Final

Engineering Evaluation and Cost Analysis Former Camp Croft Army Training Facility

Prepared for:
U.S. Army Engineering and Support Center
Huntsville

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List of Acronyms and Abbreviations

AOI	areas of interest
ARARs	Applicable or Relevant and Appropriate Requirements
ASR	Archive Search Report
cal	caliber
CCATF	Camp Croft Army Training Facility
CD	Charleston District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm/sec	centimeters per second
CWM	chemical warfare material
DDESB	Department of Defense Explosives Safety Board
DEM	digital elevation models
DO	Delivery Order
DoD	U.S. Department of Defense
DTIC	Defense Technical Information Center
EE/CA	Engineering Evaluation/Cost Analysis
EEG	Ellis Environmental Group, LC
EM	Electromagnetics
EMM	Earth-moving machinery
ft	foot
ft-bl	foot below land surface
°F	degree Fahrenheit
FUDS	Formerly Used Defense Sites
gal/day	gallons per day
GIS	geographic information system
GPR	Ground Penetrating Radar
HE	high explosive
HEAT	high explosive anti-tank
HFA	Human Factors Applications, Inc.
lb	pound
m	meter
MTV	Mobility, Toxicity, or Volume
NCP	National Oil and Hazardous Substances Contingency Plan
NGVD	national geodetic vertical datum

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NTCRA	non-time critical removal action
O&M	operation and maintenance
OE	ordnance and explosives
OE*Cert*	Ordnance and Explosives *Cost Effectiveness Tool*
OES	OES, Inc.
OOU	Ordnance Operable Unit
ORS	ordnance-related scrap
OSHA	Occupational Safety and Health Administration
QA	quality assurance
QC	quality control
QST	QST Environmental Inc.
ROEs	right-of-entries
SAR	synthetic aperture radar
SASR	Supplemental Archive Search Report
SOP	Standard Operating Procedures
SOW	Statement-of-Work
SRA	Safety Risk Assessment
SSHP	Site-Specific Safety and Health Plan
TCRA	time-critical removal action
TEAE	Total Expected Annual Exposures
USAESCH	U.S. Army Engineering and Support Center, Huntsville
UXO	unexploded ordnance
WP	work plan

1.0 Executive Summary

1.0.1 The U.S. Army Engineering and Support Center, Huntsville (USAESCH) contracted QST Environmental Inc. (QST) to perform an Engineering Evaluation/Cost Analysis (EE/CA) at the former Camp Croft Army Training Facility (CCATF). The purpose of this EE/CA is to analyze removal alternatives to reduce the risk of public exposure to ordnance and explosives (OE) and unexploded ordnance (UXO) at the site.

1.0.2 Former CCATF, located 5 miles southeast of the city of Spartanburg in Spartanburg County, South Carolina, operated during World War II to train soldiers in the use of weapons including cannons, mortars, anti-tank rockets, machine guns, hand grenades, and small arms. Following closure of the 19,000-acre facility, the government transferred approximately 7,000 acres to the South Carolina Commission of Forestry for the creation of the current Croft State Park. The remaining property was sold by the War Assets Administration to the public for residential, business, and agricultural use. Although the government had previously taken steps to clear former CCATF of ordnance waste and potentially explosive ordnance items, some ordnance contamination remained.

1.0.3 This EE/CA, conducted under Contract No. DACA87-92-D-0018, Delivery Order No. 0028, was the second EE/CA (designated the Phase II EE/CA) performed by QST at former CCATF. QST previously completed an EE/CA (Phase I) under Delivery Order No. 0013 during 1995 and submitted a Final EE/CA Report in January 1996 (ESE, 1996a). Only one Phase I EE/CA site was revisited [Ordnance Operable Unit 3 (OOU3)] during the Phase II EE/CA. The complete Statement-of-Work (SOW) for the Phase II EE/CA is detailed in Appendix A.

1.0.4 The Phase II EE/CA field investigation was conducted at former CCATF from January 6, 1997 through March 26, 1997. One hundred-thirty grids were sampled for OE/UXO. Forty-nine of the grids were located inside of Croft State Park and 81 grids were located outside of the park on private property. The grids were generally 50 by 50 feet (ft) at residential areas and 100 by 100 ft in undeveloped areas. All EE/CA investigation procedures were followed according to the Work Plan (December 1996) except where amended and approved by USAESCH.

1.0.5 This EE/CA addresses five OOUs where OE/UXO was either previously confirmed or suspected. OOUs are areas within former Camp Croft that have commonality of land use and OE/UXO type. One OOU (OOU10) lies entirely within Croft State Park. OOU9 contains property that lies within the park (OOU9A through OOU9E) and outside of the park (OOU9F through OOU9H). The remaining three OOUs (OOU3, OOU11, and OOU12) are located in private property sites outside the park but within the former CCATF boundary.

1.0.6 UXO contamination was confirmed during the EE/CA investigation at OOU3, OOU10, and OOU12.

1.1 Risk Reduction Alternatives

Alternatives to reduce the risk of public exposure were considered for each OOU. Alternatives included the following:

- No Further Action,
- Institutional Controls,
- Surface Clearance, and
- Clearance for Use.

1.1.1 The *No Further Action* alternative means that no OE removal action will be implemented to reduce risk of public exposure.

1.1.2 The *Institutional Controls* alternative may include restricting site access with fencing, providing warnings by posting signs, and educating the public through media such as notices and newspaper articles.

1.1.3 *Surface Clearance* involves removing OE/UXO visible on the surface and all such items that may be submerged but protrude through the surface. *Clearance for Use* consists of removal of OE/UXO down to depths in accordance with Department of Defense Explosives Safety Board (DDESB) guidelines, depending on the type of planned activity or construction at the OOU.

1.2 Croft State Park Ordnance Operable Units

OOU9 (Sectors A through E) and OOU10 (Sectors A through D) are located within Croft State Park property. OOU9 covers approximately 1,036 acres, of which 306 acres (Sectors A through E) are inside Croft State Park. OOU10 comprises 210 acres, all within the park boundary. All items found in OOU9 were generally associated with small arms. EE/CA sampling indicated that the entire OOU10 contained significant amounts of ordnance-related scrap (ORS) associated with higher order detonations. OOU10 Sector A contained a single intact inert 2.36-inch practice round. No UXO was discovered in OOU9 or OOU10.

1.2.1 The activities in OOU9 are generally limited to recreational surface uses (hiking and horseback riding), and since no UXO was discovered during the investigation, the No Further Action alternative

is proposed for implementation at OOU9 Sectors A through E. It would be prudent to perform surface clearance if any construction is performed in OOU9, such as proposed horse trails in Sectors 9A, 9B, and 9C.

1.2.2 Activities in OOU10 Sectors A through D are generally limited to recreational surface use (hiking and horseback riding), with little potential for intrusive subsurface activities. Therefore, the Surface Clearance alternative is proposed for implementation at OOU10. Surface Clearance consists of brush clearance, geophysical surveys to locate surface anomalies, recovery/disposal of OE/UXO, and site restoration.

1.3 Private Property Ordnance Operable Units

OOU3, OOU9 (Sectors F through H), OOU11, and OOU12 are all located on private property outside of Croft State Park. OOU9 (Sectors F through H) were identified as a small arms range. OOU3, OOU11, and OOU12 were all confirmed as grenade and/or mortar impact areas; UXO was discovered at OOU3 and OOU12. OOU9 covers approximately 1,036 acres, of which 730 acres (comprising Sectors F through H) are located outside of the park. OOU11 is 87 acres in size, OOU12 is 94 acres, and OOU3 is 46 acres.

1.3.1 OOU9 Sectors F, G, and H are owned by local residents. Sectors 9F and 9H are located in areas with a moderate density of trees and underbrush. Sector 9G is located in an area of residential lawn mixed with moderately dense forest. No UXO or large item ORS were found during the Phase II EE/CA investigation within OOU9 Sectors F, G, and H; the No Further Action alternative is proposed for OOU9 Sectors F, G,and H.

1.3.2 OOU3 (Wedgewood subdivision) was previously investigated as a part of the Phase I EE/CA investigation and based on initial findings, expanded to include additional areas during the Phase II EE/CA investigation. The total investigation area included approximately 46 acres which comprises the entire Wedgewood subdivision. Practice grenades, ORS and 2.36-inch rocket fragments that may have been an overshot from another local firing range were found during the Phase I EE/CA investigation. A removal action performed in March 1997, recovered a total of seven UXO items (all MK II fragmentation grenades) in a 2.6-acre area.

1.3.3 Because OOU3 is comprised of private residential property, prevention of intrusive activities (e.g., children digging, planting, pool construction, installation of utility lines) is impracticable. Therefore, Clearance for Use is the recommended risk reduction alternative for the expanded OOU3 area.

1.3.4 OOU11 (Sectors A through D) includes approximately 87 acres outside of Croft State Park where ORS was found during the Phase II EE/CA investigation. OOU11 is subdivided into four sectors based on their physical location. OOU11 Sector A is located in an area previously used for training maneuvers. The top of a grenade and a 60-mm practice mortar (expended) were found at this site. OOU11 Sector B is also located in area used for training maneuvers. Items found at this site included small arms and grenade ORS. OOU11 Sector C is located in an area where M9 rifle grenade fragments were found. This ORS was most likely from training activities. OOU11 Sector D is located in an area suspected as a former grenade range. Ordnance has been reportedly found at Sector 11D in the past but none was found during the Phase II EE/CA investigation.

1.3.5 OOU11 is privately owned and undeveloped with the exception of Sector 11D (Cotton Creek Golf Course). There are less than 100 visitors per year estimated and little recreational activities other than hiking at Sectors 11A, 11B, and 11C. Approximately 25,000 persons per year play golf at Sector 11D (Cotton Creek Golf Course). No UXO was found at OOU11 during the Phase II EE/CA investigation. The ORS found was indicative of high order detonations and were found less than 20-inches deep with most items less than one foot in depth. Also, UXO has reportedly been found and disposed by Cotton Creek Golf Course personnel in the past. Therefore, the risk reduction alternative recommended for OOU11 is Clearance for Use.

1.3.6 OOU12 (Sectors A and B) is comprised of 94 acres divided into two sectors based on their physical location. Sector 12A includes 78 acres located north of the park near the intersection of Dairy Ridge Road and State Route 295. Sector 12B includes 16 acres located south of the park, west of Forest Mill Road. OOU12 Sector A is located in an area suspected of being an impact range for high explosive ordnance. Items identified at this site included: M9 Rifle Grenades, 2.36-inch rockets, practice M6A3 Rifle Grenades, M11 Practice Rifle Grenades, and MK II Fragmentation Hand Grenades. OOU12 sector 12B is located in an area which may have been used for training maneuvers. The only UXO found at this site was a live M9 Rifle Grenade. The lack of any other type of ORS indicates that this area had only limited training use.

1.3.7 All ordnance items found were less than 21 inches deep at sector 12A and 4 inches deep at Sector 12B. Most items were found less than 1 foot (ft) deep at Sector 12A. The risk reduction alternative recommended at OOU12 is Clearance for Use.

1.4 Risk Reduction Summary

The risk reduction alternatives recommended for each of the OOUs investigated during the Phase II EE/CA are as follows:

- OOU3 - Clearance for Use
- OOU9 - No Further Action
- OOU10 - Surface Clearance
- OOU11 - Clearance for Use
- OOU12 - Clearance for Use

1.4.1 Analysis of the cost of implementation and the estimated risk reduction were performed as part of the EE/CA analysis. By reviewing the cost and estimated exposure reduction analysis, it can be ascertained that significant risk reduction can be obtained cost effectively by implementing "surface clearance" alternative for OOU10, OOU11, and OOU12; and it would appear that this alternative could be the recommended alternative; however, due to the fact that OOU11 and OOU12 are on residential properties, a higher level of remedial activity, clearance for use, was selected.

2.0 Site Characterization

2.1 Introduction/Authorization

On March 30, 1995, QST received Contract No. DACA87-92-D-0018, Delivery Order (DO) No. 0028, Annex AA, from the USAESCH, to conduct an EE/CA at the former CCATF. QST has prepared this EE/CA in accordance with the National Oil and Hazardous Substances Contingency Plan (NCP) and the special requirements of the SOW for Delivery Order No. 0028. A copy of the SOW is included as Appendix A. The NCP and SOW provide the basis for selecting the corrective action alternatives to reduce public safety risks associated with OE at the former CCATF area. USAESCH has chosen to generally follow the NCP guidance for conducting EE/CAs to analyze risk-reduction alternatives for Formerly Used Defense Sites (FUDS) that may be contaminated by OE.

2.1.1 Objectives

This report is prepared to meet the requirements set forth in the SOW. The report objectives include:

- Determining the nature and extent of OE contamination at former CCATF,
- Documenting the investigations and evaluating removal response alternatives for former CCATF, and
- Recommending the most cost-effective actions to reduce the public safety risk associated with exposure to OE at former CCATF

2.1.1.1 The steps taken to prepare this EE/CA and arrive at the recommendations for risk-reduction alternatives at former CCATF have included reviewing existing data, conducting a site visit, developing a trip report after the site visit, preparing a site-specific work plan (WP), performing field investigations, collecting and compiling field data, collecting additional data, preparing cost estimates, and evaluating the risk-reduction alternatives.

2.1.2 Definitions

The following definitions will be used for the purposes of this report:

- Unexploded Ordnance (UXO)—All ordnance items that may potentially be explodable or ignitable,
- Ordnance-Related Scrap (ORS)—All ordnance items that clearly are not explodable or ignitable,
- Ordnance and Explosives (OE)—Includes all ORS and UXO items as defined previously, and
- Ordnance—Military supplies (i.e., weapons and ammunition).

2.2 Facility Description and History

2.2.1 Camp Croft Facility Description

The former CCATF covers approximately 19,000 acres and lies south of Spartanburg in Spartanburg County, South Carolina. Figure 2-1 shows the location and boundary of the former CCATF.

2.2.2 General Military History

Camp Croft was established in January 1941 as an army training facility. The camp consisted of two general areas: a series of training, firing, and impact ranges (16,929 acres); and a troop housing (cantonment) area with attached administrative quarters (1,742 acres). The firing ranges at the former CCATF consisted of pistol, rifle, machine gun, mortar, anti-aircraft, and anti-tank ranges. OEW/UXO that may be encountered at the former CCATF include: .30-caliber (cal) and .50-cal small arms rounds; 20-mm hand and rifle smoke, tear gas, and incendiary grenades; 60- and 81-mm high explosive (HE) practice, smoke, tear gas, and illumination mortar rounds; and 2.36-inch high explosive anti-tank (HEAT) smoke, incendiary, and practice rockets. The former CCATF also contained a gas chamber/gas obstacle course area (199 acres) where realistic chemical warfare training was conducted, and a practice grenade court (175 acres). The training range impact area (Area A), cantonment (Area B), grenade court (Area C), and gas chambers and gas obstacle course (Area D) locations are shown in Figure 2-2.

2.2.2.1 In 1947, the entire acreage of the former CCATF was declared surplus by the War Assets Administration. By 1950, the Army sold the land in pieces to organizations and businesses. This sale also included the transfer of 7,088 acres of land to the South Carolina Commission of Forestry for the creation of Croft State Park. The remaining acreage has been converted to residential housing, churches, and industrial and commercial businesses. The gas chamber and gas obstacle course have been removed, and no evidence of past chemical training is found at the site.

2.2.3 Environmental Setting

The following sections reference information gathered from the Archive Search Report (ASR) (USACE, 1994) and the Croft State Park Management Plan (South Carolina Department of Parks, Recreation, and Tourism). The referenced author, Terry A. Ferguson, provides the geologic detail at Croft State Park in the Croft State Park Management Plan.

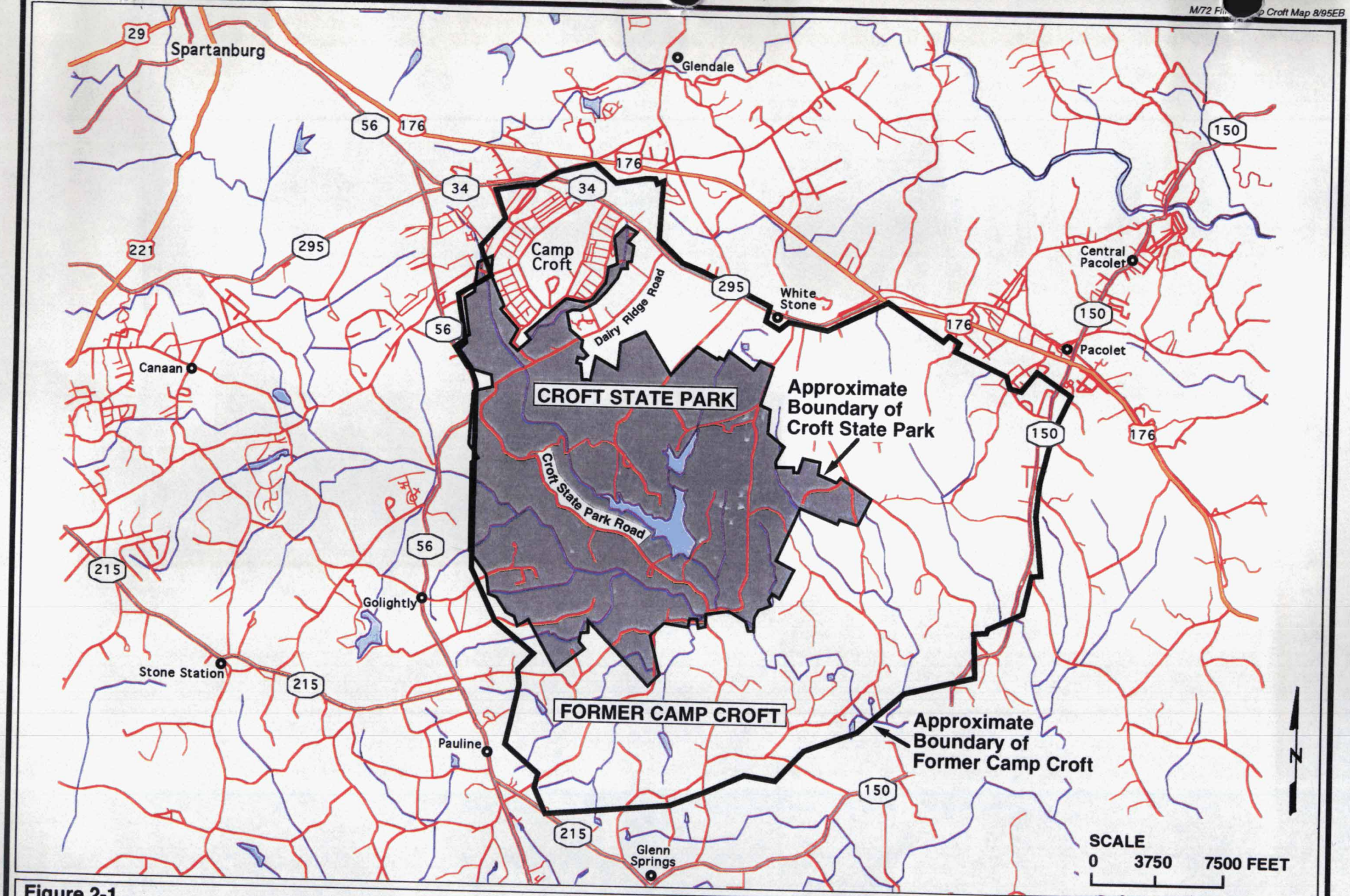
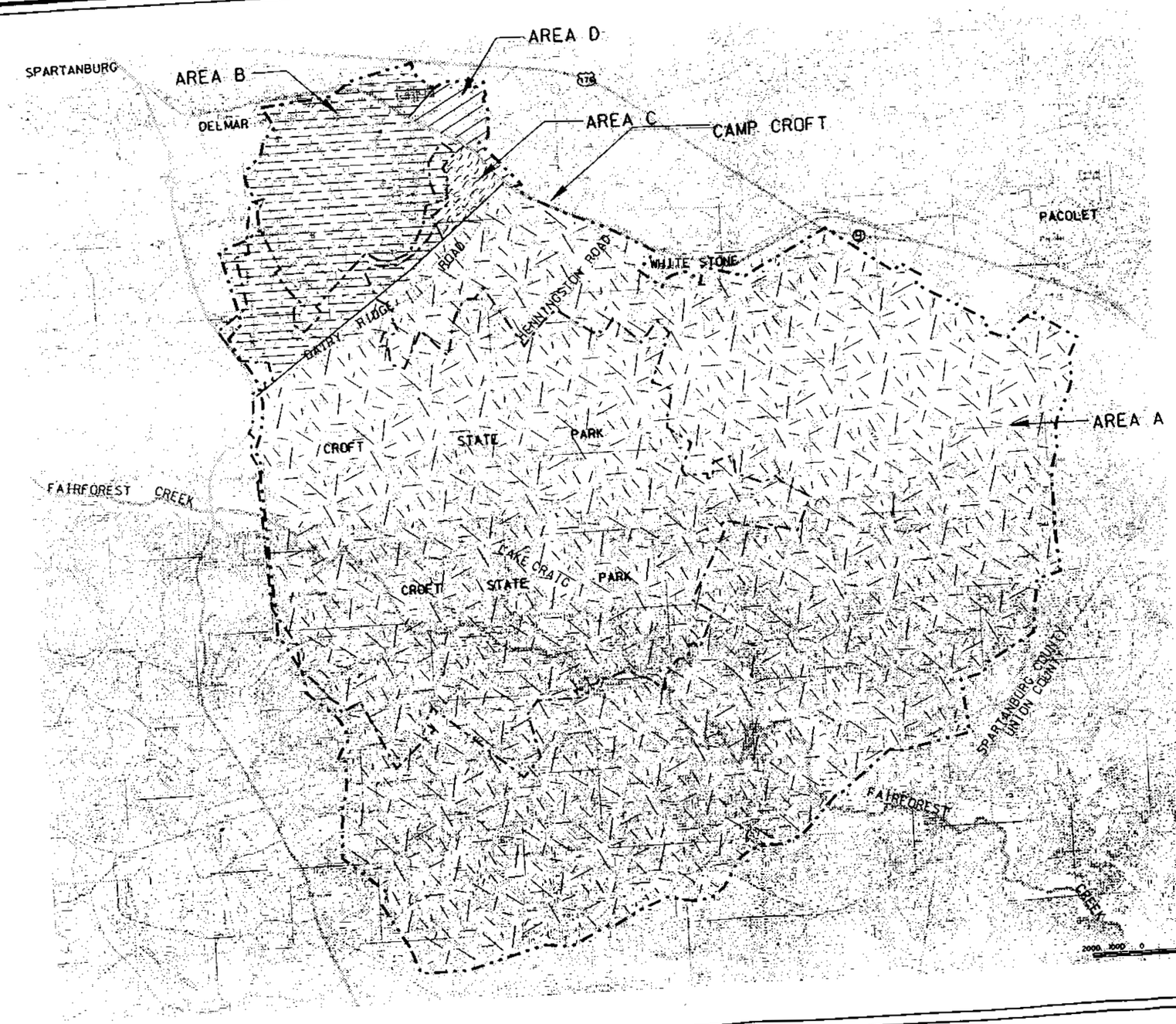


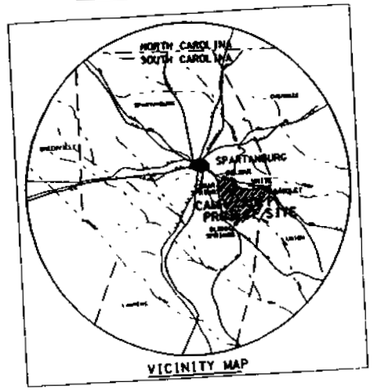
Figure 2-1
FORMER CCATF LOCATION MAP

SOURCE: QST.

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNSTVILLE





LEGEND

- CAMP CROFT BOUNDARY
- CROFT STATE PARK BOUNDARY
- INTERSTATE, STATE HIGHWAY
- AREA A = TRAINING RANGE IMPACT AREA
- AREA B = CANTONMENT AREA
- AREA C = GRENADE COURT
- AREA D = GAS CHAMBERS AND GAS OBSTACLE COURSE AREA

N

APPROXIMATE SCALE
0 2500 5000 FEET

Figure 2-2
FORMER CCATF TRAINING AREAS

SOURCE: QST.

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

2.2.3.1 Geology

Croft State Park is underlain by Paleozoic age metamorphic and igneous rock (Ferguson, 1988). Two distinct rock belts, the Inner Piedmont Belt and the Kings Mountain Belt, lie within Spartanburg county and trend northeast to southwest, bisecting the park.

2.2.3.1.1 The Inner Piedmont Belt underlies the western portion of the park. It is comprised mainly of biotite and granitic gneisses, with several types of igneous rock and igneous intrusions. Outcrops of igneous intrusions in this belt primarily occur as undeformed granite and diabase dikes along a northeast to southwest trending line in the northwest portion of the park. A diabase dike also outcrops in the vicinity of one of the granite outcrops.

2.2.3.1.2 The Kings Mountain Belt underlies the eastern portion of the park and is comprised of pegmatite and diabase dikes. The pegmatite dikes lie in the northeast portion of the park, and the diabase dikes lie in the southeast-central portion of the park. Diabase dikes of Mesozoic age lie within the park and are underlain by the Pacolet granite. A diabase dike lies along the eastern edge of the park.

2.2.3.1.3 The easternmost portion of the park is underlain by granite of Devonian age associated with the Pacolet Mills pluton. The granite is reported as metacrystic, biotite-rich, and granodioritic in composition.

2.2.3.1.4 The Inner Piedmont Belt and the Kings Mountain Belt are separated by the Kings Mountain Shear Zone. These Late Paleozoic age rocks are assigned to the Battleground Formation. The Battleground Formation includes low- to medium-grade metamorphic, volcanic and sedimentary rocks. It includes manganiferous mica schist with concordant layers of gondite, and trends northeast to southwest across the east-central portion of the park.

2.2.3.2 Soils

Native soils in the study area are saprolitic. Saprolite is formed from rock that has been subjected to chemical weathering. Overlying layers of weathered residual bedrock known as saprolite (red clay) range from a few feet thick to more than 100 ft thick. Median thickness is 50 to 60 ft. Saprolite depth varies from 20 to 400 feet below land surface (ft-bls).

2.2.3.2.1 A soil survey conducted in 1968 by the Soil Conservation Service (Croft State Park Management Plan) shows 53 different soil types in the park. Most of the soils are eroded, and land is

gullied as a result of previous land uses. The soil survey listed 19 different areas that feature gullies; some feature one or two large gullies, while others feature an expanse of several acres with a series of small gullies.

2.2.3.2.2 Much of the erosion took place when cotton farming was an active enterprise. More occurred when portions of the area were used for military training as part of Camp Croft. Encroaching forest slowed erosion in the late 1940s, stabilizing most of the gullies. Colonization by shortleaf pines also improved soil moisture retention and added organic material to the soil.

2.2.3.2.3 Most of the severely eroded soil lies in the former cantonment area in the northwestern portion of former CCATF. Cataula clay loam with a 2- to 15-percent slope and mixed alluvial land overlies the area. Congaree soil traverses the northwest area of the park and lies in the far northern portion of the former cantonment area and in the central portion of the park. The floodplain banks of Fairforest Creek also consist of Congaree soils. Eroded Madison sandy loams with a 15- to 25-percent slope comprise the remaining area.

2.2.3.2.4 The northern portion of Croft State Park is comprised of Madison sandy loams with a 15-to 25-percent slope (eroded soil). Madison clay loam with a 15- to 40-percent slope also lies in the northern portion of the park (severely eroded soil). Eroded soil types including the Cataula clay loam, with a 2- to 6-percent slope, sparsely occur in the northern portion of the park. Moderately gullied land lies in the north-central portion of the park and holds friable materials and 10- to 40-percent slopes.

2.2.3.2.5 The remaining portion of the park consists of eroded and severely eroded soils in the vicinity of Lake Johnson and Lake Craig. Moderately gullied land consisting of Congaree soils lies in the southwestern portion of the park along Fairforest Creek's floodplain.

2.2.3.3 Weather

The Spartanburg County climate is considered temperate, and rainfall is well-distributed throughout the year. The prevailing winds are from the southwest, but blow from the northeast in late summer and early fall. Average wind velocity is about 8 miles per hour. The average annual relative humidity is approximately 70 percent. Rainfall ranges from 1/10-inch (approximately 76 days per year) to 1 inch (approximately 14 days per year). The highest yearly rainfall recorded is 73.93 inches in 1929. Warm weather generally lasts from May into September, with few breaks in the heat during midsummer. Most summers have one or more days when the temperature exceeds 100 degrees Fahrenheit (°F). Winters are mild and relatively short, with approximately 60 days at freezing temperatures or below.

2.2.3.4 Water Resources

Two major surface water features, Lake Johnson and the Lake Craig, lie in Croft State Park and were formed by the construction of a dam in 1951. Lake Craig, the larger lake, covers approximately 150 acres and lies in the south-central portion of the park. Lake Johnson covers approximately 75 acres and lies just north of Lake Craig. Fairforest Creek runs along the southern boundary of the park. Drinking water is not believed to be obtained from Lake Johnson or Lake Craig. Farmers in the former CCATF area are believed to have water wells used to irrigate crops and livestock. A well survey would identify potential water sources in the area.

2.2.3.5 Physiography and Surface Water Drainage

Croft State Park elevations range from 210 to 225 ft national geodetic vertical datum (NGVD) in the northwestern portion of the park in the former cantonment area. A gradual change in topographic relief occurs in the remaining portion of the former CCATF with elevations ranging from 180 to 255 ft NGVD. Surface water drainage is primarily from the topographic high to lower elevations into the surface water features. Surface water features identified at former CCATF include Fairforest Creek, Kelsey Creek, Thomson Creek, Lake Craig, and Lake Johnson.

2.2.3.6 Groundwater

The saprolite unit within Croft State Park contains a heterogeneous mixture of sand, silt, and clay with an approximate hydraulic conductivity of 10^{-4} to 10^{-7} centimeters per second (cm/sec). The Hornblende Gneiss Bedrock beneath the saprolite has an estimated permeability greater than 10^{-3} cm/sec. The saprolite and bedrock units are considered to be interconnected and make up the aquifer in this region.

2.2.3.6.1 Groundwater depth in the southwest section of Croft State Park (near the county landfill) is 20 to 30 feet below ground surface. The saprolite in this area has a potential yield of 72,000 gallons per day (gal/day), versus 201,600 gal/day for the bedrock unit. No groundwater data were made available for other areas of the park.

2.2.4 EE/CA Investigation Areas

Much of the former CCATF has been considered potentially contaminated with OE because incomplete record keeping and limited availability of archive data has not been sufficient to eliminate areas from further investigation. The main areas of EE/CA investigations have been in the former training range impact area. Additional areas were investigated in the former cantonment area and the practice grenade court area. The gas chamber/gas obstacle course no longer exists and no historical recorded evidence was located to document and confirm the presence of chemical warfare material

(CWM) or OE since site closure (ASR, USACE, 1994). One hundred-thirty sampling grids were investigated by QST during the January through March 1997 EE/CA investigation at former CCATF. Forty-nine grids were sampled in Croft State Park. Eighty-one grids were sampled in privately owned areas. Although some areas were developed (with homesites), most private properties investigated were undeveloped.

2.2.4.1 Croft State Park Area EE/CA Investigations

Croft State Park consists of approximately 7,000 acres or one-third of the former CCATF total of 19,000 acres. The previous EE/CA investigations in the park have centered around the high use areas (camping grounds, the equestrian area, hiking and horse trails). The number of park visitors, which averaged approximately 155,000 a year between 1992 to 1995, was reduced to 54,000 in 1996 (according to Croft State Park Ranger, March 1997). The closure of park areas for the EE/CA investigations was the primary cause for the reduction of visitors in 1996. The majority of the 1997 EE/CA sampling grids were in more remote areas of the park. The sampling grid locations and results of the 1997 EE/CA investigation are detailed in Section 2.4.

2.2.4.1.1 There are currently five horse trails, totaling approximately 20 miles, throughout the park area. An additional four horse trails, totaling approximately 10 miles, are proposed for completion during 1997. The location of the existing and proposed horse trails is shown in Figure 2-3. The EE/CA investigations that were conducted on or near the horse trails are discussed in Section 2.4.

2.2.4.2 Private Property EE/CA Investigations

Approximately 12,000 acres, or two-thirds of the former CCATF, is privately owned. The former cantonment area is now primarily housing developments, small businesses, and a golf course. The majority of the former training range impact area (to the south, southeast, and east of the park) is wooded and undeveloped, with some homesites. The originally proposed EE/CA sample grid locations were presented in the WP (ESE, 1996e) for this EE/CA report. However, right-of-entries (ROEs) were not received for some sites which therefore could not be investigated.

2.3 Previous OE Investigations

2.3.1 Identification of EE/CA Sampling Sites

In the December 1996 Final Work Plan, QST proposed that 77 sites be sampled at former CCATF. The selection of the sites was based on information from the Supplemental Archive Search Report (SASR) (ESE, 1996c), site reconnaissance activities, and the Supplemental Engineering Report (ESE, 1996d). USACE Charleston District (CD) also recommended that several additional sites be sampled during the January through March 1997 EE/CA sampling field effort.

2.3.2 1984 Site Survey of Former CCATF

In 1984, USACE-CD conducted a site survey of the former CCATF. This study concluded that the "potential for unexploded and dangerous bombs, shells, rockets, mines and charges either upon or below the surface" could be found at the former CCATF.

2.3.3 1990 Site Screening Investigation

In 1990, a report by the South Carolina Bureau of Solid and Hazardous Waste Management, Department of Health and Environmental Control, documented a site screening of the domestic landfill located near the former CCATF. This landfill was first used in 1971, and no records were available to indicate any use of this landfill by the U.S. Department of Defense (DoD) or the existence of any previous U.S. Army landfill at this site.

2.3.4 1991 Preliminary Assessment

In 1991, USACE-CD conducted a Preliminary Assessment Study of this site. This study determined that the site was eligible for further investigation under DERP for FUDS. This study also determined that the site contains several locations where drums were placed inside wells during the closure procedures conducted at the site. The report generated by this assessment did not indicate the presence of soil or groundwater contamination due to medical, ordnance, or chemical weapons.

2.3.5 1994 OE ASR

In 1994, the USACE, Rock Island District conducted a site inspection and archives search of the former CCATF (USACE, 1994). The final report, dated April 1994, outlined the nature and degree of OE/UXO contamination to be found at the former CCATF. This report listed the ordnance that may be found at or below the surface (see Section 2.2 of the ASR). This report also stated that the gas chamber and gas obstacle course no longer exist, and that no historical recorded evidence was located to document and confirm the presence of chemical ordnance since site closure. It did state, however, that based on the nature of the former CCATF's training mission, the potential for chemical ordnance or chemical contamination of the area's soil does exist. It is believed that chemical training during that period would have involved the use of CN, a tear agent, as the training chemical.

2.3.6 1995-1996 CCATF Phase I EE/CA

In 1995 and 1996, QST completed an EE/CA at the former CCATF (ESE, 1996a). The purpose of this EE/CA was to analyze removal alternatives to reduce the risk of public exposure to OE/UXO at sites previously identified in the 1994 ASR (USACE, 1994). The EE/CA addressed nine OOUs where OE/UXO was either previously confirmed or suspected. Six OOUs were within Croft State Park and the remaining three OOUs were private property sites located outside the park but within the former CCATF boundary. The CCATF Phase I (Croft I) OOU locations developed for the Croft I EE/CA report are shown in Figure 2-4.

2.3.6.1 From the investigation and data developed after the investigation, numerous additional areas of suspected potential contamination were identified. However, due to the limited scope of the EE/CA, these areas were not addressed at that time.

2.3.6.2 UXO contamination was confirmed during the Croft I EE/CA investigation at five of the nine OOUs. Three of the five contaminated OOUs were within Croft State Park (OOU1B, OOU2, and OOU7). The remaining two were on private property (OOU3 and OOU6).

2.3.6.3 OOU1B, OOU2, and OOU7 were each confirmed as former mortar impact areas. Several 60- and 81-mm unexploded mortars were discovered. Evidence of 2.36-inch rockets and 4.2-inch mortars were also discovered; however, only as ORS and not as UXO. No UXO was discovered in OOU1A, OOU4, or OOU8.

2.3.6.4 At OOU1A, a 1,020-acre wooded area located in the northwest corner of the park, findings were limited to inert 37- and 57-mm projectiles (scrap). No UXO was found. The USAESCH risk contractor, QuantiTech, Inc. (QuantiTech) estimated a zero exposure probability.

CRFTFIG21

NOV 1997

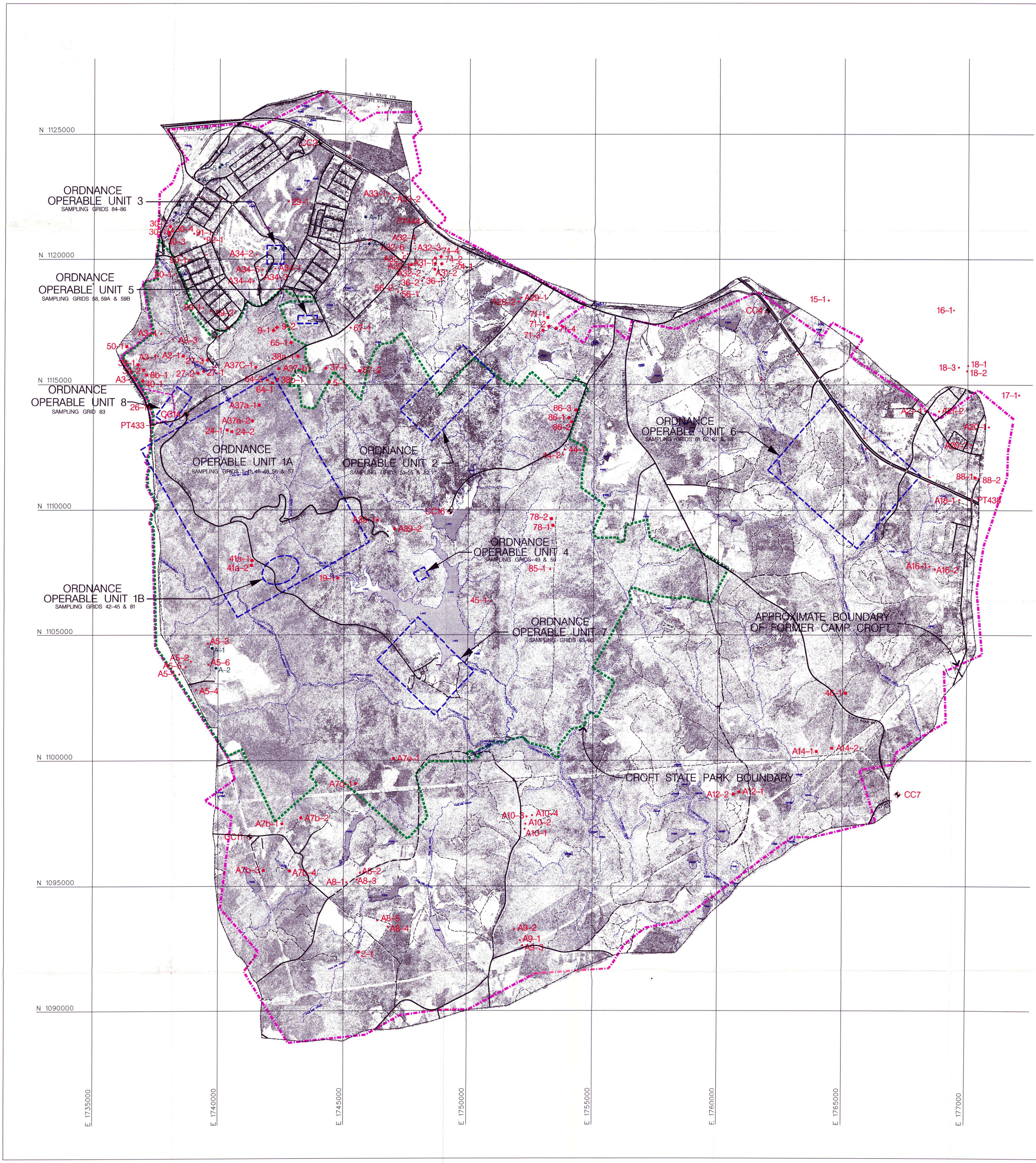


Figure 2–4

EE / CA I INVESTIGATION, ORDNANCE OPERABLE UNITS 1 THROUGH 8

SOURCE: QST 1997; USGS 1983

LEGEND

(magenta dash-dot line)	APPROXIMATE BOUNDARY OF FORMER CAMP CROFT AREA
(green dotted line)	BOUNDARY OF CROFT STATE PARK
(lines)	ROADS
(blue line)	STREAMS
(blue dashed box)	ORDNANCE OPERABLE UNITS
+	CONTROL POINT
A5–1 •	50 x 50 FOOT SURVEY GRID
A39–1 ■	100 x 100 FOOT SURVEY GRID
J–3 ●	HFA SURVEY GRID
CC16 ⊕	SURVEY MONUMENT

NOTE: COORDINATES ARE STATE PLANE IN FEET.

0 500 1000
METERS
0 1500 3000
FEET

N

SCALE: 1" = 1500FT

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2.3.6.5 Because the activities in OOU1A are generally limited to recreational surface uses (hiking and horseback riding), and since no UXO was discovered during the investigation, the No Further Action alternative was proposed for implementation at OOU1A.

2.3.6.6 At OOU1B, a 65-acre forested area located within the center of the park, twelve 60-mm and one 81-mm mortars (UXO) were discovered. QuantiTech estimated a maximum UXO density of 12 per acre for OOU1B, based on the size of the area, percent of area that was sampled, and the number of UXO found within the sampled area.

2.3.6.7 Activities in OOU1B are generally limited to recreational surface use (hiking and horseback riding), with little potential for intrusive subsurface activities. Therefore, the Surface Clearance alternative was proposed for implementation at OOU1B.

2.3.6.8 At OOU2 (a 325-acre area located on the east side of the park, approximately 0.7 mile from State Highway 295) nineteen 60-mm and one 81-mm mortars (UXO) were discovered. A single piece from a 4.2-inch mortar discovered during the investigation suggests that the area may have also been used as a 4.2-inch mortar target. However, no unexploded 4.2-inch mortars were found. QuantiTech estimated a maximum UXO density of nine per acre for OOU2.

2.3.6.9 Activities in OOU2 are generally limited to recreational surface use (hiking and horseback riding) with little potential for intrusive subsurface activities. Therefore, the Surface Clearance alternative was proposed for implementation at OOU2.

2.3.6.10 OOU7, located near the park office and campgrounds, is the busiest area of the park. Sixty 60-mm and two 81-mm mortars (UXO) were discovered during the EE/CA investigation and a follow-up time-critical removal action (TCRA) was performed by USAESCH's removal contractor, Human Factors Applications, Inc. (HFA). The TCRA was limited to surface clearance. Evidence of 2.36-inch rockets was discovered at OOU7 during the TCRA, but only as ORS and not as UXO. Based on the data developed during the EE/CA investigation combined with data from the TCRA, Quantitech estimated a maximum UXO density of 49 per acre and an exposure probability of ½ to 1/3.

2.3.6.11 UXO was discovered in this high activity area where potentially intrusive activities are planned. Therefore, the Clearance to Depth alternative was proposed.

2.3.6.12 At OOU4, a small area located in the center of the park near the swimming pool, findings were limited to .30-caliber slugs. No other ORS or UXO was found.

2.3.6.13 Activities in OOU4 are generally limited to recreational surface use (hiking and horseback riding) and since no other evidence of ORS or UXO was found, the No Further Action alternative was proposed.

2.3.6.14 At OOU8, a small area located in the northwest corner of the park just north of Dairy Ridge Road, the only ORS findings consisted of 14 empty mine shipping containers found by HFA during an earlier investigation directed by USAESCH. No OE or UXO was discovered during the EE/CA investigation.

2.3.6.15 Activities in OOU8 are generally limited to surface use and since no evidence of OE or UXO was found during the EE/CA investigation, the No Further Action alternative was proposed.

2.3.6.16 OOU3 is in a private residential area north of the park. The area was investigated due to past reports that hand grenade parts had been found. Findings during the EE/CA investigation included one MK-2 fragmentation grenade, numerous practice hand grenades, and grenade parts, suggesting that the area may have been a former grenade practice area. QuantiTech estimated a maximum UXO density of 7 per acre for OOU3 and an exposure probability ranging from zero to 1/300,000.

2.3.6.17 For OOU3, the Clearance to Depth alternative was proposed. A negligible exposure probability was estimated for this OOU. However, because it was private residential property and prevention of intrusive activities (e.g., children digging, planting, pool construction, installation of utility lines) is impracticable, clearance to depth was considered appropriate at OOU3.

2.3.6.18 OOU5 is also in a private residential area north of the park. It was investigated for similar reasons as OOU3. However, findings were limited to one rifle grenade part (tail boom). No UXO was found.

2.3.6.19 Since no UXO was found at OOU5, the No Further Action alternative was proposed.

2.3.6.20 OOU6 contains an area of approximately 340 acres of privately owned land that is currently being developed for agricultural and industrial purposes, including tree farming and industrial landfills. It was investigated due to reported findings of 105-mm Howitzer rounds. UXO findings as a result of a USAESCH-authorized TCRA and a limited EE/CA investigation included nine 105-mm smoke canisters, two 105-mm fuzed ejection rounds, one explosive burster, two 60-mm mortars, and one 81-mm illumination mortar. QuantiTech estimated a maximum UXO density of 1.31 per acre for OOU6 and a probability of exposure of zero to ½.

2.3.6.21 For OOU6, the Government Buyback alternative was proposed and rejected. The Government is pursuing a design effort to identify areas for no further action, surface clearing, and clearance to a specified depth.

2.3.7 1995-1996 Evaluation and Mapping

In 1995 to 1996, QST performed orthophotography and geographic information system (GIS) development for evaluation and prioritization of OE removal at former CCATF (ESE, 1996b). The purpose of the assignment was to develop a plan of action that could be used in the future to facilitate the efficient investigation, identification, and removal of suspected OE at the former CCATF with the prediction of the presence and location of OE to be accomplished through the study of historical records and the evaluation of past and current land use.

2.3.7.1 This report presented the results of analyses for the former CCATF. The analyses focused on the characterization and prioritization of potential OE and included GIS, historical records evaluation, and the integration of synthetic aperture radar (SAR) data. SAR data were evaluated as a potential technological tool in OE detection.

2.3.7.2 The initial investigation focused on the identification of select areas of interest (AOI) and used historical and current information. These AOI formed the basis for subsequent evaluations and analyses. Aerial photography and orthophotography, SAR image analysis, and digital elevation models (DEM) were used to identify potential OE sites and adjacent properties.

2.3.8 1996 SASR

In March 1995, USAESCH authorized QST to prepare an SASR in an effort to locate possible additional firing, bombing, and strafing ranges at the former CCATF (ESE, 1996c). The following activities were conducted from April through August 1995 as a part of the SASR:

- Searches of national, regional, and local archives;
- Searches of databases including the DoD database-Defense Technical Information Center (DTIC), Lexis, and Nexis;
- Placement of notices in national and local publications;
- Operation of a toll-free telephone number to receive information from persons knowledgeable of past CCATF activities;
- Onsite interviews with the local populace;
- Hosted a Public Open House near the former CCATF in June 1995; and
- Conducted windshield surveys or drive by surveys to locate possible OE sites.

2.3.8.1 As a result of the SASR (ESE, 1996c), 134 sites were identified as having potential OE contamination: 95 sites were identified based on interviews and archive information and 39 additional areas (A1 through A39) were identified through the aerial photography, orthophotography, and SAR image analysis.

2.3.9 1996 Supplemental Engineering Report

In October and November 1995, QST performed a site reconnaissance of each of the 134 sites where a ROE was available from the owner(s) (ESE, 1996d). ROEs were available and a site reconnaissance was conducted at 97 of the 134 sites. The reconnaissance consisted of a non-intrusive, magnetometer survey and visual inspection of each site that could be identified. Each two-person reconnaissance team included a senior UXO specialist to assist in identifying OE and/or ordnance training sites. Windshield surveys or drive by visual surveys were conducted at 19 sites. QST was unable to conduct a site reconnaissance or windshield survey at 18 sites. A Final Supplemental Engineering Report was submitted to USAESCH in March 1996.

2.3.9.1 The Final Supplemental Engineering Report provided a completed copy of the Site Reconnaissance Field Form, along with a site sketch and photographs of each site investigated. Based on available information, each site was evaluated as follows:

- Further Reconnaissance — High Priority
  - — Live and/or fragmented OE was discovered onsite.
  - — Abundant and/or large magnetic anomalies were recorded onsite.
  - — Documented historical information exists of OE reported onsite.
  - — The site was not investigated completely or at all and the potential is high for some OE onsite.
  - — High population usage exists in the area, along with some OE potential.

  One or more of these criteria warranted a high-priority rating for further reconnaissance and/or OE sampling.
  Twenty-six sites received a High-Priority rating.

- Further Reconnaissance — Medium Priority
  - — The entire site could not be completely investigated during the site reconnaissance due to its large size.
  - — ROE was unavailable and the potential for OE exists onsite.
  - — Scattered and/or deep magnetic anomalies were recorded onsite.
  - — Some population usage exists onsite.

One or more of these criteria warranted a medium-priority rating.
Twenty-eight sites received a Medium Priority rating.

- Further Reconnaissance — Low Priority
  - — No evidence of OE was found onsite.
  - — Only a few scattered, small magnetic anomalies were recorded onsite.
  - — The site was not completed investigated, but historical information suggests that the potential for OE is remote.

  One or more of these criteria warranted a low-priority rating.
  Thirty-four sites received the Low Priority rating.

- No Further Reconnaissance
  - — No evidence was discovered onsite during the site reconnaissance.
  - — No magnetic anomalies were recorded, except for what was believed to be metallic trash or metallic rock ("hot rocks").
  - — Only small caliber (rifle) ordnance is suspected onsite.

  One or more of these criteria warranted a no further reconnaissance rating.
  Forty-six sites received a No Further Reconnaissance rating.

2.4 Phase II EE/CA Investigation

The purpose of the Phase II EE/CA investigation was to select non-time critical removal actions (NTCRAs) necessary to reduce public safety risk associated with OE at the former CCATF. The focus of this EE/CA was on the residual conventional OE risks requiring NTCRAs within the boundaries of former CCATF. The EE/CA also summarizes the factors affecting the existing risk levels using the U.S. Army's Safety Risk Assessment (SRA) model and evaluates available remedial alternatives to compare their effectiveness in reduction of overall risk.

2.4.1 Prefield Activities

The prefield activities for this project included but were not limited to the following primary tasks:

- Public meetings;
- Preparing the EE/CA WP;
- Logistics and supplies preparation, procurement, and shipping protocol; and
- Obtaining the necessary permits required for execution of the field effort.

2.4.1.1 Public Meetings

A public meeting was held during the period from June 6, 1995 through June 9, 1995 in association with delivery order No. 28. The purpose of the meeting was to inform the public of the ongoing activities at the site and to obtain additional site data to be used in the Supplemental Engineering Report (ESE, 1996d). The data presented in the Supplemental Engineering Report were the basis of this Phase II investigation.

2.4.1.2 Work Plan

The final version of the WP for this project was submitted to USAESCH on December 6, 1996, and approved on December 24, 1996. The objectives of the WP were to present the site background, field objectives, field procedures, field personnel, and field equipment to be used for the EE/CA effort.

2.4.1.2.1 The WP proposed approximate locations for the investigation sites. A total of 183 grid sites were proposed for investigation in the WP.

2.4.1.3 Special Environmental Requirements

The region within the boundaries of the former CCATF includes Croft State Park. The park contains known sensitive environmental resources such as endangered plant species. QST closely coordinated site activities with park personnel and employed a local botanist to visit each grid area. No endangered or threatened plant species were found on any of the investigated grid sites. Table 2-1 provides a list of endangered or threatened plant and animal species that may inhabit the Spartanburg County, South Carolina region.

2.4.2 Project Management

The WP defined the project objectives, identified key personnel and their responsibilities, defined project lines of communications and reporting requirements, and outlined a schedule for implementing the project. The WP was followed during the EE/CA field investigation. Project organization is shown on Figure 2-5.

2.4.3 Public Affairs

2.4.3.1 Public Affairs and Project Coordination

Mr. James Truelove, USACE-CD, is the life-cycle manager for investigation activities at former CCATF. All public affairs are coordinated by the life-cycle manager. The USAESCH, as the technical

Table 2-1. Endangered and Threatened Wildlife and Plants at Camp Croft Army Training Facility
(Page 1 of 2)

Species		Historic Range	Status
Common name	**Scientific name**		
Bat, gray	Myotis grisescens	Southeastern US	E
Cougar, eastern	Felis concolor couguar	Eastern North America	E
Panther, Florida	Felis concolor coryi	USA (LA & AR east to SC & FL)	E
Crane, whooping	Grus americana	USA (Rocky Mtns east to Carolinas)	E
Eagle, bald	Haliaeetus leucocephalus	N. America south to N. Mexico	E
Falcon, peregrine	Falco peregrinus	Worldwide	E
Pelican, brown	Pelecanus occidentalis	USA (Carolinas to TX)	E
Plover, piping	Charadrius melodus	USA (Atlantic & Gulf coasts)	E
Stork, wood	Mycteria americana	USA (TX to Carolinas)	E
Tern, least	Sterna antillarum	USA (Atlantic & Gulf coasts)	E
Tern, roseate	Sterna dougallii dougallii	Coasts of Atlantic Basin	E
Woodpecker, ivory-billed	Campephilus principalis	USA (southeastern)	E
Woodpecker, red-cockaded	Picoides (=Dendrocopos) borealis	USA (southeastern)	E
Alligator, american	Alligator mississippiensis	Southeastern USA	E
Snake, eastern indigo	Drymarchon corais couperi	USA (SC)	T
Tortoise, gopher	Gopherus polphemus	USA (SC)	T
Beetle, American burying (=Giant carrion beetle)	Nicrophorus americanus	USA (Eastern states south to FL)	E
Bunched arrowhead	Sagittaria fasciculata	USA (NC, SC)	E
Michaux's sumac	Rhus michauxii	USA (NC, SC, GA)	E
Canby's dropwort	Oxypolis canbyi	USA (MD, SC, NC)	E
Harperella	Ptilimnium nodosum	USA (AL, GA, SC, NC)	E
Dwarf-flowered heartleaf	Hexastylis naniflora	USA (NC, SC)	T
Schweinitz's sunflower	Helianthus schweintzii	USA (NC, SC)	E
Black-spored quillwort	Isoetes malanospora	USA (GA, SC)	E
Pondberry	Lindera melissifolia	USA (AL, FL, NC, SC)	T
Swamp pink	Helonias bullata	USA (GA, MD, NC, SC)	T
Relict trillium	Trillium reliquum	USA (AL, GA, SC)	E

Table 2-1. Endangered and Threatened Wildlife and Plants at Camp Croft Army Training Facility
(Page 2 of 2)

Species		Historic Range	Status
Common name	**Scientific name**		
Small whorled pogonia	Isotria medeoloides	USA (DC, DE, GA, SC)	E
Rough-leaved loosestrife	Lysimachia asperulaefolia	USA (NC, SC)	E
Mountain sweet pitcher-plant	Sarracenia rubra ssp. jonesii	USA (NC, SC)	E
Miccosukee gooseberry	Ribes echinellum	USA (FL, SC)	T
Little amphianthus	Amphianthus pusillus	USA (AL, GA, SC)	T
Treefrog, pine barrens	Hyla andersonii	USA (FL, AL, NC, SC)	E

Note: E = Endangered.
T = Threatened.

Source: QST, 1997.

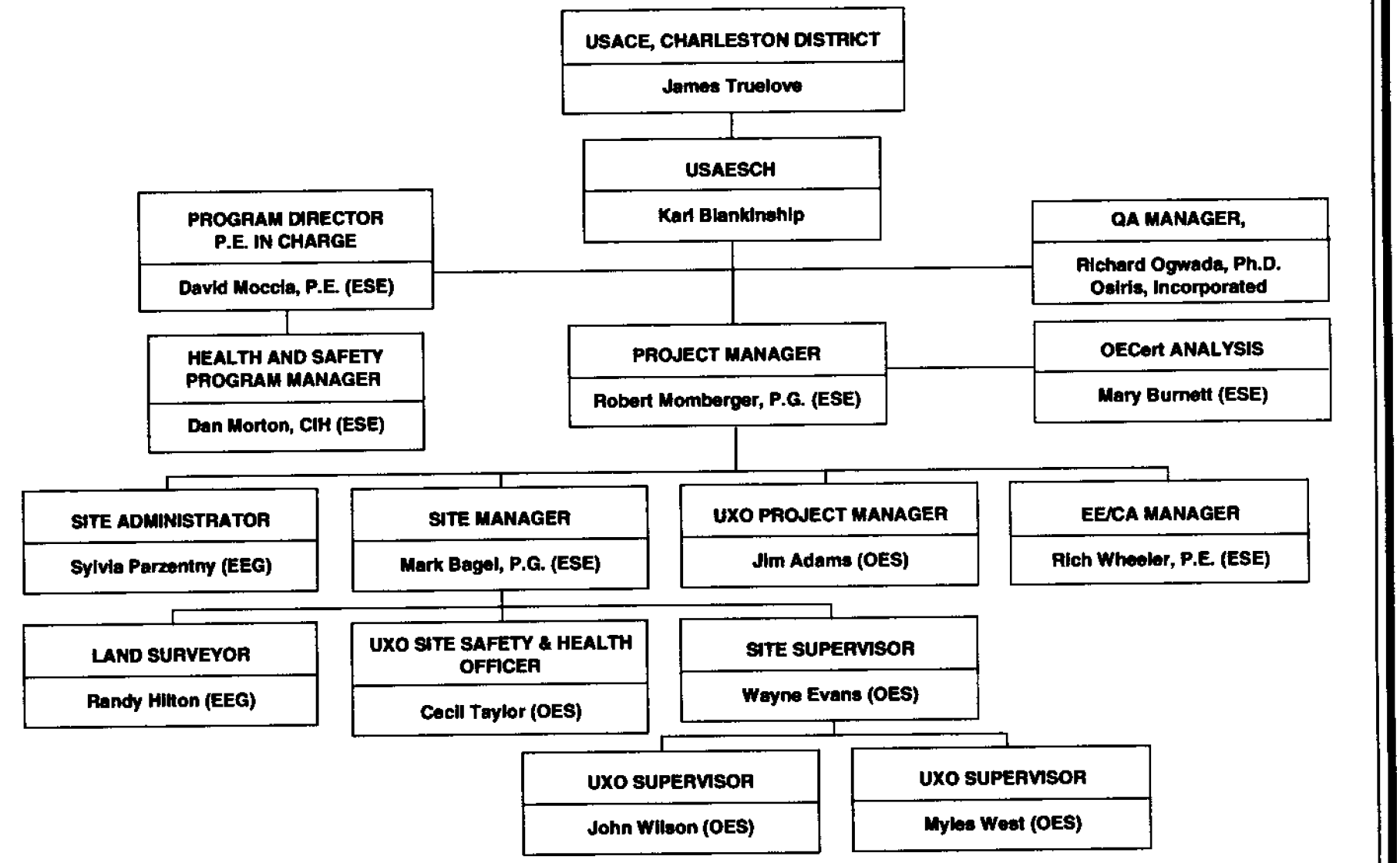

Figure 2-5
PROJECT ORGANIZATION CHART

SOURCE: QST.

FORMER CAMP CROFT ARMY TRAINING FACILITY
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center for explosive safety and removal, was given the primary task of technical management of the former CCATF EE/CA project. Mr. Karl Blankinship was the USAESCH technical manager. The following coordination protocol was followed:

- All QST communications and contacts with the public were coordinated under the direction of the USACE-CD public affairs officer and the USAESCH technical manager.
- Information/contacts made by QST during the project were documented and forwarded to the USACE-CD public affairs officer and the USAESCH technical manager, and
- Public meetings were conducted based on instructions received from the USAESCH technical manager in conjunction with USACE-CD.

2.4.4 Sampling Grid Selection

QST, with the assistance of USACE-CD, selected 183 grids for investigation prior to the field effort. Eleven grids were added during the field effort by the USACE-CD life cycle manager to bring the total of sampling grids to 194. Sixty grids were not investigated due to unattained ROEs. Four grids were not investigated due to time constraints. The site selection criteria are discussed in the following subsections.

2.4.4.1 Sample Location Selection Rationale

The selection of the sample grid locations was based on the data presented in the ASR, the SASR, the previous EE/CA report, public meetings, and site reconnaissance. The location of each sample grid was based on the following criteria:

- Site Historical Data—Historical data obtained from the ASR and SASR, as well as historical photographs, were used to locate impact areas. Historical descriptions of activities at each site were also used to determine the dispersion of ordnance at each investigation area.
- Environmental Concerns—QST closely coordinated grid locations with the South Carolina Parks Department and a local botanist to position sites away from environmentally sensitive areas.
- Accessibility—The selection of survey grid locations considered the amount of site preparation required before executing sampling activities, as well as the advantages of inspecting areas that would require minimal site preparation.
- Field modification—The exact locations of the final placement and dimensions of the sampling grids were considered to be changeable until the grid survey was conducted. The USAESCH technical manager also approved the modification of grid sizes in response to site conditions such as vegetation and topography. The USAESCH technical manager approved the use of 50- by 50-ft grids (reduced from the typical 100- by 100-ft grids) near the end of the project so that more areas could be investigated during the limited time available.

2.4.5 Site Preparation

Site preparation included locating grids, vegetation clearing, and grid set-up activities. The grids were located either by the UXO teams or by the land survey contractor. Vegetation clearing and grid set-up operations were conducted by the UXO teams before the geophysical survey. The absolute minimum amount of site clearing in the grid sampling areas, both in vegetation volume and height was completed. The clearing operations were completed in accordance with the site-specific WP (ESE, 1996e).

2.4.6 Investigation Methods

This section describes standard practices, investigation methods, and procedures for collecting, processing, and controlling the data associated with OE geophysical surveys at each sampling site. The investigative methods were completed in accordance with the site-specific WP (ESE, 1996e).

2.4.6.1 Geophysical Investigation

Prior to the investigation, an inert 60-mm mortar was buried 3 foot below the ground surface, as specified in the USACE SOW. This item was used for daily standard checks of the magnetometer.

2.4.6.1.1 The field investigation team subdivided each sampling grid into geophysical sensor survey lanes centered approximately 5 ft apart. Survey lane spacing of 5 ft was required to provide full coverage when using the Schonstedt flux-gate magnetometer as described in the work plan. A small surveyor's flag was placed at the exact location of any anomaly until the survey and excavation operations were complete.

2.4.6.1.2 The magnetometer was used to sweep close to the ground surface across the 5-ft lanes. This was conducted by sweeping the magnetometer from side to side to get maximum coverage of the lane. When the locator came within range of an iron-bearing object, both audible and visual signals were created. The anomaly was interpreted by the visual signal to be either positive or negative. A horizontal object provides a signal that is positive on one end and negative on the other. A vertical buried item will create a singular anomaly of either pole. Two vertical closely buried items generally provide a signal that is the same polarity.

2.4.6.1.3 When an anomaly is detected, the magnetometer is held over the item and slowly moved in an X-shaped pattern to determine the extent and orientation of the item. The item is then marked by placing a flag in the center of the anomaly according to the interpretation of the signals.

2.4.6.2 Geophysical Survey Mapping

Once subsurface anomalies were identified and flagged, the total number of anomalies from each grid was determined by counting the total number of anomalies from each survey lane and adding the sum from each lane with subsequent lanes in a given grid to obtain a total number of anomalies for that grid. The total number of anomalies was then denoted on the site map.

2.4.6.3 Excavation of Anomalies

The Gridstats software developed by USAESCH was used to determine the location and sequential order of anomalies to be excavated. The Gridstats program provides a total of 100 sampling sequence lists, each containing the randomly generated numbers 1 through 32. Each grid was subdivided into 32 subgrids to correspond to the numbers in the random sampling sequence lists. One of the 100 random sequence sampling lists was randomly chosen for each sampling grid prior to sampling. The subgrid sampling order was determined by the order provided on the chosen random sampling sequence list.

2.4.6.3.1 One anomaly in each of the chosen subgrids was sampled by the UXO survey team in the order that the subgrids were listed in the random sampling sequence list. Manual excavation (e.g., use of hand tools, shovels) as specified in the WP was performed on the selected anomaly. All excavation activities were conducted in a prepared exclusion zone within which only UXO-qualified personnel were allowed. Soil removal from the access pit was stockpiled in the immediate area for later backfilling of excavations.

2.4.6.3.2 Engineering controls consisting of metal blast boxes weighing approximately 400 pounds (lb) each were used for excavations located close to houses or other inhabited structures. Where engineering controls were required, sampling protocol was verified as follows:

- The estimated number of anomalies to be excavated (the SiteStats program estimates approximately 33 percent of the total number of anomalies for grid characterization) was calculated.
- The sampling sequence was used to calculate the number of anomalies required for sampling in each subgrid.
- The required number of anomalies to be sampled in each subgrid were excavated prior to moving to the next subgrid, thus reducing the movement of the boxes.

2.4.6.3.3 The UXO team leader identified each anomaly as either ORS, UXO, or a false positive OE (usually the result of magnetic rock). After input of the findings from the excavation, the gridstats program alerted the operator when a statistically significant number of samples had characterized the grid. As circumstances allowed, unearthed OE items were photographed for documentation purposes.

2.4.6.4 UXO Handling and Disposal

Only UXO-qualified personnel were allowed to handle OE items in accordance with the Site-Specific Safety and Health Plan (SSHP) (Appendix D of the WP) and Demolition/Disposal Range Standard Operating Procedures (SOP) (Appendix E of the WP). The UXO supervisor evaluated all encountered and suspected UXO and determined if the work planned for the area could safely continue and what actions must occur prior to commencing OE handling and disposal efforts. Such recommendations were immediately communicated to the senior UXO supervisor, who contacted the onsite QST site manager and USAESCH safety representative, if necessary, to determine the appropriate course of action. Relevant training requirements of 29 CFR 1910.120e(i) applied to all UXO handling and disposal activities conducted during the field investigation [Occupational Safety and Health Administration (OSHA), 1994]. All UXO items found at the site were blown in place. The final decision on what OE items were transported was made by the UXO site supervisor and site safety officer.

2.4.6.5 UXO, ORS, and Explosives Accounting

A detailed account of all UXO materials encountered during the investigation was entered onto an Ordnance Accountability Form. The accounting included the number of UXO items, description of the condition of the items and fuze, photographs (as appropriate), date, and method and location of disposition.

2.4.6.5.1 All explosive disposal operations were documented on a Blast Record form. The form tracked the date, location, explosives used, site conditions, and items disposed of. An explosives log was also kept to account for all explosives expended in the disposal of UXO items.

2.4.6.5.2 The ORS accounting process included all shrapnel and all non-OE metallic debris encountered. An attempt was made to describe the ORS collected from each site. Total metallic debris was accounted for by gross weight per sampling site either by direct measurement using a scale or, for small ORS items, by estimation based on the number and size of items found.

2.4.6.6 Explosives Storage

The explosives were shipped to former CCATF and stored in two locked explosives magazines delivered to the site by USAESCH. The magazines were located at the bunker area close to the office. The magazines were secured by a double locked galvanized steel fence. Lightning protection was provided in accordance with USAESCH safety requirements. Due to safety distance requirements, the explosives were subsequently moved to a nearby bunker for storage.

2.4.6.7 Disposal of Inert ORS

Inert ORS was transported and stored in plastic bags in an unused corner of the equipment storage bunker. All metallic debris disposed of was then inspected by the senior UXO supervisor, who signed a certification that the ORS was inert. The ORS items were turned over to a local scrap dealer during the demobilization operations.

2.4.6.8 Land Locational Survey

QST subcontracted with Ellis Environmental Group, LC (EEG), to provide location survey and mapping support for the former CCATF EE/CA investigation. EEG personnel provided initial layout of the grids, set control points, and then located the grids based on North American Datum, 1983.

2.4.6.8.1 A GPS control network utilizing several existing monuments was set up for the orientation of the land survey. Several control points were concurrently located to assist with the location survey. Traverses were conducted using conventional survey methodology to locate a corner of each grid. A bearing to a second corner was taken and was used to locate the other grid corners. A map showing the location of grids, survey control points, and survey monuments are included in Appendix B.

2.4.7 Field Investigation Results

The QST team was able to fully investigate 130 of the 194 EE/CA sampling grids. The sampling grids varied in size in accordance with the proximity to residential or commercial properties. The grid dimensions were either 100 by 100 or 50 by 50 ft. Near the end of the field effort, the USAESCH project manager suggested the grid size of all grids be reduced to 50 by 50 ft to increase production rates.

2.4.7.0.1 The grid locations are included in the survey drawings located in Appendix B. Also included in the drawings are the control points used for the survey.

2.4.7.0.2 The gridstats software program was used in the field to determine anomaly sample locations within each grid. All UXO/ORS was encountered at depths of less than 3 ft. However, in accordance with the WP, anomalies were excavated to a maximum depth of 4 ft. Table 2-2 presents a description and the depth of ordnance found during the investigation.

2.4.7.0.3 Photographs and videotapes were taken at each of the sites. The photographs, some of which are included in Appendix C, show typical OE and vegetation at the sampling grids.

Table 2-2. Description and Depth of OE Found During Phase II EE/CA Investigation (Page 1 of 2)

UXO-ID	Date	Description	Depth (inches)	Sampling Grid	Action Taken	Shot#	Noise	Remarks
1*	2/12/97	2.36" Practice Rocket	3	A3-1	Blown in Place	1	78 db	
2**	2/18/97	M9 HEAT Rifle Grenade	2	A32-2	Blown In Place	4	81 db	
3	2/18/97	M9 HEAT Rifle Grenade	6	A32-2	Blown in Place	2	83 db	
4	2/18/97	M9 HEAT Rifle Grenade	11	A32-2	Blown In Place	3	81 db	
5	2/19/97	M9 HEAT Rifle Grenade	4	36-1	Blown In Place	5	78 db	
6	2/19/97	M9 HEAT Rifle Grenade	2	36-1	Blown In Place	6	81 db	
7	2/20/97	M9 HEAT Rifle Grenade	6	36-2	Blown In Place	7	82 db	
8	2/24/97	M9 HEAT Rifle Grenade	3	56-1	Blown In Place	8	72 db	
9	2/24/97	M11 Practice Rifle Grenade	1	56-1	Blown In Place	9	72 db	
10	2/24/97	M9 HEAT Rifle Grenade	21	56-2	Blown In Place	10	76 db	
11	3/4/97	M9 HEAT Rifle Grenade	9	A31-1	Blown In Place	11	82 db	
12	3/4/97	M9 HEAT Rifle Grenade	9	A31-1	Blown In Place	15	76 db	
13	3/4/97	M9 HEAT Rifle Grenade	21	A31-1	Blown In Place	12	80 db	
14	3/4/97	M9 HEAT Rifle Grenade	18	A31-1	Blown In Place	16	78 db	
15	3/4/97	M9 HEAT Rifle Grenade	3	A31-1	Blown In Place	13	80 db	
16	3/4/97	MK II Hand Grenade	21	A31-1	Blown In Place	11	82 db	
17	3/4/97	MK II Hand Grenade	14	A31-1	Blown In Place	14	78 db	
18	3/5/97	M9 HEAT Rifle Grenade	9	74-4	Blown In Place	17	45 db	
19	3/5/97	M9 HEAT Rifle Grenade	6	74-4	Blown In Place	18	60 db	
20	3/5/97	M9 HEAT Rifle Grenade	9	74-4	Blown In Place	19	65 db	

* UXO #1 was found to be inert.

** UXO #2 was found just off grid adjacent to Grid A32-2. It was partially visible and for safety reasons it was excavated and destroyed.

Table 2-2. Description and Depth of OE Found During Phase II EE/CA Investigation (Page 2 of 2)

UXO-ID	Date	Description	Depth (inches)	Sampling Grid	Action Taken	Shot#	Noise	Remarks
21	3/5/97	M9 HEAT Rifle Grenade	8	74-4	Blown In Place	20	45 db	
22	3/5/97	M9 HEAT Rifle Grenade	7	A31-2	Blown In Place	21	74 db	
23	3/5/97	M9 HEAT Booster Cup	7	A31-2	Blown In Place	21	74 db	
24	3/5/97	M9 HEAT Rifle Grenade	2	A31-2	Blown In Place	22	80 db	
25	3/5/97	MK II Hand Grenade	4	A31-2	Blown In Place	23	78 db	
26	3/5/97	M9 HEAT Rifle Grenade	3	A31-2	Blown In Place	24	78 db	
27	3/5/97	M9 Booster Cup	3	A31-2	Blown In Place	24	78 db	
28	3/5/97	M6 A3 2.36" Rocket	5	A31-2	Blown In Place	25	70db	
29	3/19/97	M9 HEAT Rifle Grenade	4	A10-2	Blown In Place	26	82db	

Source: QST, 1997.

2.4.7.0.4 Table 2-3 presents a summary of the sampling results. Included in this summary is the grid identification, grid size, the number of total anomalies, the number of anomalies sampled, the number of pieces and total weight of ordnance related scrap, the number of surface and subsurface UXOs, and the number of false positive OE items found at each grid investigated during the EE/CA field investigation.

2.4.7.0.5 Approximately 360 lbs of ORS was collected and weighed by scale during the field effort. Due to the remote location, some of the ORS was not removed from a few of the sites. In these cases, the amount of ORS left behind is estimated by weight per grid. The weight of ORS and other appropriate information is included in the descriptions of items found in each grid as discussed in the following sections. The weight of ORS collected during the investigation per site (sampling grid) is included in Table 2-3. The ORS was collected in a locked storage area and was later delivered to a local scrap dealer.

2.4.7.0.6 No surface UXO was found during the EE/CA investigation. Twenty seven subsurface UXOs were collected at the investigated sites A32, A31, 74, and 36 on the north end of the former CCATF and at area A10, on the south end of the former CCATF. One item was found intact in Grid A3. However, after demolition, it was determined that the item was an inert practice round. Appendix D includes the UXO accountability logs that were completed during the investigation. Also included in Appendix D are descriptions of the ordnance items found during the EE/CA investigation and maps showing their locations.

2.4.7.0.7 The field effort was initiated on January 6, 1997, with the office setup, delivery of supplies, and site preparation. The UXO investigation crews arrived onsite on January 13, 1997, to begin clearing vegetation in the grid locations. The land survey crew mobilized to the site on January 30, 1997. Demobilization of the project was completed by March 27, 1997. A summary of the dates and findings completed at each grid during the investigation is presented in Table 2-3. The following sections describe the rationale for choosing grid locations and the results of the investigations at each of the sites.

2.4.7.0.8 Sample area designations are those determined by the Supplemental Engineering Report (ESE, 1996d) and the WP (ESE, 1996e). Originally there were 90 (numbered sequentially 1 through 90) potential OE areas identified in the SASR and 39 (numbered sequentially A1 through A39) potential OE areas identified through evaluation of historical aerial photographs of the former CCATF. The following sample areas are those sampled during the EE/CA investigation. The number of grids sampled at each sample area were determined by the size of the potential OE area and historical OE information.

Table 2-3. Sampling Results from Former Camp Croft Phase II EE/CA Investigation (Page 1 of 4)

Sampling Grid	Date Cleared	Grid Size (acre)	Total Anomalies	Sampling Results					
				Anomalies Sampled	ORS Weight (pounds)	ORS Number	Surface UXO	Sub-surface UXO	False Positive OE
2-1	13-Mar-97	0.06	1	1	0.1	1	0	0	0
5-1	03-Feb-97	0.23	51	21	2	5	0	0	16
8b-1	19-Feb-97	0.06	21	9	0.1	1	0	0	8
9-1	29-Jan-97	0.23	114	38	0	0	0	0	38
9-2	30-Jan-97	0.23	144	48	0	0	0	0	48
15-1	13-Mar-97	0.06	40	12	0	0	0	0	12
16-1	05-Feb-97	0.06	88	29	0	0	0	0	29
17-1	18-Mar-97	0.06	69	23	0	0	0	0	23
18-1	05-Feb-97	0.06	113	38	0	0	0	0	38
18-2	06-Feb-97	0.06	131	43	0	0	0	0	43
18-3	06-Feb-97	0.06	29	23	0	0	0	0	23
19-1	06-Mar-97	0.23	15	15	0	0	0	0	15
24-1	11-Mar-97	0.06	55	17	0.1	3	0	0	14
24-2	11-Mar-97	0.06	49	15	0.1	1	0	0	14
26-1	19-Feb-97	0.06	16	16	0	0	0	0	16
27-1	04-Feb-97	0.23	143	48	0	0	0	0	48
27-2	04-Feb-97	0.23	126	42	2	3	0	0	39
27-3	03-Feb-97	0.23	48	16	0.5	1	0	0	15
29-1	20-Mar-97	0.06	20	20	1	1	0	0	19
30-1	25-Feb-97	0.23	35	14	0	0	0	0	14
30-2	25-Feb-97	0.23	30	12	1	1	0	0	11
30-3	25-Feb-97	0.06	8	8	0	0	0	0	8
30-4	25-Feb-97	0.06	4	4	0	0	0	0	4
36-1	19-Feb-97	0.06	51	21	4	6	0	2	13
36-2	20-Feb-97	0.06	48	20	6	11	0	1	8
37-1	21-Feb-97	0.23	46	19	0	0	0	0	19
38a-1	03-Feb-97	0.23	67	27	0	0	0	0	27
38b-1	30-Jan-97	0.23	56	23	1.2	5	0	0	18
39-1	13-Feb-97	0.23	47	16	0.5	2	0	0	14
39-2	13-Feb-97	0.23	28	12	0.5	1	0	0	11
40-1	19-Feb-97	0.06	14	14	0	0	0	0	14
41a-1	25-Feb-97	0.23	147	59	0	0	0	0	59
41a-2	25-Feb-97	0.23	95	38	1	1	0	0	37
44-1	12-Mar-97	0.06	88	28	0	0	0	0	28
44-2	12-Mar-97	0.06	69	22	0	0	0	0	22
45-1	12-Mar-97	0.06	40	12	0	0	0	0	12
46-1	06-Feb-97	0.06	67	29	4	2	0	0	27
50-1	10-Feb-97	0.06	203	65	0	0	0	0	65

Table 2-3. Sampling Results from Former Camp Croft Phase II EE/CA Investigation (Page 2 of 4)

Sampling Grid	Date Cleared	Grid Size (acre)	Total Anomalies	Sampling Results					
				Anomalies Sampled	ORS Weight (pounds)	ORS Number	Surface UXO	Sub-surface UXO	False Positive OE
56-1	24-Feb-97	0.06	43	18	1.5	5	0	2	11
56-2	24-Feb-97	0.23	27	11	0	0	0	1	10
64-1	28-Jan-97	0.23	164	49	0	0	0	0	49
64-2	29-Jan-97	0.23	45	15	0	0	0	0	15
65-1	21-Feb-97	0.23	126	51	0.01	1	0	0	50
67-1	21-Feb-97	0.06	47	19	0	0	0	0	19
67-2	21-Feb-97	0.23	41	17	0	0	0	0	17
71-1	06-Feb-97	0.23	60	22	0	0	0	0	22
71-2	10-Feb-97	0.23	65	26	2	11	0	0	15
71-3	10-Feb-97	0.23	59	26	0.5	4	0	0	22
71-4	10-Feb-97	0.23	51	21	1.5	3	0	0	18
74-1	03-Mar-97	0.06	35	14	0	0	0	0	14
74-2	03-Mar-97	0.23	120	48	25	40	0	0	8
74-3	04-Mar-97	0.23	301	75	15	63	0	0	12
74-4	05-Mar-97	0.23	240	96	10	90	0	4	2
78-1	06-Mar-97	0.23	143	48	0	0	0	0	48
78-2	06-Mar-97	0.23	130	43	0	0	0	0	43
80-1	18-Mar-97	0.23	55	19	0	0	0	0	19
85-1	11-Mar-97	0.06	21	6	0	0	0	0	6
86-1	12-Mar-97	0.06	20	20	0.1	1	0	0	19
86-2	11-Mar-97	0.06	28	9	0.2	2	0	0	7
86-3	13-Mar-97	0.06	107	34	25	6	0	0	28
88-1	27-Jan-97	0.06	610	186	0	0	0	0	186
88-2	11-Mar-97	0.06	29	9	0	0	0	0	9
89-1	10-Mar-97	0.06	23	10	0	0	0	0	10
89-2	10-Mar-97	0.06	33	14	0	0	0	0	14
90-1	10-Mar-97	0.06	40	16	0	0	0	0	16
91-1	10-Mar-97	0.06	23	7	0	0	0	0	7
92-1	10-Mar-97	0.06	117	37	0	0	0	0	37
A2-1	11-Feb-97	0.06	175	58	0	0	0	0	58
A3-1	12-Feb-97	0.06	137	56	10	3	0	1	52
A3-2	19-Feb-97	0.23	10	10	0	0	0	0	10
A3-3	20-Feb-97	0.06	173	70	0.1	1	0	0	69
A3-4	24-Feb-97	0.06	210	70	0	0	0	0	70
A5-1	13-Mar-97	0.06	37	11	0	0	0	0	11
A5-2	13-Mar-97	0.06	9	9	0	0	0	0	9
A5-3	13-Mar-97	0.06	11	11	0	0	0	0	11
A5-4	13-Mar-97	0.06	12	12	0	0	0	0	12

Table 2-3. Sampling Results from Former Camp Croft Phase II EE/CA Investigation (Page 3 of 4)

Sampling Grid	Date Cleared	Grid Size (acre)	Total Anomalies	Sampling Results					
				Anomalies Sampled	ORS Weight (pounds)	ORS Number	Surface UXO	Sub-surface UXO	False Positive OE
A5-5	17-Mar-97	0.06	37	11	0	0	0	0	11
A5-6	17-Mar-97	0.06	21	6	0.1	2	0	0	4
A7b-1	27-Jan-97	0.23	37	14	0.25	1	0	0	13
A7b-2	27-Jan-97	0.23	57	23	0.25	5	0	0	18
A7b-3	28-Jan-97	0.23	37	16	0.1	1	0	0	15
A7b-4	28-Jan-97	0.23	104	48	0	0	0	0	48
A7d-1	24-Jan-97	0.23	124	50	1	8	0	0	42
A7e-1	15-Jan-97	0.23	105	42	0.5	19	0	0	23
A8-1	17-Mar-97	0.06	16	16	0	0	0	0	16
A8-2	17-Mar-97	0.06	21	6	0	0	0	0	6
A8-3	17-Mar-97	0.06	5	5	0	0	0	0	5
A8-4	20-Mar-97	0.06	7	7	0.25	5	0	0	2
A8-5	24-Mar-97	0.06	7	7	0	0	0	0	7
A9-1	19-Mar-97	0.06	9	9	0	0	0	0	9
A9-2	18-Mar-97	0.06	4	4	0	0	0	0	4
A9-3	17-Mar-97	0.06	14	14	0	0	0	0	14
A10-1	19-Mar-97	0.06	23	11	0	0	0	0	11
A10-2	19-Mar-97	0.06	10	10	0	0	0	1	9
A10-3	18-Mar-97	0.06	24	10	0	0	0	0	10
A10-4	18-Mar-97	0.06	42	17	0	0	0	0	17
A12-1	12-Feb-97	0.23	66	27	0	0	0	0	27
A12-2	12-Feb-97	0.23	14	14	0	0	0	0	14
A14-1	05-Feb-97	0.23	46	19	0	0	0	0	19
A14-2	05-Feb-97	0.23	45	18	0	0	0	0	18
A16-1	20-Feb-97	0.06	10	10	0.25	3	0	0	7
A16-2	20-Mar-97	0.06	13	13	0.5	2	0	0	11
A18-1	19-Mar-97	0.23	84	28	0	0	0	0	28
A20-1	18-Mar-97	0.06	31	10	0	0	0	0	10
A20-2	19-Mar-97	0.06	43	14	0	0	0	0	14
A21-1	11-Feb-97	0.06	60	25	0	0	0	0	25
A21-2	11-Feb-97	0.06	52	21	0	0	0	0	21
A29-1	19-Mar-97	0.06	10	10	0	0	0	0	10
A29-2	19-Mar-97	0.06	6	6	0	0	0	0	6
A31-1	04-Mar-97	0.23	1009	152	218	144	0	7	1
A31-2	05-Mar-97	0.23	481	80	17	65	0	7	8
A32-1	13-Feb-97	0.23	82	33	1	8	0	0	25
A32-2	18-Feb-97	0.06	67	27	0	0	0	2	25
A32-3	24-Mar-97	0.06	44	18	0	0	0	0	18

Table 2-3. Sampling Results from Former Camp Croft Phase II EE/CA Investigation (Page 4 of 4)

Sampling Grid	Date Cleared	Grid Size (acre)	Total Anomalies	Sampling Results					
				Anomalies Sampled	ORS Weight (pounds)	ORS Number	Surface UXO	Sub-surface UXO	False Positive OE
A32-4	24-Mar-97	0.06	10	10	0	0	0	0	10
A32-5	24-Mar-97	0.06	8	8	0	0	0	0	8
A32-6	24-Mar-97	0.06	12	12	0.1	1	0	0	11
A33-1	12-Mar-97	0.06	27	8	0	0	0	0	8
A33-2	12-Mar-97	0.06	191	61	0	0	0	0	61
A34-1	21-Jan-97	0.06	353	142	0	0	0	0	142
A34-2	16-Jan-97	0.06	83	35	2	5	0	0	30
A34-3	04-Feb-97	0.06	932	280	0	0	0	0	280
A34-4	23-Jan-97	0.06	131	53	0	0	0	0	53
A34-5	22-Jan-97	0.06	330	132	2	4	0	0	128
A37a-1	29-Jan-97	0.23	12	12	0	0	0	0	12
A37a-2	29-Jan-97	0.23	45	19	0	0	0	0	19
A37b-1	04-Feb-97	0.23	66	27	0	0	0	0	27
A37c-1	04-Feb-97	0.23	98	40	0	0	0	0	40
A39-1	05-Mar-97	0.23	233	66	0	0	0	0	66
A39-2	06-Mar-97	0.23	21	9	0	0	0	0	9

Source: QST, 1997.

2.4.7.1 Sample Area 2

Sample Area 2 is on undeveloped land south of Croft State Park along Paulene Creek. Reportedly, 2.35-inch rockets and 60-mm mortars were found previously in this vicinity. One sample grid was investigated in this medium-priority site (as defined in the 1996 Supplemental Engineering Report).

2.4.7.1.1 Grid 2-1

Grid 2-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with little underbrush. This site required minimal clearing.

2.4.7.1.1.1 A single anomaly was detected. This anomaly was excavated and found to be an ORS item, specifically an M-1 clip. No UXO items were found on the surface or in the subsurface. There were also no false positive OE signals detected.

2.4.7.1.2 Summary of Results at Sample Area 2.

The finding of the M-1 clip indicates some small arms activity occurred in this area. There were no indications of any larger OE (e.g., 2.35-inch rockets or 60-mm mortars) found during the investigation.

2.4.7.2 Sample Area 5

Sample Area 5 is within the north border of Croft State Park, immediately southeast of Dairy Ridge Road. This area was possibly used as a pistol and gunnery range. One sample grid was investigated in this low-priority site.

2.4.7.2.1 Grid 5-1

Grid 5-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.2.1.1 Twenty-one of the 51 total anomalies detected during the investigation were excavated. Five ORS items were found. The ORS consisted of 30 caliber bullets and two empty flare casings. No UXO items were found on the surface or in the subsurface. Sixteen anomalies were false positive OE signals caused by trash.

2.4.7.2.2 Summary of Results at Sample Area 5.

Items found during the investigation indicate this area may have been used as a pistol and gunnery range. There was no evidence of any activity other than small arms usage in the area.

2.4.7.3 Sample Area 8b

Sample Area 8b-1 is on the west side of Croft State Park and northeast of the intersection between Dairy Ridge Road and Route 56. Allegedly, munitions were discovered on this property. One sample grid was investigated at this low-priority site.

2.4.7.3.1 Grid 8b-1

Grid 8b-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.3.1.1 Nine of the 21 total anomalies detected during the investigation were excavated. One ORS item (an M-1 clip) was found. No UXO items were found on the surface or subsurface. Eight anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.3.2 Summary of Results at Sample Area 8b.

Items found during the investigation indicate this area may have been used for military maneuvers.

2.4.7.4 Sample Area 9

Sample Area 9 is on the north side of Croft State Park and north of Dairy Ridge Road. This site was possibly a former grenade range. Two sample grids were investigated in this medium-priority site.

2.4.7.4.1 Grid 9-1

Grid 9-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.4.1.1 Thirty-eight of the 114 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All thirty-eight anomalies were false positive OE signals caused by non-UXO-related trash including magnetic rock, cans, and wire.

2.4.7.4.2 Grid 9-2

Grid 9-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.4.2.1 Forty-eight of the 144 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 48 anomalies were false positive OE signals caused by non-UXO-related trash and magnetic rock.

2.4.7.4.3 There were no indications of OE (e.g., grenades) found during the investigation at this site.

2.4.7.5 Sample Area 15

Sample area 15 is west of Pacolet off Highway 295. This area is commercially developed. There were 57 and 37-caliber rounds previously found in the area. One grid was investigated in this low-priority site.

2.4.7.5.1 Grid 15-1

Grid 15-1 encompassed an area 50 by 50 ft (0.06 acre) and was an open field with tall grass and pine trees. This site required minimal clearing.

2.4.7.5.1.1 Twelve of the 40 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 12 anomalies were false positive OE signals consisting of trash that included nails, staples, and wire.

2.4.7.5.2 Summary of Results at Sample Area 15.

There was no evidence of OE activity found during the investigation at this site.

2.4.7.6 Sample Area 16

Sample Area 16 is on the north side of Pacolet. Munitions were reportedly used in this area. One grid was investigated in this low-priority site.

2.4.7.6.1 Grid 16-1

Grid 16-1 encompassed an area 50 by 50 ft (0.06 acre) and was an open landscaped yard with grass and a few trees. This site was in a residential area and required minimal clearing.

2.4.7.6.1.1 Twenty-nine of the 88 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 29 anomalies were false positive OE signals.

2.4.7.6.2 Summary of Results at Sample Area 16.

There was no evidence of OE activity found in sample area 16 during the investigation at this site.

2.4.7.7 Sample Area 17

Sample Area 17 is on the southeast of Pacolet. Site 17 was reportedly a Howitzer firing point. One sample grid was investigated in this low-priority site.

2.4.7.7.1 Grid 17-1

Grid 17-1 encompassed an area 50 by 50 ft (0.06 acre) and was an open landscaped grass field. This site required minimal clearing.

2.4.7.7.1.1 Twenty three of the 69 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 23 anomalies were false positive OE signals caused by trash.

2.4.7.7.2 Summary of Results at Sample Area 17.

No evidence of OE activity was found during the investigation at this area.

2.4.7.8 Sample Area 18

Sample Area 18 is on the south of Pacolet. Site 18 was reportedly an old munitions burial dump. Three sample grids were investigated in this high-priority site.

2.4.7.8.1 Grid 18-1

Grid 18-1 encompassed an area 50 by 50 ft (0.06 acre) and was an open landscaped grass field with some trees. This site required minimal clearing.

2.4.7.8.1.1 Thirty-eight of the 113 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 38 anomalies were false positive OE signals that included magnetic rock, nails, and wire.

2.4.7.8.2 Grid 18-2

Grid 18-2 encompassed an area 50 by 50 ft (0.06 acre) and was an open landscaped grass field with some trees. This site required minimum clearing.

2.4.7.8.2.1 Forty-three of the 131 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 43 anomalies were false positive OE signals that included magnetic rock and wire.

2.4.7.8.3 Grid 18-3

Grid 18-3 encompassed an area 50 by 50 ft (0.06 acre) and was an open landscaped grass field with some trees. This site required minimal clearing.

2.4.7.8.3.1 Twenty-three of the 29 total anomalies detected during the investigation were excavated. No ORS items were found. No UXOs were found on the surface or in the subsurface. All 23 anomalies were false positive OE signals consisting of trash that included magnetic rock and nails.

2.4.7.8.4 Summary of Results at Sample Area 18

No burial locations were found in sample area 18. Four grids were proposed for this area in the WP. However, due to the findings in the first three grids, only three grids were investigated.

2.4.7.9 Sample Area 19

Sample Area 19 is on the southwest side of Lake Craig in Croft State Park. Site 19 was reportedly an old munitions burial dump. One sample grid was investigated in this low-priority site.

2.4.7.9.1 Grid 19-1

Grid 19-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.9.1.1 Fifteen of the 15 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 15 anomalies were false positive OE signals consisting of trash.

2.4.7.9.2 Summary of Results at Sample Area 19

No OE burial locations were found in sample area 19.

2.4.7.10 Sample Area 24

Sample Area 24 is on undeveloped land south of Dairy Ridge Road near the entrance to Croft State Park. Mortars were found previously in a gully in the vicinity of the site. Two sample grids were investigated in this medium-priority site.

2.4.7.10.1 Grid 24-1

Grid 24-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.10.1.1 Seventeen of the 55 total anomalies detected during the investigation were excavated. Three ORS items, weighing approximately 0.1 lb, were encountered. The ORS consisted of three 30.06 shell casings. No UXOs were found on the surface or in the subsurface. Fourteen of the anomalies were false positive OE signals consisting of trash.

2.4.7.10.2 Grid 24-2

Grid 24-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.10.2.1 Fifteen of the 49 total anomalies detected during the investigation were excavated. One ORS item, a 30.06 shell casing, was encountered. No UXO items were found on the surface or in the subsurface. Fourteen of the anomalies were false positive OE signals caused by trash.

2.4.7.10.3 Summary of Results at Sample Area 24

The findings of 30.06 cartridges indicates that some small arms activity occurred in this area. There were no indications of any activity other than small arms usage (e.g., mortars) found during the investigation.

2.4.7.11 Sample Area 26

Sample Area 26 is near the intersection of Dairy Ridge Road and Route 56. Munitions were previously located on property in the vicinity of Area 26. One sample grid was investigated in this low-priority site.

2.4.7.11.1 Grid 26-1

Grid 26-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.11.1.1 All of the 16 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 16 anomalies were false positive OE signals consisting of trash that included magnetic rock, cans, and wire.

2.4.7.11.2 Summary of Results at Sample Area 26

There were no indications of any OE activity (e.g., munitions) found during the investigation.

2.4.7.12 Sample Area 27

Sample Area 27 is north of Dairy Ridge Road near the intersection of Dairy Ridge Road and the park entrance. Site 27 was possibly used as an old mortar range target area. Three sample grids were investigated in this medium-priority site.

2.4.7.12.1 Grid 27-1

Grid 27-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some open marshy areas. This site required minimal clearing.

2.4.7.12.1.1 Forty-eight of the 143 total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All 48 of the anomalies were false positive OE signals consisting of trash that included magnetic rock and wire.

2.4.7.12.2 Grid 27-2

Grid 27-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some open marshy areas. This site required minimal clearing.

2.4.7.12.2.1 Forty-two of the 126 total anomalies detected during the investigation were excavated. Three ORS items were encountered. These items consisted of one expended illumination "Pop-up" flare, one empty 60-mm mortar illumination candle, and one M-1 clip. No UXO items were found on the surface or in the subsurface. Thirty nine of the anomalies were false positive OE signals consisting of trash that included magnetic rock and wire.

2.4.7.12.3 Grid 27-3

Grid 27-3 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some open marshy areas. This site required minimal clearing.

2.4.7.12.3.1 Sixteen of the 48 total anomalies detected during the investigation were excavated. One ORS item was encountered. This item was an empty MK 2 Hand Grenade with no fuze. No UXO items were found on the surface or in the subsurface. Fifteen of the anomalies were false positive OE signals consisting of trash or mag/rock that included magnetic rock, cans, and wire.

2.4.7.12.4 Summary of Results at Sample Area 27

Items found during the investigation indicate this area may have been used for practice maneuvers. There was no evidence of non practice items being used. However, some items found at this site may have once contained minor charges that may be harmful if an item with a full practice charge is found and is mishandled.

2.4.7.13 Sample Area 29

Sample Area 29 is at the Cotton Creek Golf Club at the northwest corner of the investigation area. Various types of old ordnance items were allegedly found in this area. One sample grid was investigated in this low-priority site.

2.4.7.13.1 Grid 29-1

Grid 29-1 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area at the edge of a landscaped golf course. This site required minimal clearing.

2.4.7.13.1.1 All of the 20 total anomalies detected during the investigation were excavated. One ORS item was encountered. This item was a practice grenade with no explosives. No UXO items were found on the surface or in the subsurface. Nineteen of the anomalies were false positive OE signals consisting of trash and magnetic rock.

2.4.7.13.2 Summary of Results at Sample Area 29

Items found during the investigation indicate this area may have been used for practice maneuvers. There was no evidence of non-practice items being used. However, one item found at this site may have once contained minor charges that may be harmful if an item with a full practice charge is found and is mishandled.

2.4.7.14 Sample Area 30

Sample Area 30 is in the northwest corner of the investigation area along Kelsey Creek. Various types of old ordnance (including machine guns) were previously found in this area. Four sample grids were investigated in this medium-priority site.

2.4.7.14.1 Grid 30-1

Grid 30-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with heavy vines and kudzu. This site required moderate clearing.

2.4.7.14.1.1 Fourteen of the 35 total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All 14 of the anomalies were false positive OE signals caused by trash.

2.4.7.14.2 Grid 30-2

Grid 30-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with heavy vines and kudzu. This site required moderate clearing.

2.4.7.14.2.1 Twelve of the 30 total anomalies detected during the investigation were excavated. One ORS item was encountered, This item consisted of fragments from an M9 rifle grenade. No UXO items were found on the surface or in the subsurface. Eleven of the anomalies were false positive OE signals caused by trash.

2.4.7.14.3 Grid 30-3

Grid 30-3 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with heavy vines and kudzu. This site required moderate clearing.

2.4.7.14.3.1 All of the eight total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All eight of the anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.14.4 Grid 30-4

Grid 30-4 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with heavy vines and kudzu. This site required moderate clearing.

2.4.7.14.4.1 All of the four total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All four of the anomalies were false positive OE signals consisting of trash and magnetic rock.

2.4.7.14.5 Summary of Results at Sample Area 30

Items found during the investigation indicate this area may have been used for practice maneuvers. There was no evidence of non practice items being used. However, some items found at this site may have once contained minor charges that may be harmful if an item with a full practice charge is found and is mishandled.

2.4.7.15 Sample Area 36

Sample Area 36 is in the northwest corner of the investigation area south of Dairy Ridge Road and Highway 295. This area was allegedly a bazooka and 2.36-inch rocket training range and a rifle grenade range. Two sample grids were investigated in this high-priority site. Additional grids in this vicinity are included in nearby sample areas.

2.4.7.15.1 Grid 36-1

Grid 36-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with dense underbrush, pine trees, and moderately steep hills. This site required heavy clearing activities.

2.4.7.15.1.1 Twenty-one of the 51 total anomalies detected during the investigation were excavated. Six ORS items were encountered. The ORS consisted of 2.36-inch rocket fragments and cones. No UXOs were found on the surface. Two M9 HEAT rifle grenades (with internal fuzes) were identified in the subsurface. All UXO items were blown in place.

2.4.7.15.1.2 Thirteen of the anomalies were false positive OE signals caused by trash.

2.4.7.15.2 Grid 36-2

Grid 36-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with dense underbrush, pine trees, and moderately steep hills. This site required heavy clearing activities.

2.4.7.15.2.1 Twenty of the 48 total anomalies detected during the investigation were excavated. Eleven ORS items, weighing approximately 6 lbs, were encountered. The ORS consisted of fragments from M9 rifle grenades, 2.36-inch rockets, and a grenade spoon. One M9 HEAT rifle grenade (with internal fuze) was identified in the subsurface. This UXO item was blown in place.

2.4.7.15.2.2 Eight of the anomalies were false positive OE signals caused by trash.

2.4.7.15.3 Summary of Results at Sample Area 36

Items found during the investigation confirm this area was used as a bazooka and 2.36-inch rocket training range and a rifle grenade range. The UXO found at this site was live and was blown in place. The ORS found is an indication of the different types of ordnance previously used and which may still remain.

2.4.7.16 Sample Area 37

Sample Area 37 is south of Dairy Ridge Road just north of the Croft State Park boundary. This area was reportedly a bazooka, 105-mm, and 2.36-inch rocket training range and a rifle grenade range. One sample grid was investigated in this low-priority site.

2.4.7.16.1 Grid 37-1

Grid 37-1 encompassed an area 100 by 100 ft (0.23 acre) and was moderately wooded. This site required moderate clearing.

2.4.7.16.1.1 Nineteen of the 46 total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All 19 of the anomalies were false positive OE signals caused by trash.

2.4.7.16.2 Summary of Results at Sample Area 37

No indications of OE activity (e.g., bazooka rounds, 2.36-inch rockets) were found during the investigation.

2.4.7.17 Sample Area 38a

Sample Area 38a is north of Dairy Ridge Road just inside the Croft State Park boundary. This area was allegedly a small arms impact area. One sample grid was investigated in this low-priority site.

2.4.7.17.1 Grid 38a-1

Grid 38a-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with moderate undergrowth. This site required moderate clearing.

2.4.7.17.1.1 Twenty-seven of the 67 total anomalies detected during the investigation were excavated. No ORS items were encountered. No UXO items were found on the surface or in the subsurface. All 27 of the anomalies were false positive OE signals caused by trash.

2.4.7.17.2 Summary of Results at Sample Area 38a

No indications of OE activity (e.g., small arms) were found during the investigation.

2.4.7.18 Sample Area 38b

Sample Area 38a is south of Dairy Ridge Road just inside the Croft State Park boundary. This area was allegedly a small arms impact area. An embankment along the north side of the dirt road leading to the site was man-made and was most likely the firing point for grenades and other munitions toward targets on the other side of the berm. One sample grid was investigated in this low-priority site.

2.4.7.18.1 Grid 38b-1

Grid 38b-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with moderate undergrowth. This site required moderate clearing.

2.4.7.18.1.1 Twenty-three of the 56 total anomalies detected during the investigation were excavated. Five ORS items were encountered. The ORS consisted of grenade tops and fragments and one M-1 clip. No UXO items were found on the surface or in the subsurface. Eighteen of the anomalies were false positive OE signals consisting of trash.

2.4.7.18.2 Summary of Results at Sample Area 38b

Items found during the investigation confirm this area was used as a grenade and small arms range. The ORS items found had indications of high order detonations. Even though no UXO was found, there is the possibility that UXO does exist at this site.

2.4.7.19 Sample Area 39

Sample Area 39 is north of Dairy Ridge Road just inside the Croft State Park boundary off Route 56. This area was allegedly a mortar training facility. Access to this site is behind the Spartanburg Forestry Commission Headquarters. Two sample grids were investigated in this medium-priority site.

2.4.7.19.1 Grid 39-1

Grid 39-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with moderate undergrowth. This site required moderate clearing.

2.4.7.19.1.1 Sixteen of the 47 total anomalies detected during the investigation were excavated. Two ORS items were encountered. The ORS consisted of one M-1 clip and one 30 caliber casing. No UXO items were found on the surface or in the subsurface . Fourteen of the anomalies were false positive OE signals caused by trash.

2.4.7.19.2 Grid 39-2

Grid 39-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with moderate undergrowth. This site required moderate clearing.

2.4.7.19.2.1 Twelve of the 28 total anomalies detected during the investigation were excavated. One ORS item (an M-1 clip) was encountered. No UXO items were found on the surface or in the subsurface. Eleven of the anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.19.3 Summary of Results at Sample Area 39

Items found during the investigation indicate this area was used for troop maneuvers using small arms. Mortar fragments were not found in this area.

2.4.7.20 Sample Area 40

Sample Area 40 is north of Dairy Ridge Road just inside the Croft State Park boundary off Route 56. This area was allegedly an embankment used as a firing point as part of the mortar training facility. Access to this site is behind the Spartanburg Forestry Commission Headquarters. One sample grid was investigated in this low-priority site.

2.4.7.20.1 Grid 40-1

Grid 40-1 encompassed an area 50 by 50 ft (0.06 acres) and was wooded with dense underbrush and scattered trees. This site required heavy clearing activities.

2.4.7.20.1.1 All of the 14 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 14 anomalies were false positive OE signals caused by trash.

2.4.7.20.2 Summary of Results at Sample Area 40

No indications of OE activity (e.g., mortars) were found during the investigation at this site.

2.4.7.21 Sample Area 41a

Sample Area 41a is south of Dairy Ridge Road to the east of the Croft State Park entrance road. This area was allegedly used as a mock village for mortar, rifle grenade, and hand grenade training. Two sample grids were investigated in this medium-priority site.

2.4.7.21.1 Grid 41a-1

Grid 41a-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.21.1.1 Fifty-nine of the 147 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 59 anomalies were false positive OE signals caused by trash.

2.4.7.21.2 Grid 41a-2

Grid 41a-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.21.2.1 Thirty-eight of the 95 total anomalies detected during the investigation were excavated. One ORS item (fragment from a MK2 practice grenade) was found. No UXO items were found on the surface or in the subsurface. Thirty seven anomalies were false positive OE signals caused by trash.

2.4.7.21.3 Summary of Results at Sample Area 41a

Items found during the investigation indicate this area may have been used for practice maneuvers. There was no evidence of non practice items being used. However, some items found at this site may have once contained minor charges that may be harmful if an item with a full practice charge is found and is mishandled.

2.4.7.22 Sample Area 44

Sample Area 44 is on the northeast side of Croft State Park to the south of a road leading to the picnic area near Lake Johnson. This area was allegedly used as a impact area for 105-mm smoke rounds and dummy hand grenades. There was evidence of old buildings that may have been used for targets. Two sample grids were investigated in this medium-priority site.

2.4.7.22.1 Grid 44-1

Grid 44-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.22.1.1 Twenty-eight of the 88 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 28 anomalies were false positive OE signals caused by trash.

2.4.7.22.2 Grid 44-2

Grid 44-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.22.2.1 Twenty-two of the 69 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 22 anomalies were false positive OE signals caused by trash.

2.4.7.22.3 Summary of Results at Sample Area 44

No indications of OE activity (e.g., 105-mm smoke rounds, grenades) were found during the investigation at this site.

2.4.7.23 Sample Area 45

Sample Area 45 is east of Lake Craig in Croft State Park. This area was allegedly used as a impact area for 105-mm smoke projectiles. One sample grid was investigated in this low-priority site.

2.4.7.23.1 Grid 45-1

Grid 45-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded. This site required moderate clearing

2.4.7.23.1.1 Twelve of the 40 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 12 anomalies were false positive OE signals caused by trash including cans and barbed wire.

2.4.7.23.2 Summary of Results at Sample Area 45

No indications of OE activity (e.g., 105-mm smoke rounds) were found during the investigation at this site.

2.4.7.24 Sample Area 46

Sample Area 46 is southeast of Croft State Park east of Whitestone Road. This area was allegedly used as a impact area for 105-mm smoke projectiles. 105-mm projectiles were reportedly stacked up along an old logging road. Evidence of mortar craters were seen off the road. Two sample grids were scheduled for investigation in this medium-priority site. Only one grid was sampled due to ROE problems.

2.4.7.24.1 Grid 46-1

Grid 46-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.24.1.1 Twenty-nine of the 67 total anomalies detected during the investigation were excavated. Two ORS items were found. The ORS consisted of one grenade top and one expended 60-mm practice

mortar. No UXO items were found on the surface or in the subsurface. Twenty-seven anomalies were false positive OE signals consisting of trash.

2.4.7.24.2 Summary of Results at Sample Area 46

Items found during the investigation indicate this area may have been used as an impact range for mortars. There was no evidence of non practice items being used. However, some items found at this site may have once contained minor charges that may be harmful if an item with a full practice charge is found and is mishandled.

2.4.7.25 Sample Area 50

Sample Area 50 is at Allen Chapel on Highway 56 west of Croft State Park. Munitions (3 by 2 ft) with fins were allegedly found at this site. Two sample grids were planned for investigation in this high-priority site. Due to the small size of the area and the lack of sizeable anomalies, only one grid was investigated.

2.4.7.25.1 Grid 50-1

Grid 50-1 encompassed an area 100 by 100 ft (0.23 acre) and was a clear open field. This site required minimal clearing.

2.4.7.25.1.1 Sixty-five of the 203 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 65 anomalies were false positive OE signals caused by trash including magnetic rock, nails, and wire.

2.4.7.25.2 Summary of Results at Sample Area 50

No indications of OE activity (e.g., munitions) were found during the investigation at this site.

2.4.7.26 Sample Area 56

Sample Area 56 is north of Croft State Park off the east side of Dairy Ridge Road. Munitions including 105-mm mortars, 2.36-inch rockets, and unidentifiable fragments were reportedly seen along the entrance road toward the Ramantannin Property. Two sample grids were investigated in this high-priority site.

2.4.7.26.1 Grid 56-1

Grid 56-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some brush. This site required moderate clearing.

2.4.7.26.1.1 Eighteen of the 43 total anomalies detected during the investigation were excavated. Five ORS items were found. The ORS consisted of M9 fragments, M6A3 fragments, and a 2.36-cone. No UXO items were found on the surface. The two UXO items identified in the subsurface were one M9 HEAT rifle grenade and one M11 practice rifle grenade. These UXO items were blown in place.

2.4.7.26.1.2 Eleven anomalies were false positive signals caused by non-UXO related trash.

2.4.7.26.2 Grid 56-2

Grid 56-2 encompassed an area 100 by 100 ft (0.23 acre) and was an open field. This site required minimal clearing.

2.4.7.26.2.1 Eleven of the 27 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface. One M9 HEAT rifle grenade was identified in the subsurface. This UXO item was blown in place.

2.4.7.26.2.2 Ten anomalies were false positive signals caused by non-UXO related trash.

2.4.7.26.3 Summary of Results at Sample Area 41a

Items found during the investigation indicate this area was used as a high explosive impact range. Live Ordnance items found at this site may be dangerous if mishandled and should be remediated.

2.4.7.27 Sample Area 64

Sample Area 64 is on the northeast side of Croft State Park off the east side of Dairy Ridge Road. This was allegedly a small arms "village" fighting area. Two sample grids were investigated in this low-priority site.

2.4.7.27.1 Grid 64-1

Grid 64-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.27.1.1 Fifty-nine of the 164 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 49 anomalies were false positive OE signals caused by trash.

2.4.7.27.2 Grid 64-2

Grid 64-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.27.2.1 Fifteen of the 45 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 15 anomalies were false positive OE signals caused by trash including cans, pipe, and wire.

2.4.7.27.3 Summary of Results at Sample Area 64

No indications of OE activity (e.g., small arms) were found during the investigation at this site.

2.4.7.28 Sample Area 65

Sample Area 65 is on the northeast side of Croft State Park off the west side of Dairy Ridge Road. Bunkers were allegedly located on this property. One sample grid was to be investigated in this low-priority site.

2.4.7.28.1 Grid 65-1

Grid 65-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush and scattered trees. This site required moderate clearing.

2.4.7.28.1.1 Fifty-one of the 126 total anomalies detected during the investigation were excavated. One ORS item (a 30-caliber casing) was found. No UXO items were found on the surface or in the subsurface. Fifty anomalies were false positive OE signals caused by trash.

2.4.7.28.2 Summary of Results at Sample Area 65

Items found during the investigation indicate this area may have been used for maneuvers. However, there was a notable lack of large quantities of small arms normally associated with a small arms practice range. There was no evidence of OE activity other than small arms in the area.

2.4.7.29 Sample Area 67

Sample Area 67 the north of Croft State Park to the east of Dairy Ridge Road. This site was reportedly a dummy grenade range. Two sample grids were investigated in this medium-priority site.

2.4.7.29.1 Grid 67-1

Grid 67-1 encompassed an area 50 by 50 ft (0.06 acre) and was a clear field. This site required minimal clearing.

2.4.7.29.1.1 Nineteen of the 47 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 19 anomalies were false positive OE signals caused by trash including wire, nails, and cans.

2.4.7.29.2 Grid 67-2

Grid 67-2 encompassed an area 100 by 100 ft (0.23 acre) and was a clear field. This site required minimal clearing.

2.4.7.29.2.1 Seventeen of the 41 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 17 anomalies were false positive OE signals caused by trash including magnetic rock, wire, nails, tools, washers, and a horseshoe.

2.4.7.29.3 Summary of Results at Sample Area 67

No indications of OE activity (e.g., grenades) were found during the investigation at this site.

2.4.7.30 Sample Area 71

Sample Area 71 is north of Croft State Park, South of Highway 295, and west of Whitestone Road. This site was allegedly used as a 60-mm mortar range. Four sample grids were investigated in this large, medium-priority site.

2.4.7.30.1 Grid 71-1

Grid 71-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.30.1.1 Twenty-two of the 60 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 22 anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.30.2 Grid 71-2

Grid 71-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.30.2.1 Twenty-six of the 65 total anomalies detected during the investigation were excavated. Eleven ORS items were found. The ORS (2 lbs) consisted of M-1 clips, a smoke grenade spoon, and 30.06-caliber casings. No UXO items were found on the surface or in the subsurface. Fifteen anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.30.3 Grid 71-3

Grid 71-3 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.30.3.1 Twenty-six of the 59 total anomalies detected during the investigation were excavated. Four ORS items were found. The ORS (approximately 0.5 lb) consisted of an M-1 clip and 30.06-caliber casings. No UXO items were found on the surface or in the subsurface. Twenty two anomalies were false positive OE signals caused by non-UXO- related trash.

2.4.7.30.4 Grid 71-4

Grid 71-4 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.30.4.1 Twenty-one of the 51 total anomalies detected during the investigation were excavated. Three ORS items (1.5 lbs) were found. The ORS consisted of M-1 clips and 30.06-caliber casings. No UXO items were found on the surface or in the subsurface. Eighteen anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.30.5 Summary of Results at Sample Area 71

Items found during the investigation indicate this area may have been used for small arms and grenade maneuvers. However, there was a notable lack of large quantities of small arms normally associated with a small arms practice range. There was no evidence of mortars in the area.

2.4.7.31 Sample Area 74

Sample Area 74 is north of Croft State Park to the south of the intersection between Dairy Ridge Road and Highway 295. This site was alleged to be a 2.36-inch rocket and rifle grenade impact area. Four sample grids were investigated in this large, high-priority site.

2.4.7.31.1 Grid 74-1

Grid 74-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.31.1.1 Fourteen of the 35 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 14 anomalies were false positive OE signals caused by non-UXO related trash.

2.4.7.31.2 Grid 74-2

Grid 74-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.31.2.1 Forty-eight of the 120 total anomalies detected during the investigation were excavated. Forty ORS items were found. The ORS (25 lbs) consisted of three pieces of 2.36-inch scrap with the remainder being M9 rifle grenade scrap. No UXO items were found on the surface or in the subsurface. Eight anomalies were false positive OE signals caused by non-UXO-related trash including fencing and barbed wire.

2.4.7.31.3 Grid 74-3

Grid 74-3 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.31.3.1 Seventy-five of the 301 total anomalies detected during the investigation were excavated. Sixty-three ORS items (15 lbs) were found. The ORS was all fragments from M9 rifle grenades. No UXO items were found on the surface or in the subsurface. Twelve anomalies were false positive OE signals consisting of non-UXO-related trash.

2.4.7.31.4 Grid 74-4

Grid 74-4 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.31.4.1 Ninety-six of the 240 total anomalies detected during the investigation were excavated. Ninety ORS items (10 lbs) were found. The vast majority of ORS was M9 rifle grenade scrap. Also present were small quantities of 2.36-inch rocket fragments and MK II hand grenade fragments. No UXO items were found on the surface in this grid. Four M9 HEAT rifle grenades were found in the subsurface. These UXO items were all blown in place.

2.4.7.31.4.2 Two anomalies were false positive signals caused by non-UXO-related trash.

2.4.7.31.5 Summary of Results at Sample Area 74

Items found during the investigation indicate this area was used as an impact range for 2.36-inch anti-tank rockets, M9-rifle grenades, and Mk II hand grenades. This site contains high order explosives that could be hazardous if mishandled.

2.4.7.32 Sample Area 78

Sample Area 78 is on the east side of Croft State Park to the west of Lake Johnson. This area was reportedly a mortar firing point and a dummy land mine area. Two sample grids were investigated in this medium-priority site.

2.4.7.32.1 Grid 78-1

Grid 78-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.32.1.1 Forty-eight of the 143 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 48 anomalies were false positive OE signals caused by trash.

2.4.7.32.2 Grid 78-2

Grid 78-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.32.2.1 Forty-three of the 130 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 43 anomalies were false positive OE signals caused by trash including wire.

2.4.7.32.3 Summary of Results at Sample Area 78

No indications of OE activity (e.g., land mines, mortars) were found during the investigation at this site.

2.4.7.33 Sample Area 80

Sample Area 80 is north of Croft State Park on the west side of Cedar Springs Road. This area was allegedly a hand grenade range. One sample grid was investigated in this low-priority site.

2.4.7.33.1 Grid 80-1

Grid 80-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some clear areas under the power lines. This site required moderate clearing.

2.4.7.33.1.1 Nineteen of the 55 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 19 anomalies were false positive OE signals consisting of trash.

2.4.7.33.2 Summary of Results at Sample Area 80

No indications of OE activity (e.g., grenades) were found during the investigation at this site.

2.4.7.34 Sample Area 85

Sample area 85 is on the east side of Croft State Park to the east of Lake Craig. This area was reportedly a mortar firing point. One sample grid was investigated in this medium-priority site.

2.4.7.34.1 Grid 85-1

Grid 85-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.34.1.1 Six of the 21 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All six anomalies were false positive OE signals caused by trash.

2.4.7.34.2 Summary of Results at Sample Area 85

No indications of OE activity (e.g., mortars) were found during the investigation at this site.

2.4.7.35 Sample Area 86

Sample Area 86 is within the northeastern boundary of Croft State Park and west of Whitestone Road. This area was reportedly a mortar firing point. Three sample grids were investigated in this low-priority site.

2.4.7.35.1 Grid 86-1

Grid 86-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.35.1.1 All of the 20 total anomalies detected during the investigation were excavated. One ORS item (an M-14 clip) was found. No UXO items were found on the surface or in the subsurface. Nineteen anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.35.2 Grid 86-2

Grid 86-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.35.2.1 Nine of the 28 total anomalies detected during the investigation were excavated. Two ORS items were found. The ORS consisted of one M-1 clip and one grenade spoon. No UXO items were found on the surface or in the subsurface. Seven anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.35.3 Grid 86-3

Grid 86-3 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.35.3.1 Thirty-four of the 107 total anomalies detected during the investigation were excavated. Six ORS items were found. The ORS (3 lbs) consisted of two 60-mm target practice mortar, one 60-mm mortar tail fins, two 30-caliber casings, and one grenade pull ring. No UXO items were found on the surface or subsurface. Twenty eight anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.35.4 Summary of Results at Sample Area 86

Items found during the investigation indicate this area was likely used as a mortar range and for military maneuvers. It appears that at least some of the ORS may have resulted from high order detonations. Although no live UXOs were found, there is a possibility that this site may contain practice items or items containing explosives.

2.4.7.36 Sample Area 88

Sample Area 88 is on Route 50 north of the intersection of Route 50 and Highway 176 (alt) near the town of Pacolet. This area was reportedly a gas canister burial site. Two sample grids were investigated in this area at the request of the USACE-CD life cycle manager.

2.4.7.36.1 Grid 88-1

Grid 88-1 encompassed an area 100 by 100 ft (0.23 acre) and was a clear field. This site required minimal clearing.

2.4.7.36.1.1 One hundred-eighty-six of the 610 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 186 anomalies were false positive OE signals caused by trash from an old homestead.

2.4.7.36.2 Grid 88-2

Grid 88-2 encompassed an area 50 by 50 ft (0.06 acre) and was a clear field. This site required minimal clearing.

2.4.7.36.2.1 Nine of the 29 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All nine anomalies were false positive OE signals caused by trash.

2.4.7.36.3 Summary of Results at Sample Area 88

There were no indications of a burial site for gas canisters within the depth of excavation (4 ft maximum). There was no indication of deeper burial at the grid locations sampled.

2.4.7.37 Sample Area 89

Sample Area 89 is on Cedar Springs Road, North of Croft State Park. Two sample grids were investigated in this area at the request of the USACE-CD life cycle manager.

2.4.7.37.1 Grid 89-1

Grid 89-1 encompassed an area 50 by 50 ft (0.06 acre) and was a lightly wooded lot in a residential area. This site required minimal clearing.

2.4.7.37.1.1 Ten of the 23 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 10 anomalies were false positive OE signals caused by trash.

2.4.7.37.2 Grid 89-2

Grid 89-2 encompassed an area 50 by 50 ft (0.06 acre) and was a lightly wooded lot in a residential area. This site required minimal clearing.

2.4.7.37.2.1 Fourteen of the 33 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or in the subsurface. All 33 anomalies were false positive OE signals caused by trash.

2.4.7.37.3 Summary of Results at Sample Area 89

No indications of OE activity were found during the investigation at this site.

2.4.7.38 Sample Area 90

Sample Area 90 is on Huntington Drive north of the northeastern corner of Croft State Park. One sample grid was investigated in this area at the request of the USACE-CD life cycle manager.

2.4.7.38.1 Grid 90-1

Grid 90-1 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately overgrown field in a residential area. This site required moderate clearing.

2.4.7.38.1.1 Sixteen of the 40 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 16 anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.38.2 Summary of Results at Sample Area 90

No indications of OE activity were found during the investigation at this site.

2.4.7.39 Sample Area 91

Sample Area 91 is on Huntington Drive north of the northeastern corner of Croft State Park. One sample grid was investigated in this area at the request of the USACE-CD life cycle manager.

2.4.7.39.1 Grid 91-1

Grid 91-1 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared lot in a residential area. This site required minimal clearing.

2.4.7.39.1.1 Seven of the 23 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All seven anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.39.2 Summary of Results at Sample Area 91

No indications of OE activity were found during the investigation at this site.

2.4.7.40 Sample Area 92

Sample Area 92 is on Huntington Drive north of the northeastern corner of Croft State Park. One sample grid was investigated in this area at the request of the USACE-CD life cycle manager.

2.4.7.40.1 Grid 92-1

Grid 92-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.40.1.1 Thirty-seven of the 117 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 37 anomalies were false positive OE signals caused by trash.

2.4.7.40.2 Summary of Results at Sample Area 92

No indications of OE activity were found during the investigation at this site.

2.4.7.41 Historical Aerial Photograph Sites

Several sample areas were identified based on historical aerial photographs. These areas are designated by the letter "A" prior to the site number. These sites were prioritized based on the data from the site reconnaissance.

2.4.7.41.1 Sample Area A2

Area A2 is on the northwest corner of Croft State Park and east of Highway 56. One grid was investigated at this site.

2.4.7.41.1.1 Grid A2-1

Grid A2-1 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with some undergrowth and scattered trees. This site required moderate clearing.

2.4.7.41.1.1.1 Fifty-eight of the 175 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 58 anomalies were false positive OE signals caused by trash including magnetic rock and nails.

2.4.7.41.1.2 Summary of Results at Sample Area A2

No indications of OE activity were found during the investigation at this site.

2.4.7.41.2 Sample Area A3

Area A3 is on the northwest corner of the Croft State Park to the east of Highway 56. Four grids were investigated at this site.

2.4.7.41.2.1 Grid A3-1

Grid A3-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush and trees. This site required moderate clearing.

2.4.7.41.2.1.1 Fifty-six of the 137 total anomalies detected during the investigation were excavated. Three ORS items were found. The ORS consisted of fragment from a 2.36-inch round. No UXO items were found on the surface. One item (an intact 2.36-inch practice rocket) was found in the subsurface at this grid and was blown in place. However, following demolition, it was determined not to have contained a charge. Fifty-two anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.2.2 Grid A3-2

Grid A3-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and trees. This site required moderate clearing.

2.4.7.41.2.2.1 All of the 10 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 10 anomalies were false positive OE signals caused by trash.

2.4.7.41.2.3 Grid A3-3

Grid A3-3 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and trees. This site required moderate clearing.

2.4.7.41.2.3.1 Seventy of the 173 total anomalies detected during the investigation were excavated. One ORS item (a 30-caliber casing) was found. No UXO items were found on the surface or subsurface. Sixty-nine anomalies were false positive OE signals caused by non-UXO-related trash that included cans, nails, and wire.

2.4.7.41.2.4 Grid A3-4

Grid A3-4 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush and trees. This site required moderate clearing.

2.4.7.41.2.4.1 Seventy of the 210 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 70 anomalies were false positive OE signals caused by trash including barbed wire.

2.4.7.41.2.5 Summary of Results at Sample Area A3

Items found during the investigation indicate this area was likely used for military maneuvers. It appears that small arms fire and anti-tank rockets were used in dispersed areas within this site. Bunkers east of grid A3-1 may have been used for observation purposes during the maneuvers. Only a small amount of OE fragments were observed in this area as evidence of high order explosives. Inert practice rounds were also used.

2.4.7.41.3 Sample Area A5

Area A5 is in the southwest quarter of Croft State Park near Flemming Branch of Fairforest Creek. Six grids were investigated in this area.

2.4.7.41.3.1 Grid A5-1

Grid A5-1 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.1.1 Eleven of the 37 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 11 anomalies were false positive OE signals caused by trash including magnetic rock and cans.

2.4.7.41.3.2 Grid A5-2

Grid A5-2 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.2.1 All of the nine total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. The nine anomalies were all false positive OE signals caused primarily by magnetic rock and some trash.

2.4.7.41.3.3 Grid A5-3

Grid A5-3 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.3.1 All of the 11 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 11 anomalies were false positive OE signals caused by magnetic rock.

2.4.7.41.3.4 Grid A5-4

Grid A5-4 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.4.1 All of the 12 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. The 12 anomalies were false positive OE signals caused primarily by magnetic rock and some trash.

2.4.7.41.3.5 Grid A5-5

Grid A5-5 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.5.1 Eleven of the 37 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. The eleven anomalies were all false positive OE signals caused by magnetic rock.

2.4.7.41.3.6 Grid A5-6

Grid A5-6 encompassed an area 50 by 50 ft (0.06 acre) and was a moderately wooded area. This site required moderate clearing.

2.4.7.41.3.6.1 Six of the 21 total anomalies detected during the investigation were excavated. Two ORS items (both 30-caliber casings) were found. No UXO items were found on the surface or subsurface. Four anomalies were false positive OE signals caused by trash.

2.4.7.41.3.7 Summary of Results at Sample Area A5

Items found during the investigation indicate this area was likely used for military maneuvers. It appears that small arms were used in dispersed areas within this site.

2.4.7.41.4 Sample Area A7

Area A7 is at the southern boundary of Croft State Park. This site is on both park and private property. Six grids were investigated where ROE could be obtained.

2.4.7.41.4.1 Grid A7b-1

Grid A7b-1 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with some underbrush. This site required moderate clearing.

2.4.7.41.4.1.1 Fourteen of the 37 total anomalies detected during the investigation were excavated. One ORS item (an expended 37-mm APT - tracer round) was found. No UXO items were found on the surface or subsurface. Thirteen anomalies were false positive OE signals caused by trash.

2.4.7.41.4.2 Grid A7b-2

Grid A7b-2 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with some underbrush. This site required moderate clearing.

2.4.7.41.4.2.1 Twenty-three of the 57 total anomalies detected during the investigation were excavated. Five ORS items were found. The ORS consisted of M14 clips and one M1 stripper clip. No UXO items were found on the surface or subsurface. Eighteen anomalies were false positive OE signals caused by non-ordnance-related trash.

2.4.7.41.4.3 Grid A7b-3

Grid A7b-3 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with some underbrush. This site required moderate clearing.

2.4.7.41.4.3.1 Sixteen of the 37 total anomalies detected during the investigation were excavated. One ORS item (a piece of an M-1 clip) was found. No UXO items were found on the surface or subsurface. Fifteen anomalies were false positive OE signals caused by non-ordnance- related trash.

2.4.7.41.4.4 Grid A7b-4

Grid A7b-4 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with some underbrush. This site required moderate clearing.

2.4.7.41.4.4.1 Forty-eight of the 104 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 48 anomalies were false positive OE signals caused by trash that included springs and wire.

2.4.7.41.4.5 Grid A7d-1

Grid A7d-1 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.4.5.1 Fifty of the 124 total anomalies detected during the investigation were excavated. Eight ORS items were found. The ORS consisted of a grenade ring and 30 caliber clips and cartridges. No UXO items were found on the surface or subsurface. All 50 anomalies were false positive OE signals consisting of trash.

2.4.7.41.4.6 Grid A7e-1

Grid A7e-1 encompassed an area 100 by 100 ft (0.23 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.4.6.1 Forty-two of the 105 total anomalies detected during the investigation were excavated. Nineteen ORS items were found. The ORS consisted of a rifle flare, M-1 clips, and 30-caliber casings. No UXO items were found on the surface or subsurface. All 42 anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.41.4.7 Summary of Results at Sample Area A7

Items found during the investigation indicate this area was likely used for military maneuvers. It appears that small arms were used in dispersed areas within this site.

2.4.7.41.5 Sample Area A8

Area A8 is south of the southern boundary of Croft State Park. Five grids were investigated in this area.

2.4.7.41.5.1 Grid A8-1

Grid A8-1 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.5.1.1 All of the 16 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 16 anomalies were false positive OE signals caused by trash.

2.4.7.41.5.2 Grid A8-2

Grid A8-2 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.5.2.1 Six of the 21 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 6 anomalies were false positive OE signals caused by trash.

2.4.7.41.5.3 Grid A8-3

Grid A8-3 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.5.3.1 All of the five total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All five anomalies were false positive OE signals caused by trash.

2.4.7.41.5.2 Grid A8-4

Grid A8-4 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.5.2.1 All of the seven total anomalies detected during the investigation were excavated. Five ORS items were found. The ORS item included four 30-caliber cartridges and one M-1 clip. No UXO items were found on the surface or subsurface. Two anomalies were false positive OE signals caused by non-ordnance-related trash.

2.4.7.41.5.3 Grid A8-5

Grid A8-5 encompassed an area 50 by 50 ft (0.06 acre) and was a wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.5.3.1 All of the seven total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All seven anomalies were false positive OE signals caused by non-ordnance-related trash and magnetic rock.

2.4.7.41.5.4 Summary of Results at Sample Area A8

Items found during the investigation indicate this area was likely used for military maneuvers. It appears that small arms were used in dispersed areas within this site.

2.4.7.41.6 Sample Area A9

Area A9 is south of the southern boundary of Croft State Park. Three grids were investigated in this area. The grid locations were limited due to the lack of ROE to some properties.

2.4.7.41.6.1 Grid A9-1

Grid A9-1 encompassed an area 50 by 50 ft (0.06 acre) and was a heavily wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.6.1.1 All of the nine total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All nine anomalies were false positive OE signals consisting of non-ordnance-related trash.

2.4.7.41.6.2 Grid A9-2

Grid A9-2 encompassed an area 50 by 50 ft (0.06 acre) and was a heavily wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.6.2.1 All of the four total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All four anomalies were false positive OE signals caused by non-ordnance-related trash.

2.4.7.41.6.3 Grid A9-3

Grid A9-3 encompassed an area 50 by 50 ft (0.06 acre) and was a heavily wooded area with heavy underbrush. This site required heavy clearing activities.

2.4.7.41.6.3.1 All of the 14 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 14 anomalies were false positive OE signals caused by non-ordnance-related trash that included barbed wire.

2.4.7.41.6.4 Summary of Results at Sample Area A9

No indications of OE activity were found during the investigation at this site.

2.4.7.41.7 Sample Area A10

Area A10 is south of Croft State Park. Four grids was investigated in a small portion of the overall site. There were problems obtaining ROEs to the entire area.

3.4.7.41.1 Grid A10-1

Grid A10-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.7.1.1 Eleven of the 23 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 23 anomalies were false positive OE signals caused by trash.

2.4.7.41.7.2 Grid A10-2

Grid A10-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.7.2.1 All of the 10 total anomalies detected during the investigation were excavated. No ORS items were found. No anomalies were found on the surface in this grid. One UXO item (an M9 HEAT rifle grenade) was found in the subsurface. Nine anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.7.3 Grid A10-3

Grid A10-3 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.7.3.1 Ten of the 24 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 10 anomalies were false positive OE signals caused by magnetic rock.

2.4.7.41.7.4 Grid A10-4

Grid A10-4 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.7.4.1 Seventeen of the 42 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 17 anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.7.5 Summary of Results at Sample Area A10

One UXO item was found in Area A10. As this item was a high explosive round, this area may require further investigation once additional ROEs are obtained.

2.4.7.41.8 Sample Area A12

Area A12 is east of Croft State Park on the west side of Whitestone Road. Two grids were investigated in a small portion of the overall site. There were problems obtaining ROEs to the entire area.

2.4.7.41.8.1 Grid A12-1

Grid A12-1 encompassed an area 100 by 100 ft (0.23 acre) and was a partially cleared and plowed field. This site required minimal clearing.

2.4.7.41.8.1.1 Twenty-seven of the 66 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 27 anomalies were false positive OE signals caused by trash.

2.4.7.41.8.2 Grid A12-2

Grid A12-2 encompassed an area 100 by 100 ft (0.23 acre) and was a partially cleared and plowed field. This site required minimal clearing.

2.4.7.41.8.2.1 Fourteen of the 14 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 14 anomalies were false positive OE signals caused by trash.

2.4.7.41.8.3 Summary of Results at Sample Area A12

No indications of OE activity were found during the investigation at this site.

2.4.7.41.9 Sample Area A14

Area A14 is east of the Croft State Park on the west side of Whitestone Road. Two grids were investigated in a small portion of the overall site. There were problems obtaining ROEs to the entire area.

2.4.7.41.9.1 Grid A14-1

Grid A14-1 encompassed an area 100 by 100 ft (0.23 acre) and was a cleared area. This site required minimal clearing.

2.4.7.41.9.1.1 Nineteen of the 46 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 19 anomalies were false positive OE signals caused by of trash.

2.4.7.41.9.2 Grid A14-2

Grid A14-2 encompassed an area 100 by 100 ft (0.23 acre) and was a cleared area. This site required minimal clearing.

2.4.7.41.9.2.1 Eighteen of the 45 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 18 anomalies were false positive OE signals caused by trash.

2.4.7.41.9.3 Summary of Results at Sample Area A14

No indications of OE activity were found during the investigation at this site.

2.4.7.41.10 Sample Area A16

Area A16 is east of the Croft State Park on the west side of Highway 150. Two grids were investigated in a small portion of the overall site. There were problems obtaining ROEs to the entire area.

2.4.7.41.10.1 Grid A16-1

Grid A16-1 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared area. This site required minimal clearing.

2.4.7.41.10.1.1 All of the 10 total anomalies detected during the investigation were excavated. Three ORS items were found. The ORS consisted of three M-1 clips. No UXO items were found on the surface or subsurface. Seven anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.10.2 Grid A16-2

Grid A16-2 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared area. This site required minimal clearing.

2.4.7.41.10.2.1 All of the 13 total anomalies detected during the investigation were excavated. Two ORS items were found. The ORS consisted an M-1 clip and 30-caliber casings. No UXO items were found on the surface or subsurface. Eleven anomalies were false positive OE signals consisting of non-UXO-related trash.

2.4.7.41.10.3 Summary of Results at Sample Area A16

Items found during the investigation indicate this area was likely used for military maneuvers. It appears that small arms fire was performed in dispersed areas within this site.

2.4.7.41.11 Sample Area A18

Area A18 is northeast of Croft State Park and south of Highway 176 (alt). One grid was investigated at this site

2.4.7.41.11.1 Grid A18-1

Grid A18-1 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared area. This site required minimal clearing.

2.4.7.41.11.1.1 Twenty-eight of the 84 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 28 anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.41.11.2 Summary of Results at Sample Area A18

No indications of OE activity were found during the investigation at this site.

2.4.7.41.12 Sample Area A20

Area A20 is north of Highway 176 bypass near Pacolet. Two grids were investigated at this site

2.4.7.41.12.1 Grid A20-1

Grid A20-1 encompassed an area 50 by 50 ft (0.06 acre) and was a landscaped property with woods. This site required minimal clearing.

2.4.7.41.12.1.1 Ten of the 31 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 10 anomalies were false positive OE signals consisting of trash.

2.4.7.41.12.2 Grid A20-2

Grid A20-2 encompassed an area 50 by 50 ft (0.06 acre) and was a landscaped property with woods. This site required minimal clearing.

2.4.7.41.12.2.1 Fourteen of the 43 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 14 anomalies were false positive OE signals caused by trash.

2.4.7.41.12.3 Summary of Results at Sample Area A20

No indications of OE activity were found during the investigation at this site.

2.4.7.41.13 Sample Area A21

Area A21 is north of Highway 176 bypass near Pacolet. Two grids were investigated at this site.

2.4.7.41.13.1 Grid A21-1

Grid A21-1 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared area with few obstructions. This site required minimal clearing.

2.4.7.41.13.1.1 Twenty-five of the 60 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 25 anomalies were false positive OE signals caused by trash.

2.4.7.41.13.2 Grid A21-2

Grid A21-2 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared area with few obstructions. This site required minimal clearing.

2.4.7.41.13.2.1 Twenty-one of the 52 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 21 anomalies were false positive OE signals consisting of trash.

2.4.7.41.13.3 Summary of Results at Sample Area A21

No indications of OE activity were found during the investigation at this site.

2.4.7.41.14 Sample Area A29

Area A29 is along the west side of Henningston Road just south of Highway 295. Two grids were investigated at this site.

2.4.7.41.14.1 Grid A29-1

Grid A29-1 encompassed an area 50 by 50 ft (0.06 acre) and was a lot in a residential area. This site required minimal clearing.

2.4.7.41.14.1.1 All of the 10 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 10 anomalies were false positive OE signals caused by trash.

2.4.7.41.14.2 Grid A29-2

Grid A29-2 encompassed an area 50 by 50 ft (0.06 acre) and was a lot in a residential area. This site required minimal clearing.

2.4.7.41.14.2.1 All of the six total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All six anomalies were false positive OE signals caused by trash.

2.4.7.41.14.3 Summary of Results at Sample Area A29

No indications of OE activity were found during the investigation at this site.

2.4.7.41.15 Sample Area A31

Area A31 is north of Croft State Park, south of the intersection of Dairy Ridge Road and Route 295. Two grids were investigated at this site.

2.4.7.41.15.1 Grid A31-1

Grid A31-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.15.1.1 One hundred-fifty-two of the 1,009 total anomalies detected during the investigation were excavated. One hundred-forty-four ORS items (218 lbs) were found. All ORS was M9 rifle grenade scrap with the exception of one piece of 2.36-inch rocket scrap and two pieces of MK II hand grenade scrap. No UXO items were found on the surface in this grid. Seven UXO items were found in the subsurface at this grid including five M9 HEAT rifle grenades and two MKII hand grenades. These UXO items were blown in place.

2.4.7.41.15.1.2 One anomaly gave a false positive signal caused by non-UXO-related trash.

2.4.7.41.15.2 Grid A31-2

Grid A31-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.15.2.1 Eighty of the 481 anomalies detected during the investigation were excavated. Sixty-five ORS items were found. All ORS (17 lbs) was M9 rifle grenade scrap with the exception of three

fragments of 2.36-inch rocket. No UXO items were found on the surface in this grid. Seven UXO items were found in the subsurface at this grid including five M9 HEAT rifle grenades, one MKII hand grenade, and one M6 A3 2.36-inch rocket. These UXO items were all blown in place.

2.4.7.41.15.2.2 Eight anomalies gave a false positive OE signal caused by non-UXO-related trash.

2.4.7.41.15.3 Summary of Results at Sample Area A31

Items found during the investigation indicate this area was used as an impact range for 2.36-inch anti-tank rockets, M9-rifle grenades, and Mk II hand grenades. This site contains high order explosives which, if mishandled, could be hazardous.

2.4.7.41.16 Sample Area A32

Area A32 is north of Croft State Park and south of the intersection of Dairy Ridge Road and Route 295. Six grids were investigated at this site.

2.4.7.41.16.1 Grid A32-1

Grid A32-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.16.1.1 Thirty-three of the 82 total anomalies detected during the investigation were excavated. Eight ORS items were found. The ORS consisted of 2.36-inch rocket debris, 40-mm casing debris, and 30.06 casing debris. No UXO items were found on the surface or in the subsurface. Twenty-five anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.16.2 Grid A32-2

Grid A32-2 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.16.2.1 Twenty-seven of the 67 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface. Two M9 HEAT rifle grenades were found in the subsurface. These UXO items were blown in place.

2.4.7.41.16.2.2 Twenty-five anomalies were false positive OE signals caused by non-UXO-related trash.

2.4.7.41.16.3 Grid A32-3

Grid A32-3 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.16.3.1 Eighteen of the 44 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 18 anomalies were false positive OE signals caused by trash.

2.4.7.41.16.4 Grid A32-4

Grid A32-4 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with dense underbrush. This site required heavy clearing activities.

2.4.7.41.16.4.1 All of the 10 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 10 anomalies were false positive OE signals caused by trash including magnetic rock, pipe, and nails.

2.4.7.41.16.5 Grid A32-5

Grid A32-5 encompassed an area 50 by 50 ft (0.06 acre) and was a landscaped lot in a residential area. This site required minimal clearing.

2.4.7.41.16.5.1 All of the eight total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All eight anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.41.16.6 Grid A32-6

Grid A32-6 encompassed an area 50 by 50 ft (0.06 acre) and was a landscaped lot in a residential area. This site required minimal clearing.

2.4.7.41.16.6.1 All of the 12 total anomalies detected during the investigation were excavated. One ORS item (a 30-caliber casing) was found. No UXO items were found on the surface or subsurface. Eleven anomalies were false positive OE signals caused by trash.

2.4.7.41.16.7 Summary of Results at Sample Area A32

Items found during the investigation indicate this area was used as an impact range for 2.36-anti- tank rockets, M9-rifle grenades, and Mk II hand grenades. This site contains high order explosives which, if mishandled, could be hazardous.

2.4.7.41.17 Sample Area A33

Area A33 is north of Croft State Park and northwest of the intersection of Dairy Ridge Road and Route 295. Two grids were investigated at this site.

2.4.7.41.17.1 Grid A33-1

Grid A33-1 encompassed an area 50 by 50 ft (0.06 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.17.1.1 Eight of the 27 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All eight anomalies were false positive OE signals caused by trash that included nails, cans, and wire.

2.4.7.41.17.2 Grid A33-2

Grid A33-2 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared field. This site required minimal clearing.

2.4.7.41.17.2.1 Sixty-one of the 191 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 61 anomalies were false positive OE signals caused by trash that included magnetic rock, tin, nails, and wire.

2.4.7.41.17.2 Summary of Results at Sample Area A33

No indications of OE activity were found during the investigation at this site.

2.4.7.41.18 Sample Area A34

Area A34 is north of Croft State Park in the Wedgewood subdivision. This general area was designated as OOU3 in the Phase I EE/CA report (ESE, 1994) and has been expanded by the USACE-CD life cycle manager to include the entire subdivision. Only one grid was originally proposed for

investigation in this area. However, the USACE-CD life cycle manager increased the number of grids to five to better cover the entire area.

2.4.7.41.18.1 Grid A34-1

Grid A34-1 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared lot in a residential area. This site required minimal clearing.

2.4.7.41.18.1.1 One hundred-forty-two of the 353 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. The 142 anomalies were all false positive OE signals caused by magnetic rock and some trash.

2.4.7.41.18.2 Grid A34-2

Grid A34-2 encompassed an area 50 by 50 ft (0.06 acre) and was a clear lot in a residential area. This site required minimal clearing.

2.4.7.41.18.2.1 Thirty-five of the 83 total anomalies detected during the investigation were excavated. Five ORS items were found. The ORS consisted of fragments from a 2.36-inch rocket and other unidentified scrap. No UXO items were found on the surface or subsurface. Thirty anomalies were false positive OE signals caused by non-ordnance-related trash.

2.4.7.41.18.3 Grid A34-3

Grid A34-3 encompassed an area 50 by 50 ft (0.06 acre) and was a clear lot in a residential area. This site required minimal clearing.

2.4.7.41.18.3 Two hundred-eighty of the 932 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. The 280 anomalies were all false positive OE signals caused primarily by magnetic rock and some trash including tin snips.

2.4.7.41.18.4 Grid A34-4

Grid A34-4 encompassed an area 50 by 50 ft (0.06 acre) and was a clear lot in a residential area. This site required minimal clearing.

2.4.7.41.18.4.1 Fifty-three of the 131 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 53 anomalies were false positive OE signals caused by trash and magnetic rock.

2.4.7.41.18.5 Grid A34-5

Grid A34-5 encompassed an area 50 by 50 ft (0.06 acre) and was a cleared lot in a residential area. This site required minimal clearing.

2.4.7.41.18.5.1 One hundred-thirty-two of the 330 total anomalies detected during the investigation were excavated. Four ORS items (Nk II grenade fragments) were found. No UXO items were found on the surface or subsurface. One hundred-twenty-eight anomalies were false positive OE signals caused by non-ordnance-related trash.

2.4.7.41.18.6 Summary of Results at Sample Area A34

Items found during the investigation indicate this area was used as an impact range for 2.36" anti-tank rockets, and a practice range for Mk II hand grenades. This site generally contains practice grenades which, if mishandled, may be a hazard. Evidence of higher order explosions were observed in the rocket fragments. However, UXOs containing high explosives were not found.

2.4.7.41.19 Sample Area A37

Area A37 is in Croft State Park near the field office along Dairy Ridge Road. Four grids were investigated in this area.

2.4.7.41.19.1 Grid A37a-1

Grid A37a-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.19.1.1 All of the 12 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 12 anomalies were false positive OE signals consisting of trash.

2.4.7.41.19.2 Grid A37a-2

Grid A37a-2 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.19.2.1 Nineteen of the 45 total anomalies detected during the investigation were excavated. No buried ORS items were found. However a density of twenty-seven 30-caliber cartridges per square foot were observed at the ground surface. The magnetometer operator had to clear portions of the ground surface and only magged and flagged anomalies that were from subsurface items. To save time, the entire grid surface was not cleared of cartridges. No UXO items were found on the surface or subsurface. All 19 anomalies were false positive OE signals caused by trash.

2.4.7.41.19.3 Grid A37b-1

Grid A37b-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.19.3.1 Twenty-seven of the 66 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 27 anomalies were false positive OE signals caused by trash including nails.

2.4.7.41.19.4 Grid A37c-1

Grid A37c-1 encompassed an area 100 by 100 ft (0.23 acre) and was wooded with some underbrush. This site required moderate clearing.

2.4.7.41.19.4.1 Forty of the 98 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 40 anomalies were false positive OE signals caused by trash including magnetic rock, nails, and barbed wire.

2.4.7.41.19.5 Summary of Results at Sample Area A37

No indications of OE activity were found at most of these grid sites. Location A37a-2 was an apparent localized small arms target range. This area contained numerous 30-caliber cartridges on the ground surface. There were several target bunkers set up in this area.

2.4.7.41.20 Sample Area A39

Area A39 is in Croft State Park on the north side of McFadden. Two grids were investigated in this area. This area was adjacent to the Croft State Park swimming pool and recreation area.

2.4.7.41.20.1 Grid A39-1

Grid A39-1 encompassed an area 100 by 100 ft (0.23 acre) and was a cleared portion of the state park adjacent to the swimming pool. This site required minimal clearing.

2.4.7.41.20.1.1 Sixty-six of the 233 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All 66 anomalies were false positive OE signals caused by trash including magnetic rock, wire, and nails.

2.4.7.41.20.2 Grid A39-2

Grid A39-2 encompassed an area 100 by 100 ft (0.23 acre) and was a cleared portion of the state park adjacent to the swimming pool. This site required minimal clearing.

2.4.7.41.20.2.1 Nine of the 21 total anomalies detected during the investigation were excavated. No ORS items were found. No UXO items were found on the surface or subsurface. All nine anomalies were false positive OE signals caused by trash.

2.4.7.41.20.3 Summary of Results at Sample Area A39

No indications of OE activity were found during the investigation at this site.

2.4.7.42 Production Rates

Production rates were estimated based on man hours spent on the specified tasks during the field effort. Figure 2-6 presents a pie chart showing the resulting production rates.

- Approximately 13 percent of the manhours were expended during mobilization and demobilization activities. This included office and site set up, shipping of supplies, travel, and site-specific safety training.
- Approximately 19 percent of the manhours were expended locating the grid, setting up the grid, and clearing of vegetation. The clearing operations included clearing paths to sites in the interior of the study areas and clearing vegetation within the grids. The vegetation was cleared just enough for effective magnetometer use. Equipment maintenance is also included in the manhours for clearing.
- Approximately 17 percent of the manhours was used for survey activities, including staking sites and obtaining coordinates of the site corners.
- Approximately 18 percent of the total manhours were used during mag/flag operations. These manhours were spent locating and flagging anomalies.

Field Production
(percent total man hours)

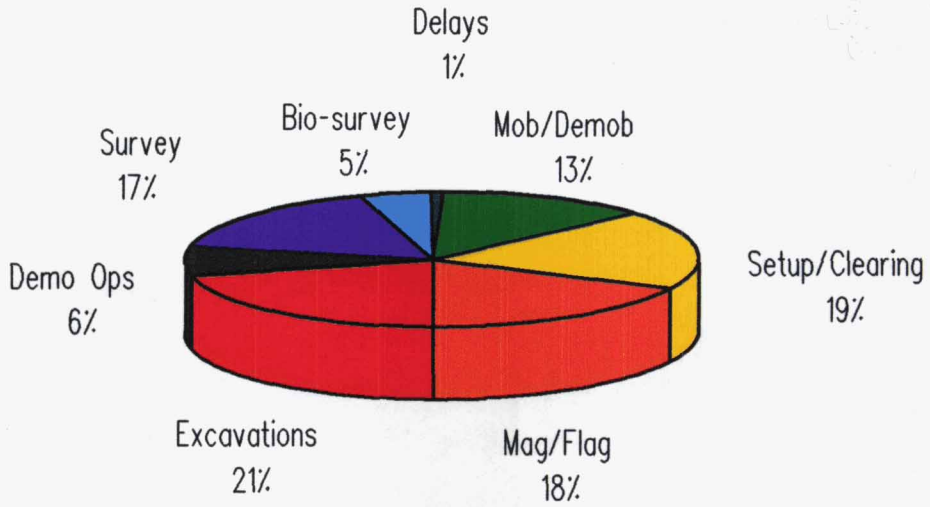

Figure 2-6
PRODUCTION RATES CCATF
PHASE II EE/CA INVESTIGATION

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

- Approximately 21 percent of the manhours was spent conducting the intrusive activities, including locating the correct anomaly to be excavated using the Gridstats software created by QuantiTech. The manhours for the intrusive work also include the time expended collecting ORS and transporting the ORS to the storage area.
- Approximately 6 percent of the manhours was required for demolition operations, including the filling of sand bags for tamping, transporting explosives, setting up charges, and the cleanup required after detonation.
- Approximately 5 percent of the total manhours was required for a biologic survey. A biologist was escorted to each grid area to determine whether threatened or endangered species were located in the grid.
- Delays accounted for less than 1 percent of the total manhours. These delays were primarily caused by local resident concerns or unsafe weather conditions.

2.4.8 Site Safety

The safety procedures provided in the site-specific WP (ESE, 1995) were followed during the EE/CA field investigation conducted at former CCATF. The procedures included the following:

- Non-UXO qualified personnel were not permitted to perform UXO operations (e.g., access, identification, transportation, storage, or disposal of UXO).
- UXO operations were not conducted during the hours from sunset to sunrise or during electrical storms or other severe weather conditions.
- A minimum of two UXO-qualified persons, trained as per 29 CFR 1910.120e(i), were present during all UXO operations.
- During all OE/UXO confirmation operations, only the minimum number of UXO-qualified personnel were allowed inside the exclusion zone. All others were evacuated to a pre-designated assembly point.
- All access, identification, and disposal/venting procedures of OE/UXO were accomplished by UXO-qualified personnel.

2.4.8.0.1 Any suspected or known OE/UXO encountered during geophysical survey operations was clearly marked and its position noted on the appropriate map. A UXO supervisor evaluated all encountered UXO and determined if the work planned for the area could safely continue or what actions must occur prior to commencing work. Such recommendations were made immediately to the senior UXO supervisor, who in turn contacted the USAESCH safety representative, if necessary.

2.4.8.1 Site Control

On discovery of suspected OE/UXO, the immediate area was clearly marked and secured as an exclusion zone and warnings were posted to ensure no unauthorized personnel entry into the exclusion zone.

2.4.8.1.1 Due to the number of sampling sites and the large size of former CCATF, overall site control through one point was not feasible.

2.4.8.1.2 The protection of the public during the EE/CA investigation was a primary concern. QST and local agencies coordinated closely to ensure visitors were not in the vicinity during intrusive or demolition activities.

2.4.8.2 General Site UXO and Safety Procedures

General site safety procedures listed in this section were followed throughout this project, in addition to USACE safety concepts and considerations for UXO as described in the following appendices to the site-specific WP (ESE, 1996e):

- Explosives Safety Precautions (Appendix C),
- SSHP (Appendix D), and
- Demolition/Disposal Range SOP (Appendix E).

2.4.8.2.1 The UXO supervisors were responsible for the handling of all UXOs. The UXO supervisor, site safety officer, and senior UXO supervisor reviewed the condition of each UXO and determined if the round could be moved to a demolition area for disposal.

2.4.8.2.2 The site safety officer prepared a daily tailgate safety briefing. The safety briefing included discussion of each hazard suspected at the sites, the previous day's problems, and other pertinent information. A special safety briefing was conducted weekly to discuss safety topics in detail.

2.4.8.2.3 The site safety officer conducted daily inspections and verified the implementation of safety procedures at each site, safe equipment operation, safety supplies, and other safety-related procedures.

2.4.8.3 Accident Reporting

No accidents occurred and thus none were reported to the QST site manager during the field effort. However, procedures were in place (as stated in the WP) to properly report and document if any accident had occurred.

2.4.9 Quality Control

The quality control (QC) procedures performed during the EE/CA activities at former CCATF were in accordance with the site-specific WP (ESE, 1996e). The site-specific WP was designed to manage, control, and document performance of work efforts in accordance with the USAESCH SOW.

2.4.9.0.1 According to the QST QA program, effective daily field QC management was delegated to the QST site manager. The site manager interacted daily with the project team to ensure that all QC procedures presented in the WP were followed during project performance. The QST site manager generated daily field activity reports for the QST project manager. These reports included a description of quality assurance (QA)/QC activities and was the basis of monthly project reports to USAESCH.

2.4.9.0.2 System audits were conducted to assess and document project staff performance. System audits were inspections of training status, records, QC data, calibrations, and conformance to approved procedures as specified in the WP. USAESCH Safety Personnel performed several inspections during the site operations to determine whether safety protocol were being followed.

2.4.9.0.3 The subcontractor, OES, Inc. (OES) was responsible for record keeping and the QC of ordnance, explosives, and ORS. Accountability logs were maintained under the supervision of the OES site supervisor/manager. Safety records were maintained by OES's site safety manager. The QST site manager audited the records several times during the field effort.

2.4.9.1 Equipment Standard Response Checks

Equipment Standard Response Checks QC was supervised by the UXO supervisor (team leader) and recorded in the daily log book. Standard response checks were completed on all field equipment. As per the work plan.

2.4.9.2 Field Investigation Documentation

Field investigation documentation consisted of the following elements:

- Daily training records,
- Photographic records,
- Working maps,
- Records of UXO items,
- Daily field records,
- Site safety records, and
- Cost tracking records.

2.4.9.2.1 All gridstat data were compiled daily and collected in a three-ring binder.

2.5 Evaluation of OE Contamination

The risk presented by UXO depends on the number, type, and depth of the ordnance and the likelihood that the public will come in contact with the UXO. This risk can be minimized by the selection of the most cost-effective risk reduction alternative and by implementing the alternative in a timely manner.

2.5.0.1 The risk presented by ordnance is determined in part by the type and size of the item. The risk is also determined by the density of unexploded ordnance in an area. Practice bombs that are equipped with a small spotting charge could be harmful to a person finding the item if the charge is intact. Unexpended incendiary devices such as white phosphorous can be extremely hazardous to the person finding the device but would not affect others some distance away. Projectiles containing high explosives, however, could be hazardous not only to the finder but also to persons thousands of feet away. Finally, areas that have a high concentration of ordnance-related items are also likely to contain a higher number of items that could endanger the public.

2.5.0.2 To evaluate the degree of risk presented by the ordnance areas identified in the former CCATF area, a careful judgement must be made of the amount, location, and type of UXO in each area. The result of this determination will then be used to evaluate the cost of the various removal response alternatives that are appropriate for each area of the project site. This judgement must be based on not only the field sampling but also on the available historical information and collective experience gained from investigation of sites where similar activity has occurred. Statistical analysis of collected data is useful as guidance when judging ordnance density, but the data required for reliable analysis are rarely obtainable. Similarly, the identity of the ordnance items that are found during sampling may help to characterize the type of ordnance within an area but also rarely is complete enough to accurately identify the true nature of the contamination.

2.5.1 Overall Evaluation of OE Contamination

There are three major divisions of sites that will be evaluated for OE contamination. These sites include: Small arms areas, ORS areas, and UXO areas. This grouping was developed based on the results of the EE/CA Phase II field investigation.

2.5.1.1 Small Arms Areas

There were nine sampling areas across the site where the presence of small arms were observed. These areas were generally used for military maneuvers and small arms firing ranges. The location

and type of ORS found in these areas (e.g., cartridges, M-1 clips, small caliber tracer rounds) is an indication of the dispersed nature of activities where these items were found. As a result, there is little hazard associated with the items found in the small arms investigation areas. However, hazardous OE items may have been used sporadically at any location at the former CCATF.

2.5.1.2 ORS Areas

There were nine sampling areas where ORS was recovered. Four areas within the park include one former grenade range and three ordnance impact areas. The five areas outside the park include two possible former grenade ranges, and three former impact areas. Items found at these sites include fragments from hand grenades, 2.36-inch rockets, M9 rifle grenades, several types of practice and live mortars, and other miscellaneous fragment items. Even though no UXOs were found at these sites, the fragments found at some of the sites were indicative of high order detonations. These sites have a moderate potential of containing live UXO.

2.5.1.2.1 At some of the ORS sites, most of the items found were practice items. Although no items containing explosives were found, there is a potential for items with minor explosive charges to be buried at some of these sites. These items with minor explosive charges may be hazardous to people who may find and mishandle the item.

2.5.1.3 UXO Areas

UXO was recovered from two areas. Both were outside Croft State Park. One area was an impact range for several types of munitions including mortars, 2.36-inch rockets, M9-rifle grenades, and hand grenades. Most of these items contained high order explosives and were blown in place. This area contains the highest risk seen at the former CCATF. The second area, south of the park, contained one UXO item (a M9 HEAT rifle grenade) and no other fragments or scrap.

2.6 SiteStats

After the site investigations were completed, and the investigation area was determined, the SiteStats software program, developed by Quantitech, was used to determine the density of ordnance within the areas where ordnance was found. The results of the SiteStats analyses are provided in Appendix E. Table 2-4 summarizes the site stats data including the the sector, the ordnance density, and the alpha and beta values.

Table 2-4. SiteStats Results

Sector	SiteStats Ordnance Density (Items /sq ft)	Alpha Value	Beta Value
10A	0=00	0.3666	1.0000
10B	0=00	1.0000	0.3506
10C	0=00	1.0000	0.4444
10D	0=00	1.0000	0.5538
11A	0=00	1.0000	0.6031
11B	0=00	1.0000	0.2510
11C	0=00	1.0000	0.2665
11D	0=00	1.0000	0.6000
12A	1.30E-03	0.4708	1.0000
12B	0=00	1.0000	0.2681

Note: Alpha Value is the probability of concluding that the sector is nonhomogeneous when it is homogeneous.

Beta Value is the probability of concluding that the sector is homogeneous when it is nonhomogeneous.

SiteStats Ordnance Density is calculated by the SiteStats program.

3.0 Development of Ordnance Operable Units

The definition of the investigation areas was based primarily on prior military use of the areas and knowledge gained from previous investigations, interviews, and archive searches. To facilitate the EE/CA analysis, however, the sites must be subdivided into OOUs.

3.1 Selection Criteria

OOUs are used to divide a site into distinct units for analysis. The purpose of this division can be to facilitate either the investigation or the evaluation of risk reduction alternatives. The units may be defined by common site characteristics, the nature and extent of contamination, similar past land use, current ownership, or current and potential land use.

3.1.1 Common Site Characteristics

Common site conditions may include geography, topography, soils, geology, or ecology. Geography and topography may affect the degree to which the area is accessible to the human population. Decreased accessibility could mean a decreased overall risk to the population. In addition, decreased risk due to geography or topography-limited access would be permanent.

3.1.1.1 The nature of the geology and soils may affect the depth to which OE may be buried. In areas with thick soft soils, OE may be buried to several feet. Burial depth would affect the excavation methods used in removal actions. Deep burial may decrease the risk to the public and the need for removal actions. In areas where the soil is thin or absent, OE will lie near the surface. Most areas at the site do not have a soil thickness greater than 2 ft. Rock was generally encountered at the sample grid areas within 4 inches of the surface to approximately 2 ft in depth.

3.1.2 Nature and Extent of Contamination

The nature of the contamination will affect the type of risk reduction alternative selected. In the case of the former CCATF Phase II investigation, the OE contamination includes small arms, mortars, hand grenades, rifle grenades, and 2.36-rockets. Areas that were used as targets for large-sized ordnance may require special consideration. No CWM is known to exist at the site.

3.1.2.1 Areas that, in general, have a low probability of containing OE should be grouped together because the low probability will affect the recommendation of the selected risk reduction alternative. Areas that have a history of OE discovery should similarly be grouped.

3.1.3 Similar Past Land Use

The historical use of an area is related to the likelihood of encountering contamination. Areas used as observation sites or as staging areas would by unlikely to contain residual OE. Areas that were heavily used as target areas, however, would have a high probability of containing residual OE and should be grouped together.

3.1.4 Current Ownership

The current ownership of an area affects primarily the implementability of certain risk reduction alternatives. Publicly owned land often can be more easily investigated and cleared than privately owned land. Implementing risk reduction alternatives on land owned by the state government may be more implementable than land owned by individuals, although the degree of implementability may not be significant.

3.1.5 Current and Potential Land Use

Current and potential land use can affect potential exposure to OE. Areas that are currently used for recreational purposes by the public and areas that are likely to have high public usage should be given special consideration and probably defined as a distinct OOU.

3.1.6 Public Accessibility

One of the most important factors defining the degree of risk presented by an area is the potential for access by the public. Accessibility is related to many of the other selection criteria. Land uses that are heavily oriented to the public will result in a high level of potential exposures. Areas difficult to access by the public will result in low probability of potential exposures.

3.2 Definition of EE/CA OOUs

To facilitate the evaluation of risk reduction alternatives for the Phase II EE/CA, four additional OOUs (OOU9 through OOU12) were identified based on the similarity of previous site activity, type of land ownership (private or public), and remedial requirements. Each of the four OOUs were subdivided into sectors based on their geographical locations (see Figure 3-1). Table 3-1 presents a summary of the characteristics defining each OOU and its corresponding sectors.

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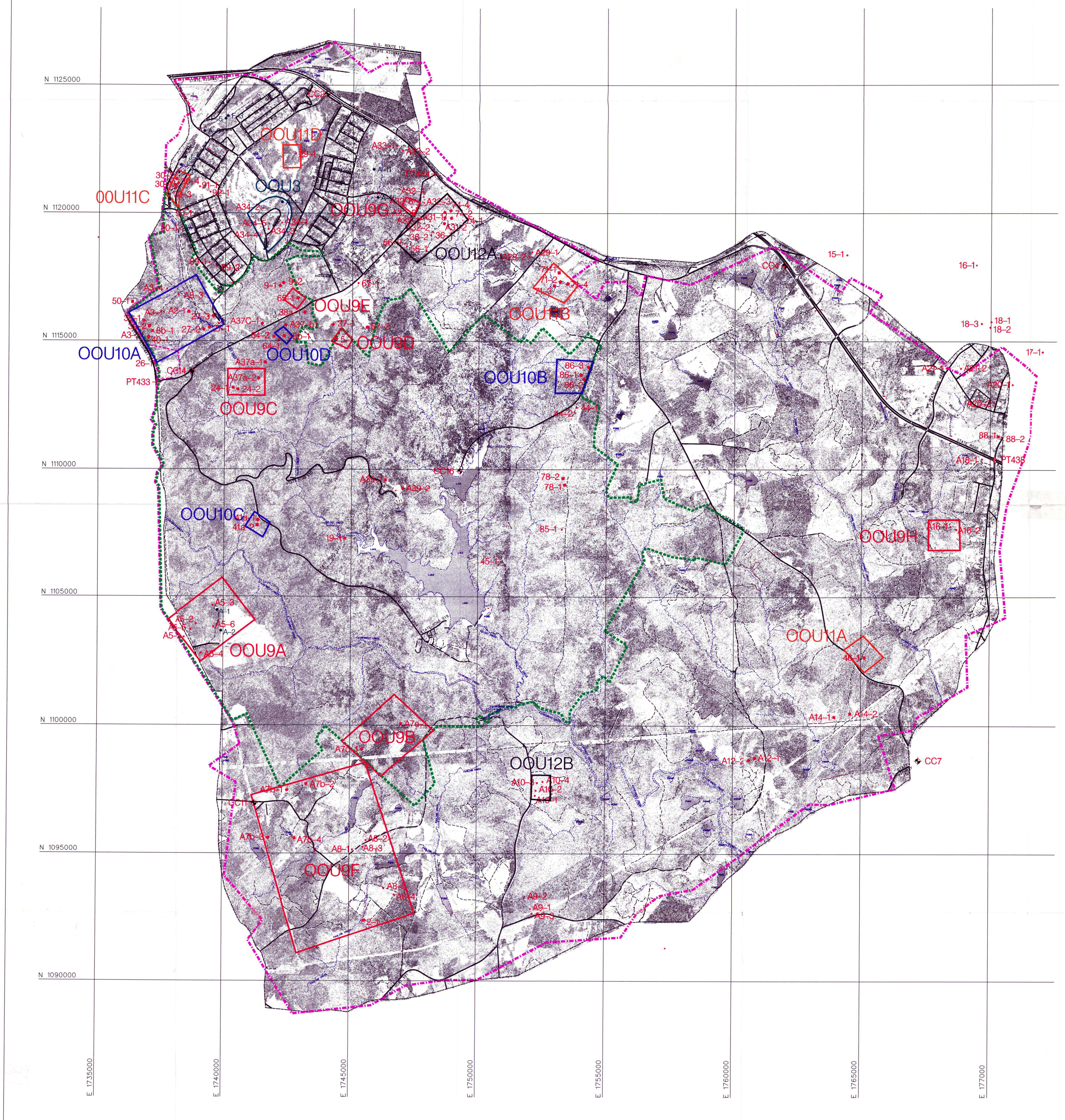


Figure 3–1

OOU LOCATIONS PHASE II INVESTIGATION

SOURCE: QST 1997; USGS 1983

LEGEND

- APPROXIMATE BOUNDARY OF FORMER CAMP CROFT AREA
- BOUNDARY OF CROFT STATE PARK
- ROADS
- STREAMS
- OOU10C — ORDNANCE OPERABLE UNITS
- + CONTROL POINT
- A5–1 • 50 x 50 FOOT SURVEY GRID
- A39–1 ■ 100 x 100 FOOT SURVEY GRID
- J–3 ● HFA SURVEY GRID
- CC16 ⊕ SURVEY MONUMENT

NOTE: COORDINATES ARE STATE PLANE IN FEET.

METERS: 0 500 1000

FEET: 0 1500 3000

N

SCALE: 1" = 1500FT

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER
HUNTSVILLE

Table 3-1. Summary of OOU Characteristics (Page 1 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	**OOU9 (9A through 9H)**	**OOU10 (10A through 10D)**	**OOU11 (11A through 11D)**	**OOU12 (12A and 12B)**
Site Characteristics					
Geography	Foothills area of the Blue Ridge Mountains.	Foothills area of the Blue Ridge Mountains.	Foothills area of the Blue Ridge Mountains.	Foothills area of the Blue Ridge Mountains.	Foothills area of the Blue Ridge Mountains.
Topography	Moderately hilly with some flat areas.	Varies from fairly flat to moderately hilly.	Moderate to steep hills with creek/river valleys.	Varies from flat to moderately hilly. Sector 11B contains a moderately steep creek valley.	Moderate to steep hills with creek/river valleys.
Soils	Thick saprolitic and clayey soils, normally derived from granitic igneous or micaceous metamorphic rocks.	Thick saprolitic and clayey soils, normally derived from granitic igneous or micaceous metamorphic rocks. In localized areas mixed alluvial sediments predominate.	Thick saprolitic and clayey soils, normally derived from granitic igneous or micaceous metamorphic rocks. In localized areas mixed alluvial sediments predominate.	Thick saprolitic and clayey soils, normally derived from granitic igneous or micaceous metamorphic rocks.	Soils are primarily saprolitic and clayey, normally derived from granitic igneous or micaceous metamorphic rocks. In localized areas mixed alluvial sediments predominate.

Table 3-1. Summary of OOU Characteristics (Page 2 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	**OOU9 (9A through 9H)**	**OOU10 (10A through 10D)**	**OOU11 (11A through 11D)**	**OOU12 (12A and 12B)**
Vegetation	Varies from land-scaped yards to small wooded areas.	Sectors vary widely: 9A - Clear to lightly wooded areas. 9D, 9E, 9F & 9H - Moderate woods and underbrush. 9B and 9C - Heavy woods and thick underbrush. 9G - Residential lawn grass mixed with moderately dense forest.	Sectors vary: 10A and 10B - Moderate to heavy woods and thick underbrush. 10C and 10D - Moderate woods and underbrush.	Sectors vary: 11A - Moderate woods and underbrush. 11B - Clear to lightly wooded areas. 11C - Heavy woods and thick underbrush. 11D - Golf course; manicured grass areas alternating with wooded areas.	12A - Thick vegetation consisting of trees and underbrush. 12B - Moderately thick vegetation (trees and underbrush).
Public Accessibility	Privately owned. Casual public entry.	9A through 9E - Publicly owned state park land. Hosts approximately 100,000 visitors per year. 9F through 9H - Privately owned. Casual public entry.	10A through 10D - Publicly owned state park land. Hosts approximately 100,000 visitors per year.	11A, 11B, 11C - Privately owned. Casual public entry. 11D - Golf Course has an estimated 25,000 visitors per year.	12A - Privately owned. Leased as a hunting property. 12B - Privately owned. Casual public entry.

Table 3-1. Summary of OOU Characteristics (Page 3 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	**OOU9 (9A through 9H)**	**OOU10 (10A through 10D)**	**OOU11 (11A through 11D)**	**OOU12 (12A and 12B)**
LAND USE					
Past Use	Practice Grenade Range.	9A through 9H - Various Small Arms Ranges.	10A and 10B - Areas used for training maneuvers. 10C - Areas used for training maneuvers and possibly as a mock village. 10D - Practice Grenade Range.	11A, 11B and 11C - Areas used for training maneuvers. 11D - Suspected Grenade Range.	12A - Impact range for live high explosive items. 12B - Suspected area of training maneuvers.
Present Use	Residential.	9A through 9E - Recreation including hiking, wildlife observation, picnicking, and horseback riding. 9F through 9H - Privately owned, some residences.	10A through 10D - Recreation including hiking, wildlife observation, picnicking, and horseback riding.	11A - Industrial property. 11B - Privately owned field used for grazing. 11C - Privately owned mostly wooded property. 11D - Active golf course.	12A - Privately owned. Parts are residential and parts are leased as a hunting property. 12B - Residential.

Table 3-1. Summary of OOU Characteristics (Page 4 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	**OOU9 (9A through 9H)**	**OOU10 (10A through 10D)**	**OOU11 (11A through 11D)**	**OOU12 (12A and 12B)**
Potential Future Use	Residential.	9A through 9E - Recreation including hiking, wildlife observation, picnicking, and horseback riding. 9F through 9H - Residential.	10A through 10D - Recreation including hiking, wildlife observation, picnicking, and horseback riding.	11A - Industrial property. 11B - Privately owned. 11C - Privately owned. 11D - Golf course with potential for additional construction.	12A - Residential and leased as a hunting property. 12B - Residential.

Table 3-1. Summary of OOU Characteristics (Page 5 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	OOU9 (9A through 9H)	OOU10 (10A through 10D)	OOU11 (11A through 11D)	OOU12 (12A and 12B)
NATURE AND EXTENT OF PRESENT CONTAMINATION					
Ordnance	ORS from hand grenades, rifle grenades, and rockets.	Small arms projectiles.	ORS from hand grenades, rifle grenades, rockets, land mines, mortars, flares, and small arms projectiles.	ORS from hand grenades, rifle grenades, rockets, mortars, and small arms projectiles.	12A - Fragments of and live UXOs including M9 Rifle Grenades, 2.36" rockets, Practice M6A3 Rifle Grenade, M11 Practice Rifle Grenade, and Mk II Hand Grenades. 12B - Live M9 Rifle Grenade.
UXO Density	Estimated at 0.778/acre based on data obtained during clearance by HFA.	No UXO found. None anticipated.	No UXO found. Estimated at 0 to 18 UXOs per acre (based on analogy to OOU12B).	No UXO found. Estimated at 0 to 7 UXOs per acre (based on analogy to OOU12B).	12A - Estimated at 57 UXOs/acre based on results of field investigation. 12B - Estimated at 8.6 UXOs/acre based on results of field investigation.

Table 3-1. Summary of OOU Characteristics (Page 6 of 6)

Selection Criteria	Ordnance Operable Unit (OOU)				
	OOU3	**OOU9 (9A through 9H)**	**OOU10 (10A through 10D)**	**OOU11 (11A through 11D)**	**OOU12 (12A and 12B)**
CURRENT OWNERSHIP	Privately owned.	9A through 9E - Publicly owned state land (South Carolina). 9F through 9H - Privately owned.	10A through 10D - Publicly owned state land (South Carolina).	11A, 11B, 11C - Privately owned. 11D - Privately owned golf course.	12A and 12B - Privately owned.
PROPERTY OWNERSHIP/ MANAGEMENT	Property is privately managed.	9A through 9E - Publicly owned and managed (State of South Carolina) 9F through 9H - Privately managed property.	10A through 10D - Publicly owned and managed (State of South Carolina)	11A through 11D - Privately managed property.	12A and 12B - Privately managed property.

Source: QST, 1997.

3.2.0.1 The grouping of sectors into OOUs was based on the actual findings during the EE/CA investigation. A list of the items found during the investigation by OOU and a description of the type of activity the findings indicate is presented in Table 3-2.

3.2.0.2 OOU9 was defined primarily by the presence of small arms at investigation grids. OOU10 was defined primarily by the presence of ORS from mortars, grenades, and rockets within the Croft State Park boundaries. OOU11 was defined primarily by the presence of ORS from expended mortars, grenades, and rockets outside the Croft State Park boundaries. OOU12 includes all the locations where live UXO was found. Live UXO was found only outside the park. One previous OOU (OOU3) was revisited to determine the extent of potential OE contamination throughout the Wedgewood Subdivision.

3.2.1 OOU3 - Wedgewood Subdivision

OOU3 was previously investigated as part of the Camp Croft Phase I EE/CA investigation. This OOU was revisited during the Phase II investigation to determine if additional areas within the Wedgewood Subdivision may require clearance. USACE-CD requested additional investigation in this high use (residential) area.

3.2.1.1 The OOU3 investigation area included approximately 46 acres that comprise the entire Wedgewood Subdivision (see Figure 3-2). OOU3 is located in an area that was formerly used as a practice grenade range. The grenade fragments found were primarily from practice grenades that formerly held black powder charges. The field team identified 2.36-inch rocket fragments on the northwest side of the investigation area (adjacent to the golf course). This may have been overshoot from another local firing range.

3.2.1.2 Human Factors Applications Inc. (HFA), performed an NTCRA in the OOU3 area that was delineated in QST's Camp Croft Phase I EE/CA report (ESE,1996a). During their investigation, HFA performed a complete clearance within the previous OOU3. A total of seven live Mk II Fragmentation Grenades were found during the NTCRA investigation. The total HFA investigation area was approximately 3.0 acres. The resulting ordnance density found by HFA is approximately 2.68 UXOs per acre. The HFA sample area is included in Figure 3-2.

3.2.1.3 OOU3 is owned by local residents. Permission for clearance operations must be obtained by all land owners prior to commencement of field activities. This OOU is primarily landscaped, with some forested areas. QST was not made aware of any future development plans for this OOU.

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 1 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
3	A34-2	2.36" Rocket Frag	6		x			x	
		Unidentified ORS (4)	3-6						
3	A34-5	Mk II Grenade Parts	6		x	x			
		Mk II Grenade Parts (4)	1-14		x	x			
9A	A5-6	30 Cal Cartridge Casings (2)	1&3				x		
9B	A7e-1	Rifle Flare	2			x			
		30 cal Cartridge Casing (12)	2-6				x		
		30 Cal Cartridge	3				x		
		30 Cal Stripper Clip	6				x		
		M1 Clips (3)	1-4				x		
		Stripper Clip	3				x		
9C	A37a-2	30 Cal Cartridge (27/ft2*)	0-1				x		
9C	24-1	30 Cal Cartridges (3)	1-2				x		
9C	24-2	30 Cal Cartridge	3				x		
		30 Cal Ammo	3				x		
9D	5-1	30 Ca Bullets (9)	3-14				x		
		Empty Flare Casing	4					x	
9E	65-1	30 Cal Cartridge Casing	8				x		
9F	A7b-1	37mm APT with Tracer Expended	16						x

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 2 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
9F	A7b-2	M1 Stripper Clip	9				x		
		M14 Clips (4)	4-11				x		
9F	A7d-1	30 Cal Cartridges (3)	na				x		
		30 Cal Clips (3)	na				x		
		Grenade Ring	na			x			
9F	A8-4	30 Cal cartridges (4)	3-7				x		
		M-1 Clip	2				x		
9G	A32-5	None Found							
9G	A32-6	30 Cal Cartridge	2				x		
9H	A16-1	M-1 Clips (3)	2-3				x		
9H	A16-2	4 ea. 30 Cal Cartridge Casings	2				x		
		M-1 Clip	2				x		
10A	A3-1	Rifle Grenade Debris	2		x	x			
		2.36" Practice Round	4					x	Inert
		Land Mine Debris (2)	1&2		x				
10A	A3-3	30 Cal Cartridge Casing	2				x		
10A	8-b-1	M-1 Clip	6				x		
10A	27-3	M-1 Clip	1				x		

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 3 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
10A	27-3	Illumination Pop-up Flare (expired)	6					x	
		Empty 60mm Mortar Illumination Candle	5					x	
		Empty Grenade	5			x			
10A	39-1	30 Cal Cartridge Casing	6				x		
		M-1 Clips (2)	9				x		
10A	39-2	M-1 Clip	5				x		
10B	86-1	M-14 Magazine	1				x		
10B	86-2	Grenade Spoon	3		x	x			
10B	86-3	30 cal Cartridge Casings (2)	3&7				x		
		60mm Mortar Tailfin	2						x
		60mm Target Practice Mortar (2)	16&20						x
		Grenade Pull Ring	13		x				
10C	41a-2	MK II Practice Grenade Scrap	6			x			
10D	38b-1	Grenade Frag (2)	1&5		x	x			
		Grenade Top/Old WP	4			x			
		M-1 Clip	6				x		
11A	46-1	Grenade Top	9		x	x			
		60mm Mortar Expended	18					x	

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 4 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
11B	71-2	Grenade Spoon	17		x	x	x		
		30.06 Shells (9)	4-21				x		
		M-1 Clips (3)	6-21				x		
11B	71-3	30.06 Shells (2)	9-11				x		
		M1 Clips (2)	2&3				x		
11B	71-4	8 each 30.06 Casings	1				x		
		M-1 Clips (2)	1&8				x		
11C	30-2	M9 Rifle Grenade Scrap	13		x	x			
11D	29-1	Practice Grenade	3			x			
12A	36-1	Grenade Spoon	6			x			
		M9 HEAT Rifle Grenade	7&11	x	x	x			
		2.36" Rocket Motors (2)	6	x				x	
		2.36 Cone Frag (2)	9&20		x			x	
		2.36 scrap	13					x	
		Unidentifiable Frag	4		x				
12A	36-2	Grenade Spoon	12		x	x			
		M9 Frag (5)	7-11		x	x			
		M9A1 Rocket Grenade	6	x	x	x			
		2.36" Cone Frag (4)	3-11		x			x	
		2.36" Fin Frag	9					x	
12A	56-1	M11 Practice Rifle Grenade	1			x			
		M6 Cone Scrap	7		X	x			

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 5 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
		M6 Frag	2		X	x			
		M9 Frag	11		X	x			
		M9 HEAT Rifle Grenade	1	x	x	x			
		Practice M6A3 Rifle Grenade	2		x	x			
		2.36" Rocket Cone Scrap	2					x	
12A	56-2	M9 HEAT Rifle Grenade	21	x	x	x			
12A	74-2	M9 Tail Assembly (37)	1-10		x	x			
		2.36" Scrap (3)	6-10		x			x	
12A	74-3	M9 Scrap - (Tail Assembly) (63)	1-11		x	x			
12A	A31-1	M9 A1 Rifle Grenade (5)	3-21	x	x	x			
		M9 Scrap - (Tail Assembly) (141)	1-31		x	x			
		Mk II Hand Grenade (2)	9-21	x	x	x			
		MK II Hand Grenade Scrap	3-11		x	x			
		2.36" Scrap	6		x			x	
12A	A31-2	M9 A1 Rifle Grenade (3)	2-3	x	x	x			
		M9 A1 Rifle Grenade Booster	7	x	x	x			
		M9 Scrap - (Tail Assembly) (32)	1-17		x	x			

Table 3-2. Sample Recovery From Former CCATF Phase II EE/CA Investigation (Page 6 of 6)

Sector ID	Grid ID	Description	Depth (in)	UXO	Indication				
					High Explosive Activity	Grenade Activity	Small Arms Activity	Rocket/Mortar Activity	Other
12A	A31-2	Mk II Hand Grenade	4	x	x	x			
		2.36" Rocket	5	x	x			x	
		2.36" Scrap (3)	3-13		x			x	
12A	A32-1	30.06 Casing Debris	17				x		
		2.36" Rocket Debris (6)	4-18		x			x	
		40mm Casing Debris	8						
12B	A10-2	M9 Rifle Grenade	4	x	x	x			

Source: QST, 1997.

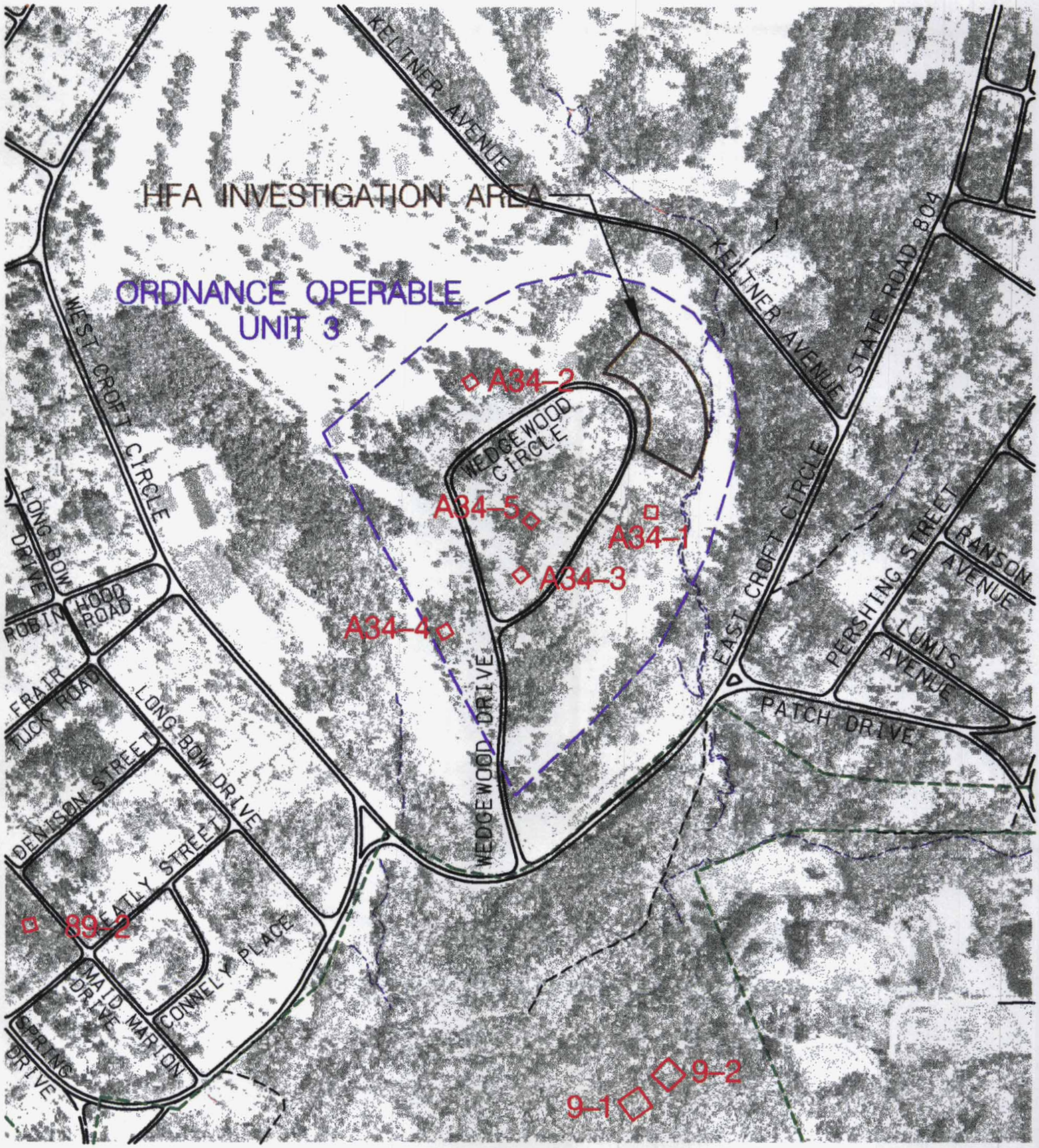


Figure 3–2
ORDNANCE OPERABLE UNIT 3

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

3.2.2 OOU9 – Small Arms Areas

OOU9 comprises approximately 1,036 acres including 306 acres inside Croft State Park and 730 acres outside of Croft State Park. This OOU includes areas where only items from small arms fire were found during the Phase II EE/CA investigation. OOU9 is subdivided into eight sectors based on their physical location. Sectors A through E were located inside the park, Sectors F through G were located outside the park boundaries. All the sectors included in OOU9 are presented in Figure 3-1. Items found in OOU9 include 30 caliber cartridges, empty flare casings, M-1 clips, 37-mm APT, M-1 Stripper Clip, and a grenade ring. All items found were generally associated with small arms fire.

3.2.2.1 The hazards associated with the items found are very low. All items found were less than 16 inches deep. Most items were found less than 8 inches deep.

3.2.2.2 Sector 9A includes approximately 129 acres on the west boundary of Croft State Park near Fairforest Creek. Sector 9B includes approximately 127 acres on the south boundary of Croft State Park and south of Fairforest Creek. Sector 9C includes approximately 35 acres inside the park east of the intersection of Dairy Ridge Road and the entrance to Croft State Park. Sector 9D includes approximately 7 acres on the north boundary of Croft State Park, to the east of Dairy Ridge Road. Sector 9E includes approximately 8 acres on the north boundary of Croft State Park, to the west of Dairy Ridge Road. Sector 9F includes approximately 691 acres immediately south of Croft State Park. Sector 9G includes approximately 6 acres north of Croft State Park and north of Dairy Ridge Road immediately southwest of the intersection between Dairy Ridge Road and State Highway 295. Sector 9H includes approximately 33 acres west of Croft State Park along State Highway 150.

3.2.2.3 OOU Sectors 9A through 9E are administered by the South Carolina Parks Department. All activities related to ordnance clearance and investigation will require coordination with park personnel. These sectors are located in forested areas that may contain endangered plant species. Even though endangered species were not found during the field effort, care must be taken to verify future investigation areas are not habitats for endangered species.

3.2.2.4 OOU9A through 9E are located in Croft State Park. The park receives approximately 155,000 visitors per year. This number has been steadily decreasing over the last few years due to the closing of portions of the park for ordnance investigations. As of late February 1997, only 18,000 visitors had entered the park in 1997. It is estimated that only 54,000 visitors entered the park in 1996. With a reduction of UXO activity it is estimated that approximately 100,000 may visit the park this year. An estimated increase by 2,000 people per year may be expected once the UXO investigations and clean up are completed.

3.2.2.5 OOU Sectors 9F through 9H are owned by local residents. Permission for clearance operations must be obtained by all land owners prior to commencement. OOU sectors 9F and 9H are located in areas with a moderate density of trees and underbrush. OOU9G is in a residential area with lawn mixed with moderately dense forest.

3.2.2.6 As OOU9F and 9H are privately owned and undeveloped, it is estimated that less than 100 individuals per year visit these properties. There are few recreational activities other than hiking, which occurs on these properties. OOU9G is privately owned and a portion of the property is moderately forested.

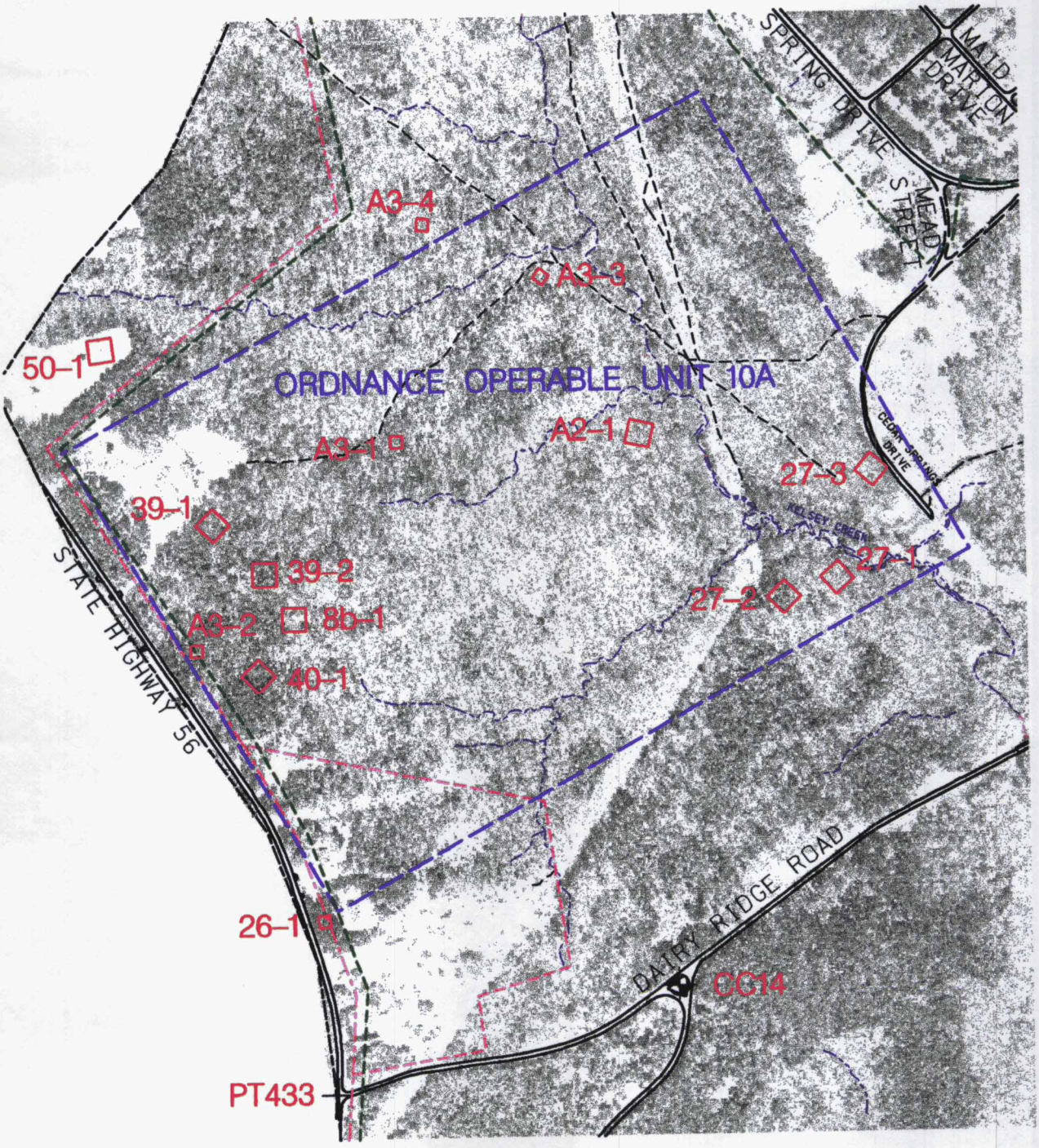
3.2.3 OOU10 — Grenade, Mortar, and Rocket Scrap Found in Park

OOU10 includes 210 acres of Croft State Park where ORS was found during the Phase II EE/CA investigation. OOU10 is subdivided into four sectors based on their physical location. Sector 10A includes approximately 157 acres in the northwest corner of the Croft State Park (see Figure 3-3), Sector 10B includes approximately 37 acres in the northeast corner of Croft State Park (see Figure 3-4). Sector 10C includes approximately 11 acres along the entrance road to the park on the east side of Croft State Park (see Figure 3-5). Sector 10D includes 5 acres located near Dairy Ridge Road on the western side of the site (see Figure 3-6). The property within OOU10 is administered by the South Carolina Parks Department.

3.2.3.1 OOU Sector 10A is located in an area previously used for training maneuvers. Along with fragments from rifle grenades, land mines, hand grenades, mortars, pop-up flares, and an intact 2.36-inch practice rocket, evidence indicates a dispersion of small arms throughout the area. There is at least one observation bunker located in sampling area A3 (within this sector). Part of this area is an archaeologic site, consisting of a soapstone quarry; therefore, care must be taken during investigations. Permission for clearance operations must be obtained by the local archeological society.

3.2.3.1.1 OOU Sector 10B is also located in an area formerly used for training maneuvers. Items found at this site include 60-mm mortar fragments, practice mortars, grenade spoon, along with small arms scrap.

3.2.3.1.2 OOU Sector 10C is located in an area where a practice grenade was found. This is most likely from the remains of an individual military practice maneuver. OOU10C is located in a portion of OOU1A from the Phase I EE/CA investigation. This area was revisited due to interviews pointing out that this specific area was used as a mock village for mortar, rifle, and hand grenades. The finding of the grenade may indicate the proximity of the mock village.



LEGEND

- APPROXIMATE BOUNDARY CAMP CROFT AREA
- BOUNDARY OF CROFT STATE PARK
- BOUNDARY OF OOU 10A
- ROADS
- STREAMS
- 26-1 INVESTIGATION GRID
- CC14 SURVEY MONUMENT
- PT433 SURVEY CONTROL POINT

N

SCALE: 1" = 600'

Figure 3-3
ORDNANCE OPERABLE UNIT 10A

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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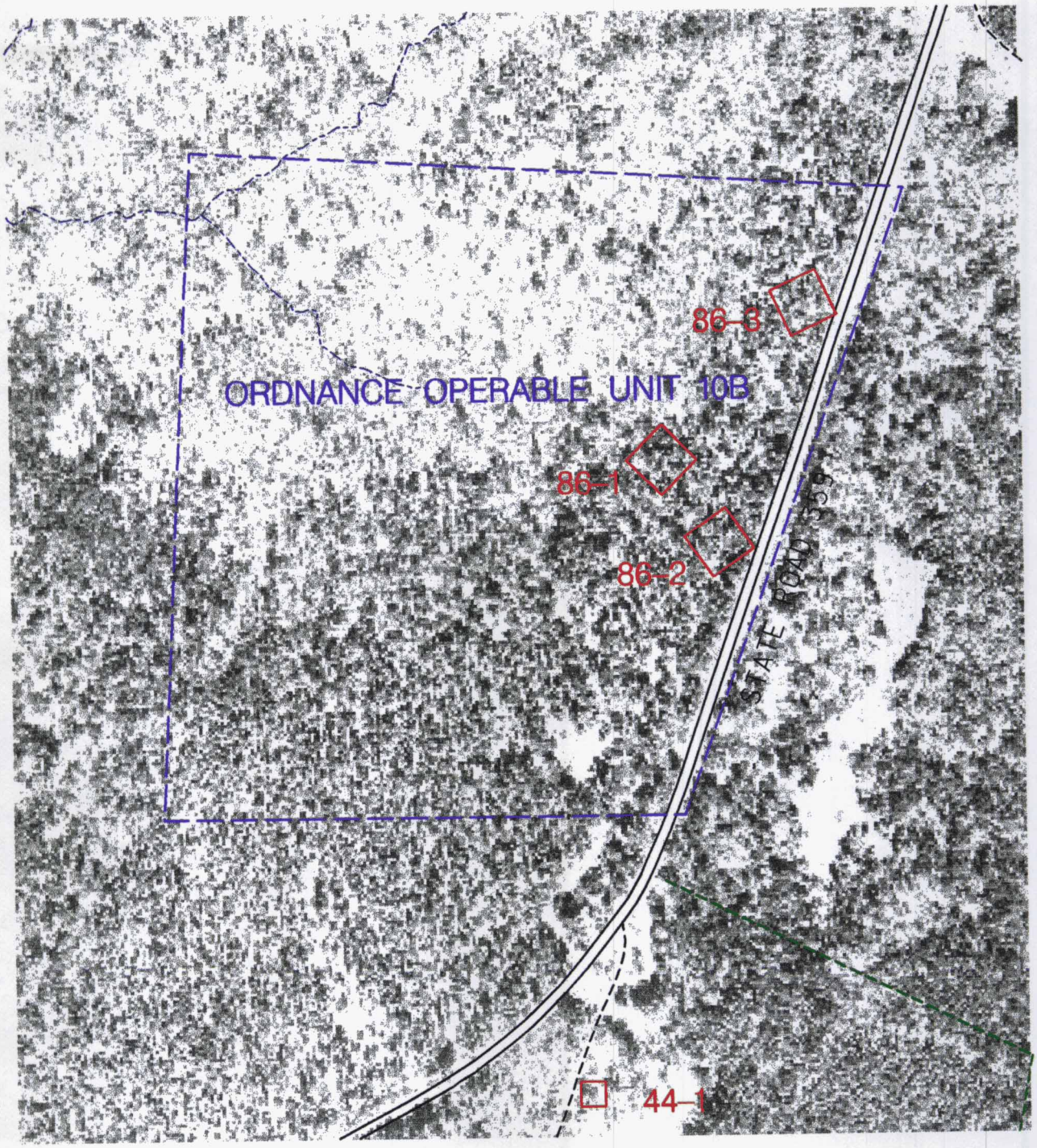
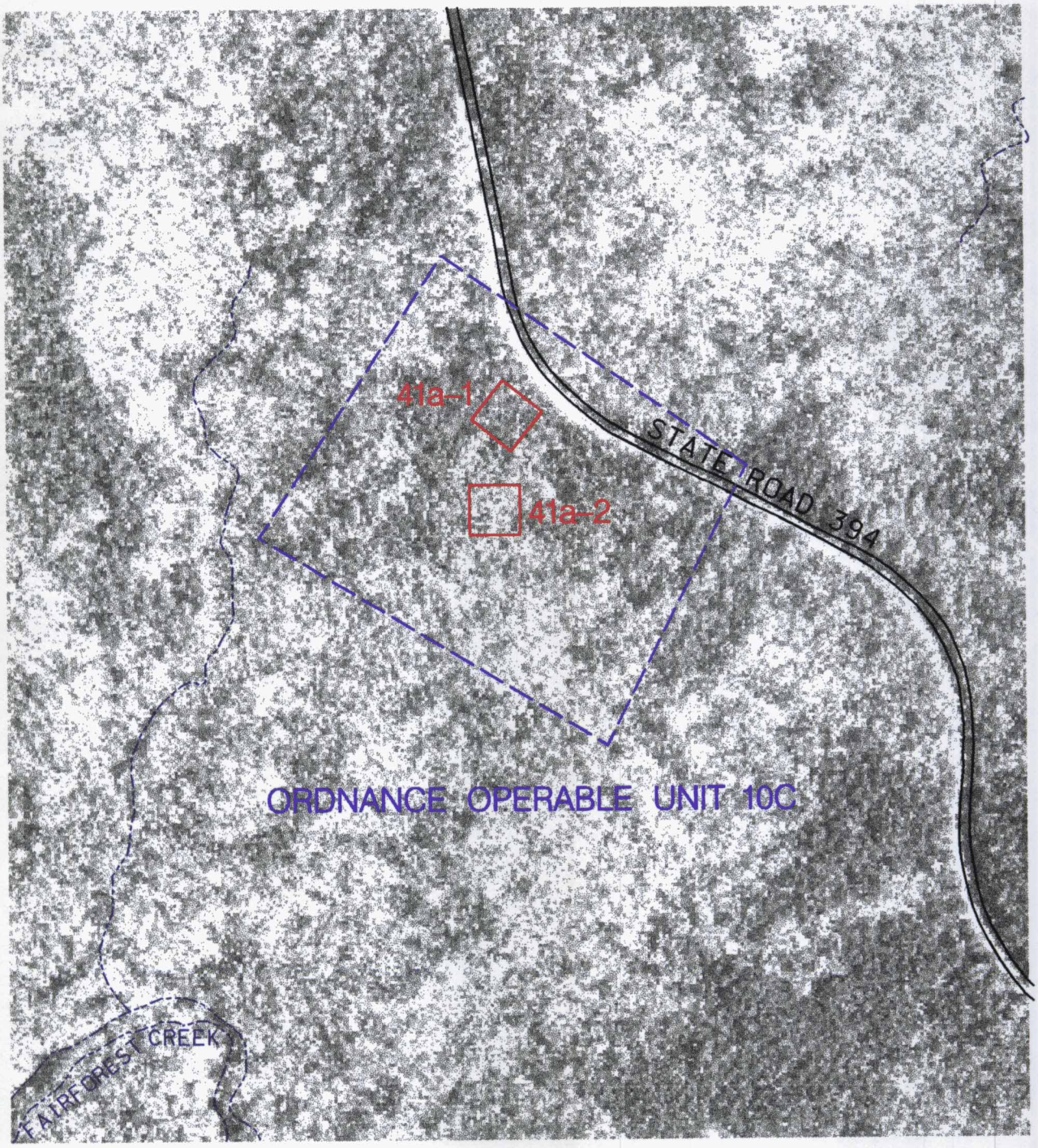


Figure 3–4
ORDNANCE OPERABLE UNIT 10B

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE



LEGEND

BOUNDARY OF OOU 10C

ROADS

STREAMS

41a–1 INVESTIGATION GRID

N

SCALE: 1" = 300'

Figure 3–5
ORDNANCE OPERABLE UNIT 10C

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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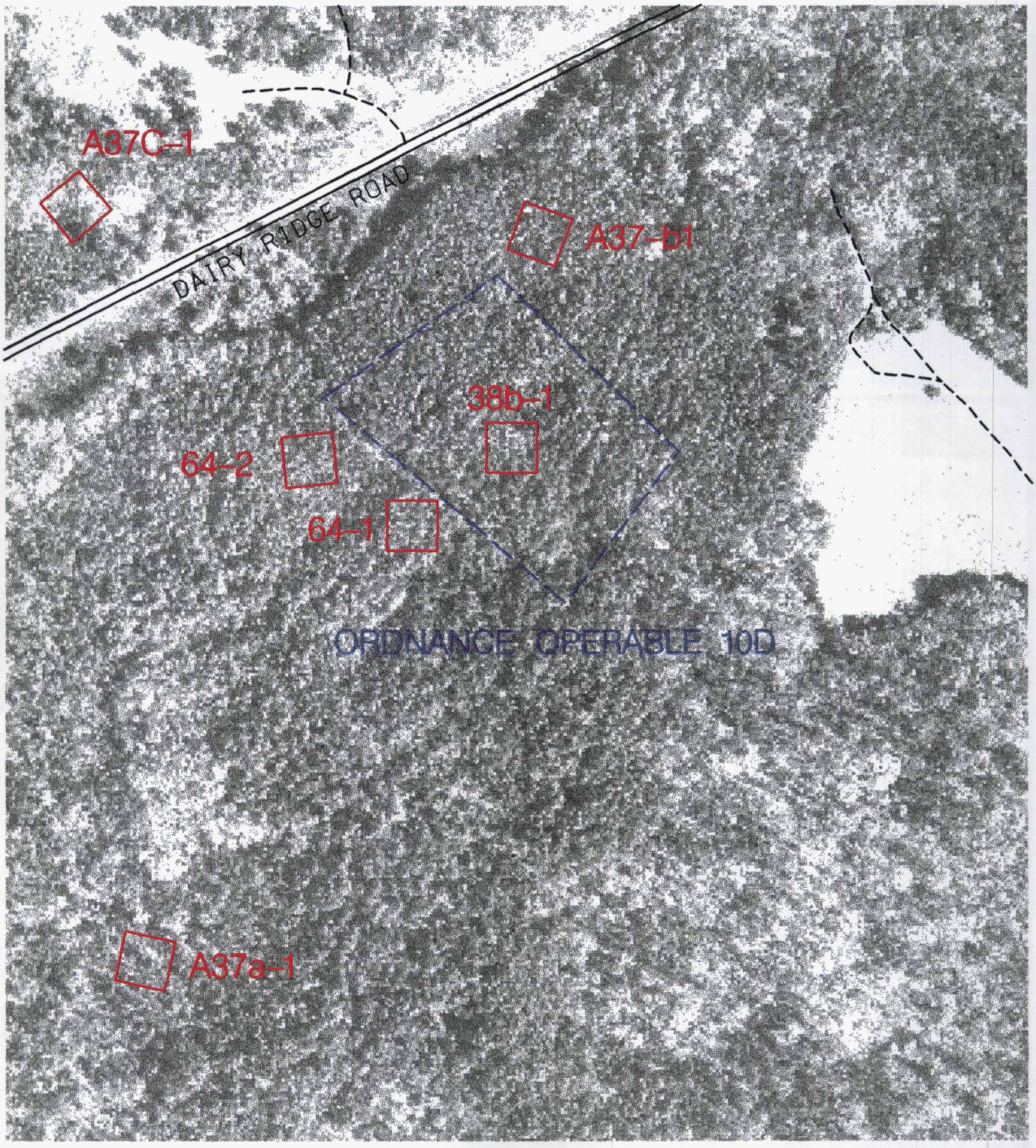

LEGEND

BOUNDARY OF OOU 10D

ROADS

64–2 INVESTIGATION GRID

N

SCALE: 1" = 300'

Figure 3–6
ORDNANCE OPERABLE UNIT 10D

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
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3.2.3.1.3 OOU Sector 10D is in an area formerly used for live grenade practice. Items found at this site indicated signs of high order detonations. The area is marked by a large embankment on the north side of the entrance road where it appears the troops set up to fire at targets located inside the embankment. Small arms were also found in this area. The entrance road to this site is a proposed trail which will, in the future, bring many visitors into this area.

3.2.3.2 The EE/CA sampling indicated that the entire OOU contains significant amounts of ORS. The ORS is indicative of high order detonations in most of the sampled grids. Practice rounds found during the investigation may also contain small charges that could create a hazard to someone finding the item and mishandling it. All fragments of ordnance items found were less than 20-inches deep with most items less than 1 ft deep.

3.2.3.2.1 All sectors within OOU10 were within the park area. These areas were heavily forested. The undergrowth in these areas is not dense due to the thick canopy.

3.2.3.2.2 The Camp Croft State Park receives approximately 155,000 visitors per year. This number has been steadily decreasing over the last few years due to the closing of portions of the park for ordnance investigations. As of late February 1997, only 18,000 visitors had entered the park in 1997. It is estimated that only 54,000 visitors entered the park last year. With a reduction of UXO activity it is estimated that approximately 100,000 may visit the park this year. An estimated increase by 2,000 people per year may be expected once the UXO investigations and clean up are completed.

3.2.4 OOU11 — Grenade, Mortar, and Rocket Scrap Found Outside Park Area

OOU11 includes 87 acres outside of Croft State Park where ORS was found during the Phase II EE/CA investigation. OOU11 is subdivided into four sectors based on physical location. Sector 11A includes approximately 25 acres west of Croft State Park on the west side of Whitestone Road (see Figure 3-7). Sector 11B includes approximately 31 acres north of Croft State Park and southeast of the intersection between Route 295 and Henningston Road (see Figure 3-8). Sector 11C includes approximately 17 acres northwest of Croft State Park on the east side of Kelsey Creek Road and northwest of the intersection of Cedar Springs Road and Huntington Drive (see Figure 3-9). Sector 11D includes 14 acres on the Cotton Club Golf Course north of the Wedgewood Subdivision. OOU 11 is privately owned by local residents or commercially (see Figure 3-10).

3.2.4.1 OOU Sector 11A is in an area previously used for training maneuvers. The top of a grenade and a 60-mm practice mortar (expended) were found at this site.

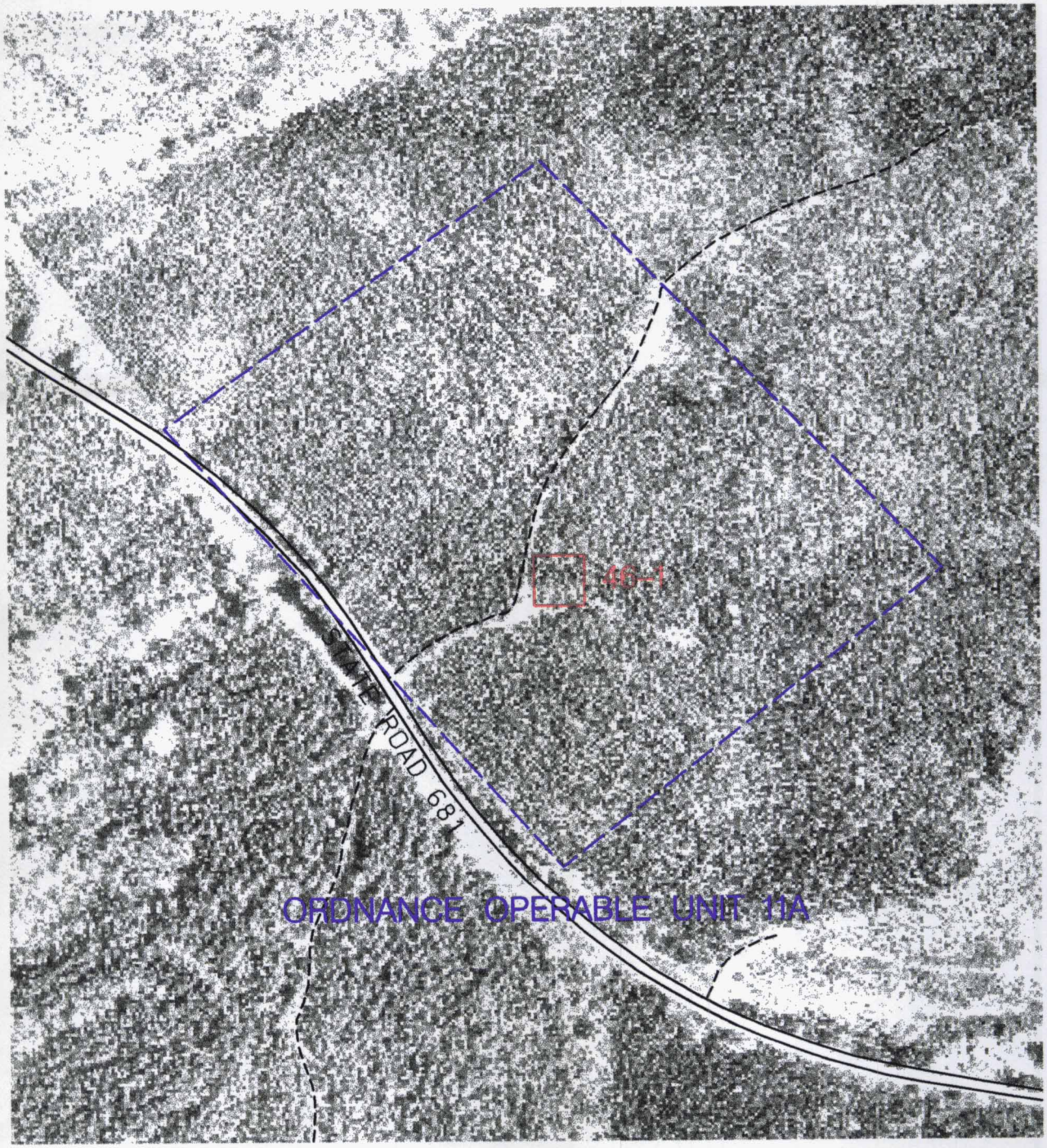

Figure 3–7
ORDNANCE OPERABLE UNIT 11A

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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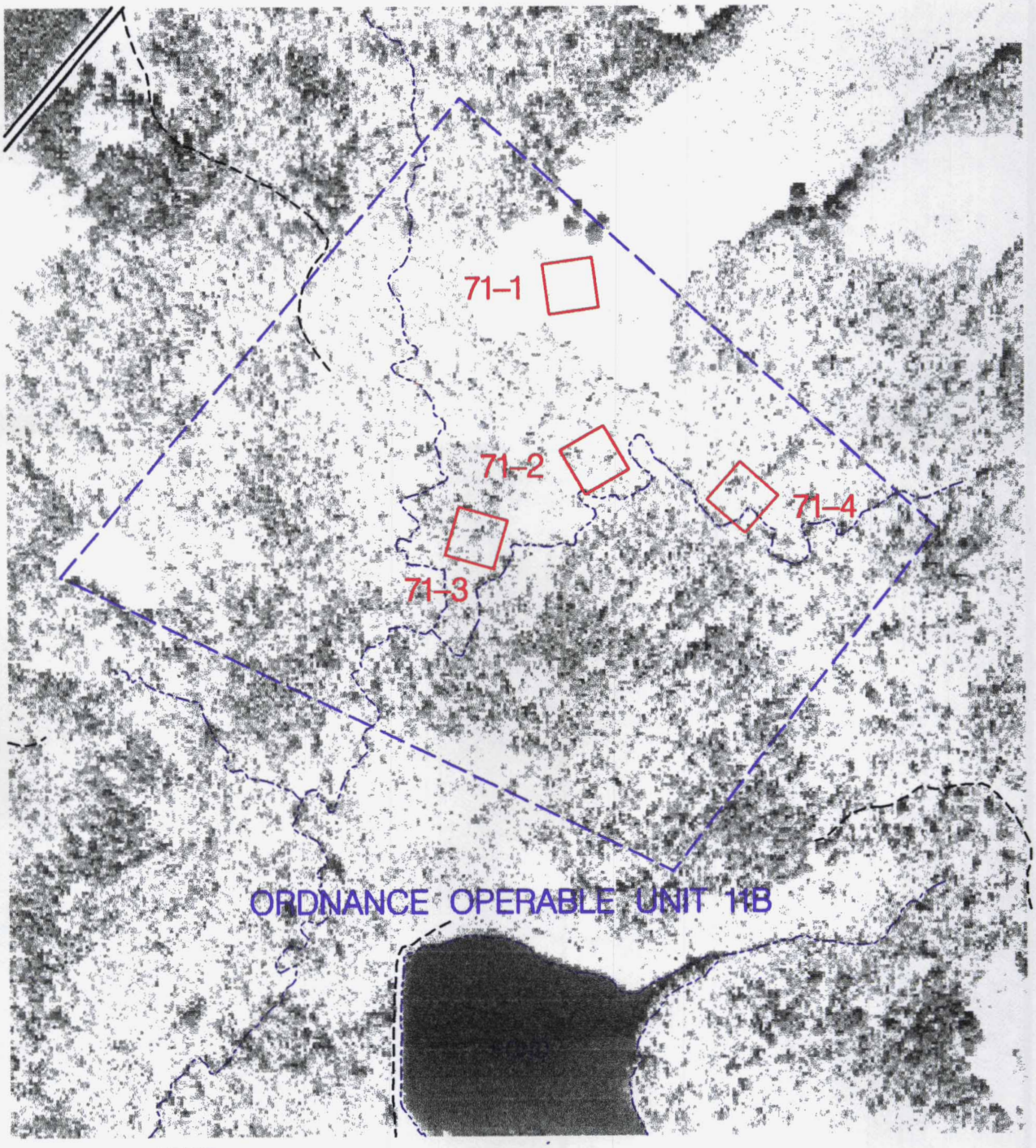

Figure 3–8
ORDNANCE OPERABLE UNIT 11B

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

U.S. ARMY ENGINEERING AND SUPPORT CENTER HUNTSVILLE

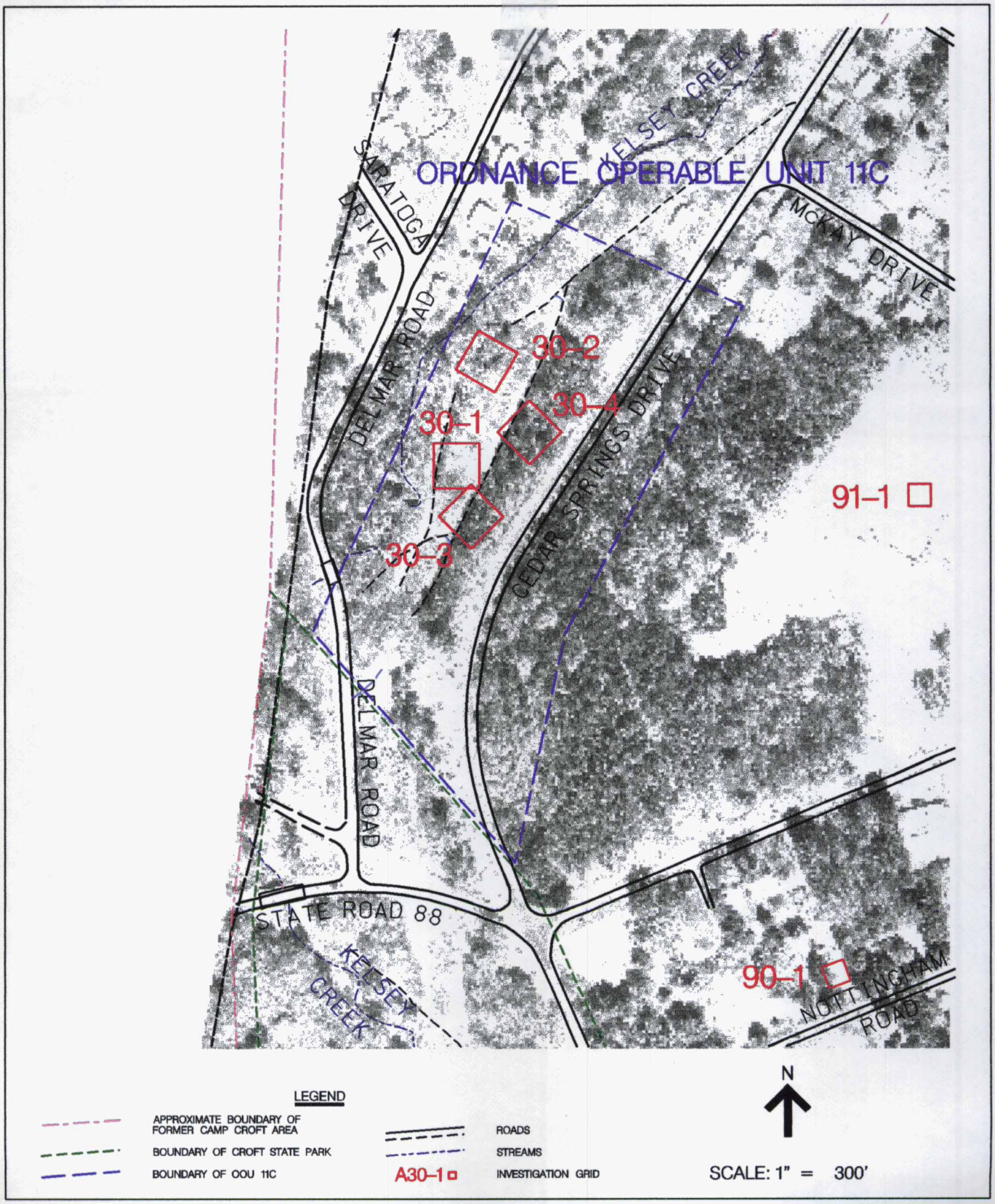

Figure 3–9
ORDNANCE OPERABLE UNIT 11C

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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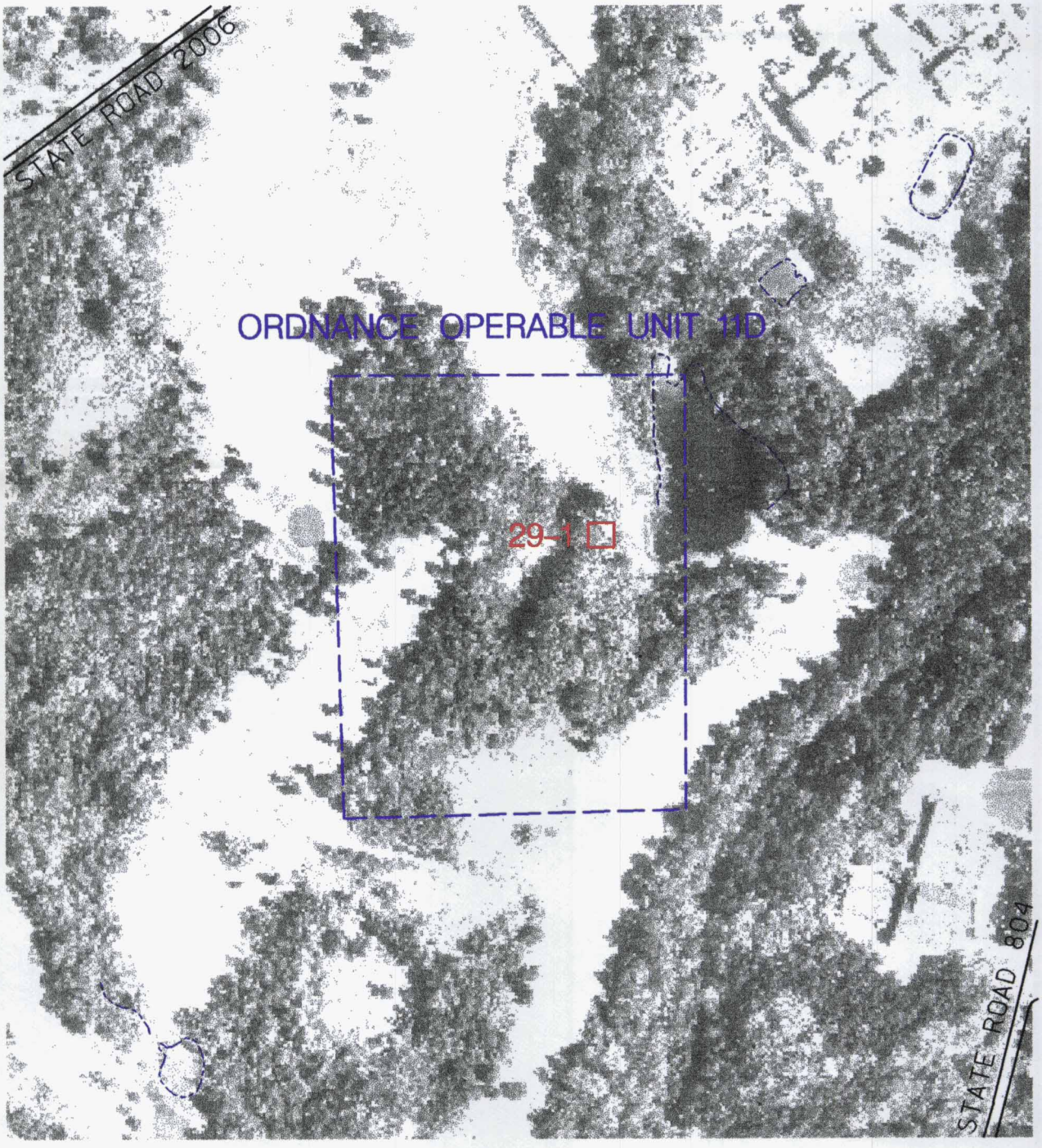

Figure 3–10
ORDNANCE OPERABLE UNIT 11D

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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3.2.4.1.1 OOU Sector 11A is owned by Carolina Bowater Corporation. Permission for clearance operations must be obtained by the owner prior to beginning any field activities. This OOU sector is currently forested. QST was not made aware of any development plans for this OOU sector.

3.2.4.1.2 OOU Sector 11B is in an area formerly used for training maneuvers. Items found at this site include small arms and a grenade spoon (fragment). This area is included in OOU 11 due to the existence of the grenade fragment.

3.2.4.1.3 OOU Sector 11B is owned by a local resident. Permission for clearance operations must be obtained by the owner prior to beginning any field activities. This OOU sector is currently open field used for grazing. QST was not made aware of any development plans for this OOU sector.

3.2.4.1.4 OOU Sector 11C is in an area where M9 rifle grenade fragments were found. This is most likely from training activities. OOU11C is in a residential area adjacent to Kelsey Creek where ordnance items were allegedly found prior to QST's investigation.

3.2.4.1.5 OOU sector 11C is privately owned and is undeveloped, moderately wooded property. QST was not made aware of any development plans for this OOU sector

3.2.4.1.6 OOU Sector 11D is in an area suspected as a grenade range. Other types of ordnance have allegedly been found in this area in the past, but were not found during our investigation.

3.2.4.1.7 OOU sector 11D is privately owned and is developed for use as a golf course. Some of the area is wooded and may require investigation. The open fairways have already been modified and graded, thus the likelihood of finding UXOs in this area would be reduced. Forested areas remain within this OOU. These areas may require further investigation and/or remediation. QSTwas not made aware of any further development plans for this OOU sector. However, their is the possibility that new sand traps, greens, ponds, and other structures may be added or built in the future.

3.2.4.2 The EE/CA sampling indicated that the entire OOU11 contains significant amounts of ORS. The ORS is indicative of high order detonations in most of the sampled grids. Practice rounds found during the investigation may also contain small charges that could create a hazard to someone finding and mishandling the item. All fragments of ordnance items found were less than 20 inches deep with most items less than 1 ft deep.

3.2.4.2.1 As OOU11 is privately owned and undeveloped, with the exception of Sector 11D, it is estimated that less than 100 individuals per year will visit these properties. There are few recreational activities other than hiking, which occurs on these properties. There are approximately 25,000 visitors per year to the golf course.

3.2.5 OOU12 — UXO Areas Outside Park Area

OOU12 includes 94 acres outside of Croft State Park where live UXOs were found during the Phase II EE/CA investigation. OOU12 is subdivided into two sectors based on physical location. Sector 12A, includes approximately 78 acres north of the Croft State Park on the southeast of the intersection between Dairy Ridge Road and State Route 295. (see Figure 3-11). Figure 3-12 shows OOU Sector 12A and the grids completed in association with the historical aerial photograph taken in 1944. Sector 12B includes approximately 16 acres located south of Croft State Park and west of Forest Mill Road (see Figure 3-13). Figure 3-14 shows OOU Sector 12B and the grids completed in association with the historical aerial photograph taken in 1944.

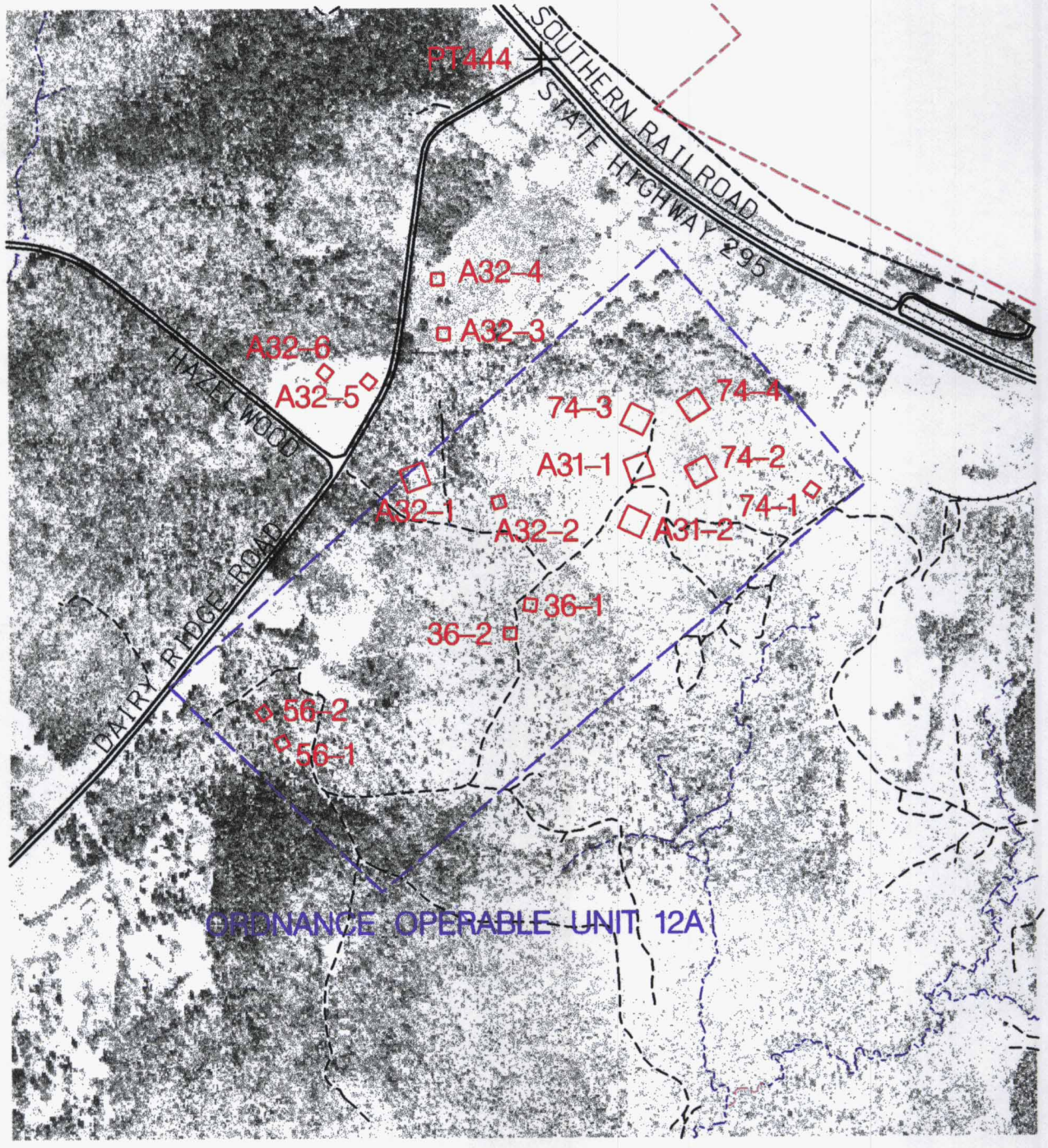
3.2.5.1 Based on historical photographs, maps, and interviews, OOU Sector 12A is in an area suspected of being an impact range for high explosive items. Items identified at this site were both fragments and UXO. These items included M9 rifle grenades, 2.36-rockets, practice M6A3 rifle grenade, M11 practice rifle grenade, and Mk II fragmentation hand grenades.

3.2.5.1.1 OOU Sector 12A is owned by local residents. The investigation to determine the total extent of the contaminated area was hindered as ROE was not given to all the originally proposed investigation areas at the time of the field event. Permission for clearance operations must be obtained by land owners prior to beginning field activities. This OOU sector is primarily open field with brush and some forested areas. QST was not made aware of any development plans for this OOU sector.

3.2.5.1.2 OOU Sector 12B is in an area that may have been used for training maneuvers. The only UXO found at this site was an M9 rifle grenade. The lack of any other type of fragments indicates this area was sparsely used.

3.2.5.1.3 OOU Sector 12B is owned by a local resident. ROE to the entire originally proposed investigation area was not obtained prior to completion of the field effort. As a result, additional investigation at areas identified on historical photograph locations may be warranted once additional ROE is obtained. Permission for further investigation and clearance operations must be obtained by the landowner prior to beginning any field activities. This OOU sector is currently forested. QST was not made aware of any development plans for this OOU sector.

3.2.5.2 The EE/CA sampling indicated that OOU12 contains significant amounts of UXO and ORS. The ORS and UXO is indicative of high order detonations in most of the sampled grids. Practice rounds found during the investigation may also contain small charges that could create a hazard to someone finding and mishandling the item. All fragments of ordnance items found were less than



LEGEND

- APPROXIMATE BOUNDARY OF FORMER CAMP CROFT AREA
- BOUNDARY OF OOU 12A
- ROADS
- STREAMS
- 36-2 INVESTIGATION GRID
- PT444 SURVEY CONTROL POINT

N

SCALE: 1" = 600'

Figure 3-11
ORDNANCE OPERABLE UNIT 12A

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
SPARTANBURG, SC

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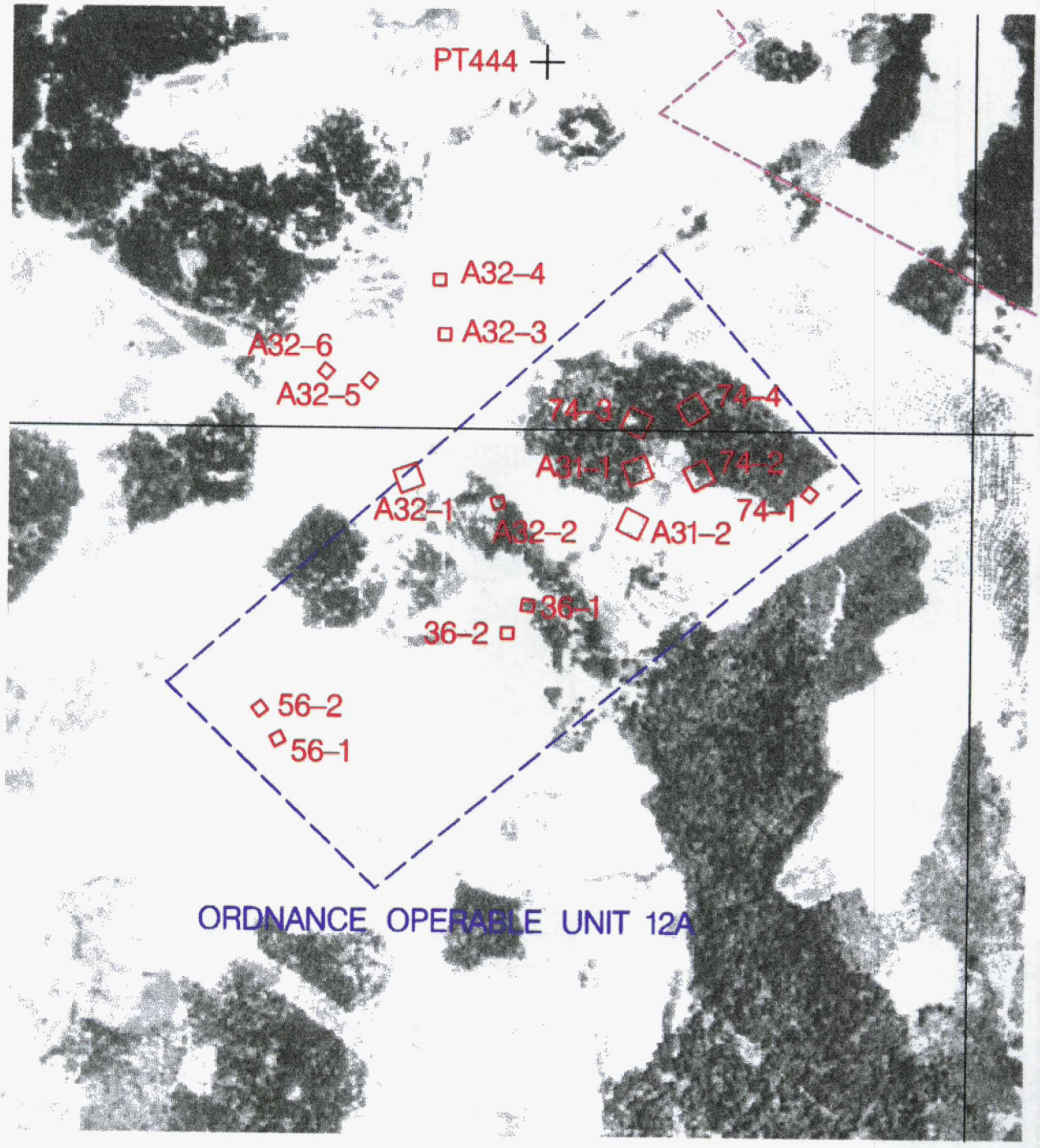

LEGEND

- APPROXIMATE BOUNDARY OF FORMER CAMP CROFT AREA
- BOUNDARY OF OOU 12A
- 36–2 INVESTIGATION GRID
- PT444 SURVEY CONTROL POINT

N

SCALE: 1" = 600'

Figure 3–12

HISTORICAL AERIAL PHOTOGRAPH (1944)
ORDNANCE OPERABLE UNIT 12A

SOURCE: QST 1997; USGS 1963

FORMER CAMP CROFT ARMY TRAINING FACILITY
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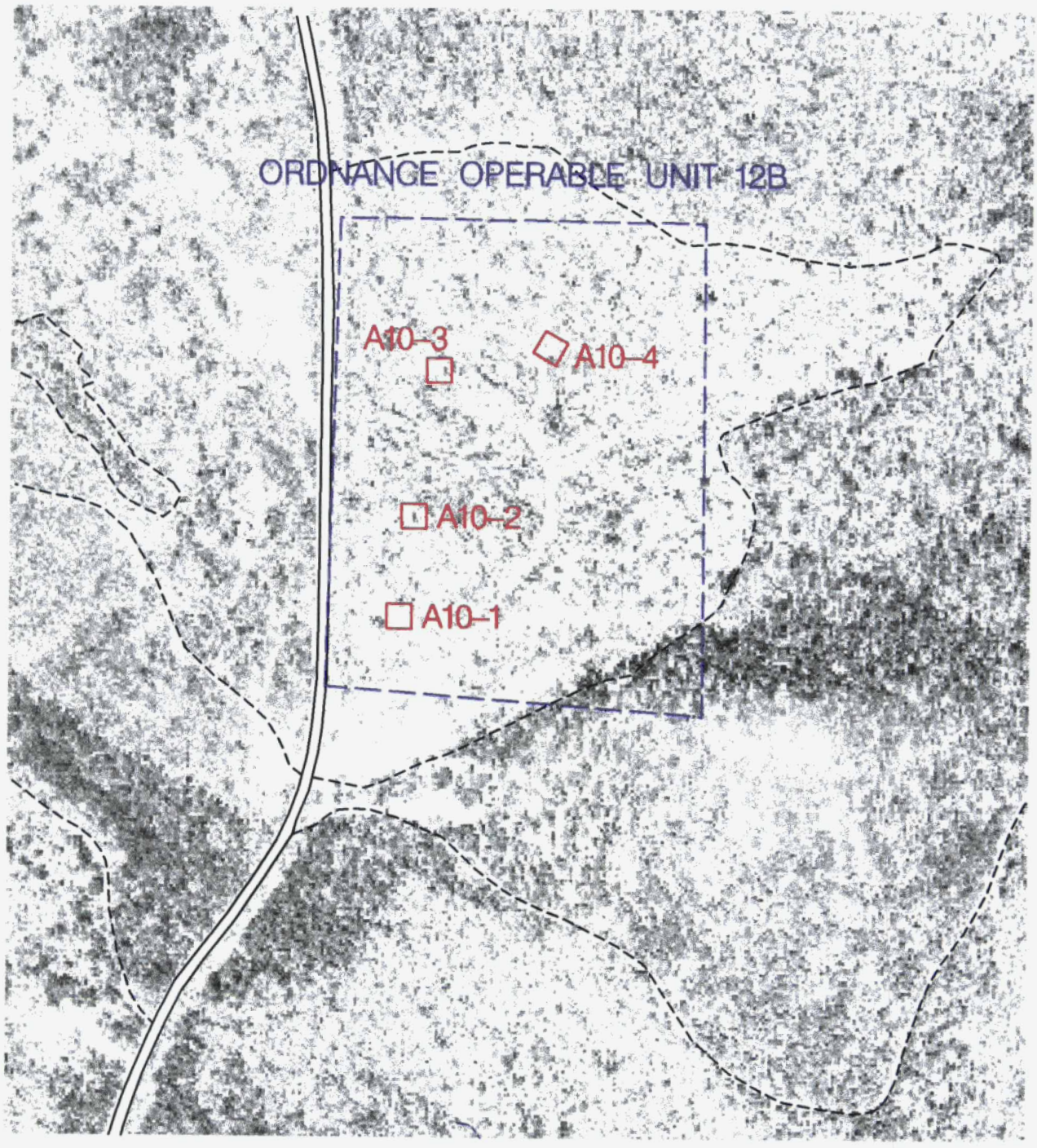

Figure 3–13
ORDNANCE OPERABLE UNIT 12B

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
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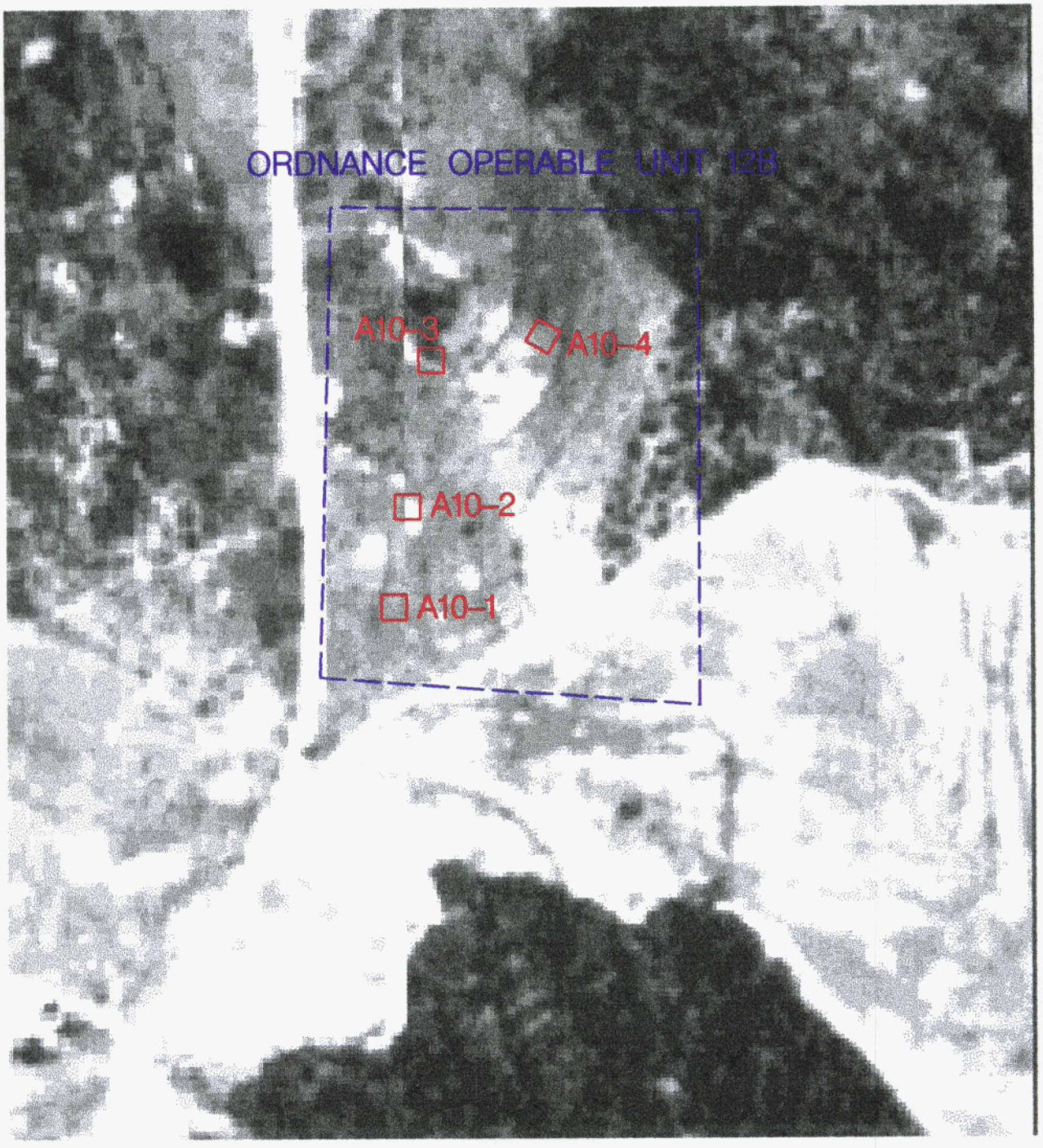

Figure 3–14
HISTORICAL AERIAL PHOTOGRAPH (1944)
ORDNANCE OPERABLE UNIT 12B

SOURCE: QST 1997; USGS 1983

FORMER CAMP CROFT ARMY TRAINING FACILITY
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21 inches deep at OOU 12A and at 4 inches deep at OOU12B. Most items were found less than 1-ft deep.

3.3 Streamlined Risk Evaluation

A streamlined risk evaluation is intermediate in scope between the limited risk evaluation undertaken for emergency removal actions and the conventional baseline assessment normally conducted for remedial actions. For this EE/CA, the streamlined risk evaluation will focus on the specific problem that the risk reduction action is intended to address.

3.3.1 Assessment of Applicable or Relevant and Appropriate Requirements

ARARs are defined as:

> "those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund") site." [40 Code of Federal Regulations (CFR) 300.5].

3.3.1.1 ARAR selection depends on the hazardous substances present at the site, site characteristics and location, and the specific actions selected for a remedy. Therefore, these requirements may be chemical-, location-, or action-specific. Chemical-specific ARARs are health- or risk-based concentration limits set for specific hazardous substances, pollutants, or contaminants. Location-specific ARARs address circumstances such as the presence of endangered species on the site or the location of the site relative to a regulated area. Action-specific ARARs control or restrict particular types of remedial actions selected as alternatives for site cleanup.

3.3.1.2 There are no chemical-specific ARARs applicable for the remediation of sites contaminated with OE. Location- and action-specific ARARs applicable for the remediation of the former Camp Croft are presented in Table 3-3.

3.4 No Further Action Areas

During the 1993 ASR and subsequent investigations, no evidence to indicate the possible presence of UXO was uncovered in any of the OOU9 locations. The only OE related materials found were small arms scrap in small quantities that have been determined to be little or no threat to human health or the environment. Because of the low likelihood of a hazard existing at this area, no further action has been

Table 3-3. Applicable or Relevant and Appropriate Requirements (ARARs) (Page 1 of 2)

Activity	ARAR	Citation	Applicability or Relevance
Action-Specific			
Transportation of OEW Offsite	Standards applicable to transporters of hazardous waste	40 CFR 263	If OEW is transported offsite for disposal, the transporter must comply with requirements for manifesting and recordkeeping.
Worker Safety	Occupational Safety and Health Act (OSHA).	29 USC ss. 651-678	Provides workers with personal protection equipment during all phases of remediation. Provides adequate protection to the community by reducing dust potentially generated during material excavation and handling activities.
	Safety concepts and basic considerations for unexploded explosive ordnance (UXO) operations.	USACE 16 Dec. 92	Provides workers with safety guidance to be followed during probing for, excavation, moving, and disposal of UXO.
Location-Specific			
Presence of endangered or threatened species or critical habitat of such species as designated in 50 CFR 17, 50 CFR 226, or 50 CFR 227	Endangered Species Act of 1973 as amended (latest amendment June 1986). Code of Laws of South Carolina, Title 50: Ch. 15, Species Conservation Act. Heritage Trust's Elements of Concern: Plants and Animals.	50 CFR 402 40 CFR 6.302(h) SC11-17, Sec. 40(c), and 50(d) and (e).	Actions which jeopardize species/habitat must be avoided or appropriate mitigation measures taken. Offsite actions which affect species/habitat require consultation with DOI, USFWS, NMFS, and/or state agencies, as appropriate, to ensure that proposed actions do not jeopardize the continued existence of the species or adversely modify or destroy critical habitat. Consultation with the responsible agency is also strongly recommended for onsite actions.

Table 3-3. Applicable or Relevant and Appropriate Requirements (ARARs) (Page 2 of 2)

Activity	ARAR	Citation	Applicability or Relevance
National Historic and Cultural Resources	South Carolina follows federal regulations under National Historic Preservation Act of 1966; 1906 Antiquities Act; Archaeological Resources Protection Act of 1979; Archaeological and Historic Preservation Act of 1974; and Historic Sites Act of 1935.	36 CFR 60.9 - 36 CFR 800.1 36 CFR 800.4 and 800.5 ACT 16 USC 470-470w-6 - 16 USC 470(b)(2)(4) USC 470ii	State Historic Preservation Officer (SHPO) must be contacted. Integrates requirements of federal laws and regulations dealing with historic properties including historic and prehistoric district sties, buildings, structures, and objects.
		32 CFR 229 SC Title 60, Ch.12, Sec. 60-12-30	Facility must regulate the excavation of archaeological sites on federal lands.
Delineation of the landward extent of wetlands and surface waters	Wetlands protection	40 CFR 6.302(a)	Actions should be avoided that have adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists.

Note: Excavation and material handling operations will be conducted in accordance with the OEW/UXO safety specifications described in the U.S. Army Corps of Engineers, Huntsville Division, *Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO) Operations (revised 16 Dec 92).*

CFR = Code of Federal Regulations.
DOI = U.S. Department of Interior.
NMFS = National Marine Fisheries Service.
RCRA = Resource Conservation and Recovery Act.
SC = South Carolina.
USC = United States Code.
USACE = U.S. Army Corps of Engineers.
USFWS = U.S. Fish and Wildlife Service.

Source: QST, 1997.

selected for OOU9 (including OOUA, B, C, D, E, F, G, and H) and it will not be considered further in this EE/CA.

3.5 Recommended Risk Reduction Alternative for OOU3 (Wedgewood Subdivision)

A portion of OOU3 (in the Wedgewood Subdivision) was initially investigated during the Phase I EE/CA for the former CCATF. In the original (Phase I) EE/CA report, Clearance for Use was the recommended remedial alternative for OOU3. This remedial action has been recently completed by HFA for the area identified in the EE/CA investigation (approximately 3 acres).

3.5.1 As requested, additional grids were investigated in the Wedgewood subdivision. The findings of the Phase II investigation provide data that support the Phase I EE/CA analysis. The data indicate that MK II fragmentation hand grenades were used in a larger area than the initial investigation. The results of the Phase II investigation of the Wedgewood Subdivision confirmed the need to implement clearance for use over a larger area. QST also suggested that an additional EE/CA analysis would not be required for the increase in area of OOU3 as the data collected during the Phase II investigation supports the selected risk reduction alternative recommended in the Phase I EE/CA analysis.

3.5.2 Therefore, QST recommends clearance for use for the entire Wedgewood Subdivision (approximately 46 acres). The analysis of the risk reduction alternatives and rationale for selection of this alternative are presented in the Phase I EE/CA report. In the Phase I report, the estimated cost to implement the recommended alternative over 3 acres (the original OOU3) was $131,000. Using the same cost/acre, QST estimates that "clearance for use" within the entire 46-acre Wedgewood Subdivision will cost $2,010,000. No further analysis will be presented in this report for OOU3.

3.6 OE*Cert* Analysis

QST performed a risk analysis based on the results of the EE/CA investigation. At the direction of the USAESCH, QST used the Ordnance and Explosives Cost Effectiveness Tool (OE*Cert*) developed by Quantitech, Inc. This computer model estimates the risk to the public and the environment from the presence of OE. The analysis was based on the general site characterization data obtained by QST during the field effort. The "Sectors" used in the OE*Cert* analysis generally correspond to the areas where ORS and OE were found during the EE/CA investigation. The small arms areas (OOU9) were not included in the analysis as the potential for explosive detonation from the items found at those sites was minimal and as stated in Sec. 3.4., no further action has been recommended. The results of the OE*Cert* analysis are included in the OE*Cert* report (Appendix F).

3.6.1 Risk Analysis Database

A risk analysis database is included in the OE*Cert* model. The database is divided into two sections: the site database and the sector database. The site database includes demographic data for the CCATF area. The sector database provides data concerning the individual sectors, including: sector size, ordnance density, physical description, biological hazards, and activities. A copy of the data provided in the database is included in the OE*Cert* report.

3.6.2 Density Estimates

As the first step in the evaluation of UXO contamination at the former CCATF, a numerical analysis of the sampling data was performed using both SiteStats and spreadsheet calculations. The SiteStats model was used to calculate the density and probability that a site is homogeneous or nonhomogeneous based on the sampling data (See Table 2-4). The spreadsheet estimate of total UXOs in each grid (see totals from Table 3-4) was calculated by dividing the number of subsurface UXO recovered by the percent of the total anomalies sampled and adding the number of surface UXO recovered during the sampling to the total UXO estimate for each grid. The surface UXOs were included in the calculation because the risk presented by surface UXO is at least as great as the subsurface UXO. For grids where UXOs were found, the UXO density was calculated by dividing the total UXOs (surface and subsurface) by the total area of the OOU sector. During the field investigation, UXOs were found at OOU12A and 12B only.

3.6.2.0.1. The SiteStats algorithm calculates density and probability of homogeneity/nonhomogeneity based on only one grid size. At OOU12A there were two different size grids sampled, therefore a hand calculation was performed to effectively combine the two grid sizes. The SiteStats algorithm determined that there were 57 UXOs per acre. The spreadsheet-calculated UXO density was used for analysis at this OOU.

3.6.2.0.2 Only one buried UXO was found at OOU12B. The SiteStats algorithm determined that there were zero UXOs per acre. QST used the spreadsheet-calculated UXO density for analysis at this OOU.

3.6.2.0.3 The densities calculated as stated previously were entered into the OECert model for further analysis. Analogies were made to OOU12B to determine the point, low, and high density estimates for sites in OOU10 and 11 (see the OECert report in Appendix F).

3.6.2.0.4 Statistical methods were used to determine the low density and high density estimates for each OOU sector. These statistical methods are included with the data provided in Appendix F. The resulting densities were used as input factors into the OE*Cert* model.

Table 3-4. Summary of OOU Sector Field Data, Former CCATF Phase II EE/CA Investigation (Page 1 of 3)

Sector/OOU ID	Grid Number	Date	Site Acreage	Anomalies			UXO Items Recovered		UXO Estimate			
				Total	Sampled	Percent	Subsurface	Surface	Gridstats Subsurface (Per Grid)	Total UXOs (Per Grid)	Percent of Total Anomalies	Density (UXO/acre)
3	A34-1	21-Jan-97	0.06	353	142	40.23	0	0	0	0	0	0.00
3	A34-2	16-Jan-97	0.06	83	35	42.17	0	0	0	0	0	0.00
3	A34-3	04-Feb-97	0.06	932	280	30.04	0	0	0	0	0	0.00
3	A34-4	23-Jan-97	0.06	131	53	40.46	0	0	0	0	0	0.00
3	A34-5	22-Jan-97	0.06	330	132	40.00	0	0	0	0	0	0.00
		TOTALS =	0.3	1829	642	35.10	0	0	0	0	0	0.00
9A	A5-1	13-Mar-97	0.06	37	11	29.73	0	0	0	0	0	0.00
9A	A5-2	13-Mar-97	0.06	9	9	100.00	0	0	0	0	0	0.00
9A	A5-3	13-Mar-97	0.06	11	11	100.00	0	0	0	0	0	0.00
9A	A5-4	13-Mar-97	0.06	12	12	100.00	0	0	0	0	0	0.00
9A	A5-5	17-Mar-97	0.06	37	11	29.73	0	0	0	0	0	0.00
9A	A5-6	17-Mar-97	0.06	21	6	28.57	0	0	0	0	0	0.00
		TOTALS =	0.36	127	60	47.24	0	0	0	0	0	0.00
9B	A7d-1	24-Jan-97	0.23	124	50	40.32	0	0	0	0	0	0.00
9B	A7e-1	15-Jan-97	0.23	105	42	40.00	0	0	0	0	0	0.00
		TOTALS =	0.46	229	92	40.17	0	0	0	0	0	0.00
9C	24-1	11-Mar-97	0.06	55	17	30.91	0	0	0	0	0	0.00
9C	24-2	11-Mar-97	0.06	49	15	30.61	0	0	0	0	0	0.00
9C	A37a-2	29-Jan-97	0.23	45	19	42.22	0	0	0	0	0	0.00
		TOTALS =	0.35	149	51	34.23	0	0	0	0	0	0.00
9D	5-1	03-Feb-97	0.23	51	21	41.18	0	0	0	0	0	0.00
		TOTALS =	0.23	51	21	41.18	0	0	0	0	0	0.00
9E	65-1	21-Feb-97	0.23	126	51	40.48	0	0	0	0	0	0.00
		TOTALS =	0.23	126	51	40.48	0	0	0	0	0	0.00
9F	2-1	13-Mar-97	0.06	1	1	100.00	0	0	0	0	0	0.00
9F	A7b-1	27-Jan-97	0.23	37	14	37.84	0	0	0	0	0	0.00
9F	A7b-2	27-Jan-97	0.23	57	23	40.35	0	0	0	0	0	0.00
9F	A7b-3	28-Jan-97	0.23	37	16	43.24	0	0	0	0	0	0.00
9F	A7b-4	28-Jan-97	0.23	104	48	46.15	0	0	0	0	0	0.00
9F	A8-1	17-Mar-97	0.06	16	16	100.00	0	0	0	0	0	0.00
9F	A8-2	17-Mar-97	0.06	21	6	28.57	0	0	0	0	0	0.00
9F	A8-3	17-Mar-97	0.06	5	5	100.00	0	0	0	0	0	0.00
9F	A8-4	20-Mar-97	0.06	7	7	100.00	0	0	0	0	0	0.00
9F	A8-5	24-Mar-97	0.06	7	7	100.00	0	0	0	0	0	0.00
		TOTALS =	1.28	292	143	48.97	0	0	0	0	0	0.00
9G	A32-5	24-Mar-97	0.06	8	8	100.00	0	0	0	0	0	0.00
9G	A32-6	24-Mar-97	0.06	12	12	100.00	0	0	0	0	0	0.00
		TOTALS =	0.12	20	20	100.00	0	0	0	0	0	0.00

Table 3-4. Summary of OOU Sector Field Data, Former CCATF Phase II EE/CA Investigation (Page 2 of 3)

Sector/OOU ID	Grid Number	Date	Site Acreage	Anomalies			UXO Items Recovered		UXO Estimate			
				Total	Sampled	Percent	Subsurface	Surface	Gridstats Subsurface (Per Grid)	Total UXOs (Per Grid)	Percent of Total Anomalies	Density (UXO/acre)
9H	A16-1	20-Feb-97	0.06	10	10	100.00	0	0	0	0	0	0.00
9H	A16-2	20-Mar-97	0.06	13	13	100.00	0	0	0	0	0	0.00
		TOTALS =	0.12	23	23	100.00	0	0	0	0	0	0.00
10A	27-1	04-Feb-97	0.23	143	48	33.57	0	0	0	0	0	0.00
10A	27-2	04-Feb-97	0.23	126	42	33.33	0	0	0	0	0	0.00
10A	27-3	03-Feb-97	0.23	48	16	33.33	0	0	0	0	0	0.00
10A	39-1	13-Feb-97	0.23	47	16	34.04	0	0	0	0	0	0.00
10A	39-2	13-Feb-97	0.23	28	12	42.86	0	0	0	0	0	0.00
10A	40-1	19-Feb-97	0.06	14	14	100.00	0	0	0	0	0	0.00
10A	8b-1	19-Feb-97	0.06	21	9	42.86	0	0	0	0	0	0.00
10A	A2-1	11-Feb-97	0.06	175	58	33.14	0	0	0	0	0	0.00
10A	A3-1	12-Feb-97	0.23	137	56	40.88	0	0	0	0	0	0.00
10A	A3-2	19-Feb-97	0.06	10	10	100.00	0	0	0	0	0	0.00
10A	A3-3	20-Feb-97	0.06	173	70	40.46	0	0	0	0	0	0.00
		TOTALS =	1.68	922	351	38.07	0	0	0	0	0	0.00
10B	86-1	12-Mar-97	0.06	20	20	100.00	0	0	0	0	0	0.00
10B	86-2	11-Mar-97	0.06	28	9	32.14	0	0	0	0	0	0.00
10B	86-3	13-Mar-97	0.06	107	34	31.78	0	0	0	0	0	0.00
		TOTALS =	0.18	155	63	40.65	0	0	0	0	0	0.00
10C	41a-1	25-Feb-97	0.23	147	59	40.14	0	0	0	0	0	0.00
10C	41a-2	25-Feb-97	0.23	95	38	40.00	0	0	0	0	0	0.00
		TOTALS =	0.46	242	97	40.08	0	0	0	0	0	0.00
10D	38b-1	30-Jan-97	0.23	56	23	41.07	0	0	0	0	0	0.00
		TOTALS =	0.23	56	23	41.07	0	0	0	0	0	0.00
11A	46-1	06-Feb-97	0.23	67	29	43.28	0	0	0	0	0	0.00
		TOTALS =	0.23	67	29	43.28	0	0	0	0	0	0.00
11B	71-1	06-Feb-97	0.23	60	22	36.67	0	0	0	0	0	0.00
11B	71-2	10-Feb-97	0.23	65	26	40.00	0	0	0	0	0	0.00
11B	71-3	10-Feb-97	0.23	59	26	44.07	0	0	0	0	0	0.00
11B	71-4	10-Feb-97	0.23	51	21	41.18	0	0	0	0	0	0.00
		TOTALS =	0.92	235	95	40.43	0	0	0	0	0	0.00
11C	30-1	25-Feb-97	0.23	35	14	40.00	0	0	0	0	0	0.00
11C	30-2	25-Feb-97	0.23	30	12	40.00	0	0	0	0	0	0.00
11C	30-3	25-Feb-97	0.06	8	8	100.00	0	0	0	0	0	0.00
11C	30-4	25-Feb-97	0.06	4	4	100.00	0	0	0	0	0	0.00
		TOTALS =	0.58	77	38	49.35	0	0	0	0	0	0.00

Table 3-4. Summary of OOU Sector Field Data, Former CCAFT Phase II EE/CA Investigation (Page 3 of 3)

11D	29-1	20-Mar-97	0.06	20	20	100.00	0	0	0	0	0	0.00
		TOTALS =	0.06	20	20	100.00	0	0	0	0	0	0.00
12A	36-1	19-Feb-97	0.06	51	21	41.18	2	0	5	5	9.5	80.95
12A	36-2	20-Feb-97	0.06	48	20	41.67	1	0	2	2	5	40.00
12A	56-1	24-Feb-97	0.06	43	18	41.86	2	0	5	5	11.1	79.63
12A	56-2	24-Feb-97	0.23	27	11	40.74	1	0	2	2	9.1	10.67
12A	74-1	03-Mar-97	0.06	35	14	40.00	0	0	0	0	0	0.00
12A	74-2	03-Mar-97	0.23	120	48	40.00	0	0	0	0	0	0.00
12A	74-3	04-Mar-97	0.23	301	75	24.92	0	0	0	0	0	0.00
12A	74-4	05-Mar-97	0.23	240	96	40.00	4	0	10	10	4.2	43.48
12A	A31-1	04-Mar-97	0.23	1009	152	15.06	7	0	46	46	4.6	202.03
12A	A31-2	05-Mar-97	0.23	481	80	16.63	7	0	42	42	8.8	182.99
12A	A32-1	13-Feb-97	0.23	82	33	40.24	0	0	0	0	0	0.00
12A	A32-2	18-Feb-97	0.06	67	27	40.30	2	0	5	5	7.4	82.72
		TOTALS =	1.91	2504	595	23.76	26	0	117	117	4.4	57.29
12B	A10-1	19-Mar-97	0.06	23	11	47.83	0	0	0	0	0	0.00
12B	A10-2	19-Mar-97	0.06	10	10	100.00	1	0	1	1	10	16.67
12B	A10-3	18-Mar-97	0.06	24	10	41.67	0	0	0	0	0	0.00
12B	A10-4	18-Mar-97	0.06	42	17	40.48	0	0	0	0	0	0.00
		TOTALS =	0.24	99	48	48.48	1	0	1	1	2.1	8.59

Source: QST, 1997.

3.6.2.1 Remedial Alternatives

The OE*Cert* model was used to evaluate the number of exposures for four separate alternatives. These include No Further Action, Surface Removal, Clearance to 1-Ft Depth, and Clearance to 4-Ft Depth. As UXOs were not found at all OOUs, QST evaluated the depths of all OE found at the site to determine the resulting densities of UXOs after remediation. It is estimated that surface removal (down to 3 inches) would remove 31 percent of the OE hazard from the grid. Clearance down to 1 ft would effectively remove 83 percent of the OE. No OE was found below 4 ft deeper than the ground surface.

3.6.2.2 OE*Cert* Assumptions

3.6.2.2.1 The OE*Cert* model was used to analyze two separate scenarios: high UXO density exposures and low UXO density exposures. The number of exposures for the high density estimate provides the worst case scenario with approximately 31 percent of the UXOs at the ground surface (based on the percentage of UXOs found within 3 inches of the ground surface) and the statistical high UXO density estimates for each sector as described in Appendix F. The number of exposures for the low-density estimate is based on the premise that no UXOs are found on the ground surface (as was observed during the field investigation). The statistical population exposure estimates for sectors with a low density of UXOs (as described in Appendix F) were used to calculate low density exposure for each sector.

3.6.2.2.1.1 The average number of visitors to the park, estimated from numbers given to QST by park personnel, is approximately 155,000 individuals per year. QST discussed the areas of concern with park personnel to interpret the activities and the number of participants in investigated areas. It was determined that only about 10 percent of the total visitors would enter these areas. Of the 10 percent of the visitors to the investigation areas, 85 percent are generally on horseback, 10 percent ride offroad bikes, and only 5 percent would hike in the area. The activities and total number of participants are included in the OE*Cert* report (Appendix F).

3.6.2.2.1.2 According to the golf club management approximately 25,000 people per year visit the golf course and approximately 50 percent of the total participants who visit OOU11D would enter into areas that are undeveloped (e.g., out of bound areas to retrieve errant golf balls). A value of 12,500 people per year was entered as the number of participants of each activity analyzed in the OE*Cert* model for OOU11D.

3.6.2.2.1.3 The activities selected for each of the sectors were based on site observations indicating that a specific activity had occurred. The selected activities are included in the table of input values presented in Appendix F.

3.6.2.2.1.4 The estimates for the 1-ft and 4-ft removal scenarios were based on the assumption that 83 and 100 percent, respectively, of the UXOs found at the site would be removed should a clearance to the respective depths be performed. There were no indications of ordnance burial below 4 ft during the field investigation.

3.6.2.2.1.5 The estimated number of exposures calculated for the high density values show a reduction in exposure potential from the No Further Action alternative to the Surface Removal alternative. In some of the sectors (OOU10B, OOU10C, OOU10D, OU11A, OOU11B, and OOU12B), the exposure potential was reduced to zero as there were no intrusive activities suspected at those sites.

3.6.2.2.1.6 The number of exposures calculated for the low density values assume that no UXOs were found at the surface. Therefore, the resulting number of exposures to UXO were the same for the No Further Action alternative. In some of the sectors (OOU10B, OOU10C, OOU10D, OU11A, OOU11B, and OOU11B), the exposure potential was zero as there were no intrusive activities suspected at those sites. In OOU10B, OOU10D, OOU11A, OOU11C, OOU11D, and OOU12B, the zero exposures were based on the low-density estimate being zero.

3.6.2.3 OE*Cert* Results

The OE*Cert* analysis was performed for each OOU sector to predict the expected number of yearly exposures, daily exposures, exposures per individul, exposures per activity, exposures per person per visit, and several other important descriptive statistics. The OE*Cert* model considers whether the exposures are from activities that are surface only or include a ground intrusive component.

3.6.2.3.1 OE*Cert* provides an assessment of risk in terms of a predicted number of yearly exposures. Table 3-5 presents a summary of the results of this analysis. According to the OE*Cert* analysis, the number of exposures progressively decrease as more substantive removal response alternatives are applied to each sector. Generally, when a more substantive alternative fails to substantially reduce potential exposures, the latter would be considered the most effective. The exposures for the No Further Action alternative provide a baseline for the comparison of progressively more substantive alternatives.

Table 3-5. Total Expected Annual Exposures *(TEAE), Total Population (Page 1 of 2)

Sector	No Action	Surface Removal	1-Ft Removal	4-Ft Removal
High Density Exposure Estimate				
OOU10A	644	27	6	0
OOU10B	1,703	0	0	0
OOU10C	12,289	0	0	0
OOU10D	14,083	0	0	0
Average OOU10	7,180	7	2	0
OOU11A	273	0	0	0
OOU11B	964	0	0	0
OOU11C	3,216	343	7	0
OOU11D	20,443	1,022	22	0
Average OOU11	6,224	341	7	0
OOU12A	88,490	344	85	0
OOU12B	730	0	0	0
Average OOU12	22,305	86	21	0
Point Density Exposure Estimate				
OOU10A	228	18	4	0
OOU10B	401	0	0	0
OOU10C	3,200	0	0	0
OOU10D	2,561	0	0	0
Average OOU10	1,598	5	1	0
OOU11A	51	0	0	0
OOU11B	251	0	0	0
OOU11C	799	147	3	0
OOU11D	3,747	348	7	0
Average OOU11	1,212	124	3	0
OOU12A	38,576	279	69	0
OOU12B	162	0	0	0
Average OOU12	9,685	70	17	0

Table 3-5. Total Expected Annual Exposures *(TEAE), Total Population (Page 2 of 2)

Sector	No Action	Surface Removal	1-Ft Removal	4-Ft Removal
Low Density Exposure Estimate				
OOU10A	14	10	2	0
OOU10B	0	0	0	0
OOU10C	0	0	0	0
OOU10D	0	0	0	0
Average OOU10	4	3	1	0
OOU11A	0	0	0	0
OOU11B	0	0	0	0
OOU11C	0	0	0	0
OOU11D	0	0	0	0
Average OOU11	0	0	0	0
OOU12A	4,002	213	52	0
OOU12B	0	0	0	0
Average OOU12	1,001	53	13	0

* TEAE - the predicted number of exposures for the total population in a given year after a given alternative has been implemented. This number is predicted by the OECert model.

Source: QST, 1997.

4.0 Identification of Risk Reduction Goals and Objectives

USAESCH has chosen to generally follow EPA guidance for conducting EE/CAs to analyze risk reduction alternatives for FUDS sites that may be contaminated by OE. The EPA promulgated EE/CA guidance to reduce risk of public exposure at HTRW sites; however, the general process is well-suited to addressing OE sites and is accepted by regulatory agencies. Not all facets of the EE/CA guidance are applicable to OE sites.

4.1 Determination of Risk Reduction Scope

The scope of this EE/CA is to address possible OE contamination at former CCATF. In this section, goals and objectives for risk reduction are identified and developed.

4.1.1 Risk Reduction Goal and Objectives

The goal of the NTCRA at former CCATF is to minimize the risk of exposure to OE that could create a threat to public health and the environment, while also minimizing the hazards to personnel performing the risk reduction. The objectives for attaining this goal are as follows:

- Identify and implement the appropriate technologies for risk reduction;
- Minimize the environmental damage during risk reduction;
- Detect and dispose of OE where a threat exists to the public health;
- Minimize risk to Croft State Park personnel and to the general public who will use or visit the park;
- Minimize risk to owners, residents, and other users of private property; and
- Use appropriate personnel and implement safety measures to reduce the risk of ordnance exposure.

4.1.1.1 If actual OE removal is required, the following methods will be implemented:

- Implement environmental pre-screening of the sites where OE removal is required (pre-screening to occur prior to any OE removal with the required concurrence of USAESCH personnel),
- Provide a clear preference to an in-place disposal method for OE recovered at the site, and
- Use appropriate disposal techniques for the residual waste generated during the removal actions.

4.2 Determination of Schedule

The final schedule for activities associated with risk reduction at former CCATF will depend on many factors, including the completion date for the EE/CA, the time required to implement selected alternatives, the nature of the threat, negotiations with regulatory agencies, availability of required resources, weather, and other intangibles. Since the potential threat has existed since WWII, the schedule associated with risk reduction may not be as critical for those areas where construction or development are not planned. The effort needed to implement each alternative is discussed in Section 6.0 of this report.

4.3 Objectives/Criteria Used in Analysis of Alternatives

This section provides a detailed analysis of the risk reduction alternatives for possible OE contamination. The evaluation criteria outlined in *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (EPA, 1993) serve as the basis for conducting the detailed analysis. The following represent the primary criteria that the analysis considers:

- Effectiveness,
- Implementability, and
- Cost.

4.3.0.1 Each of the evaluation criteria is further divided into specific factors for a complete analysis of the alternatives. These criteria and corresponding factors are discussed in the following paragraphs.

4.3.1 Effectiveness

4.3.1.1 Overall Protection of Public Health and the Environment

The effectiveness criteria are measurements of the ability of an alternative to meet the objective within the scope of the proposed action. Effectiveness is discussed in terms of overall protection of human health and the environment.

4.3.1.2 Long-Term Effectiveness and Permanence

This evaluation criterion addresses the results of an alternative in terms of the risk remaining at the site after risk reduction objectives have been met. The following factors characterize the potential remaining risk at the site following completion of the implementation phase:

- The magnitude of risk remaining due to unremoved OE contamination following the completion of the alternative, and

- The adequacy and reliability of controls that are used to manage unremoved OE contamination remaining at the site.

4.3.1.3 Reduction of Mobility, Toxicity, or Volume (MTV)

This evaluation criterion assesses the level to which the alternative reduces risk by destroying contaminants, reducing the total mass of contaminants, reducing the total volume of contaminated media, and/or irreversibly reducing the contaminants' mobility. Although not necessarily applicable to this site, the specific factors typically considered for evaluating a risk reduction alternative in accordance with EPA guidance for conducting EE/CAs are as follows:

- The treatment processes the remedy would employ and the materials they would treat;
- The amount of hazardous materials that would be destroyed or treated, including how the principal threat(s) would be addressed;
- The degree of expected reduction in MTV measured as a percentage of reduction (or order of magnitude);
- The degree to which the treatment would be irreversible;
- The type and quantity of treatment residuals that would remain following treatment; and/or
- Whether the alternative would satisfy the statutory preference for treatment as a principal element.

4.3.1.3.1 For the former CCATF, this evaluation criterion will assess the level to which the alternative reduces risk by destroying the contaminant (OE), or reducing the total mass of the contaminant. For OE-contaminated sites, the media surrounding the OE are not typically contaminated, and the OE is not typically mobile.

4.3.1.4 Short-Term Effectiveness

This evaluation criterion addresses the alternative's effect on human health and the environment during construction and implementation of the risk reduction action. The implementation phase of an alternative is completed once response objectives are met. The short-term effectiveness is based on the following four factors:

- The potential risk to the community,
- The potential risk to the workers implementing the risk reduction actions,
- The potential for adverse impacts on the environment due to implementation of the action, and
- The time required to meet the risk reduction objectives.

4.3.1.5 Compliance With ARARs

This evaluation criterion serves as a check to assess whether each alternative meets the potential federal, state, and local ARARs identified in this EE/CA process.

4.3.1.5.1 No chemical-specific ARARs exist at this time for cleanup of ordnance-contaminated sites. Location- and action-specific ARARs potentially applicable for the proposed alternatives under consideration are discussed in Section 3.3.1.

4.3.2 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various materials and services required during its implementation. The following factors must be considered during the implementability analysis.

4.3.2.1 Technical Feasibility

This factor evaluates the relative ease of implementing or completing an alternative considering physical constraints and the previous use of established technologies. The following items should be considered:

- Ability to construct and operate the alternative;
- Reliability, or the ability of a technology to meet specified process efficiencies or performance goals;
- Ease of undertaking future risk reduction actions that may be required; and
- Ability to monitor the effectiveness of the remedy.

4.3.2.2 Administrative Feasibility

This factor evaluates activities that require coordination with other offices and agencies (e.g., obtaining permits for offsite activities or rights-of-way and easements required for construction, or compliance with statutory limits).

4.3.2.3 Availability of Services and Materials

This factor evaluates the availability of the technologies (materials or services) required to implement an alternative. The following items should be considered:

- Availability of adequate offsite treatment, storage capacity, and disposal services;
- Availability of personnel and technology, using the removal action schedule as a guide;

- Availability of prospective technologies; and
- Availability of services and materials required for the alternative.

4.3.2.4 State Acceptance

This factor evaluates the technical and administrative issues and concerns the State of South Carolina may have regarding each of the alternatives. State acceptance will be a factor in the final selection of the alternative in the EE/CA Action Memorandum.

4.3.2.5 Community Acceptance

This factor evaluates the issues and concerns that the public may have regarding each of the alternatives. Community acceptance will be a factor in the final selection of the alternative in the EE/CA Action Memorandum.

4.3.3 Cost

The total estimated cost is used to determine overall cost effectiveness.

5.0 Identification and Development of Risk Reduction Alternatives

Based on the nature and analysis of contamination and risk reduction goals and objectives discussed in previous sections of this report, a limited number of appropriate alternatives will be evaluated. In this section, the appropriate technologies will be identified and risk reduction alternatives developed. In the following section, each alternative will be discussed in greater detail and evaluated with respect to specific criteria.

5.1 Identification of Technologies

Technologies for the detection, recovery, and disposal of OE contamination at the former CCATF are identified in the following sections.

5.1.1 Detection

Several geophysical methods are available for the detection of buried ordnance. These methods are classified based on the type of parameter (physical, electrical, or chemical) they measure. The following are the most commonly used methods and the associated systems for ordnance detection:

- Magnetometer,
- Ground Penetrating Radar (GPR),
- Frequency Domain Electromagnetics (EM) System,
- Resistivity Measurement System, and
- Time Domain EM System.

5.1.2 Recovery

If OE is detected, it will be excavated and identified and either be left in place for later disposal or recovered from the excavation and moved to a safe location for later disposal. If recovered from the soil, OE is separated either mechanically or manually depending on the expected density, type, and size of the OE and the type and quantity of soil excavated.

5.1.3 Disposal

OE can be disposed of by the following methods:

- *In-situ* detonation,
- Offsite detonation, or
- Incineration.

5.1.3.1 *In-situ* detonation is destruction of the OE while in the ground. The item is detected, identified, and then detonated in place. Offsite detonation requires that the item be recovered from the excavation and transported to an approved disposal range for detonation. Incineration involves destruction through combustion. For the sites at former CCATF, it is anticipated that disposal of OE will be either through *in-situ* detonation or offsite detonation.

5.2 Development of Alternatives

Based on the previously described technologies, alternatives were assembled to address OE contamination at the former CCATF. Both removal and non-removal alternatives were developed.

5.2.0.1 Non-removal alternatives include the following:

- Alternative 1: No Further Action, and
- Alternative 2: Institutional Controls.

5.2.0.2 Removal alternatives include:

- Alternative 3: Surface Clearance, and
- Alternative 4: Clearance for Use.

5.2.0.2.1 Alternative 3: Surface Clearance, is a removal alternative. However, it is not intended to entirely remove the contamination. It involves removing surface materials (that could potentially include OE) and/or light clearing of leaves, vines, and vegetation ground cover (which could result in the unearthing of OE). Therefore, removal action technologies for detection, recovery, and disposal are potentially applicable.

5.2.0.2.2 Alternative 4: Clearance for Use, was developed from the removal action technologies described in Section 5.1. Alternative 4 consists of fully locating, excavating, and removing OE to a depth conducive with the anticipated or expected land use and overall health and safety of the affected community. Alternative 4 consists of the following selected removal action technologies that are most commonly used and most appropriately applicable to OE remediation:

- Detection by magnetometer,
- Recovery by excavation, and
- Disposal by detonation or disposal at an appropriate facility.

6.0 Description and Evaluation of Alternatives

This section describes the general alternative components, followed by an evaluation of the four selected alternatives: No Further Action, Institutional Controls, Surface Clearance, and Clearance for Use. For each alternative, it is assumed that the alternative will be used throughout the entire OOU. However, this should not preclude selective implementation of an alternative as required or recommended. Section 7.0 will discuss the application of the alternatives for each OOU.

6.1 Alternative Components

This section describes the components considered for the removal response alternatives, including the following:

- Site preparation,
- Detection,
- Sifting,
- Excavation,
- Detonation,
- Transportation, and
- Disposal.

6.1.1 Site Preparation

Site preparation includes clearing surface vegetation and other activities required to facilitate the detection and removal of OE from an OOU. Vegetative clearance would be accomplished using tractor-mounted mowers, gas-powered trimmers with saw blade attachments and using hand-held machetes. The level of effort required for this clearance would vary depending on the density of growth and terrain of each OOU. The level of effort would also vary with the nature of the risk reduction alternative to be implemented. For example, surface clearance requires less vegetative clearance than clearance for use. Site clearance activities would be completed prior to startup of other activities. The site preparation team would consist of trained personnel and a site safety officer.

6.1.2 Detection

After the vegetation clearance is complete, magnetometers would be used for detecting buried ordnance. Most of the OE found in the former CCATF is metal and, therefore, will be detectable with a magnetometer (metal detector).

6.1.3 Sifting

Soil sifting would be required at areas where the expected density of ordnance is high. The purpose of sifting is to mechanically separate ordnance items from the excavated soil. One method involves gravity seperation using a vibrating table. None of the areas (or OOUs) at the former CCATF are anticipated to contain high densities of siftable ordnance contamination.

6.1.4 Excavation

After an exclusion zone is established and all required preparatory actions are implemented, excavation activities would be initiated. Excavation up to 3 ft would be accomplished manually by EOD-qualified personnel. Earth-moving machinery (EMM) may be used for excavations greater than 3 ft.

6.1.4.1 EMM can be operated by non-EOD trained personnel under the direct supervision of UXO personnel. All excavation operations would comply with the provisions of 29 CFR 1926 Subpart P; *Safety Concepts and Basic Considerations for UXO Operations* (USACE, 1992a); and *USACE Safety and Health Requirements Manual*, October 1992 (USACE, 1992b).

6.1.4.2 If the soil excavated along with the OE is determined to be uncontaminated (i.e., does not contain OE), it would be stockpiled in the immediate area for later backfilling of excavations. However, if the excavated soil is found to be contaminated with ordnance, the OE must be removed from the soil before backfilling.

6.1.4.3 No CWM is known to exist at the site and none is expected to be discovered. However, if an item is discovered that is identified as potential CWM, all field operations will be stopped immediately and the area will be evacuated within a 500-meter (m) area secured by two UXO specialists. The USACE safety representative would then be notified immediately, and appropriate direction/action would be taken by USACE. In the interim, the remediation contractor would secure and mark the area and cease operations until receiving further direction.

6.1.5 Detonation

Detonation, when applicable, would be accomplished by the field team using appropriate equipment, as approved by the USAESCH field representative. All detonation activities would be in accordance with an approved OE Operation Plan and conducted by qualified UXO specialists. If special or heavy equipment is required to construct disposal range facilities, formal approval would be obtained from the USAESCH field representative before proceeding with procurement activities. All OE disposal activities involving detonation or the use of explosives would be completed with a clear preference for

inplace or onsite treatment over offsite disposal alternatives. Efforts would be made to reduce noise levels by using damping materials and sand bags. If OE items are determined not to be movable within safety guideline, and the situation precludes detonating the item in-place, the USAESCH field representative would be notified, who in turn, would take appropriate action.

6.1.6 Transportation

All ORS including metallic debris, shrapnel, or fragments discovered during excavation, would be collected, transported, and stored in an approved onsite temporary storage location, and placed in an approved temporary holding container such as a rolloff box within the storage area for later disposal. The transportation would be performed using appropriate containers in accordance with a previously approved OE operational plan.

6.1.7 Disposal

ORS items recovered during excavations at each site would be disposed of in a manner appropriate for the specific site and the nature of the item. Disposal will either be by the local DRMO or by recycling by a local scrap metal recycling company.

6.2 Description of Selected Alternatives

6.2.1 Alternative 1: No Further Action

This alternative is a no-action alternative and is included to provide a baseline comparison with other removal response alternatives. No technologies are associated with this alternative. No risk reduction measure resulting in the treatment, containment, risk reduction, or limited access to OE would be implemented. Therefore, potential OE would not be removed and no restrictions would be placed on access to the site. The No Further Action alternative is appropriate for sites where no OE contamination has been found, where there is no documented evidence of OE contamination, or where the nature and extent of the OE contamination poses no threat to those who may encounter and handle it (e.g., small arms fire only).

6.2.1.1 Effectiveness

6.2.1.1.1 Overall Protection of Public Health and the Environment

This alternative implements no risk reduction actions. The potential contaminants remain in place, and there is no reduction of risk to the public of exposure to ordnance.

6.2.1.1.2 Long-Term Effectiveness and Permanence

With this alternative, contamination would remain in place, and there would not be a long-term change in site conditions. For practical purposes, it is assumed that under the no-action alternative, cleanup at the specific site would never be achieved. The magnitude of the risk would remain undiminished at the conclusion of Alternative 1 activities and would contribute nothing to the future remedial objectives.

6.2.1.1.3 Reduction of MTV

Since no OE would be treated, removed, or destroyed under this alternative, the MTV of the OE contamination would remain unchanged.

6.2.1.1.4 Short-Term Effectiveness

Implementing the no-action alternative would result in no short-term risk to the surrounding community. No additional adverse environmental impacts from implementing this alternative would occur.

6.2.1.1.5 Compliance with ARARs

Since no action would be implemented, no location-specific, action-specific, or chemical-specific ARARs are applicable to this alternative. No ARARs are identified for ordnance-related activities.

6.2.1.2 Implementability

6.2.1.2.1 Technical Feasibility

This alternative involves no action; therefore, technical feasibility is not applicable to this alternative.

6.2.1.2.2 Administrative Feasibility

This alternative is administratively feasible.

6.2.1.2.3 Availability of Service and Materials

No services or materials would be required to implement this alternative.

6.2.1.2.4 Local Government Acceptance

No permits or approvals would be required from either state or local authorities to implement this alternative.

6.2.2.5 Community Acceptance

The community may express concerns regarding this alternative, particularly with regards to OOUs that have shown evidence of OE contamination. Therefore, this alternative is generally not recommended for sites with known or suspected OE contamination.

6.2.2 Cost

There is no cost associated with this alternative.

6.3 Alternative 2: Institutional Controls

Institutional controls is a limited-action alternative that uses public information and land use restrictions to minimize public exposure to OE. Implementing this alternative could result in limiting the future use and development of the areas.

6.3.0.1 Institutional controls at the former CCATF would consist of the following:

- Educating personnel, surrounding landowners, and visitors about the potential hazards associated with the sites;
- Posting signs at strategic locations, and/or
- Erecting perimeter fencing around the OOU to physically restrict access to the contaminated sites.

6.3.0.2 Public education would include the following:

- Collateral material development such as brochures and fact sheets. Distribution of such materials to the public could occur through mailings; by making materials available at public places such as churches, libraries, parks, schools, and other public gathering facilities; or by disseminating materials at public information meetings.
- Exhibit design and placement. Exhibits could be designed and placed in areas for public viewing. Permanent or moveable exhibits could be designed for a variety of situations.
- Public notices published in area publications. Public notices could be written and published in area publications, including newspapers, church and civic newsletters, business communications, and other publications.

- Educational videotape production. A videotape could be produced to explain the risks from exposure to OE at the former facility. The tape should be approximately 10 to 15 minutes in length and appeal to audiences from school children to adults.
- Issuance of a "prudent man letter". Such a letter would inform its recipient that a particular area is contaminated and a prudent man would not dig in that area.

6.3.0.3 Sign posting would consist of designing and installing signs at strategic locations frequented by the public, informing the public of potential dangers of contacting ordnance and to prevent or discourage entry into contaminated areas.

6.3.0.4 Fencing would consist of installing a security fence capable of preventing or significantly discouraging entry into contaminated areas. A typical security fence would be chain-link type with strands of barbed wire along the top. Fencing of any currently unfenced areas would restrict access to currently accessible and publicly used areas. Fencing of individual OOUs could be considered and would act to deter trespassers. However, the OOUs may not be appropriate divisions for fence determination. Development of strict rules of entry must also be implemented in conjunction with fence construction.

6.3.0.5 Institutional controls when properly implemented can be an effective alternative to reduce risk at formerly used defense sites. Institutional control is an appropriate alternative where the risk to the public has been documented as low and can be managed without actual removal of OE. This alternative would not remove ordnance contamination from the area.

6.3.0.6 With the exception of digging for sign or fence post installation, no intrusive activity would be associated with this alternative. The technologies associated with this alternative would be advertising, sign posting, and fencing. No risk reduction measure resulting in the removal of OE would be implemented. The quantity of fencing, number of signs to be posted, inspections, perimeter patrols, and other requirements associated with this alternative would be site specific. If a fence were to be constructed, future use or development of the fenced areas would be restricted without further OE removal.

6.3.0.7 Fence construction, in conjunction with sign posting, issuance of a "prudent man letter," and educating the public, should be considered as a complete institutional control package.

6.3.0.8 A comparative analysis of the removal response alternatives (including elements of the Institutional Controls alternative) for each OOU is presented in Section 7.0. Recommendations related to this alternative are presented in Section 8.0.

6.3.0.9 Costs for fencing are included in Appendix G. However, institutional controls excluding fencing should also be strongly considered.

6.3.1 Effectiveness

6.3.1.1 Overall Protection of Public Health and the Environment

Institutional controls would not remove or destroy OE contamination and therefore cannot be seen as providing overall protection to public health and the environment. However, to the extent that the controls are effective, the threat to public health and the environment will be reduced.

6.3.1.1.1 Educating the public of the risk of contact with OE would minimize the likelihood that the public would handle OE that they might observe within the former CCATF. Education could be accomplished by holding public meetings and presenting printed material to visitors.

6.3.1.1.2 Posting signs at areas of special concern would reinforce warnings regarding risk of exposure to OE at specific areas.

6.3.1.1.3 Erecting a security fence around areas of potential OE contamination would further reduce the potential for public exposure. However, contamination would remain in place and its threat to the environment would remain.

6.3.1.1.4 The level of protection would be greater than that provided by Alternative 1 because of informing the public and potential visitors of the dangers related to ordnance. The likelihood of accidental exposure would be reduced by implementing this alternative, thus reducing the risk. However, the OE would remain in place, and the potential risk would remain.

6.3.1.2 Long-Term Effectiveness and Permanence

Institutional controls would restrict future construction activities and reduce the possibility of exposure to the OE. Fencing would be more restrictive than signage or advertising and would be reliable in achieving the objective of preventing direct public contact with OE. The possibility of accidental exposure would increase if the fence is damaged, signs are removed or deteriorate, or if persons are allowed to walk onto the fenced areas.

6.3.1.2.1 Adequate public education would require followup efforts to achieve long-term effectiveness and permanence because of visits by new members of the public and turnover of Croft State Park employees. Signs and fences would be relatively effective and would be permanent structures that should require minimal maintenance.

6.3.1.3 Reduction of MTV

No contamination would be removed or destroyed under this alternative; therefore, the MTV of the contaminants would remain unchanged.

6.3.1.4 Short-Term Effectiveness

Safety concerns during the implementation period would be associated with the potential for exposure of workers to site contamination during fence and sign installation. This exposure risk is assumed to be low because OE avoidance procedures would be employed and little soil excavation would be required to install the fence and/or signs. There should be no risk to the affected community and no adverse environmental impacts from implementing this alternative.

6.3.1.5 Compliance with ARARs

No chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to this alternative would include excavation and worker safety. The location-specific ARARs potentially applicable to this alternative would be complied with during site activities.

6.3.2 Implementability

6.3.2.1 Technical Feasibility

The technology associated with implementing this alternative (i.e., sign posting, advertising, and fence construction) would be reliable, readily accessible, and easily implementable. The technologies associated with this alternative are well proven and have been used at numerous sites under similar conditions. The services of EOD-qualified personnel are not required except to clear sign locations, fence post excavations, and the route of fence lines.

6.3.2.2 Administrative Feasibility

Public education and posting signs should be administratively feasible in most areas. However, it would require coordination with the South Carolina Department of Parks, Recreation, and Tourism; the local park management; and local residents and property owners (when implemented on privately owned property). No permits or waivers are anticipated to implement this alternative within Croft State Park; and the need for easements, right-of-way agreements, or zoning variances is not expected.

6.3.2.2.1 Approval and coordination with private property owners will be required in some OOUs. For fencing or sign posting on private property, ROE agreements will be required and easement may

be needed. Implementation of the public education/information points of this alternative should require no easements, right-of-way, or zoning variances.

6.3.2.3 Availability of Service and Materials

Public education requires no special materials or equipment. Required services are easily obtained. The sign posting and fencing alternatives would be easily implemented because no special equipment and/or operators are required. Construction of a perimeter security fence and posting signs requires only conventional construction equipment and techniques in most areas. During sign installation and/or fence post excavation, however, EOD-trained personnel must clear the area prior to construction and the proper safety precautions must be implemented to prevent untrained personnel from handling OE.

6.3.2.4 Local Government Acceptance

No state permits are anticipated with this alternative at this time.

6.3.2.5 Community Acceptance

It is expected that the local community would accept education and sign posting alternatives. However, restriction of public access by erecting fences around areas frequented by the public would probably meet with opposition. Private land owners are not likely to accept fencing around and restricting of access to their property. The community may express concerns since this alternative does not remove the contamination and therefore, may not be viewed as a permanent solution. OOUs located within the park boundary have varying degrees of public access and the public may prefer clearance of these areas rather than the less effective restriction of site access. The need for a positive community relations campaign may be warranted.

6.3.3 Cost

Several costs for this alternative are presented in Appendix G. The estimated cost to educate personnel, surrounding land owners, and visitors (i.e., the Education/Information Program) must be considered as a total cost and cannot be broken into individual OOUs.

6.3.3.1 For all OOUs, fencing costs assume that a perimeter fence is constructed around the entire unit. This fence will include placing signs at regular intervals to advise the public that entry into the area is not permitted. Since installing fence posts is an intrusive activity, costs for clearance by EOD-qualified individuals must be included.

6.4 Alternative 3: Surface Clearance

The Surface Clearance alternative consists of using UXO specialists who are trained in recognition, handling, and disposal of OE to perform a visual survey of the entire surface of each OOU and to remove OE from the ground surface, near surface (less than 6 inches), or any OE that is partially buried. This alternative would be effective in minimizing the risk of the public who may be engaging in nonintrusive activities from having incidental contact with OE.

6.4.0.1 This alternative includes site preparation activities (vegetation clearance) as needed to adequately and completely perform the visual survey. Limited geophysical investigation and removal of surface debris is anticipated. The geophysical investigation is usually conducted using a magnetometer. Surface clearance does require significant clearance of brush and shrubs to ensure that all areas have been adequately examined. Selective probing of the near surface soil up to a depth of 6 inches may be employed to investigate magnetic anomalies and identify near surficial metallic debris that may not be visually apparent.

6.4.0.2 Surface clearance is an appropriate alternative where surface contamination by OE is confirmed, or where surface OE inspections have not been previously performed. A limited number of OE surveys have been conducted at sites within the former CCATF.

6.4.0.3 Within all OOUs, the effort associated with implementing this alternative would vary from one OOU to another and would depend on the topography, vegetation, and current land use. Associated with the Surface Clearance alternative, the public education portion of Alternative 2 would be required prior to start of work.

6.4.1 Effectiveness

6.4.1.1 Overall Protection of Public Health and the Environment

Surface clearance would be effective in removing those OE items that are most likely to be encountered by the public. Implementing this alternative would greatly reduce the risk of a member of the public accidentally encountering and handling an OE item. Surface clearance would not remove all OE potentially present. Subsurface OE, if present, would remain. As such, only limited protection would be provided for intrusive activities.

6.4.1.1.1 Whether surface clearance increases the overall protection of the public is strongly related to the quantity of OE that lies on or near the surface. In OOUs where surface OE is common, considerable increase in protection can result from implementing this alternative.

6.4.1.2 Long-Term Effectiveness and Permanence

Surface clearance would be a reliable means of reducing exposure to members of the public who are engaged in nonintrusive activities; therefore, the alternative should be reliable in reducing the risk of direct contact with ordnance contamination located on the surface. The possibility of exposure during intrusive activities would remain and, therefore, removal of risk associated with OE would not be fully achieved. The upward migration of OE resulting from soaking and drying and/or freezing and thawing could potentially bring buried OE to the surface. Implementing this alternative would not ensure removal of all contamination; therefore, there would be a continuing potential risk to the public and/or the environment.

6.4.1.3 Reduction of MTV

The threats associated with exposure to contamination are partially addressed with this alternative. OE contamination discovered on the surface would be removed under this alternative. However, any subsurface OE would remain and, therefore, the MTV of the buried contaminants would remain unchanged.

6.4.1.3.1 OE items are neither mobile nor toxic. Implementing this alternative would reduce the volume of OE at the surface at all OOUs. The extent of volume reduction would depend on the density of ordnance items present at the OOUs and the extent that these items are found at the surface.

6.4.1.4 Short-Term Effectiveness

Safety concerns during the implementation period would primarily be associated with the potential for exposure of OE specialists during surface clearance. The USACE safety procedures manual, *Safety Concepts and Basic Considerations for UXO Operations* (USACE, 1992a), would be followed, which would significantly limit the actual risk to the workers. There would be limited risk to the affected community resulting from implementing the proposed action. There should be no adverse environmental impacts resulting from implementing this alternative.

6.4.1.5 Compliance with ARARs

No chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to this alternative include excavation, protection of endangered species, and worker safety. The location-specific ARARs potentially applicable to this alternative would be complied with during site activities.

6.4.2 Implementability

6.4.2.1 Technical Feasibility

This alternative would be technically feasible for all OOUs. Efforts associated with implementing this alternative would vary based on the topography, terrain, and vegetation in each OOU. EOD-qualified personnel must be used during implementation of all facets of the Surface Clearance alternative. Public education (see Institutional Controls) should also be conducted as an integral part of the Surface Clearance alternative.

6.4.2.2 Administrative Feasibility

Surface clearance activities should be administratively feasible in most areas. However, activities associated with this alternative would require coordination with USAESCH, South Carolina Department of Parks, Recreation, and Tourism, the local park management, and local residents and property owners (when implemented on private property). To implement this alternative within Croft State Park, no permits or waivers are anticipated and there should be no need for easements, right-of-way agreements, or zoning variances. However, permits and/or approvals may be required if it becomes necessary to transport OE offsite for disposal

6.4.2.2.1 Approval and coordination with private property owners will be required in some OOUs. ROEs must be obtained; however, the need for easements, rights-of-way, and zoning variances is not expected.

6.4.2.3 Availability of Service and Materials

The special equipment, skills, personnel, and technology associated with this alternative include geophysical investigation, land clearing, and EOD training. The proper safety precautions must be implemented to prevent untrained personnel from handling OE items.

6.4.2.4 Local Government Acceptance

No state permits are anticipated with this alternative at this time.

6.4.2.5 Community Acceptance

The community may have concerns regarding this alternative since it does not necessarily remove all the contamination and therefore may not be viewed as a permanent solution. OOUs located within the park boundary have varying degrees of access, and there may be a clear public preference for more

complete clearance of these areas rather than the less effective surface clearance. However, this alternative would be viewed as preferable to Alternative 1, No Further Action, or Alternative 2, Institutional Controls. Similar concerns may be expressed for the private property sites. The need for a positive community relations campaign may be warranted.

6.4.3 Cost

The estimated cost to perform surface clearance at the former CCATF depends on topography, vegetative cover, and site access. The items included in this cost estimate (Appendix G) are site preparation and clearing, surveying and QC, visual inspection of cleared areas, limited geophysical investigation, removal and disposal of OE, mobilization/demobilization, and sign posting. Signs would be posted to advise the public that there is a potential for encountering OE in the area particularly if they engage in any intrusive activity.

6.4.3.1 The implementation cost of this alternative is based on the estimated density of surface OE within each OOU. This density is based on the best information available from the EE/CA sampling and effort. The estimated costs are based on QST's experience in completing similar projects, discussions with EOD-trained personnel, and general knowledge of the site. The vegetation, topography, and site access are expected to vary significantly within the OOUs. Unit costs are assumed to be the average costs across the entire OOU.

6.4.3.2 The education/information program is applicable to all OOUs within the former CCATF. This Education/Information Program is considered part of the costs for implementing Alternative 3 and must be added to the costs developed for implementing this alternative for each OOU.

6.5 Alternative 4: Clearance for Use

This alternative involves all activities necessary to fully locate, excavate, and remove OE to a depth conducive with the expected land use, public access, and overall health and safety of the affected community. Activities could potentially include vegetation clearance as required to geophysically investigate the sites, completion of geophysical investigation(s), excavation of anomalies, and destruction of OE. Technologies that could be used for this alternative include magnetic geophysical investigative methods and handling/disposal of OE (including detonation of UXOs). This alternative includes surface clearance over the entire site and excavation and clearance in areas of known activities.

6.5.0.1 DDESB guidelines [in recently approved changes to DoD 6055.9-STD] state that the depth to which UXO should be removed depends on the projected end use of the land and the extent of human

exposure. The removal depth may be determined by using site-specific information, including the nature of the site, the types of ordnance expected, and the depths at which such ordnance would most likely be found. Estimates of ordnance burial depths may also be determined by published technical data, historical records, and by data collected during site investigations.

6.5.0.2 For planning purposes, the DDESB suggests that areas subject to limited public access should be cleared to a depth of 1 ft. Areas subject to public access (for activities including agriculture, surface recreation, vehicle parking, or surface supply storage) should be cleared to a depth of 4 ft. In an area where unrestricted public access is expected, and/or where construction activity is planned, clearance to a depth of up to 10 ft may be required. In areas where future use and public access is undefined, surface clearance is appropriate. In the construction areas, clearance should be performed to a depth 4 ft deeper than the planned excavation. The actual clearance depth can be modified during the removal action based on actual depths that ordnance is consistently found. This modification requires approval from DDESB.

6.5.0.3 As with Alternative 3, the effort associated with implementing this alternative at an OOU would vary from one OOU to another and the level of effort required for risk reduction would depend on the topography, vegetation, and current land use. The public education portion of Alternative 2 should be included with implementation of this alternative.

6.5.0.4 All of the technologies identified in Section 5.1 and many of the alternative components discussed in Section 6.1 are applicable to this alternative.

6.5.1 Effectiveness

6.5.1.1 Overall Protection of Public Health and the Environment

In most OOUs, implementing this alternative would significantly reduce the potential for direct contact with OE. This alternative would provide a more effective overall protection of public health and the environment than Alternatives 1, 2, or 3.

6.5.1.2 Long-Term Effectiveness and Permanence

Implementing this alternative would significantly reduce the potential for exposure to OE contamination. Since most of the OE at the site is located either on the surface or at relatively shallow depths, implementing this alternative would effectively and permanently reduce the risk to the public of exposure to OE. This alternative would not require annual operation and maintenance (O&M) to be permanent and would need to be addressed further only if additional intrusive activities are to be initiated below the depth cleared.

6.5.1.3 Reduction of MTV

Clearance for use would significantly reduce the MTV of the potential OE contaminants in the areas where clearance is performed (e.g., building construction, trails, and other recreational facilities).

6.5.1.4 Short-Term Effectiveness

The potential for exposure of OE to workers during clearance and risk reduction activities could be significant. The USACE safety procedures manual, *Safety Concepts and Basic Considerations for UXO Operations*, would be followed. There would be minimal anticipated risk to the affected community resulting from implementing the proposed action. However, if OE is discovered and detonation is the preferred disposal alternative, then the area could be affected by noise and ground shock. There should be no adverse environmental impacts resulting from implementing this alternative at any of the OOUs.

6.5.1.5 Compliance With ARARs

No chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to this alternative would include excavation and worker safety. The location-specific ARARs potentially applicable to this alternative would be complied with during site activities.

6.5.2 Implementability

6.5.2.1 Technical Feasibility

The technology associated with implementing this alternative is reliable, readily accessible, and easily implementable for OE discovered at the site. EOD-qualified personnel must be used during the implementation of all facets of this alternative.

6.5.2.2 Administrative Feasibility

Clearance for use activities should be administratively feasible in most areas. However, activities associated with this alternative would require coordination with USAESCH; South Carolina Department of Parks, Recreation, and Tourism; the local park management; and local residents and property owners (when implemented on private property). To implement this alternative within Croft State Park, no permits or waivers are anticipated and there should be no need for easements, right-of-way agreements, or zoning variances. However, permits and/or approvals may be required if it becomes necessary to transport OE offsite for disposal

6.5.2.2.1 Approval and coordination with private property owners will be required in some OOUs. ROEs must be obtained; however, the need for easements, rights-of-way, and zoning variances is not expected.

6.5.2.3 Availability of Service and Materials

The special equipment, skill, personnel, and technology associated with this alternative would include geophysical investigation, site clearing, and OE training. Proper safety precautions must be implemented to prevent untrained personnel from handling these materials.

6.5.2.4 Local Government Acceptance

No state permits are anticipated with this alternative at this time.

6.5.2.5 Community Acceptance

It is anticipated that this alternative will be well-received by the local community, since it represents the highest proposed level of OE removal and should result in the greatest overall protection to the public. However, some local citizens may be concerned that the alternative will result in unnecessary disruption of daily activities and potential destruction of property and/or habitat due to excavation and in-place detonation activities. The need for a positive community relations campaign may be warranted to ensure the public that appropriate measures will be taken to minimize inconvenience and prevent damage to local property or habitat.

6.5.3 Cost

The cost estimates (Appendix G) include site preparation and clearing, surveying and QC, geophysical investigation, excavation of anomalies, removal and disposal of OE, mobilization/demobilization, and sign posting.

6.5.3.1 The estimated density of OEs that would be discovered and would require disposal/detonation is based on the best information available from the EE/CA sampling efforts. The estimated costs to complete the tasks indicated are based on QST's experience in completing similar projects, discussions with EOD-trained personnel, and knowledge of the site. The vegetation, topography, and site access may vary within the OOUs. Unit costs are assumed to be the average costs across the entire OOU.

6.5.3.2 The education/information program is applicable to all OOUs within the former CCATF. The education/information program is considered part of the costs for implementing Alternative 4 and must be added to the costs presented.

7.0 Comparative Analysis of Risk Reduction Alternatives

Section 6.0 presented and evaluated four alternatives. This section presents a comparative analysis of these alternatives for OOU10, OOU11, and OOU12.

7.0.1 QST performed a risk analysis based on the results of the EE/CA investigation, using OE*Cert* (as developed by Quantitech). The results of this analysis have been used to assist in comparing the risk reduction alternatives for each OOU. Refer to Section 3.6 for additional information related to the OE*Cert* analysis.

7.1 Risk Reduction Analysis — OOU10

OOU10 includes 210 acres of Croft State Park where ORS was found during the Phase II EE/CA investigation. OOU10 is subdivided into four sectors (OOU10A, OOU10B, OOU10C, and OOU10D), all within the park area and administered by the South Carolina Parks Department. The EE/CA sampling indicated that the entire OOU contains significant amounts of ORS, much of which is indicative of high order detonations. Practice rounds found during the investigation may also contain small charges which could create a hazard to someone finding the item and mishandling it. All fragments of ordnance items found were less than 20 inches deep, with most items less that 1 ft below grade. For additional information related to OOU10 refer to Section 3.2.3.

7.1.1 Effectiveness

7.1.1.1 Overall Protection of Public Health and the Environment

Alternative 1, No Further Action, provides no additional risk reduction. The potential contaminants remain in place and there is no risk reduction of ordnance exposure.

7.1.1.1.1 Alternative 2, Institutional Controls, would minimize the likelihood that members of the public would handle OE that they might observe within this OOU during outdoor recreational activities. Education could be accomplished by holding public meetings and presenting printed material to visitors and members of the public. This education process would be most effectively implemented for the entire park rather than by OOUs.

7.1.1.1.2 Erecting security fence around all segments of the OOU would reduce the exposure potential by restricting access. However, with the sectors of OOU10 scattered throughout the park and some of the park areas still uninvestigated or undefined as a part of any OOU, the overall effectiveness

of fencing around only the sectors of OOU10 is limited. Sign posting at specific areas would effectively reinforce warnings about risk of exposure to OE.

7.1.1.1.3 The protection level provided by Alternative 2 is expected to be higher than Alternative 1 because of notification of potential visitors to the dangers of ordnance (with education programs and signage). As with Alternative 1, this alternative leaves contaminants in place and provides little increased protection to the public and the environment.

7.1.1.1.4 Alternative 3, Surface Clearance, would be effective in removing those OE items that are most likely to be encountered by the public. Surface clearance, however, would not remove all OE that could potentially be present. Subsurface OE, if present, would remain. As such, limited protection would be provided for intrusive activities that may occur within this unit.

7.1.1.1.5 Alternative 3 would increase the protection provided to the public and the environment (as compared to Alternatives 1 and 2) because a selective OE removal action would be implemented with this alternative.

7.1.1.1.6 Within OOU10, Alternative 3 would provide significant protection to the public and environment since there is some control over the intrusive activities that are allowed within the park area and the only intrusive activities currently planned for OOU10 are associated with hiking and camping.

7.1.1.1.7 Alternative 4, Clearance for Use, would reduce the risk of direct contact with OE, unless intrusive activities are initiated below the depth cleared. Although Alternative 4 would provide the most effective overall protection of public and the environment, this increased risk reduction is small when compared with the reduction provided by Alternative 3.

7.1.1.2 Long-Term Effectiveness and Permanence

7.1.1.2.1 Alternative 1, No Further Action, implements no action at the site. Therefore, this alternative would have no impact on long-term effectiveness and permanence.

7.1.1.2.2 Alternative 2, Institutional Controls, would reduce the possibility of exposure to the contaminants and would be effective if it is maintained through periodic evaluation and reinforcement. However, liability and risk would persist because the potential contaminants would not be destroyed and would remain in place. In OOU10, the long-term effectiveness and permanence would depend on the effectiveness and permanence of the education program initiated within the park.

7.1.1.2.3 Alternative 3, Surface Clearance, would be an effective means of reducing exposure to members of the public who are not engaged in intrusive activities. In OOU10, this alternative would provide a relatively permanent solution to protect the public engaged in non intrusive activities, but would have no permanent effect on buried ordnance. It would provide limited protection for activities such as building construction. In OOU10, there is some control over the activities of park visitors, however, some public intrusive activity is anticipated by campers, hikers, and other visitors to the park. Camping outside of designated campgrounds is illegal, but this does not prevent casual camping in areas hidden from park personnel.

7.1.1.2.4 Alternative 4, Clearance for Use, would provide an effective and permanent means of reducing the potential for exposure to OE. Implementing this alternative would be effective and permanent, unless intrusive activities are initiated below the depth cleared.

7.1.1.2.5 Significant quantities of ORS was detected in OOU10 during the EE/CA sampling effort. ORS was removed from the surface and subsurface of the grids investigated. However, other areas not investigated within OOU10 may also contain potentially significant quantities of OE. The long-term effectiveness of Alternative 3 as compared with Alternative 4 would be a function of the future use of the area.

7.1.1.3 Reduction of MTV

The MTV of the potential OE contamination would remain unchanged with implementation of Alternatives 1 or 2.

7.1.1.3.1 Alternative 3, Surface Clearance, would reduce the volume of contaminants within the OOU. OE discovered on the surface would be removed or destroyed under this alternative. However, any subsurface OE would remain; therefore, the MTV of the buried contaminants would remain unchanged. According to results of the OE*Cert* analysis, the total number of annual exposures is expected to be significantly reduced with implementation of this alternative. In OOU10B, OOU10C, and OOU10D, no exposures are expected (for both the high density and low density exposure) if surface clearance is completed. In OOU10A the number of expected annual exposures is reduced from 37,973 to 807 percent using the high density estimate (refer to Table 3-5).

7.1.1.3.2 Alternative 4, Clearance for Use, would significantly reduce the volume of the potential contaminants. According to results of the OE*Cert* analysis, the total number of annual exposures is expected to be significantly reduced with implementation of this alternative. If OOU10 is cleared to a depth of 4 ft, no exposures are expected. If cleared to a depth of 1 ft, the expected exposures are zero for OOU10B, OOU10C, and OOU10D. Within OOU10A, the expected exposures are reduced from

37,973 to 137, using the high density estimate, or from 409 to 70, using the low density estimate (refer to Table 3-5).

7.1.1.4 Short-Term Effect During Implementation

For Alternative 1, no action would be implemented. No risks are associated with the safety of workers during the implementation period.

7.1.1.4.1 For Alternative 2, Institutional Controls, minimal safety concerns would be associated with the potential for exposure of workers to UXO while posting signs or erecting fencing. No risk would be expected for the affected community and no adverse environmental impacts should result from this alternative.

7.1.1.4.2 For Alternative 3, Surface Clearance, safety concerns would be primarily associated with the potential for exposure by UXO specialists during surface clearance. The degree of exposure risk would vary depending on the clearing and inspection activities of different areas within the OOU. In OOU10, the potential would exist for exposure to workers to OE; however, little risk would be expected to the affected community. However, the community could be affected by noise or restricted access during implementation.

7.1.1.4.3 Alternative 4, Clearance for Use, has the greatest potential for ordnance exposure during UXO clearance and removal activities. However, this exposure would be limited to workers who have been trained in handling and disposing of OE. There is a potential for the community to be affected (by noise or restricted access) during the implementation of this alternative.

7.1.1.5 Compliance with ARARs

For all alternatives, no chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to Alternatives 2, 3, and 4 include excavation, protection of endangered species and worker safety (Table 3-3). The location-specific ARARs potentially applicable to OOU10 would be complied with during implementation of any alternative.

7.1.2 Implementability

7.1.2.1 Technical Feasibility

Alternative 1 involves no action at the site.

7.1.2.1.1 Alternative 2, Institutional Controls, would be technically feasible and implementable. The education and public information portion of this alternative would be easily implemented. Sign posting and fencing would also be technically feasible; however, in some areas (with heavy vegetative cover and limited access) fence construction would be difficult.

7.1.2.1.2 Alternative 3, Surface Clearance, would be technically feasible. EOD-trained personnel would be required during implementation of all facets of the Surface Clearance alternative.

7.1.2.1.3 Alternative 4, Clearance for Use, would be technically feasible. EOD-trained personnel must be used during implementation of all the facets of the Clearance for Use alternative.

7.1.2.2 Administrative Feasibility

Alternative 1 is administratively feasible.

7.1.2.2.1 For Alternative 2, Institutional Controls, public education and the selective posting of signs would be administratively feasible. However, erecting fencing around the sectors of OOU10 may not be administratively feasible, since it would permanently restrict public access to many areas currently used by the public.

7.1.2.2.2 Alternative 3, Surface Clearance, would be administratively feasible at OOU10. However, excessive vegetation clearance would likely be received with reluctance.

7.1.2.2.3 Alternative 4, Clearance for Use, would be administratively feasible at OOU10. However, excessive vegetation clearance would likely be received with considerable reluctance.

7.1.2.3 Availability of Services and Materials

Alternative 1 requires no services or materials.

7.1.2.3.1 The services and materials required to implement Alternative 2, Institutional Controls, are readily available. However, during installation of fencing and sign posts, EOD-trained personnel would be required to clear the area.

7.1.2.3.2 For Alternatives 3 and 4, special equipment, skills, personnel, and technology include geophysical investigation, land clearing, and EOD training.

7.1.2.3.3 For all alternatives, special skills, equipment, and personnel would be needed if buried ordnance is discovered and must be detonated or disposed of. The proper safety precautions would need to be implemented to prevent untrained personnel from handling these materials.

7.1.2.4 Local Government Acceptance

The need for local government acceptance is not anticipated for Alternative 1.

7.1.2.4.1 For Alternative 2, no state permits are anticipated. However, state acceptance of fencing of Croft State Park (or portions of the park) would be doubtful. Fencing would likely restrict public access to an unacceptable degree.

7.1.2.4.2 For Alternatives 3 and 4, no state permits are anticipated. However, state acceptance of extensive vegetation clearance would be questionable. State acceptance may also be needed if endangered species or archaeologically significant items are encountered. Close coordination with the South Carolina Parks Department will be necessary. There are archaeologically sensitive areas located in OOU10A.

7.1.2.5 Community Acceptance

The community may express concerns regarding Alternative 1, due to the accessibility of OOU10 to the public and the evidence of OE contamination.

7.1.2.5.1 For Alternative 2, it is expected that the community would accept education and sign posting at OOU10 or other locations within Croft State Park. However, restriction of access to lands by erecting fencing at OOU10 would be met with opposition by the public.

7.1.2.5.2 Alternatives 3 and 4 could be received with some resistance by the immediate community, since it will temporarily restrict community activities and could require excessive vegetation clearance in OOU10 during implementation. However, the community should view favorably the potential risk reduction attained through implementation of these alternatives.

7.1.3 Cost

Alternative 1 incurs no cost and is therefore the least expensive of the four alternatives. Alternatives 2, 3 and 4 each incur increasing costs, beginning with Alternative 2.

7.1.3.1 The total estimated cost to implement the education/information portion of Alternatives 2, 3, or 4 is $25,000 to $50,000. This encompasses all OOUs and cannot effectively be divided among the individual OOUs. To maintain the program, an estimated $2,500 to $5,000 per year is required.

7.1.3.2 The total estimated costs to implement Alternatives 2, 3 and 4 are $545,000, $745,000, and $3,210,000, respectively, and in addition, the Education/Information Program cost. All assumptions used in the cost estimates are stated in Appendix G.

7.2 Risk Reduction Analysis – OOU11

OOU11 includes 87 acres outside of Croft State Park where ORS was found during the Phase II EE/CA investigation. OOU11 is subdivided into four sectors (OOU11A, OOU11B, OOU11C, and OOU11D), all outside of the park on privately owned or commercial properties. The EE/CA sampling indicated that the entire OOU contains significant amounts of ORS, much of which is indicative of high order detonations. Practice rounds found during the investigation may also contain small charges which could create a hazard to someone finding the item and mishandling it. All fragments of ordnance items found were less than 20 inches deep, with most items less that 1 ft below grade. For additional information related to OOU11 refer to Section 3.2.4.

7.2.0.1 Although all of OOU11 is privately owned, OOU11D is unique in its land use. OOU11D is currently being used as a golf course and the vast majority of the intrusive activities that are likely to occur in this area have been completed. Also, due to its usage as a golf course, OOU11D is visited by a greater number of people and the likelihood of exposure to OE is much greater (if OE exists on the property).

7.2.1 Effectiveness

7.2.1.1 Overall Protection of Public Health and the Environment

Alternative 1, No Further Action, provides no additional risk reduction. The potential contaminants remain in place and there is no risk reduction of ordnance exposure.

7.2.1.1.1 Alternative 2, Institutional Controls, would minimize the likelihood that members of the public would handle OE that they might observe within this OOU. However, the public is generally aware of the previous activities that were conducted at the former CCATF, and therefore the protection provided by implementation of this alternative is limited. Education could be accomplished by holding public meetings and presenting printed material to residents and members of the public.

This education process would be most effectively implemented for the entire area rather than by OOUs.

7.2.1.1.2 Erecting security fence around all segments of the OOU would reduce the exposure potential by restricting access. However, with the sectors of OOU11 scattered throughout the area and some areas still uninvestigated or undefined as a part of any OOU, the overall effectiveness of fencing around only the sectors of OOU11 is limited. Additionally, fencing private property provides some protection to the general public, but provides no additional protection to the private property owner. Sign posting at specific areas would effectively reinforce warnings about risk of exposure to OE.

7.2.1.1.3 Although fencing will provide some overall protection of public health and the environment, it is not likely to be a viable option on a semi-private golf course or on private properties (refer to paragraph 7.2.2.2.1).

7.2.1.1.4 The protection level provided by Alternative 2 is expected to be higher than Alternative 1 because of notification of the public to the dangers of ordnance (with education programs and signage). As with Alternative 1, this alternative leaves contaminants in place and provides little increased protection to the public and the environment.

7.2.1.1.5 Alternative 3, Surface Clearance, would be effective in removing those OE items that are most likely to be encountered by the public. Surface clearance, however, would not remove all OE that could potentially be present. Subsurface OE, if present, would remain. As such, limited protection would be provided for intrusive activities that may occur within this unit.

7.2.1.1.6 Within OOU11, Alternative 3 would provide protection to the public and environment; however there is limited control over the intrusive activities that are allowed. Therefore, the overall protection of public health and the environment would be predicated upon the amount of intrusive activities that are implemented after completion of the alternative.

7.2.1.1.7 Alternative 3 would increase the protection provided to the public and the environment (as compared to Alternatives 1 and 2) because a selective OE removal action would be implemented with this alternative.

7.2.1.1.8 Alternative 4, Clearance for Use, would reduce the risk of direct contact with OE, unless intrusive activities are initiated below the depth cleared. Alternative 4 would provide the most effective overall protection of public and the environment.

7.2.1.1.9 The anticipated intrusive activities vary within OOU11. In OOU11A, OOU11B, and OOU11C, QST was not made aware of any development plans. However, that does not rule out future

intrusive activities. OOU11D is currently being used as a golf course and the vast majority of the intrusive activities that are likely to occur in this area have been completed. Wooded areas and other previously undeveloped areas within the golf course may contain significant contamination and should be the focus of any risk reduction activities in OOU11D.

7.2.1.2 Long-Term Effectiveness and Permanence

7.2.1.2.1 Alternative 1, No Further Action, implements no action at the site. Therefore, this alternative would have no impact on long-term effectiveness and permanence.

7.2.1.2.2 Alternative 2, Institutional Controls, would reduce the possibility of exposure to the contaminants and would be effective if it is maintained through periodic evaluation and reinforcement. However, liability and risk would persist because the potential contaminants would not be destroyed and would remain in place. In OOU11, the long-term effectiveness and permanence would depend on the effectiveness and permanence of the education program.

7.2.1.2.3 Alternative 3, Surface Clearance, would be an effective means of reducing exposure to members of the public who are not engaged in intrusive activities. In OOU11, this alternative would provide a relatively permanent solution to protect the public engaged in non intrusive activities, but would have no permanent effect on buried ordnance. It would provide limited protection for activities such as building or pool construction. In OOU11, there is no control over the activities of the residents and some intrusive activity should be anticipated.

7.2.1.2.4 Alternative 4, Clearance for Use, would provide an effective and permanent means of reducing the potential for exposure to OE. Implementing this alternative would be effective and permanent, unless intrusive activities are initiated below the depth cleared.

7.2.1.2.5 In OOU11 significant quantities of ORS were detected during the EE/CA sampling effort. ORS was removed from the surface and subsurface of the grids investigated. However, other areas not investigated within OOU11 may also contain potentially significant quantities of OE. The long-term effectiveness of Alternative 3 as compared with Alternative 4 would be a function of the anticipated future use of the area. Anticipated future use of OOU11A, OOU11B, and OOU11C is unknown. OOU11D is currently being used as a golf course, with no plans for use as anything other than a golf course.

7.2.1.3 Reduction of MTV

The MTV of the potential OE contamination would remain unchanged with implementation of Alternatives 1 or 2.

7.2.1.3.1 Alternative 3, Surface Clearance, would reduce the volume of contaminants within the OOU. OE discovered on the surface would be removed or destroyed under this alternative. However, any subsurface OE would remain; therefore, the MTV of the buried contaminants would remain unchanged. According to the results of the OE*Cert* analysis, the total number of annual exposures is expected to be reduced to zero within OOU11A and OOU11B. However, within OOU11C and OOU11D the number of expected annual exposures is reduced by only 1 to 2 percent (using the high density exposure estimate) (refer to Table 3-5).

7.2.1.3.2 Alternative 4, Clearance for Use, would significantly reduce the volume of the potential contaminants. According to the results of the OE*Cert* analysis, the total number of annual exposures is expected to be significantly reduced with implementation of this alterative. If OOU11 is cleared to a depth of 4 ft, no exposures are expected. If cleared to a depth of 1 ft, the expected exposures are reduced to zero within OOU11A and OOU11B and are reduced by 82 to 83 percent within OOU11C and OOU11D (using the high density exposure estimate) (refer to Table 3-5).

7.2.1.3.3 The volume of potential contaminants have probably already been reduced in OOU11D during construction of the golf course. However, the fact that one piece of ORS was discovered during the Phase II investigations indicates that further volume reduction is likely during implementation of Alternatives 3 or 4. It is anticipated that most volume reduction would be concentrated in undeveloped portions of the golf course.

7.2.1.3.4 In OOU11A, OOU11B, and OOU11C little development has occurred. OOU11A is presently forested, OOU11B is used for grazing, and OOU11C is mostly wooded. Reduction in the volume of OE is likely with implementation of Alternatives 3 or 4.

7.2.1.4 Short-Term Effect During Implementation

For Alternative 1, no action would be implemented. No risks are associated with the safety of workers during the implementation period.

7.2.1.4.1 For Alternative 2, Institutional Controls, minimal safety concerns would be associated with the potential for exposure of workers to UXO while posting signs or erecting fencing. No risk would be expected for the affected community and no adverse environmental impacts should result from this alternative.

7.2.1.4.2 For Alternative 3, Surface Clearance, safety concerns would be primarily associated with the potential for exposure by UXO specialists during surface clearance. The degree of exposure risk would vary depending on the clearing and inspection activities of different areas within the OOU. In OOU11, the potential would exist for exposure to workers to OE; however, little risk would be

expected to the affected community. However, the community could be affected by noise or restricted access during implementation.

7.2.1.4.3 Alternative 4, Clearance for Use, has the greatest potential for ordnance exposure during UXO clearance and removal activities. However, this exposure would be limited to workers who have been trained in handling and disposing of OE. There is a potential for the community to be affected (by noise or restricted access) during the implementation of this alternative.

7.2.1.5 Compliance with ARARs

For all alternatives, no chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to Alternatives 2, 3, and 4 include excavation, protection of endangered species and worker safety (Table 3-3). The location-specific ARARs potentially applicable to OOU11 would be complied with during implementation of any alternative.

7.2.2 Implementability

7.2.2.1 Technical Feasibility

Alternative 1 involves no action at the site.

7.2.2.1.1 Alternative 2, Institutional Controls, would be technically feasible. Sign posting and the education and public information portion of this alternative would be easily implemented. Fencing would also be technically feasible; however, in some areas (with heavy vegetative cover and limited access) fence construction would be difficult and, as discussed in paragraph 7.2.2.2.1, fencing of the golf course and private properties is not administratively feasible.

7.2.2.1.2 Alternative 3, Surface Clearance, would be technically feasible. EOD-trained personnel would be required during implementation of all facets of the surface removal alternative.

7.2.2.1.3 Alternative 4, Clearance for Use, would be technically feasible. EOD-trained personnel must be used during implementation of all the facets of the clearance for use alternative.

7.2.2.2 Administrative Feasibility

Alternative 1 is administratively feasible.

7.2.2.2.1 For Alternative 2, Institutional Controls, public education would be administratively feasible. However, posting of signs would be administratively very difficult. Residents would be

reluctant to accept signs that could potentially lower their property value or ability to sell their property. Restricting access or erecting fencing around the sectors of OOU11 or around the entire area would not be possible on these privately-owned properties.

7.2.2.2.2 Alternative 3, Surface Clearance, and Alternative 4, Clearance for Use, would be met with some degree of administrative difficulty due to the fact that private owners are involved and implementing these alternatives will impact the activities currently being performed within OOU11. Disruption of public access is short-lived with these alternatives; however, vegetation clearing operations, excavations, and detonation/disposal of ordnance will not be accepted without reluctance. It is unlikely that the golfers or golf course owners (OOU11D) will be receptive to any appreciable disruption of their activities.

7.2.2.3 Availability of Services and Materials

Alternative 1 requires no services or materials.

7.2.2.3.1 The services and materials required to implement Alternative 2 (Institutional Controls) are readily available. However, during installation of fencing and sign posts, EOD-trained personnel would be required to clear the area.

7.2.2.3.2 For Alternatives 3 and 4, special equipment, skills, personnel, and technology include geophysical investigation, land clearing, and EOD training.

7.2.2.3.3 For all alternatives, special skills, equipment, and personnel would be needed if buried ordnance is discovered and must be detonated or disposed of. The proper safety precautions would need to be implemented to prevent untrained personnel from handling these materials.

7.2.2.4 Local Government Acceptance

The need for local government acceptance is not anticipated for Alternative 1.

7.2.2.4.1 For Alternative 2, no state permits are anticipated.

7.2.2.4.2 For Alternatives 3 and 4, no state permits are anticipated. However, state acceptance may also be needed if endangered species or archaeologically significant items are encountered.

7.2.2.5 Community Acceptance

The community may express concerns regarding Alternative 1, due to the accessibility of OOU11 to the public (particularly at the golf course) and the evidence of OE contamination.

7.2.2.5.1 For Alternative 2, it is expected that the community would accept education. However, sign posting or restriction of access to lands by erecting fencing at OOU11 would not be acceptable.

7.2.2.5.2 Although the community should view favorably the potential risk reduction attained through implementation of these alternatives, Alternatives 3 and 4 could be received with some resistance by the immediate community, since it will temporarily restrict community activities (particularly at the golf course) and could require excessive vegetation clearance in OOU11 during implementation. The private property owners that are directly affected within OOU11 are the most likely members of the community to resist implementation.

7.2.3 Cost

Alternative 1 incurs no cost and is therefore the least expensive of the four alternatives. Alternatives 2, 3, and 4 each incur additional costs.

7.2.3.1 The total estimated cost to implement the education/information portion of Alternatives 2, 3, or 4 is $25,000 to $50,000. This encompasses all OOUs and cannot effectively be divided among the individual OOUs. To maintain the program, an estimated $2,500 to $5,000 per year is required.

7.2.3.2 The total estimated costs to implement Alternatives 2, 3, and 4 are $430,000, $275,000, and $718,000, respectively, and in addition, the Education/Information Program cost. All assumptions used in the cost estimates are stated in Appendix G.

7.2.3.3 Please note that in OOU11, the estimated cost to implement Alternative 2, Institutional Controls (including fencing), is greater than the cost to complete a surface clearance, Alternative 3. Although the cost to implement Alternative 3 usually exceeds the cost to install fencing and signage at FUDS, within OOU11 this is not the case. Reasons for this include:

- The fencing estimate is based upon constructing fencing around the perimeter of each OOU, which in OOU11 includes four individual unattached sectors. As compared with the acreage within OOU11, the perimeter around the individual sectors is proportionally larger than if the OOU was comprised of only one sector.
- Half of OOU11D will not be cleared or investigated, thus reducing the Alternative 3 cost without affecting the Alternative 2 costs.

7.3 Risk Reduction Analysis — OOU12

OOU12 includes 94 acres outside of Croft State Park where UXOs were found during the Phase II EE/CA investigation. OOU12 is subdivided into two sectors (OOU12A and OOU12B), both outside of the park on privately owned and undeveloped properties. The EE/CA sampling indicated that the entire OOU contains significant amounts of UXO and ORS. Much of the ORS is indicative of high order detonations. Practice rounds found during the investigation may also contain small charges which could create a hazard to someone finding the item and mishandling it. All fragments of ordnance items found were less than 21-inches deep in OOU12A and 4-inches at OOU12B. Most items were found less that 1 ft below grade. For additional information related to OOU11 refer to Section 3.2.5.

7.3.0.1 Due to the fact that both UXO and ORS indicative of high order detonations were found in OOU12, a high level of potential risk exists.

7.3.1 Effectiveness

7.3.1.1 Overall Protection of Public Health and the Environment

Alternative 1, No Further Action, provides no additional risk reduction. The potential contaminants remain in place and there is no risk reduction of ordnance exposure.

7.3.1.1.1 Alternative 2, Institutional Controls, would minimize the likelihood that members of the public would handle OE that they might observe within OOU12. However, the public is generally aware of the previous activities that were conducted at the former CCATF, and therefore the protection provided by implementation of this alternative is limited. Education could be accomplished by holding public meetings and presenting printed material to residents and members of the public. This education process would be most effectively implemented for the entire area rather than by OOUs.

7.3.1.1.2 Erecting security fence around all segments of the OOU would reduce the exposure potential by restricting access. However, with the sectors of OOU12 scattered throughout the area and some areas still uninvestigated or undefined as a part of any OOU, the overall effectiveness of fencing around only the sectors of OOU12 is limited. Additionally, fending of private property provides some protection to the general public, but provides no additional protection to the private property owner. Sign posting at specific areas would effectively reinforce warnings about risk of exposure to OE.

7.3.1.1.3 Although fencing will provide some overall protection of public health and the environment, it is not likely to be a viable option on private properties.

7.3.1.1.4 The protection level provided by Alternative 2 is expected to be higher than Alternative 1 because of notification of the public to the dangers of ordnance (with education programs and signage). As with Alternative 1, this alternative leaves contaminants in place and provides little increased protection to the public and the environment.

7.3.1.1.5 Alternative 3, Surface Clearance, would be effective in removing those OE items that are most likely to be encountered by the public. Surface clearance, however, would not remove all OE that could potentially be present. Subsurface OE, if present, would remain. As such, limited protection would be provided for intrusive activities that may occur within this unit.

7.3.1.1.6 Within OOU12, Alternative 3 would provide protection to the public and environment; however, there is limited control over the intrusive activities that are allowed. Therefore, the overall protection of public health and the environment would be predicated upon the amount of intrusive activities that are implemented after completion of the alternative.

7.3.1.1.7 Alternative 3 would increase the protection provided to the public and the environment (as compared to Alternatives 1 and 2) because a selective OE removal action would be implemented with this alternative.

7.3.1.1.8 Alternative 4, Clearance for Use, would reduce the risk of direct contact with OE, unless intrusive activities are initiated below the depth cleared. Alternative 4 would provide the most effective overall protection of public and the environment.

7.3.1.1.9 The anticipated intrusive activities within OOU12 are unknown. The properties are currently undeveloped and QST was not made aware of any development plans. However, that does not rule out future intrusive activities. Although a significant portion of the OE lies near the surface, implementation of Alternative 4 provides the best overall protection to public health and the environment where development is expected.

7.3.1.1.10 The high level of potential risk associated with the ordnance that was found, combined with the ready accessibility to this private property makes it particularly important to reduce the risk and to provide the best overall protection to the public health and the environment in OOU12.

7.3.1.2 Long-Term Effectiveness and Permanence

7.3.1.2.1 Alternative 1, No Further Action, implements no action at the site. Therefore, this alternative would have no impact on long-term effectiveness and permanence.

7.3.1.2.2 Alternative 2 (Institutional Controls) would reduce the possibility of exposure to the contaminants and would be effective if it is maintained through periodic evaluation and reinforcement. However, liability and risk would persist because the potential contaminants would not be destroyed and would remain in place. In OOU12, the long-term effectiveness and permanence would depend on the effectiveness and permanence of the education program.

7.3.1.2.3 Alternative 3, Surface Clearance, would be an effective means of reducing exposure to members of the public who are not engaged in intrusive activities. In OOU12, this alternative would provide a relatively permanent solution to protect the public engaged in non intrusive activities, but would have no permanent effect on buried ordnance. It would provide limited protection for activities such as building or pool construction. In OOU12, there is no control over the activities of the residents and some intrusive activity is possible.

7.3.1.2.4 Alternative 4, Clearance for Use, would provide an effective and permanent means of reducing the potential for exposure to OE. Implementing this alternative would be effective and permanent, unless intrusive activities are initiated below the depth cleared.

7.3.1.2.5 In OOU12 significant quantities of UXO and ORS was detected during the EE/CA sampling effort. UXO and ORS was removed from the surface and subsurface of the grids investigated. However, other areas not investigated within OOU12 may also contain potentially significant quantities of OE. (QST could not obtain permission for clearance prior to commencement of operations in many area within OOU12). The long-term effectiveness of Alternative 3 as compared with Alternative 4 would be a function of the anticipated future use of OOU12A and OOU12B.

7.3.1.3 Reduction of MTV

The MTV of the potential OE contamination would remain unchanged with implementation of Alternatives 1 or 2.

7.3.1.3.1 Alternative 3, Surface Clearance, would reduce the volume of contaminants within the OOU. OE discovered on the surface would be removed or destroyed under this alternative. However, any subsurface OE would remain; therefore, the MTV of the buried contaminants would remain unchanged. According to results of the OE*Cert* analysis, with implementation of this alternative, the total number of annual exposures is expected to be reduced to zero with OOU12B. However, with OOU12A, the number of expected annual exposures is reduced by only 40 percent (using the high density exposure estimate) (refer to Table 3-5).

7.3.1.3.2 Alternative 4, Clearance for Use, would significantly reduce the volume of the potential contaminants. According to results of the OE*Cert* analysis, the total number of annual exposures is

expected to be significantly reduced with implementation of this alternative. If OOU12 is cleared to a depth of 4 ft, no exposures are expected. If cleared to a depth of 1 ft, the expected exposures are reduced to zero with OOU12B and are reduced by 90 percent (from 10,473,164 exposures to 1,084,162 exposures) within OOU12A (using the high density exposure estimate) (refer to Table 3-5).

7.3.1.3.3 In OOU12 no development has occurred. Reduction in the volume of OE is likely with implementation of Alternatives 3 or 4, although a more significant reduction can be expected with implementation of Alternative 4.

7.3.1.4 Short-Term Effect During Implementation

For Alternative 1, no action would be implemented. No risks are associated with the safety of workers during the implementation period.

7.3.1.4.1 For Alternative 2, Institutional Controls, minimal safety concerns would be associated with the potential for exposure of workers to UXO while posting signs or erecting fencing. No risk would be expected for the affected community and no adverse environmental impacts should result from this alternative.

7.3.1.4.2 For Alternative 3, Surface Clearance, safety concerns would be primarily associated with the potential for exposure by UXO specialists during surface clearance. The degree of exposure risk would vary depending on the clearing and inspection activities of different areas within the OOU. In OOU12, the potential would exist for exposure to workers to OE; however, little risk would be expected to the affected community. However, the community could be affected by noise or restricted access during implementation.

7.3.1.4.3 Alternative 4, Clearance for Use, has the greatest potential for ordnance exposure during UXO clearance and removal activities. However, this exposure would be limited to workers who have been trained in handling and disposing of OE. There is a potential for the community to be affected (by noise or restricted access) during the implementation of this alternative.

7.3.1.5 Compliance with ARARs

For all alternatives, no chemical-specific ARARs are associated with OE. The action-specific ARARs potentially applicable to Alternatives 2, 3, and 4 include excavation, protection of endangered species and worker safety (Table 3-3). The location-specific ARARs potentially applicable to OOU12 would be complied with during implementation of any alternative.

7.3.2 Implementability

7.3.2.1 Technical Feasibility

Alternative 1 involves no action at the site.

7.3.2.1.1 Alternative 2, Institutional Controls, would be technically feasible and implementable. Sign posting and the education and public information portion of this alternative would be easily implemented. Fencing would also be technically feasible; however, in some areas (with heavy vegetative cover and limited access) fence construction would be difficult and, as discussed in paragraph 7.3.2.2.1, fencing of private properties and restricting access to these properties is not administratively feasible.

7.3.2.1.2 Alternative 3, Surface Clearance, would be technically feasible. EOD-trained personnel would be required during implementation of all facets of the surface removal alternative.

7.3.2.1.3 Alternative 4, Clearance for Use, would be technically feasible. EOD-trained personnel must be used during implementation of all the facets of the Clearance for Use alternative.

7.3.2.2 Administrative Feasibility

Alternative 1 is administratively feasible.

7.3.2.2.1 For Alternative 2, Institutional Controls, public education would be administratively feasible. However, posting of signs would be administratively very difficult. Property owners and neighbors would be reluctant to accept signs that could potentially lower their property value or ability to sell their property. Restricting access or erecting fencing around the sectors of OOU12 or around the entire area would not be possible on these privately-owned properties.

7.3.2.2.2 Alternative 3, Surface Clearance, and Alternative 4, Clearance for Use, would be met with some degree of administrative difficulty due to the fact that the land within OOU12 is privately owned. QST had difficulty obtaining ROEs to investigate many of the areas within OOU12 and, although disruption of public access and impact to the property is likely to be short-lived with these alternatives, implementation of these alternatives are expected to be administratively difficult. Vegetation clearing operations, excavations, and detonation/disposal of ordnance will not be accepted without reluctance.

7.3.2.3 Availability of Services and Materials

Alternative 1 requires no services or materials.

7.3.2.3.1 The services and materials required to implement Alternative 2 (Institutional Controls) are readily available. However, during installation of fencing and sign posts, EOD-trained personnel would be required to clear the area.

7.3.2.3.2 For Alternatives 3 and 4, special equipment, skills, personnel, and technology include geophysical investigation, land clearing, and EOD training.

7.3.2.3.3 For all alternatives, special skills, equipment, and personnel would be needed if buried ordnance is discovered and must be detonated or disposed of. The proper safety precautions would need to be implemented to prevent untrained personnel from handling these materials.

7.3.2.4 Local Government Acceptance

The need for local government acceptance is not anticipated for Alternative 1.

7.3.2.4.1 For Alternative 2, no state permits are anticipated.

7.3.2.4.2 For Alternatives 3 and 4, no state permits are anticipated. However, state acceptance may also be needed if endangered species or archaeologically significant items are encountered.

7.3.2.5 Community Acceptance

The community may express concerns regarding Alternative 1, due to the accessibility of OOU12 to the public and the evidence of OE contamination, including UXOs.

7.3.2.5.1 For Alternative 2, it is expected that the community would accept education. However, sign posting or restriction of access to lands by erecting fencing at OOU12 would not be acceptable.

7.3.2.5.2 Although the community should view favorably the potential risk reduction attained through implementation of these alternatives, Alternatives 3 and 4 could be received with some resistance by the property owners and community in the immediate area, since it will temporarily restrict community activities and could require excessive vegetation clearance in OOU12 during implementation. The private property owners that are directly affected within OOU12 are the most likely members of the community to resist implementation.

7.3.3 Cost

Alternative 1 incurs no cost and is therefore the least expensive of the four alternatives. Alternatives 2, 3, and 4 each incur increasing costs, beginning with Alternative 2.

7.3.3.1 The total estimated cost to implement the education/information portion of Alternatives 2, 3, or 4 is $25,000 to $50,000. This encompasses all OOUs and cannot effectively be divided among the individual OOUs. To maintain the program, an estimated $2,500 to $5,000 per year is required.

7.3.3.2 The total estimated costs to implement Alternatives 2, 3, and 4 are $296,000, $464,000, and $2,608,000, respectively, and in addition, the Education/Information Program cost. All assumptions used in the cost estimate are stated in Appendix G.

8.0 Recommended Risk Reduction Alternatives and Priority Ranking

This section recommends alternatives for each OOU based on the description and evaluation of risk reduction alternatives presented in Section 6.0, the comparative analysis of risk reduction alternatives presented in Section 7.0, and an overall knowledge of the site and conditions. Table 8-1 presents a summary of the risk reduction alternative analyses (presented in Section 7.0) and costs for OOU9, OOU10, OOU11, and OOU12. The recommended alternative is noted in the text. The recommended alternative for OOU9 is No Further Action. The recommended alternative for OOU 10 is Surface Clearance. The recommended alternative for risk reduction at OOU11 and OOU12 is Clearance for Use.

8.0.1 The cost for implementing an information/education program for one OOU is only slightly greater than the cost of implementing the program for all OOUs. In addition to the specific recommendations presented in the following sections, QST recommends the information/education program be developed for all OOUs. The estimated cost to develop and implement an information/ education program applicable to all OOUs at former CCATF is $25,000 to $50,000. The estimated annual cost to administer the program is $2,500 to $5,000.

8.0.2 The OOUs delineated in this EE/CA represent only the portions of the sites that were investigated. Further assessment by the government will be required to determine if additional areas not sampled during this EE/CA should be investigated.

8.1 Risk Reduction Analysis Results

The total expected annual exposures (TEAE) values presented in the OE*Cert* report (See Appendix F) were produced using a statistical model software created by Quantitech. The OE*Cert* results (Table 3-5) provides the TEAE after implementation (based on the high, point, and low density estimates) for several alternatives at each OOU. The OECert analysis was performed for individual sectors within each OOU and the average value was calculated for the entire OOU.

8.1.1 ESE used the values from the OE*Cert* report to calculate the Exposure Reduction for all remedial alternatives proposed at each OOU. Table 8-2 provides the calculations and resulting exposure reductions for each alternative at each OOU.

8.1.2 The no further action alternative (Alternative Number 1) provides no further exposure reduction as ordnance is not removed.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 1 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
OOU-9 SMALL ARMS AREAS				
EFFECTIVENESS				
Overall Protection of Public Health and the Environment	No additional protection.	Provides limited additional protection to public as compared to Alternative 1.	Provides some protection to public not engaged in intrusive activities. However, OE related materials have been determined to be little or no risk.	Provides most protection to public health. However, OE related materials have been determined to be little or no risk.
Long-term Effectiveness and Permanence	No impact on long-term effectiveness and permanence.	Limited additional effectiveness; liability and risk would persist; contaminants would remain	Effective for non-intrusive activities. Permanent unless intrusive activities are performed.	Effective for all activities above cleared depths. Permanent.
Reduction of MTV	Remains unchanged.	No MTV reduction.	Some volume reduction.	Significant volume reduction.
Short-Term Effect During Implementation	No risk to safety of workers.	Limited risk to workers while installing signs and fence posts, no risk to public.	Limited risk to workers. No risk to public but could be affected by noise and restricted access.	Limited risk to workers. No risk to public but could be affected by noise and restricted access.
Compliance with ARARs	None applicable.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.
IMPLEMENTABILITY				
Technical Feasibility	Feasible.	Feasible.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 2 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
Administrative Feasibility	Feasible	Fencing and permanent access restrictions not feasible.	Feasible in park. Administratively difficult on private properties. Excessive vegetation clearance would be met with reluctance.	Feasible in park. Administratively difficult on private properties. Excessive vegetation clearance would be met with reluctance.
Availability of Services and Materials	None required.	Services and materials available.	Available, special UXO skills required.	Available, special UXO skills required.
Local Government Acceptance	None required	Need for state permits not anticipated.	Acceptance needed if endangered species or archaeologically significant items are encountered.	Acceptance needed if endangered species or archaeologically significant items are encountered.
Community Acceptance	Community acceptance likely.	Community not likely to accept fencing anywhere or signs on private property. Other controls likely to be acceptable.	Some resistance expected by the public during implementation. Significant resistance anticipated by private property owners.	Some resistance expected by the public during implementation. Significant resistance by private property owners.
COST	No cost.	$ Not determined	$ Not determined	$ Not determined
OOU-10 Grenade and Mortar Areas Within Park				
EFFECTIVENESS				
Overall Protection of Public Health and the Environment	No risk reduction.	Some risk reduction. Fencing and signs would increase protectiveness, but effectiveness of fencing only OOU-10 is limited.	**Significant increased risk reduction** over Institutional Controls. Surface clearance would increase protection for visitors, hikers, and campers.	Little increased risk reduction over surface clearance since limited intrusive activities are expected in this area.
Long-term Effectiveness and Permanence	No impact on long-term effectiveness and permanence.	Effective, if public information programs are periodically repeated. The fencing component would be permanent if maintained.	Effective and relatively permanent for non-intrusive activities.	Effective and permanent for all activities.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 3 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
Reduction of MTV	Remains unchanged.	No MTV reduction.	Some volume reduction.	Significant volume reduction.
Short-Term Effects During Implementation	No risk to safety of workers.	Limited risk to workers while installing signs and fence posts. No risk to public.	Limited risk to workers. Very little risk to public, but could be affected by noise and restricted access.	Limited risk to workers. Very little risk to public, but could be affected by noise and restricted access.
Compliance with ARARs	None applicable.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.
IMPLEMENTABILITY				
Technical Feasibility	Feasible	Feasible	Feasible. Clearance of heavy brush will make implementation difficult in some areas.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.
Administrative Feasibility	Feasible.	Public education and signs are feasible. Fencing and permanent access restriction not feasible.	Feasible. Will require close coordination with Park officials. Excessive vegetation clearance likely to be met with resistance.	Feasible. Will require close coordination with Park officials. Excessive vegetation clearance likely to be met with reluctance.
Availability of Services and Materials	None required.	Available.	Available, special UXO skills required.	Available, special UXO skills required.
Local Government Acceptance	None required.	No permits anticipated. Acceptance of fencing doubtful.	No permits anticipated. State acceptance of excessive vegetation clearance questionable. Acceptance needed if endangered species or archaeologically significant items are encountered.	No permits anticipated. State acceptance of excessive vegetation clearance questionable. Acceptance needed if endangered species or archaeologically significant items encountered.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 4 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
Community Acceptance	May express concern.	Generally expected. Resistance expected from park visitors if access is restricted.	Should be viewed favorably. Some resistance by the public if access is restricted or excessive vegetation clearance is needed.	Should be viewed favorably. Some resistance by the public if excessive vegetation clearance is needed.
COST	No cost.	$ 545,000	$ 745,000	$ 3,110,000
OOU-11 Grenade and Mortar Areas Outside Park				
EFFECTIVENESS				
Overall Protection of Public Health and the Environment	No additional protection.	Limited protection. Public awareness would decrease risk. Fencing and signs in OOU-11 only has limited effectiveness.	Provides protection to public not involved in intrusive activities. Future intrusive activities are unknown.	Most effective overall protection to public health and the environment. Limited additional protection at the golf course.
Long-Term Effectiveness and Permanence	No impact on long term effectiveness and permanence.	Some effectiveness if maintained through reinforcement. Contaminants remain.	Effective for non-intrusive activities. Permanent unless intrusive activities are performed.	Effective and permanent for all activities above clearance depth.
Reduction of MTV	None.	None.	Some volume reduction.	Significant volume reduction (except at golf course).
Short-Term Effects During Implementation	No short term risk.	Limited risk while installing signs and fence posts. No risk to the public.	Limited risk to workers. Very limited risk to public, but could be affected by noise and restricted access.	Some risk to workers. Very limited risk to public, but could be affected by noise and restricted access.
Compliance with ARARs	None applicable.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 5 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
IMPLEMENTABILITY				
Technical Feasibility	Feasible.	Feasible	Feasible. Clearance of heavy brush will make implementation difficult in some areas.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.
Administrative Feasibility	Feasible.	Limited feasibility. Property is privately owned. Education feasible. Fencing not feasible. Signs would be met with reluctance.	Administratively difficult. Access permission required. Some landowners are expected to deny access.	Administratively difficult. Access permission required. Some limitations on excavation expected from landowners.
Availability of Services and Materials	None required.	Available.	Available, special UXO skills required.	Available, special UXO skills required.
Local Government Acceptance	None required.	Need for local government acceptance is not anticipated.	Need for local government acceptance is not anticipated. May be needed if endangered species or archaeologically significant items are encountered.	Need for local government acceptance is not anticipated. May be needed if endangered species or archaeologically significant items are encountered.
Community Acceptance	May express concerns.	Private property. Acceptance of sign posting and fencing not anticipated.	Community should favorably view risk reduction. Private property. Rights-of-entry difficult to obtain.	Community should favorably view risk reduction. Private property. Rights-of-entry difficult to obtain.
COST	No cost.	$ 426,000	$ 275,000	$ 718,000
OOU-12 UXO Areas Outside Park				
EFFECTIVENESS				
Overall Protection of Public Health and the Environment	No additional protection.	Limited protection. Public awareness would decrease risk. Fencing and signs in OOU-12 only has limited effectiveness.	Provides protection to public not involved in intrusive activities. Future intrusive activities are unknown.	Most effective overall protection to public health and the environment. Significant risk currently exists.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 6 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
Long-term Effectiveness and Permanence	No impact on long term effectiveness and permanence.	Some effectiveness if maintained through reinforcement. Contaminants remain.	Effective for non-intrusive activities. Permanent unless intrusive activities are performed.	Effective and permanent for all activities above clearance depth.
Reduction of MTV	None.	None.	Some volume reduction.	Significant volume reduction.
Short-Term Effects During Implementation	No short-term risk.	Limited risk while installing signs and fence posts. No risk to the public.	Limited risk to workers. Very limited risk to public, but could be affected by noise and restricted access.	Some risk to workers. Very limited risk to public, but could be affected by noise and restricted access.
Compliance with ARARs	Not applicable.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.	No chemical-specific ARARs. Action- and location-specific ARARs would be complied with.
IMPLEMENTABILITY				
Technical Feasibility	Feasible.	Feasible.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.	Feasible. Clearance of heavy brush will make implementation difficult in some areas.
Administrative Feasibility	Feasible.	Limited feasibility. Property is privately owned. Education feasible. Fencing not feasible. Signs would be met with reluctance.	Administratively difficult. Access permission required. Some landowners are expected to deny access.	Administratively difficult. Access permission required. Some landowners are expected to deny access.
Availability of Services and Materials	None required.	Available.	Available, special UXO skills required.	Available, special UXO skills required.

Table 8-1. Analysis of Risk Reduction Alternatives (Page 7 of 7)

Risk Reduction Component	Alternative 1 No Further Action	Alternative 2 Institutional Controls	Alternative 3 Surface Clearance	Alternative 4 Clearance for Use
Local Government Acceptance	None required.	Need for local government acceptance not anticipated.	Need for local government acceptance not anticipated. May be needed if endangered species or archaeologically significant item is encountered.	Need for local government acceptance not anticipated. May be needed if endangered species or archaeologically significant item is encountered.
Community Acceptance	May express concerns.	Private property. Acceptance of sign posting and fencing not expected.	Community should favorably view risk reduction. Private property. Rights-of-entry difficult to obtain.	Community should favorably view risk reduction. Private property. Rights-of-entry difficult to obtain.
COST	No cost.	$ 296,000	$ 464,000	$ 2,608,000

Note: An education/information program is applicable to all OOUs within the former Camp Croft Training Facility. The total estimated cost to develop and implement this program is $25,000 to $50,000. This cost has not been distributed among the OOUs. The estimated annual cost to administer the education/information program is $2,500 to $5,000.

The shaded area represents the recommended alternative for OOU.

Source: QST, 1997.

Table 8-2. Calculation of Exposure Reduction At Former Camp Croft - EE/CA Phase II (Page 1 of 2)

OOU Location	Remedial Activity	Total Expected Annual Exposures (Average)*	Exposure Reduction (Total Number)	Exposure Reduction Percent +
High Density Estimate				
OOU10	No Action	7180	0	0
	Surface Removal	7	7173	100
	1-Foot Removal	2	7178	100
	4-Foot Removal	0	7180	100
OOU11	No Action	6224	0	0
	Surface Removal	341	5883	95
	1-Foot Removal	7	6217	100
	4-Foot Removal	0	6224	100
OOU12	No Action	22305	0	0
	Surface Removal	86	22219	100
	1-Foot Removal	21	22284	100
	4-Foot Removal	0	22305	100
Point Density Estimate				
OOU10	No Action	1598	0	0
	Surface Removal	5	1593	100
	1-Foot Removal	1	1597	100
	4-Foot Removal	0	1598	100
OOU11	No Action	1212	0	0
	Surface Removal	124	1088	90
	1-Foot Removal	3	1209	100
	4-Foot Removal	0	1212	100
OOU12	No Action	9685	0	0
	Surface Removal	70	9615	99
	1-Foot Removal	17	9668	100
	4-Foot Removal	0	9685	100
Low Density Estimate				
OOU10	No Action	14	0	0
	Surface Removal	10	4	29

Table 8-2. Calculation of Exposure Reduction At Former Camp Croft - EE/CA Phase II (Page 2 of 2)

OOU Location	Remedial Activity	Total Expected Annual Exposures (Average)*	Exposure Reduction (Total Number)	Exposure Reduction Percent +
	1-Foot Removal	2	12	86
	4-Foot Removal	0	14	100
OOU11	No Action	0	0	0
	Surface Removal	0	0	0
	1-Foot Removal	0	0	0
	4-Foot Removal	0	0	0
OOU12	No Action	1001	0	0
	Surface Removal	53	948	95
	1-Foot Removal	13	988	99
	4-Foot Removal	0	1001	100

* Total Expected Annual Exposures (Average values from table 3-5.)
Exposure Reduction - Reduction in the number of exposures due to the implementation of a remedial activity. Calculated by subtracting the number of exposures resulting from a specific remedial activity and subtracting the number of exposures from the no action alternative value.
+ Exposure Reduction Percent - Percent exposure reduction resulting from a specific remedial action.

Source: QST, 1997.

8.1.3 For Alternative Number 2, Institutional Controls, it is difficult to quantify the risk reduction due to the fact that ordnance is not removed from the site and fencing will inhibit, but not prevent exposures. There are numerous variables including maintenance of fencing, monitoring frequency, frequency of public education, etc., that must be addressed to determine the resulting risk reduction of this alternative. A risk reduction models for estimating the effectivesness of institutional controls is not presently available. This alternative was not selected as the remedial alternative at any of the OOUs investigated during the Phase II EE/CA investigation.

8.1.4 The data obtained during the EE/CA investigation indicated no activities are known or are presently proposed below a depth of one foot at any of the sites. Therefore, the clearance depth for Clearance for Use (Alternative Number 4) was determined to be one foot.

8.1.5 Table 8-3 presents the cost and estimated exposure reduction from the OECert analysis. By reviewing the cost and estimated exposure reduction analysis, it can be ascertained that signigicant risk reduction be obtained cost effectively by implementing the "surface clearance" aleternative for OOU10, OOU11, and OOU12; and it would appear that this alternative could be the recommended alternative; however, due to the fact that OOU11 and OOU12 are on residential properties, a higher level of remedial activity, Clearance for Use, was selected. The selected remedial alternatives are highlighted in Table 8-3.

8.2 OOU3 — Expansion of 1996 EE/CA OOU3 Area

As also recommended in the Phase I EE/CA Report (ESE, 1996a), Alternative 4, Clearance for Use, is the recommended alternative for the expanded OOU3, based on the following rationale:

- OOU3 is primarily a moderately to densely populated residential development.
- ORS items were detected during the EE/CA Phase I and II investigations.
- Future construction may unearth subsurface UXO.
- Alternative 4 reduces the likelihood that members of the public would encounter OE.
- Alternative 4 is administratively feasible.
- Implementing Alternative 4 would meet the clearance to depth requirements of the various land uses.
- Alternative 4 is technically feasible.
- Only properties where the landowner provides right-of-entry will be investigated.

8.2.1 The estimated cost for implementing Alternative 4 at OOU3 is $3,013,000. This cost is due to the large number of anomalies found at the OOU during the EE/CA investigation. The cost is also greater than expected due to the use of the blast boxes for engineering controls. A 10-percent increase

Table 8-3. Cost Estimate and Risk Reduction (Yearly Exposures) of Ordance Operable Units at the Former CCATF

Location	Alternative Number and Description	Cost	Estimated Risk Reduction (Reduction in Yearly Exposures)					
			High Estimate Reduction		Point Estimate Reduction		Low Estimate Reduction	
			Reduction	Percent	Reduction	Percent	Reduction	Percent
OOU-10	1 No Action	0.00	0	0	0	0	0	0
	2 Institutional Controls	$544,000	NC	NC	NC	NC	NC	NC
	3 Surface Clearance	$745,000	7,173	100	1593	100	4	29
	4 Clearance For Use	$3,210,000	7,178	100	1597	100	12	86
OOU-11	1 No Action	0.00	0	0	0	0	0	0
	2 Institutional Controls	$275,000	NC	NC	NC	NC	NC	NC
	3 Surface Clearance	$275,000	5,883	95	1088	90	0	0
	4 Clearance For Use	$718,000	6,217	100	1209	100	0	0
OOU-12	1 No Action	0.00	0	0	0	0	0	0
	2 Institutional Controls	$296,000	NC	NC	NC	NC	NC	NC
	3 Surface Clearance	$464,000	22,219	100	9615	99	948	95
	4 Clearance For Use	$2,610,000	22,284	100	9668	100	988	99

Note: NC = Risk Reduction Values Not Calculated.

Estimated Risk Reduction (yearly exposures) values are calculated from total expected annual exposures calculated from the OE*Cert* data. These data are conservative estimates produced by Quantitech's Risk Assessment Model.
Highlighted fields indicate the chosen alternatives.

Source: QST.

to the cost of excavation is assumed based on the results of the EE/CA field investigations. A summary of assumptions is included with the cost estimate in Appendix G.

8.3 OOU9 — Small Arms Areas (A Through H)

Alternative 1, No Further Action, is the recommended alternative for OOU9. This alternative was selected based on the following rationale:

- The OE-related materials found were small arms scrap in small quantities.
- UXO items were not detected at the OOU9 during the EE/CA investigation.
- Alternative 1 would likely receive community acceptance.
- Alternative 1 is administratively feasible.
- Implementing Alternative 1 would cause no inconvenience to the community and no risk to workers.
- Alternative 1 is technically feasible.

8.3.1 There is no cost to implement Alternative 1 at OOU9 (Areas A through H).

8.4 OOU10 (A, B, C, and D)- Grenade and Mortar Areas Within Park

Alternative 3, Surface Clearance, is recommended for the OOU10 grenade and mortar areas within the park. This alternative was selected based on the following rationale:

- OOU10 is a state-owned property and intrusive activities can be controlled.
- Significant amounts of ORS were collected from OOU10 during the EE/CA investigation.
- The presence of OE is likely in the impact areas.
- Alternative 3 reduces the likelihood that members of the public would encounter OE.
- Alternative 3 is technically feasible, although clearance of heavy brush in some areas will make implementation difficult.
- Alternative 3 is administratively feasible, although it will require close coordination with park officials.
- Because OOU10 is owned by the State of South Carolina, Alternative 3 would be implementable and the ROEs would be obtainable on the entire OOU.
- Because OOU10 is an established Croft State Park, future construction will be minimal and construction can be controlled.

8.4.1 The estimated cost to implement Alternative 3 at OOU10 is **$745,000**.

8.5 OOU11 (A, B, C, and D) - Grenade and Mortar Areas Outside Park

Alternative 4, Clearance for Use, is the recommended alternative for OOU11. This alternative was selected based on the following rationale:

- Alternative 4 is the most effective alternative for overall protection to public health and the environment.
- Alternative 4 is effective and permanent for all activities above clearance depth.
- During the EE/CA field investigation, ORS items indicative of high order detonations and possible risk were discovered.
- Alternative 4 is technically feasible, although clearance of heavy brush will make implementation difficult in some areas.
- Alternative 4 would probably have local government acceptance.
- The community would favorably view the risk reduction of Alternative 4.
- Alternative 4 would reduce the likelihood that members of the public would encounter OE.
- OOU11 is privately owned and there is no control over future intrusive activities.

8.5.1 In OOU11D, no clearance is needed on the portions of the golf course that have been previously developed (e.g., greens, fairways, sand traps). This acreage is not included in these recommendations.

8.5.2 The estimated cost to implement Alternative 4 at OOU11 is **$718,000**.

8.6 OOU12 (A and B) - UXO Areas Outside Park

Alternative 4, Clearance for Use, is the recommended alternative for OOU12. This alternative was selected based on the following rationale:

- Alternative 4 offers the most effective overall protection to public health and the environment .
- UXO and ORS items indicative of high order detonations and possible risk were detected at OOU12A and OOU12B during the EE/CA investigation.
- Alternative 3 reduces the likelihood that members of the public would encounter OE.
- Alternative 4 is effective and permanent for all activities above clearance depth.
- Alternative 4 is technically feasible, although clearance of heavy brush will make implementation difficult in some areas.
- Alternative 4 would probably have local government acceptance.
- The community would favorably view the risk reduction of Alternative 4.

8.6.1 The estimated cost to implement Alternative 4 at OOU12 is **$2,608,000**.

References

Environmental Science and Engineering, Inc. (ESE). 1996a. *Engineering Evaluation/Cost Analysis Former Camp Croft Army Training Facility, Spartanburg, South Carolina*. Prepared for U.S. Army Engineering and Support Center, Huntsville, January 1996.

Environmental Science and Engineering, Inc. (ESE). 1996b. *Evaluation and Mapping, Former Camp Croft Army Training Facility, Spartanburg, South Carolina*. Prepared for U.S. Army Engineering and Support Center, Huntsville, January 1996.

Environmental Science and Engineering, Inc. (ESE). 1996c. *Former Camp Croft Final Supplemental Archive Search Report*. Prepared for U.S. Army Engineering and Support Center, Huntsville, July 1996.

Environmental Science and Engineering, Inc. (ESE). 1996d. *Former Camp Croft Final Supplemental Engineering Report*. Prepared for U.S. Army Engineering and Support Center, Huntsville, March 1996.

Environmental Science & Engineering, Inc. (ESE). 1996e. *Former Camp Croft Final Work Plan*. Prepared for U.S. Army Engineering and Support Center, Huntsville, December 1996.

U.S. Army Corps of Engineers, Huntsville Division. 1992. *Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO) Operations*, December 1992.

U.S. Environmental Protection Agency (EPA). 1993. *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*. Publication 9360.0-32, 8/93.

U.S. Environmental Protection Agency. 1990. *Superfund Removal Procedures, Action Memorandum Guidance*, EPA/540/P-90/004, 12/90.

U.S. Army Corps of Engineers (USACE), Rock Island District. 1994. *Ordnance and Explosive Waste Archives Search Report for the Former Camp Croft Army Training Facility*, April, 1994.

U.S. Occupational Health and Safety Administration (OSHA). 1994. *Hazardous Waste Operations and Emergency Response Training Regulations*. 40 CFR 1910.120, 7/94.

Code of Federal Regulations (CFR). 1993. *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*. 40 CFR 300.415, 7/93.

South Carolina Department of Parks, Recreation, and Tourism (SCDPRT). 1989. *Croft State Park Management Plan*.

Appendix A

Statement of Work

APPENDIX A
ANNEX AA
STATEMENT OF WORK
ADDITIONAL WORK FOR
ENGINEERING EVALUATION/COST ANALYSIS
FORMER CAMP CROFT
SPARTANBURG, SOUTH CAROLINA
21 October 1996

1. OBJECTIVE

Perform additional work to complete the entire former Camp Croft Engineering Evaluation/Cost Analysis (EE/CA), in accordance with the National Contingency Plan (NCP) and the special requirements of this Scope of Work (SOW). The EE/CA for the entire former Camp Croft site will be used as the basis for the selection of the corrective action in order to reduce public safety risk associated with Ordnance and Explosives (OE). The A-E shall coordinate closely with the Contracting Officer and other contractors performing the removal of OE or other investigative work on site. The removal may be performed at the same time as this additional work.

2. BACKGROUND

The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program - Formerly Used Defense Sites. OE contamination exists on property formerly owned by the Department of the Army.

2.1 General. OE is a safety hazard and constitutes an imminent endangerment to the public. These actions will be performed in substantial compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). For any actions on site, no Federal, State, or Local permits are required. The provisions of 29 CFR 1910.120 shall apply to all actions taken at this site.

2.2 This site is not a suspected Chemical Warfare Material (CWM) site. However, if the A-E encounters suspected CWM during work, the A-E shall immediately withdraw from the work area and

notify the Corps of Engineers on-site Safety Specialist or the CEHNC project manager for guidance. The Huntsville Center Safety Office will notify the Technical Escort Unit (TEU). The A-E shall, after coordination with the CEHNC Safety Specialist, move to another work site and continue work under this Scope of Work (SOW).

2.3 Site Description. Camp Croft was established as a World War II Army Infantry Replacement Training Center on 10 January 1941. The camp consisted of two general areas: a series of firing ranges; and a troop housing area with attached administrative headquarters. Camp Croft is located approximately five miles southeast of Spartanburg, South Carolina and encompassed approximately 19,045 acres. The following are areas of concern, as related to OE:

2.3.1 Training Range Impact Area. This area of present-day Croft State Park is suspected to be contaminated with OE that would have been generated during small arms ammunition and mortar training conducted by infantry troops. Ordnance waste located includes .30 caliber small arms, 60 mm and 81 mm mortars, 105 mm illumination projectiles, and 20 mm projectile evidence, hand grenades, and fuzes. There are approximately 16,929 acres that classified as the range impacts areas. There are two campgrounds located within the park area for an estimated 100 acres total. Hiking trails, roads, parking lots, and Craig Lake are also located in the impact area.

2.3.2 Gas Chambers and Gas Obstacle Course Area. The gas chambers and obstacle course were located on land east of Kohler parking lot. These structures have been removed and no chemical ordnance or other evidence of past chemical training were found. Gas chambers and obstacle course area are located on approximately 199 acres.

2.3.3 Cantonment Area. The cantonment area is presently used as Camp Croft residential area. The size of the cantonment area is approximately 167 acres. Some Camp Croft-era structures still remain at the present time.

2.3.4 Grenade Court. The Grenade court is approximately 175 acres in size. The site is being graded for construction. There are no evidence of OE located at this site.

3. TASK 1- PREPARE A WORK PLAN

The A-E shall prepare an abbreviated Work Plan to accomplish this Delivery Order for approval. The Work Plan must be approved by the Contracting Officer prior to the start of any field work.

4. TASK 2- PREPARE SUPPLEMENTAL ARCHIVE SEARCH REPORT (SASR)

The A-E shall provide a team of professionals to perform additional SASR for the former Camp Croft site. The team shall visit the site to collect additional information, interview knowledgeable local populace, and prepare the SASR for the site. The A-E shall coordinate with the CEHNC project manager to obtain local point of contacts that shall be interviewed. The A-E shall provide all logistical supports for a public meeting to be held at Spartanburg, SC. This shall include mailing the notification to all persons on the mailing list. All cost associated with this public meeting shall be paid by the A-E. The A-E shall provide a senior UXO supervisor to assist in this public meeting. The Government will conduct the public meeting. The A-E shall obtain approval from the Contracting Officer prior to performing this task.

5. TASK 3- PERFORM SITE RECONNAISSANCE OF ADDITIONAL SAMPLING AREAS

The A-E shall prepare a supplemental Safety Plan for approval prior to the start of this task. The A-E shall perform site reconnaissance of all of the proposed additional sampling areas. Conditions of the proposed sampling areas shall be recorded and photographed. The results of this task shall be included in the supplemental engineering report.

6. TASK 4- PUBLIC MEETINGS

6.1 The A-E shall attend meetings to be held at the site or CEHNC to discuss project status, progress, and plans for future activities. These meetings will involve personnel from the Government. The A-E shall provide a minimum of two professionals,

thoroughly familiar with the project, at the minimum of one meetings. The meetings should last not more than one day. The A-E shall be required to provide technical support and other support as directed by the Contracting Officer for the Public Involvement.

6.2 The A-E shall provide all logistical support for up to three public meetings to be held at the site. This shall include mailing the notification to all persons on the mailing list. All cost associated with this public meeting shall be paid by the A-E.- The A-E shall provide a senior UXO supervisor to assist in this public meeting. The Government will conduct the public meeting. The A-E shall obtain approval from the Contracting Officer prior to performing this task.

6.3 The A-E shall provide all logistical support for up to two additional public meetings to be held at the site. This shall include a pre-brief to Government personnel at the A-E's office prior to the public meeting. Logistical support shall include mailing the notification to all persons on the mailing list. All costs associated with the public meeting shall be paid by the A-E. The A-E shall provide a Senior UXO Supervisor to assist in this public meeting. The Government will conduct the public meeting. The A-E shall obtain approval from the Contracting Officer prior to performing this task.

7. TASK 5- PROJECT MANAGEMENT

The A-E shall, during the life of this Delivery Order, manage this Delivery Order in accordance with the SOW, Appendix A. All project management associated with this Delivery Order, with the exception of direct technical oversight of work described in the preceding and following tasks, shall be accounted for in this task.

8. SCHEDULE

Task	Date
Draft Work Plan	7 Apr 95
Final Work Plan	19 Apr 95
Draft SASR	21 Jul 95
Final SASR	5 Sep 95

Draft Engineering Report	3 Oct 95
Final Engineering Report	16 Oct 95
Draft Work Plan for EE/CA	15 Jul 96
Receive Government Comments	1 Aug 96
Draft Final WP for EE/CA	5 ~~1~~ Nov 96
Receive Government Comments	22 ~~10~~ Nov 96
Final Work Plan for EE/CA	9 ~~4~~ Dec 96
Pre-Draft EE/CA	25 Apr 97
Receive Government Comments	15 May 97
Draft EE/CA	29 May 97
Public Meeting	10 Jun 97
Receive Comments	3 Jul 97
Final EE/CA	24 Jul 97
Draft Action Memorandum	12 Jun 97
Receive Government Comments	3 Jul 97
Final Action Memorandum	24 Jul 97

All work and services under this delivery order shall be completed by 30 Aug 97.

8.1 Review Comments. The A-E shall review all comments received through the CEHNC Project Manager and evaluate their appropriateness based upon their merit. The A-E shall incorporate all applicable comments and provide a written response to each comment as an attachment to the next submittal.

8.2 Identification of Responsible Personnel. Each submittal shall identify the specific members and title of the subcontractor and A-E's staff which had significant input into the report. All final submittal shall be sealed by the registered Professional Engineer-In-Charge.

8.3 Correspondence. The A-E shall keep a record of phone conversation and written correspondence affecting decisions relating to the performance of this delivery order. A summary of the phone conversation and copy of written correspondence shall be submitted to the Contracting Officer with the monthly progress report.

8.4 Monthly Progress Report. The A-E shall prepare and submit monthly progress reports describing the work performed since the previous report, work currently underway and work anticipated. The report shall state whether current work is on

schedule. If the work is not on schedule, the A-E shall state what actions are taken in order to get back on schedule. The report shall be submitted to the Contracting Officer not later than the 10th day of each calendar month.

8.5 Computer Files. All final text files generated by the A-E under this delivery order shall be furnished to the Contracting Officer in WordPerfect, IBM PC compatible format. All drawings shall be on reproducible (mylar) and design file compatible with CEHNC GIS System.

8.6 Public Affairs. The A-E shall not publicly disclose any data generated or reviewed under this contract. The A-E shall refer all requests for information concerning the site condition to CEHNC Project Manager. Reports and data generated under this delivery order are the property of the Department of Defense and distribution to any other sources by the A-E, unless authorized by the Contracting Officer, is prohibited.

8.7 Addressee.	Copies
US ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ATTN: CEHNC-OE-DG (Ms. Patti Berry) 4820 University Square HUNTSVILLE, AL. 35816-1822	6
US ARMY ENGINEER DISTRICT, CHARLESTON ATTN: CESAC-EN-PR (Mr. Wayne Bogan) P.O. BOX 919 CHARLESTON, SC. 29402-0919	Draft WP, 4 Final WP, 10 Pre-Draft EE/CA, 4 Draft EE/CA, 10 Final EE/CA, 10
HEADQUARTERS, US ARMY CORPS OF ENGINEERS ATTN: CEMP-RF (Mr. James Huang) Room 2214-C 20 Massachusetts Avenue Washington, D.C. 20314-1000	1
COMMANDER 547th EXPLOSIVE ORDNANCE DETACHMENT (EODCT) Ft. GILLEM FOREST PARK, GA. 30050-5000	1

9. TASKS 6, 7, & 8 - PREPARE EE/CA FOR THE DEVELOPING AREAS, THE PARK AREAS, AND THE NON-DEVELOPING AREAS

The A-E shall prepare one EE/CA for the developing areas, the park areas, and the non-developing areas. As part of this task, the A-E shall prepare an additional WP and propose the OE sampling locations. The A-E shall supplement the existing work plan for this task order for the UXO related work. The work plan must include: UXO Operational Plan; Site-Specific Safety & Health Plan (SSHP); Equipment Plan; Environmental Protection Plan; Quality Control Plan; Work, Data, and Cost Management Plan; and Geophysical Investigation Plan. The actual OE sampling will be performed in accordance with "Task 9 - Site Characterization." The results of the sampling will be utilized for the preparation of the EE/CA. The A-E shall utilize a UXO risk assessment model provided by the Contracting Officer to perform the risk assessment. The A-E shall evaluate the risk that the site represents to human health and the environment. The risk evaluated shall be related to the site safety related OE and shall not consider chronic health effects which could result from chemical constituents of OE. The A-E shall collect the data items (for the applicable site type) to be used in the OE Cost/Risk Effectiveness Program (OE Cert). After the site investigation is complete and the baseline site risk is assessed, the A-E shall identify and analyze removal alternatives. Then, based on close consultation with the Contracting Officer, the A-E shall recommend a preferred removal alternative. The EE/CA report shall be prepared in accordance with the guidance contained in "Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA." The A-E shall obtain approval from the Contracting Officer prior to the start of this task. Schedules to complete this task will be as directed at the time this task is approved.

10. TASK 9 - SITE CHARACTERIZATION

The A-E shall characterize the sites for developing, park, and non-developing areas identified in the approved Work Plan by implementing the work described in the Work Plan and including but not necessarily limited to the following activities:

10.1 Geophysical Investigations. The A-E shall implement geophysical investigations as described in the approved Work Plan.

10.2 Intrusive Investigations. The A-E shall, utilizing qualified personnel, implement site UXO sweeps as described in the approved Work Plan in order to actually locate OE at these sites. The A-E shall identify in the Work Plan a percent of the total anomalies to be excavated for each particular site, up to a maximum number of excavations for each given site. This excavation is intended for site characterization and not complete OE removal.

10.2.1 UXO Destruction. The A-E will be responsible for the destruction of UXO encountered during site investigations and characterizations utilizing an approved UXO subcontractor and in accordance with all aspects of the project Work Plan.

10.3 Surveying. The A-E shall perform all location surveys and mapping required to establish boundaries of areas identified in the approved Work Plan and as required to support the project. During all field and intrusive activities, the survey crew shall be accompanied by a UXO Specialist who shall perform a UXO survey in each area prior to the surveyors starting work. Based on site conditions, it is possible that a UXO escort will not be required in all areas at all times after the initial site visit. However, such a decision will be made jointly by the on-site Safety Officer and CEHNC Safety Specialist who may rescind or modify it at any time. Grid corners shall be established using ~~precision surveying methods~~ a hand held Global Positioning System (GPS). Each corner of each grid area shall be located by establishing the appropriate state plane gird system to the closest 1 foot and shall be both tabulated and shown on maps of the site. Other coordinate systems and accuracy specifications are not acceptable and shall not be used. The A-E shall mark and survey the corners of the designated grids with stakes or other visible temporary markers. Individual locations

of recovered UXOs only shall be tape measured or the x and y distance estimated to obtain a horizontal accuracy of plus or minus one foot from the established grid corners. If subsurface UXOs are encountered, their depth below ground surface shall also be measured. The location of ordnance scrap, ordnance fragments, shrapnel, small arms ammunition, and metallic debris shall be recorded only on a per-grid basis and not located by coordinates. The use of Total Station, GPS, or other precision survey method to locate individual UXOs, UXO scrap, or geophysical anomalies within a grid shall not be performed. A magnetometer shall be used to survey the location for the establishment of any monuments or markers.

10.3.1 Items and data to be submitted to CEHNC as part of this task are as follows:

10.3.1.1 A tabulated list of all control points and a list of all adjusted coordinates established and/or used for this survey.

10.3.1.2 Electronic copies of all survey data, maps, or boundary controls information developed during this action. These files shall include all CADD drawings in Microstation (Version 5.0) format, all raw field notes, or any GPS triangulations in ASCII format.

11. TASK 10 - EE/CA ACTION MEMORANDUM

After the EE/CA has been approved by the Contracting Officer, the A-E shall prepare an EE/CA Action Memorandum in accordance with the EPA Guidance Document, "Superfund Removal Procedures, Action Memorandum Guidance, OSWER Dir. 9360.3-01, December 1990."

12. HEALTH AND SAFETY PLAN

12.1 Safety and Health Program. The Occupational Safety and Health Administration (OSHA) requires all employers performing on-site activities to develop and maintain an ongoing written Safety and Health Program in compliance with OSHA Standard 29 CFR 1910.120(b)/29 CFR 1926.65(b). The program, including updates, shall be made available on request.

12.2 Site Safety and Health Plan (SSHP). The SSHP required by 29 CFR 1910.120(b)/29 CFR 1926.65(b)(4), and as defined by this SOW, shall be prepared and submitted. On-site activities shall not commence until the plan has been reviewed and accepted. The SSHP shall describe the site-specific safety and health procedures, practices and equipment to be implemented and utilized in order to protect affected personnel from the potential hazards associated with the site-specific tasks to be performed. The level of detail provided in the SSHP shall be tailored to the type of work, complexity of operations to be accomplished and the hazards anticipated. The A-E shall address all elements contained in Appendix B of ER 385-1-92 in preparing the SSHP. Where the use of a specific topic is not applicable to the project, the A-E shall provide a negative declaration to establish that adequate consideration was given of the topic and give a brief justification for its omission. Information readily available in standards texts shall be repeated only to the extent necessary to meet the requirements of this SOW. The SSHP shall not duplicate general information contained in the Safety and Health Program that is not specifically related to this project.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
u	1 1

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
002808	SEE BLOCK 16C		

6. ISSUED BY CODE ae10

US ARMY ENGINEERING & SUPPORT CTR
ATTN: CEHNC-PM-AE
P O BOX 1600
HUNTSVILLE AL 35807-4301
Terry Burton M33(205) 895-1381

7. ADMINISTERED BY (If other than Item 6) CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Vendor ID: 00011597

ENVIRON SCIENCE & ENGRING INC
ATTN MR DAVID MOCCIA
PO BOX 1703
GAINESVILLE FL 32602 1703

CODE 1N480 FACILITY CODE

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO. DACA87-92-D-0018 0028

10B. DATED (SEE ITEM 13) 03/27/95

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

Mod Obligated Amount US $0.00

EFT: T

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X)	
X	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. 52.243-2 ALT III "Changes - Cost Reimbursement"
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103 (b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return Orig copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

a. This modification is issued to extend the interim and the overall completion dates at no additional cost to the Government.

b. Change to the task order is page AA-5. This page is attached hereto and made a part hereof. Arrows in the margin of the page indicate the revisions.

c. All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
DAVID M. Moccia, Assoc. Vice Pres	Lynda Bonde C01

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
David M. Moccia (Signature of person authorized to sign)	9-23-97	BY Lynda Bonde (Signature of Contracting Officer)	9/14/97

8. SCHEDULE

Draft Engineering Report	3 Oct 95
Final Engineering Report	16 Oct 95
Draft Work Plan for EE/CA	15 Jul 96
Receive Government Comments	1 Aug 96
Draft Final WP for EE/CA	5 Nov 96
Receive Government Comments	22 Nov 96
Final Work Plan for EE/CA	9 Dec 96
Pre-Draft EE/CA	25 Apr 97
Receive Government Comments	15 May 97
Draft EE/CA	19 Sep 97
Public Meeting	23 Oct 97
Receive Comments	11 Nov 97
Final EE/CA	2 Dec 97
Draft Action Memorandum	9 Dec 97
Receive Government Comments	23 Dec 97
Final Action Memorandum	31 Dec 97

All work and services under this delivery order shall be completed by 14 January 1998.

8.1 Review Comments. The A-E shall review all comments received through the CEHNC Project Manager and evaluate their appropriateness based upon their merit. The A-E shall incorporate all applicable comments and provide a written response to each comments as an attachment to the next submittal.

8.2 Identification of Responsible Personnel. Each submittal shall identify the specific members and title of the subcontractor and the A-Es staff which had significant input into the report. All final submittals shall be sealed by the registered Professional Engineer-In-Charge.

8.3 Correspondence. The A-E shall keep a record of phone conversation and written correspondence affecting decisions relating to the performance of this delivery order. A summary of the phone conversation and copy of written correspondence shall be submitted to the Contracting Officer with the monthly progress report.

8.4 Monthly Progress Report. The A-E shall prepare and submit monthly progress reports describing the work performed since the previous report, work currently underway and work anticipated. The report shall state whether current work is on

Appendix B

Location of Survey Data

USACE HUNTSVILLE DIVISION
&
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
AT
FORMER CAMP CROFT
SPARTANBURG, SOUTH CAROLINA

ELLIS ENVIRONMENTAL GROUP, LC
SURVEY & MAPPING SUMMARY

TABLE OF CONTENTS

NOTE: FOR INDIVIDUAL GRID LOCATION DATA REFERENCE TO RECORD FIELD BOOKS (3).

SECTION 1

Procedures and Equipment Summary

GPS Observations and Procedures

To initiate the field effort, a group of existing monuments was located. These monuments served as the base for establishing a network of State Plane Coordinates. SPC reference of North American 1983 with a Geodetic reference of 1980, Lambert Conformal, South Carolina US foot (USFT). A single base station occupied the existing monument for the duration of the session as a single rover occupied unknown points to establish baselines. These baselines consisted of two intervisible points placed in the proximity of designated investigation areas. The said baselines were placed strategically for future control and also to have an overhead window to allow the rover to receive signals from at least five GPS satellites from within the GPS constellation. GPS observations were recorded from January 28 through 30, 1997. At the end of each work day, the data were downloaded and differentially post processed to ensure valid data were logged.

GPS Equipment Used:

- Ashtec Super CA12 Reliance GPS receiver with Husky FS2 Controller and Ashtec Software version 1.2
- Ashtec LM 12 Base Station

Software Used:

- Ashtec Pnav differential post-processing software version 2.21

Procedure Used:

- Rapid Static

Traverse Procedures

A back sight was placed on one point of the baseline with the total station occupying the remaining control point. Field data were logged with conventional field notes and the data collector to ensure valid data. The instrument man kept a set of traverse notes as the party chief made sketches and recorded for the daily log. As an area of grids was completed, a traverse was run to the nearest monument or traverse leg to provide a ratio of precision. All loops closed were to third order or better. Road intersections were tied for proportion and reference. A high precision Suunto compass was used to acquire tangent bearings of the grid locations to be applied to the record sketches.

Traverse equipment used:

- Zeiss Elta 50 Routine total Station (calibrated prior to mobilization)
- Hewlett Packard 48GX Data Collector
- Three tripod set
- Triple and single prisms
- Ashtec tribrachs and adapters

Software used:

- TDS Easy Map Plus version 5.3

SECTION 2

S.E. OF UNIT WEIGHT = (UNDEFINED)

NUMBER OF -

OBS. EQUATIONS	106
UNKNOWNS	106
DEGREES OF FREEDOM	0
ITERATIONS	0

GROUP 1 ROT. ANGLES (sec.) AND SCALE DIFF. (ppm):

HOR. SYSTEM	0.000	0.000	0.000	0.000
STD. ERRORS	0.000	0.000	0.000	0.000
XYZ SYSTEM	0.000	0.000	0.000	

ADJUSTED POSITIONS:

		LAT.	LON.	ELEV.	STD. ERRORS (m)		
1	CC01	34 54 20.71444	81 53 2.07675	227.565	0.000	0.000	0.000
2	CC02	34 55 3.27123	81 52 15.12419	234.319	0.000	0.000	0.000
3	CC03	34 54 21.77817	81 51 43.93809	212.739	0.000	0.000	0.000
4	CC04	34 54 22.07974	81 51 44.72116	208.566	0.000	0.000	0.000
5	CC05	34 54 22.24840	81 51 45.55894	216.776	0.000	0.000	0.000
6	CC06	34 54 22.83277	81 51 47.57739	231.122	0.000	0.000	0.000
7	CC07	34 54 24.90340	81 51 41.33654	214.519	0.000	0.000	0.000
8	CC08	34 54 24.54069	81 51 41.81057	220.114	0.000	0.000	0.000
9	CC09	34 54 26.39871	81 51 40.88388	215.804	0.000	0.000	0.000
10	CC10	34 54 26.80445	81 51 40.44336	212.024	0.000	0.000	0.000
11	CC11	34 54 27.36261	81 51 34.64185	201.674	0.000	0.000	0.000
12	CC12	34 54 27.37866	81 51 35.20129	201.352	0.000	0.000	0.000
13	CC13	34 54 32.40989	81 51 43.57251	218.232	0.000	0.000	0.000
14	CC14	34 54 32.78511	81 51 43.88576	219.265	0.000	0.000	0.000
15	CC15	34 54 31.49304	81 51 41.46726	215.252	0.000	0.000	0.000
16	CC16	34 54 30.79455	81 51 42.85414	216.387	0.000	0.000	0.000
17	CC17	34 54 22.89810	81 51 42.69274	212.015	0.000	0.000	0.000
18	CC18	34 54 18.25360	81 51 42.41465	210.389	0.000	0.000	0.000
19	CC19	34 53 29.28251	81 52 16.71971	219.667	0.000	0.000	0.000
20	CC20	34 53 7.35893	81 45 56.47457	215.329	0.000	0.000	0.000
21	CC21	34 53 7.65340	81 45 57.62478	216.211	0.000	0.000	0.000
22	CC22	34 53 7.97425	81 45 59.78348	216.758	0.000	0.000	0.000
23	CC23	34 53 8.10587	81 46 1.24558	218.826	0.000	0.000	0.000
24	CC24	34 51 13.44575	81 50 35.41606	207.577	0.000	0.000	0.000
25	CC25	34 51 14.32892	81 50 34.97436	206.922	0.000	0.000	0.000
26	CC26	34 51 3.72092	81 50 53.03409	203.556	0.000	0.000	0.000
27	CC27	34 51 4.65522	81 50 53.59284	191.778	0.000	0.000	0.000
28	CC28	34 50 28.69217	81 51 25.30846	196.676	0.000	0.000	0.000
29	CC29	34 50 29.75256	81 51 25.93311	200.374	0.000	0.000	0.000
30	CC30	34 50 47.28807	81 51 29.15156	220.606	0.000	0.000	0.000
31	CC31	34 50 48.60159	81 51 28.46853	217.705	0.000	0.000	0.000
32	CC32	34 50 50.96725	81 51 19.39667	204.636	0.000	0.000	0.000
33	CC33	34 50 49.72224	81 51 20.24279	211.228	0.000	0.000	0.000
34	CC34	34 50 29.93060	81 51 38.19095	211.653	0.000	0.000	0.000
35	CC35	34 50 28.99497	81 51 36.83478	215.663	0.000	0.000	0.000

ACCURACIES (m):

		D. LAT.	D. LON.	VERT.
CC01	CC02	0.000	0.000	0.000
CC01	CC03	0.000	0.000	0.000

CC01	CC04	0287A	1938.540	-0.000	40.638	-0.000	-0.0
			316.885	-0.000	1963.918	-0.000	-0.0
			23.631	0.000	-16.951	0.000	0.0
CC01	CC05	0287A	1918.017	-0.000	45.850	0.000	0.0
			310.154	0.000	1942.645	-0.000	-0.0
			32.591	-0.000	-8.761	-0.000	-0.0
CC01	CC06	0287A	1867.496	-0.000	63.892	-0.000	-0.0
			301.456	0.000	1891.399	-0.000	-0.0
			55.569	-0.000	5.536	-0.000	-0.0
CC01	CC07	0287A	2017.243	0.000	127.603	0.000	0.0
			373.511	0.000	2049.893	0.000	0.0
			98.398	-0.000	-10.934	-0.000	-0.0
CC01	CC08	0287A	2006.885	0.000	116.433	0.000	0.0
			360.933	0.000	2037.847	0.000	0.0
			92.433	0.000	-5.348	0.000	0.0
CC01	CC09	0287A	2025.035	0.000	173.677	-0.000	-0.0
			400.200	0.000	2061.412	0.000	0.0
			136.923	-0.000	-9.646	-0.000	-0.0
CC01	CC10	0287A	2034.654	0.000	186.174	-0.000	-0.0
			411.935	0.000	2072.606	0.000	0.0
			145.014	0.000	-13.417	0.000	0.0
CC01	CC11	0287A	2177.858	-0.000	203.285	-0.000	-0.0
			450.935	0.000	2219.908	0.000	0.0
			153.197	-0.000	-23.643	-0.000	-0.0
CC01	CC12	0287A	2163.721	0.000	203.788	0.000	0.0
			449.466	0.000	2205.706	0.000	0.0
			153.418	-0.000	-23.978	-0.000	-0.0
CC01	CC13	0287A	1942.741	0.000	358.968	-0.000	-0.0
			493.512	0.000	1993.268	0.000	0.0
			290.227	-0.000	-7.308	-0.000	-0.0
CC01	CC14	0287A	1934.052	0.000	370.536	0.000	0.0
			498.098	0.000	1985.322	0.000	0.0
			300.301	0.000	-6.283	0.000	0.0
CC01	CC15	0287A	1997.591	0.000	330.679	0.000	0.0
			487.490	0.000	2046.698	0.000	0.0
			265.351	0.000	-10.236	0.000	0.0
CC01	CC16	0287A	1964.613	-0.000	309.176	-0.000	-0.0
			469.389	0.000	2011.476	0.000	0.0
			248.349	-0.000	-9.127	-0.000	-0.0
CC01	CC17	0287A	1987.875	0.000	65.826	-0.000	-0.0
			335.662	0.000	2015.427	0.000	0.0
			46.286	-0.000	-13.461	-0.000	-0.0
CC01	CC18	0287A	2006.270	0.000	-77.309	-0.000	-0.0
			256.900	-0.000	2022.400	0.000	0.0
			-72.023	0.000	-15.062	0.000	0.0

			266.471	0.000	10805.802	-0.000	-0.0
			-1861.132	-0.000	-8.552	-0.000	-0.0
CC01	CC21	0287A	10849.473	-0.000	-2254.222	0.000	0.0
			266.709	0.000	10776.591	-0.000	-0.0
			-1853.184	-0.000	-7.654	-0.000	-0.0
[redacted]01	CC22	0287A	10794.475	-0.000	-2244.353	0.000	0.0
			264.011	0.000	10721.770	-0.000	-0.0
			-1844.760	-0.000	-7.078	-0.000	-0.0
CC01	CC23	0287A	10757.640	-0.000	-2240.310	-0.000	-0.0
			259.311	0.000	10684.642	-0.000	-0.0
			-1840.250	-0.000	-4.991	-0.000	-0.0
CC01	CC24	0297A	4151.821	-0.000	-5773.435	-0.000	-0.0
			-2723.720	0.000	3720.892	-0.000	-0.0
			-4745.700	-0.000	-18.538	-0.000	-0.0
CC01	CC25	0297A	4160.645	-0.000	-5746.223	-0.000	-0.0
			-2706.198	0.000	3732.125	-0.000	-0.0
			-4723.741	-0.000	-19.166	-0.000	-0.0
CC01	CC26	0297A	3732.603	-0.000	-6072.917	-0.000	-0.0
			-2953.473	0.000	3273.191	-0.000	-0.0
			-4993.927	-0.000	-23.093	-0.000	-0.0
CC01	CC27	0297A	3714.848	-0.000	-6044.108	-0.000	-0.0
			-2929.630	-0.000	3259.018	-0.000	-0.0
			-4977.030	-0.000	-34.857	-0.000	-0.0
CC01	CC28	0297A	3007.535	-0.000	-7151.956	-0.000	-0.0
			-3674.668	0.000	2452.673	-0.000	-0.0
			-5883.759	-0.000	-31.581	-0.000	-0.0
CC01	CC29	0297A	2989.610	-0.000	-7119.273	-0.000	-0.0
			-3661.439	0.000	2436.818	0.000	0.0
			-5854.827	-0.000	-27.864	-0.000	-0.0
CC01	CC30	0297A	2867.286	0.000	-6578.856	-0.000	-0.0
			-3383.812	-0.000	2355.342	0.000	0.0
			-5399.770	-0.000	-7.182	0.000	0.0
CC01	CC31	0297A	2880.851	0.000	-6538.384	-0.000	-0.0
			-3356.101	0.000	2372.721	0.000	0.0
			-5368.208	-0.000	-10.032	-0.000	-0.0
CC01	CC32	0297A	3101.583	-0.000	-6465.600	-0.000	-0.0
			-3271.600	0.000	2603.248	-0.000	-0.0
			-5315.847	-0.000	-22.848	-0.000	-0.0
CC01	CC33	0297A	3084.176	-0.000	-6503.962	0.000	0.0
			-3301.703	0.000	2581.726	-0.000	-0.0
			-5343.567	-0.000	-16.308	-0.000	-0.0
CC01	CC34	0297A	2682.177	-0.000	-7113.614	-0.000	-0.0
			-3711.603	0.000	2125.373	-0.000	-0.0
			-5843.880	-0.000	-16.842	-0.000	-0.0
[redacted]C01	CC35	0297A	2719.085	-0.000	-7142.473	-0.000	-0.0
			-3726.290	-0.000	2159.809	-0.000	-0.0

= 6378137.000 1/f = 298.2572235 W Longitude positive WEST

PRELIMINARY COORDINATES:

			LAT.		LON.	ELEV.	G.H.	CONSTR.
1		CC01	34 54 20.71390	81 53	2.07300	227.465	-31.921	
2	FFF	CC02	34 55 3.27123	81 52	15.12419	234.319	-31.948	
3		CC03	34 54 21.77762	81 51	43.93436	212.639	-31.926	
4		CC04	34 54 22.07921	81 51	44.71742	208.467	-31.926	
5		CC05	34 54 22.24786	81 51	45.55520	216.675	-31.926	
6		CC06	34 54 22.83223	81 51	47.57366	231.022	-31.927	
7		CC07	34 54 24.90286	81 51	41.33280	214.419	-31.928	
8		CC08	34 54 24.54016	81 51	41.80683	220.014	-31.928	
9		CC09	34 54 26.39819	81 51	40.88014	215.703	-31.929	
10		CC10	34 54 26.80391	81 51	40.43962	211.923	-31.929	
11		CC11	34 54 27.36207	81 51	34.63811	201.573	-31.930	
12		CC12	34 54 27.37812	81 51	35.19753	201.251	-31.930	
13		CC13	34 54 32.40935	81 51	43.56876	218.132	-31.932	
14		CC14	34 54 32.78456	81 51	43.88199	219.164	-31.932	
15		CC15	34 54 31.49250	81 51	41.46351	215.151	-31.932	
16		CC16	34 54 30.79401	81 51	42.85039	216.287	-31.931	
17		CC17	34 54 22.89756	81 51	42.68900	211.914	-31.927	
18		CC18	34 54 18.25308	81 51	42.41088	210.289	-31.924	
19		CC19	34 53 29.28198	81 52	16.71595	219.565	-31.894	
20		CC20	34 53 7.35840	81 45	56.47083	215.229	-31.898	
21		CC21	34 53 7.65286	81 45	57.62101	216.110	-31.898	
22		CC22	34 53 7.97371	81 45	59.77974	216.658	-31.898	
23		CC23	34 53 8.10532	81 46	1.24183	218.726	-31.898	
24		CC24	34 51 13.44522	81 50	35.41233	207.477	-31.817	
25		CC25	34 51 14.32838	81 50	34.97060	206.822	-31.818	
26		CC26	34 51 3.72038	81 50	53.03032	203.455	-31.810	
27		CC27	34 51 4.65459	81 50	53.58909	191.675	-31.811	
28		CC28	34 50 28.69164	81 51	25.30472	196.576	-31.787	
29		CC29	34 50 29.75202	81 51	25.92937	200.272	-31.787	
30		CC30	34 50 47.28752	81 51	29.14780	220.506	-31.798	
31		CC31	34 50 48.60106	81 51	28.46476	217.604	-31.799	
32		CC32	34 50 50.96671	81 51	19.39294	204.535	-31.801	
33		CC33	34 50 49.72172	81 51	20.23906	211.128	-31.800	
34		CC34	34 50 29.93006	81 51	38.18722	211.552	-31.787	
35		CC35	34 50 28.99443	81 51	36.83104	215.563	-31.786	

GROUP 1, NO. OF VECTORS AND BIAS CONSTRAINTS:

34 0.000 -0.001 0.000 0.001 0.000 0.001 0.000 0.001

VECTORS:

		DX	DY	DZ	LENGTH	ERROR CODES		
CC01	CC02	1074.701	906.000	1079.316	1772.214	3 51.0	51.0	2
CC01	CC03	1959.457	311.047	18.397	1984.077	3 51.0	51.0	2
CC01	CC04	1938.540	316.885	23.631	1964.411	3 51.0	51.0	2
CC01	CC05	1918.017	310.154	32.591	1943.205	3 51.0	51.0	2
CC01	CC06	1867.496	301.456	55.569	1892.486	3 51.0	51.0	2
CC01	CC07	2017.243	373.511	98.398	2053.889	3 51.0	51.0	2
CC01	CC08	2006.885	360.933	92.433	2041.177	3 51.0	51.0	2
CC01	CC09	2025.035	400.200	136.923	2068.737	3 51.0	51.0	2
CC01	CC10	2034.654	411.935	145.014	2080.994	3 51.0	51.0	2
CC01	CC11	2177.858	450.935	153.197	2229.322	3 51.0	51.0	2
CC01	CC12	2163.721	449.466	153.418	2215.230	3 51.0	51.0	2

CC01	CC19	1267.265	-728.618	-1304.458	1959.198	3	51.0	51.0	2
C01	CC20	10879.020	266.471	-1861.132	11040.285	3	51.0	51.0	2
CC01	CC21	10849.473	266.709	-1853.184	11009.836	3	51.0	51.0	2
CC01	CC22	10794.475	264.011	-1844.760	10954.156	3	51.0	51.0	2
CC01	CC23	10757.640	259.311	-1840.250	10916.986	3	51.0	51.0	2
CC01	CC24	4151.821	-2723.720	-4745.700	6868.620	3	51.0	51.0	2
CC01	CC25	4160.645	-2706.198	-4723.741	6851.876	3	51.0	51.0	2
[redacted]01	CC26	3732.603	-2953.473	-4993.927	6898.886	3	51.0	51.0	2
[redacted]01	CC27	3714.848	-2929.630	-4977.030	6866.852	3	51.0	51.0	2
CC01	CC28	3007.535	-3674.668	-5883.759	7560.891	3	51.0	51.0	2
CC01	CC29	2989.610	-3661.439	-5854.827	7524.819	3	51.0	51.0	2
CC01	CC30	2867.286	-3383.812	-5399.770	6987.777	3	51.0	51.0	2
CC01	CC31	2880.851	-3356.101	-5368.208	6955.600	3	51.0	51.0	2
CC01	CC32	3101.583	-3271.600	-5315.847	6970.037	3	51.0	51.0	2
CC01	CC33	3084.176	-3301.703	-5343.567	6997.649	3	51.0	51.0	2
CC01	CC34	2682.177	-3711.603	-5843.880	7424.352	3	51.0	51.0	2
CC01	CC35	2719.085	-3726.290	-5865.253	7461.893	3	51.0	51.0	2

SHIFTS:

1	0.017	-0.095	0.100
2	0.000	0.000	0.000
3	0.017	-0.095	0.100
4	0.016	-0.095	0.099
5	0.017	-0.095	0.101
6	0.017	-0.095	0.100
7	0.017	-0.095	0.100
8	0.016	-0.095	0.100
9	0.016	-0.095	0.101
10	0.017	-0.095	0.101
11	0.017	-0.095	0.101
12	0.017	-0.095	0.101
13	0.017	-0.095	0.100
14	0.017	-0.096	0.101
15	0.017	-0.095	0.101
16	0.017	-0.095	0.100
17	0.017	-0.095	0.101
18	0.016	-0.096	0.100
19	0.016	-0.095	0.102
20	0.016	-0.095	0.100
21	0.017	-0.096	0.101
22	0.017	-0.095	0.100
23	0.017	-0.095	0.100
24	0.016	-0.095	0.100
25	0.017	-0.096	0.100
26	0.017	-0.096	0.101
27	0.020	-0.095	0.103
28	0.016	-0.095	0.100
29	0.017	-0.095	0.102
30	0.017	-0.095	0.100
31	0.016	-0.096	0.101
32	0.017	-0.095	0.101
33	0.016	-0.095	0.100
34	0.017	-0.095	0.101
35	0.017	-0.095	0.100

ADJUSTED VECTORS, GROUP 1:

			DX,DY,DZ	V	DN,DE,DU	v	v'
CC01	CC02	0287A	1074.701	0.000	1310.567	-0.000	-0.0
[redacted]			906.000	0.000	1192.935	0.000	0.0

ELLIPSOID:	GRS80	Geodetic Ref. Sys. 1980
SEMI-MAJOR AXIS:		6378137.000
VERSE FLATTENING:		298.2572221
PROJECTION:	LC83	Lambert Conformal
ZONE:	SC__USF 3900	South Carolina US Foot
UNITS:	USFT	USFT

POINT	NORTHING	EASTING	HEIGHT	SITE
00001	1119046.388	1734956.785	746.603	CC01
00002	1123315.794	1738903.688	768.762	CC02
00003	1119098.953	1741465.798	697.961	CC03
00004	1119129.987	1741400.831	684.270	CC04
00005	1119147.621	1741331.196	711.206	CC05
00006	1119208.106	1741163.575	758.273	CC06
00007	1119413.115	1741685.113	703.801	CC07
00008	1119376.773	1741645.326	722.157	CC08
00009	1119563.980	1741724.074	708.017	CC09
00010	1119604.696	1741761.106	695.616	CC10
00011	1119657.104	1742244.770	661.659	CC11
00012	1119659.114	1742198.189	660.602	CC12
00013	1120173.593	1741505.214	715.983	CC13
00014	1120211.747	1741479.441	719.372	CC14
00015	1120079.435	1741679.779	706.206	CC15
00016	1120009.779	1741563.682	709.930	CC16
00017	1119211.316	1741570.466	695.586	CC17
00018	1118741.552	1741589.712	690.251	CC18
00019	1113817.539	1738696.290	719.165	CC19
00020	1111347.039	1770350.085	706.459	CC20
00021	1111377.520	1770254.481	709.352	CC21
00022	1111411.293	1770074.881	711.147	CC22
00023	1111425.503	1769953.173	717.932	CC23
00024	1100011.228	1747017.592	681.026	CC24
00025	1100100.216	1747055.132	678.877	CC25
00026	1099040.065	1745541.230	667.833	CC26
00027	1099134.904	1745495.438	629.192	CC27
00028	1095520.873	1742822.020	645.261	CC28
00029	1095628.509	1742770.843	657.394	CC29
00030	1097403.561	1742517.298	723.772	CC30
00031	1097535.884	1742575.330	714.254	CC31
00032	1097768.783	1743333.422	671.377	CC32
00033	1097643.497	1743261.859	693.004	CC33
00034	1095655.000	1741749.275	694.398	CC34
00035	1095559.468	1741861.528	707.554	CC35
00036	1116280.911	1743027.298	749.864	CC36
00037	1115644.159	1741817.233	735.465	CC37
00038	1114433.769	1739417.061	684.815	CC38
00039	1113834.911	1738683.245	714.461	CC39
00040	1113436.792	1737291.399	726.304	CC40

SECTION 3

FILE: CROFT.CR5
COORDINATE LIST

C:\TDS\TDS_DAT\CROFT.CR5

Point #	Northing	Easting	Elevation	Note
1,	1119046.3880,	1734956.7850,	746.6030,	CC01=cc13
2,	1123315.7940,	1738903.6880,	768.7620,	CC02=cc01
3,	1119098.9530,	1741465.7980,	697.9610,	CC03
4,	1119129.9870,	1741400.8310,	684.2700,	CC04
5,	1119147.6210,	1741331.1960,	711.2060,	CC05
6,	1119208.1060,	1741163.5750,	758.2730,	CC06
7,	1119413.1150,	1741685.1130,	703.8010,	CC07
8,	1119376.7730,	1741645.3260,	722.1570,	CC08
9,	1119563.9800,	1741724.0740,	708.0170,	CC09
10,	1119604.6960,	1741761.1060,	695.6160,	CC10
11,	1119657.1040,	1742244.7700,	661.6590,	CC11
12,	1119659.1140,	1742198.1890,	660.6020,	CC12
13,	1120173.5930,	1741505.2140,	715.9830,	CC13
14,	1120211.7470,	1741479.4410,	719.3720,	CC14
15,	1120079.4350,	1741679.7790,	706.2060,	CC15
16,	1120009.7790,	1741563.6820,	709.9300,	CC16
17,	1119211.3160,	1741570.4660,	695.5860,	CC17
18,	1118741.5520,	1741589.7120,	690.2510,	CC18
19,	1113817.7270,	1738695.5240,	719.3600,	19-CC14
20,	1111347.0390,	1770350.0850,	706.4590,	CC20
21,	1111377.5200,	1770254.4810,	709.3520,	CC21
22,	1111411.2930,	1770074.8810,	711.1470,	CC22
23,	1111425.5030,	1769953.1730,	717.9320,	CC23
24,	1100011.2280,	1747017.5920,	681.0260,	CC24
25,	1100100.2160,	1747055.1320,	678.8770,	CC25
26,	1099040.0650,	1745541.2300,	667.8330,	CC26
27,	1099134.9040,	1745495.4380,	629.1920,	CC27
28,	1095520.8730,	1742822.0200,	645.2610,	CC28
29,	1095628.5090,	1742770.8430,	657.3940,	CC29
30,	1097403.5610,	1742517.2980,	723.7720,	CC30
31,	1097535.8840,	1742575.3300,	714.2540,	CC31
32,	1097768.7830,	1743333.4220,	671.3770,	CC32
33,	1097643.4970,	1743261.8590,	693.0040,	CC33
34,	1095655.0000,	1741749.2750,	694.3980,	CC34
35,	1095559.4680,	1741861.5280,	707.5540,	CC35
36,	1116280.9110,	1743027.2980,	749.8640,	CC36
37,	1115644.1590,	1741817.2330,	735.4650,	CC37
38,	1114433.7690,	1739417.0610,	684.8150,	CC38
39,	1113834.9110,	1738683.2450,	714.4610,	CC39
40,	1113436.7920,	1737291.3990,	726.3040,	CC40
41,	1098930.8332,	1747290.7890,	628.5880,	NAIL SET
42,	1098975.0010,	1747995.2890,	618.6870,	NAIL SET
43,	1097251.8230,	1748003.4340,	674.9040,	NAIL SET
44,	1112146.4800,	1737134.9970,	685.7890,	NAIL SET
45,	1111507.5950,	1767526.0350,	733.2040,	NAIL SET
46,	1110338.3570,	1770133.4990,	689.8120,	NAIL SET
47,	1110950.8910,	1770287.9720,	694.9000,	HAIL SET
48,	1099781.2940,	1766594.4580,	665.4780,	NAIL SET

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49,	1099140.6910,	1766941.6530,	658.9360,NAIL SET
50,	1121577.4180,	1748250.4780,	766.2580,NAIL SET
51,	1122020.4290,	1747785.0960,	759.3130,NAIL SET
52,	1115137.6360,	1742037.6621,	738.2418,NAIL SET
53,	1115130.9893,	1741976.6203,	736.9586,SE COR GRID 64-2
54,	1115121.6794,	1741877.5732,	729.8650,SW COR GRID 64-2
55,	1115125.6977,	1741977.4023,	737.1293,NAIL SET
56,	1115095.8204,	1742072.5242,	736.8333,NW COR GRID 64-1
57,	1115077.3261,	1742220.9799,	737.2921,NAIL SET
58,	1115115.5602,	1742275.4004,	737.9225,SW GRID 38b-1
59,	1115149.1345,	1742369.4558,	735.7648,SE GRID 38-1
60,	1114955.2944,	1742386.2669,	729.8831,NAIL SET
61,	1114680.8978,	1742328.3332,	728.7546,NAIL SET
62,	1114502.2454,	1742317.3510,	721.9480,NAIL SET
63,	1114342.0217,	1742235.4157,	719.2258,NAIL SET RD FORK
64,	1114064.6993,	1742260.1544,	711.3879,NAIL SET
65,	1114014.6359,	1741936.9843,	709.1728,NAIL SET
66,	1113906.3859,	1741702.0712,	710.4770,NAIL SET
67,	1114125.9701,	1741761.3684,	698.8971,NAIL SET
68,	1114221.4563,	1741651.9626,	681.2814,NE GRID A37-A1
69,	1114243.8400,	1741555.2284,	676.1660,NW GRID A37-A1
70,	1113780.4199,	1741566.3855,	713.6234,NAIL SET
71,	1113598.1242,	1741466.3475,	706.3165,NAIL SET
72,	1113558.7315,	1741363.8544,	702.2743,GRID A37-A2
73,	1102596.9320,	1764943.1894,	660.0581,NAIL SET
74,	1102627.2007,	1765074.9977,	669.6665,SW GRID 46-1
75,	1110430.4207,	1769698.0760,	675.4802,NE GRID A18-1
76,	1110330.5867,	1769700.5304,	675.1629,SE GRID A18-1
77,	1112201.1298,	1767804.9656,	754.6827,NAIL SET
78,	1112901.0933,	1767815.6514,	768.2770,NAIL SET
79,	1114552.5805,	1768748.2075,	789.6562,NAIL SET
80,	1115404.5603,	1770086.1009,	818.3038,NAIL SET
81,	1115288.4753,	1769835.6151,	814.1031,NAIL SET
82,	1115666.0370,	1769664.8058,	811.1598,CORNER 18-3
83,	1115715.0544,	1769656.9146,	811.5806,CORNER 18-3
84,	1115534.3434,	1770004.6036,	819.5744,CORNER 18-2
85,	1115573.8574,	1769973.9850,	818.7911,TP CORNER 18-2
86,	1115737.1392,	1770040.7840,	813.5210,CORNER 18-1
87,	1115784.5993,	1770024.2811,	813.0021,CORNER 18-1
88,	1115974.1622,	1770694.3688,	832.4253,NAIL-HARDEES
89,	1116666.0952,	1770901.9720,	832.1101,NAIL SET RR TRK
90,	1117599.5309,	1769481.1566,	823.7445,NAIL SET
91,	1117930.1248,	1769410.7839,	828.8166,CORNER GRID 16-1
92,	1117994.2743,	1769386.5463,	829.6489,CORNER GRID 16-1
93,	1101577.5318,	1766396.2284,	634.8829,NAIL SET
94,	1100322.1416,	1764655.1379,	609.6461,NAIL SET
95,	1100536.9292,	1764628.9769,	626.1581,CORN A14-2
96,	1100424.8864,	1764540.5490,	612.6274,CORN A14-2
97,	1100179.5050,	1764370.9695,	610.3013,NAIL SET
98,	1100210.4875,	1764175.1094,	611.9116,NAIL SET
99,	1100396.9327,	1764022.2192,	572.8952,CORN A14-1
100,	1100407.7790,	1763921.3228,	568.4733,CORN A14-1

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101,	1100319.7485,	1763903.4102,	562.7455,CORN A14-1
102,	1115132.9568,	1740806.7986,	677.1595,NAIL SET
103,	1115289.9907,	1740449.3279,	665.7041,NAIL SET
104,	1115601.6867,	1740027.7562,	641.5779,NAIL SET
105,	1115590.1987,	1739388.1412,	611.5184,NE CORNER 27-1
106,	1116042.3495,	1739530.3618,	646.6522,CORNER 27-3
107,	1115513.1253,	1739162.7380,	632.2399,TIE 27-2
108,	1115873.0897,	1742272.4151,	741.0355,NAIL SET
109,	1115686.3438,	1742345.9023,	747.8341,NW CORNER A37-b1
110,	1116091.5835,	1743065.8593,	749.4518,SW CORNER 38a-1
111,	1116187.2670,	1743099.7644,	747.1741,NW CORNER 38a-1
112,	1116114.0743,	1742688.7556,	746.3324,NAIL SET
113,	1116584.9836,	1742468.7662,	840.1123,NAIL SET
114,	1116914.4295,	1742070.9502,	798.0752,NAIL SET
115,	1117172.1738,	1742085.3364,	776.5178,NW CORNER SITE 9
116,	1117206.8384,	1742190.9021,	787.1150,NAIL SET
117,	1117231.4745,	1742166.4518,	783.7635,NE CORNER 9
118,	1117349.5918,	1742288.1510,	768.7613,NE CORNER 9
119,	1117278.6489,	1742217.6462,	773.9649,NW CORNER 9
120,	1117214.7622,	1742293.1093,	787.5871,SW CORNER 9
121,	1116491.1366,	1742732.8479,	739.3929,NAIL SET
122,	1116650.9979,	1742788.5921,	746.6944,NW 65-1
123,	1116612.2449,	1742882.1315,	747.7112,SW 65-1
124,	1116582.1528,	1743476.1140,	750.8991,NAIL SET
125,	1115462.7322,	1744033.3501,	703.4690,NAIL SET
126,	1115266.0538,	1744151.2530,	675.1326,NAIL SET
127,	1115160.5593,	1744360.2455,	681.9785,NW 5-1
128,	1115672.4697,	1741527.4982,	733.8772,A37C-1 LOCATION
129,	1120843.6493,	1748969.2371,	767.6025,NAIL SET
130,	1119965.9183,	1750742.9964,	761.8457,NAIL SET
131,	1119191.6899,	1752742.3432,	761.3260,NAIL SET
132,	1117852.4804,	1753564.2954,	752.2985,NAIL SET
133,	1117623.4514,	1753175.2384,	723.5542,SE OF 71-1
134,	1117722.7113,	1753161.4118,	724.9786,NE OF 71-1
135,	1117603.1895,	1753062.1855,	718.2705,NAIL SET
136,	1117495.0056,	1753200.3452,	711.8257,NAIL SET
137,	1117241.4045,	1753387.2092,	685.4965,NW OF 71-4
138,	1117340.5387,	1753095.4666,	691.1535,NW OF 71-2
139,	1117227.9759,	1752894.0295,	683.1721,NE OF 71-3
140,	1114257.4227,	1737110.3272,	726.2633,NAIL SET
141,	1114840.8809,	1736839.9090,	722.0387,NAIL SET
142,	1115073.3968,	1736956.3874,	735.4718,NAIL SET SE 40-1
143,	1115231.2723,	1736775.1906,	729.0679,NAIL SET SW A3-2
144,	1115424.3869,	1736800.8199,	736.7172,NAIL SET
145,	1115519.3419,	1736937.6127,	732.3365,NAIL SET SW 39-2
146,	1115683.0095,	1736931.4766,	719.4985,NAIL SET
147,	1115430.5567,	1737062.2760,	739.9818,NW 8b-1
148,	1115778.0224,	1736845.2616,	724.6297,SE OF 39-1
149,	1115912.3377,	1736780.9483,	729.9302,NAIL SET
150,	1116053.4041,	1736793.8177,	735.6092,NAIL SET
151,	1116051.9261,	1737030.0589,	722.5044,NAIL SET
152,	1116095.3260,	1737383.4595,	697.4071,NAIL SET

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153,	1116145.6819,	1737533.4749,	691.5701,NW OF A3-1
154,	1115864.7485,	1742186.8102,	741.1619,NAIL SET
155,	1116028.2826,	1741505.4041,	739.9898,NAIL SET
156,	1116082.7071,	1741300.6367,	721.9653,SW OF A37c-1
157,	1115271.2813,	1736491.3449,	728.0401,NAIL SET
158,	1116449.9509,	1735767.4075,	728.3084,NAIL SET
159,	1116464.4703,	1736276.2078,	712.3369,SW OF 50-1
160,	1116476.6966,	1736374.6147,	710.3579,SE OF 50-1
161,	1114126.5735,	1737188.1137,	734.1966,NW OF 26-1
162,	1114134.2801,	1737235.1038,	735.7193,NE OF 26-1
163,	1114322.1670,	1737349.7519,	729.3116,NAIL SET
164,	1114850.9992,	1740213.9123,	630.2385,NAIL SET
165,	1114160.1926,	1740519.8486,	588.0902,NAIL SET C/L CRK
166,	1114007.7493,	1740576.6666,	588.4767,NAIL SET
167,	1113705.2364,	1740340.9506,	588.3559,NAIL SET
168,	1113230.7733,	1740273.3502,	585.3585,NW OF 24-1
169,	1113251.6708,	1740274.4082,	585.1554,NAIL SET
170,	1113170.1836,	1740561.8898,	612.8823,NE OF 24-2
171,	1116582.2147,	1744142.8282,	761.0817,NAIL SET
172,	1117229.7314,	1745221.0789,	749.0080,SW OF 67-1
173,	1117298.8805,	1745236.6866,	750.4303,NE OF 67-1
174,	1115904.5413,	1744260.8105,	729.7122,NAIL SET
175,	1115635.3985,	1744179.9998,	702.3581,NW OF 37-1
176,	1115305.5646,	1745167.9572,	752.9851,NAIL SET
177,	1113166.0399,	1745492.7501,	770.5064,MON. SPA 181
178,	1112350.4745,	1745638.5956,	758.1139,NAIL SET
179,	1112344.7431,	1745268.0350,	744.3625,NAIL SET
180,	1112257.7989,	1745295.0504,	740.1729,SW OF A32-1
181,	1112175.5790,	1745350.1159,	739.5712,NW OF A32-1
182,	1112175.3609,	1744988.8713,	726.4004,NAIL SET
183,	1112060.9236,	1744980.5038,	713.0058,SW OF A32-2
184,	1112039.6083,	1745025.8570,	714.1972,NW OF A32-2
185,	1112079.0851,	1744852.8051,	708.2111,NAIL SET
186,	1112085.3864,	1744637.1418,	694.0592,NAIL SET
187,	1112256.8970,	1744638.1188,	713.8198,NE OF 36-1
188,	1116822.6432,	1735496.9356,	732.2824,NAIL SET
189,	1118367.1001,	1735069.3495,	766.7061,NAIL SET
190,	1119036.7607,	1734933.9184,	747.8541,NAIL SET
191,	1119600.5451,	1736292.8802,	699.7612,NAIL SET
192,	1119046.0428,	1734955.6729,	746.8318,MON. CROFT-13
193,	1120531.7265,	1737961.6064,	697.9546,NAIL SET
194,	1121039.4432,	1738138.9242,	694.6433,NAIL SET
195,	1121034.8608,	1737908.1131,	673.7184,SW OF 30-1
196,	1121247.6516,	1738043.0129,	674.6325,SE OF 30-2
197,	1118040.7280,	1754802.0673,	780.3153,NAIL SET
198,	1117714.9789,	1755795.0881,	807.6311,NAIL SET
199,	1116532.0445,	1755735.9030,	852.6142,NAIL SET
200,	1115882.3059,	1755315.6739,	851.4700,NAIL SET
201,	1115103.0768,	1754709.4771,	840.4131,NAIL SET
202,	1112746.5399,	1753892.8601,	820.5224,NAIL SET
203,	1111765.7085,	1753543.2998,	799.3676,NAIL SET
204,	1111569.4029,	1753558.2838,	790.8913,NAIL SET

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205,	1111206.5682,	1753762.1485,	759.8214,NAIL SET
206,	1110627.5456,	1753726.2229,	763.2247,NAIL SET
207,	1110197.4286,	1753629.7709,	786.8403,NAIL SET
208,	1109695.2385,	1753463.4947,	787.5071,NAIL SET
209,	1109349.5346,	1753412.0578,	790.9894,SE OF 78-1
210,	1109449.1007,	1753403.0167,	789.1107,NE OF 78-1
211,	1109612.1640,	1753348.1779,	786.8250,SE OF 78-2
212,	1109710.9399,	1753338.5547,	786.1548,NE OF 78-2
213,	1109352.0308,	1753423.1748,	789.8611,NAIL SET
214,	1108456.4148,	1753504.0415,	796.5098,NAIL SET
215,	1107734.6805,	1753388.7925,	795.3227,NAIL SET
216,	1107619.8985,	1753300.2064,	792.0500,NE OF 41a-2
217,	1107718.5424,	1753291.7292,	789.5488,NE OF 85-1
218,	1114595.9224,	1745936.0545,	763.1252,NAIL SET
219,	1114517.2365,	1745713.5095,	756.2913,SW OF 68-1
220,	1114521.4476,	1745763.5520,	757.0107,NW OF 68-1
221,	1114598.8665,	1745593.9418,	756.1744,SE OF 68-2
222,	1114604.6223,	1745643.6420,	755.9472,NE OF 68-2
223,	1114584.4590,	1745908.7748,	758.1004,MON. SPA 180
224,	1122687.7341,	1747186.1608,	746.0096,NAIL SET
225,	1122595.2062,	1746753.1603,	731.6221,SE OF A33-1
226,	1122645.1971,	1746747.8202,	732.7572,NE OF A33-1
227,	1116419.9986,	1744935.1146,	734.4107,NAIL SET
228,	1115592.6529,	1745632.1756,	664.3980,NE OF 67-2
229,	1115578.8507,	1745533.5575,	664.2108,NW OF 67-2
230,	1113488.1583,	1738639.9997,	719.1964,NAIL SET
231,	1112920.8876,	1738150.7182,	706.4654,NAIL SET
232,	1112678.0189,	1737800.2537,	696.7582,NAIL SET
233,	1112429.4073,	1737657.5648,	700.8859,NAIL SET
234,	1111817.0470,	1737742.4848,	705.6666,NAIL SET
235,	1111327.2880,	1738037.1750,	694.5115,NAIL SET
236,	1110990.9568,	1738490.4714,	691.5697,NAIL SET
237,	1110435.4725,	1738905.5767,	706.4823,NAIL SET
238,	1109898.6669,	1739048.9193,	718.4845,NAIL SET
239,	1109657.0327,	1739369.3615,	725.7234,NAIL SET
240,	1109369.1889,	1740006.2706,	728.6545,NAIL SET
241,	1109606.1739,	1740810.5718,	718.1457,NAIL SET
242,	1109426.5612,	1741126.8109,	722.4481,NAIL SET
243,	1108545.2276,	1741309.9183,	703.0031,NAIL SET
244,	1108095.3031,	1741356.8055,	778.1727,NAIL SET
245,	1108049.8977,	1741326.6122,	775.0353,NE OF 41a-1
246,	1107971.9225,	1741264.8850,	766.3002,NW OF 41a-1
247,	1107842.5465,	1741359.7072,	754.5568,SE OF 41a-2
248,	1120901.4977,	1737989.8472,	690.1869,SE OF 30-3
249,	1121088.0808,	1738119.5896,	689.0011,SE OF 30-4
250,	1112205.6656,	1744645.4763,	712.2754,NAIL SET
251,	1112300.5459,	1744644.2136,	712.5170,NAIL SET
252,	1112367.8100,	1744585.0744,	721.6651,NE OF 36-2
253,	1114314.6987,	1768657.0472,	774.3353,NAIL SET
254,	1113961.2927,	1768308.1404,	757.6076,NE OF A21-1
255,	1113920.4560,	1768279.5370,	756.3869,SE OF A21-1
256,	1113944.4388,	1768870.8680,	762.8176,SE OF A21-2

257,	1113984.9477,	1768841.3626,	759.9972,NE OF A21-2
258,	1098050.6214,	1761585.6283,	593.5281,NAIL SET
259,	1098214.6576,	1761299.6880,	587.5022,NAIL SET
260,	1098488.2881,	1761281.3739,	592.8078,NAIL SET
261,	1098708.7818,	1760944.8704,	569.1412,SE OF A12-1
262,	1098799.7918,	1760904.5713,	568.5050,NE OF A12-1
263,	1098668.0621,	1760713.5109,	552.5203,NE OF A12-2
264,	1098714.5274,	1760624.5366,	547.0882,NW OF A12-2
265,	1112485.3239,	1744457.6019,	726.7434,NAIL SET
266,	1112822.9085,	1744368.1543,	728.2334,NAIL SET
267,	1112980.6889,	1744269.9977,	722.9798,NAIL SET
268,	1113409.7373,	1744668.2680,	742.3288,NAIL SET
269,	1113369.1176,	1744943.9911,	762.4012,TP AT SE OF 56-1
270,	1113320.7389,	1745091.2319,	759.3502,SE OF 56-2
271,	1116182.2215,	1737475.3404,	693.8164,NAIL SET
272,	1116371.1006,	1737568.9074,	681.8830,NAIL SET
273,	1116492.3754,	1737752.3375,	663.5359,NAIL SET
274,	1116625.9955,	1737855.2599,	652.2882,NAIL SET
275,	1116800.1591,	1738064.7939,	638.2473,NAIL SET
276,	1116837.8367,	1738161.2875,	632.2366,NW OF A3-3
277,	1116957.2519,	1737818.0504,	645.4953,NAIL SET
278,	1117000.4356,	1737699.7444,	657.7207,SE OF A3-4
279,	1113943.5962,	1768352.9651,	759.4922,NAIL SET
280,	1112592.1278,	1769296.4578,	748.5845,NAIL SET
281,	1112269.2883,	1770161.8667,	800.2255,NAIL SET
282,	1112566.6895,	1770171.9254,	784.9703,SE OF A20-2
283,	1112174.9278,	1770767.4434,	792.0240,NAIL SET
284,	1113291.6021,	1770901.4149,	812.5281,NAIL SET
285,	1113275.8799,	1770865.2354,	810.5010,SE OF A20-1
286,	1109500.3375,	1740399.7671,	717.8938,NAIL SET
287,	1109759.1207,	1740650.3160,	727.4134,NAIL SET
288,	1109708.8696,	1741102.7567,	728.8258,NAIL SET
289,	1109746.7205,	1741322.7524,	718.0709,NAIL SET
290,	1110105.2255,	1741681.6944,	711.0731,NAIL SET
291,	1110144.6935,	1742018.0294,	695.2347,NAIL SET
292,	1110142.9652,	1742350.9909,	664.6476,NAIL SET
293,	1110366.7292,	1742452.5414,	643.5992,NAIL SET
294,	1110328.5558,	1742680.6521,	598.0777,NAIL SET
295,	1110015.4185,	1742655.1741,	605.4664,NAIL SET
296,	1109694.0621,	1742974.0763,	577.5887,NAIL SET
297,	1109850.5812,	1743273.1009,	607.2243,NAIL SET
298,	1110146.4922,	1743545.2464,	713.8722,NAIL SET
299,	1110180.8018,	1743739.6092,	723.5107,NAIL SET
300,	1109849.4334,	1743963.2004,	744.3634,NAIL SET
301,	1109957.7490,	1744586.5080,	799.0950,NAIL SET
302,	1110166.0982,	1744735.9322,	797.3733,NAIL SET
303,	1110436.1641,	1744795.7503,	788.1502,NAIL SET
304,	1110518.2014,	1745345.3241,	797.1487,NAIL SET
305,	1110146.7999,	1745652.6329,	789.7864,NAIL SET
306,	1109716.4896,	1745743.2686,	786.0234,NAIL SET
307,	1109567.1098,	1746137.9795,	782.9849,NAIL SET
308,	1109300.1808,	1746383.9577,	803.2346,NAIL SET

309,	1109551.3855,	1746278.2186,	794.8479,SW OF A39-1
310,	1109491.8502,	1747001.3995,	802.2160,SE OF A39-2
311,	1113362.5529,	1754128.3196,	822.6805,NAIL SET
312,	1113599.8602,	1754210.4959,	822.5530,NAIL SET
313,	1113896.8922,	1754314.6916,	822.7500,NAIL SET
314,	1113450.5219,	1754086.4551,	821.5705,NE OF 86-2
315,	1113615.9152,	1753985.7142,	813.3541,SE OF 86-1
316,	1113929.0263,	1754247.8796,	822.2126,SE OF 86-3
317,	1109346.5557,	1746726.9623,	793.9443,NAIL SET
318,	1109183.4314,	1746745.9240,	796.3967,MON. CROFT-15
319,	1109174.0660,	1746738.6949,	710.8429,CALL COORDS CC15
320,	1112816.4913,	1754024.2601,	818.7044,NW OF 43-1
321,	1112300.6048,	1753725.5738,	813.0274,NAIL SET
322,	1112435.1383,	1753809.7270,	817.4893,NW OF 44-1
323,	1112187.4309,	1753735.6182,	814.1737,SW OF 44-2
324,	1120043.4053,	1738066.3293,	681.2107,NAIL SET
325,	1120363.6609,	1738775.4837,	735.8609,NAIL SET
326,	1119644.5882,	1738331.9708,	688.6913,NAIL SET
327,	1119878.5257,	1738771.1750,	697.9372,NAIL SET
328,	1119938.4763,	1738827.1346,	698.6620,SE OF 90-1
329,	1120788.2735,	1739257.5384,	773.0893,NAIL SET
330,	1120837.0757,	1739370.4120,	778.4289,NW OF 92-1
331,	1120993.6382,	1739005.5881,	755.5747,SE OF 91-1
332,	1111932.7231,	1744595.7396,	697.3477,NAIL SET
333,	1111600.5996,	1744634.9918,	715.3932,NAIL AT SW A31-1
334,	1111682.2983,	1744585.2205,	712.9106,NW COR. A31-2
335,	1111401.2874,	1744694.9358,	724.0927,NAIL SET
336,	1111439.5743,	1744430.6404,	735.6021,SW COR. 74-2
337,	1111522.9125,	1744493.0526,	727.0765,NAIL SET
338,	1111454.2295,	1744834.2373,	739.1069,SW OF 74-3
339,	1111635.3388,	1744413.2374,	732.8024,NAIL SET
340,	1111484.8669,	1744278.3451,	743.7051,NAIL SET
341,	1111400.7334,	1744160.3702,	746.9377,NAIL SET
342,	1111143.8952,	1744088.0956,	758.3822,NW OF 74-1
343,	1111487.5901,	1744512.8220,	725.7236,NAIL SET
344,	1111288.7012,	1744700.9750,	730.4821,NAIL SET
345,	1111249.8195,	1744635.6316,	731.6048,SW OF 74-4
346,	1116929.1386,	1738188.3794,	624.6019,NAIL SET
347,	1116800.7922,	1738340.3532,	631.3697,NAIL SET
348,	1116678.1908,	1738473.9013,	617.2448,NAIL SET
349,	1111226.5595,	1770433.7852,	697.7461,SE OF 88-2
350,	1109298.9619,	1746943.7642,	799.3836,NW OF A39-2
351,	1107639.4765,	1742168.8282,	752.5185,NAIL SET
352,	1107338.5112,	1742268.7319,	763.6063,NAIL SET
353,	1106982.1517,	1742241.0470,	767.3135,NAIL SET
354,	1106741.1167,	1742536.7251,	759.1827,NAIL SET
355,	1106579.7205,	1743180.6946,	750.2393,NAIL SET
356,	1106273.4951,	1743442.5514,	754.1039,NAIL SET
357,	1105964.6057,	1743795.8517,	748.1277,NAIL SET
358,	1106176.3201,	1744082.0606,	746.2100,NAIL SET
359,	1106312.5665,	1744245.4552,	737.6130,NAIL SET
360,	1106749.1683,	1744473.5358,	703.3999,NAIL SET

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361,	1107041.9275,	1744634.0237,	693.8614,NAIL SET
362,	1107227.4409,	1744774.4002,	684.1630,SW OF 19-1
363,	1118390.5962,	1738805.1515,	668.7636,NAIL SET
364,	1117912.2635,	1739153.9914,	696.3701,NAIL SET
365,	1118048.7656,	1739327.0926,	715.4360,NW OF 89-1
366,	1118001.4115,	1739253.5381,	706.8872,NAIL SET
367,	1118041.9130,	1739504.0293,	710.4872,NAIL SET
368,	1118000.4855,	1739578.0030,	705.9513,NAIL SET
369,	1117928.1840,	1739608.3853,	692.2707,NW OF 89-2
370,	1116437.5645,	1738428.6090,	638.6163,NAIL SET
371,	1116195.9742,	1738528.8705,	610.8753,NW OF A2-1
372,	1107205.3415,	1753378.8306,	802.8964,NAIL SET
373,	1106491.0716,	1753348.0912,	785.3879,NAIL SET
374,	1106504.8366,	1753165.2155,	776.2428,NAIL SET
375,	1106435.0885,	1752913.7766,	741.7052,NAIL SET
376,	1106515.2081,	1752687.8787,	709.8150,NAIL SET
377,	1106459.4741,	1752288.6941,	641.7744,NAIL SET
378,	1106247.9030,	1751936.4014,	597.5764,NAIL SET
379,	1106199.6952,	1751631.2990,	583.4925,NAIL SET
380,	1106102.4412,	1751252.3950,	646.8178,NAIL SET
381,	1106183.8332,	1751095.1525,	681.5224,NAIL SET
382,	1106327.7497,	1750915.0440,	672.4754,SW OF 45-1
383,	1122482.1884,	1746927.5966,	738.1015,NW OF A33-2
384,	1116073.9321,	1770265.4320,	826.9047,NAIL SET
385,	1117383.0953,	1766879.1901,	812.6837,NAIL SET
386,	1115965.1064,	1770687.1265,	831.1038,SCGS MON. 42 292
387,	1117570.2894,	1766291.9322,	822.5253,NAIL SET
388,	1118364.5016,	1764345.3334,	838.0823,SE OF 15-1
389,	1109610.6984,	1770174.7484,	670.2334,NAIL SET
390,	1108365.9145,	1769909.7212,	730.1735,NAIL SET
391,	1107356.3413,	1769856.2238,	691.4407,NAIL SET
392,	1107424.4012,	1769141.3962,	688.7071,NAIL SET
393,	1107540.7044,	1768922.1100,	702.2637,NAIL SET
394,	1107813.1513,	1768648.9087,	720.7034,NAIL SET
395,	1107781.7861,	1768496.4294,	726.3698,NE OF A16-1
396,	1107679.3961,	1768713.2968,	723.4893,NE OF A16-2
397,	1118912.1964,	1752791.1417,	754.1419,NAIL SET
398,	1118091.8631,	1752111.9914,	761.6693,NAIL SET
399,	1118327.0576,	1752014.6259,	763.3497,NAIL SET
400,	1118494.4525,	1752101.5253,	760.3885,NE OF A29-1
401,	1118276.5203,	1751979.7476,	762.1289,SE OF A29-2
402,	1119467.0052,	1738348.1620,	679.2103,NAIL SET
403,	1119413.4227,	1738222.0138,	657.2537,NE OF 80-1
404,	1112001.1477,	1745756.5438,	763.7481,NE OF A32-1
405,	1112094.3694,	1745866.9218,	767.1500,NE OF A32-2
406,	1111905.2232,	1745732.4812,	759.3197,NAIL SET
407,	1111700.8037,	1745636.8872,	762.7411,SW OF A32-3
408,	1111480.3884,	1745805.3539,	749.1576,NE OF A32-4
409,	1113631.8394,	1771074.0658,	813.2575,NAIL SET
410,	1114547.2308,	1771708.5936,	809.6076,NAIL SET
411,	1114572.8841,	1772037.6831,	822.7012,SW OF 17-1
412,	1123688.5757,	1745763.4468,	764.2970,NAIL SET

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413, 1124681.0897, 1743970.9852, 793.3630,MON. CROFT 2
414, 1123143.1053, 1745415.4182, 770.6036,NAIL SET
415, 1122517.7952, 1745158.3173, 742.4221,NAIL SET
416, 1122527.4568, 1744682.3472, 756.1111,NAIL SET
417, 1122978.3638, 1743984.5825, 706.5330,NAIL SET
418, 1122379.1678, 1743777.1367, 713.2793,NAIL SET
419, 1122300.1254, 1743264.1468, 703.8403,NAIL SET
420, 1122297.9171, 1742773.6714, 712.0238,SE OF 29-1
421, 1124192.0449, 1743422.4074, 795.0936,NAIL SET
422, 1123993.0288, 1742787.1162, 785.1249,NAIL SET
423, 1123546.2124, 1742158.9564, 793.0390,NAIL SET
424, 1122248.0806, 1740444.9146, 768.8182,NAIL SET
425, 1123161.6044, 1739094.3250, 747.8473,NAIL SET
426, 1123331.3080, 1738905.9994, 768.6298,MON. CROFT-1
427, 1108089.4009, 1741357.3983, 687.2707,427-TP 244
428, 1120487.3436, 1749521.6369, 762.2837,MON. CROFT 3
429, 1117383.0630, 1745185.1097, 752.4025,MON. SPA 179
430, 1116474.1518, 1743280.8408, 749.8853,MON. SCGS 42 045
431, 1115904.5300, 1744260.8125, 728.4187,TP 431-TP 174
432, 1115462.6355, 1744033.2196, 702.0717,TP 432-TP 125
433, 1113374.2132, 1737254.2750, 721.8447,HWY.56-D.R.RD.
434, 1118977.1607, 1734906.5893, 748.8014,HWY.56-C.C.C.RD.
435, 1115970.2795, 1770607.4832, 831.9332,HWY.9-CHURCH ST.
436, 1115446.4855, 1772003.7278, 835.5362,HWY.9-HWY.150
437, 1116738.3790, 1770907.6367, 832.1314,CHURCH ST-MAIN
438, 1110398.2060, 1770174.1616, 690.5490,HWY.176-HWY.150
439, 1111593.0919, 1767539.3928, 677.7272,HWY.176-DEERWOOD
440, 1111699.5248, 1767538.1696, 731.8239,MON. CROFT 5
441, 1124335.1222, 1744604.2316, 782.3694,HWY.295-E.CROFT
442, 1124743.3388, 1743934.5239, 793.6890,TIE.PT-295-W.CR.
443, 1123658.7483, 1745743.6293, 763.6743,HWY.295-PATCH RD
444, 1121544.5519, 1748227.1053, 765.7641,295-DAIRY RIDGE
445, 1121544.3765, 1748246.5338, 765.7655,SCGS MON.42 281
446, 1117746.9769, 1755812.5008, 807.1683,295-JOHNSON LK.
447, 1117566.1985, 1756551.4300, 827.3756,295-WHITESTONE
448, 1119051.0292, 1752883.7497, 761.2546,295-HENNINGSTON
500, 1115625.5262, 1744227.3605, 729.7122,NW OF 37-1
501, 1117607.4623, 1745419.3832, 761.0817,NAIL SET
502, 1119200.4331, 1746884.1358, 761.0817,NAIL SET
503, 1119899.4963, 1747328.8017, 761.0817,NAIL SET
504, 1119652.8971, 1747605.4547, 761.0817,NAIL SET
505, 1119735.1837, 1747644.4177, 761.0817,SW A32-1
506, 1119832.9780, 1747659.5347, 761.0817,NW A32-1
507, 1119588.6262, 1747925.5980, 761.0817,NAIL SET
508, 1119667.2012, 1748009.2157, 761.0817,SW A32-2
509, 1119713.5895, 1747990.2582, 761.0817,NW A32-2
510, 1119567.3980, 1748090.9227, 761.0817,NAIL SET
511, 1119416.7856, 1748245.4094, 761.0817,NAIL SET
512, 1119291.1965, 1748128.6016, 761.0817,NE 36-1
513, 1120236.5154, 1747478.4429, 761.0817,NE A32-5
514, 1120242.6858, 1747334.0778, 761.0817,NE A32-6
515, 1120290.7998, 1747561.0659, 761.0817,NAIL SET

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516,	1120376.5820,	1747769.8232,	761.0817,SW A32-3
517,	1120652.9478,	1747795.0409,	761.0817,NE A32-4
518,	1119332.9474,	1748156.8683,	761.0817,NAIL SET
519,	1119262.2500,	1748093.5768,	761.0817,NAIL SET
520,	1119172.2414,	1748091.5710,	761.0817,NE 36-2
521,	1118999.3828,	1748105.8704,	761.0817,NAIL SET
522,	1118690.3367,	1747943.2144,	761.0817,NAIL SET
523,	1118507.6816,	1747908.6593,	761.0817,NAIL SET
524,	1118461.4028,	1747324.7634,	761.0817,NAIL SET
525,	1118678.4905,	1747148.8400,	761.0817,SE 56-1
526,	1118813.7904,	1747073.1855,	761.0817,SE 56-2
527,	1119501.1590,	1748379.2493,	761.0817,NAIL SET
528,	1119772.6074,	1748575.4462,	761.0817,SW A31-1
529,	1119678.7517,	1748556.7791,	761.0817,NW A31-2
530,	1119752.7619,	1748835.6555,	761.0817,SW 74-2
531,	1119733.6169,	1748732.9313,	761.0817,NAIL SET
532,	1120015.2819,	1748528.1454,	761.0817,SW 74-3
533,	1119596.7111,	1748715.5714,	761.0817,NAIL SET
534,	1119616.2008,	1748917.0158,	761.0817,NAIL SET
535,	1119598.2748,	1749060.8440,	761.0817,NAIL SET
536,	1119738.5484,	1749288.1039,	761.0817,NW 74-1
537,	1119773.1069,	1748743.1975,	761.0817,NAIL SET
538,	1120046.9083,	1748739.3156,	761.0817,NAIL SET
539,	1120031.2990,	1748813.7434,	761.0817,SW 74-4
540,	1118375.6616,	1746128.9874,	761.0817,NAIL SET
541,	1118153.0306,	1746207.7270,	761.0817,SW 68-1
542,	1118203.0747,	1746203.5176,	761.0817,NW 68-1
543,	1118033.4780,	1746126.0744,	761.0817,SE 68-2
544,	1118083.1602,	1746120.3120,	761.0817,NE 68-2

FILE: SITE2AQ.CR5
COORDINATE LIST

C:\TDS\TDS_DAT\SITE2AQ.CR5

Point #	Northing	Easting	Elevation	Note
1,	1092779.3041,	1752533.8497,	718.1205,	MONUMENT CC-9
2,	1092229.6676,	1750864.5215,	0.0000,	NAIL SET
3,	1091185.9802,	1747624.7738,	41.2562,	NAIL SET
4,	1091143.0326,	1747099.5232,	30.2681,	MONUMENT CC-10
5,	1091485.5793,	1747081.4329,	28.4305,	NAIL SET
6,	1092256.7923,	1746974.2544,	-11.7321,	NAIL SET
7,	1092639.9461,	1746565.5705,	-20.4781,	NAIL SET
8,	1092866.8898,	1746310.0250,	-37.3181,	NAIL SET
9,	1092508.9490,	1745948.4493,	-41.5361,	NAIL SET
10,	1092302.9354,	1745765.5382,	-53.1564,	FOUND NAIL
11,	1092311.2556,	1745637.1366,	-66.6456,	SE OF 2-1
12,	1093875.4975,	1744056.1400,	5.6027,	NAIL SET
13,	1094832.0728,	1744818.7926,	4.9207,	NAIL SET
14,	1095049.8506,	1745126.0142,	6.4908,	NAIL SET
15,	1095120.0966,	1745146.5822,	5.6568,	SE OF A8-1
16,	1095170.7170,	1745142.3751,	6.2306,	NE OF A8-1
17,	1095366.7593,	1745489.5141,	-11.6958,	NAIL SET
18,	1095480.9572,	1745630.9877,	-22.2145,	SW OF A8-2
19,	1095281.1194,	1745499.9885,	-8.0294,	NW OF A8-3
20,	1092821.6947,	1752200.4643,	700.3842,	VOID
21,	1092764.8027,	1752231.2736,	699.5929,	NAIL SET
22,	1092811.0548,	1752147.0610,	701.4049,	SE OF A9-1
23,	1093219.1626,	1751962.6164,	700.8092,	NAIL SET
24,	1093260.2709,	1751915.3623,	695.7445,	SE OF A9-2
25,	1092615.6265,	1752187.8538,	703.8530,	SW OF A9-3
26,	1092390.4968,	1751072.6456,	-8.7186,	NAIL SET
27,	1093137.2361,	1751027.3801,	-8.5322,	NAIL SET
28,	1094310.4777,	1751558.5028,	2.5044,	NAIL SET
29,	1094781.7154,	1751534.4752,	8.1980,	NAIL SET
30,	1092779.3041,	1752533.8497,	718.1205,	MONUMENT CC-9
31,	1091143.1245,	1747099.7651,	722.4564,	MONUMENT CC-10
32,	1095410.4318,	1751536.8436,	-4.0293,	NAIL SET
33,	1096025.8479,	1751706.9418,	9.6388,	NAIL SET
34,	1096372.9909,	1751759.6179,	3.8042,	NAIL SET
35,	1096929.9214,	1752130.1361,	-17.6334,	NAIL SET
36,	1097234.9313,	1752263.5361,	-8.1272,	SW OF A10-1
37,	1097816.9205,	1752127.9731,	-37.0418,	NAIL SET
38,	1097434.6486,	1752291.0544,	-10.1035,	SW OF A10-2
39,	1097776.4330,	1752389.1129,	-21.7840,	NE OF A10-3
40,	1097787.8234,	1752550.1999,	-5.1321,	SW OF A10-4
41,	1093345.9896,	1746737.2500,	-0.0394,	SW OF A8-4
42,	1093639.4765,	1746380.5889,	-30.8006,	NE OF A8-5
43,	1094548.0717,	1744412.8010,	-30.9752,	NAIL SET
44,	1095140.6025,	1743669.8638,	-68.1753,	NAIL SET
45,	1095436.1380,	1743556.2325,	-43.0177,	NAIL SET
46,	1095734.2272,	1743352.1202,	-12.9000,	NAIL SET
47,	1096185.0125,	1743384.2176,	-0.7016,	NAIL SET
48,	1096464.3073,	1742938.8494,	18.2052,	NAIL SET

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49,	1097047.1574,	1742582.5989,	50.9433,NAIL SET
50,	1097029.1390,	1741941.2050,	56.2474,NAIL SET
51,	1096956.9872,	1741538.2749,	68.8025,NAIL SET
52,	1096941.5455,	1741257.7600,	56.7034,MON. CROFT 11
53,	1095367.4514,	1745779.0472,	-28.9951,NAIL SET
54,	1095863.0844,	1746699.6125,	-26.4993,NAIL SET
55,	1095982.2094,	1747155.7800,	-43.4236,NAIL SET
56,	1096045.2928,	1747689.7002,	-43.8634,NAIL SET
57,	1096182.7988,	1747838.7821,	-42.8087,NAIL SET
58,	1096821.5252,	1747992.4445,	-77.0746,NAIL SET
59,	1098338.7308,	1748014.6012,	-75.8537,NAIL SET
60,	1098973.4514,	1747997.4631,	-55.5465,TP 60-CC43
61,	1098929.7914,	1747293.0443,	-45.3009,TP 61-CC42
62,	1098295.5152,	1752127.8733,	-54.4755,NAIL SET
63,	1099167.3646,	1751925.3084,	-88.4140,NAIL SET
64,	1099209.1848,	1751838.1444,	-94.1849,MQN. CROFT 20
65,	1090877.4953,	1747127.3581,	39.7368,NAIL SET
66,	1090570.3674,	1747111.7743,	45.5687,NAIL SET
67,	1090129.4411,	1747051.4903,	34.5201,NAIL SET
68,	1090133.8421,	1747072.5861,	34.3247,FLEMING-S.C. RD.
69,	1089056.2855,	1746124.3317,	41.8745,NAIL SET
70,	1088460.2371,	1745919.5256,	28.2728,NAIL SET
71,	1087808.4057,	1745902.1500,	25.5721,NAIL SET
72,	1086442.1694,	1746333.6728,	50.4064,NAIL SET
73,	1086416.6893,	1746309.6961,	51.0417,SCGS MON 42 255
74,	1086364.3976,	1746356.9102,	50.8232,S.C. RD.- 215
75,	1091350.3843,	1750847.6512,	-13.8488,CL S.C. RD.
76,	1092036.7151,	1751027.2794,	-13.1914,S.C. RD-F.M.CIR.

FILE: SITEA5AA.CR5
COORDINATE LIST

C:\TDS\TDS_DAT\SITEA5AA.CR5

Point #	Northing	Easting	Elevation	Note
1,	1096941.1119,	1741258.2113,	734.4910,	MONUMENT CC11
2,	1097024.0608,	1740843.7412,	730.6900,	NAIL SET
3,	1097103.2706,	1739047.9191,	773.4040,	NAIL SET
4,	1096620.4861,	1736486.2514,	812.6910,	NAIL SET
5,	1097944.7698,	1735839.6556,	820.3675,	NAIL SET
6,	1098786.6444,	1735368.0330,	796.5984,	NAIL SET
7,	1099450.2409,	1736690.4334,	808.1819,	NAIL SET
8,	1101836.8696,	1737085.0855,	761.8393,	NAIL SET
9,	1102787.1176,	1738214.0078,	716.6997,	NAIL SET
10,	1102950.9465,	1738497.9965,	696.7666,	NAIL SET
11,	1103072.0457,	1738984.4222,	677.6699,	NAIL SET
12,	1102953.5451,	1738847.4243,	681.1644,	MONUMENT CROFT15
13,	1103155.6842,	1739374.9954,	673.6903,	POINT ON CONC.
14,	1103405.8566,	1739681.0609,	666.8766,	NAIL SET
15,	1103777.1389,	1739688.6167,	663.1587,	NAIL SET
16,	1103786.5227,	1739632.3769,	667.0735,	SE OF A5-6
17,	1104155.7916,	1739828.6053,	662.2454,	NAIL SET
18,	1104569.0687,	1739788.4209,	683.1292,	NAIL SET
19,	1104637.3972,	1739602.4091,	680.5969,	SE OF A5-3
20,	1102792.3857,	1739042.3634,	668.5789,	NW OF A5-4
22,	1103395.0236,	1738690.4789,	699.9796,	NAIL SET
23,	1103657.2232,	1738702.4898,	688.6730,	NAIL SET
24,	1103680.1208,	1738729.4080,	688.6880,	SE OF A5-5
25,	1103872.0587,	1738766.9230,	681.5987,	NAIL SET
26,	1103906.6860,	1738893.2034,	671.1757,	SW OF A5-2
27,	1103385.9973,	1738479.3504,	695.6437,	SE OF A5-1

SECTION 4

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JB,NMCROFT,DT2-2-1997,TM21:13:25.95
MO,AD0,UN0,SF1.0000000,EC0,EO0.0
OC,OP37,N 1115644.1590,E 1741817.2330,EL735.465,--CC37
BK,OP37,BP38,BS243.1419,BC0.0000
LS,HI5.000,HR5.000
TR,OP37,FP51,AR242.25500,CE-1.662,HD38.752,--NAIL SET
OC,OP51,N 1115621.5624,E 1741848.7154,EL733.803,--NAIL SET
BK,OP51,BP38,BS243.5757,BC0.0000
OC,OP37,N 1115644.1590,E 1741817.2330,EL735.465,--CC37
BK,OP37,BP38,BS243.1419,BC0.0000
TR,OP37,FP51,AR242.25550,CE-5.455,HD127.141,--NAIL SET
OC,OP51,N 1115570.0202,E 1741920.5204,EL730.010,--NAIL SET
BK,OP51,BP37,BS305.4014,BC0.0000
TR,OP51,FP52,AR219.10150,CE8.232,HD447.971,--NAIL SET
OC,OP52,N 1115137.6360,E 1742037.6621,EL738.242,--NAIL SET
BK,OP52,BP51,BS344.5029,BC0.0000
SS,OP52,FP53,AR278.56400,CE-1.283,HD61.403,--NAIL SET
SS,OP52,FP54,AR279.28000,CE-8.377,HD160.882,--SW COR GRID64-2
SS,OP52,FP55,AR273.57100,CE-1.112,HD61.431,--NE COR GRID64-1
SS,OP52,FP56,AR155.20250,CE-1.408,HD54.442,--SE COR GRID64-1
TR,OP52,FP57,AR123.22100,CE-0.950,HD192.984,--NAIL SET
OC,OP57,N 1115077.3261,E 1742220.9799,EL737.292,--NAIL SET
BK,OP57,BP52,BS288.1239,BC0.0000
SS,OP57,FP58,AR126.41550,CE0.630,HD66.509,--SW GRID 38B-1
SS,OP57,FP59,AR135.58450,CE-1.527,HD164.929,--SE GRID 38-1
TR,OP57,FP60,AR198.13400,CE-7.409,HD205.454,--NAIL SET
SP,PN53,N 1115130.9893,E 1741976.6203,EL736.9586,--SE COR GRID 64-2
OC,OP60,N 1114955.2944,E 1742386.2669,EL729.883,--NAIL SET
BK,OP60,BP57,BS306.2619,BC0.0000
TR,OP60,FP61,AR245.29000,CE-1.129,HD280.446,--NAIL SET
OC,OP61,N 1114680.8978,E 1742328.3332,EL728.755,--NAIL SET
BK,OP61,BP60,BS11.5519,BC0.0000
TR,OP61,FP62,AR171.35450,CE-6.807,HD178.990,--NAIL SET
OC,OP62,N 1114502.2454,E 1742317.3510,EL721.948,--NAIL SET
BK,OP62,BP61,BS3.3104,BC0.0000
TR,OP62,FP63,AR203.34000,CE-2.722,HD179.958,--NAIL SET RD FORK
OC,OP63,N 1114342.0217,E 1742235.4157,EL719.226,--NAIL SET RD FORK
BK,OP63,BP62,BS27.0504,BC0.0000
SS,OP63,FP64,AR147.49050,CE-7.838,HD278.424,--NAIL SET
TR,OP63,FP65,AR195.16000,CE-10.053,HD442.993,--NAIL SET
OC,OP65,N 1114014.6359,E 1741936.9843,EL709.173,--NAIL SET
BK,OP65,BP63,BS42.2104,BC0.0000
TR,OP65,FP66,AR202.54300,CE1.304,HD258.655,--NAIL SET
OC,OP65,N 1114014.6359,E 1741936.9843,EL709.173,--NAIL SET
BK,OP65,BP63,BS42.2104,BC0.0000
TR,OP65,FP67,AR260.01200,CE-10.276,HD207.933,--NAIL SET
OC,OP67,N 1114125.9701,E 1741761.3684,EL698.897,--NAIL SET
BK,OP67,BP65,BS122.2224,BC0.0000
SS,OP67,FP68,AR188.44250,CE-17.616,HD145.214,--NE GRID A37-A1
SS,OP67,FP69,AR177.23150,CE-22.731,HD237.459,--NW GRID A37-A1
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OC,OP66,N 1113906.3859,E 1741702.0712,EL710.477,--NAIL SET
BK,OP66,BP65,BS65.1534,BC0.0000
TR,OP66,FP70,AR161.52050,CE3.146,HD185.143,--NAIL SET
OC,OP70,N 1113780.4199,E 1741566.3855,EL713.623,--NAIL SET
BK,OP70,BP66,BS47.0739,BC0.0000
TR,OP70,FP71,AR161.37450,CE-7.307,HD207.941,--NAIL SET
OC,OP71,N 1113598.1242,E 1741466.3475,EL706.317,--NAIL SET
BK,OP71,BP70,BS28.4524,BC0.0000
TR,OP71,FP72,AR220.13100,CE-4.042,HD109.803,--GRID A37-A2
OC,OP72,N 1113558.7315,E 1741363.8544,EL702.274,--GRID A37-A2
BK,OP72,BP71,BS68.5834,BC0.0000
OC,OP1,N 1119046.3880,E 1734956.7850,EL746.603,--CC01=cc13
BK,OP1,BP71,BS129.5541,BC0.0000
SP,PN19,N 1113817.7270,E 1738695.5240,EL719.3600,--19-CC14
SP,PN41,N -99999.9900,E -99999.9900,EL-99999.9900,--CONTROL
SP,PN41,N -99999.9900,E -99999.9900,EL-99999.9900,--CONTROL
SP,PN41,N 1098930.8332,E 1747290.7890,EL628.5880,--NAIL SET
SP,PN42,N 1098975.0010,E 1747995.2890,EL618.6870,--NAIL SET
SP,PN43,N 1097251.8230,E 1748003.4340,EL674.9040,--NAIL SET
SP,PN44,N 1112146.4800,E 1737134.9970,EL685.7890,--NAIL SET
SP,PN45,N 1111507.5950,E 1767526.0350,EL733.2040,--NAIL SET
SP,PN46,N 1110338.3570,E 1770133.4990,EL689.8120,--NAIL SET
SP,PN47,N 1110950.8910,E 1770287.9720,EL694.9000,--HAIL SET
SP,PN48,N 1099781.2940,E 1766594.4580,EL665.4780,--NAIL SET
SP,PN49,N 1099140.6910,E 1766941.6530,EL658.9360,--NAIL SET
SP,PN50,N 1121577.4180,E 1748250.4780,EL766.2580,--NAIL SET
SP,PN51,N 1122020.4290,E 1747785.0960,EL759.3130,--NAIL SET
SP,PN51,N 1122020.4290,E 1747785.0960,EL759.3130,--NAIL SET
SP,PN51,N 1122020.4290,E 1747785.0960,EL759.3130,--NAIL SET
OC,OP48,N 1099781.2940,E 1766594.4580,EL665.478,--NAIL SET
BK,OP48,BP49,BS151.3235,BC0.0000
LS,HI5.000,HR5.000
TR,OP48,FP52,AR196.55450,CE-1.286,HD541.542,--NAIL SET
OC,OP52,N 1100311.9126,E 1766486.2352,EL664.192,--NAIL SET
BK,OP52,BP48,BS168.2820,BC0.0000
TR,OP52,FP53,AR200.27400,CE-20.744,HD496.376,--NAIL SET
OC,OP53,N 1100802.2670,E 1766563.3155,EL643.447,--NAIL SET
BK,OP53,BP52,BS188.5600,BC0.0000
TR,OP53,FP54,AR188.42150,CE-6.292,HD466.005,--NAIL SET
OC,OP54,N 1101246.3657,E 1766704.5125,EL637.155,--NAIL SET
BK,OP54,BP53,BS197.3815,BC0.0000
TR,OP54,FP55,AR130.57500,CE-1.448,HD366.558,--NAIL SET
OC,OP55,N 1101559.2465,E 1766513.5401,EL635.707,--NAIL SET
BK,OP55,BP54,BS148.3605,BC0.0000
TR,OP55,FP56,AR132.45050,CE3.688,HD1049.128,--NAIL SET
OC,OP56,N 1101765.7679,E 1765484.9404,EL639.394,--NAIL SET
BK,OP56,BP55,BS101.2110,BC0.0000
TR,OP56,FP57,AR205.12400,CE22.059,HD601.191,--NAIL SET
OC,OP57,N 1102123.9095,E 1765002.0680,EL661.454,--NAIL SET
BK,OP57,BP56,BS126.3350,BC0.0000
TR,OP57,FP58,AR198.12300,CE-7.997,HD436.886,--NAIL SET
OC,OP58,N 1102480.7866,E 1764750.0603,EL653.457,--NAIL SET
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BK,OP58,BP57,BS144.4620,BC0.0000
TR,OP58,FP73,AR274.12200,CE6.601,HD225.363,--NAIL SET
OC,OP73,N 1102596.9320,E 1764943.1894,EL660.058,--NAIL SET
BK,OP73,BP58,BS238.5840,BC0.0000
SS,OP73,FP74,AR198.05200,CE9.608,HD135.239,--SW GRID 46-1
OC,OP46,N 1110338.3570,E 1770133.4990,EL689.812,--NAIL SET
BK,OP46,BP45,BS294.0909,BC0.0000
SS,OP46,FP75,AR347.47100,CE-14.332,HD445.049,--NE GRID A18-1
SS,OP46,FP76,AR334.49100,CE-14.649,HD433.038,--SE GRID A18-1
OC,OP45,N 1111507.5950,E 1767526.0350,EL733.204,--NAIL SET
BK,OP45,BP46,BS114.0909,BC0.0000
TR,OP45,FP77,AR267.45250,CE21.479,HD747.524,--NAIL SET
OC,OP77,N 1112201.1298,E 1767804.9656,EL754.683,--NAIL SET
BK,OP77,BP45,BS201.5434,BC0.0000
TR,OP77,FP78,AR158.57550,CE13.594,HD700.045,--NAIL SET
OC,OP78,N 1112901.0933,E 1767815.6514,EL768.277,--NAIL SET
BK,OP78,BP77,BS180.5229,BC0.0000
TR,OP78,FP79,AR208.34400,CE21.379,HD1896.595,--NAIL SET
OC,OP79,N 1114552.5805,E 1768748.2075,EL789.656,--NAIL SET
BK,OP79,BP78,BS209.2709,BC0.0000
SS,OP79,FP80,AR208.03300,CE28.648,HD1586.136,--NAIL SET
TR,OP79,FP81,AR206.27350,CE24.447,HD1313.010,--NAIL SET
OC,OP81,N 1115288.4753,E 1769835.6151,EL814.103,--NAIL SET
BK,OP81,BP79,BS235.5444,BC0.0000
SS,OP81,FP82,AR99.44450,CE-2.943,HD414.402,--CORNER 18-3
SS,OP81,FP83,AR101.21300,CE-2.523,HD462.497,--CORNER 18-3
OC,OP80,N 1115404.5603,E 1770086.1009,EL818.304,--NAIL SET
BK,OP80,BP79,BS237.3039,BC0.0000
SS,OP80,FP84,AR90.21450,CE1.271,HD153.250,--CORNER 18-2
SS,OP80,FP85,AR88.58300,CE0.487,HD203.055,--TP CORNER 18-2
OC,OP85,N 1115573.8574,E 1769973.9850,EL818.791,--TP CORNER 18-2
BK,OP85,BP80,BS146.2909,BC0.0000
SS,OP85,FP86,AR235.45500,CE-5.270,HD176.417,--CORNER 18-1
SS,OP85,FP87,AR226.56150,CE-5.789,HD216.661,--CORNER 18-1
OC,OP80,N 1115404.5603,E 1770086.1009,EL818.304,--NAIL SET
BK,OP80,BP79,BS237.3039,BC0.0000
TR,OP80,FP88,AR169.22100,CE14.121,HD833.328,--NAIL-HARDEES
OC,OP88,N 1115974.1622,E 1770694.3688,EL832.425,--NAIL-HARDEES
BK,OP88,BP80,BS226.5249,BC0.0000
TR,OP88,FP89,AR149.49150,CE-0.315,HD722.406,--NAIL SET RR TRK
OC,OP89,N 1116666.0952,E 1770901.9720,EL832.110,--NAIL SET RR TRK
BK,OP89,BP88,BS196.4204,BC0.0000
TR,OP89,FP90,AR106.36100,CE-8.366,HD1700.005,--NAIL SET
OC,OP90,N 1117599.5309,E 1769481.1566,EL823.745,--NAIL SET
BK,OP90,BP89,BS123.1814,BC0.0000
SS,OP90,FP91,AR224.40450,CE5.072,HD338.001,--CORNER GRID 16-1
SS,OP90,FP92,AR223.13050,CE5.904,HD405.923,--CORNER GRID 16-1
OC,OP56,N 1101765.7679,E 1765484.9404,EL639.394,--NAIL SET
BK,OP56,BP55,BS101.2110,BC0.0000
TR,OP56,FP93,AR0.19050,CE-4.511,HD930.526,--NAIL SET
OC,OP93,N 1101577.5318,E 1766396.2284,EL634.883,--NAIL SET
BK,OP93,BP56,BS281.4015,BC0.0000
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TR,OP93,FP94,AR312.32100,CE-25.237,HD2146.486,--NAIL SET
OC,OP94,N 1100322.1416,E 1764655.1379,EL609.646,--NAIL SET
BK,OP94,BP93,BS54.1225,BC0.0000
SS,OP94,FP95,AR298.50550,CE16.512,HD216.375,--CORN A14-2
SS,OP94,FP96,AR257.40250,CE2.981,HD153.906,--CORN A14-2
TR,OP94,FP97,AR189.08200,CE0.655,HD317.957,--NAIL SET
OC,OP97,N 1100179.5050,E 1764370.9695,EL610.301,--NAIL SET
BK,OP97,BP94,BS63.2045,BC0.0000
TR,OP97,FP98,AR215.38350,CE1.610,HD198.295,--NAIL SET
OC,OP98,N 1100210.4875,E 1764175.1095,EL611.912,--NAIL SET
BK,OP98,BP97,BS98.5920,BC0.0000
SS,OP98,FP99,AR221.39300,CE-39.016,HD241.117,--CORN A14-1
SS,OP98,FP100,AR208.52200,CE-43.438,HD321.452,--CORN A14-1
SS,OP98,FP101,AR192.55050,CE-49.166,HD292.845,--CORN A14-1
OC,OP38,N 1114433.7690,E 1739417.0610,EL684.815,--CC38
BK,OP38,BP37,BS63.1419,BC0.0000
TR,OP38,FP102,AR0.03150,CE-7.655,HD1555.710,--NAIL SET
OC,OP102,N 1115132.9568,E 1740806.7986,EL677.160,--NAIL SET
BK,OP102,BP37,BS63.0951,BC0.0000
TR,OP102,FP103,AR230.33050,CE-11.455,HD390.442,--NAIL SET
OC,OP103,N 1115289.9907,E 1740449.3279,EL665.704,--NAIL SET
BK,OP103,BP102,BS113.4256,BC0.0000
BK,OP103,BP102,BS113.4256,BC0.0000
BK,OP103,BP102,BS113.4256,BC0.0000
TR,OP103,FP104,AR192.45450,CE-24.126,HD524.287,--NAIL SET
OC,OP104,N 1115601.6867,E 1740027.7562,EL641.578,--NAIL SET
BK,OP104,BP103,BS126.2841,BC0.0000
SS,OP104,FP105,AR142.29350,CE-30.060,HD639.718,--NE CORNER 27-1
SS,OP104,FP106,AR185.03400,CE5.074,HD664.519,--CORNER 27-3
SS,OP104,FP107,AR137.40350,CE-9.338,HD869.540,--TIE 27-2
OC,OP37,N 1115644.1590,E 1741817.2330,EL735.465,--CC37
BK,OP37,BP102,BS243.0951,BC0.0000
TR,OP37,FP108,AR180.08100,CE5.570,HD509.510,--NAIL SET
OC,OP108,N 1115873.0897,E 1742272.4151,EL741.035,--NAIL SET
BK,OP108,BP37,BS243.1801,BC0.0000
SS,OP108,FP109,AR275.13100,CE6.799,HD200.685,--NW CORNER A37-b1
OC,OP36,N 1116280.9110,E 1743027.2980,EL749.864,--CC36
BK,OP36,BP37,BS242.1446,BC0.0000
SS,OP36,FP110,AR286.14300,CE-0.412,HD193.215,--SW CORNER  38a-1
SS,OP36,FP111,AR260.01100,CE-2.690,HD118.408,--NW CORNER 38a-1
TR,OP36,FP112,AR1.31100,CE-3.532,HD377.419,--NAIL SET
OC,OP112,N 1116114.0743,E 1742688.7556,EL746.332,--NAIL SET
BK,OP112,BP36,BS63.4556,BC0.0000
TR,OP112,FP113,AR271.11400,CE93.780,HD519.760,--NAIL SET
OC,OP113,N 1116584.9836,E 1742468.7662,EL840.112,--NAIL SET
BK,OP113,BP112,BS154.5736,BC0.0000
TR,OP113,FP114,AR154.40100,CE-42.037,HD516.519,--NAIL SET
OC,OP114,N 1116914.4295,E 1742070.9503,EL798.075,--NAIL SET
BK,OP114,BP113,BS129.3746,BC0.0000
SS,OP114,FP115,AR233.33550,CE-21.557,HD258.145,--NW CORNER SITE 9
TR,OP114,FP116,AR252.40300,CE-10.960,HD316.056,--NAIL SET
OC,OP116,N 1117206.8384,E 1742190.9021,EL787.115,--NAIL SET
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BK,OP116,BP114,BS202.1816,BC0.0000
SS,OP116,FP117,AR112.54450,CE-3.351,HD34.710,--NE CORNER 9
SS,OP116,FP118,AR191.57350,CE-18.354,HD172.731,--NE CORNER 9
SS,OP116,FP119,AR178.07200,CE-13.150,HD76.629,--NW CORNER 9
SS,OP116,FP120,AR243.15450,CE0.472,HD102.514,--SW CORNER 9
OC,OP112,N 1116114.0743,E 1742688.7556,EL746.332,--NAIL SET
BK,OP112,BP36,BS63.4556,BC0.0000
TR,OP112,FP121,AR302.54150,CE-6.939,HD379.632,--NAIL SET
OC,OP121,N 1116491.1366,E 1742732.8479,EL739.393,--NAIL SET
BK,OP121,BP112,BS186.4011,BC0.0000
SS,OP121,FP122,AR192.33150,CE7.301,HD169.302,--NW 65-1
SS,OP121,FP123,AR224.16450,CE8.318,HD192.231,--SW 65-1
OC,OP36,N 1116280.9110,E 1743027.2980,EL749.864,--CC36
BK,OP36,BP112,BS243.4556,BC0.0000
TR,OP36,FP124,AR172.21550,CE1.035,HD540.539,--NAIL SET
OC,OP124,N 1116582.1528,E 1743476.1140,EL750.899,--NAIL SET
BK,OP124,BP36,BS236.0751,BC0.0000
TR,OP124,FP125,AR277.24200,CE-47.430,HD1250.446,--NAIL SET
OC,OP125,N 1115462.7322,E 1744033.3501,EL703.469,--NAIL SET
BK,OP125,BP124,BS333.3211,BC0.0000
TR,OP125,FP126,AR175.31200,CE-28.336,HD229.311,--NAIL SET
OC,OP126,N 1115266.0538,E 1744151.2530,EL675.133,--NAIL SET
BK,OP126,BP125,BS329.0331,BC0.0000
SS,OP126,FP127,AR147.43300,CE6.846,HD234.109,--NW 5-1
OC,OP37,N 1115644.1590,E 1741817.2330,EL735.465,--CC37
BK,OP37,BP36,BS62.1446,BC0.0000
SS,OP37,FP128,AR213.20050,CE-1.588,HD291.115,--A37C-1 LOCATION
OC,OP50,N 1121577.4180,E 1748250.4780,EL766.258,--NAIL SET
BK,OP50,BP51,BS313.3521,BC0.0000
SS,OP50,FP129,AR182.00100,CE1.345,HD1027.147,--NAIL SET
OC,OP129,N 1120843.6493,E 1748969.2371,EL767.603,--NAIL SET
BK,OP129,BP50,BS315.3531,BC0.0000
TR,OP129,FP130,AR160.44100,CE-5.757,HD1979.049,--NAIL SET
OC,OP130,N 1119965.9183,E 1750742.9964,EL761.846,--NAIL SET
BK,OP130,BP129,BS296.1941,BC0.0000
TR,OP130,FP131,AR174.50250,CE-0.520,HD2144.019,--NAIL SET
OC,OP131,N 1119191.6899,E 1752742.3432,EL761.326,--NAIL SET
BK,OP131,BP130,BS291.1006,BC0.0000
TR,OP131,FP132,AR217.17300,CE-9.027,HD1571.333,--NAIL SET
OC,OP132,N 1117852.4804,E 1753564.2954,EL752.298,--NAIL SET
BK,OP132,BP131,BS328.2736,BC0.0000
SS,OP132,FP133,AR271.03200,CE-28.744,HD451.464,--SE OF 71-1
SS,OP132,FP134,AR283.41100,CE-27.320,HD423.267,--NE OF 71-1
SS,OP132,FP135,AR275.08100,CE-34.028,HD560.589,--NAIL SET
TR,OP132,FP136,AR257.03150,CE-40.473,HD510.145,--NAIL SET
OC,OP136,N 1117495.0056,E 1753200.3452,EL711.826,--NAIL SET
BK,OP136,BP132,BS45.3051,BC0.0000
SS,OP136,FP137,AR98.06050,CE-26.329,HD315.011,--NW OF 71-4
SS,OP136,FP138,AR168.39400,CE-20.672,HD186.707,--NW OF 71-2
SS,OP136,FP139,AR183.24200,CE-28.654,HD406.367,--NE OF 71-3
OC,OP40,N 1113436.7920,E 1737291.3990,EL726.304,--CC40
BK,OP40,BP44,BS186.5441,BC0.0000
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TR,OP40,FP140,AR160.38450,CE-0.041,HD840.370,--NAIL SET
OC,OP140,N 1114257.4227,E 1737110.3272,EL726.263,--NAIL SET
BK,OP140,BP40,BS167.3326,BC0.0000
TR,OP140,FP141,AR167.34350,CE-4.225,HD643.078,--NAIL SET
OC,OP141,N 1114840.8809,E 1736839.9091,EL722.039,--NAIL SET
BK,OP141,BP140,BS155.0801,BC0.0000
TR,OP141,FP142,AR231.28300,CE13.433,HD260.059,--NAIL SET SE 40-1
OC,OP142,N 1115073.3968,E 1736956.3874,EL735.472,--NAIL SET SE 40-1
BK,OP142,BP141,BS206.3631,BC0.0000
TR,OP142,FP143,AR104.27250,CE-6.404,HD240.327,--NAIL SET SW A3-2
OC,OP143,N 1115231.2723,E 1736775.1906,EL729.068,--NAIL SET SW A3-2
BK,OP143,BP142,BS131.0356,BC0.0000
TR,OP143,FP144,AR236.29400,CE7.649,HD194.808,--NAIL SET
OC,OP144,N 1115424.3869,E 1736800.8199,EL736.717,--NAIL SET
BK,OP144,BP143,BS187.3336,BC0.0000
TR,OP144,FP145,AR227.40250,CE-4.381,HD166.519,--NAIL SET SW 39-2
OC,OP145,N 1115519.3419,E 1736937.6127,EL732.337,--NAIL SET SW 39-2
BK,OP145,BP144,BS235.1401,BC0.0000
SS,OP145,FP146,AR122.37100,CE-12.838,HD163.783,--NAIL SET
SS,OP145,FP147,AR250.13300,CE7.645,HD153.048,--NW 8b-1
OC,OP146,N 1115683.0095,E 1736931.4766,EL719.498,--NAIL SET
BK,OP146,BP145,BS177.5110,BC0.0000
SS,OP146,FP148,AR139.55350,CE5.131,HD128.298,--SE OF 39-1
TR,OP146,FP149,AR148.52000,CE10.432,HD274.318,--NAIL SET
OC,OP149,N 1115912.3377,E 1736780.9483,EL729.930,--NAIL SET
BK,OP149,BP146,BS146.4310,BC0.0000
TR,OP149,FP150,AR218.29350,CE5.679,HD141.652,--NAIL SET
OC,OP150,N 1116053.4041,E 1736793.8177,EL735.609,--NAIL SET
BK,OP150,BP149,BS185.1245,BC0.0000
TR,OP150,FP151,AR265.08450,CE-13.105,HD236.246,--NAIL SET
OC,OP151,N 1116051.9261,E 1737030.0589,EL722.504,--NAIL SET
BK,OP151,BP150,BS270.2130,BC0.0000
TR,OP151,FP152,AR172.38250,CE-25.097,HD356.056,--NAIL SET
OC,OP152,N 1116095.3261,E 1737383.4595,EL697.407,--NAIL SET
BK,OP152,BP151,BS262.5955,BC0.0000
SS,OP152,FP153,AR168.26450,CE-5.837,HD158.241,--NW OF A3-1
OC,OP37,N 1115644.1590,E 1741817.2330,EL735.465,--CC37
BK,OP37,BP36,BS62.1446,BC0.0000
TR,OP37,FP154,AR356.55200,CE5.697,HD430.403,--NAIL SET
OC,OP154,N 1115864.7485,E 1742186.8102,EL741.162,--NAIL SET
BK,OP154,BP36,BS63.3929,BC0.0000
TR,OP154,FP155,AR219.50150,CE-1.172,HD700.755,--NAIL SET
OC,OP155,N 1116028.2826,E 1741505.4041,EL739.990,--NAIL SET
BK,OP155,BP154,BS103.2944,BC0.0000
SS,OP155,FP156,AR181.23200,CE-18.025,HD211.877,--SW OF A37c-1
OC,OP141,N 1114840.8809,E 1736839.9091,EL722.039,--NAIL SET
BK,OP141,BP140,BS155.0801,BC0.0000
TR,OP141,FP157,AR165.51500,CE6.001,HD553.842,--NAIL SET
OC,OP157,N 1115271.2813,E 1736491.3449,EL728.040,--NAIL SET
BK,OP157,BP141,BS140.5951,BC0.0000
TR,OP157,FP158,AR187.26400,CE0.268,HD1383.238,--NAIL SET
OC,OP158,N 1116449.9509,E 1735767.4075,EL728.308,--NAIL SET
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BK,OP158,BP157,BS148.2631,BC0.0000
TR,OP158,FP159,AR299.55250,CE-15.972,HD509.007,--SW OF 50-1
OC,OP158,N 1116449.9509,E 1735767.4075,EL728.308,--NAIL SET
BK,OP158,BP157,BS148.2631,BC0.0000
[illegible],OP158,FP160,AR299.02100,CE-17.950,HD607.796,--SE OF 50-1
[illegible],OP140,N 1114257.4227,E 1737110.3272,EL726.263,--NAIL SET
BK,OP140,BP141,BS335.0801,BC0.0000
SS,OP140,FP161,AR174.08100,CE7.933,HD152.224,--NW OF 26-1
SS,OP140,FP162,AR159.29200,CE9.456,HD175.309,--NE OF 26-1
SS,OP140,FP163,AR99.44050,CE3.048,HD248.024,--NAIL SET
OC,OP38,N 1114433.7690,E 1739417.0610,EL684.815,--CC38
BK,OP38,BP102,BS63.1734,BC0.0000
TR,OP38,FP164,AR359.04150,CE-54.576,HD899.474,--NAIL SET
OC,OP164,N 1114850.9992,E 1740213.9123,EL630.239,--NAIL SET
BK,OP164,BP102,BS64.3357,BC0.0000
TR,OP164,FP165,AR91.32500,CE-42.148,HD755.520,--NAIL SET C/L CRK
OC,OP165,N 1114160.1926,E 1740519.8486,EL588.090,--NAIL SET C/L CRK
BK,OP165,BP164,BS336.0647,BC0.0000
TR,OP165,FP166,AR183.26450,CE0.386,HD162.688,--NAIL SET
OC,OP166,N 1114007.7493,E 1740576.6666,EL588.477,--NAIL SET
BK,OP166,BP165,BS339.3332,BC0.0000
TR,OP166,FP167,AR238.22000,CE-0.121,HD383.505,--NAIL SET
OC,OP167,N 1113705.2364,E 1740340.9506,EL588.356,--NAIL SET
BK,OP167,BP166,BS37.5532,BC0.0000
SS,OP167,FP168,AR150.11000,CE-2.997,HD479.255,--NW OF 24-1
TR,OP167,FP169,AR150.25150,CE-3.200,HD458.421,--NAIL SET
OC,OP169,N 1113251.6708,E 1740274.4082,EL585.155,--NAIL SET
BK,OP169,BP167,BS8.2047,BC0.0000
SS,OP169,FP170,AR97.28450,CE27.727,HD298.807,--NE OF 24-2
[illegible],OP124,N 1116582.1528,E 1743476.1140,EL750.899,--NAIL SET
[illegible],OP124,BP36,BS236.0751,BC0.0000
[illegible],OP124,FP171,AR213.51500,CE10.183,HD666.714,--NAIL SET
OC,OP171,N 1116582.2147,E 1744142.8282,EL761.082,--NAIL SET
BK,OP171,BP124,BS269.5941,BC0.0000
SS,OP171,FP172,AR149.01100,CE-12.074,HD1257.737,--SW OF 67-1
SS,OP171,FP173,AR146.46250,CE-10.651,HD1307.722,--NE OF 67-1
TR,OP171,FP174,AR260.07450,CE-31.370,HD687.867,--NAIL SET
OC,OP174,N 1115904.5413,E 1744260.8105,EL729.712,--NAIL SET
BK,OP174,BP171,BS350.0726,BC0.0000
SS,OP174,FP175,AZ196.42450,CE-27.354,HD281.013,--NW OF 37-1
OC,OP171,N 1116582.2147,E 1744142.8282,EL761.082,--NAIL SET
BK,OP171,BP124,BS269.5941,BC0.0000
TR,OP171,FP176,AZ141.14100,CE-8.097,HD1637.292,--NAIL SET
OC,OP176,N 1115305.5646,E 1745167.9572,EL752.985,--NAIL SET
BK,OP176,BP171,BS321.1410,BC0.0000
TR,OP176,FP177,AZ171.22050,CE17.521,HD2164.037,--NAIL SET
OC,OP177,N 1113166.0399,E 1745492.7501,EL770.506,--NAIL SET
BK,OP177,BP176,BS351.2205,BC0.0000
TR,OP177,FP178,AZ169.51400,CE-12.392,HD828.503,--NAIL SET
SP,PN177,N 1113166.0399,E 1745492.7501,EL770.5064,--MON. SPA 181
OC,OP178,N 1112350.4745,E 1745638.5956,EL758.114,--NAIL SET
BK,OP178,BP177,BS349.5140,BC0.0000

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LS,HI5.000,HR5.000
TR,OP178,FP179,AR279.15100,CE-13.751,HD370.605,--NAIL SET
OC,OP179,N 1112344.7431,E 1745268.0350,EL744.363,--NAIL SET
BK,OP179,BP178,BS89.0650,BC0.0000
SS,OP179,FP180,AR73.37300,CE-4.190,HD91.045,--SW OF A32-1
SS,OP179,FP181,AR65.00100,CE-4.791,HD188.026,--NW OF A32-1
TR,OP179,FP182,AR149.38200,CE-17.962,HD326.531,--NAIL SET
OC,OP182,N 1112175.3609,E 1744988.8713,EL726.400,--NAIL SET
BK,OP182,BP179,BS58.4510,BC0.0000
SS,OP182,FP183,AR125.25450,CE-13.395,HD114.743,--SW OF A32-2
SS,OP182,FP184,AR106.00250,CE-12.203,HD140.701,--NW OF A32-2
TR,OP182,FP185,AR175.57550,CE-18.189,HD166.682,--NAIL SET
OC,OP185,N 1112079.0851,E 1744852.8051,EL708.211,--NAIL SET
BK,OP185,BP182,BS54.4305,BC0.0000
TR,OP185,FP186,AR216.57200,CE-14.152,HD215.755,--NAIL SET
OC,OP186,N 1112085.3864,E 1744637.1418,EL694.059,--NAIL SET
BK,OP186,BP185,BS91.4025,BC0.0000
SS,OP186,FP187,AR268.39100,CE19.761,HD171.513,--NE OF A32-3
OC,OP158,N 1116449.9509,E 1735767.4075,EL728.308,--NAIL SET
BK,OP158,BP157,BS148.2631,BC0.0000
TR,OP158,FP188,AR175.35200,CE3.974,HD460.494,--NAIL SET
OC,OP188,N 1116822.6432,E 1735496.9356,EL732.282,--NAIL SET
BK,OP188,BP158,BS144.0151,BC0.0000
TR,OP188,FP189,AR200.29400,CE34.424,HD1602.553,--NAIL SET
OC,OP189,N 1118367.1001,E 1735069.3495,EL766.706,--NAIL SET
BK,OP189,BP188,BS164.3131,BC0.0000
TR,OP189,FP190,AR184.02300,CE-18.852,HD683.218,--NAIL SET
OC,OP190,N 1119036.7607,E 1734933.9184,EL747.854,--NAIL SET
BK,OP190,BP189,BS168.3401,BC0.0000
TR,OP190,FP191,AR258.54050,CE-48.093,HD1471.268,--NAIL SET
OC,OP190,N 1119036.7607,E 1734933.9184,EL747.854,--NAIL SET
BK,OP190,BP189,BS168.3401,BC0.0000
SS,OP190,FP192,AR258.19350,CE-1.022,HD23.652,--MON. CROFT-13
OC,OP191,N 1119600.5451,E 1736292.8803,EL699.761,--NAIL SET
BK,OP191,BP190,BS247.2806,BC0.0000
TR,OP191,FP193,AR173.22100,CE-1.807,HD1910.954,--NAIL SET
OC,OP193,N 1120531.7265,E 1737961.6064,EL697.955,--NAIL SET
BK,OP193,BP191,BS240.5016,BC0.0000
TR,OP193,FP194,AR138.24500,CE-3.311,HD537.790,--NAIL SET
OC,OP194,N 1121039.4432,E 1738138.9242,EL694.643,--NAIL SET
BK,OP194,BP193,BS199.1506,BC0.0000
SS,OP194,FP195,AR69.36400,CE-20.925,HD230.857,--SW OF 30-1
SS,OP194,FP196,AR136.00550,CE-20.011,HD229.237,--SW OF 30-2
SP,PN196,N 1121247.6516,E 1738043.0129,EL674.6325,--SE OF 30-2
OC,OP131,N 1119191.6899,E 1752742.3432,EL761.326,--NAIL SET
BK,OP131,BP130,BS291.1006,BC0.0000
TR,OP131,FP197,AR188.01400,CE18.989,HD2359.487,--NAIL SET
OC,OP197,N 1118040.7280,E 1754802.0673,EL780.315,--NAIL SET
BK,OP197,BP131,BS299.1146,BC0.0000
TR,OP197,FP198,AR168.57550,ZE88.30100,SD1045.442,--NAIL SET
OC,OP198,N 1117714.9789,E 1755795.0881,EL807.631,--NAIL SET
BK,OP198,BP197,BS288.0941,BC0.0000
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TR,OP198,FP199,AR254.42100,ZE87.49300,SD1185.268,--NAIL SET
OC,OP199,N 1116532.0445,E 1755735.9030,EL852.614,--NAIL SET
BK,OP199,BP198,BS2.5151,BC0.0000
TR,OP199,FP200,AR210.01450,ZE90.05050,SD773.792,--NAIL SET
OC,OP200,N 1115882.3059,E 1755315.6739,EL851.470,--NAIL SET
BK,OP200,BP199,BS32.5336,BC0.0000
TR,OP200,FP201,AR184.59150,ZE90.38300,SD987.317,--NAIL SET
OC,OP201,N 1115103.0768,E 1754709.4771,EL840.413,--NAIL SET
BK,OP201,BP200,BS37.5251,BC0.0000
TR,OP201,FP202,AR161.13550,ZE90.27250,SD2494.098,--NAIL SET
OC,OP202,N 1112746.5399,E 1753892.8601,EL820.522,--NAIL SET
BK,OP202,BP201,BS19.0646,BC0.0000
TR,OP202,FP203,AR180.30100,ZE91.09500,SD1041.475,--NAIL SET
OC,OP203,N 1111765.7085,E 1753543.2998,EL799.368,--NAIL SET
BK,OP203,BP202,BS19.3656,BC0.0000
TR,OP203,FP204,AR156.01100,ZE92.27550,SD197.059,--NAIL SET
OC,OP204,N 1111569.4029,E 1753558.2838,EL790.891,--NAIL SET
BK,OP204,BP203,BS355.3806,BC0.0000
TR,OP204,FP205,AR155.02050,ZE94.16100,SD417.343,--NAIL SET
OC,OP205,N 1111206.5682,E 1753762.1485,EL759.821,--NAIL SET
BK,OP205,BP204,BS330.4011,BC0.0000
TR,OP205,FP206,AR212.52500,ZE89.39500,SD580.146,--NAIL SET
OC,OP206,N 1110627.5456,E 1753726.2229,EL763.225,--NAIL SET
BK,OP206,BP205,BS3.3301,BC0.0000
TR,OP206,FP207,AR189.05200,ZE86.56000,SD441.431,--NAIL SET
OC,OP207,N 1110197.4286,E 1753629.7709,EL786.840,--NAIL SET
BK,OP207,BP206,BS12.3821,BC0.0000
TR,OP207,FP208,AR185.40500,ZE89.55400,SD529.002,--NAIL SET
OC,OP208,N 1109695.2386,E 1753463.4947,EL787.507,--NAIL SET
BK,OP208,BP207,BS18.1911,BC0.0000
SS,OP208,FP209,AR170.08350,ZE89.25450,SD349.527,--SE OF 78-1
SS,OP208,FP210,AR175.29050,ZE89.38150,SD253.464,--NE OF 78-1
SS,OP208,FP211,AR215.54400,ZE90.16300,SD142.126,--SE OF 78-2
SS,OP208,FP212,AR258.50350,ZE90.36550,SD125.930,--NE OF 78-2
TR,OP208,FP213,AR168.22500,ZE89.36350,SD345.576,--NAIL SET
OC,OP213,N 1109352.0308,E 1753423.1748,EL789.861,--NAIL SET
BK,OP213,BP208,BS6.4201,BC0.0000
TR,OP213,FP214,AR168.08250,ZE89.34350,SD899.284,--NAIL SET
OC,OP214,N 1108456.4148,E 1753504.0415,EL796.510,--NAIL SET
BK,OP214,BP213,BS354.5026,BC0.0000
TR,OP214,FP215,AR194.13550,ZE90.05350,SD730.879,--NAIL SET
OC,OP215,N 1107734.6805,E 1753388.7925,EL795.323,--NAIL SET
BK,OP215,BP214,BS9.0421,BC0.0000
SS,OP215,FP216,AR208.35150,ZE91.17350,SD145.028,--SE OF 85-1
SS,OP215,FP217,AR251.29150,ZE93.21300,SD98.565,--NE OF 85-1
OC,OP176,N 1115305.5646,E 1745167.9572,EL752.985,--NAIL SET
BK,OP176,BP171,BS321.1410,BC0.0000
TR,OP176,FP218,AR171.29550,ZE89.26400,SD1045.786,--NAIL SET
OC,OP218,N 1114595.9224,E 1745936.0545,EL763.125,--NAIL SET
BK,OP218,BP176,BS312.4405,BC0.0000
SS,OP218,FP219,AR297.47350,ZE91.39300,SD236.145,--SW OF 68-1
SS,OP218,FP220,AR293.54500,ZE91.51500,SD187.992,--NW OF 68-1

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SS,OP218,FP221,AR317.45300,ZE91.09500,SD342.196,--SE OF 68-2
SS,OP218,FP222,AR318.58100,ZE91.24200,SD292.630,--NE OF 68-2
SS,OP218,FP223,AR294.28200,ZE99.38150,SD30.014,--MON. SPA 180
OC,OP51,N 1122020.4290,E 1747785.0960,EL759.313,--NAIL SET
BK,OP51,BP50,BS133.3521,BC0.0000
TR,OP51,FP224,AR184.30050,ZE90.51000,SD896.770,--NAIL SET
OC,OP224,N 1122687.7341,E 1747186.1608,EL746.010,--NAIL SET
BK,OP224,BP51,BS138.0526,BC0.0000
SS,OP224,FP225,AR119.50500,ZE91.51400,SD443.010,--SE OF A33-1
SS,OP224,FP226,AR126.22000,ZE91.43250,SD440.599,--NE OF A33-1
OC,OP171,N 1116582.2147,E 1744142.8282,EL761.082,--NAIL SET
BK,OP171,BP124,BS269.5941,BC0.0000
TR,OP171,FP227,AR191.34350,ZE91.53200,SD809.162,--NAIL SET
OC,OP227,N 1116419.9986,E 1744935.1146,EL734.411,--NAIL SET
BK,OP227,BP171,BS281.3416,BC0.0000
SS,OP227,FP228,AR218.18500,ZE93.42100,SD1084.111,--NE OF 67-2
SS,OP227,FP229,AR222.59550,ZE93.53250,SD1034.694,--NW OF 67-2
OC,OP39,N 1113834.9110,E 1738683.2450,EL714.461,--CC39
BK,OP39,BP38,BS50.4657,BC0.0000
TR,OP39,FP230,AR136.19350,ZE89.13250,SD349.471,--NAIL SET
OC,OP230,N 1113488.1583,E 1738639.9997,EL719.196,--NAIL SET
BK,OP230,BP39,BS7.0632,BC0.0000
TR,OP230,FP231,AR213.40100,ZE90.58250,SD749.236,--NAIL SET
OC,OP231,N 1112920.8876,E 1738150.7182,EL706.465,--NAIL SET
BK,OP231,BP230,BS40.4642,BC0.0000
TR,OP231,FP232,AR194.30000,ZE91.18150,SD426.503,--NAIL SET
OC,OP232,N 1112678.0189,E 1737800.2537,EL696.758,--NAIL SET
BK,OP232,BP231,BS55.1642,BC0.0000
TR,OP232,FP233,AR154.34300,ZE89.10300,SD286.679,--NAIL SET
OC,OP233,N 1112429.4073,E 1737657.5648,EL700.886,--NAIL SET
BK,OP233,BP232,BS29.5112,BC0.0000
TR,OP233,FP234,AR142.15050,ZE89.33250,SD618.239,--NAIL SET
OC,OP234,N 1111817.0470,E 1737742.4849,EL705.667,--NAIL SET
BK,OP234,BP233,BS352.0617,BC0.0000
TR,OP234,FP235,AR156.51350,ZE91.07050,SD571.691,--NAIL SET
OC,OP235,N 1111327.2880,E 1738037.1750,EL694.511,--NAIL SET
BK,OP235,BP234,BS328.5752,BC0.0000
TR,OP235,FP236,AR157.36350,ZE90.17550,SD564.451,--NAIL SET
OC,OP236,N 1110990.9568,E 1738490.4714,EL691.570,--NAIL SET
BK,OP236,BP235,BS306.3427,BC0.0000
TR,OP236,FP237,AR196.39200,ZE88.46050,SD693.612,--NAIL SET
OC,OP237,N 1110435.4725,E 1738905.5767,EL706.482,--NAIL SET
BK,OP237,BP236,BS323.1347,BC0.0000
TR,OP237,FP238,AR201.49100,ZE88.45450,SD555.744,--NAIL SET
OC,OP238,N 1109898.6669,E 1739048.9193,EL718.485,--NAIL SET
BK,OP238,BP237,BS345.0257,BC0.0000
TR,OP238,FP239,AR141.58100,ZE88.58000,SD401.401,--NAIL SET
OC,OP239,N 1109657.0327,E 1739369.3615,EL725.723,--NAIL SET
BK,OP239,BP238,BS307.0107,BC0.0000
TR,OP239,FP240,AR167.18050,ZE89.45350,SD698.939,--NAIL SET
OC,OP240,N 1109369.1889,E 1740006.2706,EL728.655,--NAIL SET
BK,OP240,BP239,BS294.1912,BC0.0000
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TR,OP240,FP241,AR139.15450,ZE90.43050,SD838.554,--NAIL SET
OC,OP241,N 1109606.1739,E 1740810.5718,EL718.146,--NAIL SET
BK,OP241,BP240,BS253.3457,BC0.0000
TR,OP241,FP242,AR226.00450,ZE89.19200,SD363.712,--NAIL SET
OC,OP242,N 1109426.5612,E 1741126.8109,EL722.448,--NAIL SET
BK,OP242,BP241,BS299.3542,BC0.0000
TR,OP242,FP243,AR228.40050,ZE91.14150,SD900.364,--NAIL SET
OC,OP243,N 1108545.2276,E 1741309.9183,EL703.003,--NAIL SET
BK,OP243,BP242,BS348.1547,BC0.0000
TR,OP243,FP244,AR185.47150,ZE80.33550,SD458.564,--NAIL SET
OC,OP244,N 1108095.3031,E 1741356.8055,EL778.173,--NAIL SET
BK,OP244,BP243,BS354.0302,BC0.0000
SS,OP244,FP245,AR219.34200,ZE93.17350,SD54.618,--NE OF 41a-1
SS,OP244,FP246,AR222.38100,ZE94.24450,SD154.315,--NW OF 41a-1
SS,OP244,FP247,AR185.17300,ZE95.20150,SD253.874,--SE OF 41a-2
SP,PN216,N 1107619.8985,E 1753300.2064,EL792.0500,--NE OF 41a-2
OC,OP194,N 1121039.4432,E 1738138.9242,EL694.643,--NAIL SET
BK,OP194,BP193,BS199.1506,BC0.0000
SS,OP194,FP248,AR27.58100,ZE91.15250,SD203.157,--SE OF 30-3
SS,OP194,FP249,AR139.04100,ZE96.09100,SD52.643,--SE OF 30-4
OC,OP186,N 1112085.3864,E 1744637.1418,EL694.059,--NAIL SET
BK,OP186,BP185,BS91.4025,BC0.0000
TR,OP186,FP250,AR272.17250,ZE81.24300,SD121.936,--NAIL SET
OC,OP250,N 1112205.6656,E 1744645.4763,EL712.275,--NAIL SET
BK,OP250,BP186,BS183.5750,BC0.0000
TR,OP250,FP251,AR175.16250,ZE89.51150,SD94.889,--NAIL SET
OC,OP251,N 1112300.5459,E 1744644.2136,EL712.517,--NAIL SET
BK,OP251,BP250,BS179.1415,BC0.0000
SS,OP251,FP252,AR139.26250,ZE84.10050,SD90.031,--NE OF 36-1
OC,OP79,N 1114552.5805,E 1768748.2075,EL789.656,--NAIL SET
BK,OP79,BP81,BS55.5444,BC0.0000
BC,HI5.000,HR5.000
TR,OP79,FP253,AR145.03200,ZE93.26300,SD255.211,--NAIL SET
OC,OP253,N 1114314.6987,E 1768657.0472,EL774.335,--NAIL SET
BK,OP253,BP79,BS20.5804,BC0.0000
SS,OP253,FP254,AR203.39550,ZE91.55450,SD496.902,--NE OF 21-1
SS,OP253,FP255,AR202.47250,ZE91.53000,SD546.135,--SE OF 21-1
SS,OP253,FP256,AR129.01350,ZE91.32350,SD427.720,--SE OF 21-2
SS,OP253,FP257,AR129.49450,ZE92.10250,SD378.039,--NE OF 21-2
OC,OP93,N 1101577.5318,E 1766396.2284,EL634.883,--NAIL SET
BK,OP93,BP56,BS281.4015,BC0.0000
TR,OP93,FP258,AR312.04550,ZE90.23500,SD5965.122,--NAIL SET
OC,OP258,N 1098050.6214,E 1761585.6283,EL593.528,--NAIL SET
BK,OP258,BP93,BS53.4510,BC0.0000
TR,OP258,FP259,AR246.05200,ZE91.02500,SD329.706,--NAIL SET
OC,OP259,N 1098214.6576,E 1761299.6880,EL587.502,--NAIL SET
BK,OP259,BP258,BS119.5030,BC0.0000
TR,OP259,FP260,AR236.19450,ZE88.53300,SD274.294,--NAIL SET
OC,OP260,N 1098488.2881,E 1761281.3739,EL592.808,--NAIL SET
BK,OP260,BP259,BS176.1015,BC0.0000
SS,OP260,FP261,AR127.03500,ZE93.22000,SD403.004,--SE OF A12-1
SS,OP260,FP262,AR133.24350,ZE92.50450,SD489.495,--NE OF A12-1
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SS,OP260,FP263,AR111.23450,ZE93.52100,SD597.001,--NE OF A12-2
SS,OP260,FP264,AR112.50050,ZE93.45550,SD696.211,--NW OF A12-2
OC,OP252,N 1112367.8100,E 1744585.0744,EL721.665,--NE OF 36-1
BK,OP252,BP251,BS138.4040,BC0.0000
TR,OP252,FP265,AR173.59400,ZE88.19200,SD173.449,--NAIL SET
OC,OP265,N 1112485.3239,E 1744457.6019,EL726.743,--NAIL SET
BK,OP265,BP252,BS132.4020,BC0.0000
TR,OP265,FP266,AR212.29150,ZE89.45200,SD349.237,--NAIL SET
OC,OP266,N 1112822.9085,E 1744368.1543,EL728.233,--NAIL SET
BK,OP266,BP265,BS165.0935,BC0.0000
TR,OP266,FP267,AR162.57150,ZE91.37100,SD185.895,--NAIL SET
OC,OP267,N 1112980.6889,E 1744269.9977,EL722.980,--NAIL SET
BK,OP267,BP266,BS148.0650,BC0.0000
TR,OP267,FP268,AR254.45200,ZE88.06250,SD585.727,--NAIL SET
OC,OP268,N 1113409.7373,E 1744668.2680,EL742.329,--NAIL SET
BK,OP268,BP267,BS222.5210,BC0.0000
TR,OP268,FP269,AR235.30400,ZE85.52500,SD279.421,--NAIL SET
OC,OP269,N 1113369.1176,E 1744943.9911,EL762.401,--NAIL SET
BK,OP269,BP268,BS278.2250,BC0.0000
SS,OP269,FP270,AR189.48300,ZE91.07400,SD155.015,--SE OF 56-2
OC,OP152,N 1116095.3261,E 1737383.4595,EL697.407,--NAIL SET
BK,OP152,BP151,BS262.5955,BC0.0000
TR,OP152,FP271,AR143.35550,ZE91.37350,SD126.514,--NAIL SET
OC,OP271,N 1116182.2215,E 1737475.3404,EL693.816,--NAIL SET
BK,OP271,BP152,BS226.3550,BC0.0000
TR,OP271,FP272,AR159.45200,ZE93.14250,SD211.122,--NAIL SET
OC,OP272,N 1116371.1006,E 1737568.9074,EL681.883,--NAIL SET
BK,OP272,BP271,BS206.2110,BC0.0000
TR,OP272,FP273,AR210.10350,ZE94.46100,SD220.660,--NAIL SET
OC,OP273,N 1116492.3755,E 1737752.3375,EL663.536,--NAIL SET
BK,OP273,BP272,BS236.3145,BC0.0000
TR,OP273,FP274,AR161.04350,ZE93.48550,SD169.038,--NAIL SET
OC,OP274,N 1116625.9955,E 1737855.2599,EL652.288,--NAIL SET
BK,OP274,BP273,BS217.3620,BC0.0000
TR,OP274,FP275,AR192.39400,ZE92.57000,SD272.827,--NAIL SET
OC,OP275,N 1116800.1591,E 1738064.7939,EL638.247,--NAIL SET
BK,OP275,BP274,BS230.1600,BC0.0000
SS,OP275,FP276,AR198.24150,ZE93.19150,SD103.763,--NW OF A3-3
TR,OP275,FP277,AR72.13000,ZE88.34500,SD292.597,--NAIL SET
OC,OP277,N 1116957.2519,E 1737818.0505,EL645.495,--NAIL SET
BK,OP277,BP275,BS122.2900,BC0.0000
SS,OP277,FP278,AR167.34100,ZE84.27200,SD126.533,--SE OF A3-4
SP,PN187,N 1112256.8970,E 1744638.1188,EL713.8198,--NE OF 36-1
SP,PN252,N 1112367.8100,E 1744585.0744,EL721.6651,--NE OF 36-2
SP,PN254,N 1113961.2927,E 1768308.1404,EL757.6076,--NE OF A21-1
SP,PN255,N 1113920.4560,E 1768279.5370,EL756.3869,--SE OF A21-1
SP,PN256,N 1113944.4388,E 1768870.8680,EL762.8176,--SE OF A21-2
SP,PN257,N 1113984.9477,E 1768841.3626,EL759.9972,--NE OF A21-2
SP,PN269,N 1113369.1176,E 1744943.9911,EL762.4012,--TP AT SE OF 56-1
OC,OP79,N 1114552.5805,E 1768748.2075,EL789.656,--NAIL SET
BK,OP79,BP81,BS55.5444,BC0.0000
TR,OP79,FP279,AR157.04200,ZE92.22450,SD726.628,--NAIL SET
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OC,OP279,N 1113943.5962,E 1768352.9651,EL759.492,--NAIL SET
BK,OP279,BP79,BS32.5904,BC0.0000
TR,OP279,FP280,AR112.05450,ZE90.22450,SD1648.261,--NAIL SET
OC,OP280,N 1112592.1278,E 1769296.4578,EL748.585,--NAIL SET
BK,OP280,BP279,BS325.0449,BC0.0000
TR,OP280,FP281,AR145.22400,ZE86.48000,SD925.108,--NAIL SET
OC,OP281,N 1112269.2883,E 1770161.8667,EL800.225,--NAIL SET
BK,OP281,BP280,BS290.2729,BC0.0000
SS,OP281,FP282,AR71.28450,ZE92.56050,SD297.962,--SE OF A20-2
TR,OP281,FP283,AR168.23550,ZE90.46000,SD612.939,--NAIL SET
OC,OP283,N 1112174.9278,E 1770767.4434,EL792.024,--NAIL SET
BK,OP283,BP281,BS278.5124,BC0.0000
TR,OP283,FP284,AR87.59050,ZE88.57200,SD1124.869,--NAIL SET
OC,OP284,N 1113291.6021,E 1770901.4149,EL812.528,--NAIL SET
BK,OP284,BP283,BS186.5029,BC0.0000
SS,OP284,FP285,AR59.40150,ZE92.56300,SD39.500,--SE OF A20-1
OC,OP240,N 1109369.1889,E 1740006.2706,EL728.655,--NAIL SET
BK,OP240,BP241,BS73.3457,BC0.0000
LS,HI5.000,HR5.000
TR,OP240,FP286,AR357.59050,ZE91.29100,SD414.916,--NAIL SET
OC,OP286,N 1109500.3375,E 1740399.7671,EL717.894,--NAIL SET
BK,OP286,BP241,BS75.3311,BC0.0000
TR,OP286,FP287,AR328.31150,ZE88.29100,SD360.325,--NAIL SET
OC,OP287,N 1109759.1207,E 1740650.3160,EL727.413,--NAIL SET
BK,OP287,BP286,BS224.0426,BC0.0000
TR,OP287,FP288,AR232.15500,ZE89.49200,SD455.225,--NAIL SET
OC,OP288,N 1109708.8696,E 1741102.7567,EL728.826,--NAIL SET
BK,OP288,BP287,BS276.2016,BC0.0000
TR,OP288,FP289,AR163.54000,ZE92.45300,SD223.487,--NAIL SET
OC,OP289,N 1109746.7205,E 1741322.7524,EL718.071,--NAIL SET
BK,OP289,BP288,BS260.1416,BC0.0000
TR,OP289,FP290,AR144.47500,ZE90.47250,SD507.360,--NAIL SET
OC,OP290,N 1110105.2255,E 1741681.6944,EL711.073,--NAIL SET
BK,OP290,BP289,BS225.0206,BC0.0000
TR,OP290,FP291,AR218.16200,ZE92.40400,SD339.013,--NAIL SET
OC,OP291,N 1110144.6935,E 1742018.0294,EL695.235,--NAIL SET
BK,OP291,BP290,BS263.1826,BC0.0000
TR,OP291,FP292,AR186.59250,ZE95.14550,SD334.368,--NAIL SET
OC,OP292,N 1110142.9652,E 1742350.9909,EL664.648,--NAIL SET
BK,OP292,BP291,BS270.1751,BC0.0000
TR,OP292,FP293,AR114.06450,ZE94.53450,SD246.629,--NAIL SET
OC,OP293,N 1110366.7292,E 1742452.5414,EL643.599,--NAIL SET
BK,OP293,BP292,BS204.2436,BC0.0000
TR,OP293,FP294,AR255.05250,ZE101.08050,SD235.720,--NAIL SET
OC,OP6,N 1119208.1060,E 1741163.5750,EL758.273,--CC06
BK,OP6,BP293,BS171.4219,BC0.0000
TR,OP6,FP295,AR265.09050,ZE88.39050,SD314.246,--NAIL SET
OC,OP294,N 1110328.5558,E 1742680.6521,EL598.078,--NAIL SET
BK,OP294,BP293,BS279.3001,BC0.0000
TR,OP294,FP295,AR265.09050,ZE88.39100,SD314.259,--NAIL SET
OC,OP295,N 1110015.4185,E 1742655.1741,EL605.466,--NAIL SET
BK,OP295,BP294,BS4.3906,BC0.0000
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TR,OP295,FP296,AR130.34050,ZE93.31250,SD453.592,--NAIL SET
OC,OP296,N 1109694.0621,E 1742974.0763,EL577.589,--NAIL SET
BK,OP296,BP295,BS315.1311,BC0.0000
TR,OP296,FP297,AR107.09050,ZE84.58550,SD338.810,--NAIL SET
OC,OP297,N 1109850.5812,E 1743273.1009,EL607.224,--NAIL SET
BK,OP297,BP296,BS242.2216,BC0.0000
TR,OP297,FP298,AR160.14000,ZE75.08350,SD415.933,--NAIL SET
OC,OP298,N 1110146.4922,E 1743545.2464,EL713.872,--NAIL SET
BK,OP298,BP297,BS222.3616,BC0.0000
TR,OP298,FP299,AR217.23050,ZE87.12150,SD197.603,--NAIL SET
OC,OP299,N 1110180.8018,E 1743739.6092,EL723.511,--NAIL SET
BK,OP299,BP298,BS259.5921,BC0.0000
TR,OP299,FP300,AR246.00050,ZE87.00500,SD400.291,--NAIL SET
OC,OP300,N 1109849.4334,E 1743963.2004,EL744.363,--NAIL SET
BK,OP300,BP299,BS325.5926,BC0.0000
TR,OP300,FP301,AR114.09050,ZE85.03200,SD635.012,--NAIL SET
OC,OP301,N 1109957.7490,E 1744586.5080,EL799.095,--NAIL SET
BK,OP301,BP300,BS260.0831,BC0.0000
TR,OP301,FP302,AR135.30200,ZE90.23050,SD256.398,--NAIL SET
OC,OP302,N 1110166.0982,E 1744735.9322,EL797.373,--NAIL SET
BK,OP302,BP301,BS215.3851,BC0.0000
TR,OP302,FP303,AR156.50300,ZE91.54350,SD276.765,--NAIL SET
OC,OP303,N 1110436.1641,E 1744795.7503,EL788.150,--NAIL SET
BK,OP303,BP302,BS192.2921,BC0.0000
TR,OP303,FP304,AR249.01150,ZE89.04200,SD555.736,--NAIL SET
OC,OP304,N 1110518.2014,E 1745345.3241,EL797.149,--NAIL SET
BK,OP304,BP303,BS261.3036,BC0.0000
TR,OP304,FP305,AR238.53050,ZE90.52300,SD482.112,--NAIL SET
OC,OP305,N 1110146.7999,E 1745652.6329,EL789.786,--NAIL SET
BK,OP305,BP304,BS320.2341,BC0.0000
TR,OP305,FP306,AR207.42400,ZE90.29250,SD439.768,--NAIL SET
OC,OP306,N 1109716.4896,E 1745743.2686,EL786.023,--NAIL SET
BK,OP306,BP305,BS348.0621,BC0.0000
TR,OP306,FP307,AR122.37250,ZE90.24450,SD422.043,--NAIL SET
OC,OP307,N 1109567.1098,E 1746137.9795,EL782.985,--NAIL SET
BK,OP307,BP306,BS290.4346,BC0.0000
TR,OP307,FP308,AR206.36350,ZE86.48250,SD363.547,--NAIL SET
OC,OP308,N 1109300.1808,E 1746383.9577,EL803.235,--NAIL SET
BK,OP308,BP307,BS317.2021,BC0.0000
SS,OP308,FP309,AR19.50000,ZE91.45450,SD272.681,--SW OF A39-1
SS,OP308,FP310,AR115.24550,ZE90.05250,SD646.508,--SE OF A39-2
OC,OP202,N 1112746.5399,E 1753892.8601,EL820.522,--NAIL SET
BK,OP202,BP201,BS19.0646,BC0.0000
SS,OP202,FP311,AR1.48200,ZE89.48450,SD659.483,--NAIL SET
SS,OP202,FP312,AR1.18150,ZE89.52200,SD910.523,--NAIL SET
SS,OP202,FP313,AR1.01300,ZE89.53450,SD1225.258,--NAIL SET
OC,OP311,N 1113362.5529,E 1754128.3196,EL822.681,--NAIL SET
BK,OP311,BP201,BS18.2751,BC0.0000
SS,OP311,FP314,AR316.05100,ZE90.39100,SD97.429,--NE OF 86-2
OC,OP312,N 1113599.8602,E 1754210.4959,EL822.553,--NAIL SET
BK,OP312,BP201,BS18.2147,BC0.0000
SS,OP312,FP315,AR255.43200,ZE92.20150,SD225.542,--SE OF 86-1
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OC,OP313,N 1113896.8922,E 1754314.6917,EL822.750,--NAIL SET
BK,OP313,BP201,BS18.0724,BC0.0000
SS,OP313,FP316,AR277.33450,ZE90.24550,SD74.140,--SE OF 86-3
OC,OP308,N 1109300.1808,E 1746383.9577,EL803.235,--NAIL SET
K,OP308,BP307,BS317.2021,BC0.0000
TR,OP308,FP317,AR124.57400,ZE91.32150,SD346.250,--NAIL SET
OC,OP317,N 1109346.5557,E 1746726.9623,EL793.944,--NAIL SET
BK,OP317,BP308,BS262.1801,BC0.0000
SS,OP317,FP318,AR271.04100,ZE89.08400,SD164.241,--MON. CROFT-15
SP,PN319,N 1109174.0660,E 1746738.6949,EL710.8429,--CALL COORDS CC15
OC,OP202,N 1112746.5399,E 1753892.8601,EL820.522,--NAIL SET
BK,OP202,BP201,BS19.0646,BC0.0000
LS,HI5.200,HR5.340
TR,OP202,FP320,AR42.51300,ZE90.38450,SD148.869,--NW OF 43-1
OC,OP320,N 1112816.4913,E 1754024.2601,EL818.704,--NW OF 43-1
BK,OP320,BP202,BS241.5816,BC0.0000
OC,OP202,N 1112746.5399,E 1753892.8601,EL820.522,--NAIL SET
BK,OP202,BP201,BS19.0646,BC0.0000
TR,OP202,FP321,AR181.27000,ZE90.53050,SD476.337,--NAIL SET
OC,OP321,N 1112300.6048,E 1753725.5738,EL813.027,--NAIL SET
BK,OP321,BP202,BS20.3346,BC0.0000
SS,OP321,FP322,AR11.27500,ZE88.20200,SD158.752,--NW OF 44-1
SS,OP321,FP323,AR154.21550,ZE89.21050,SD113.626,--SW OF 44-2
OC,OP193,N 1120531.7265,E 1737961.6064,EL697.955,--NAIL SET
BK,OP193,BP191,BS240.5016,BC0.0000
LS,HI5.200,HR5.340
TR,OP193,FP324,AR107.07200,ZE91.08150,SD211.363,--SE OF A5-1
OC,OP193,N 1120531.7265,E 1737961.6064,EL697.955,--NAIL SET
BK,OP193,BP191,BS240.5016,BC0.0000
TR,OP193,FP324,AR107.07200,ZE91.08150,SD211.363,--SE OF A5-1
OC,OP193,N 1120531.7265,E 1737961.6064,EL697.955,--NAIL SET
BK,OP193,BP191,BS240.5016,BC0.0000
LS,HI5.200,HR5.340
TR,OP193,FP324,AR287.03300,ZE91.54150,SD499.700,--NAIL SET
OC,OP324,N 1120043.4054,E 1738066.3293,EL681.211,--NAIL SET
BK,OP324,BP193,BS347.5346,BC0.0000
SS,OP324,FP325,AR77.48000,ZE85.58200,SD780.042,--NAIL SET
TR,OP324,FP326,AR158.26150,ZE89.05200,SD479.248,--NAIL SET
OC,OP326,N 1119644.5882,E 1738331.9708,EL688.691,--NAIL SET
BK,OP326,BP324,BS326.2001,BC0.0000
TR,OP326,FP327,AR95.37300,ZE88.55100,SD497.710,--NAIL SET
OC,OP327,N 1119878.5257,E 1738771.1751,EL697.937,--NAIL SET
BK,OP327,BP326,BS241.5731,BC0.0000
SS,OP327,FP328,AR161.04100,ZE89.23450,SD82.014,--SE OF 90-1
OC,OP325,N 1120363.6609,E 1738775.4837,EL735.861,--NAIL SET
BK,OP325,BP324,BS245.4146,BC0.0000
TR,OP325,FP329,AR162.55450,ZE86.40150,SD643.482,--NAIL SET
OC,OP329,N 1120788.2735,E 1739257.5384,EL773.089,--NAIL SET
BK,OP329,BP325,BS228.3731,BC0.0000
SS,OP329,FP330,AR197.59350,ZE87.26550,SD123.094,--NW OF 92-1
SS,OP329,FP331,AR80.33300,ZE93.03350,SD325.508,--SE OF 91-1
OC,OP186,N 1112085.3864,E 1744637.1418,EL694.059,--NAIL SET
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BK,OP186,BP185,BS91.4025,BC0.0000
LS,HI5.200,HR5.340
TR,OP186,FP332,AR103.30000,ZE88.45300,SD158.215,--NAIL SET
OC,OP332,N 1111932.7231,E 1744595.7396,EL697.348,--NAIL SET
BK,OP332,BP186,BS15.1025,BC0.0000
TR,OP332,FP333,AR158.05100,ZE86.53150,SD334.929,--NAIL SET
OC,OP333,N 1111600.5996,E 1744634.9918,EL715.393,--NAIL SET
BK,OP333,BP332,BS353.1535,BC0.0000
SS,OP333,FP334,AR335.23250,ZE91.24100,SD95.694,--NW OF 2
SS,OP333,FP335,AR170.00050,ZE87.34050,SD208.319,--NAIL SET
SS,OP333,FP336,AR238.30100,ZE85.31400,SD260.965,--NW OF 3
TR,OP333,FP337,AR248.02500,ZE85.49150,SD162.240,--NAIL SET
OC,OP337,N 1111522.9125,E 1744493.0526,EL727.077,--NAIL SET
BK,OP337,BP333,BS61.1825,BC0.0000
SS,OP337,FP338,AR40.04300,ZE87.59500,SD348.242,--SW OF 4
TR,OP337,FP339,AR263.19150,ZE87.33500,SD138.002,--NAIL SET
OC,OP339,N 1111635.3388,E 1744413.2374,EL732.802,--NAIL SET
BK,OP339,BP337,BS144.3740,BC0.0000
TR,OP339,FP340,AR77.14500,ZE86.52200,SD202.385,--NAIL SET
OC,OP340,N 1111484.8669,E 1744278.3451,EL743.705,--NAIL SET
BK,OP340,BP339,BS41.5230,BC0.0000
TR,OP340,FP341,AR192.37500,ZE88.40000,SD144.941,--NAIL SET
OC,OP341,N 1111400.7334,E 1744160.3702,EL746.938,--NAIL SET
BK,OP341,BP340,BS54.3020,BC0.0000
SS,OP341,FP342,AR141.12400,ZE87.30500,SD267.065,--NW OF 74-1
OC,OP333,N 1111600.5996,E 1744634.9918,EL715.393,--NAIL SET
BK,OP333,BP332,BS353.1535,BC0.0000
TR,OP333,FP343,AR233.58150,ZE86.24000,SD166.752,--NAIL SET
OC,OP343,N 1111487.5901,E 1744512.8220,EL725.724,--NAIL SET
BK,OP343,BP333,BS47.1350,BC0.0000
TR,OP343,FP344,AR89.21300,ZE88.58300,SD273.829,--NAIL SET
OC,OP344,N 1111288.7013,E 1744700.9750,EL730.482,--NAIL SET
BK,OP344,BP343,BS316.3520,BC0.0000
SS,OP344,FP345,AR282.39250,ZE89.02550,SD76.047,--SW OF 74-4
OC,OP275,N 1116800.1591,E 1738064.7939,EL638.247,--NAIL SET
BK,OP275,BP274,BS230.1600,BC0.0000
TR,OP275,FP346,AR173.30350,ZE94.19250,SD179.141,--NAIL SET
OC,OP346,N 1116929.1386,E 1738188.3794,EL624.602,--NAIL SET
BK,OP346,BP275,BS223.4635,BC0.0000
TR,OP346,FP347,AR266.24200,ZE88.00400,SD199.039,--NAIL SET
OC,OP347,N 1116800.7923,E 1738340.3532,EL631.370,--NAIL SET
BK,OP347,BP346,BS310.1055,BC0.0000
TR,OP347,FP348,AR182.22150,ZE94.24400,SD181.829,--NAIL SET
SP,PN333,N 1111600.5996,E 1744634.9918,EL715.3932,--NAIL AT SW OF 1
SP,PN333,N 1111600.5996,E 1744634.9918,EL715.3932,--NAIL AT SW A31-1
SP,PN334,N 1111682.2983,E 1744585.2205,EL712.9106,--NW COR. A31-2
SP,PN336,N 1111439.5743,E 1744430.6404,EL735.6021,--SW COR. 74-2
SP,PN338,N 1111454.2295,E 1744834.2373,EL739.1069,--SW OF 74-3
OC,OP47,N 1110950.8910,E 1770287.9720,EL694.900,--HAIL SET
BK,OP47,BP46,BS194.0915,BC0.0000
OC,OP47,N 1110950.8910,E 1770287.9720,EL694.900,--HAIL SET
BK,OP47,BP46,BS194.0915,BC0.0000
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LS,HI5.200,HR5.340
SS,OP47,FP349,AR193.43200,ZE89.27050,SD311.871,--SE OF 88-2
OC,OP318,N 1109183.4314,E 1746745.9241,EL796.397,--MON. CROFT-15
BK,OP318,BP317,BS353.2211,BC0.0000
[illegible],OP318,FP350,AR66.20500,ZE89.13050,SD229.124,--NW OF A39-2
[illegible],OP244,N 1108095.3031,E 1741356.8055,EL778.173,--NAIL SET
BK,OP244,BP243,BS354.0302,BC0.0000
TR,OP244,FP351,AR125.15250,ZE91.34100,SD931.563,--NAIL SET
OC,OP351,N 1107639.4765,E 1742168.8282,EL752.519,--NAIL SET
BK,OP351,BP244,BS299.1827,BC0.0000
TR,OP351,FP352,AR222.19450,ZE87.58200,SD317.312,--NAIL SET
OC,OP352,N 1107338.5112,E 1742268.7319,EL763.606,--NAIL SET
BK,OP352,BP351,BS341.3812,BC0.0000
TR,OP352,FP353,AR202.48200,ZE89.23000,SD357.454,--NAIL SET
OC,OP353,N 1106982.1517,E 1742241.0470,EL767.313,--NAIL SET
BK,OP353,BP352,BS4.2632,BC0.0000
TR,OP353,FP354,AR124.44400,ZE91.12000,SD381.559,--NAIL SET
OC,OP354,N 1106741.1167,E 1742536.7251,EL759.183,--NAIL SET
BK,OP354,BP353,BS309.1112,BC0.0000
TR,OP354,FP355,AR154.53000,ZE90.45350,SD663.945,--NAIL SET
OC,OP355,N 1106579.7205,E 1743180.6946,EL750.239,--NAIL SET
BK,OP355,BP354,BS284.0412,BC0.0000
TR,OP355,FP356,AR215.23450,ZE89.25500,SD402.938,--NAIL SET
OC,OP356,N 1106273.4951,E 1743442.5514,EL754.104,--NAIL SET
BK,OP356,BP355,BS319.2757,BC0.0000
TR,OP356,FP357,AR171.41500,ZE90.42450,SD469.327,--NAIL SET
OC,OP357,N 1105964.6057,E 1743795.8517,EL748.128,--NAIL SET
BK,OP357,BP356,BS311.0947,BC0.0000
TR,OP357,FP358,AR102.20450,ZE90.17100,SD356.008,--NAIL SET
OC,OP358,N 1106176.3201,E 1744082.0607,EL746.210,--NAIL SET
[illegible],OP358,BP357,BS233.3032,BC0.0000
[illegible],OP358,FP359,AR176.40050,ZE92.16350,SD212.914,--NAIL SET
OC,OP359,N 1106312.5665,E 1744245.4552,EL737.613,--NAIL SET
BK,OP359,BP358,BS230.1037,BC0.0000
TR,OP359,FP360,AR157.24200,ZE93.57250,SD493.764,--NAIL SET
OC,OP360,N 1106749.1683,E 1744473.5358,EL703.400,--NAIL SET
BK,OP360,BP359,BS207.3457,BC0.0000
TR,OP360,FP361,AR181.08550,ZE91.36450,SD333.995,--NAIL SET
OC,OP361,N 1107041.9275,E 1744634.0237,EL693.861,--NAIL SET
BK,OP361,BP360,BS208.4352,BC0.0000
SS,OP361,FP362,AR188.23000,ZE92.21100,SD232.835,--SW OF 19-1
OC,OP326,N 1119644.5882,E 1738331.9708,EL688.691,--NAIL SET
BK,OP326,BP324,BS326.2001,BC0.0000
TR,OP326,FP363,AR192.59350,ZE90.50450,SD1340.443,--NAIL SET
OC,OP363,N 1118390.5962,E 1738805.1515,EL668.764,--NAIL SET
BK,OP363,BP326,BS339.1936,BC0.0000
TR,OP363,FP364,AR164.34150,ZE87.19000,SD592.673,--NAIL SET
OC,OP364,N 1117912.2635,E 1739153.9914,EL696.370,--NAIL SET
BK,OP364,BP363,BS323.5351,BC0.0000
SS,OP364,FP365,AR87.50400,ZE85.01150,SD221.282,--NW OF 80-1
TR,OP364,FP366,AR84.15250,ZE85.26250,SD134.054,--NAIL SET
OC,OP366,N 1118001.4115,E 1739253.5381,EL706.887,--NAIL SET
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BK,OP366,BP364,BS228.0916,BC0.0000
TR,OP366,FP367,AR212.39400,ZE89.09200,SD253.772,--NAIL SET
SP,PN365,N 1118048.7656,E 1739327.0926,EL715.4360,--NW OF 89-1
OC,OP367,N 1118041.9130,E 1739504.0293,EL710.487,--NAIL SET
BK,OP367,BP366,BS260.4856,BC0.0000
TR,OP367,FP368,AR218.26050,ZE92.58050,SD84.898,--NAIL SET
OC,OP368,N 1118000.4855,E 1739578.0030,EL705.951,--NAIL SET
BK,OP368,BP367,BS299.1501,BC0.0000
SS,OP368,FP369,AR217.57250,ZE99.47450,SD79.586,--NW OF 89-2
OC,OP348,N 1116678.1908,E 1738473.9013,EL617.245,--NAIL SET
BK,OP348,BP347,BS312.3310,BC0.0000
TR,OP348,FP370,AR238.06250,ZE84.58450,SD245.795,--NAIL SET
OC,OP370,N 1116437.5645,E 1738428.6090,EL638.616,--NAIL SET
BK,OP370,BP348,BS10.3935,BC0.0000
SS,OP370,FP371,AR146.48050,ZE96.01250,SD263.021,--NW OF A2-1
OC,OP215,N 1107734.6805,E 1753388.7925,EL795.323,--NAIL SET
BK,OP215,BP214,BS9.0421,BC0.0000
LS,HI5.200,HR5.340
TR,OP215,FP372,AR172.00200,ZE89.09550,SD529.489,--NAIL SET
OC,OP372,N 1107205.3415,E 1753378.8306,EL802.896,--NAIL SET
BK,OP372,BP215,BS1.0441,BC0.0000
TR,OP372,FP373,AR181.23100,ZE91.23300,SD715.142,--NAIL SET
OC,OP373,N 1106491.0716,E 1753348.0912,EL785.388,--NAIL SET
BK,OP373,BP372,BS2.2751,BC0.0000
TR,OP373,FP374,AR271.50250,ZE92.48400,SD183.614,--NAIL SET
OC,OP374,N 1106504.8366,E 1753165.2155,EL776.243,--NAIL SET
BK,OP374,BP373,BS94.1816,BC0.0000
TR,OP374,FP375,AR160.11300,ZE97.30350,SD263.191,--NAIL SET
OC,OP375,N 1106435.0885,E 1752913.7766,EL741.705,--NAIL SET
BK,OP375,BP374,BS74.2946,BC0.0000
TR,OP375,FP376,AR215.01550,ZE97.32450,SD241.779,--NAIL SET
OC,OP376,N 1106515.2081,E 1752687.8787,EL709.815,--NAIL SET
BK,OP376,BP375,BS109.3141,BC0.0000
TR,OP376,FP377,AR152.31250,ZE99.33450,SD408.736,--NAIL SET
OC,OP377,N 1106459.4741,E 1752288.6941,EL641.774,--NAIL SET
BK,OP377,BP376,BS82.0306,BC0.0000
TR,OP377,FP378,AR156.57400,ZE96.07100,SD413.296,--NAIL SET
OC,OP378,N 1106247.9030,E 1751936.4014,EL597.576,--NAIL SET
BK,OP378,BP377,BS59.0046,BC0.0000
TR,OP378,FP379,AR202.00300,ZE92.35050,SD309.202,--NAIL SET
OC,OP379,N 1106199.6952,E 1751631.2990,EL583.492,--NAIL SET
BK,OP379,BP378,BS81.0116,BC0.0000
TR,OP379,FP380,AR174.35000,ZE80.47050,SD396.301,--NAIL SET
OC,OP380,N 1106102.4412,E 1751252.3950,EL646.818,--NAIL SET
BK,OP380,BP379,BS75.3616,BC0.0000
TR,OP380,FP381,AR221.45450,ZE78.52000,SD180.455,--NAIL SET
OC,OP381,N 1106183.8332,E 1751095.1525,EL681.522,--NAIL SET
BK,OP381,BP380,BS117.2201,BC0.0000
SS,OP381,FP382,AR191.15350,ZE92.12450,SD230.717,--SW OF 45-1
OC,OP224,N 1122687.7341,E 1747186.1608,EL746.010,--NAIL SET
BK,OP224,BP51,BS138.0526,BC0.0000
SS,OP224,FP383,AR93.25350,ZE91.20500,SD330.401,--NW OF A33-2
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OC,OP88,N 1115974.1622,E 1770694.3688,EL832.425,--NAIL-HARDEES
BK,OP88,BP89,BS16.4204,BC0.0000
TR,OP88,FP384,AR266.23350,ZE90.42000,SD440.420,--NAIL SET
OC,OP384,N 1116073.9321,E 1770265.4320,EL826.905,--NAIL SET
BK,OP384,BP88,BS103.0539,BC0.0000
TR,OP384,FP385,AR188.02350,ZE90.13200,SD3630.529,--NAIL SET
OC,OP384,N 1116073.9321,E 1770265.4320,EL826.905,--NAIL SET
BK,OP384,BP88,BS103.0539,BC0.0000
SS,OP384,FP386,AR1.22350,ZE89.25450,SD435.532,--SCGS MON. 42 292
OC,OP385,N 1117383.0953,E 1766879.1901,EL812.684,--NAIL SET
BK,OP385,BP384,BS111.0814,BC0.0000
TR,OP385,FP387,AR176.32350,ZE89.04200,SD616.452,--NAIL SET
OC,OP387,N 1117570.2894,E 1766291.9322,EL822.525,--NAIL SET
BK,OP387,BP385,BS107.4049,BC0.0000
TR,OP387,FP388,AR184.30550,ZE89.34200,SD2102.443,--SE OF 15-1
OC,OP46,N 1110338.3570,E 1770133.4990,EL689.812,--NAIL SET
BK,OP46,BP47,BS14.0915,BC0.0000
LS,HI5.200,HR5.340
TR,OP46,FP389,AR162.36050,ZE91.31400,SD729.086,--NAIL SET
OC,OP389,N 1109610.6984,E 1770174.7484,EL670.233,--NAIL SET
BK,OP389,BP46,BS356.4520,BC0.0000
TR,OP389,FP390,AR195.15500,ZE87.17500,SD1274.102,--NAIL SET
OC,OP390,N 1108365.9145,E 1769909.7212,EL730.174,--NAIL SET
BK,OP390,BP389,BS12.0110,BC0.0000
TR,OP390,FP391,AR171.00500,ZE92.11100,SD1011.726,--NAIL SET
OC,OP391,N 1107356.3413,E 1769856.2238,EL691.441,--NAIL SET
BK,OP391,BP390,BS3.0160,BC0.0000
TR,OP391,FP392,AR272.24200,ZE90.12250,SD718.065,--NAIL SET
OC,OP392,N 1107424.4012,E 1769141.3962,EL688.707,--NAIL SET
BK,OP392,BP391,BS95.2620,BC0.0000
TR,OP392,FP393,AR202.30050,ZE86.50300,SD248.597,--NAIL SET
OC,OP393,N 1107540.7044,E 1768922.1100,EL702.264,--NAIL SET
BK,OP393,BP392,BS117.5625,BC0.0000
TR,OP393,FP394,AR196.58500,ZE87.14350,SD386.279,--NAIL SET
OC,OP394,N 1107813.1513,E 1768648.9087,EL720.703,--NAIL SET
BK,OP394,BP393,BS134.5515,BC0.0000
SS,OP394,FP395,AR123.27200,ZE87.51500,SD155.780,--NE OF A16-1
SS,OP394,FP396,AR19.22250,ZE88.52150,SD148.475,--NE OF A16-2
OC,OP131,N 1119191.6899,E 1752742.3432,EL761.326,--NAIL SET
BK,OP131,BP130,BS291.1006,BC0.0000
TR,OP131,FP397,AR238.55400,ZE91.25200,SD283.809,--NAIL SET
OC,OP397,N 1118912.1964,E 1752791.1417,EL754.142,--NAIL SET
BK,OP397,BP131,BS350.0546,BC0.0000
TR,OP397,FP398,AR229.31300,ZE89.35150,SD1065.012,--NAIL SET
OC,OP398,N 1118091.8631,E 1752111.9914,EL761.669,--NAIL SET
BK,OP398,BP397,BS39.3716,BC0.0000
SS,OP398,FP399,AR297.53250,ZE89.35250,SD254.558,--NAIL SET
OC,OP399,N 1118327.0576,E 1752014.6259,EL763.350,--NAIL SET
BK,OP399,BP398,BS157.3041,BC0.0000
SS,OP399,FP400,AR229.55250,ZE90.51250,SD188.628,--NE OF A29-1
SS,OP399,FP401,AR57.06000,ZE91.00300,SD61.414,--SE OF A29-2
OC,OP326,N 1119644.5882,E 1738331.9708,EL688.691,--NAIL SET
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BK,OP326,BP324,BS326.2001,BC0.0000
TR,OP326,FP402,AR208.27250,ZE92.59550,SD178.564,--NAIL SET
OC,OP402,N 1119467.0052,E 1738348.1621,EL679.210,--NAIL SET
BK,OP402,BP326,BS354.4725,BC0.0000
SS,OP402,FP403,AR252.11450,ZE99.02400,SD138.782,--NE OF 80-1
OC,OP178,N 1112350.4745,E 1745638.5956,EL758.114,--NAIL SET
BK,OP178,BP177,BS349.5140,BC0.0000
LS,HI5.200,HR5.340
SS,OP178,FP404,AR171.28550,ZE89.06100,SD368.747,--NE OF A32-1
SS,OP178,FP405,AR148.25150,ZE88.28050,SD343.230,--NE OF A32-2
TR,OP178,FP406,AR178.13550,ZE89.49500,SD455.044,--NAIL SET
OC,OP406,N 1111905.2232,E 1745732.4812,EL759.320,--NAIL SET
BK,OP406,BP178,BS348.0535,BC0.0000
SS,OP406,FP407,AR216.58100,ZE89.05450,SD225.695,--SW OF A32-3
SS,OP406,FP408,AR182.10250,ZE91.19550,SD431.156,--NE OF A32-4
OC,OP284,N 1113291.6021,E 1770901.4149,EL812.528,--NAIL SET
BK,OP284,BP283,BS186.5029,BC0.0000
TR,OP284,FP409,AR200.03500,ZE89.52100,SD381.537,--NAIL SET
OC,OP409,N 1113631.8394,E 1771074.0658,EL813.258,--NAIL SET
BK,OP409,BP284,BS206.5419,BC0.0000
TR,OP409,FP410,AR187.49250,ZE90.10500,SD1113.813,--NAIL SET
OC,OP410,N 1114547.2308,E 1771708.5936,EL809.608,--NAIL SET
BK,OP410,BP409,BS214.4344,BC0.0000
SS,OP410,FP411,AR230.48500,ZE87.42150,SD330.353,--SW OF 17-1
OC,OP224,N 1122687.7341,E 1747186.1608,EL746.010,--NAIL SET
BK,OP224,BP51,BS138.0526,BC0.0000
TR,OP224,FP412,AR167.02050,ZE89.23350,SD1739.580,--NAIL SET
OC,OP412,N 1123688.5757,E 1745763.4468,EL764.297,--NAIL SET
BK,OP412,BP224,BS125.0731,BC0.0000
SS,OP412,FP413,AR173.50550,ZE89.11000,SD2049.111,--MON. CROFT 2
TR,OP412,FP414,AR87.24500,ZE89.25450,SD647.073,--NAIL SET
OC,OP414,N 1123143.1053,E 1745415.4182,EL770.604,--NAIL SET
BK,OP414,BP412,BS32.3221,BC0.0000
TR,OP414,FP415,AR169.48400,ZE92.22300,SD676.683,--NAIL SET
OC,OP415,N 1122517.7952,E 1745158.3173,EL742.422,--NAIL SET
BK,OP415,BP414,BS22.2101,BC0.0000
TR,OP415,FP416,AR248.48450,ZE88.20100,SD476.269,--NAIL SET
OC,OP416,N 1122527.4568,E 1744682.3472,EL756.111,--NAIL SET
BK,OP416,BP415,BS91.0946,BC0.0000
TR,OP416,FP417,AR211.42300,ZE93.24200,SD832.248,--NAIL SET
OC,OP417,N 1122978.3638,E 1743984.5825,EL706.533,--NAIL SET
BK,OP417,BP416,BS122.5216,BC0.0000
TR,OP417,FP418,AR76.13300,ZE89.22400,SD634.127,--NAIL SET
OC,OP418,N 1122379.1678,E 1743777.1367,EL713.279,--NAIL SET
BK,OP418,BP417,BS19.0546,BC0.0000
TR,OP418,FP419,AR242.08400,ZE91.01350,SD519.127,--NAIL SET
OC,OP419,N 1122300.1254,E 1743264.1468,EL703.840,--NAIL SET
BK,OP419,BP418,BS81.1426,BC0.0000
SS,OP419,FP420,AR188.30050,ZE89.01400,SD490.551,--SE OF 29-1
SP,PN52,N 1115137.63600,E 1742037.66210,EL738.242,--NAIL SET
SP,PN52,N 1115137.63600,E 1742037.66210,EL738.242,--NAIL SET
SP,PN53,N 1115130.98930,E 1741976.62030,EL736.959,--SE COR GRID 64-2
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SP,PN54,N 1115121.67940,E 1741877.57320,EL729.865,--SW COR GRID 64-2
SP,PN55,N 1115125.69770,E 1741977.40230,EL737.129,--NAIL SET
SP,PN56,N 1115095.82040,E 1742072.52420,EL736.833,--NW COR GRID 64-1
SP,PN57,N 1115077.32610,E 1742220.97990,EL737.292,--NAIL SET
SP,PN58,N 1115115.56020,E 1742275.40040,EL737.922,--SW GRID 38b-1

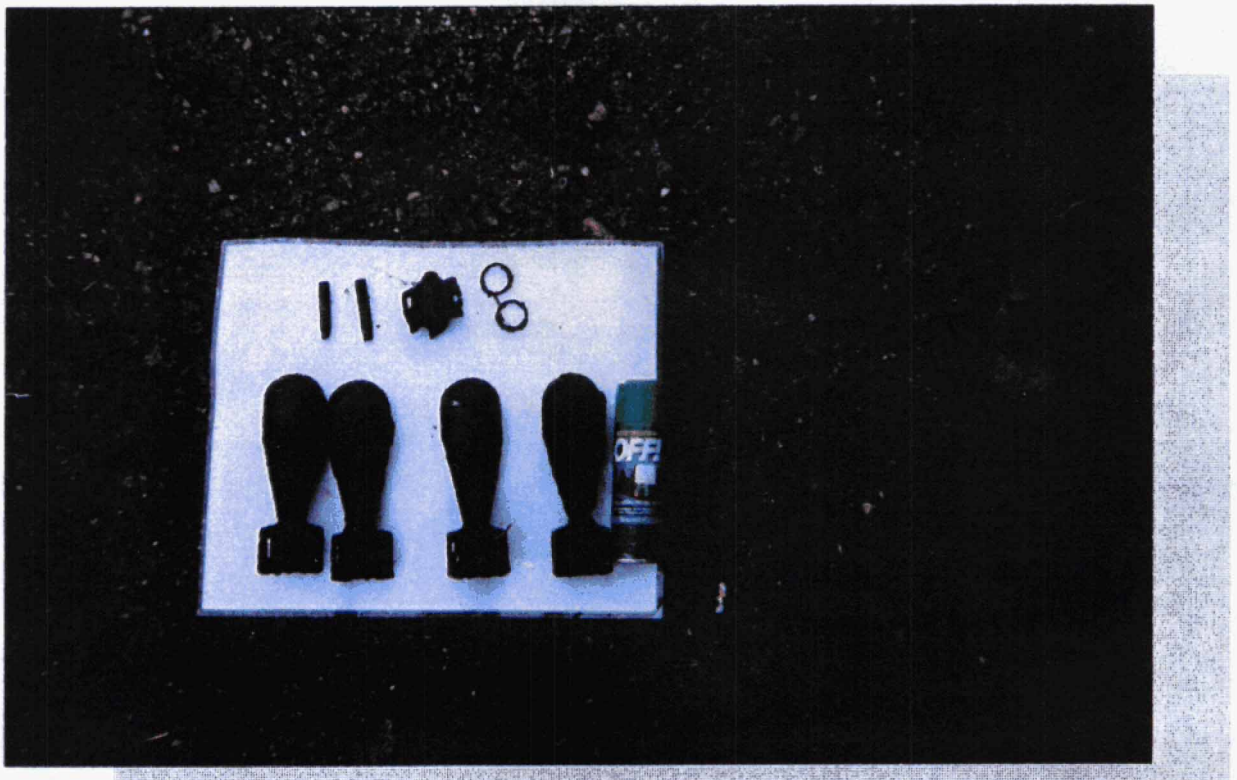
Appendix C

Photographs

PHOTOGRAPH NO. S-30
Site A3-1 2.36" Rocket

PHOTOGRAPH NO. S-12
Site 18 - Use of 2 Blast Boxes to Reduce Safe Distance Requirements

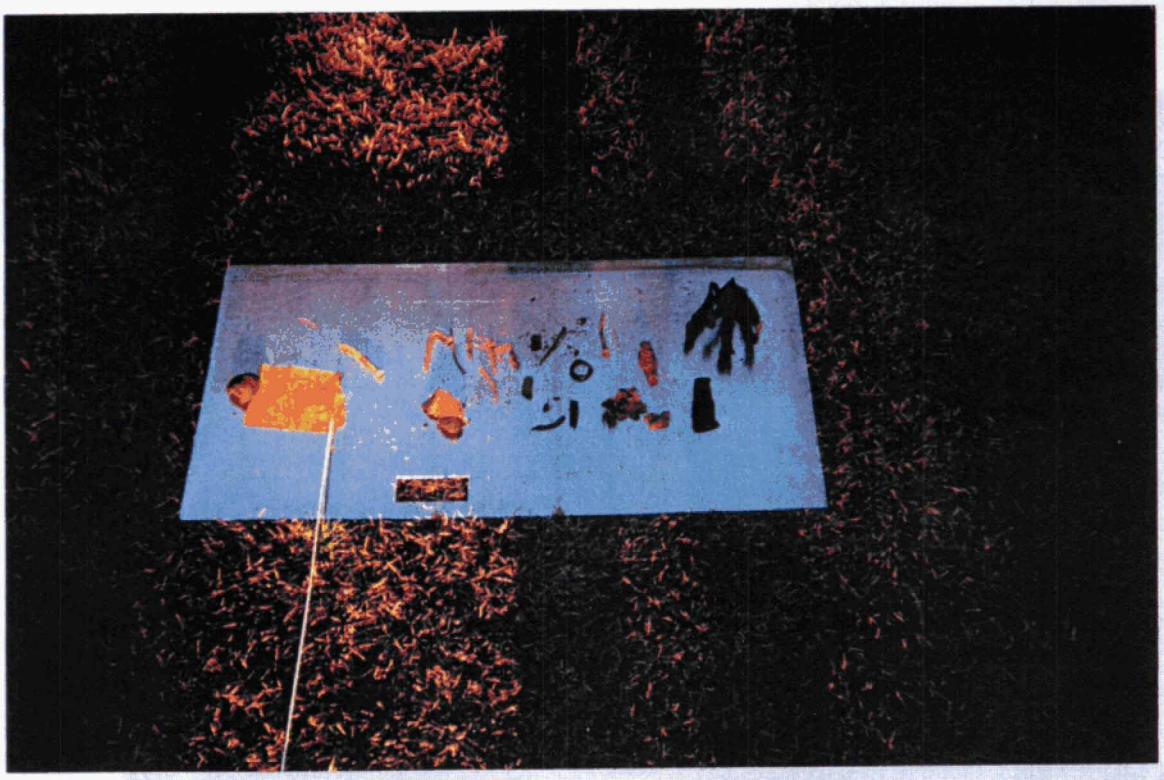
PHOTOGRAPH NO. S-67
Site 74-3 O.R.S. Recovered



PHOTOGRAPH NO. S-81
Site 86-3 O.R.S. Recovered

PHOTOGRAPH NO. M-18
Site 5-1 O.R.S. Recovered

PHOTOGRAPH NO. M-30
Site 71-G1 O.R.S. Recovered



PHOTOGRAPH NO. M-47
Site A34-002 O.R.S. Collected

PHOTOGRAPH NO. M-71
Site 56-1 M9 Rifle Grenade

PHOTOGRAPH NO. M-74
Site 67-1 Use of Blast Bunkers to Reduce Safety Distance

PHOTOGRAPH NO. M-102
Site 56-2 UXO

PHOTOGRAPH NO. M-105
Site 56-1 O.R.S. Recovered

PHOTOGRAPH NO. M-111
Site A31-1 U.X.O. Recovered, MK II

PHOTOGRAPH NO. M-112
Site A31-1 U.X.O. Recovered, M9A1

PHOTOGRAPH NO. M-126
Site A31-2 O.R.S. Recovered

Appendix D

UXO Accountability Logs, Ordnance Disposal Record, Ordnance-Related Scrap Release Form, and UXO Location Maps

UXO Accountability Logs

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
No 1	A3-1	02-12-97	3-4"	YES

ITEM DESCRIPTION:
2.36 INCH PRACTICE ROCKET

FUZE DESCRIPTION:
N/A

FUZE CONDITION:
N/A

COMMENTS/REMARKS:
UNKNOWN TYPE, UNTIL BLOWN THEN BLUE COLOR COULD BE SEEN ON BOTTOM.

ACTION TAKEN:
BLOWN IN PLACE/O.R.S. collected

SITE SUPER OR SR. UXO SUPER INTIALS: JW

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
No 2	A-32-2*	02-18-97	1-2"	YES

ITEM DESCRIPTION:
M 9 RIFLE GRENADE (OFF GRID)

FUZE DESCRIPTION:
Internal

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
H.E. A.T.

DISPOSITION/ACTION TAKEN:
BLOWN IN PLACE/ORS COLLECTED

SITE SUPER OR SR. UXO SUPER INTIALS: JW

* FOUND DIRECTLY ADJACENT TO GRID A32-2 (JUST OFF GRID)

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
WO 3	A-32-2	02-18-97	6"	YES

ITEM DESCRIPTION:
M 9 RIFLE GRENADE

FUZE DESCRIPTION:
Internal

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
H.E.A.T.

ACTION TAKEN: BLOWN IN PLACE ORS COLLECTED

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
NO 4	A-32-2	02-18-97	11"	YES

ITEM DESCRIPTION:
M 9 RIFLE GRENADE

FUZE DESCRIPTION:
Internal

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
H.E.A.T.

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE ORS COLLECTED

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
NO 5	A36-1	02-19-97	6"	YES

ITEM DESCRIPTION:
M 9 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
HEAT 0.5 CY

ACTION TAKEN:
BLOWN IN PLACE O.R.S. COMPLETE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
No. 6	A36-1	02-19-97	2"	YES

ITEM DESCRIPTION:
M9 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
~~HEAT~~ CY UNKNOWN

COMMENTS/REMARKS:
HEAT

DISPOSITION/ACTION TAKEN:
BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
NO 7	36-2	02-20-97	6	YES

ITEM DESCRIPTION:
M9A1 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
HEAT

ACTION TAKEN:
BLOW IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MM

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
8	56-1	02-24-97	3"	YES

ITEM DESCRIPTION:
M9A1 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKOWN

COMMENTS/REMARKS:
HEAT

DISPOSITION/ACTION TAKEN:
BLOWIN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MM

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
9	56-I	02-24-97	1"	YES

ITEM DESCRIPTION:
M11 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
SHOT - THEN DETERMINED IT WAS PRACTICE

ACTION TAKEN:
BLOW IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MW

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
10	56-I	02-24-97	0" SURFACE	YES

ITEM DESCRIPTION:
M9A1 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKNOWN

COMMENTS/REMARKS:
HEAT

DISPOSITION/ACTION TAKEN:
BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MW

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
11	A31-1	03-04-97	9"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MC

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
12	A31-1	03-04-97	9"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MC

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
13	A31-1	03-04-97	21"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MC

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
14	A31-1	03-04-97	18"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: MC

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
15	A31-1	03-04-97	-3"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
16	A31-1	03-04-97	21"	YES

ITEM DESCRIPTION: MK II HAND GRENADE

FUZE DESCRIPTION: EXTERNAL NO SPOON

FUZE CONDITION: ARMED

COMMENTS/REMARKS: H. E.

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
17	A31-1	03-04-97	14"	YES

ITEM DESCRIPTION:
MK II HAND GRENADE

FUZE DESCRIPTION:
EXTERNAL - SPOON MISSING

FUZE CONDITION:
ARMED

COMMENTS/REMARKS:
H. E

ACTION TAKEN:
BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
18	74-4	03-05-97	9"	YES

ITEM DESCRIPTION:
M9A1 RIFLE GRENADE

FUZE DESCRIPTION:
INTERNAL

FUZE CONDITION:
UNKWOWN

COMMENTS/REMARKS:
HEAT

DISPOSITION/ACTION TAKEN:
BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
19	74-4	03-05-97	6"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
20	74-4	03-05-97	9"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
21	74-4	03-05-97	8"	YES

ITEM DESCRIPTION: M9A1 Rifle GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
22	A31-2	03-05-97	7"	YES

ITEM DESCRIPTION: M9A1 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
23	A31-2	03-05-97	7"	YES

ITEM DESCRIPTION:

M9A1 FUZE + BOOSTER CUP

FUZE DESCRIPTION:

EXPO INTERNAL

FUZE CONDITION:

UNKNOWN

COMMENTS/REMARKS:

HE

ACTION TAKEN:

BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
24	A31-2	03-05-97	2"	YES

ITEM DESCRIPTION:

M9A1 RIFLE GRENADE

FUZE DESCRIPTION:

INTERNAL

FUZE CONDITION:

UNKNOWN

COMMENTS/REMARKS:

HEAT

DISPOSITION/ACTION TAKEN:

BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [illegible]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
25	A31-2	03-05-97	4"	YES

ITEM DESCRIPTION:

MK II HAND GRENADE

FUZE DESCRIPTION:

SPOON MISSING EXTERNAL

FUZE CONDITION:

ARMED

COMMENTS/REMARKS:

HE

ACTION TAKEN:

BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS:

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
26	A31-7	03-05-97	3"	YES

ITEM DESCRIPTION:

M9A1 RIFLE GRENADE

FUZE DESCRIPTION:

INTERNAL

FUZE CONDITION:

UNKNOWN

COMMENTS/REMARKS:

HEAT

DISPOSITION/ACTION TAKEN:

BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS:

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
27	A31-2	03-05-97	3"	YES

ITEM DESCRIPTION: M9A1 Fuze + Booster Cup

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HE

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [signature]

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
28	A31-2	03-05-97	5"	YES

ITEM DESCRIPTION: M6A3 2.36" Rocket

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

DISPOSITION/ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS: [signature]

UNEXPLODED ORDNANCE ACCOUNTABILITY LOG

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?
29	A10-2	03-19-97	4"	YES

ITEM DESCRIPTION: M9 RIFLE GRENADE

FUZE DESCRIPTION: INTERNAL

FUZE CONDITION: UNKNOWN

COMMENTS/REMARKS: HEAT

ACTION TAKEN: BLOWN IN PLACE

SITE SUPER OR SR. UXO SUPER INTIALS:

ORDNACE ID #	GRID #	DATE	DEPTH	PHOTO TAKEN?

ITEM DESCRIPTION:

FUZE DESCRIPTION:

FUZE CONDITION:

COMMENTS/REMARKS:

DISPOSITION/ACTION TAKEN:

SITE SUPER OR SR. UXO SUPER INTIALS:

Ordnance Disposal Record

ORDNANCE DISPOSAL RECORD: #1

GRID #	TYPE OF UXO ENCONTERED	SHOT #	AMOUNT OF TAMP	NOISE METER READING	EXPLO-SIVES USED	DIRECTION/ DISTANCE TO NEAREST BLDG.	COMMENTS
A 3 2 1	2.36" PRACTICE ROUND	1	3' SAND BAGS	78 AT FIRING POINT	2 Elect CAPS 10' DET CORD 2 shape CHARGES	~~EAST~~ WEST 1,200'	GOOD OPERATION
A 3 2 2 *	M 9 RIFLE GRENADE	2	3' SAND BAGS	83 AT FIRING POINT	2 Elect CAPS 10' DET CORD 1 shape charge	NORTH 200'	POLICE BLOCKED ROAD
A 3 2 2	M 9 RIFLE GRENADE	3	3' SAND BAGS	81 AT FIRING POINT	2 CAPS 10' DET CORD 1 SHAPE CHARGE	NORTH 800'	POLICE BLOCKED ROAD
A 3 2 2	M-9 RIFLE GRENADE	4	3' SAND BAGS	81 AT FIRING POINT	2 CAPS 10' DET CORD 1 SHAPE CHARGE	NORTH 800'	POLICE BLOCKED ROAD
~~A~~ 3 6 1	M-9 RIFLE GRENADE	5	3' SAN BAGS	78 AT FIRING POINT	2 CAPS 10' DET CORD 1 SHAPE CHARGE	NORTH 400'	GOOD OPERATION
~~A~~ 3 6 1	M-9 RIFLE GRENADE	6	3' SAN BAGS	81 AT FIRING POINT	2 CAPS 10' DET CORD 1 SHAPE CHARGE	NORTH 400' NORTH	GOOD OPERATION
~~A~~ 3 6 2	M9A1 RIFLE GRENADE	7	3' SAND BAGS	82 AT FIRING POINT	2 CAPS 10' DET CORD 1 SHAPE CHARGE	EAST 400'	GOOD OPERATION

* THIS UXO WAS ENCOUNTERED JUST OFF GRID ADJACENT TO GRID A32-2

ORDNANCE DISPOSAL RECORD: #2

GRID #	TYPE OF UXO ENCONTERED	SHOT #	AMOUNT OF TAMP	NOISE METER READING	EXPLO-SIVES USED	DIRECTION/ DISTANCE TO NEAREST BLDG.	COMMENTS
56/1	M9A1 RIFLE GRENADE	8	3' SAND BAGS	72	2 CAPS 4' DET CORD 1 SHAPE CHARGE	NE 400'	GOOD OPERATION
56/2	M11 RIFLE GRENADE PRACTICE	9	3' SAND BAGS	72	2 CAPS 4D. CORD 1 SHAPE CHARGE	NE 400'	GOOD OPERATION
56/2	M9A1 RIFLE GRENADE	10	3' SAND BAGS	76	2 CAPS 4'D CORD 1 SHAPE CHARGE	NE 350'	GOOD OPERATION
31/1	M9A1 2 EA RIFLE GRENADE	11	3' SAND BAG	82	4 CAP 6' DET CORD 2 SHAPE CHARGE	N 1000'	GOOD OP
31 1	M9A1 1 EA RIFLE GRENADE	12	3' SAND BAG	80	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	GOOD OP
31 1	M9A1 1 EA RIFLE GRENADE	13	3' SAND BAG	80	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	GOOD OP
31 1	M9A1 1 EA RIFLE GRENADE	14	3' SAND BAG	78	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	GOOD OP

ORDNANCE DISPOSAL RECORD: #3

GRID #	TYPE OF UXO ENCONTERED	SHOT #	AMOUNT OF TAMP	NOISE METER READING	EXPLO-SIVES USED	DIRECTION/ DISTANCE TO NEAREST BLDG.	COMMENTS
31 1	1 EA MK 2 HE GRENADE	15	3' SAND BAGS	76	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	GOOD OP D BE FROM ROAD
31 1	1 EA MK 2 HE GRENADE	16	3' SAND BAGS	78	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	GOOD OP D. BE FROM ROAD
74 4	1 EA M9A1 RIFLE GRENADE	17	3' SAND BAGS	45	2 CAPS 3' DET CORD 1 SHAPE CHARGE	NW 850'	D BE AT FIRING POINT
74 4	1 EA M9A1 RIFLE GRENADE	18	3' SAND BAG	60	2 CAPS 3' DET CORD 1 SHAPE CHARGE	NW 850'	D BE AT FIRING SITE
74 4	1 EA M9A1 RIFLE GRENADE	19	3' SAND BAGS	65	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N.W. 850'	D BE AT FIRING SITE
74 4	1 EA M9A1 RIFLE GRENADE	20	3' SAND BAGS	45	2 CAPS 3' DET CORD 1 SHAPE CHARGE	NW 850'	D BE AT FIRING SITE
~~31~~ 9 31 1	1 EA M9A1 RIFLE GRENADE 1 EA M9A1 BOOSTER CUP	21	3' SAND BAGS	74	4 CAPS 6' DET CORD 25/C	N 1000'	D BE FROM ROAD

ORDNANCE DISPOSAL RECORD: #4

GRID #	TYPE OF UXO ENCONTERED	SHOT #	AMOUNT OF TAMP	NOISE METER READING	EXPLO-SIVES USED	DIRECTION/ DISTANCE TO NEAREST BLDG.	COMMENTS
32 X 2	1 EA M9A1 RIFLE GRENADE	22	3' SAND BAGS	80	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	D.Ba FRM ROAD
31 X 2	1 EA MK II HAND GRENADE	23	3' SAND BAG	78	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	D Ba FRM ROAD
31 X 2	M9A1 1EA A-FLG GRENADE M9A1 1 EA BOOSTER CUP	24	3' SAND BAGS	78	4 CAPS 6' DET CORD 2 SHAPE CHARGE	N 1000'	D Ba FRM ROAD
31 X 2	1 EA M6A3 2.36" ROCKET	25	3' SAND BAGS	70	2 CAPS 3' DET CORD 1 SHAPE CHARGE	N 1000'	D. Ba FRM ROAD
A10 2	M9 RIFLE GRENADE 1 EA	26	3' SAND BAG	82	2 CAPS 4' DET CORD 1 SHAPE CHARGE	S.W. 1 MILE	D BA FRM FIRING POINT

Ordnance-Related Scrap Release Form

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
800 DAIRY RIDGE ROAD
SPARTANBURG, SOUTH CAROLINA 39302
TEL: (864) 577 0068
FAX: (864) 577 0066

I certify that the property listed below has been inspected by me, and to the best of my knowledge, contains no items of a dangerous nature.

Site Supervisor
Wayne Evans

03/25/97
Date

Item Inventory: 370 Pounds of Ordnance Related Scrap (ORS)

Grid Maps Showing UXOs

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

				Number of Anomalies per Lane
1	9	17	25	9
2	10	18	26	4
3	11	19	27	5
4	12	20	28	4
5	13	21	29	6
6	14	22	30	3
7	15	23	31	9
8	16	20	32	3
				4
				4
				51

GRID I.D. # 36-1

WEIGHT OF ORS 4 LB LBS

MAP ORIENTATION

WIND DIRECTION

1 SUBSURFACE UXO

2 SURFACE UXO

D DEMO LOCATION

FIRE SAFETY EQUIPMENT

PIT,TRENCHES, BUNKER, ETC.

RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

Total Number of Anomalies

NOTES. GRID A-36-1 USE SEQUENCE # 51

51 ANOMALIES TOTAL = 20.4 ROUNDED TO 21

SQUARE # 1 WAS M-9

SQUARE # 3 & 23 - RM X 2

SQUARE # 17 & M-9

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1 mARRS	9	17 2.36 cone	25
2 X	10	18	26
3 X	11	19 2.36 pointe	27 grenade grenade mARRS
4	12	20 mARRS	28 2.36 cone
5 X	13	21 mARRS X2	29
6 X	14	22 2.36 w/t body	30
7	15	23	31 X
8 BRAIDED WIRE	16 2.36 FIN	20	32 M9 A1 (1)

Number of Anomalies per Lane

8
6
3
2
7
5
5
6
3
3
1

Total Number of Anomalies: 48

GRID I.D. 26 2

WEIGHT OF ORS 6 LB LBS

MAP ORIENTATION

WIND DIRECTION

Photo direction ↑

(1) SUBSURFACE UXO

(2) SURFACE UXO

(D) DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

—— RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: A-36-2 USE SEQUENCE #52

48 Anomalies ≤10% = 19.2 Rand to 20

M9 A-1

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1	9 (1)	17 X	25 (1)
2 X	10 X	18	26 X
3	11	19	27
12 MGAA3 FRAG		20	28
5 X	13 X	21 X	29
6	14 X	22 X	30 X
7	15 X	23 X	31
8	16 X	24	32

↑ Photo direction

Number of Anomalies per Lane

3
1
5
9
7
9
0
5
2
1
43

GRID I.D. 56-1

LBS

WEIGHT OF ORS

MAP ORIENTATION

WIND DIRECTION

(1) SUBSURFACE UXO

(2) SURFACE UXO

Total Number of Anomalies

D DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

—— RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: Grid 56-1 sequence # 54

43 Anomalies + 40% = 17.2 Rounds to 18.

2 EA MG A3 Rounds

1 EA MG A3 Empty (Frag)

1 EA MG Combo

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1 X	9 X	17 (1) M1 A3 Burne Lth 2 Ballistic windshield	25
2	10	18	26 X
3 X	11	19	27
4	12 X	20	28 X
5	13	21	29
6 X	14 X	22 X	30
7 X	15 X	23 X	31
8	16 X	24 X	32

Number of Anomalies per Lane

1
3
3
3
3
2
2
5
3
2

Total Number of Anomalies 27

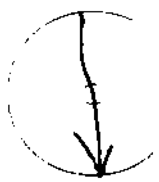
GRID I.D. SG-2

LBS WEIGHT OF ORS

MAP ORIENTATION

Photo Direction

WIND DIRECTION



(1) SUBSURFACE UXO

(2) SURFACE UXO

(D) DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

— RESTRICTED AREA BOUNDARY

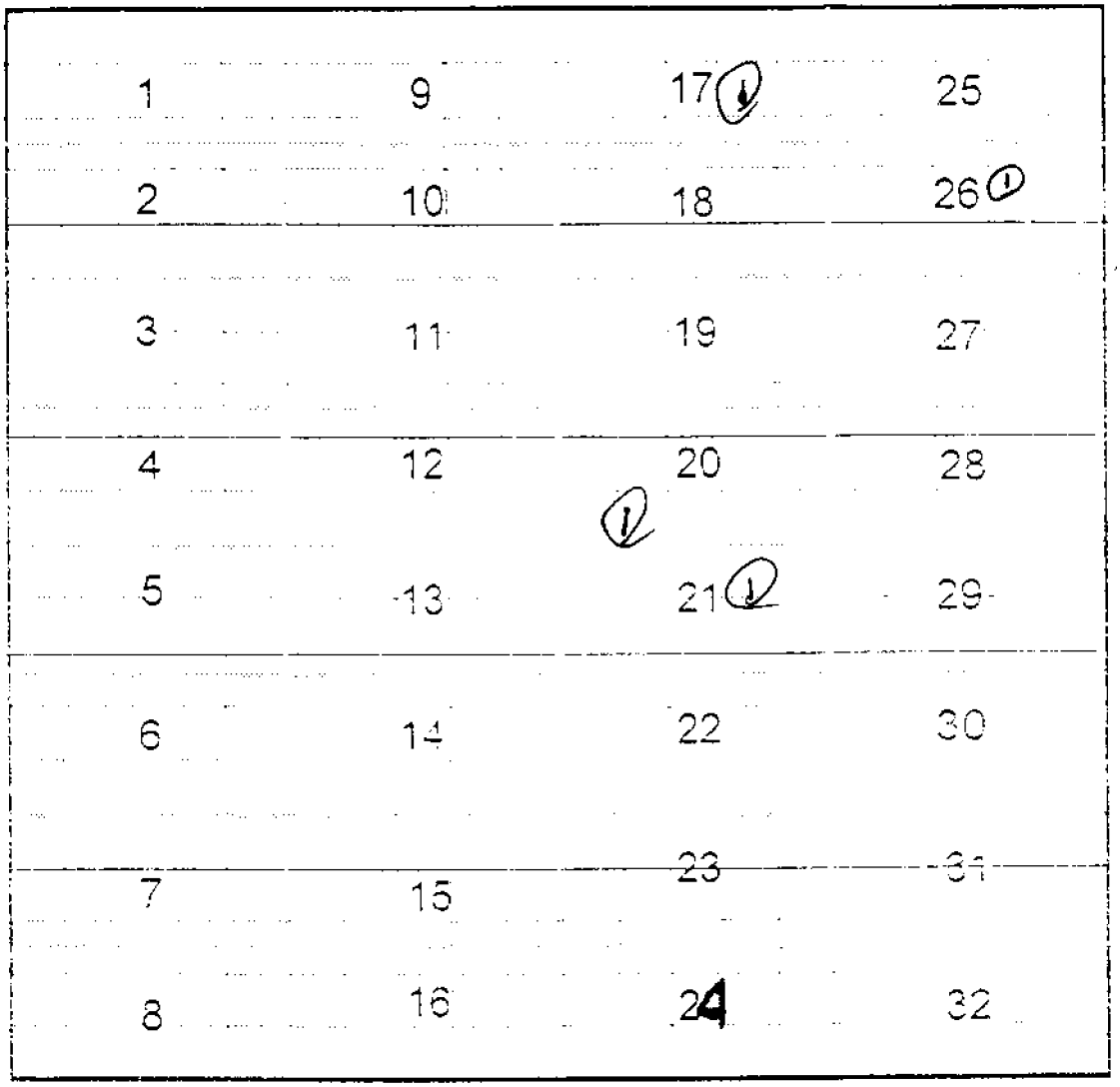
X ENTRY/EXIT POINT

NOTES: Grid SG-2 Were sequence 57 anomalies 10 ... 10.8 ... 11 ...
1EA M1A3

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

GRID I.D. 74-4

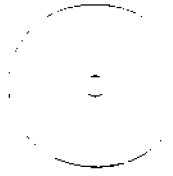
WEIGHT OF ORS 10 LBS



Number of Anomalies per Lane
14
10
12
12
10
14
12
13
10
12
11
12
13
9
10
11
10
13
15
17
Total Number of Anomalies 240

MAP ORIENTATION

WIND DIRECTION



(1) SUBSURFACE UXO

(2) SURFACE UXO

D DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

— RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: Sampling Sheet #85 96 Samples taken.
ORS Mostly M94 Flag some 2-36" Rocket Flag.
These was Wire. UXO's were M94 with Fuze
and Booster Cup.

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	20	32

Number of Anomalies per Lane

6
6
7
6
3
9
11
1
8
8
11
14
8
3
9
12
7
6
4
7

Total Number of Anomalies 137

WEIGHT OF ORS 10 LBS GRID I.D. A3-1

MAP ORIENTATION

WIND DIRECTION

(1) SUBSURFACE UXO

[2] SURFACE UXO

D DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

— RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: Sample Sheet # 57 46 Samples

@ 2.36 inch Rocket

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	20	32

Number of Anomalies per Lane

1
2
1
2
2
0
1
1
1
0
0
1

Total Number of Anomalies 10

GRID I.D. A-10-2

IBS

WLIGHT OI ORS

MAP ORIENTATION

WIND DIRECTION

1 SUBSURFACE UXO

2 SURFACE UXO

D DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: Grid A-10-2 UXO shot # 73

IEA mg rifle grenade

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1 (1 mgA1)	9 (1 mgA1)	17	25
2	10	18	26
3	11	19	27 (1 mgA1)
4 (1 mgA1)	12 (1 MK2)	20	28 (6 mgA1)
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24 (1 MK2)	32

Number of Anomalies per Lane

GRID I.D.	LBS WEIGHT OF ORS
	102
	49
	60
A31-1	30
	90
	83
	71
	48
	53
	79
	51
	52
	61
	49
	31
	42
	20
	19
	14
	12

Total Number of Anomalies: 1009

Info Direction

MAP CRIENTATION

WIND DIRECTION

(1) SUBSURFACE UXO
(2) SURFACE UXO
(D) DEMO LOCATION
▲ FIRE SAFETY EQUIPMENT
⬡ PIT, TRENCHES, BUNKER, ETC.
— RESTRICTED AREA BOUNDARY
X ENTRY/EXIT POINT

NOTES: Grid A31-1 Sequence 70

5 EA mgA1 rifle grenade.

2 EA MK-2 Hand grenade

SURFACE ORS Removed prior to MAG FLAG.

WAS 782 Items

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	20	32

Number of Anomalies per Lane

28
29
17
19
24
25
28
30
26
25
19
14
21
18
38
39
24
20
18
21

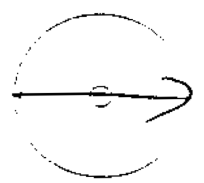
Total Number of Anomalies 481

GRID I.D. A31-2

WEIGHT OF ORS 17 LBS

MAP ORIENTATION

WIND DIRECTION



(1) SUBSURFACE UXO

(2) SURFACE UXO

(D) DEMO LOCATION

▲ FIRE SAFETY EQUIPMENT

⬡ PIT, TRENCHES, BUNKER, ETC.

—— RESTRICTED AREA BOUNDARY

X ENTRY/EXIT POINT

NOTES: A31-2 [illegible] 21

481 Anomalies [illegible] 1922 [illegible] to 193

FORMER CAMP CROFT
CROFT STATE PARK, SOUTH CAROLINA
EE/CA INVESTIGATION FIELD MAP

				Number of Anomalies per Lane
1	9	17	25	15
2	Tail M9 10 23 6 Rnd Expended Frag	18 ①	26	5
3 ①	11	19	27	16
4X	12	20	28	3
5	13X	21	29X	4
6	14	22	30	1
7	15	23	31	6
8	16	20	32	3
				7
				7
			Total Number of Anomalies	67

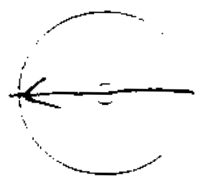
GRID I.D. A32-2

LBS

WEIGHT OF OES

MAP ORIENTATION

WIND DIRECTION



(1) SUBSURFACE UXO
(2) SURFACE UXO
(D) DEMO LOCATION
▲ FIRE SAFETY EQUIPMENT
⬡ PIT, TRENCHES, BUNKER, ETC.
— RESTRICTED AREA BOUNDARY
X ENTRY/EXIT POINT

NOTES: A32-2 Sequence # 50
Grid Size is 50X50 67 Anomalies × 40% = 26.8
Roundup to 27 digs
2 EA M9 Rifle grenades

Appendix E

SiteStats Data

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 10A
Date: 25 Apr 97
Number of Grids: 775
Minimum Number of Grids to Sample: 14
Average Number of Grids to Sample: 28
Maximum Number of Grids to Sample: 42
Number of Grids Sampled: 11
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 83 per grid
Expected Density of Non-UXO Items: 8.30E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 1
Total Number of Surface UXO Items Found: 0
Cost Error: 0.3666
Risk Error: 1.0000

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 16 Col 6
Date: 2/19/97
Grid Number: 8b-1
Number of Anomalies: 21
Number of Samples Collected: 9
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 8
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 21
Sample Plan Number: 60
Cost Error: 1.0000
Risk Error: 0.3500

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 21 Col 2
Date: 2/4/97
Grid Number: 27-1
Number of Anomalies: 143
Number of Samples Collected: 48
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 48
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 143
Sample Plan Number: 19
Cost Error: 1.0000
Risk Error: 0.5217

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 22 Col 14
Date: 2/4/97
Grid Number: 27-2
Number of Anomalies: 126
Number of Samples Collected: 42
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 39
Number of UXO Scrap Items Found: 3
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 126
Sample Plan Number: 30
Cost Error: 1.0000
Risk Error: 0.5223

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 17 Col 29
Date: 2/3/97
Grid Number: 27-3
Number of Anomalies: 48
Number of Samples Collected: 16
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 15
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 48
Sample Plan Number: 18
Cost Error: 1.0000
Risk Error: 0.5023

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 21 Col 28
Date: 2/13/97
Grid Number: 39-1
Number of Anomalies: 47
Number of Samples Collected: 16
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 14
Number of UXO Scrap Items Found: 2
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 47
Sample Plan Number: 38
Cost Error: 1.0000
Risk Error: 0.4952

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 13 Col 10
Date: 2/13/97
Grid Number: 39-2
Number of Anomalies: 28
Number of Samples Collected: 12
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 11
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 28
Sample Plan Number: 39
Cost Error: 1.0000
Risk Error: 0.3826

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 18 Col 5
Date: 2/19/97
Grid Number: 40-1
Number of Anomalies: 14
Number of Samples Collected: 14
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 14
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 14
Sample Plan Number: 61
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 9 Col 3
Date: 4/25/97
Grid Number: A2-1
Number of Anomalies: 175
Number of Samples Collected: 58
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 58
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 175
Sample Plan Number: 36
Cost Error: 1.0000
Risk Error: 0.5271

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 17 Col 19
Date: 2/12/97
Grid Number: A3-1
Number of Anomalies: 137
Number of Samples Collected: 56
Number of Sub-Surface UXO Items Found: 1
Number of False Positive Items Found: 52
Number of UXO Scrap Items Found: 3
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 2
Expected Number of Non-UXO Items: 135
Sample Plan Number: 37
Cost Error: 1.0000
Risk Error: 0.0944

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 13 Col 19
Date: 2/19/97
Grid Number: A3-2
Number of Anomalies: 10
Number of Samples Collected: 10
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 10
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 10
Sample Plan Number: 62
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10A
Grid Location: Row 1 Col 29
Date: 2/20/97
Grid Number: A3-3
Number of Anomalies: 173
Number of Samples Collected: 70
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 69
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 173
Sample Plan Number: 64
Cost Error: 1.0000
Risk Error: 0.4667

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 10B
Date: 25 Apr 97
Number of Grids: 210
Minimum Number of Grids to Sample: 10
Average Number of Grids to Sample: 21
Maximum Number of Grids to Sample: 31
Number of Grids Sampled: 3
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 51 per grid
Expected Density of Non-UXO Items: 5.10E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.3506

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10B
Grid Location: Row 1 Col 1
Date: 3/12/97
Grid Number: 86-1
Number of Anomalies: 20
Number of Samples Collected: 20
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 19
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 20
Sample Plan Number: 7
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10B
Grid Location: Row 13 Col 10
Date: 3/11/97
Grid Number: 86-2
Number of Anomalies: 28
Number of Samples Collected: 9
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 7
Number of UXO Scrap Items Found: 2
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 28
Sample Plan Number: 2
Cost Error: 1.0000
Risk Error: 0.4870

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10B
Grid Location: Row 12 Col 15
Date: 3/13/97
Grid Number: 86-3
Number of Anomalies: 107
Number of Samples Collected: 34
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 28
Number of UXO Scrap Items Found: 6
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 107
Sample Plan Number: 9
Cost Error: 1.0000
Risk Error: 0.5333

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 10C
Date: 25 Apr 97
Number of Grids: 56
Minimum Number of Grids to Sample: 8
Average Number of Grids to Sample: 16
Maximum Number of Grids to Sample: 24
Number of Grids Sampled: 2
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 121 per grid
Expected Density of Non-UXO Items: 1.21E-02 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.4444

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10C
Grid Location: Row 6 Col 6
Date: 2/25/97
Grid Number: 41a-1
Number of Anomalies: 147
Number of Samples Collected: 59
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 59
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 147
Sample Plan Number: 58
Cost Error: 1.0000
Risk Error: 0.4676

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10C
Grid Location: Row 3 Col 3
Date: 2/25/97
Grid Number: 41a-2
Number of Anomalies: 95
Number of Samples Collected: 38
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 37
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 95
Sample Plan Number: 59
Cost Error: 1.0000
Risk Error: 0.4622

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 10D
Date: 25 Apr 97
Number of Grids: 25
Minimum Number of Grids to Sample: 7
Average Number of Grids to Sample: 13
Maximum Number of Grids to Sample: 20
Number of Grids Sampled: 1
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 56 per grid
Expected Density of Non-UXO Items: 5.60E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.5538

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 10D
Grid Location: Row 1 Col 1
Date: 1/30/97
Grid Number: 38-b-1
Number of Anomalies: 56
Number of Samples Collected: 23
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 18
Number of UXO Scrap Items Found: 5
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 56
Sample Plan Number: 22
Cost Error: 1.0000
Risk Error: 0.4392

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 11A
Date: 24 Apr 97
Number of Grids: 130
Minimum Number of Grids to Sample: 9
Average Number of Grids to Sample: 19
Maximum Number of Grids to Sample: 28
Number of Grids Sampled: 1
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 67 per grid
Expected Density of Non-UXO Items: 6.70E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.6031

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11A
Grid Location: Row 4 Col 4
Date: 2/6/97
Grid Number: 46-1
Number of Anomalies: 67
Number of Samples Collected: 29
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 27
Number of UXO Scrap Items Found: 2
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 67
Sample Plan Number: 29
Cost Error: 1.0000
Risk Error: 0.4258

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 11B
Date: 24 Apr 97
Number of Grids: 169
Minimum Number of Grids to Sample: 10
Average Number of Grids to Sample: 20
Maximum Number of Grids to Sample: 30
Number of Grids Sampled: 4
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 58 per grid
Expected Density of Non-UXO Items: 5.80E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.2510

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11B
Grid Location: Row 1 Col 1
Date: 2/6/97
Grid Number: 71-1
Number of Anomalies: 60
Number of Samples Collected: 22
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 22
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 60
Sample Plan Number: 40
Cost Error: 1.0000
Risk Error: 0.4800

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11B
Grid Location: Row 9 Col 4
Date: 2/10/97
Grid Number: 71-2
Number of Anomalies: 65
Number of Samples Collected: 26
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 15
Number of UXO Scrap Items Found: 11
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 65
Sample Plan Number: 41
Cost Error: 1.0000
Risk Error: 0.4533

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11B
Grid Location: Row 13 Col 1
Date: 2/10/97
Grid Number: 71-3
Number of Anomalies: 59
Number of Samples Collected: 26
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 22
Number of UXO Scrap Items Found: 4
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 59
Sample Plan Number: 42
Cost Error: 1.0000
Risk Error: 0.4148

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11B
Grid Location: Row 7 Col 10
Date: 2/10/97
Grid Number: 71-4
Number of Anomalies: 51
Number of Samples Collected: 21
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 18
Number of UXO Scrap Items Found: 3
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 51
Sample Plan Number: 43
Cost Error: 1.0000
Risk Error: 0.4348

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 11C
Date: 24 Apr 97
Number of Grids: 78
Minimum Number of Grids to Sample: 8
Average Number of Grids to Sample: 17
Maximum Number of Grids to Sample: 25
Number of Grids Sampled: 4
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 19 per grid
Expected Density of Non-UXO Items: 1.90E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.2665

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11C
Grid Location: Row 5 Col 11
Date: 2/25/97
Grid Number: 30-1
Number of Anomalies: 35
Number of Samples Collected: 14
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 14
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 35
Sample Plan Number: 80
Cost Error: 1.0000
Risk Error: 0.4267

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11C
Grid Location: Row 3 Col 7
Date: 2/25/97
Grid Number: 30-2
Number of Anomalies: 30
Number of Samples Collected: 12
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 11
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 30
Sample Plan Number: 81
Cost Error: 1.0000
Risk Error: 0.4160

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11C
Grid Location: Row 1 Col 10
Date: 2/25/97
Grid Number: 30-3
Number of Anomalies: 8
Number of Samples Collected: 8
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 8
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 8
Sample Plan Number: 68
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11C
Grid Location: Row 3 Col 12
Date: 2/25/97
Grid Number: 30-4
Number of Anomalies: 4
Number of Samples Collected: 4
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 4
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 4
Sample Plan Number: 69
Cost Error: 0.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 11D
Date: ########
Number of Grids: 24
Minimum Number of Grids to Sample: 7
Average Number of Grids to Sample: 13
Maximum Number of Grids to Sample: 20
Number of Grids Sampled: 1
Grid Area: 2,500 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 20 per grid
Expected Density of Non-UXO Items: 8.00E-03 per square foot
Total Number of Sub-Surface UXO Items Found: 0
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.6000

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 11D
Grid Location: Row 1 Col 1
Date: 3/20/97
Grid Number: 29-1
Number of Anomalies: 20
Number of Samples Collected: 20
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 19
Number of UXO Scrap Items Found: 1
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 20
Sample Plan Number: 29
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: 12A
Date: 25 Nov 97
Number of Grids: 338
Minimum Number of Grids to Sample: 12
Average Number of Grids to Sample: 23
Maximum Number of Grids to Sample: 35
Number of Grids Sampled: 12
Grid Area: 10,000 Square Feet
Expected Number of Sub-Surface UXO Items: 13 per grid
Expected Density of Sub-Surface UXO Items: 1.30E-03 per square foot
Expected Number of Non-UXO Items: 254 per grid
Expected Density of Non-UXO Items: 2.54E-02 per square foot
Total Number of Sub-Surface UXO Items Found: 47
Total Number of Surface UXO Items Found: 0
Cost Error: 0.4708
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Cost Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 9 Col 12
Date: 19 Feb 97
Grid Number: 36-1
Number of Anomalies: 204
Number of Samples Collected: 84
Number of Sub-Surface UXO Items Found: 8
Number of False Positive Items Found: 52
Number of UXO Scrap Items Found: 24
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 19
Expected Number of Non-UXO Items: 185
Sample Plan Number: 47
Cost Error: 0.0000
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 9 Col 11
Date: 20 Feb 97
Grid Number: 36-2
Number of Anomalies: 182
Number of Samples Collected: 80
Number of Sub-Surface UXO Items Found: 4
Number of False Positive Items Found: 32
Number of UXO Scrap Items Found: 44
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 9
Expected Number of Non-UXO Items: 173
Sample Plan Number: 33
Cost Error: 0.5257
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 6 Col 2
Date: 24 Feb 97
Grid Number: 56-1
Number of Anomalies: 172
Number of Samples Collected: 72
Number of Sub-Surface UXO Items Found: 8
Number of False Positive Items Found: 44
Number of UXO Scrap Items Found: 20
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 19
Expected Number of Non-UXO Items: 153
Sample Plan Number: 18
Cost Error: 0.0000
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 5 Col 2
Date: 24 Feb 97
Grid Number: 56-2
Number of Anomalies: 27
Number of Samples Collected: 11
Number of Sub-Surface UXO Items Found: 1
Number of False Positive Items Found: 10
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 2
Expected Number of Non-UXO Items: 25
Sample Plan Number: 2
Cost Error: 1.0000
Risk Error: 0.5236

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 12 Col 24
Date: 03 Mar 97
Grid Number: 74-1
Number of Anomalies: 140
Number of Samples Collected: 76
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 76
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 140
Sample Plan Number: 77
Cost Error: 1.0000
Risk Error: 0.0466

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 9 Col 22
Date: 03 Mar 97
Grid Number: 74-2
Number of Anomalies: 120
Number of Samples Collected: 48
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 8
Number of UXO Scrap Items Found: 40
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 120
Sample Plan Number: 65
Cost Error: 1.0000
Risk Error: 0.0466

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 6 Col 21
Date: 04 Mar 97
Grid Number: 74-3
Number of Anomalies: 301
Number of Samples Collected: 75
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 12
Number of UXO Scrap Items Found: 63
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 301
Sample Plan Number: 68
Cost Error: 1.0000
Risk Error: 0.1762

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 6 Col 23
Date: 05 Mar 97
Grid Number: 74-4
Number of Anomalies: 240
Number of Samples Collected: 96
Number of Sub-Surface UXO Items Found: 4
Number of False Positive Items Found: 2
Number of UXO Scrap Items Found: 90
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 10
Expected Number of Non-UXO Items: 230
Sample Plan Number: 81
Cost Error: 0.4930
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 7 Col 20
Date: 04 Mar 97
Grid Number: A31-1
Number of Anomalies: 1009
Number of Samples Collected: 152
Number of Sub-Surface UXO Items Found: 7
Number of False Positive Items Found: 1
Number of UXO Scrap Items Found: 144
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 46
Expected Number of Non-UXO Items: 963
Sample Plan Number: 47
Cost Error: 0.0000
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 9 Col 18
Date: 05 Mar 97
Grid Number: A31-2
Number of Anomalies: 481
Number of Samples Collected: 80
Number of Sub-Surface UXO Items Found: 7
Number of False Positive Items Found: 8
Number of UXO Scrap Items Found: 65
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 42
Expected Number of Non-UXO Items: 439
Sample Plan Number: 32
Cost Error: 0.0000
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 1 Col 12
Date: 13 Feb 97
Grid Number: A32-1
Number of Anomalies: 82
Number of Samples Collected: 33
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 25
Number of UXO Scrap Items Found: 8
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 82
Sample Plan Number: 7
Cost Error: 1.0000
Risk Error: 0.0454

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: 12A
Grid Location: Row 5 Col 14
Date: 18 Feb 97
Grid Number: A32-2
Number of Anomalies: 268
Number of Samples Collected: 108
Number of Sub-Surface UXO Items Found: 8
Number of False Positive Items Found: 100
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 20
Expected Number of Non-UXO Items: 248
Sample Plan Number: 21
Cost Error: 0.0000
Risk Error: 1.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SiteStats Results

Site Name: Former Camp Croft
Sector ID: Sector 12B
Date: 24-Apr-97
Number of Grids: 70
Minimum Number of Grids to Sample: 8
Average Number of Grids to Sample: 16
Maximum Number of Grids to Sample: 25
Number of Grids Sampled: 4
Grid Area: 25,000 Square Feet
Expected Number of Sub-Surface UXO Items: 0 per grid
Expected Density of Sub-Surface UXO Items: 0.00E+00 per square foot
Expected Number of Non-UXO Items: 24 per grid
Expected Density of Non-UXO Items: 9.60E-04 per square foot
Total Number of Sub-Surface UXO Items Found: 1
Total Number of Surface UXO Items Found: 0
Cost Error: 1.0000
Risk Error: 0.2681

NOTE:

Cost Error is the probability of concluding that the sector is non-homogeneous when it is homogeneous.

Risk Error is the probability of concluding that the sector is homogeneous when it is non-homogeneous.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 12B
Grid Location: Row 2 Col 1
Date: 3/18/97
Grid Number: A10-4
Number of Anomalies: 42
Number of Samples Collected: 17
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 17
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 42
Sample Plan Number: 19
Cost Error: 1.0000
Risk Error: 0.4324

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 12B
Grid Location: Row 8 Col 7
Date: 3/18/97
Grid Number: A10-3
Number of Anomalies: 24
Number of Samples Collected: 10
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 10
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 24
Sample Plan Number: 72
Cost Error: 1.0000
Risk Error: 0.3789

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 12B
Grid Location: Row 1 Col 6
Date: 3/19/97
Grid Number: A10-2
Number of Anomalies: 10
Number of Samples Collected: 10
Number of Sub-Surface UXO Items Found: 1
Number of False Positive Items Found: 9
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 1
Expected Number of Non-UXO Items: 9
Sample Plan Number: 73
Cost Error: 1.0000
Risk Error: 0.0000

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

SITESTATS GRID SAMPLING RESULTS

Site Name: Former Camp Croft
Sector ID: Sector 12B
Grid Location: Row 4 Col 2
Date: 3/19/97
Grid Number: A10-1
Number of Anomalies: 23
Number of Samples Collected: 11
Number of Sub-Surface UXO Items Found: 0
Number of False Positive Items Found: 11
Number of UXO Scrap Items Found: 0
Number of Surface UXO Items Found: 0
Expected Number of Sub-Surface UXO Items: 0
Expected Number of Non-UXO Items: 23
Sample Plan Number: 74
Cost Error: 1.0000
Risk Error: 0.3111

NOTE:

Risk Error is the probability of concluding that the grid is insufficiently contaminated when it is sufficiently contaminated.

Cost Error is the probability of concluding that the grid is sufficiently contaminated when it is insufficiently contaminated.

Appendix F

OE*Cert* Report

Final

Risk Analysis
Former Camp Croft
Army Training Facility

Prepared for:
U.S. Army Engineering and Support Center
Huntsville

Prepared by:
QST Environmental Inc.
Gainesville, Florida

January 1998

QST Project No. 3195165G

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Acronyms

CCATF	Camp Croft Army Training Facility
DDESB	Department of Defense Explosives Safety Board
EE/CA	Engineering Evaluation and Cost Analysis
ESE	Environmental Science & Engineering, Inc.
FUD	formerly used defense site
OE	ordnance and explosives
OOU	ordnance operable unit
ORS	ordnance-related scrap
QST	QST Environmental Inc.
USAESCH	U.S. Army Engineering and Support Center, Huntsville
UXO	unexploded ordnance

1.0 Executive Summary

The U.S. Army Engineering and Support Center, Huntsville (USAESCH) contracted QST Environmental Inc. (QST) [formerly known as Environmental Science & Engineering, Inc. (ESE)] to apply Version 2.0 of the Ordnance and Explosives Cost-Effectiveness Risk Tool (OE*Cert*) (CEHND, 1995) to perform a risk analysis based on the results of the engineering evaluation and cost analysis (EE/CA) investigation (ESE, 1997). This tool was used to evaluate the risk of public exposure to ordnance and explosives (OE) and unexploded ordnance (UXO) at the former Camp Croft Army Training Facility (CCATF).

1.1 Acreage

The former CCATF is 19,044.46 acres located approximately 5 miles southeast of Spartanburg, South Carolina. The current land usage is 7,088.08 acres for Camp Croft State Park, 4,936.24 acres for farming, 256 acres for private industry, and 6,764.14 suburban acres, which includes a public golf course (USAESCH, 1997).

1.2 Intrusive and Nonintrusive Activities

Public exposure occurs during participation in the following commonly performed recreational and occupational activities at the site. The nonintrusive activities at the site, which include those activities that only disturb the surface soil, include motorbiking, hunting, hiking, biking, horseback riding, shortcutting, and ranching. The intrusive activities at the site involve or have the potential to involve disturbance beyond the surface of the soil and include child playing, driving off-road vehicles, working on construction projects, and conducting archeological investigations.

1.3 Cost Estimates

Costs were not developed using the OE*Cert* model, but were developed using local standard rates and site-specific quantities. The cost estimates for the various risk reduction alternatives are presented in the EE/CA report (ESE, 1997).

1.4 Risk Reduction Alternatives for Ordnance Operable Units

The five ordnance operable units (OOUs) where OE/UXO was either confirmed or suspected are OOU3, OOU9, OOU10, OOU11, and OOU12. The risk reduction alternatives considered for each OOU are:

- no further action: no OE removal action will be implemented to reduce the risk of public exposure;
- institutional controls: restricting site access with fencing, providing warnings by posting signs, and educating the public through media such as notices and newspaper articles;
- surface clearance: removing OE/UXO visible on the surface and all such items that may be submerged but protrude through the surface; and
- clearance for use: removing OE/UXO down to depths in accordance with Department of Defense Explosives Safety Board (DDESB) guidelines, depending on the type of planned activity or construction at the OOU.

1.4.1 Clearances for use were analyzed for depths of 1 and 4 feet. OOU3 was not evaluated by the OE*Cert* model as it was previously analyzed during the Phase I EE/CA (ESE, 1996). Clearance for use is the recommended risk reduction alternative for the OOU3 area (ESE, 1997).

1.4.2 OOU9 sites were not included in the analysis as the potential for explosive detonation from the items found at those sites was minimal and no further action has been recommended. The chosen alternative for OOU10 was surface clearance and for OOUs 11 and 12 was clearance for use (ESE,1997).

1.5 Risk Estimates for Sectors

Total population exposure estimates were developed using low, point, and high density estimates for all risk reduction alternatives. These values were determined for each sector. OOUs 10, 11, and 12 each consist of two or more sectors. A sector is defined as a geographically continuous area with homogeneous physical characteristics and ordnance densities. Ten sectors were evaluated for this risk assessment to include 10A, 10B, 10C, 10D, 11A, 11B, 11C, 11D, 12A, and 12B. See Appendix A for location of sectors. Sector 10 sites (A, B, C, and D) are within Croft State Park. All sector sites at 11 and 12 are outside the park boundary in private property. Sector 11D is a golf course. Risks were calculated for all intrusive and nonintrusive activities as defined in Section 1.2.

1.5.1 Table 1-1 provides the percent reduction in estimated annual population exposures and the approximate number of annual population exposures reduced through implementation of various risk reduction alternatives.

Table 1-1. Percent Reduction in Annual Population Exposures and Number of Annual Population Exposures Reduced per Risk Reduction Alternative

	Percent Reduction (Top Number) / Number Reduced (Bottom Number)								
	Risk Reduction Alternative								
	Surface (0-3 Inches)			1 Foot			4 Feet		
	UXO Density Estimate								
Sector	Low	Point	High	Low	Point	High	Low	Point	High
10A	29% 4	92% 210	96% 617	86% 12	98% 224	99% 638	100% 14	100% 228	100% 644
10B	--	100% 401	100% 1,703	--	100% 401	100% 1,703	--	100% 401	100% 1,703
10C	--	100% 3,200	100% 12,289	--	100% 3,200	100% 12,289	--	100% 3,200	100% 12,289
10D	--	100% 2,561	100% 14,083	--	100% 2,561	100% 14,083	--	100% 2,561	100% 14,083
11A	--	100% 51	100% 273	--	100% 51	100% 273	--	100% 51	100% 273
11B	--	100% 251	100% 964	--	100% 251	100% 964	--	100% 251	100% 964
11C	--	82% 652	89% 2,873	--	100% 792	100% 3,209	--	100% 799	100% 3,216
11D	--	91% 3,399	95% 19,421	--	100% 3,740	100% 20,421	--	100% 3,747	100% 20,443
12A	95% 3,789	99% 38,297	100% 88,146	99% 3,950	100% 38,507	100% 88,405	100% 4,002	100% 38,576	100% 88,490
12B	--	100% 162	100% 730	--	100% 162	100% 730	--	100% 162	100% 730

Note: -- = No expected exposures.

Source: QST.

2.0 Background

The U.S. Army Engineering and Support Center, Huntsville (USAESCH) contracted QST Environmental Inc. (QST) [formerly known as Environmental Science & Engineering, Inc. (ESE)] to apply Version 2.0 of the Ordnance and Explosives Cost-Effectiveness Risk Tool (OE*Cert*) (CEHND, 1995) to perform a risk analysis based on the results of the Phase II engineering evaluation and cost analysis (EE/CA) investigation (ESE, 1997). This tool was used to evaluate the risk of public exposure to ordnance and explosives (OE) and unexploded ordnance (UXO) at the former Camp Croft Army Training Facility (CCATF) in Spartanburg, South Carolina. A location map showing the former CCATF and investigation areas of the Phase II EE/CA is included in Appendix A.

2.0.1 Public exposure occurs during participation in the following commonly performed nonintrusive and intrusive activities at the site. The nonintrusive activities at the site, which include those activities that only disturb the surface soil, are motorbiking, hunting, hiking, biking, horseback riding, shortcutting, and ranching. The intrusive activities at the site, which involve or have the potential to involve disturbance beyond the surface of the soil, include child playing, driving off-road vehicles, working on construction projects, and conducting archeological investigations.

2.0.2 The OE*Cert* model evaluates both the likelihood of a public exposure to UXO and the associated hazard of being exposed to UXO. This is expressed as:

Risk = (# Public Exposures to UXO) x (UXO Hazard Factor).

Based on the sampling data provided, the UXO types at Camp Croft are assumed to be common across each sector. A sector is defined as a geographically continuous area with homogeneous physical characteristics and ordnance densities. Additionally, the UXO hazard factors are assumed to be the same for each sector (QuantiTech, 1995). This report expresses risks as the expected number of public exposures to UXO. Appendix B provides QuantiTech's description of OE*Cert* exposure calculations (QuantiTech, 1995).

2.0.3 Public exposures to UXO can be modeled using the Poisson distribution, which can be utilized when discrete events (such as exposures to UXO) occur in a fixed interval (such as a year). Assumptions for Poisson processes include:

- the probability of a single occurrence of the event is directly proportional to the size of the interval;

- if the interval is sufficiently small, the probability of two or more occurrences of the event is negligible; and

- the occurrences of the event in nonoverlapping intervals are independent, that is, what happens in one interval has no effect on what happens in another nonoverlapping interval (Dowdy and Wearden, 1983).

The probability function for the Poisson distribution is as follows:

$$p(y;\lambda) = \frac{e^{-\lambda}\lambda^{y}}{y!}$$

where: y = value of the random variable or number of UXO exposures (e.g. 0, 1, 2, 3, 4, ...);
λ = Greek letter, lambda, which represents the expected number of UXO exposures in the specified acreage associated with an activity in one year;
e = constant which is the base of the natural logarithms which equals 2.7183 when rounded to four decimal places; and
y! = y factorial (e.g. 4! = 4 x 3 x 2 x 1 = 24).

2.1 Exposure Calculations

The expected number of individual exposures is calculated as μ. This μ value is then used to obtain the expected number of population exposures, the probability of individual exposure, and the probability of population exposures. Details on the calculation of μ can be found in Appendix C, which provides example calculations for motorbiking (a nonintrusive risk) at Sector 12A and performing an archeological investigation (an intrusive risk) at Sector 10A. The calculation of μ varies widely depending on the activity and whether or not it is intrusive. Once μ is calculated, the expected exposures and probabilities of exposure are calculated as follows for all intrusive and nonintrusive activities:

$$\textit{Expected Individual Exposures} = \mu$$

$$\textit{Expected Population Exposures} = \mu \times \textit{no. of participants}$$

$$Probability\ of\ Individual\ Exposure = 1 - e^{-\mu}$$

$$Probability\ of\ Population\ Exposures = 1 - e^{(-\mu)\ x\ (no.\ of\ participants)}$$

Risks were calculated simply by multiplying the expected exposures by 29, which is an adjusted hazard factor for UXO.

2.2 Estimated Number of Participants

The estimated number of people participating in a given activity at a sector is based on the estimated county population and the predicted proportion of persons in various age brackets that would be expected to participate in the activity. An example of a calculation for the number of motorbikers at Sector 12A is provided in Appendix C. The OE*Cert* model allows for the number of participants and the activity areas to be overridden by the user. For this run of the OE*Cert* model, the number of participants was overridden for Sector 10, but was not overridden for Sectors 11 and 12. This is because prior knowledge was available for the number of visitors to the park (Sector 10), whereas for Sectors 11 and 12, prior knowledge of the number of persons traversing the areas outside the park was unavailable. The estimates for the numbers of participants in activities at Sectors 11 and 12 are likely to be overly conservative.

3.0 Risk Estimation

3.1 Risk Estimation Inputs

The sectors used in the OE*Cert* analysis correspond to the sample gird areas where ORS and OE were found during the EE/CA investigation. Table 3-1 provides the sector numbers, grids, and sector areas in square feet and acres. Table 3-2 provides physical sector characteristics such as vegetation type, soil type, and slope in addition to recreational and occupational activities that occur in each sector. Input and output from the OE*Cert* model are in Appendix D.

3.1.1 Ordnance Density Estimates

In order for SiteStats to estimate the density of ordnance at a site within established statistical error bounds, a sufficient number of grids must be sampled. It was determined from SiteStats that all sectors/OOU IDs had an insufficient number of grids sampled, with cost errors (α) ranging from 0.37 to 1 and risk errors (β) ranging from 0.15 to 1. Due to the insufficient sampling, a default α value of 0.2 was used. The following formula (Hollander and Wolfe, 1973) was used to obtain lower and upper 80-percent confidence limits (LCL80, UCL80) on p, the proportion of subsurface UXOs found in the anomalies sampled:

$$(LCL80, UCL80) = \hat{p} \pm \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}\, z_{\alpha/2}$$

where:

	$\hat{p}$	=	x / n;
	x	=	number of subsurface UXOs found in anomalies sampled;
	n	=	number of anomalies sampled; and
	$z_{\alpha/2}$	=	z value from the standard normal distribution using an estimated cost error, α, of 0.20 (EPA, 1992);
		=	$z_{0.2/2} = z_{0.1} = 1.28$.

3.1.1.1 The values used in these equations for the ten sectors/OOU IDs can be found in Appendix E. The sample proportion, LCL80, and UCL80 values were then multiplied by the total number of anomalies found during the Phase II EE/CA investigation (ESE, 1997) and divided by the total number of acres to

Table 3-1. Sector Definitions

Sector	Grids	Sector Area	
		sq ft	acres
10A	27-1 to -3, 39-1, 39-2, 40-1, 8b-1, A2-1, A3-1, A3-2, A3-3	6,822,367	156.62
10B	86-1 to -3	1,603,444	36.81
10C	41a-1, 41a-2	495,277	11.37
10D	38b-1	220,849	5.07
11A	46-1	1,071,576	24.6
11B	71-1 to -4	1,362,992	31.29
11C	30-1 to -4	746,183	17.13
11D	29-1	601,564	13.81
12A	36-1, 36-2, 56-1, 56-2, 74-1 to -4, A31-1, A31-2, A32-1, A32-2	3,250,012	74.61
12B	A10-1 to -4	700,009	16.07

Source: QST.

Table 3-2. Sector Characteristics

Sector	Activities	Vegetation	Soil Type	Slope
10A	Archeology, hunting	Brushy/trees	Clay	Level
10B	Hiking, hunting	Brushy/trees	Clay	Level
10C	Hiking, horseback riding, hunting, biking	Brushy/trees	Clay	Moderate
10D	Hiking, horseback riding, hunting, biking	Brushy/trees	Clay	Level
11A	Hiking	Brushy/trees	Clay	Level
11B	Ranching	Grassy/brushy	Clay	Moderate
11C	Children playing, short cuts	Grassy/brushy	Clay	Level
11D	Children playing, construction, hiking	Grassy/brushy	Clay	Level
12A	Hunting, motor bikes, off-road vehicles	Brushy/trees	Clay	Moderate
12B	Hunting	Grassy/brushy	Clay	Moderate

Sources: Perry (1997), QST.

obtain the low and high density estimates in UXOs per acre. Since no subsurface UXOs were found in the anomalies sampled at Sectors 10 and 11, the sample proportion for Sector 12B of 0.0208 was used to be conservative.

3.1.2 City and County Population Estimates

The average annual number of visitors to the park based on data from Croft State Park personnel is approximately 155,000. This number was divided into age categories based on percentages from the 1990 U.S. Census data for Spartanburg city and county. These approximated park visitor estimates were used as the city and county data in OE*Cert* for park sectors 10A, 10B, 10C, and 10D (Table 3-4).

3.1.2.1 Since the populations of the communities surrounding the site were unavailable, the populations for areas outside the park were determined by using population numbers from the nearest zip code (Fanning, 1997). Sectors 11B, 11C, 11D, and 12A were closest to zip code 29302, Sector 11A was closest to zip code 29372, and Sector 12B was closest to zip code 29374. As a result, the population data for these zip codes were used for the city data that were input into the OE*Cert* model. Spartanburg county age range percentages were used to estimate the age ranges for the county data for the nonpark sectors. Table 3-4 provides the estimated city and county populations for the nonpark sectors.

3.1.3 Estimated Distribution of Ordnance and Explosives

It is estimated that surface removal (down to 3 inches) would eliminate 31 percent of the OE hazard. Clearance down to 1 ft would effectively remove 83 percent of the OE. Since no OE was found below 4 ft deeper than ground surface, clearance down to 4 ft would remove 100 percent of the OE (ESE, 1997). Figure 3-1 illustrates the estimated distribution of OE.

3.1.4 Estimated Number of Participants

For Sectors 11 and 12, the OE*Cert* model was used to estimate the annual number of participants in the various activities because prior information was not known as to the number of potential visitors to these areas. Prior information was known about Sector 11D, the golf course, which has approximately 25,000 golfers annually according to the golf club management. Roughly 50 percent of the golfers (or 12,500) venture into the undeveloped areas to retrieve errant golf balls. Since golfing is not an available option in the OE*Cert* model, hiking was used as a surrogate. The model predicted that there would be 14,115 "hikers", so this value was retained in the analysis since it was close to the estimated number of 12,500 golfers. For Sector 10, Croft State Park, there are approximately 155,000 park visitors, with 10 percent of those visitors, or 15,500 visitors, recreating in the areas corresponding to Sectors 10A, 10B, 10C, and

Table 3-3. Ordnance Density Estimates Used in OE*Cert*

	Ordnance Density Estimates					
	Items / Acre			Items / Sq Ft		
Sector	Low	Point	High	Low	Point	High
10A	6.1	11.4	16.8	1.4E-4	2.6E-4	3.9E-4
10B	0	17.9	37.8	0	4.1E-4	8.7E-4
10C	1.2	11	20.7	2.8E-5	2.5E-4	4.8E-4
10D	0	5.1	14.4	0	1.2E-4	3.3E-4
11A	0	5.8	15.3	0	1.3E-4	3.5E-4
11B	0.5	5.3	10.1	1.1E-5	1.2E-4	2.3E-4
11C	0	2.8	6.7	0	6.4E-5	1.5E-4
11D	0	6.9	20.6	0	1.6E-4	4.7E-4
12A	43.2	57.3	71.4	9.9E-4	1.3E-3	1.6E-3
12B	0	8.6	19.5	0	2.0E-4	4.5E-4

Source: QST.

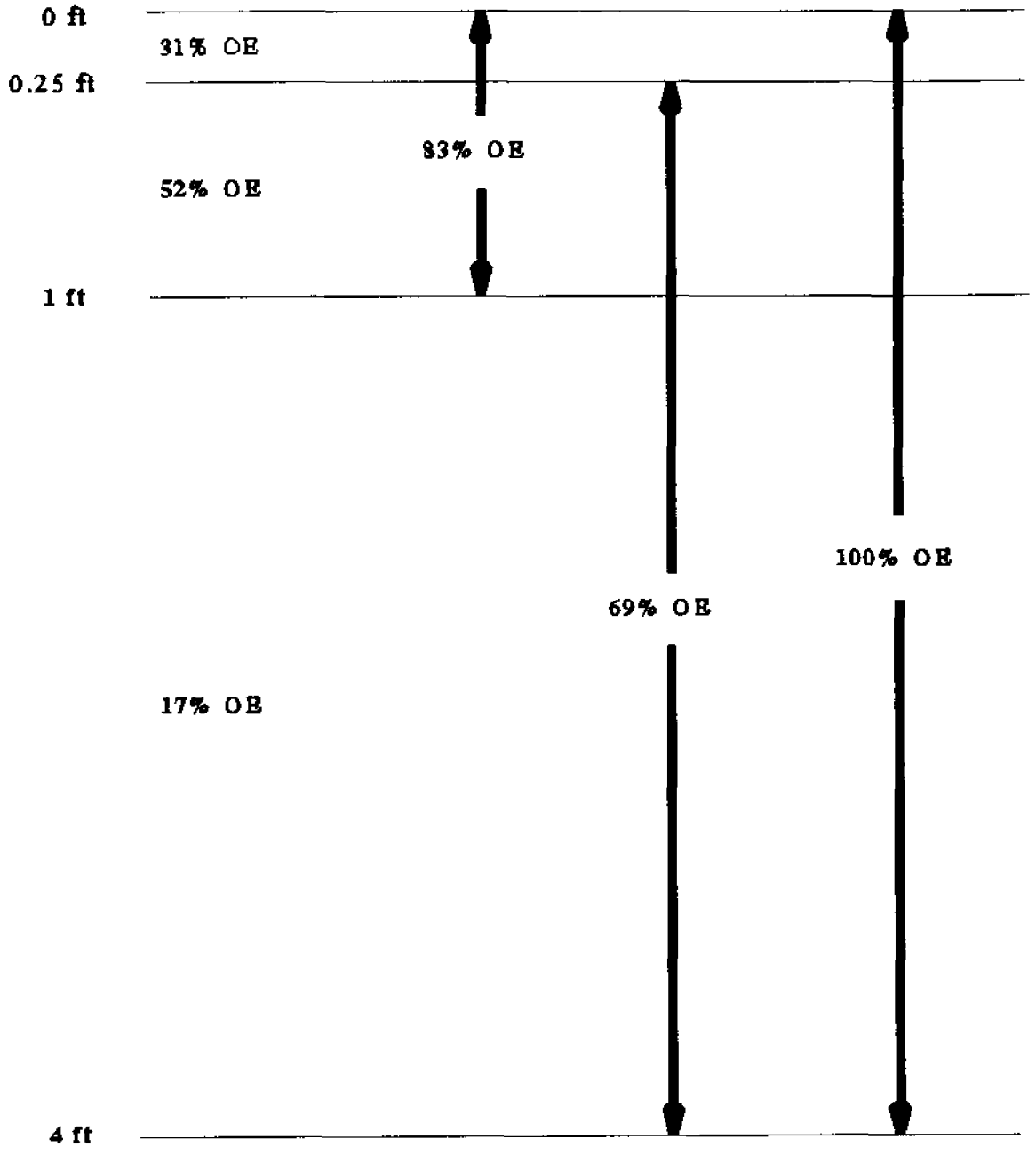
Table 3-4. City and County Population Input Values for OECert Model

	Sectors Inside Croft State Park (10A, 10B, 10C, and 10D)						Sectors Outside Croft State Park (11A, 11B, 11C, 11D, 12A, and 12B)								
	Sectors 10A, 10B, 10C, 10D Spartanburg County			Sectors 10A, 10B, 10C, 10D Spartanburg City			Sectors 11B, 11C, 11D, 12A Post Office Name: Spartanburg (Zip Code 29302)			Sector 11A Post Office Name: Pacolet (Zip Code 29372)			Sector 12B Post Office Name: Glenn Springs (Zip Code 29374)		
Age Range	Actual County Population	Actual County Percent	Estimated Park Visitors Based on "County" Age Percents (1)	Actual City Population	Actual City Percent	Estimated Park Visitors Based on "City" Age Percents (2)	Zip Code or "City" Population (2)	Zip Code or "City" Percent	Estimated "County" Population (1,3)	Zip Code or "City" Population (2)	Zip Code or "City" Percent	Estimated "County" Population (1,3)	Zip Code or "City" Population (2)	Zip Code or "City" Percent	Estimated "County" Population (1,3)
0-5	18,200	8.02%	12,438	4,110	9.46%	14,656	3,053	8.38%	2,924	264	6.40%	331	244	5.46%	359
6-11	18,658	8.23%	12,751	3,552	8.17%	12,666	2,843	7.80%	2,998	297	7.20%	339	220	4.92%	368
12-17	18,969	8.36%	12,964	3,223	7.41%	11,493	2,857	7.84%	3,048	367	8.89%	345	407	9.11%	374
18-24	24,570	10.83%	16,792	5,534	12.73%	19,734	3,963	10.87%	3,948	360	8.73%	447	454	10.16%	484
25-34	36,461	16.08%	24,918	6,941	15.97%	24,751	5,797	15.91%	5,859	558	13.52%	663	1,049	23.47%	718
35-44	34,801	15.34%	23,784	5,813	13.37%	20,729	5,725	15.71%	5,592	568	13.77%	633	794	17.77%	686
45-54	26,154	11.53%	17,874	4,131	9.50%	14,731	4,141	11.36%	4,203	433	10.49%	476	514	11.50%	515
55-64	20,299	8.95%	13,873	3,489	8.03%	12,442	3,204	8.79%	3,262	512	12.41%	369	349	7.81%	400
65+	28,688	12.65%	19,606	6,674	15.35%	23,799	4,860	13.34%	4,610	767	18.59%	522	438	9.80%	565
Total	*226,800*	*100.00%*	*155,000*	*43,467*	*100.00%*	*155,000*	*36,443*	*100.00%*	*36,443*	*4,126*	*100.00%*	*4,126*	*4,469*	*100.00%*	*4,469*

Note: (1) = Used as county population OECert input values.
(2) = Used as city population OECert input values.
(3) = For Sectors outside Croft State Park, the Spartanburg County age percentage breakdowns were used to calculate the estimated "county" populations.
Total annual number of Croft State Park visitors is 155,000 (Perry, 1997).

Sources: Fanning (1997), Perry (1997), QST (1997), U.S. Census Bureau (1990).

Figure 3-1. Estimated Distribution of Ordnance and Explosives



10D (Perry, 1997). Approximately 5 percent of the 15,500 persons, or 775 persons, would be hiking; 85 percent of the 15,500 persons, or 13,175 persons, would be horseback riding; 10 percent of the 15,500 persons, or 1,550 persons, would be biking (Perry, 1997); and 1,400 persons would be hunting (Hart, 1997). It was estimated that 2 persons would be conducting archeological investigations at Sector 10A annually, and that 2 persons would be working on construction projects at Sector 11D annually.

3.2 Risk Estimation Results

Table 3-5 and Figure 3-2 provide the total annual expected population exposures for the 10 sectors evaluated for the various risk reduction alternatives and UXO density estimates. These exposure estimates assume that all the potential recreational and occupational activities occur at each sector. For example, these estimates assume that hiking, horseback riding, hunting, and biking occur at Sector 10C.

Table 3-6 provides the expected annual population exposures for the various activities that occur at the 10 sectors evaluated for the various risk reduction alternatives and UXO density estimates. Intrusive activities such as conducting archeological investigations, child playing, working on construction projects, and driving off-road vehicles occur at Sectors 10A, 11C, 11D, and 12A. Since nonintrusive activities such as hunting, hiking, biking, horseback riding, ranching, short cutting, and riding motor bikes do not disturb the subsurface soil, note in Table 3-6 that the number of exposures are zero for all nonintrusive activities for 0.25 and 1-ft clearance risk reduction alternatives.

Table 3-7 provides the probabilities of annual individual exposure for the 10 sectors for the various risk reduction alternatives and UXO density estimates. Table 3-8 provides the probabilities of annual individual exposure broken down by sector activity.

3.3 Interpretation of Risk Results

The total annual expected population exposures provided in Table 3-5 are quite variable at times between the low, point, and high density estimates. This could be due to the fact that: (1) insufficient sampling was conducted at the site; and/or (2) the percent of surface UXO was allowed to vary between 0% for the low estimate, 15.5% for the point estimate, and 31% for the high estimate. For sectors with nonintrusive activities occurring exclusively (Sectors 10B, 10C, 10D, 11A, 11B, and 12B), no exposures were expected with surface and 1 ft clearance alternatives. For sectors with both intrusive and nonintrusive activities (Sectors 10A, 11C, 11D, and 12A), exposures decreased markedly with surface and 1 ft clearance alternatives. Expected exposures were generally the highest at Sector 12A, with the bulk of the exposure occurring from driving off-road vehicles (Table 3-6 and Figure 3-1).

Table 3-5. Total Annual Expected Population Exposures

Sector	Activity Types[a]	Risk Reduction Alternatives								
		No Action			Surface (0-3 Inches)			1 Foot		
		UXO Density Estimate								
		Low	Point	High	Low	Point	High	Low	Point	High
10A	I, NI	14	228	644	10	18	27	2	4	6
10B	NI	0	401	1,703	0	0	0	0	0	0
10C	NI	0	3,200	12,289	0	0	0	0	0	0
10D	NI	0	2,561	14,083	0	0	0	0	0	0
11A	NI	0	51	273	0	0	0	0	0	0
11B	NI	0	251	964	0	0	0	0	0	0
11C	I, NI	0	799	3,216	0	147	343	0	3	7
11D	I, NI	0	3,747	20,443	0	348	1,022	0	7	22
12A	I, NI	4,002	38,576	88,490	213	279	344	52	69	85
12B	NI	0	162	730	0	0	0	0	0	0

Note: The risk reduction alternative of 4-ft removal results in no public exposures per year.

[a] I = intrusive, NI = nonintrusive.

Source: QST.

Figure 3-2. Annual Population Exposures for Varying Densities and Risk Reduction Alternatives

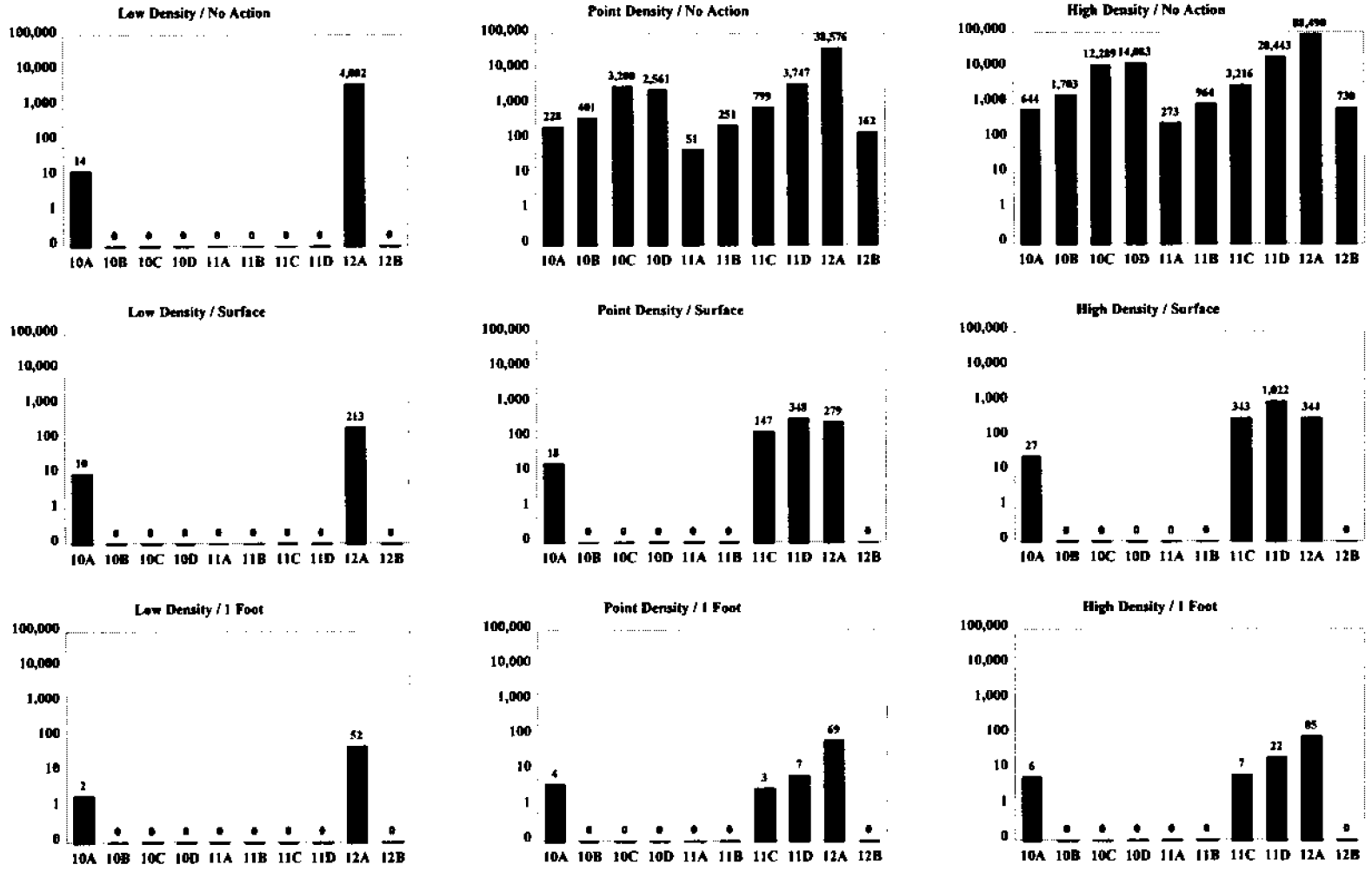


Table 3-6. Expected Annual Population Exposures for Sector Activities

Sector	Activity (I=intrusive, NI=nonintrusive)	Risk Reduction Alternative: No Action — UXO Density Estimate: Low	No Action: Point	No Action: High	Surface (0-3 Inches) Removal: Low	Surface (0-3 Inches) Removal: Point	Surface (0-3 Inches) Removal: High	1-Ft Removal: Low	1-Ft Removal: Point	1-Ft Removal: High
10A	Archeology (I)	14	22	28	10	18	27	2	4	6
	Hunting (NI)	0	205	616	0	0	0	0	0	0
10B	Hiking (NI)	0	78	330	0	0	0	0	0	0
	Hunting (NI)	0	324	1,374	0	0	0	0	0	0
10C	Biking (NI)	0	156	598	0	0	0	0	0	0
	Hiking (NI)	0	28	109	0	0	0	0	0	0
	Horseback riding (NI)	0	2,898	11,127	0	0	0	0	0	0
	Hunting (NI)	0	118	455	0	0	0	0	0	0
10D	Biking (NI)	0	125	685	0	0	0	0	0	0
	Hiking (NI)	0	23	125	0	0	0	0	0	0
	Horseback riding (NI)	0	2,319	12,752	0	0	0	0	0	0
	Hunting (NI)	0	95	521	0	0	0	0	0	0
11A	Hiking (NI)	0	51	273	0	0	0	0	0	0
11B	Ranching (NI)	0	251	964	0	0	0	0	0	0
11C	Children playing (I)	0	793	3,189	0	147	343	0	3	7
	Short cuts (NI)	0	6	27	0	0	0	0	0	0
11D	Children playing (I)	0	2,825	15,031	0	346	1,018	0	7	20
	Construction (I)	0	2	5	0	2	5	0	0	1
	Hiking (NI)	0	920	5,406	0	0	0	0	0	0
12A	Hunting (NI)	0	8,601	21,172	0	0	0	0	0	0
	Motor bikes (NI)	0	5,458	13,436	0	0	0	0	0	0
	Off-road vehicles (I)	4,002	24,517	53,881	213	279	344	52	69	85
12B	Hunting (NI)	0	162	730	0	0	0	0	0	0

Note: The risk reduction alternative of 4-ft removal results in no public exposures per year.

Source: QST.

Table 3-7. Probabilities of Annual Individual Exposure for Sectors

	Risk Reduction Alternative								
	No Action			Surface (0-3 Inches) Removal			1-Ft Removal		
	UXO Density Estimate								
Sector	Low	Point	High	Low	Point	High	Low	Point	High
10A	1/1	1/1	1/1	1/1	1/1	1/1	1/2	1/1	1/1
10B	0	1/3	1/1	0	0	0	0	0	0
10C	0	1/2	1/1	0	0	0	0	0	0
10D	0	1/3	1/1	0	0	0	0	0	0
11A	0	1/32	1/6	0	0	0	0	0	0
11B	0	1/2	1/1	0	0	0	0	0	0
11C	0	1/32	1/8	0	1/176	1/75	0	1/8,707	1/3,715
11D	0	1/1	1/1	0	1/2	1/1	0	1/6	1/3
12A	1/4	1/1	1/1	1/61	1/46	1/38	1/245	1/187	1/152
12B	0	1/16	1/4	0	0	0	0	0	0

Note: The risk reduction alternative of 4-ft removal results in no public exposures per year.

Table 3-8. Probabilities of Annual Individual Exposure for Sector Activities

Sector	Activity (I=intrusive, NI=nonintrusive)	Risk Reduction Alternative: No Action — UXO Density Estimate: Low	Point	High	Surface (0-3 Inches) Removal — Low	Point	High	1-Ft Removal — Low	Point	High
10A	Archeology (I)	1/1	1/1	1/1	1/1	1/1	1/1	1/2	1/1	1/1
	Hunting (NI)	0	1/8	1/3	0	0	0	0	0	0
10B	Hiking (NI)	0	1/10	1/3	0	0	0	0	0	0
	Hunting (NI)	0	1/5	1/2	0	0	0	0	0	0
10C	Biking (NI)	0	1/10	1/3	0	0	0	0	0	0
	Hiking (NI)	0	1/28	1/8	0	0	0	0	0	0
	Horseback riding (NI)	0	1/5	1/2	0	0	0	0	0	0
	Hunting (NI)	0	1/13	1/4	0	0	0	0	0	0
10D	Biking (NI)	0	1/13	1/3	0	0	0	0	0	0
	Hiking (NI)	0	1/35	1/7	0	0	0	0	0	0
	Horseback riding (NI)	0	1/6	1/2	0	0	0	0	0	0
	Hunting (NI)	0	1/16	1/3	0	0	0	0	0	0
11A	Hiking (NI)	0	1/32	1/6	0	0	0	0	0	0
11B	Ranching (NI)	0	1/2	1/1	0	0	0	0	0	0
11C	Children playing (I)	0	1/33	1/9	0	1/176	1/75	0	1/8,707	1/3,715
	Short cuts (NI)	0	1/1,029	1/220	0	0	0	0	0	0
11D	Children playing (I)	0	1/9	1/2	0	1/71	1/24	0	1/3,483	1/1,186
	Construction (I)	0	1/2	1/1	0	1/2	1/1	0	1/6	1/3
	Hiking (NI)	0	1/16	1/3	0	0	0	0	0	0
12A	Hunting (NI)	0	1/3	1/2	0	0	0	0	0	0
	Motor bikes (NI)	0	1/1	1/1	0	0	0	0	0	0
	Off-road vehicles (I)	1/4	1/1	1/1	1/61	1/46	1/38	1/245	1/187	1/152
12B	Hunting (NI)	0	1/16	1/4	0	0	0	0	0	0

Note: The risk reduction alternative of 4-ft removal results in no public exposures per year.

Source: QST.

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Appendix A. OOU Locations Phase II Investigation

Appendix B. OE*Cert* Exposure Calculation Description (QuantiTech, 1995)

NOTE: The following information was obtained from QuantiTech (1995).

Public exposure to both surface and subsurface UXO items is characterized by a Poisson process. The Poisson distribution is the appropriate distribution because it is believed that sectors can be delineated, via appropriate sampling techniques, that exhibit homogeneously distributed UXO. This homogeneous distribution of UXO allows the passage of participants through the site to be characterized as a Poisson process.

The public exposures result from individuals performing specific activities (both recreational and occupational) within UXO-contaminated areas. The expected number of surface UXO exposures per participant in a sector is dependent on UXO density, the proportion of UXO on the surface of the ground, and the activity participant's exposure area (the area traversed by an individual while performing an activity). The expected number of subsurface UXO exposures per participant in an area is dependent on the UXO density, the proportion of UXO beneath the surface of the ground, the density distribution of the subsurface UXO, and the area associated with an activity performed in the area.

The calculation of the total expected number of exposures to UXO at a site follows a step-by-step process. First, for each sector, the expected number of exposures for a single individual participating in a specific activity is calculated. Second, the number of individuals that are expected to participate annually in that activity on the site is determined based on the demographics surrounding the site and activity participation data. The two values are combined as shown in the following relationship to give the total annual number of exposures expected to occur for participants in the activity that was identified.

E[Activity Exposures] = E[exposures for single participant] x E[participants]

These calculations are then performed for each activity that has been determined to be participated in at the FUDS. The values for the expected number of exposures resulting from participation in each activity are summed to yield the overall risk value for the site.

$$E[\,Total\ \ Exposures\,] = \sum_{all\ \ activities} E[\,Activity\ \ Exposures\,]$$

Appendix C. Example Participant and Risk Calculations

Example Calculation for the Number of Motorbikers at Sector 12A:

Age	Proportion of Age Range That Rides Motorbikes (QuantiTech, 1995)	Estimated "County" Population (U.S. Census Bureau, 1990)	Estimated Number of Motorbikers in "County" (Column 2 x Column 3)
0-5	0	2,924	0
6-11	0	2,998	0
12-17	0.042	3,048	128.016
18-24	0.052	3,948	205.296
25-34	0.039	5,859	228.501
35-44	0.016	5,592	89.472
45-54	0.012	4,203	50.436
55-64	0.007	3,262	22.834
65+	0.001	4,610	4.610
Total		36,443	729.309

It is assumed that motorbikers ride 12 times per year (QuantiTech, 1995). We then take the estimated number of motorbikers in the "county" (729.309) and multiply it by 12 times per year as follows:

$$729.309\ people\ x\ \frac{12\ excursions}{year} = 8{,}751.708\ county\ motorbike\ excursions\ per\ year$$

The following equation (QuantiTech, 1995) adjusts the population according to the county and state areas (811 sq mi and 31,117 sq mi, respectively) and number of parks (58):

$$8{,}751.708\ excursions\ x\ \frac{1}{\frac{811\ sq\ mi}{31{,}117\ sq\ mi} x\ 58 + 1} = 3{,}484\ motorbikers\ per\ year\ at\ OOU12A$$

Example Calculation for a Nonintrusive Risk (Motorbikers at Sector 12A; High Ordnance Density; No Action):

The calculations on the previous page estimate the number of people participating in motorbiking at Sector 12A to be 3,484.

The area of Sector 12A is 74.61 acres.

The high ordnance density is 0.0016 items / sq ft.

The percentage of ordnance on the surface is assumed to be 31 percent.

The surface sweep efficiency is 95 percent.

The activity velocity is 30 ft / sec.

Participation time is 4 hours.

Path width is 1 ft.

Slope degradation is 0.6.

Vegetation degradation is 0.6.

The following equation converts participation time from hours to seconds:

$$Participation\ Time = 4\ hours \times \frac{3{,}600\ seconds}{1\ hour} = 14{,}400\ seconds$$

The following equation calculates the traversed area from the quantities defined above:

$$Traversed\ Area = \frac{Veloc \times Slope\ Degrad \times Veg\ Degrad \times Particip\ Time \times Path\ Width}{\frac{43{,}560\ sq\ ft}{1\ acre}} = 3.57\ acres$$

Example Calculation for a Nonintrusive Risk (Motorbikers at Sector 12A; High Ordnance Density; No Action) -- Continued:

The effective area is the minimum of the Sector 12A area (74.61 acres) and the traversed area (3.57 acres) which is 3.57 acres.

The effective area is converted from acres to square feet as follows:

$$Effective\ Area = 3.57\ acres\ x\ \frac{43{,}560\ sq\ ft}{1\ acre} = 155{,}520\ sq\ ft$$

The expected individual exposures, μ, are calculated as follows:

$$\mu = UXO\ Dens\ x\ Surf\ UXO\ \%\ x\ Effect\ Area\ x\ (1 - Sweep\ Effic)$$

$$\mu = 0.0016\ items/sq\ ft\ x\ 0.31\ x\ 155{,}520\ sq\ ft\ x\ (1 - 0.95) = 3.86$$

The expected population exposures are calculated by multiplying μ (3.86) by the number of participants (3,484) to obtain 13,448 exposures.

The probability of exposure for an individual motorbiker is obtained as follows:

$$1 - e^{-\mu} = 1 - e^{-3.86} = 0.98$$

The probability of exposure for all motorbikers is obtained by multiplying μ by N, the expected number of motorbikers at the site, in the following equation:

$$1 - e^{-\mu x N} = 1 - e^{-3.86 x 3{,}484} = 1$$

Risks are obtained by multiplying the number of exposures by the UXO hazard factor of 29.

Example Calculation for an Intrusive Risk (Archeologists at Sector 10A; High Ordnance Density; No Action):

The number of archeologists at the site is 2.

The clearance depth is 0 ft.

The sector area is 156.62 acres.

The traversed area is 50,000 sq ft.

The UXO high density estimate is 0.00039 items / sq ft.

The percent of UXO on the surfice is 31%.

The sweep efficiency is 95%.

The path width is 6 ft.

The path area is calculated as follows:

$$Path\ Area = \sqrt{\frac{Sector\ Area\ x\ 43{,}560}{3.14}}\ x\ PathWidth = 8{,}844$$

The μ (path) value is calculated as follows:

$$\mu\ (path) = UXO\ Dens\ x\ Path\ Area\ x\ Surf\ UXO\ \%\ x\ (1 - Sweep\ Effic) = 0.0535$$

The surface area is the minimum of the traversed area (50,000 sq ft) and the sector area (6,822,367 sq ft), which is the traversed area of 50,000 sq ft.

The subsurface area is equivalent to the surface area of 50,000 sq ft.

The weight of the UXO is assumed to be 0.50 lbs.

The soil type is clay.

Example Calculation for an Intrusive Risk (Archeologists at Sector 10A; High Ordnance Density; No Action) -- Continued:

The following regression equations (CEHND, 1995) are used to calculate the maximum ordnance depth, the average ordnance depth, and the ordnance distribution mode:

$$Max\ Ord\ Depth = 1.4 \times 4.633 \times 0.9744^{\frac{1}{0.5}} \times 0.5^{0.3287} = 4.90$$

$$Avg\ Ord\ Depth = 0.75 \times 4.321 \times 0.9521^{\frac{1}{0.5}} \times 0.5^{0.3237} = 2.35$$

$$Ord\ Distrib\ Mode = 3 \times Avg\ Ord\ Depth - Max\ Ord\ Depth = 2.14$$

The visitor intrusion depth is 6.

The sweep efficiencies for 0-1 ft, 1-2 ft, 2-4 ft, 4-6 ft, 6-8 ft, and 8-10 ft are 95%, 92.3%, 76.2%, 34.8%, 20%, 10%, and 5%, respectively.

The surface component of μ is calculated as follows:

$$\mu\ (surface) = UXO\ Dens \times Surf\ \% \times Effect\ Surf\ Area \times (1 - 0.95) = 0.30$$

The subsurface compontent of μ for no clearance of UXO is calculated as follows, where MOD is maximum ordnance depth and ODM is ordnance distribution mode:

$$\frac{(1 - Surf\%) \times UXO\ Dens \times ODM^2 - Clear\ Depth^2}{ODM \times MOD} + \frac{MOD - ODM}{MOD}$$

Appendix D. Input and Output from OE*Cert* Model

Site-Specific OECert Input Data

Site Name	Camp Croft State Park Sectors 10A, 10B, 10C, 10D	NonPark Sectors Closest to Zip Code 29302 Post Office Name: Spartanburg 11B, 11C, 11D, 12A	NonPark Sectors Closest to Zip Code 29372 Post Office Name: Pacolet 11A	NonPark Sectors Closest to Zip Code 29374 Post Office Name: Glenn Springs 12B
Original FUDS Area (Acres)	19,044.46	19,044.46	19,044.46	19,044.46
US Region	South	South	South	South
Census Division	South Atlantic	South Atlantic	South Atlantic	South Atlantic
Site Corps District	HND	HND	HND	HND
Site State	SC	SC	SC	SC
RAC Score	1	1	1	1
General Ordnance Type	Conventional	Conventional	Conventional	Conventional
County Size (sq mi)	811	811	811	811
City Area (sq mi)	11.1	18.7	18.7	18.7
Average Size Commercial Construction (sq ft)				
Avg Size Residential Construction (sq ft)	1,300	1,300	1,300	1,300
Number of Commercial Permits	890.2	890.2	890.2	890.2
Number of Residential Permits	685.2	685.2	685.2	685.2
Number of New Permits	78.8	78.8	78.8	78.8
[0-5] County Population	12,438	2,924	331	359
[6-11] County Population	12,751	2,998	339	368
[12-17] County Population	12,964	3,048	345	374
[18-24] County Population	16,792	3,948	447	484
[25-34] County Population	24,918	5,859	663	718
[35-44] County Population	23,784	5,592	633	686
[45-54] County Population	17,874	4,203	476	515
[55-64] County Population	13,873	3,262	369	400
[65+] County Population	19,606	4,610	522	565
[0-5] City Population	14,656	3,053	264	244
[6-11] City Population	12,666	2,843	297	220
[12-17] City Population	11,493	2,857	367	407
[18-24] City Population	19,734	3,963	360	454
[25-34] City Population	24,751	5,797	558	1,049
[35-44] City Population	20,729	5,725	568	794
[45-54] City Population	14,731	4,141	433	514
[55-64] City Population	12,442	3,204	512	349
[65+] City Population	23,799	4,860	767	438
Number of Sectors	4	4	1	1
Primary Site Type	Dispersed	Dispersed	Dispersed	Dispersed
State Index	41	41	41	41

Sources: Fanning (1997), Perry (1997), QST (1997), QuantiTech (1995), USAESCH (1997), U.S. Census Bureau (1990).

(URL reload)

1990 US Census Data
Database: **C90STF3A**
Summary Level: **State--County**

Spartanburg County: FIPS.STATE=45, FIPS.COUNTY90=083

PERSONS
Universe: Persons

Total	226800

AGE
Universe: Persons

Under 1 year	2443
1 and 2 years	6758
3 and 4 years	6032
5 years	2967
6 years	3193
7 to 9 years	9026
10 and 11 years	6439
12 and 13 years	6102
14 years	3025
15 years	3217
16 years	3319
17 years	3306
18 years	3698
19 years	3826
20 years	3472
21 years	3455
22 to 24 years	10119
25 to 29 years	17943
30 to 34 years	18518
35 to 39 years	18273
40 to 44 years	16528
45 to 49 years	14382
50 to 54 years	11772
55 to 59 years	10508
60 and 61 years	4021
62 to 64 years	5770
65 to 69 years	9813
70 to 74 years	7561
75 to 79 years	5558
80 to 84 years	3541
85 years and over	2215

(URL reload)

1990 US Census Data
Database: **C90STF3A**
Summary Level: **State--Place**

Spartanburg city: FIPS.STATE=45, FIPS.PLACE90=68290

PERSONS
Universe: Persons

Total	43467

AGE
Universe: Persons

Under 1 year	604
1 and 2 years	1509
3 and 4 years	1262
5 years	735
6 years	593
7 to 9 years	1809
10 and 11 years	1150
12 and 13 years	990
14 years	522
15 years	544
16 years	536
17 years	631
18 years	740
19 years	1076
20 years	955
21 years	943
22 to 24 years	1820
25 to 29 years	3301
30 to 34 years	3640
35 to 39 years	3204
40 to 44 years	2609
45 to 49 years	2125
50 to 54 years	2006
55 to 59 years	1646
60 and 61 years	733
62 to 64 years	1110
65 to 69 years	2086
70 to 74 years	1705
75 to 79 years	1352
80 to 84 years	920
85 years and over	611

(URL reload)

1990 US Census Data
Database: **C90STF3B**
Summary Level: **ZIP Code**

Spartanburg County (pt.): ZIP=29302

PERSONS
Universe: Persons

Total	36443

AGE
Universe: Persons

Under 1 year	389
1 and 2 years	1074
3 and 4 years	1007
5 years	583
6 years	466
7 to 9 years	1468
10 and 11 years	909
12 and 13 years	876
14 years	480
15 years	552
16 years	434
17 years	515
18 years	527
19 years	659
20 years	655
21 years	590
22 to 24 years	1532
25 to 29 years	3016
30 to 34 years	2781
35 to 39 years	2979
40 to 44 years	2746
45 to 49 years	2169
50 to 54 years	1972
55 to 59 years	1603
60 and 61 years	568
62 to 64 years	1033
65 to 69 years	1496
70 to 74 years	1249
75 to 79 years	954
80 to 84 years	733
85 years and over	428

(URL reload)

1990 US Census Data
Database: C90STF3B
Summary Level: ZIP Code

Spartanburg County (pt.): ZIP=29372

PERSONS
Universe: Persons

Total	4126

AGE
Universe: Persons

Under 1 year	16
1 and 2 years	122
3 and 4 years	86
5 years	40
6 years	49
7 to 9 years	148
10 and 11 years	100
12 and 13 years	120
14 years	54
15 years	78
16 years	57
17 years	58
18 years	61
19 years	65
20 years	44
21 years	45
22 to 24 years	145
25 to 29 years	268
30 to 34 years	290
35 to 39 years	314
40 to 44 years	254
45 to 49 years	223
50 to 54 years	210
55 to 59 years	242
60 and 61 years	93
62 to 64 years	177
65 to 69 years	254
70 to 74 years	195
75 to 79 years	163
80 to 84 years	103
85 years and over	52

(URL reload)

1990 US Census Data
Database: **C90STF3B**
Summary Level: **ZIP Code**

Spartanburg County (pt.): ZIP=29374

PERSONS
Universe: Persons

Total	4469

AGE
Universe: Persons

Under 1 year	45
1 and 2 years	68
3 and 4 years	49
5 years	62
6 years	40
7 to 9 years	98
10 and 11 years	82
12 and 13 years	118
14 years	135
15 years	34
16 years	73
17 years	47
18 years	49
19 years	56
20 years	76
21 years	42
22 to 24 years	231
25 to 29 years	574
30 to 34 years	475
35 to 39 years	497
40 to 44 years	297
45 to 49 years	277
50 to 54 years	237
55 to 59 years	215
60 and 61 years	70
62 to 64 years	64
65 to 69 years	139
70 to 74 years	177
75 to 79 years	62
80 to 84 years	48
85 years and over	12

Sector Name	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A
Ordnance Density	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Point	Point	Point	Point	Point
Clearance	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	156.62	36.81	11.37	5.07	24.6	31.29	17.13	15.81	74.61	16.07	156.62	36.81	11.37	5.07	24.6
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level
Vegetation	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	0	0	0	400	0	400	0	300	0	0	0	0	0	400	0
Barriers Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0
LOS Distance to Localized Contamination (feet)	10	10	10	10	10	15	20	20	15	20	10	10	10	10	10
Snakes Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bees Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Poisonous Foliage Present	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	0	0	0	0	0	540500	0	0	0	0	0	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	50000	0	0	0	0	0	0	0	0	0	50000	0	0	0	0
Number Archaeologists	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Number of Excavations Per Year	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Child Play	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No
Short Cut	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Biking	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Hiking	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Motor Bike	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Archeology	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Tourist Attraction ?	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No
Expected Number of Tourists	15500	15500	15500	15500	n/a	n/a	n/a	12500	n/a	n/a	15500	15500	15500	15500	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Materials	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosporus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.50%	15.50%	15.50%	15.50%	15.50%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50
Ordnance Density (items/sq ft)	0.0001400	0.0000000	0.0000280	0.0000000	0.0000000	0.0000110	0.0000000	0.0000000	0.0009900	0.0000000	0.0002600	0.0004100	0.0002500	0.0001200	0.0001300
Total Density (items/sq ft)															
Total Number of Ordnance Items	0	161	50	23	0	137	75	61	1951	211	0	161	50	23	0
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3
Slope Index	1	1	2	1	1	2	1	1	2	2	1	1	2	1	1
Dig Method Index	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Type Index	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Site Data Location Index	51	51	51	51	54	57	57	57	57	60	52	52	52	52	55
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Snorkel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Attractive Items															
Dispersed Water Area (sq ft)															

Sector Name	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B
Ordnance Density	Point	Point	Point	Point	Point	High	High	High	High	High	High	High	High	High	High
Clearance	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	31.29	17.13	13.81	74.61	16.07	156.62	36.81	11.37	5.07	24.6	31.29	17.13	13.81	74.61	16.07
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Moderate	Moderate
Vegetation	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	400	0	300	0	0	0	0	0	400	0	400	0	300	0	0
Barriers Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
LOS Distance to Localized Contamination (feet)	15	20	20	15	20	10	10	10	10	10	15	20	20	15	20
Snakes Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Bees Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Poisonous Foliage Present	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	740500	0	0	0	0	0	0	0	0	0	740500	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	0	0	0	0	0	50000	0	0	0	0	0	0	0	0	0
Number Archaeologists	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Number of Excavations Per Year	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Child Play	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No	No
Short Cut	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Biking	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Hiking	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Motor Bike	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Archeology	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Tourist Attraction	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
Expected Number of Tourists	n/a	n/a	12500	n/a	n/a	15500	15500	15500	15500	n/a	n/a	n/a	12500	n/a	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Materials	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosporus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	15.50%	15.50%	15.50%	15.50%	15.50%	31.00%	31.00%	31.00%	31.00%	31.00%	31.00%	31.00%	31.00%	31.00%	31.00%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00
Ordnance Density (items/sq ft)	0.0001200	0.0000640	0.0001600	0.0013000	0.0002000	0.0003900	0.0008700	0.0004800	0.0003300	0.0003500	0.0002300	0.0001500	0.0004700	0.0016400	0.0004500
Total Density (items/sq ft)															
Total Number of Ordnance Items	137	75	61	1951	211	0	161	50	23	0	137	75	61	1951	211
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	5	5	1	5	5	5	5	5	3	5	5	5	1	5	5
Slope Index	2	1	1	2	2	1	1	2	1	1	2	1	1	2	2
Dig Method Index	1	1	1	3	1	1	1	1	1	1	1	1	1	3	1
Soil Type Index	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Site Data Location Index	58	58	58	58	61	53	53	53	53	56	59	59	59	59	62
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Snorkel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Attractive Sites															
Dispersed Water Area (sq ft)															

Sector Name	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A
Ordnance Density	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Point	Point	Point	Point	Point
Clearance	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	156.62	36.81	11.37	5.07	24.6	31.29	17.13	13.81	74.61	16.07	156.62	36.81	11.37	5.07	24.6
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level
Vegetation	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	0	0	0	400	0	400	0	500	0	0	0	0	0	400	0
Barriers Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0
LOS Distance to Localized Contamination (feet)	10	10	10	10	10	15	20	20	15	20	10	10	10	10	10
Smoke Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dust Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Poisonous Foliage Present	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	0	0	0	0	0	760500	0	0	0	0	0	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	50000	0	0	0	0	0	0	0	0	0	50000	0	0	0	0
Number Archaeologists	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Number of Excavations Per Year	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Child Play	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No
Short Cut	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Biking	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Hiking	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Motor Bike	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Archeology	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Tourist Attraction ?	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No
Expected Number of Tourists	15500	15500	15500	15500	n/a	n/a	n/a	12500	n/a	n/a	15500	15500	15500	15500	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Minerals	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosperus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50
Ordnance Density (items/sq ft)	0.0000946	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Total Density (items/sq ft)															
Total Number of Ordnance Items	0	181	50	23	0	137	95	61	1951	211	0	161	50	23	0
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	5	5	5	3	5	5	5	1	5	5	5	5	5	3	5
Slope Index	1	1	2	1	1	2	1	1	2	2	1	1	2	1	1
Dig Method Index	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
Soil Type Index	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2
Site Data Location Index	63	63	63	63	66	69	69	69	69	72	64	64	64	64	67
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Snorkel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Attractive Sites															
Dispersed Water Area (sq ft)															

Sector Name	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B
Ordnance Density	Point	Point	Point	Point	Point	High	High	High	High	High	High	High	High	High	High
Clearance	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	31.29	17.13	13.81	74.61	16.07	156.62	36.81	11.37	5.07	24.6	31.29	17.13	13.81	74.61	16.07
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Moderate	Moderate
Vegetation	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	400	0	500	0	0	0	0	0	400	0	400	0	500	0	0
Barriers Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
LOS Distance to Localized Contamination (feet)	15	20	20	15	20	10	10	10	10	10	15	20	20	15	20
Snakes Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Bees Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Poisonous Foliage Present	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	740500	0	0	0	0	0	0	0	0	0	740500	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	0	0	0	0	0	50000	0	0	0	0	0	0	0	0	0
Number Archaeologists	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Number of Excavations Per Year	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Child Play	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No	No
Short Cut	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Biking	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Hiking	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Motor Bike	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Archeology	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Tourist Attraction ?	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
Expected Number of Tourists	n/a	n/a	12500	n/a	n/a	155001	155001	155001	155001	n/a	n/a	12500	n/a	n/a	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Materials	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosporus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00
Ordnance Density (items/sq ft)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Total Density (items/sq ft)															
Total Number of Ordnance Items	137	75	61	1951	211	0	161	50	23	0	137	75	61	1951	211
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	5	5	1	5	5	5	5	5	1	5	5	5	1	5	5
Slope Index	2	1	1	2	2	1	1	2	1	1	2	1	1	2	2
Dig Method Index	1	1	1	3	1	1	1	1	1	1	1	1	1	3	1
Soil Type Index	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Site Data Location Index	70	70	70	70	73	65	65	65	65	68	71	73	71	71	74
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Snorkel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Attractive Sites															
Dispersed Water Area (sq ft)															

Sector Name	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A
Ordnance Density	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Point	Point	Point	Point	Point
Clearance	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	156.62	36.81	11.37	5.07	24.6	31.29	17.17	13.91	74.61	16.07	156.62	36.81	11.37	5.07	24.6
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level
Vegetation	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	0	0	0	400	0	400	0	300	0	0	0	0	0	400	0
Burners Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0
LOS Distance to Localized Contamination (feet)	10	10	10	10	10	15	20	20	15	30	10	10	10	10	10
Snakes Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bees Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Poisonous Foliage Present	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	0	0	0	0	0	740500	0	0	0	0	0	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	50000	0	0	0	0	0	0	0	0	0	50000	0	0	0	0
Number Archaeologists	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Number of Excursions Per Year	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Child Play	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No
Short Cut	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Biking	No	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Hiking	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	Yes	No
Motor Bike	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Archeology	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Tourist Attraction ?	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No
Expected Number of Tourists	15500	15500	15500	15500	n/a	n/a	n/a	12500	n/a	n/a	15500	15500	15500	15500	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Materials	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosporus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50
Ordnance Density (items/sq ft)	0.0000230	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	0.0000442	#REF!	#REF!	#REF!	#REF!
Total Density (items/sq ft)															
Total Number of Ordnance Items	0	161	50	23	0	137	75	61	1951	211	0	161	50	23	0
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	5	5	5	5	5	5	5	1	5	5	5	5	5	3	5
Slope Index	1	1	2	1	1	2	1	1	2	2	1	1	2	1	1
Dig Method Index	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
Soil Type Index	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Site Data Location Index	75	75	75	75	78	81	81	81	81	84	76	76	76	76	79
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SnorLel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Automotive Sites															
Dispersed Water Area (sq ft)															

Sector Name	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B
Ordnance Density	Point	Point	Point	Point	Point	High	High	High	High	High	High	High	High	High	High
Clearance	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
Sector Area (acres)	31.29	17.13	13.81	74.61	16.07	156.62	36.81	11.37	5.07	24.6	31.29	17.13	13.81	74.61	16.07
Sector Demographic Location	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Slope	Moderate	Level	Level	Moderate	Moderate	Level	Level	Moderate	Level	Level	Moderate	Level	Level	Level	Moderate
Vegetation	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees	Grassy/Brush	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Brushy/Trees	Grassy/Brush	Grassy/Brush	Grassy/Brush	Brushy/Trees
Soil Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Primary Crop	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Maximum Walking Distance To Sector (feet)	400	0	300	0	0	0	0	0	400	0	400	0	300	0	0
Barriers Present?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Number of Buildings in Sector	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
LOS Distance to Localized Contamination (feet)	15	20	20	15	20	10	10	10	10	10	15	20	20	15	20
Snakes Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Bees Present	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Poisonous Foliage Present	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Farming Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ranching Area (sq ft)	740500	0	0	0	0	0	0	0	0	0	740500	0	0	0	0
Metal Detecting Area (sq ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Area (sq ft)	0	0	0	0	0	500001	0	0	0	0	0	0	0	0	0
Number Archaeologists	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Number of Excavations Per Year	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Child Play	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No	No
Short Cut	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No
Picnicing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Camping	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hunting	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Freshwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Off-Road Vehicle	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Biking	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Hiking	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No
Swimming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Horseback Riding	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Motor Bike	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Jogging	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Metal Detecting	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Saltwater Fishing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Board Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Skiing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Snorkeling	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
SCUBA	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Sailing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Surfing	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dune Buggies	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Construction	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No
Surveying	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Farming	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ranching	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Archaeology	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Tourist Attraction	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
Expected Number of Tourists	n/a	n/a	12500	n/a	n/a	15500	15500	15500	15500	n/a	n/a	n/a	12500	n/a	n/a
LOCALIZED Armed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED UnArmed UXO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Explosives & Materials	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Propellants & Pyrotechnics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED Non-Controlled Chemical	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED White Phosporus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LOCALIZED CWM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DISPERSED Percentage UXO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
DISPERSED Percentage Light/Motion Sensitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage White Phosphorous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DISPERSED Percentage CBR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of Ordnance on Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Ordnance Weight (lbs)	0.50	0.50	0.50	2.00	2.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	2.00	2.00
Ordnance Density (items/sq ft)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total Density (items/sq ft)															
Total Number of Ordnance Items	137	75	61	1951	211	0	161	50	23	0	137	75	61	1951	211
Number of Remediation Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dig Method	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig	Hand Dig
Surface Sweep Efficiency	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Clearance Depth (feet)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Subsurface Sweep Efficiency	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Number of Remediation Teams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetation Index	5	5	1	5	5	5	5	5	3	5	5	5	1	5	5
Slope Index	2	1	1	2	2	1	1	2	1	1	2	1	1	2	2
Dig Method Index	1	1	1	3	1	1	1	1	1	1	1	1	1	3	1
Soil Type Index	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Site Data Location Index	82	82	82	82	85	77	77	77	77	80	85	85	85	85	86
Child Play Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Camping Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Off Road Vehicle Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Farming Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Localized Excavation Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Child Play Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Picnic Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Freshwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Swimming Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Saltwater Fishing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Board Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Skiing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Snorkel Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SCUBA Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surfing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sailing Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motor Biking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hunting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hiking Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metal Detecting Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dune Buggies Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shoreline Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Visibility	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Construction Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archaeology Water Area (sq feet)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sweep Efficiency 0-1 Feet	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%	92.30%
Sweep Efficiency 1-2 Feet	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%	76.20%
Sweep Efficiency 2-4 Feet	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%	34.80%
Sweep Efficiency 4-6 Feet	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Sweep Efficiency 6-8 Feet	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Sweep Efficiency 8-10 Feet	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Localized Contamination Area (sq ft)															
Number of Alternative Attractive Sites															
Dispersed Water Area (sq ft)															

Sector Name	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C
Ordnance Density	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Point	Point	Point
Clearance	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures									0.00E+00				
MOTORBIKING Expected Population Exposures									0.00E+00				
MOTORBIKING Probability Individual Exposure									0.00E+00				
MOTORBIKING Probability Population Exposure									0.00E+00				
MOTORBIKING Individual Risk									0.00E+00				
MOTORBIKING Population Risk									0.00E+00				
HUNTING Expected Individual Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	1.43E-01	2.25E-01	8.23E-02
HUNTING Expected Population Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	2.05E+02	3.24E+02	1.18E+02
HUNTING Probability Individual Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	1.33E-01	2.01E-01	7.90E-02
HUNTING Probability Population Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	1.00E+00	1.00E+00	1.00E+00
HUNTING Individual Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	4.13E+00	6.52E+00	2.39E+00
HUNTING Population Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	5.95E+03	9.39E+03	3.44E+03
HIKING Expected Individual Exposures		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				1.00E-01	3.66E-02
HIKING Expected Population Exposures		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				2.77E+01	2.84E+01
HIKING Probability Individual Exposure		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				9.34E-02	3.60E-02
HIKING Probability Population Exposure		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				1.00E+00	1.00E+00
HIKING Individual Risk		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				2.91E+00	1.06E+00
HIKING Population Risk		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				2.25E+03	8.23E+02
BIKING Expected Individual Exposures			0.00E+00	0.00E+00									1.00E-01
BIKING Expected Population Exposures			0.00E+00	0.00E+00									1.56E+02
BIKING Probability Individual Exposure			0.00E+00	0.00E+00									9.56E-02
BIKING Probability Population Exposure			0.00E+00	0.00E+00									1.00E+00
BIKING Individual Risk			0.00E+00	0.00E+00									2.91E+00
BIKING Population Risk			0.00E+00	0.00E+00									4.51E+03
HORSEBACK Expected Individual Exposures			0.00E+00	0.00E+00									2.20E-01
HORSEBACK Expected Population Exposures			0.00E+00	0.00E+00									2.90E+03
HORSEBACK Probability Individual Exposure			0.00E+00	0.00E+00									1.97E-01
HORSEBACK Probability Population Exposure			0.00E+00	0.00E+00									1.00E+00
HORSEBACK Individual Risk			0.00E+00	0.00E+00									6.38E+00
HORSEBACK Population Risk			0.00E+00	0.00E+00									8.40E+04
SHORT CUT Expected Individual Exposures							0.00E+00						
SHORT CUT Expected Population Exposures							0.00E+00						
SHORT CUT Probability Individual Exposure							0.00E+00						
SHORT CUT Probability Population Exposure							0.00E+00						
SHORT CUT Individual Risk							0.00E+00						
SHORT CUT Population Risk							0.00E+00						
RANCHING Expected Individual Exposures						0.00E+00							
RANCHING Expected Population Exposures						0.00E+00							
RANCHING Probability Individual Exposure						0.00E+00							
RANCHING Probability Population Exposure						0.00E+00							
RANCHING Individual Risk						0.00E+00							
RANCHING Population Risk						0.00E+00							
CHILD PLAY Expected Individual Exposures							0.00E+00	0.00E+00					
CHILD PLAY Expected Population Exposures							0.00E+00	0.00E+00					
CHILD PLAY Probability Individual Exposure							0.00E+00	0.00E+00					
CHILD PLAY Probability Population Exposure							0.00E+00	0.00E+00					
CHILD PLAY Individual Risk							0.00E+00	0.00E+00					
CHILD PLAY Population Risk							0.00E+00	0.00E+00					
OFFROAD VEHICLE Expected Individual Exposures									3.12E-01				
OFFROAD VEHICLE Expected Population Exposures									4.00E+03				
OFFROAD VEHICLE Probability Individual Exposure									2.68E-01				
OFFROAD VEHICLE Probability Population Exposure									1.00E+00				
OFFROAD VEHICLE Individual Risk									9.06E+00				
OFFROAD VEHICLE Population Risk									1.16E+05				
CONSTRUCTION Expected Individual Exposures								0.00E+00					
CONSTRUCTION Expected Population Exposures								0.00E+00					
CONSTRUCTION Probability Individual Exposure								0.00E+00					
CONSTRUCTION Probability Population Exposure								0.00E+00					
CONSTRUCTION Individual Risk								0.00E+00					
CONSTRUCTION Population Risk								0.00E+00					
ARCHAEOLOGY Expected Individual Exposures	7.05E+00										1.12E+01		
ARCHAEOLOGY Expected Population Exposures	1.41E+01										2.24E+01		
ARCHAEOLOGY Probability Individual Exposure	9.99E-01										1.00E+00		
ARCHAEOLOGY Probability Population Exposure	1.00E+00										1.00E+00		
ARCHAEOLOGY Individual Risk	2.05E+02										3.24E+02		
ARCHAEOLOGY Population Risk	4.09E+02										6.49E+02		
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E+00	9.42E+00	1.27E+01
NON_INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E+03	1.36E+04	9.28E+04
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	2.05E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.06E+00	0.00E+00	3.24E+02	0.00E+00	0.00E+00
INTRUSIVE Risk (Population)	4.09E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E+05	0.00E+00	6.49E+02	0.00E+00	0.00E+00
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	4.09E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E+05	0.00E+00	6.60E+03	1.16E+04	9.28E+04
Motorbike N									3.48E+03				
Hunting N	1.44E+03	1.44E+03	1.44E+03	1.44E+03					2.01E+04	2.47E-03	1.44E+03	1.44E+03	1.44E+03
Hiking N		7.75E+02	7.75E+02	7.75E+02	1.60E+03			1.41E+04				7.75E+02	7.75E+02
Biking N			1.55E+03	1.55E+03									1.55E+03
Horseback N			1.32E+04	1.32E+04									1.32E+04
Shortcut N							5.83E+03						
Ranching N						3.65E+02							
Child Play N							2.57E+04	2.43E+04					
Off Road Vehicles N									1.28E+04				
Construction N								2.00E+00					
Archaeology N	2.00E+00										2.00E+00		
Motorbike mu									0.00E+00				
Hunting mu	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	1.43E-01	2.25E-01	8.23E-02
Hiking mu		0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				1.00E-01	3.66E-02
Biking mu			0.00E+00	0.00E+00									1.00E-01
Horseback mu			0.00E+00	0.00E+00									2.20E-01
Shortcut mu							0.00E+00						
Ranching mu						0.00E+00							
Child Play mu							0.00E+00	0.00E+00					
Off Road Vehicles mu									3.12E-01				
Construction mu								0.00E+00					
Archaeology mu	7.05E+00										1.12E+01		

Sector Name	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B
Ordnance Density	Point	Point	Point	Point	Point	Point	Point	High	High	High	High	High	High
Clearance	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action	No Action
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures						1.57E+00							
MOTORBIKING Expected Population Exposures						5.46E+03							
MOTORBIKING Probability Individual Exposure						7.91E-01							
MOTORBIKING Probability Population Exposure						1.00E+00							
MOTORBIKING Individual Risk						4.54E+01							
MOTORBIKING Population Risk						1.58E+05							
HUNTING Expected Individual Exposures	6.58E-02					4.28E-01	6.58E-02	4.28E-01	9.54E-01	3.16E-01	3.62E-01		
HUNTING Expected Population Exposures	9.47E+01					8.60E+03	1.62E+02	6.16E+02	1.37E+03	4.55E+02	5.21E+02		
HUNTING Probability Individual Exposure	6.37E-02					3.48E-01	6.37E-02	3.48E-01	6.13E-01	2.71E-01	3.04E-01		
HUNTING Probability Population Exposure	1.00E+00					1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00		
HUNTING Individual Risk	1.91E+00					1.24E+01	1.91E+00	1.24E+01	2.77E+01	9.16E+00	1.05E+01		
HUNTING Population Risk	2.75E+03					2.49E+05	4.71E+03	1.79E+04	3.98E+04	1.32E+04	1.51E+04		
HIKING Expected Individual Exposures	2.93E-02	3.18E-02			6.52E-02				4.25E-01	1.41E-01	1.61E-01	1.71E-01	
HIKING Expected Population Exposures	2.27E+01	5.07E+01			9.20E+02				3.30E+02	1.09E+02	1.25E+02	2.73E+02	
HIKING Probability Individual Exposure	2.89E-02	3.13E-02			6.31E-02				3.46E-01	1.31E-01	1.49E-01	1.57E-01	
HIKING Probability Population Exposure	1.00E+00	1.00E+00			1.00E+00				1.00E+00	1.00E+00	1.00E+00	1.00E+00	
HIKING Individual Risk	8.51E-01	9.21E-01			1.89E+00				1.23E+01	4.08E+00	4.68E+00	4.96E+00	
HIKING Population Risk	6.59E+02	1.47E+03			2.67E+04				9.56E+03	3.16E+03	3.63E+03	7.92E+03	
BIKING Expected Individual Exposures	8.03E-02									3.86E-01	4.42E-01		
BIKING Expected Population Exposures	1.25E+02									5.98E+02	6.85E+02		
BIKING Probability Individual Exposure	7.72E-02									3.20E-01	3.57E-01		
BIKING Probability Population Exposure	1.00E+00									1.00E+00	1.00E+00		
BIKING Individual Risk	2.33E+00									1.12E+01	1.28E+01		
BIKING Population Risk	3.61E+03									1.73E+04	1.99E+04		
HORSEBACK Expected Individual Exposures	1.76E-01									8.45E-01	9.68E-01		
HORSEBACK Expected Population Exposures	2.32E+03									1.11E+04	1.28E+04		
HORSEBACK Probability Individual Exposure	1.61E-01									5.70E-01	6.20E-01		
HORSEBACK Probability Population Exposure	1.00E+00									1.00E+00	1.00E+00		
HORSEBACK Individual Risk	5.10E+00									2.45E+01	2.81E+01		
HORSEBACK Population Risk	6.72E+04									3.23E+05	3.70E+05		
SHORT CUT Expected Individual Exposures				9.72E-04									
SHORT CUT Expected Population Exposures				5.66E+00									
SHORT CUT Probability Individual Exposure				9.72E-04									
SHORT CUT Probability Population Exposure				9.97E-01									
SHORT CUT Individual Risk				2.82E-02									
SHORT CUT Population Risk				1.64E+02									
RANCHING Expected Individual Exposures			6.89E-01										2.64E+00
RANCHING Expected Population Exposures			2.51E+02										9.64E+02
RANCHING Probability Individual Exposure			4.98E-01										9.29E-01
RANCHING Probability Population Exposure			1.00E+00										1.00E+00
RANCHING Individual Risk			2.00E+01										7.66E+01
RANCHING Population Risk			7.29E+03										2.79E+04
CHILD PLAY Expected Individual Exposures				3.09E-02	1.16E-01								
CHILD PLAY Expected Population Exposures				7.93E+02	2.82E+03								
CHILD PLAY Probability Individual Exposure				3.04E-02	1.10E-01								
CHILD PLAY Probability Population Exposure				1.00E+00	1.00E+00								
CHILD PLAY Individual Risk				8.95E-01	3.37E+00								
CHILD PLAY Population Risk				2.30E+04	8.19E+04								
OFFROAD VEHICLE Expected Individual Exposures						1.91E+00							
OFFROAD VEHICLE Expected Population Exposures						2.45E+04							
OFFROAD VEHICLE Probability Individual Exposure						8.52E-01							
OFFROAD VEHICLE Probability Population Exposure						1.00E+00							
OFFROAD VEHICLE Individual Risk						5.55E+01							
OFFROAD VEHICLE Population Risk						7.11E+05							
CONSTRUCTION Expected Individual Exposures					9.61E-01								
CONSTRUCTION Expected Population Exposures					1.92E+00								
CONSTRUCTION Probability Individual Exposure					6.18E-01								
CONSTRUCTION Probability Population Exposure					8.54E-01								
CONSTRUCTION Individual Risk					2.79E+01								
CONSTRUCTION Population Risk					5.57E+01								
ARCHAEOLOGY Expected Individual Exposures								1.39E+01					
ARCHAEOLOGY Expected Population Exposures								2.78E+01					
ARCHAEOLOGY Probability Individual Exposure								1.00E+00					
ARCHAEOLOGY Probability Population Exposure								1.00E+00					
ARCHAEOLOGY Individual Risk								4.03E+02					
ARCHAEOLOGY Population Risk								8.07E+02					
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	1.02E+01	9.21E-01	2.00E+01	2.82E-02	1.89E+00	5.78E+01	1.91E+00	1.24E+01	4.00E+01	4.89E+01	5.61E+01	4.96E+00	7.66E+01
NON_INTRUSIVE Risk (Population)	7.43E+04	1.47E+03	7.29E+03	1.64E+02	2.67E+04	4.08E+05	4.71E+03	1.79E+04	4.94E+04	3.56E+05	4.08E+05	7.92E+03	2.79E+04
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	8.95E-01	3.12E+01	5.55E+01	0.00E+00	4.03E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	2.30E+04	8.20E+04	7.11E+05	0.00E+00	8.07E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	7.43E+04	1.47E+03	7.29E+03	2.32E+04	1.09E+05	1.12E+06	4.71E+03	1.87E+04	4.94E+04	3.56E+05	4.08E+05	7.92E+03	2.79E+04
Motorbike N						3.48E+03							
Hunting N	1.44E+03					2.01E+04	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03		
Hiking N	7.75E+02	1.60E+03			1.41E+04				7.75E+02	7.75E+02	7.75E+02	1.60E+03	
Biking N	1.55E+03									1.55E+03	1.55E+03		
Horseback N	1.32E+04									1.32E+04	1.32E+04		
Shortcut N				5.83E+03									
Ranching N			3.65E+02										3.65E+02
Child Play N				2.57E+04	2.43E+04								
Off Road Vehicles N						1.28E+04							
Construction N					2.00E+00								
Archaeology N								2.00E+00					
Motorbike mu						1.57E+00							
Hunting mu	6.58E-02					4.28E-01	6.58E-02	4.28E-01	9.54E-01	3.16E-01	3.62E-01		
Hiking mu	2.93E-02	3.18E-02			6.52E-02				4.25E-01	1.41E-01	1.61E-01	1.71E-01	
Biking mu	8.03E-02									3.86E-01	4.42E-01		
Horseback mu	1.76E-01									8.45E-01	9.68E-01		
Shortcut mu				9.72E-04									
Ranching mu			6.89E-01										2.64E+00
Child Play mu				3.09E-02	1.16E-01								
Off Road Vehicles mu						1.91E+00							
Construction mu					9.61E-01								
Archaeology mu								1.39E+01					

Sector Name	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A
Ordnance Density	High	High	High	High	Low	Low	Low	Low	Low	Low	Low	Low	Low
Clearance	No Action	No Action	No Action	No Action	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures			3.86E+00										0.00E+00
MOTORBIKING Expected Population Exposures			1.34E+04										0.00E+00
MOTORBIKING Probability Individual Exposure			9.79E-01										0.00E+00
MOTORBIKING Probability Population Exposure			1.00E+00										0.00E+00
MOTORBIKING Individual Risk			1.12E+02										0.00E+00
MOTORBIKING Population Risk			3.90E+05										0.00E+00
HUNTING Expected Individual Exposures			1.05E+00	2.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HUNTING Expected Population Exposures			2.12E+04	7.30E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HUNTING Probability Individual Exposure			6.31E-01	2.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HUNTING Probability Population Exposure			1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HUNTING Individual Risk			3.05E+01	8.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HUNTING Population Risk			6.14E+05	2.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
HIKING Expected Individual Exposures		3.83E-01				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
HIKING Expected Population Exposures		5.41E+03				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
HIKING Probability Individual Exposure		3.10E-01				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
HIKING Probability Population Exposure		1.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
HIKING Individual Risk		1.11E+01				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
HIKING Population Risk		1.57E+05				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
BIKING Expected Individual Exposures							0.00E+00	0.00E+00					
BIKING Expected Population Exposures							0.00E+00	0.00E+00					
BIKING Probability Individual Exposure							0.00E+00	0.00E+00					
BIKING Probability Population Exposure							0.00E+00	0.00E+00					
BIKING Individual Risk							0.00E+00	0.00E+00					
BIKING Population Risk							0.00E+00	0.00E+00					
HORSEBACK Expected Individual Exposures							0.00E+00	0.00E+00					
HORSEBACK Expected Population Exposures							0.00E+00	0.00E+00					
HORSEBACK Probability Individual Exposure							0.00E+00	0.00E+00					
HORSEBACK Probability Population Exposure							0.00E+00	0.00E+00					
HORSEBACK Individual Risk							0.00E+00	0.00E+00					
HORSEBACK Population Risk							0.00E+00	0.00E+00					
SHORT CUT Expected Individual Exposures	4.56E-03										0.00E+00		
SHORT CUT Expected Population Exposures	2.65E+01										0.00E+00		
SHORT CUT Probability Individual Exposure	4.55E-03										0.00E+00		
SHORT CUT Probability Population Exposure	1.00E+00										0.00E+00		
SHORT CUT Individual Risk	1.32E-01										0.00E+00		
SHORT CUT Population Risk	7.70E+02										0.00E+00		
RANCHING Expected Individual Exposures										0.00E+00			
RANCHING Expected Population Exposures										0.00E+00			
RANCHING Probability Individual Exposure										0.00E+00			
RANCHING Probability Population Exposure										0.00E+00			
RANCHING Individual Risk										0.00E+00			
RANCHING Population Risk										0.00E+00			
CHILD PLAY Expected Individual Exposures	1.24E-01	6.19E-01									0.00E+00	0.00E+00	
CHILD PLAY Expected Population Exposures	3.19E+03	1.50E+04									0.00E+00	0.00E+00	
CHILD PLAY Probability Individual Exposure	1.17E-01	4.61E-01									0.00E+00	0.00E+00	
CHILD PLAY Probability Population Exposure	1.00E+00	1.00E+00									0.00E+00	0.00E+00	
CHILD PLAY Individual Risk	3.60E+00	1.79E+01									0.00E+00	0.00E+00	
CHILD PLAY Population Risk	9.25E+04	4.36E+05									0.00E+00	0.00E+00	
OFFROAD VEHICLE Expected Individual Exposures			4.20E+00										1.66E-02
OFFROAD VEHICLE Expected Population Exposures			5.39E+04										2.13E+02
OFFROAD VEHICLE Probability Individual Exposure			9.85E-01										1.65E-02
OFFROAD VEHICLE Probability Population Exposure			1.00E+00										1.00E+00
OFFROAD VEHICLE Individual Risk			1.22E+02										4.81E-01
OFFROAD VEHICLE Population Risk			1.56E+06										6.17E+03
CONSTRUCTION Expected Individual Exposures		2.35E+00										0.00E+00	
CONSTRUCTION Expected Population Exposures		4.69E+00										0.00E+00	
CONSTRUCTION Probability Individual Exposure		9.04E-01										0.00E+00	
CONSTRUCTION Probability Population Exposure		9.91E-01										0.00E+00	
CONSTRUCTION Individual Risk		6.81E+01										0.00E+00	
CONSTRUCTION Population Risk		1.36E+02										0.00E+00	
ARCHAEOLOGY Expected Individual Exposures					4.84E+00								
ARCHAEOLOGY Expected Population Exposures					9.67E+00								
ARCHAEOLOGY Probability Individual Exposure					9.92E-01								
ARCHAEOLOGY Probability Population Exposure					1.00E+00								
ARCHAEOLOGY Individual Risk					1.40E+02								
ARCHAEOLOGY Population Risk					2.81E+02								
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	1.32E-01	1.11E+01	1.42E+02	8.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Risk (Population)	7.70E+02	1.57E+05	1.00E+06	2.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	3.60E+00	8.60E+01	1.22E+02	0.00E+00	1.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-01
INTRUSIVE Risk (Population)	9.25E+04	4.36E+05	1.56E+06	0.00E+00	2.81E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.17E+03
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	9.33E+04	5.93E+05	2.57E+06	2.12E+04	2.81E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.17E+03
Motorbike N			3.48E+03										3.48E+03
Hunting N			2.01E+04	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03					2.01E+04
Hiking N		1.41E+04				7.75E+02	7.75E+02	7.75E+02	1.60E+03			1.41E+04	
Biking N							1.55E+03	1.55E+03					
Horseback N							1.32E+04	1.32E+04					
Shortcut N	5.83E+03										5.83E+03		
Ranching N										3.63E+02			
Child Play N	2.57E+04	2.43E+04									2.57E+04	2.43E+04	
Off Road Vehicles N			1.28E+04										1.28E+04
Construction N		2.00E+00										2.00E+00	
Archaeology N					2.00E+00								
Motorbike mu			3.86E+00										0.00E+00
Hunting mu			1.05E+00	2.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00
Hiking mu		3.83E-01				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	
Biking mu							0.00E+00	0.00E+00					
Horseback mu							0.00E+00	0.00E+00					
Shortcut mu	4.56E-03										0.00E+00		
Ranching mu										0.00E+00			
Child Play mu	1.24E-01	6.19E-01									0.00E+00	0.00E+00	
Off Road Vehicles mu			4.20E+00										1.66E-02
Construction mu		2.35E+00										0.00E+00	
Archaeology mu					4.84E+00								

Sector Name	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B
Ordnance Density	Low	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	High	High
Clearance	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures										0.00E+00			
MOTORBIKING Expected Population Exposures										0.00E+00			
MOTORBIKING Probability Individual Exposure										0.00E+00			
MOTORBIKING Probability Population Exposure										0.00E+00			
MOTORBIKING Individual Risk										0.00E+00			
MOTORBIKING Population Risk										0.00E+00			
HUNTING Expected Individual Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HUNTING Expected Population Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HUNTING Probability Individual Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HUNTING Probability Population Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HUNTING Individual Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HUNTING Population Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Expected Individual Exposures			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
HIKING Expected Population Exposures			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
HIKING Probability Individual Exposure			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
HIKING Probability Population Exposure			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
HIKING Individual Risk			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
HIKING Population Risk			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
BIKING Expected Individual Exposures				0.00E+00	0.00E+00								
BIKING Expected Population Exposures				0.00E+00	0.00E+00								
BIKING Probability Individual Exposure				0.00E+00	0.00E+00								
BIKING Probability Population Exposure				0.00E+00	0.00E+00								
BIKING Individual Risk				0.00E+00	0.00E+00								
BIKING Population Risk				0.00E+00	0.00E+00								
HORSEBACK Expected Individual Exposures				0.00E+00	0.00E+00								
HORSEBACK Expected Population Exposures				0.00E+00	0.00E+00								
HORSEBACK Probability Individual Exposure				0.00E+00	0.00E+00								
HORSEBACK Probability Population Exposure				0.00E+00	0.00E+00								
HORSEBACK Individual Risk				0.00E+00	0.00E+00								
HORSEBACK Population Risk				0.00E+00	0.00E+00								
SHORT CUT Expected Individual Exposures								0.00E+00					
SHORT CUT Expected Population Exposures								0.00E+00					
SHORT CUT Probability Individual Exposure								0.00E+00					
SHORT CUT Probability Population Exposure								0.00E+00					
SHORT CUT Individual Risk								0.00E+00					
SHORT CUT Population Risk								0.00E+00					
RANCHING Expected Individual Exposures							0.00E+00						
RANCHING Expected Population Exposures							0.00E+00						
RANCHING Probability Individual Exposure							0.00E+00						
RANCHING Probability Population Exposure							0.00E+00						
RANCHING Individual Risk							0.00E+00						
RANCHING Population Risk							0.00E+00						
CHILD PLAY Expected Individual Exposures								5.70E-03	1.43E-02				
CHILD PLAY Expected Population Exposures								1.47E+02	3.46E+02				
CHILD PLAY Probability Individual Exposure								5.69E-03	1.42E-02				
CHILD PLAY Probability Population Exposure								1.00E+00	1.00E+00				
CHILD PLAY Individual Risk								1.65E-01	4.14E-01				
CHILD PLAY Population Risk								4.25E+03	1.00E+04				
OFFROAD VEHICLE Expected Individual Exposures										2.18E-02			
OFFROAD VEHICLE Expected Population Exposures										2.79E+02			
OFFROAD VEHICLE Probability Individual Exposure										2.16E-02			
OFFROAD VEHICLE Probability Population Exposure										1.00E+00			
OFFROAD VEHICLE Individual Risk										6.32E-01			
OFFROAD VEHICLE Population Risk										8.10E+03			
CONSTRUCTION Expected Individual Exposures									7.71E-01				
CONSTRUCTION Expected Population Exposures									1.54E+00				
CONSTRUCTION Probability Individual Exposure									5.37E-01				
CONSTRUCTION Probability Population Exposure									7.86E-01				
CONSTRUCTION Individual Risk									2.23E+01				
CONSTRUCTION Population Risk									4.47E+01				
ARCHAEOLOGY Expected Individual Exposures		8.98E+00										1.35E+01	
ARCHAEOLOGY Expected Population Exposures		1.80E+01										2.70E+01	
ARCHAEOLOGY Probability Individual Exposure		1.00E+00										1.00E+00	
ARCHAEOLOGY Probability Population Exposure		1.00E+00										1.00E+00	
ARCHAEOLOGY Individual Risk		2.61E+02										3.91E+02	
ARCHAEOLOGY Population Risk		5.21E+02										7.82E+02	
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	0.00E+00	2.61E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-01	2.28E+01	6.32E-01	0.00E+00	3.91E+02	0.00E+00
INTRUSIVE Risk (Population)	0.00E+00	5.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.25E+03	1.01E+04	8.10E+03	0.00E+00	7.82E+02	0.00E+00
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	0.00E+00	5.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.25E+03	1.01E+04	8.10E+03	0.00E+00	7.82E+02	0.00E+00
Motorbike N										3.48E+03			
Hunting N	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03					2.01E+04	2.47E+03	1.44E+03	1.44E+03
Hiking N			7.75E+02	7.75E+02	7.75E+02	1.60E+03			1.41E+04				7.75E+02
Biking N				1.55E+03	1.55E+03								
Horseback N				1.32E+04	1.32E+04								
Shortcut N								5.83E+03					
Ranching N							3.65E+02						
Child Play N								2.57E+04	2.43E+04				
Off Road Vehicles N										1.28E+04			
Construction N									2.00E+00				
Archaeology N		2.00E+00										2.00E+00	
Motorbike mu										0.00E+00			
Hunting mu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hiking mu			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00
Biking mu				0.00E+00	0.00E+00								
Horseback mu				0.00E+00	0.00E+00								
Shortcut mu								0.00E+00					
Ranching mu							0.00E+00						
Child Play mu								5.70E-03	1.43E-02				
Off Road Vehicles mu										2.18E-02			
Construction mu									7.71E-01				
Archeology mu		8.98E+00										1.35E+01	

Sector Name	10C	10D	11A	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A
Ordnance Density	High	High	High	High	High	High	High	High	Low	Low	Low	Low	Low
Clearance	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	0.25 ft	1 ft	1 ft	1 ft	1 ft	1 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures							0.00E+00						
MOTORBIKING Expected Population Exposures							0.00E+00						
MOTORBIKING Probability Individual Exposure							0.00E+00						
MOTORBIKING Probability Population Exposure							0.00E+00						
MOTORBIKING Individual Risk							0.00E+00						
MOTORBIKING Population Risk							0.00E+00						
HUNTING Expected Individual Exposures	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HUNTING Expected Population Exposures	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HUNTING Probability Individual Exposure	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HUNTING Probability Population Exposure	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HUNTING Individual Risk	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HUNTING Population Risk	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
HIKING Expected Individual Exposures	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Expected Population Exposures	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Probability Individual Exposure	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Probability Population Exposure	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Individual Risk	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
HIKING Population Risk	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
BIKING Expected Individual Exposures	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
BIKING Expected Population Exposures	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
BIKING Probability Individual Exposure	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
BIKING Probability Population Exposure	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
BIKING Individual Risk	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
BIKING Population Risk	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Expected Individual Exposures	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Expected Population Exposures	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Probability Individual Exposure	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Probability Population Exposure	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Individual Risk	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
HORSEBACK Population Risk	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
SHORT CUT Expected Individual Exposures					0.00E+00								
SHORT CUT Expected Population Exposures					0.00E+00								
SHORT CUT Probability Individual Exposure					0.00E+00								
SHORT CUT Probability Population Exposure					0.00E+00								
SHORT CUT Individual Risk					0.00E+00								
SHORT CUT Population Risk					0.00E+00								
RANCHING Expected Individual Exposures				0.00E+00									
RANCHING Expected Population Exposures				0.00E+00									
RANCHING Probability Individual Exposure				0.00E+00									
RANCHING Probability Population Exposure				0.00E+00									
RANCHING Individual Risk				0.00E+00									
RANCHING Population Risk				0.00E+00									
CHILD PLAY Expected Individual Exposures					1.34E-02	4.19E-02							
CHILD PLAY Expected Population Exposures					3.43E+02	1.02E+03							
CHILD PLAY Probability Individual Exposure					1.33E-02	4.10E-02							
CHILD PLAY Probability Population Exposure					1.00E+00	1.00E+00							
CHILD PLAY Individual Risk					3.88E-01	1.21E+00							
CHILD PLAY Population Risk					9.96E+03	2.95E+04							
OFFROAD VEHICLE Expected Individual Exposures							2.68E-02						
OFFROAD VEHICLE Expected Population Exposures							3.44E+02						
OFFROAD VEHICLE Probability Individual Exposure							2.65E-02						
OFFROAD VEHICLE Probability Population Exposure							1.00E+00						
OFFROAD VEHICLE Individual Risk							7.78E-01						
OFFROAD VEHICLE Population Risk							9.96E+03						
CONSTRUCTION Expected Individual Exposures						2.26E+00							
CONSTRUCTION Expected Population Exposures						4.53E+00							
CONSTRUCTION Probability Individual Exposure						8.96E-01							
CONSTRUCTION Probability Population Exposure						9.89E-01							
CONSTRUCTION Individual Risk						6.56E+01							
CONSTRUCTION Population Risk						1.31E+02							
ARCHAEOLOGY Expected Individual Exposures									1.09E+00				
ARCHAEOLOGY Expected Population Exposures									2.17E+00				
ARCHAEOLOGY Probability Individual Exposure									6.62E-01				
ARCHAEOLOGY Probability Population Exposure									8.86E-01				
ARCHAEOLOGY Individual Risk									3.15E+01				
ARCHAEOLOGY Population Risk									6.30E+01				
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-01	6.69E+01	7.78E-01	0.00E+00	3.15E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.96E+03	2.96E+04	9.96E+03	0.00E+00	6.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.96E+03	2.96E+04	9.96E+03	0.00E+00	6.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Motorbike N							3.48E+03						
Hunting N	1.44E+03	1.44E+03					2.01E+04	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03	
Hiking N	7.75E+02	7.75E+02	1.60E+03			1.41E+04				7.75E+02	7.75E+02	7.75E+02	1.60E+03
Biking N	1.55E+03	1.55E+03									1.55E+03	1.55E+03	
Horseback N	1.32E+04	1.32E+04									1.32E+04	1.32E+04	
Shortcut N					5.85E+03								
Ranching N				3.63E+02									
Child Play N					2.37E+04	2.43E+04							
Off Road Vehicles N							1.28E+04						
Construction N						2.00E+00							
Archaeology N									2.00E+00				
Motorbike au							0.00E+00						
Hunting au	0.00E+00	0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Hiking au	0.00E+00	0.00E+00	0.00E+00			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biking au	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
Horseback au	0.00E+00	0.00E+00									0.00E+00	0.00E+00	
Shortcut au					0.00E+00								
Ranching au				0.00E+00									
Child Play au					1.34E-02	4.19E-02							
Off Road Vehicles au							2.68E-02						
Construction au						2.26E+00							
Archaeology au									1.09E+00				

Sector Name	11B	11C	11D	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D
Ordnance Density	Low	Low	Low	Low	Low	Point	Point	Point	Point	Point	Point	Point	Point
Clearance	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures				0.00E+00									
MOTORBIKING Expected Population Exposures				0.00E+00									
MOTORBIKING Probability Individual Exposure				0.00E+00									
MOTORBIKING Probability Population Exposure				0.00E+00									
MOTORBIKING Individual Risk				0.00E+00									
MOTORBIKING Population Risk				0.00E+00									
HUNTING Expected Individual Exposures				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HUNTING Expected Population Exposures				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HUNTING Probability Individual Exposure				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HUNTING Probability Population Exposure				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HUNTING Individual Risk				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HUNTING Population Risk				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
HIKING Expected Individual Exposures			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
HIKING Expected Population Exposures			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
HIKING Probability Individual Exposure			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
HIKING Probability Population Exposure			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
HIKING Individual Risk			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
HIKING Population Risk			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
BIKING Expected Individual Exposures								0.00E+00	0.00E+00				
BIKING Expected Population Exposures								0.00E+00	0.00E+00				
BIKING Probability Individual Exposure								0.00E+00	0.00E+00				
BIKING Probability Population Exposure								0.00E+00	0.00E+00				
BIKING Individual Risk								0.00E+00	0.00E+00				
BIKING Population Risk								0.00E+00	0.00E+00				
HORSEBACK Expected Individual Exposures								0.00E+00	0.00E+00				
HORSEBACK Expected Population Exposures								0.00E+00	0.00E+00				
HORSEBACK Probability Individual Exposure								0.00E+00	0.00E+00				
HORSEBACK Probability Population Exposure								0.00E+00	0.00E+00				
HORSEBACK Individual Risk								0.00E+00	0.00E+00				
HORSEBACK Population Risk								0.00E+00	0.00E+00				
SHORT CUT Expected Individual Exposures		0.00E+00										0.00E+00	
SHORT CUT Expected Population Exposures		0.00E+00										0.00E+00	
SHORT CUT Probability Individual Exposure		0.00E+00										0.00E+00	
SHORT CUT Probability Population Exposure		0.00E+00										0.00E+00	
SHORT CUT Individual Risk		0.00E+00										0.00E+00	
SHORT CUT Population Risk		0.00E+00										0.00E+00	
RANCHING Expected Individual Exposures	0.00E+00										0.00E+00		
RANCHING Expected Population Exposures	0.00E+00										0.00E+00		
RANCHING Probability Individual Exposure	0.00E+00										0.00E+00		
RANCHING Probability Population Exposure	0.00E+00										0.00E+00		
RANCHING Individual Risk	0.00E+00										0.00E+00		
RANCHING Population Risk	0.00E+00										0.00E+00		
CHILD PLAY Expected Individual Exposures		0.00E+00	0.00E+00									1.15E-04	2.87E-04
CHILD PLAY Expected Population Exposures		0.00E+00	0.00E+00									2.95E+00	6.97E+00
CHILD PLAY Probability Individual Exposure		0.00E+00	0.00E+00									1.15E-04	2.87E-04
CHILD PLAY Probability Population Exposure		0.00E+00	0.00E+00									9.48E-01	9.99E-01
CHILD PLAY Individual Risk		0.00E+00	0.00E+00									3.33E-03	8.33E-03
CHILD PLAY Population Risk		0.00E+00	0.00E+00									8.56E+01	2.02E+02
OFFROAD VEHICLE Expected Individual Exposures				4.09E-03									
OFFROAD VEHICLE Expected Population Exposures				5.24E+01									
OFFROAD VEHICLE Probability Individual Exposure				4.08E-03									
OFFROAD VEHICLE Probability Population Exposure				1.00E+00									
OFFROAD VEHICLE Individual Risk				1.19E-01									
OFFROAD VEHICLE Population Risk				1.52E+03									
CONSTRUCTION Expected Individual Exposures			0.00E+00										1.73E-01
CONSTRUCTION Expected Population Exposures			0.00E+00										3.46E-01
CONSTRUCTION Probability Individual Exposure			0.00E+00										1.59E-01
CONSTRUCTION Probability Population Exposure			0.00E+00										2.92E-01
CONSTRUCTION Individual Risk			0.00E+00										5.01E+00
CONSTRUCTION Population Risk			0.00E+00										1.00E+01
ARCHAEOLOGY Expected Individual Exposures						2.02E+00							
ARCHAEOLOGY Expected Population Exposures						4.03E+00							
ARCHAEOLOGY Probability Individual Exposure						8.67E-01							
ARCHAEOLOGY Probability Population Exposure						9.82E-01							
ARCHAEOLOGY Individual Risk						5.85E+01							
ARCHAEOLOGY Population Risk						1.17E+02							
NON_INTRUSIVE Probability of Exposure (Individual)													
NON_INTRUSIVE Probability of Exposure (Population)													
NON_INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Expected Exposures (Individual)													
NON_INTRUSIVE Expected Exposures (Population)													
INTRUSIVE Probability of Exposure (Individual)													
INTRUSIVE Probability of Exposure (Population)													
INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	1.19E-01	0.00E+00	5.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-03	5.02E+00
INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	1.52E+03	0.00E+00	1.17E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.56E+01	2.12E+02
INTRUSIVE Expected Exposures (Individual)													
INTRUSIVE Expected Exposures (Population)													
TOTAL POPULATION RISK	0.00E+00	0.00E+00	0.00E+00	1.52E+03	0.00E+00	1.17E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.56E+01	2.12E+02
Motorbike N				3.48E+03									
Hunting N				2.01E+04	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03				
Hiking N			1.41E+04				7.75E+02	7.75E+02	7.75E+02	1.60E+03			1.41E+04
Biking N								1.55E+03	1.55E+03				
Horseback N								1.32E+04	1.32E+04				
Shortcut N		5.83E+03										5.83E+03	
Ranching N	3.65E+02										3.65E+02		
Child Play N		2.57E+04	2.43E+04									2.57E+04	2.43E+04
Off Road Vehicles N				1.28E+04									
Construction N			2.00E+00										2.00E+00
Archaeology N						2.00E+00							
Motorbike mu				0.00E+00									
Hunting mu				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Hiking mu			0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00
Biking mu								0.00E+00	0.00E+00				
Horseback mu								0.00E+00	0.00E+00				
Shortcut mu		0.00E+00										0.00E+00	
Ranching mu	0.00E+00										0.00E+00		
Child Play mu		0.00E+00	0.00E+00									1.15E-04	2.87E-04
Off Road Vehicles mu				4.09E-03									
Construction mu			0.00E+00										1.73E-01
Archaeology mu						2.02E+00							

Sector Name	12A	12B	10A	10B	10C	10D	11A	11B	11C	11D	12A	12B
Ordnance Density	Point	Point	High	High	High	High	High	High	High	High	High	High
Clearance	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft	1 ft
Sector Type	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed
MOTORBIKING Expected Individual Exposures	0.00E+00										0.00E+00	
MOTORBIKING Expected Population Exposures	0.00E+00										0.00E+00	
MOTORBIKING Probability Individual Exposure	0.00E+00										0.00E+00	
MOTORBIKING Probability Population Exposure	0.00E+00										0.00E+00	
MOTORBIKING Individual Risk	0.00E+00										0.00E+00	
MOTORBIKING Population Risk	0.00E+00										0.00E+00	
HUNTING Expected Individual Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HUNTING Expected Population Exposures	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HUNTING Probability Individual Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HUNTING Probability Population Exposure	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HUNTING Individual Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HUNTING Population Risk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
HIKING Expected Individual Exposures				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
HIKING Expected Population Exposures				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
HIKING Probability Individual Exposure				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
HIKING Probability Population Exposure				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
HIKING Individual Risk				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
HIKING Population Risk				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
BIKING Expected Individual Exposures					0.00E+00	0.00E+00						
BIKING Expected Population Exposures					0.00E+00	0.00E+00						
BIKING Probability Individual Exposure					0.00E+00	0.00E+00						
BIKING Probability Population Exposure					0.00E+00	0.00E+00						
BIKING Individual Risk					0.00E+00	0.00E+00						
BIKING Population Risk					0.00E+00	0.00E+00						
HORSEBACK Expected Individual Exposures					0.00E+00	0.00E+00						
HORSEBACK Expected Population Exposures					0.00E+00	0.00E+00						
HORSEBACK Probability Individual Exposure					0.00E+00	0.00E+00						
HORSEBACK Probability Population Exposure					0.00E+00	0.00E+00						
HORSEBACK Individual Risk					0.00E+00	0.00E+00						
HORSEBACK Population Risk					0.00E+00	0.00E+00						
SHORT CUT Expected Individual Exposures									0.00E+00			
SHORT CUT Expected Population Exposures									0.00E+00			
SHORT CUT Probability Individual Exposure									0.00E+00			
SHORT CUT Probability Population Exposure									0.00E+00			
SHORT CUT Individual Risk									0.00E+00			
SHORT CUT Population Risk									0.00E+00			
RANCHING Expected Individual Exposures								0.00E+00				
RANCHING Expected Population Exposures								0.00E+00				
RANCHING Probability Individual Exposure								0.00E+00				
RANCHING Probability Population Exposure								0.00E+00				
RANCHING Individual Risk								0.00E+00				
RANCHING Population Risk								0.00E+00				
CHILD PLAY Expected Individual Exposures									2.69E-04	8.43E-04		
CHILD PLAY Expected Population Exposures									6.91E+00	2.05E+01		
CHILD PLAY Probability Individual Exposure									2.69E-04	8.43E-04		
CHILD PLAY Probability Population Exposure									9.99E-01	1.00E+00		
CHILD PLAY Individual Risk									7.81E-03	2.45E-02		
CHILD PLAY Population Risk									2.01E+02	5.94E+02		
OFFROAD VEHICLE Expected Individual Exposures	5.37E-03										6.61E-03	
OFFROAD VEHICLE Expected Population Exposures	6.98E+01										8.47E+01	
OFFROAD VEHICLE Probability Individual Exposure	5.35E-03										6.58E-03	
OFFROAD VEHICLE Probability Population Exposure	1.00E+00										1.00E+00	
OFFROAD VEHICLE Individual Risk	1.56E-01										1.92E-01	
OFFROAD VEHICLE Population Risk	1.99E+03										2.46E+03	
CONSTRUCTION Expected Individual Exposures										5.08E-01		
CONSTRUCTION Expected Population Exposures										1.02E+00		
CONSTRUCTION Probability Individual Exposure										3.98E-01		
CONSTRUCTION Probability Population Exposure										6.38E-01		
CONSTRUCTION Individual Risk										1.47E+01		
CONSTRUCTION Population Risk										2.95E+01		
ARCHAEOLOGY Expected Individual Exposures			3.62E+00									
ARCHAEOLOGY Expected Population Exposures			6.05E+00									
ARCHAEOLOGY Probability Individual Exposure			9.51E-01									
ARCHAEOLOGY Probability Population Exposure			9.96E-01									
ARCHAEOLOGY Individual Risk			8.77E+01									
ARCHAEOLOGY Population Risk			1.75E+02									
NON_INTRUSIVE Probability of Exposure (Individual)												
NON_INTRUSIVE Probability of Exposure (Population)												
NON_INTRUSIVE Risk (Individual)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Risk (Population)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NON_INTRUSIVE Expected Exposures (Individual)												
NON_INTRUSIVE Expected Exposures (Population)												
INTRUSIVE Probability of Exposure (Individual)												
INTRUSIVE Probability of Exposure (Population)												
INTRUSIVE Risk (Individual)	1.56E-01	0.00E+00	8.77E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.81E-03	1.48E+01	1.92E-01	0.00E+00
INTRUSIVE Risk (Population)	1.99E+03	0.00E+00	1.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E+02	6.24E+02	2.46E+03	0.00E+00
INTRUSIVE Expected Exposures (Individual)												
INTRUSIVE Expected Exposures (Population)												
TOTAL POPULATION RISK	1.99E+03	0.00E+00	1.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E+02	6.24E+02	2.46E+03	0.00E+00
Motorbike N	3.48E+03										3.48E+03	
Hunting N	2.01E+04	2.47E+03	1.44E+03	1.44E+03	1.44E+03	1.44E+03					2.01E+04	2.47E+03
Hiking N				7.75E+02	7.75E+02	7.75E+02	1.60E+03			1.41E+04		
Biking N					1.55E+03	1.55E+03						
Horseback N					1.32E+04	1.32E+04						
Shortcut N									5.83E+03			
Ranching N								3.65E+02				
Child Play N									2.57E+04	2.43E+04		
Off Road Vehicles N	1.28E+04										1.28E+04	
Construction N										2.00E+00		
Archaeology N			2.00E+00									
Motorbike mu	0.00E+00										0.00E+00	
Hunting mu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
Hiking mu				0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00		
Biking mu					0.00E+00	0.00E+00						
Horseback mu					0.00E+00	0.00E+00						
Shortcut mu									0.00E+00			
Ranching mu								0.00E+00				
Child Play mu									2.69E-04	8.43E-04		
Off Road Vehicles mu	5.37E-03										6.61E-03	
Construction mu										5.08E-01		
Archaeology mu			3.62E+00									

Appendix E. Ordnance Density Estimates

Appendix E. Ordnance Density Estimates

Sector/ OOU I.D.	Subsurface UXOs Found in Anomalies Sampled (x)**	Number of Anomalies Sampled (n)	Sample Proportion (p_hat=x/n)	z_(0.2/2)	Two-sided Lower 80% Confidence Limit (LCL80)	Two-sided Upper 80% Confidence Limit (UCL80)	Total Anomalies	Acreage Sampled	Point Density Estimate (UXO/Acre)	Low Density Estimate (UXO/Acre)	High Density Estimate (UXO/Acre)
Actual											
12A	26	595	0.0437	1.2816	0.0330	0.0544	2504	1.91	57.3	43.2	71.4
12B	1	48	0.0208	1.2816	-0.0056	0.0473	99	0.24	8.6	-2.3	19.5
Estimated											
10A	***7.31***	351	0.0208	1.2816	0.0111	0.0306	922	1.68	11.4	6.1	16.8
10B	***1.31***	63	0.0208	1.2816	-0.0022	0.0439	155	0.18	17.9	-1.9	37.8
10C	***2.02***	97	0.0208	1.2816	0.0022	0.0394	242	0.46	11.0	1.2	20.7
10D	***0.48***	23	0.0208	1.2816	-0.0173	0.0590	56	0.23	5.1	-4.2	14.4
11A	***0.60***	29	0.0208	1.2816	-0.0132	0.0548	67	0.24	5.8	-3.7	15.3
11B	***1.98***	95	0.0208	1.2816	0.0021	0.0396	235	0.92	5.3	0.5	10.1
11C	***0.79***	38	0.0208	1.2816	-0.0089	0.0505	77	0.58	2.8	-1.2	6.7
11D	***0.42***	20	0.0208	1.2816	-0.0201	0.0618	20	0.06	6.9	-6.7	20.6

** Bold italics indicate estimated number of subsurface UXOs based on similarities to 12B.

Source: QST.

Appendix G

Cost Estimate

Appendix G
Former CCATF Cost Estimate

The costs provided in this EE/CA are estimated based on the consultant's best engineering judgement and experience. Attached are the estimated costs to implement each of the alternatives at each OOU. The costs are based on specific assumptions for all sites including:

1. The cost of site preparation for all OE clearance activities is based on the estimated extent of clearing and grubbing required. An average clearing cost was applied over the entire OOU.
2. The costs provided in the attached tables for each alternative at each OOU do not include the costs for an Education/Information program. As discussed in Section 7 of the EE/CA report, the cost to develop the program will be $25,000 to $50,000. The annual cost to maintain and administer the program will be $2,500 to $5,000.
3. The cost estimate includes a contingency of 25% to cover the cost of unforeseen conditions (such as anomalous concentrations of underbrush, hazardous conditions, etc.).
4. The cost estimate includes a consulting fee of 15% of the implementation cost. The consulting services include: planning, consulting, design, plans and specifications, permitting, health and safety plans, work plans, and other field support services.
5. The linear footage of fencing was calculated by determining the perimeter around each sector of each OOU.
6. The number of signs to be fabricated and posted was based upon the perimeter around each OOU sector, assuming the placement of warning signs at approximately 300 feet on center around each perimeter.
7. For the Surface Clearance alternative (#3), the estimated cost for "Visual inspection, limited geophysical inspection" includes the cost for disposal of any surface ORS or other surface scrap discovered.
8. For the Clearance for Use alternative (#4), the estimated cost for "Geophysical investigation" includes the cost for disposal of any surface ORS or surface scrap. The estimated cost for "Excavation of anomalies" includes the cost for disposal of any unearthed ORS or other scrap.
9. Within each OOU, the total number of anomalies to be excavated was determined by multiplying the actual number of anomalies found (within the area investigated) by the total acreage within the OOU divided by the acreage investigated.
10. In OOU12, the estimated density of UXOs per acre (which will be encountered and must be disposed of/detonated) was calculated by dividing the number of UXOs recovered by the acreage investigated and dividing this number by the number of anomalies sampled over the total number of anomalies. This calculation was performed on a sector by sector basis. The calculated density (in UXOs per acre) was then multiplied by the acreage within each OOU sector to determine the total UXOs within OOU12. The density and quantity of anomalies and OE items presented in Sections 2 and 3 of this report, were used to determine the cost values.
11. For OOU10 and OOU11 no UXOs were discovered during the limited geophysical investigation that was completed. In OOU12B, 2.1% of the anomalies investigated were found to be UXO.

OOU10 and OOU11 have similar historical aspects and the ORS discovered was similar to that discovered in OOU12. Therefore, for cost estimating purposes, we have assumed that the UXO that may be found In OOU10 and OOU11 (when the entire OOU is cleared) will range from 0% to 2.1%, or an average of 1.05%. To determine the anticipated density of UXOs within OOU10 and OOU11, the total number of anomalies found were divided by the acreage sampled times 1.05%. This density was multiplied by the total acreage within each OOU to determine the total number of UXOs that will be recovered and must be disposed of/detonated.

12. Although no UXO or ORS was found on the surface during ESE's limited geophysical investigation, we must assume that some percentage of the UXOs found within an entire OOU will be found on the surface. During the investigation 55% of the UXOs were found within six inches of the surface and 31% were found within 3 inches of the surface. For cost estimating purposes, we assumed that 31% of the UXOs would be found on the surface. This number is reflected in the line described under Alternative 3 as "Disposal/detonation of UXO (surface)" .

13. A golf course is included as part of OOU11. Sector OOU11D is 14 acres in size and includes a completed golf course. For estimating purposes, we assumed that half of that 14 acres (which includes all greens, fairways and previously developed/disturbed properties) will be excluded. No clearing, geophysical investigation, excavation, etc. will be completed in these areas.

14. It was determined in Section 3 of this report that OOU9 would require " No Further Action". Therefore, no cost estimates have been provided for this OOU.

15. As stated in Section 3 of this report, the limited confirmatory investigation completed within OOU3 for this Phase II EE/CA confirmed the recommendation of "Clearance for Use" over the entire Wedgewood Subdivision. ESE has prepared an estimate for this OOU with the following assumptions:

- Three acres of the 46 proposed acres have already been remediated by HFA;
- The cost of preparation and clearing will be less at this OOU than at other OOUs due to the properties are already landscaped.
- The cost of the geophysical investigation will be less than other OOUS due to only a small number of trees and bushes to be dealt with.
- The number of anomalies per acre used to calculate the excavation of anomalies is based on the total number from grids A34-1, A34-2, A34-4, and A34-5. Grid A34-3 was not used as the investigation result (932 anomalies in 0.06 acres) was atypical when compared to the findings at the other investigation grids in this OOU (average of 224 grids per 0.06 acres).
- The cost per excavation was increased by 10% due to the usage of the blast boxes in the residential area.

The cost estimate for OOU3- Wedgewood subdivision is included with these assumptions but is not placed in the EE/CA cost analysis summary table.

COST ESTIMATE SUMMARY
EE/CA for Former Camp Croft Army Training Facility

ORDNANCE OPERABLE UNIT	ALTERNATIVE 2 INSTITUTIONAL CONTROLS	ALTERNATIVE 3 SURFACE CLEARANCE	ALTERNATIVE 4 CLEARANCE FOR USE
OOU-10 Grenade & Mortar Areas (inside park)	$544,480	$745,040	$3,210,240
OOU-11 Grenade & Mortar Areas (outside park)	$426,240	$274,560	$717,840
OOU12 UXO Areas Outside Park	$295,680	$463,520	$2,608,320

Notes:

Shading denotes the recommended alternative for each OOU.

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-10 Grenade & Mortar Areas Within Park
Alternative 2 - INSTITUTIONAL CONTROLS
Estimated by: RGW
Checked by: MGB
Reviewed by: [signature]

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Sign fabrication & posting	68	ea	$100.00	$6,800
2	Fence around each OOU sector, chainlink, 6' high plus 3 strands of barbed wire 9 ga.	20400	feet	$15.00	$306,000
3	UXO support (for fencing and sign installation)	15	day	$500.00	$7,500
4	Mobilize/demobilize	1	ls	$20,000.00	$20,000

Total Capital Cost	$340,300
Contingency (25%)	$85,075
Consulting (15%)	$51,045
Overhead & profit (20%)	$68,060
Total Estimated Cost	$544,480

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-10 Grenade & Mortar Areas Within Park
Alternative 3- SURFACE CLEARANCE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	210	acres	$1,000.00	$210,000
2	Survey/QC	210	acres	$100.00	$21,000
3	Visual inspection, limited geophysical investigation	210	acres	$750.00	$157,500
4	Disposal/detonation of UXO (surface)	407	UXO	$50.00	$20,350
5	Mobilize/demobilize	1	ls	$50,000.00	$50,000
6	Sign fabrication & posting	68	ea	$100.00	$6,800

Total Capital Cost	$465,650
Contingency (25%)	$116,413
Consulting (15%)	$69,848
Overhead & profit (20%)	$93,130
Total Estimated C	$745,040

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-10 Grenade & Mortar Areas Within Park
Alternative 4 - CLEARANCE FOR USE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	210	acres	$1,000.00	$210,000
2	Survey /QC	210	acres	$100.00	$21,000
3	Geophysical investigation	210	acres	$1,800.00	$378,000
4	Excavation of anomalies	125,000	anomalies	$10.00	$1,250,000
5	Disposal/detonation of UXO	1,312	UXO	$50.00	$65,600
6	Sign fabrication & posting (located along roads & trails)	68	ea	$100.00	$6,800
7	Mobilize/demobilize	1	ls	$75,000.00	$75,000

Total Capital Cost	$2,006,400
Contingency (25%)	$501,600
Consulting (15%)	$300,960
Overhead & profit (20%)	$401,280
Total Estimated Cost	$3,210,240

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-11 Grenade & Mortar Areas Outside Park
Alternative 2 - INSTITUTIONAL CONTROLS
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Sign fabrication & posting	54	ea	$100.00	$5,400
2	Perimeter fencing, around each OOU sector, chainlink, 6' high plus 3 strands of barbed wire 9 ga.	16000	feet	$15.00	$240,000
3	UXO support (for fencing and sign installation)	12	day	$500.00	$6,000
4	Mobilize/demobilize	1	ls	$15,000.00	$15,000

Total Capital Cost	$266,400
Contingency (25%)	$66,600
Consulting (15%)	$39,960
Overhead & profit (20%)	$53,280
Total Estimated Cost	$426,240

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-11 Grenade & Mortar Areas Outside Park
Alternative 3 - SURFACE CLEARANCE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	80	acres	$750.00	$60,000
2	Survey/QC	80	acres	$100.00	$8,000
3	Visual inspection, limited geophysical investigation	80	acres	$750.00	$60,000
4	Disposal/detonation of UXO (surface)	64	UXO	$50.00	$3,200
5	Mobilize/demobilize	1	ls	$35,000.00	$35,000
6	Sign fabrication & posting	54	ea	$100.00	$5,400

Total Capital Cost	$171,600
Contingency (25%)	$42,900
Consulting (15%)	$25,740
Overhead & profit (20%)	$34,320
Total Estimated Cost	$274,560

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-11 Grenade & Mortar Areas Outside Park
Alternative 4 - CLEARANCE FOR USE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	80	acres	$750.00	$60,000
2	Survey /QC	80	acres	$100.00	$8,000
3	Geophysical investigation	80	acres	$1,500.00	$120,000
4	Excavation of anomalies	19,500	anomalies	$10.00	$195,000
5	Disposal/detonation of UXO	205	UXO	$50.00	$10,250
6	Sign fabrication & posting	54	ea	$100.00	$5,400
7	Mobilize/demobilize	1	ls	$50,000.00	$50,000

Total Capital Cost	$448,650
Contingency (25%)	$112,163
Consulting (15%)	$67,298
Overhead & profit (20%)	$89,730
Total Estimated Cost	$717,840

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-12 UXO Areas Outside Park
Alternative 2 - INSTITUTIONAL CONTROLS
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Sign fabrication & posting	38	ea	$100.00	$3,800
2	Fencing, around each OOU, chainlink, 6' high plus 3 strands of barbed wire 9 ga.	11400	feet	$15.00	$171,000
3	UXO support (for fencing and sign installation)	10	day	$500.00	$5,000
4	Mobilize/demobilize	1	ls	$5,000.00	$5,000

Total Capital Cost	$184,800
Contingency (25%)	$46,200
Consulting (15%)	$27,720
Overhead & profit (20%)	$36,960
Total Estimated Cost	$295,680

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-12 UXO Areas Oustide Park
Alternative 3 - SURFACE CLEARANCE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	94	acres	$1,000.00	$94,000
2	Survey/QC	94	acres	$100.00	$9,400
3	Visual inspection, limited geophysical investigation	94	acres	$750.00	$70,500
4	Disposal/detonation of UXO (surface)	1,440	UXO	$50.00	$72,000
5	Sign fabrication & posting	38	ea	$100.00	$3,800
6	Mobilize/demobilize	1	ls	$40,000.00	$40,000

Total Capital Cost	$289,700
Contingency (25%)	$72,425
Consulting (15%)	$43,455
Overhead & profit (20%)	$57,940
Total Estimated Cost	$463,520

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-12 UXO Areas Outside Park
Alternative 4 - CLEARANCE FOR USE
Estimated by: RGW
Checked by: MGB
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	94	acres	$1,000.00	$94,000
2	Survey /QC	94	acres	$100.00	$9,400
3	Geophysical investigation	94	acres	$1,500.00	$141,000
4	Excavation of anomalies	109,000	anomalies	$10.00	$1,090,000
5	Disposal/detonation of UXO	4,640	UXO	$50.00	$232,000
6	Sign fabrication & Posting	38	ea	$100.00	$3,800
7	Mobilize/demobile	1	ls	$60,000	$60,000

Total Capital Cost	$1,630,200
Contingency (25%)	$407,550
Consulting (15%)	$244,530
Overhead & profit (20%)	$326,040
Total Estimated Cost	$2,608,320

COST ESTIMATE
EE/CA for Former Camp Croft Army Training Facility

Project: 319-5165G-0600-3100
Site: OOU-3 Wedgewood Subdivision
Alternati CLEARANCE FOR USE
Estimate MGB
Checked RW
Reviewed by:

ITEM NO.	DESCRIPTION	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL COST
1	Site Preparation and clearing	43	acres	$125.00	$5,375
2	Survey /QC	43	acres	$100.00	$4,300
3	Geophysical investigation	43	acres	$1,200.00	$51,600
4	Excavation of anomalies (using blast boxes provided by USAESCH)	160,533	anomalies	$11.00	$1,765,863
5	Disposal/detonation of OE	108	UXO	$50.00	$5,405
6	Sign fabrication & posting (located along roads & trails)	5	ea	$100.00	$500
7	Mobilize/demobilize	1	ls	$50,000.00	$50,000
			Total Capital Cost		$1,883,043
			Contingency (25%)		$470,761
			Consulting (15%)		$282,456
			Overhead & profit (20%)		$376,609
			Total Estimated Cos		$3,012,869

Note: Costs assume that all residents in this subdivision wish to have their properties remediated.
The acreage assumed for OOU3 does not include 3 acres already remediated by HFA.
The number of anomalies were based on the total number found at this OOU minus the worse case (Grid A34-3) as the number of anomalies at this grid were an abberation from what was seen at the rest of this site.

Appendix H

Comments and Responses

QST ENVIRONMENTAL INC.
RESPONSE TO COMMENTS, FORMER CAMP CROFT
PRELIMINARY DRAFT EE/CA REPORT

Arkie Fanning

COMMENT 1: General:
The grid results should be shown in a table for ease of review.

RESPONSE 1:
A new paragraph, 2.4.7.0.4, has been added to make appropriate reference to Table 2-3.

COMMENT 2: General:
The SiteStats results should be provided in a table in section 2. Just show the sector, the density, and the beta confidence.

RESPONSE 2:
The SiteStats data Table 2-4 has been added, providing the in tabular form.

COMMENT 3: General:
The contractor should verify that qualified personnel were used to perform the OECert analysis. The task manager for OECert must have an engineering degree with advanced courses in Operations Research and Statistics and have either two years experience in developing risk analyses or one year experience in utilizing OECert. Also, the contractor should have sent the resume of the task manager in for approval prior to performing any OECert work.

RESPONSE 3:
In response to earlier requests to substantiate QST's qualifications to perform the OECert analysis, QST provided a letter (April 3, 1997) that described the qualifications of the personnel selected to perform the analysis and included resumes. The USAESCH project manager gave QST verbal notice to proceed. A copy of the April 3, 1997 letter is attached.

COMMENT 4: General:
Please provide charts that show the risk reductions per risk alternative.

RESPONSE 4:
The data for the risk reduction per alternative is presented in Table 8-1. QST will provide charts presenting this data for your approval in the Draft Final EE/CA Report.

COMMENT 5: Section 3.6.2.2:
Please explain why the density estimates per sector from SiteStats was not used.

RESPONSE 5:
For Sectors in OOU 10 and 11, no actual UXO items were found. There was no UXO density calculated from the SiteStats model. The densities had to be inferred from other site data. The SiteStats densities for OOU 12A could not be used because of the variability of the grid sizes within this operable unit. The OECert model can be used to calculate the densities only if the grid sizes are consistent.

Even though one UXO item was found at OOU 12B, SiteStats predicted zero UXOs per acre for the entire area. In our judgement the SiteStats estimate was too low and we therefore used the number of predicted UXOs per grid from the GridStats data to calculate the estimated density per acre and averaged each grid to get an estimated density for the entire area..

COMMENT 6: Section 3.6.2.2.1.1:
Please quote the rationale for the assumption that only 1% of total park visitors visit these sectors, and why 10% of golfers go into these areas.

RESPONSE 6:
Based on discussions with Park personnel, QST estimated that over 90 percent of the park visitors go to the park specifically to visit the lakes, the pool area, picnic areas, camping areas, the hiking trails and/or the horse trails. People generally stay within the confines of the prepared areas in order to limit exposure potential to dangerous plants and other situations. Park visitors seldom stop to hike into unmarked areas off the main roads or deeper into the wooded areas. QST has evaluated each of the OOU Sector locations along with the knowledge of the high use areas and has made a best engineering judgement that of the remaining 10% of the visitors, 10% of those (1% of the total visitors to the park), might find themselves in the vicinity of the OOU Sectors discussed in the report.

Based on the configuration of the Cotton Country Club Golf Course, QST estimated that 1 out of 10 golfers that go to the course will hit a ball into the nearby woods or into an undisturbed wooded area at least once during their visit. The UXOs are suspected to be in areas not disturbed by course construction and maintenance. Most of the area within the golf course has been recently disturbed. QST would be happy to discuss any additional data you may have which may enhance our estimate.

COMMENT 7: Section 3.6.2.3.1:
Please rewrite the first sentence. OECert does predict yearly exposures but it also predicts daily exposures, monthly exposures, exposure per individual, exposures per activity, exposures per person per visit, exposures per person per visit per activity, etc. There are a number of predictive statistics developed by OECert.

RESPONSE 7:
The first sentence has been revised to reflect all parameters estimated by the OECert model.

COMMENT 8: General:
Tables should be placed in the body of the work. The report is exceedingly difficult to follow.

RESPONSE 8:
We will discuss this change with the USAESCH project manager to determine his preference.

COMMENT 9: General:
The cost of suggested risk reduction alternatives and the expected risk reductions should be included in a table somewhere in the report.

RESPONSE 9:
The cost and expected isk Reduction are included in Table 8-1. We have changed the text in Section 8.0 to include a description of Table 8-1.

COMMENT 10: General:
There is no risk report. The contractor should provide a risk report IAW and HNC SOP for OECert. It is impossible to determine what the proper risk reduction alternative should be without a properly developed risk report.

RESPONSE 10:
QST was scoped to run the OECert model and include the results in the EE/CA report. A separate report was not produced as our budget for the OECert model was reduced during negotiations. QST has reviewed several OECert Reports and included all the pertinent data, including the input and output values, into EE/CA report.

COMMENT 11: Section 8.1:
Please explain the difference between the total expected annual exposure (TEAE) and the Estimated Risk Reduction. OECert gives the number of exposures per risk reduction alternative. Is the estimated risk reduction simply one number subtracted from another in OECert?

RESPONSE 11:
ESE has revised the text in Section 8.1 to provide a clearer description of the process and clarify the descriptions of the terms used. The title of Table 3-5 had been revised to "Total Expected Annual Exposures (TEAE)". A definition of the TEAE has been included at the bottom of the table. Table 8-2 has been added to provide the calculations and definition of the Estimated Expected Annual Exposures.

COMMENT 12: Section 8.1.1:
The effectiveness of institutional controls for OE sites (particularly FUDS sites) has never been mathematically modeled to my knowledge. The Quantitech assumption of no impact was provided by the Government during the development of OECert. If the contractor has a model, please provide it for evaluation for use at other sites.

RESPONSE 12:
The reference to Quantitech regarding assumption of the impact of institutional controls will be deleted. QST does not have a model to evaluate institutional controls. However, using our best engineering judgement at this site, we would expect a minimum of 50% risk reduction if the institutional controls are properly implemented and maintained.

COMMENT 13: Section 8.1.2:
Please explain why OECert did not provide a total expected annual exposures for alternative 4. That is the purpose of OECert. Please explain why the computer program is wrong. Also, please explain why Earth Science has not contacted the HNC risk manager prior to the draft stage to discuss any problems they have had with the risk tools.

RESPONSE 13:
QST prepared the OECert analysis by in-putting the data in accordance with the SOP provided by the USAESCH project manager. Due to the tight schedule, it was necessary to prepare the OECert to show the HNC Risk Manager how we planned to proceed, then revise it according to his comments after a review meeting. The report is still in the draft stages and we hope to get input prior to the draft final.

COMMENT 14: General:
This was the most difficult EE/CA I have yet evaluated. Please put the tables and charts in the body of the work to make evaluation of the results easier.

RESPONSE 14:
The report was prepared following the same general outline and presentation as with previous EE/CA reports which were approved by the USAESCH project managers. Tables and Figures will be inserted and revised as directed by the USAESCH project manager. QST will make an effort to clarify all problems with the text.

McCowan

COMMENT 1:
The cost contained in the EE/CA show a realistic approach to each alternative.

RESPONSE 1:
No response required. Thank you.

COMMENT 2:
The cost for each alternative appears to be in line with similar actions.

RESPONSE 2:
No response required. Thank you.

Mr. Sang

COMMENT 1: Para 2.4.7:
Recommend that a summary table be created to summarize the results of the investigation. The table should include the Sample Area, Grid Number, Size of the Grid, Number of Anomalies, Number of Excavation, and OE/ORS founded. This table would be very useful.

RESPONSE 1:
A reference to Table 2-3 has been added in Paragraph 2.4.7.0.4 of the report. We have also provided a description of the table in the paragraph. QST has provided the appropriate data you have requested in Table 2-3.

Lynn Helms

COMMENT 1: Para 2.4.1.2:

a. Clarify "the final version of the WP... Approved on December 24, 1996." I recall this approval using conditional based upon the compliance with comments that were attached.

b. State when the comments attached to the Notice to Proceed were completely addressed.

RESPONSE 1:

a. The final revised version of the work plan was completed and discussed with the project manager (Ms. Patti Berry), issued the notice to proceed on January 7, 1997 (Telephone conversation with Robert Momberger, QST project manager).

b. The comments were addressed on the replacement pages transmitted on 01/08/97. A copy of the replacement pages are attached.

COMMENT 2: Para 2.4.6.1:

The SOW does not specify this; please clarify.

RESPONSE 2:

QST has revised the sentence to read that the daily standard response checks are required in the approved work plan.

COMMENT 3: Para 2.4.6.1.1, Para 2.4.9:

a. Clarify, "...Schonstedt flux-gate on equivalent type...". Specify the process for determining equivalency.

b. Specify the process for determining the, "...exact location of any anomaly..." and how this process is checked for quality.

RESPONSE 3:

a. The sentence was revised to reflect use of the Schonstedt GA72C flux gate magnetometer as described in the work plan. No other magnetometer was used for investigative purposes.

b. Paragraphs 2.4.6.1.2 and 2.4.6.1.3 have been added to respond to this comment.

COMMENT 4: Para 2.4.6.2:

Provide electronic copies of survey data and maps as stated in para 10.3.1.2 of the SOW.

RESPONSE 4:

This data will be provided. As there was no delivery date specified in the SOW, QST

included the survey drawings in the work plan, for review prior to the submission of the final data and maps. The electronic deliverables in item 10.3.1.2 are generally provided after the hard copies have been reviewed and approved.

COMMENT 5: Para 2.4.9:
Describe the quality control of the: 1) geophysical survey; 2) digital data required in para 10.3.11.2 of the SOW; and 3) mapping.

RESPONSE 5:
The quality control was described in the work plan. It has been previously determined by USAESCH project managers that the report will not reiterate items that were in the work plan. Upon the USAESCH PM approval, QST will insert sections dealing with the quality control from the work plan to the report.

COMMENT 6: Para 2.4.9.1:
QST states that, "calibration was completed on all field equipment...". Provide the calibration procedures for each instrument, the periodicity requirement of each instrument, the required skills to calibrate the instruments and the QC for the procedures.

RESPONSE 6:
All statements including the work "calibrations" will be revised to "Standard Checks" from the report as calibrations were not performed. Standard checks were provided in a manner and at a frequency as stated in the approved work plan.

Tommy Hunt

COMMENT 1: Appendix B, Section 1:
"...to allow the rover to lock on five space vehicles for the term of the session." What space vehicles (i.e., old solid rocket tanks, pieces of the Gemini 12). How about a little more professional language like "five satellites in the GPS Constellation".

RESPONSE 1:
According to the survey subcontractor the Terminology "Space Vehicles" is universally accepted by GPS operators and manufacturers. QST asked and the survey contractor rewrote the sentence to read " ...to allow the rover to receive signals from at least 5 GPS Satellites from within the GPS Constellation".

COMMENT 2: General:
Ensure that CEHNC-ED-CS-D receives an electronic copy of all maps and survey data as described in Para 8.5 and 10.3.1.2 in the original SOW for this action. This includes all data submitted as part of Appendix 91B 92 - Location of Survey Data. The CR5 files from the Tripod Data Systems may be used at a future date for other control work on this project.

RESPONSE 2:
This data will be provided. As there was no delivery date in the SOW, QST was waiting for the approval of the survey drawings presented in the report prior to the transmission of the final data and maps.

COMMENT 3: Appendix B, Sheet 1:
There is a Survey Grid showing up in the middle of Lake Craig. I don't think we did any work in the lake! Check your overlay registration. Secondly, why are we using old grad sheets as the underlay. We flew this job in 1995 and have a complete set of digital orthophotographs of the complete site. These should be our primary control underlay sheets Not the old quad sheets.

RESPONSE 3:
There are no grids in Lake Craig. Grid 19-1 is near, but not in Lake Craig. The use of the digital orthophotographs has been incorporated into the Figures as requested.

COMMENT 4: Figure 2-3 and Figure 2-4:
As stated in the comment above why are we using the old quad sheet as the underlay for the mapping information. We flew this job in 1995 and have a complete set of digital orthophotographs of the complete site. These should be our primary control underlay sheets, not the old quad sheets.

RESPONSE 4:
See response to Comment number 3 (above).

COMMENT 5: Figures 3-1 through Figures 3-13:
Same as comment No. 5. These make pretty picture in color, but the pixel size is so large when blown up, that they don't lend any relative information. The digital orthophotos are available for loan from this office on CD ROM in 3 different flight scales for map and drawing creation. Use the digital orthophotos for underlay detail.

RESPONSE 5:
See response to Comment number 3 (above).

M. Slovak

COMMENT 1: Table of Contents:
Page numbering is not correct. One example of this is the entry for paragraph 2.4.4, Sampling Grid Selection, which lists page 2-15. The correct page for this entry is page 2-16. Recommend the contractor review the document and ensure that the page numbering is correct.

RESPONSE 1:
All incorrect numbering within the table of contents has been corrected.

COMMENT 2: Page 2-17, Para 2.4.6.1:
This paragraph describes the test source used and refers to the USACE SOW. In the SOW in Appendix A, there is no mention of the test source to be used. Contractor should include the complete SOW that pertains to this EE/CA in their report.

RESPONSE 2:
The reference to the Standard Checks performed in the field should have been the approved work plan not the SOW. The reference to the SOW has been deleted and changed to reference the approved work plan.

COMMENT 3: Page 2-17, Para 2.4.6.2:
Per the GridStats/SiteStats SOP, only the total flagged anomalies for the entire grid are to be counted, not the anomalies for each survey lane of that grid. Recommend that the contractor follow the procedures in the GridStats/SiteStats SOP.

RESPONSE 3:
A survey lane is a portion of the survey grid. The total number of anomalies from each grid was determined by counting the total number of anomalies from each survey lane and adding the sum from each lane with subsequent lanes in a given grid to obtain a total number of anomalies for that grid. The total number of anomalies from the entire grid was also presented on the site map. The text has been revised to include the total number of anomalies from each grid.

COMMENT 4: Page 2-17, Para 2.4.6.3:
GridStats divides the grid into "32" subgrids, not "36" subgrids. Recommend that the contractor correct this paragraph to reflect the correct amount of subgrids.

RESPONSE 4:
Noted. Correction has been made.

COMMENT 5: Page 2-77, Para 2.6:
Paragraph should be labeled "SiteStats/Grid Stats" not just "SiteStats". The SiteStats program selects the grids to be sampled, while the GridStats program is used to collect the data for those selected grids. Recommend contractor use the proper terminology.

RESPONSE 5:
Nonconcur. As stated in the work plan and due to schedule and budgetary constraints, QST was not able to run SiteStats to determine the number of grids and the grid locations to be sampled for each sampling area. The SiteStats program was run only to determine the alpha and beta values along with the UXO density for the OECert program.

COMMENT 6: Appendix E:
"SiteStats Data" should be labeled "SiteStats/GridStats Data". Also, no electronic survey data (3.5" Disk) is included for SiteStats/GridStats Data. It is this electronic data that shows what subgrids had UXO items, UXO scrap, no anomalies, etc. Recommend the contractor include this electronic data in the report.

RESPONSE 6:
See response to Comment Number 5. There was no specific requirement to provide SiteStats/GridStats data in our scope of work.

ATTACHMENT 1
April 3, 1997 Letter

Environmental
Science &
Engineering, Inc.

A CILCORP Company

April 3, 1997

U.S. Army Engineering and Support Center, Huntsville
4820 University Square
Huntsville, AL 35816-1822

ATTN: CEHNC-PM-OT, Project Management
Mr. Karl Blankinship, Project Manager

RE: Task 6 - Ordnance and Explosives Cost-Effectiveness Risk Tool (OECert) Program; Additional Work for the Engineering Evaluation/Cost Analysis (EE/CA) at the Former Camp Croft; Contract No. DACA87-92-D-0018, Delivery Order No. 0028
ESE Document No. 3195165G-0500-3100-97-04-03-01

Bob Momberger talked with Arkie Fanning (USAESCH) today regarding ESE's Scope-of-Work to perform the OECert analysis of the Former Camp Croft field data. Mr. Fanning informed Bob that there is a USAESCH requirement that the OECert analysis must be reviewed and signed off by a project technical manager (TM) that has both an engineering degree (with PE?) and an advanced degree in statistics with experience in operations research (OR). We planned to have Mary Burnett of ESE's Risk Assessment Department, who has a Masters in Statistics and OR experience, to manage the OECert task. The OECert analysis will also be reviewed by Ms. Claire Marcussen, ESE's Risk Assessment Department Manager, who has over 14 years experience with risk analyses.

ESE was unaware of the OECert review requirements at the time of the cost negotiations for the OECert task that was awarded to ESE on November 30, 1996. If it is necessary to contract all or part of this task to an outside consultant it will affect the project schedule and budget. I am confident that the Croft project team can complete the OECert analysis with appropriate guidance and review by USAESCH.

Please advise me if the above USAESCH OECert requirement is applicable to this ESE Delivery Order and what steps can be taken to resolve this issue. ESE appreciates the continued opportunity to be of professional service to you, your staff, and USAESCH.

Sincerely,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

David Moccia, P.E.
Project Director

pc: Robert Kinsley Momberger, P.G., Project Manager

DMM:RKM:srs

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (904) 332-3318 Outside FL (800) 874-7872 Fax (904) 332-0507

ATTACHMENT 2
Draft Workplan
Replacement Pages

Table of Contents

Table of Contents (continued)

3.1.6.5 UXO Supervisor

UXO supervisors must have a minimum of 10 years combined contractor UXO and military EOD experience with a minimum of 3 years active military EOD training and 7 years as a UXO contractor. The UXO supervisor performs onsite duties, including locating UXO, site clearing, equipment operation, UXO safety, and escort duties, as required. The UXO supervisor will serve as a team leader and reports to the senior UXO supervisor.

3.1.6.6 UXO Specialist

The UXO specialist must have a minimum of 3 years military EOD experience. The UXO specialist performs onsite duties, including locating UXO, equipment operation, UXO safety, and escort duties, as required. The UXO specialist reports to the assigned team leader/UXO supervisor.

3.1.6.7 UXO Service Support Specialist

The UXO service support specialist is trained in the use of UXO locator equipment, site clearing techniques and equipment, UXO safety, and basic UXO recognition features. The UXO service support specialist is at no time permitted to excavate or handle suspected or known OE/UXO materials. The UXO service support specialist reports to the assigned team leader/site supervisor.

3.1.7 Project Communication and Reports

Verbal (telephone) correspondence with the public or non-USACE governmental agencies and all written correspondence will be documented and routed to the ESE project manager. All written communications from USACE will be addressed to the ESE project manager. Incoming written communications will be annotated with the date received. Telephone communications between the ESE field office and other parties will be recorded on USAESCH-approved ESE telephone conversation or correspondence forms. The most critical correspondence is the documentation of activities that stop work or require USAESCH SOW revisions.

3.1.7.1 The following communications will be documented in a chronological communications log maintained by the ESE project manager:

- Each and every occasion that OE/UXO is encountered,
- When work is stopped for safety reasons,
- Health and safety violations, and
- Personnel changes and reason for changes.

3.1.7.2 The ESE project manager for Delivery Order No. 0028 will be Robert Momberger, P.G.; Gainesville, Florida. Correspondence concerning this delivery order is to be sent to:

Mailing Address	Shipping Address
ESE P.O. Box 1703 Gainesville, FL 32602-1703 Telephone: (352) 333-3628 Attn: Mr. R. Momberger, P.G.	ESE 14220 Newberry Road Gainesville, FL 32607

3.1.8 Project Work Schedule

The project schedule was initiated with the Notice to Proceed date of March 30, 1995, and ends with the technical completion of the Final Action Memorandum on May 9, 1997. The current overall schedule is presented chronologically with major milestones in Appendix B to this WP. The actual technical completion date will depend on the approved number of sampling sites and the possible addition of the preparation of the EE/CA Action Memorandum to the current SOW.

3.1.8.1 A milestone that could potentially alter this schedule is the receipt of rights-of-entry (entry permission) for several proposed sampling sites at the former CCATF. These sites exist within the boundaries of the former CCATF but are located outside the current Croft State Park boundary. To maintain the project schedule, these rights-of-entry must be received in a timely manner. The USACE, Charleston District will be responsible for obtaining rights-of-entry.

3.1.8.2 The ESE site manager, OES site supervisor, and SSHO/QCS will be onsite during the EE/CA sampling, estimated to be 5 to 6 weeks. This management team will supervise and manage the efforts of two UXO teams, each consisting of four people. Each team will be responsible for completing brush clearing, magnetometer surveys and flagging of anomalies, excavating anomalies, and disposing of OE/UXO. Based on an estimated average of three grids per day per team for clearing, surveying, and excavation, and an estimated total of 183 sampling grids, it is estimated that clearing, surveying, and excavation of anomalies will require approximately 31 working days or 8 weeks (basis: 40 hour, 4-day work week). This estimate is based on an average and will depend on the degree of clearing required and the number of anomalies excavated. The number and location of anomalies to be excavated will be established in the field as the magnetometer surveys are completed.

3.1.8.3 Project management activities will occur frequently throughout the project period. These activities will include monthly progress reports, periodic project meetings, and other non-specified activities.

3.5.2.5 Site survey activities will be conducted during the geophysical investigation. EEG survey personnel, accompanied by a UXO qualified person, will follow behind the geophysical investigation team and survey the site corners.

3.5.2.6 Site survey activities will include establishing NAD83 coordinates of site corner stakes by approved survey methods. The sampling site location will be surveyed to the nearest benchmark or permanent monument, and the grid locations will be determined by hand-held GPS methods. However, due to the thick brush and trees and heavy foliage over the majority of sites, conventional survey methods may be employed. All activities will be conducted in accordance with the SSHP and the Demolition/Disposal SOP (Appendix E).

3.5.2.7 The coordinate system used for the land survey activities will be the state plane coordinate system referenced to NAD83. A control network is required to merge the relative positions of individual survey data and related sampling site features information. A primary land survey control point for each EE/CA sampling site will be identified and marked by the land surveyor. Secondary control points will be the corner reference points established at each EE/CA sampling site. The grid location data will be placed on maps prpoduced using Intergraph Microstation and in a relational database with the grid survey data.

3.5.3 Site Clearing

Because most sampling sites are heavily vegetated, it is anticipated that most of the total sampling site acreage will require some degree of clearing prior to conducting geophysical surveys. Site clearing operations will be completed prior to startup of activities at each sampling site to avoid time delays. Two teams will be scheduled to complete clearing efforts at designated sampling sites, prior to scheduled geophysical survey efforts. Each site clearing and site investigation team will consist of one UXO supervisor, two UXO specialists, and one UXO service support specialist. One senior UXO supervisor will supervise and manage the field investigation teams.

3.5.3.1 Tree Removal

Trees (3 inches in diameter and smaller) will be removed on a case-by-case basis and only as required to accomplish the tasks outlined in the SOW. A botanist and/or biologist familiar with the species found in Croft State Park will be onsite prior to the location of grids to assist in the identification of protected species. The botanist will identify areas of protected tree populations.

3.5.3.1.1 During the investigations, trees requiring removal will be cut with chain saws. The tree will be sectioned, if necessary, to remove it from the immediate area, so that it does not interfere with OE detection or survey activities. If trees larger than 3 inches in diameter are determined to impact the investigation, ESE will advise USAESCH and SCDPRT. No further site action will be taken without full coordination and approval of USAESCH and SCDPRT.

3.5.3.2 Brush Cutting

Brush clearance will be accomplished with gas-powered string trimmers with saw blade attachments and ditch axes. The brush will be cut to a height of no greater than 6 inches above ground surface to eliminate interferences with OE sampling operations.

3.5.3.3 Grass Cutting

If encountered, grass will be cleared using a gas-powered string trimmer with a saw blade or line attachment. The grass will be cut to a height of no greater than 6 inches above ground surface to eliminate interferences with OE sampling operations. If possible, other equipment, such as a bush hog, may be used to clear grass upon approval by USAESCH.

3.5.4 Geophysical Survey Procedures

This section describes standard practices and procedures for collecting, processing, and controlling the data associated with OE geophysical surveys at each of the sampling sites. The data obtained during this investigation will be input into a statistical program (GridStats and SiteStats).

3.5.4.0.1 The geophysical survey techniques to be used at the former CCATF incorporate a hand-held magnetometer and flagging (mag & flag). Use of any other technique may require SOW amendment and modifications of project budget and schedule. Features of this technique are described in Appendix F.

3.5.4.1 Geophysical Survey

The geophysical survey will be conducted using a Schonstedt GA-72 Cd flux-gate magnetometer. A description of the analysis leading to the choice of geophysical equipment to be used is described in the Equipment Plan (Appendix F). The equipment response will be checked daily and at each grid prior to use to verify the equipment is working properly. The sole purpose of the magnetometer is to obtain anomaly locations for mag & flag operations.

3.5.4.1.1 Standard Response Checks

The standard response of the magnetometer will be checked daily using two methods. A 60-mm projectile or equivalent will be buried 2 to 3 ft-bgs. The instrument will be checked each morning to verify the ability of the instrument to detect the object.

3.5.4.1.1.1 Subsequently, a standard test will be performed at each grid site to determine the ability of the instrument to detect a metallic object in a standard testing apparatus. The standard testing apparatus will consist of a 3-ft-long, 2-inch diameter PVC pipe filled with compacted soil. An iron nail or small piece of iron will be placed in one end of the testing apparatus prior to capping. A mark will be placed on the PVC with indelible ink at the nail, at 1 ft, at 2 ft, and at a point on the opposite end cap.

3.5.4.1.1.2 The testing apparatus will be laid on the ground within the grid at a location where no magnetic anomalies are detected. The magnetometer response will be tested by holding the instrument perpendicular over the marks previously placed on the apparatus. The response at 3-ft will be tested at the end farthest away from the source by holding the testing apparatus perpendicular to the ground and placing the magnetometer on the mark on the end cap in line with the apparatus. The magnetometer unit number and the results of the standard response check will be recorded in the field logbook either by noting the response level at each marked location on the testing apparatus or by noting a response was detected. If there is a marked decrease in the response levels from a previous response check of an individual unit, the batteries will be changed and the unit retested. If the source of the problem is not found, the magnetometer will be taken out of service until a standard response is attained (after repair).

3.5.4.1.2 Other Geophysical Equipment

If problems arise that result in proving the survey method to be ineffective or incapable of providing the required data quality and resolution, the site may require resurveying using other approved portable magnetometer methods. Onsite trials may be required before the final decision can be made as to which method will perform best at a particular site.

3.5.4.2 Mag and Flag Procedures

The field team will subdivide each sample grid into parallel sensor survey lanes approximately 5 ft apart. The lanes will be marked with a rope, paint, or other device. The magnetometer operator (technician) will walk the survey line assuring the magnetometer probe covers the entire area within the two ropes marking the lane. The magnetometer probe will be held at a constant height of no more than 6-inches above the ground over entire survey lane. The technician will walk at a speed that will provide complete coverage of the site (i.e. less than 1 ft between magnetometer passes).

3.5.4.2.1 The technician will stop his survey at each anomaly encountered to determine the extent of the anomaly and location. A small surveyor's flag will be placed in the ground at the exact location of each detected anomaly. After each lane is surveyed, the total number of anomalies encountered on that lane will be calculated and recorded on the survey map. Upon completion of the grids, the total number of anomalies detected will be calculated and recorded on the map and in the field log books. This number is critical for the GridStats calculations.

3.5.4.2.2 The locations of all surface and buried UXO and significant UXO fragments encountered during the investigation will be identified on the geophysical investigation map. These items will be identified and their condition determined. These data will be included as

comments on the map. Also included as comments on the map will be an identification of the type of ORS found (i.e., 4.2-inch mortar frag).

3.5.5 Access and Excavation

Access to and excavation of OE items will be completed only after a 200-ft exclusion zone is established and all preparatory actions required in the Demolition/Disposal SOP (Appendix E) are completed. Once a UXO is identified, the exclusion zone will be adjusted to meet the fragmentation distance for the particular UXO.

3.5.5.1 Access to suspect subsurface OE targets will be granted to perform identification and to determine the need for detonation. All access activities will be performed by the UXO specialist under the direct supervision of the UXO supervisor. Only UXO qualified personnel will be allowed to perform UXO access procedures.

3.5.5.2 Manual or equipment methods (e.g., hand tools) as specified in the Demolition/Disposal SOP (Appendix E) will be used to perform all excavation activities. Soil removed from the disposal area will be stockpiled in the immediate area for later backfilling of excavations.

3.5.5.3 If circumstances allow, photographs of the unearthed OE item may be taken for documentation purposes prior to in-place detonation.

3.5.5.4 If UXO items are confirmed and the situation precludes detonating the UXO item in-place, the USAESCH safety representative will be notified.

3.5.6 Field Data Analysis

Data collected in the field during the grid investigation will be entered into the GridStats and SiteStats computer programs (developed by Quantitech) to determine when a statistically significant number of samples have been collected at each grid site. The management of these data is described in Section 3.4 of this WP.

3.5.6.1 The GridStats program will randomly choose 1 of 100 previously prepared sampling sequence lists containing a random selection of the 36 equivalent area subgrids. The approximate location of each subgrid will be located in the field and one anomaly from each selected subgrid will be excavated to a depth of no more than 4 ft or until the anomaly has been recovered.

3.5.6.2 The results of the excavation will be entered into the GridStats program in the order of sample collection. Each surface UXO, subsurface UXO, ORS, and each false positive detected during the investigation will be identified and logged into the program. The program will indicate when a statistically significant number of samples have been collected to characterize each grid. If

4.0 QC PLAN

The QC Plan described in this section will be used for all work performed during completion of the EE/CA activities at the former CCATF. The site-specific QC system was designed to manage, control, and document performance of work efforts in accordance with the USAESCH SOW. The QC Plan will achieve the following objectives:

- Ensure USAESCH notifications as required by the USAESCH SOW,
- Document the quality of work efforts via audits and independent staff reviews of deliverables,
- Ensure the proper use of explosives and procedures,
- Ensure the development of an appropriate ordnance accountability ledger and appropriate OE scrap chain-of-custody and disposal,
- Ensure data integrity through implementation of data management QC procedures, and
- Ensure data precision through implementation of field equipment standard response checks and use procedures.

4.1 Overall QC Management

The overall site QC responsibilities will be under the management of the ESE project manager. The QA manager will be provided by Osiris Incorporated (a small business, QA/QC specialty company). The ESE site manager will report all QC actions to the QA manager. The OES SM/QAM is responsible for the QC of subcontractor OE/UXO operations. The responsibilities and qualifications of all QC roles are provided in Section 3.0 of this WP.

4.1.1 The ESE and OES project managers will have overall responsibility for assigning QC responsibilities and ensuring that QC programs are implemented in accordance with the USAESCH SOW.

4.2 Field Investigation QC Management

4.2.1 Overall Field QC Management

Safety and health QC procedures as established in the SSHP will be the responsibility of the ESE site manager with primary implementation by the designated SSHO/QCS. Overall field QC management will be provided by the UXO subcontractor site QA manager.

4.2.2 SSHO/QCS

The SSHO/QCS will not be directly involved in the UXO operations but will perform as the site safety officer. The SSHO/QCS will advise the site supervisor on all QC matters. Daily QC audits of documentation, work in progress, and monitoring will be conducted and recorded in the QC activity log.

4.2.3 Other QC Responsibilities

All project field team personnel are responsible for performing their QC functions as outlined in this section.

4.2.4 Field Data Management QC

The site supervisor is the onsite field data manager and will be responsible for tabulating all data collected or produced by geophysical survey teams and placing the data under the custody and control of the project data management system.

4.2.5 Equipment Standard Response QC

Equipment standard response checks will be supervised by the SSHO/QCS and recorded in the daily logbook. Standard response checks will be completed on all field equipment by using the manufacturer's standard response procedures or use-specific equipment check program. Equipment standard response checks will be completed on the prescribed schedule, and the standard response results will be recorded in the daily field logbook.

4.2.5.1 Equipment Standard Response Procedures

Measurement equipment used onsite will be checked daily for operational reliability and standard response, prior to use at the site. Before beginning geophysical surface searches, source materials will be used to verify the equipment's accuracy. Records of these equipment checks will be maintained in the QC activity log. If equipment field checks indicate that any piece of equipment is not operating correctly and field repair cannot be made, the equipment will be tagged and removed from service. The site supervisor will be notified and a request for replacement equipment will be expedited. Replacement equipment will meet the same specifications for accuracy and sensitivity as the equipment removed from service.

4.2.5.1.1 Instrument check-out and standard response checks will be the responsibility of the UXO subcontractor site SSHO/QCS. All equipment used onsite will be dedicated to the project until completion. The designated site SSHO/QCS is responsible for checking and recording the operational condition of all equipment daily. An equipment standard response check will be performed each day and recorded in the field notebook.

4.3 Field Investigation Documentation

4.3.1 Daily Field Activity Records

Field activity logbooks will be maintained daily, if applicable, and all entries will be recorded in ink. All personnel will use bound and numbered field logbooks with consecutively numbered pages. The following logs will be maintained.

4.3.1.1 Daily Activity Log

- Date and recorder of field information;
- Start and end time of work activities including breaks, lunch, and down times;
- Visitors;
- Weather conditions;
- Relevant events;
- Important phone calls;
- Changes from approved or planned work instructions; and
- Signature of the ESE site manager indicating concurrence.

4.3.1.2 Safety Log

- Date and recorder of log,
- Tailgate safety briefing (time conducted and by whom),
- Weather conditions,
- Significant site events relating to safety,
- Accidents,
- Stop work due to safety,
- Safety audits, and
- Signature of the ESE site manager indicating concurrence.

4.3.1.3 Training Log

- Date and recorder of log;
- Nature of training (personnel will complete the ESE and the UXO documentation of training form);
- Visitor training; and
- Signature of both the ESE and UXO subcontractor site managers, indicating concurrence.

4.3.1.4 QC Activity Log

- Date and recorder of log;
- Equipment standard response checks;
- Equipment monitoring results;
- QC audits;
- Nonconformance reports; and
- Signature of the ESE site manager and the site supervisor, indicating concurrence.

4.3.1.5 Ordnance Accountability Log

- Date and recorder of log;
- Assigned identification number;
- Type, condition, and location;
- Disposition; and
- Signature of the ESE site manager and the site supervisor, indicating concurrence.

4.3.2 Photographic Records

Photographic records, in addition to the required site videotape, will be maintained by site personnel. Significant activities will be documented by 35-mm color prints and/or by videotape. Photographic records will be used to supplement information recorded in the daily activity logs, including photographs of equipment prior to use, typical ordnance items, and the condition of sites prior, during, and after any activity. Photographs will be maintained in a photograph logbook with appropriate labels identifying the negative and a complete description of the photograph subject.

4.3.3 Working Map

Working maps or sketches of the sampling sites will be used to document ordnance locations during excavation and removal activities. As UXO is located and identified, the assigned technician will record (on the working map) the location and corresponding log entry number in the Ordnance Accountability Log. If a large number of OE/UXO items are found, such as a burial site, the area will be marked on the working map along with the total number of OE/UXO items found at that site.

4.3.4 Records Of Inert Ordnance Items

Inert ordnance items and nonhazardous scrap will be disposed of through a local civilian scrap yard at no cost to the government. Appropriate documentation will be obtained from the scrap dealer as instructed by USAESCH.

4.3.4.1 ESE will prepare a certificate to be signed by the site supervisor. The certificate will state the following:

> I certify that the property listed hereon has been inspected by me, and, to the best of my knowledge, contains no items of a dangerous nature.
>
> _____ Date: _____
>
> Site Supervisor

LIST OF ACRONYMS AND ABBREVIATIONS

ALS	Advanced Life Saving
ANSI	American National Standards Institute
CBC	complete blood count
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	cardiopulmonary resuscitation
CSHP	Corporate Safety and Health Program
CWM	chemical warfare material
°C	degrees Celsius
DOD	U.S. Department of Defense
DOT	Department of Transportation
EOD	explosive ordnance disposal
ESE	Environmental Science & Engineering, Inc.
°F	degrees Fahrenheit
FM	Factory Mutual Engineering Corp.
ft	foot
gal	gallon
GFCI	ground fault circuit interrupter
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	high-efficiency particulate air
hr	hour
HR	heart rate
IHS	industrial hygiene service
mph	miles per hour
MSDS	material safety data sheet
NEC	National Electric Code
NESC	National Electrical Safety Code
NIOSH	National Institute of Occupational Safety and Health
OE	ordnance and explosive waste
OES	Ordnance/Explosives Environmental Services, A Division of ATI
OHP	occupational health program
OHS	occupational health services
OSHA	Occupational Safety and Health Administration
OT	oral temperature
oz	ounce
POL	petroleum, oil, and lubricant
PPE	personal protective equipment
SOP	standard operating procedure
SOW	scope (statement) of work

SSHO	site safety and health officer
SSHP	site safety and health plan
SZ	support zone
TLV	threshold limit value
TWA	time-weighted average
UL	Underwriters Laboratory
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USATEU	U.S. Army Technical Escort Unit
UV	ultraviolet
UXO	unexploded ordnance
WBGT	wet bulb, dry globe temperature
WP	work plan
WWII	World War II
WZ	Work Zone

1.0 INTRODUCTION

1.1 PURPOSE/OBJECTIVES

This Site Safety and Health Plan (SSHP) has been prepared by Environmental Science & Engineering, Inc. (ESE) and Ordnance/Explosives Environmental Services (OES), a Division of ATI, and is designed to anticipate, identify, evaluate, and control safety and health hazards which may be encountered during this engineering evaluation/cost analysis (EE/CA) study at the former Camp Croft Army Training Facility (CCATF), near Spartanburg, South Carolina. This SSHP also describes the response procedures that will be implemented if an emergency arises during the conduct of the site tasks outlined in this document and the Work Plan (WP). All project activities shall be performed in accordance with this SSHP and the references listed in Section 1.2. Where the word "shall" is used, the provisions of this plan are mandatory.

1.1.1 The levels of personal protection and the procedures specified in this plan are based on the best available information from reference documents and current site data. These recommendations represent the minimum health and safety requirements to be observed by all personnel engaged in this project. Unforeseeable site conditions or changes in the Scope of Work (SOW) may warrant a reassessment of protection levels and controls stated. All adjustments to the SSHP must have prior approval by the USAESCH and ESE.

1.1.2 All ESE, OES, and other subcontractor personnel involved in this project shall read this document carefully, understand and comply with it, and complete the SSHP acknowledgement form prior to the start of work. All onsite personnel shall follow the designated safety and health procedures, be alert to the hazards associated with working onsite, and exercise reasonable caution at all times.

1.1.3 Unexploded ordnance (UXO) and hazardous waste pose a serious safety and health problem that endangers human and animal life and environmental quality. The regulations and guidelines listed in Section 1.2 provide employers and employees with information on the potential for injury and illness resulting from hazardous waste operations.

1.2 REGULATIONS AND GUIDELINES

The safety and health of onsite personnel and the local community will be ensured by following all applicable requirements and regulations listed in the following publications:

1. Occupational Safety and Health Administration (OSHA) General Industry Standards, 29 Code of Federal Regulations (CFR) 1910;

2. OSHA Construction Standards, 29 CFR 1926;
3. USAESCH EM 385-1-1;
4. ESE Corporate Health and Safety Program (CHSP);
5. Army Regulation (AR) 385-40 (with USAESCH Supplement 1), Accident Reporting and Records;
6. U.S. Environmental Protection Agency (EPA) Hazardous Waste Management, 40 CFR 260-276, latest edition; and
7. Engineering Regulation (ER) 385-1-92, Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive (OEW) Activities, 18 March 1994.
8. OES Corporate Safety and Health Program (CSHP).

1.3 REFERENCES

In addition to the publications and regulations previously listed, the following documents were used as reference material in the preparation of this document:

1. U.S. Department of Defense (DOD) 4145.26-M, Contractors' Safety Manual for Ammunition and Explosives;
2. Occupational Safety and Health Guidance for Hazardous Waste Site Activities, U.S. Department of Health and Human Services, National Institute of Occupational Safety and Health (NIOSH), October 1985; and
3. Threshold Limit Values and Biological Exposure Indices for 1993 and for 1993 through 1996, American Conference of Governmental Industrial Hygienists (ACGIH), 1993.

5. Site personnel with a known hypersensitivity to stinging insects will keep required emergency medication on or near their person at all times.

11.10.5 BITING INSECTS

Many types of biting insects such as mosquitos, flies and fleas may be encountered onsite. The use of insect repellents will be encouraged by the OES SSHO/QCS if deemed necessary. The biting insects of greatest concern are spiders, especially the black widow and the brown recluse, because of the significant adverse heath effects their bites can cause.

11.10.5.1 The black widow is a coal-black bulbous spider 3/4 to 1 1/2 inches in length, with a bright red hour-glass on the under side of the abdomen. The black widow is usually found in dark, moist locations, especially under rocks and rotting logs and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

1. Sensation of pinprick or minor burning at the time of the bite;
2. Appearance of small punctures (but sometimes none are visible); and
3. After 15 to 60 minutes, intense pain is felt at the site of the bite, which spreads quickly and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of the face and extremities.

11.10.5.2 The brown recluse is brownish to tan in color, rather flat, and 1/2 to 5/8 inches long with a dark brown violin shape on the underside. It may be found in trees or in dark locations. Victims of a brown recluse bite may exhibit the following signs or symptoms:

1. Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite;
2. Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance;
3. Systemic affects such as a generalized rash, joint pain, chills, fever, nausea, and vomiting; and
4. Possibly severe pain after 8 hours, with the onset of tissue necrosis.

11.10.5.3 There is no effective first aid treatment for either of these bites. Except for very young, very old, or weak victims, these spider bites are not considered to be life threatening. However, medical treatment must be sought to reduce the extent of damage caused by the injected toxins.

11.10.5.4 If either of these spiders are suspected or known to be onsite, the OES SSHO/QCS will brief the site personnel as to the identification and avoidance of the spiders. As with stinging insects, site personnel should report to the OES SSHO/QCS if they locate either of these spiders onsite or notice any type of bite while involved in site activities.

11.10.6 HANTAVIRUS

Hantavirus is a disease spread primarily from infected rodent urine, feces, and saliva. To prevent worker exposure to this disease, enclosed workplaces (to include storage magazines) shall be constructed and maintained, so far as reasonably practical, to prevent the entrance or harborage of rodents. Initially, symptoms are flu-like, such as fever, chills, body aches, or troubled breathing. These symptoms may progress to life-threatening respiratory distress. Areas with evidence of rodent activity should be thoroughly cleaned in a manner that limits the potential for the dirt or dust from becoming airborne. General-purpose household disinfectant kills the hantavirus. Dead rodents, rodent nests, droppings, and other items that may have been tainted should be sprayed with disinfectant solution and the disinfected materials double bagged, labeled as infectious, and disposed of properly. Protective equipment for persons who may be exposed include coveralls (disposable if possible), rubber boots, rubber gloves, nonvented goggles, and a respirator with high-efficiency particulate air (HEPA) filter. Equipment should be decontaminated on removal. Workers who develop symptoms of the Hantavirus within 45 days of the last potential exposure should seek immediate medical attention.

11.11 UXO/OE

UXO/OE may be present and located during site activities. If UXO is located onsite, its location will be marked, and the onsite government representative will be notified of the presence of the UXO. All UXO-qualified personnel will follow the SWPs listed in Section 3.0 of the WP, and all non-UXO-qualified personnel will comply with the following SWPs:.

1. Non-UXO qualified personnel will receive site-specific UXO recognition training prior to participation in site activities;
2. No soil-penetrating activities will be allowed without the area first being cleared by UXO-qualified personnel;
3. Non-UXO qualified personnel will be escorted onsite by UXO qualified personnel, until such time as the area is cleared;
4. Once an area has been cleared and flagged, non-UXO qualified personnel may perform duties in the area unescorted but shall not leave the cleared area unescorted;
5. No excavation or soil-penetrating activities will be conducted in an area unless previously cleared by UXO/OE-qualified personnel; and
6. Non-UXO qualified personnel will not touch or disturb any object which could potentially be UXO/OE related and will immediately notify the nearest UXO-qualified person of the presence of the object.

11.11.1 TRANSPORTATION OF UXO/OE

All motor vehicles used in the transport of UXO/OE will be maintained and all operators will be trained in accordance with the OES Motor Vehicle Safety Program. At least two properly rated fire extinguishers are required to be mounted on the vehicle for flammable cargoes to include UXO/OE. Explosive placards will be mounted on all four sides of the transporting vehicle. The load shall be distributed, choked, tied down, or secured to prevent movement while in transit. All UXO/OE materials being prepared for transport will be handled in accordance with USAESCH's *Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO)* (Appendix C of WP).

11.11.1.1 Operators of vehicles transporting personnel, explosives, flammable, or toxic substances shall stop at railroad crossings or drawbridges and shall not proceed until the course is clear. A stop shall not be required at a streetcar crossing within a business or residential district; at a railroad grade

crossing or drawbridge protected by a watchperson, traffic officer, or by a traffic signal indicating approaching vehicles may proceed.

11.11.1.2 No explosives, flammable materials (except normal fuel supply), or toxic substances shall be transported in vehicles carrying personnel.

11.11.1.3 If base-ejection type projectiles must be transported to a disposal area or collection point, the base shall be oriented to the rear of the vehicle and the projectile secured, in the event the ejection charges function during transport.

11.11.1.4 If OE, with exposed hazardous filer (HE, etc.) must be moved to a disposal area, the item shall be placed in a heavy duty conductive plastic bag to prevent migration of the hazardous filler. Padding shall also be added to protect the exposed fill from heat, shock, and friction. An ideal padding material is vermiculite, kitty litter, or sand.

11.11.1.5 Motor vehicles and material handling equipment used for transporting ammunition or explosives must meet the following requirements:

1. Exhaust systems shall be kept in good mechanical repair at all times.
2. Lighting systems shall be electric.
3. As a minimum, two Class 2A:10B:C-rated, portable fire extinguishers shall be mounted on the vehicle outside of the cab, on the driver's side.
4. Wheels of carriers must be choked and brakes set during loading and unloading.
5. No explosives or ammunition shall be loaded into or unloaded from motor vehicles while their motors are running.

11.11.1.6 Motor vehicles and material handling equipment used to transport explosives shall be inspected prior to use to determine that:

1. Fire extinguishers are filled and in good working order.
2. Electrical wiring is in good condition and properly attached.
3. Fuel tank and piping are secure and not leaking.
4. Brakes, steering, and other equipment are in good condition.
5. The exhaust system is not exposed to accumulations of grease, oil, gasoline, or other fuels, and has ample clearance from fuel lines and other combustible materials.

No more than two persons shall ride in a truck transporting explosives or ammunition, and no person shall be allowed to ride in the trailer/bed. Vehicles shall not be refueled when carrying explosives. Vehicles must be 100 ft from magazine or trailers containing explosives before refueling. All vehicles used for transportation explosive materials will be cleaned of visible explosive contamination before releasing the vehicles for other duties.

11.11.2 CWM

If CWM or suspected CWM is encountered, all work within 500 meters of the location will cease, the area will be evacuated, and USAESCH will be notified. Two UXO specialists will maintain security on the item from an upwind location. The remainder of the field team will be posted on all access routes to ensure no unauthorized personnel enter the site. This posture will be maintained until

relieved by proper military authority (i.e., EOD Unit of U.S. Army Technical Escort Unit. ESE and OES will render assistance as requested by USAESCH.

11.12 COLD STRESS

The affects experienced by site personnel when working in cold environments depend on many environmental and personal factors, such as ambient air temperature, wind speed, duration of exposure, type of protective clothing and equipment worn, type of work conducted, level of physical effort, and health status of the worker. In cold environments, overexposure can cause significant stress on the body, which can lead to serious and permanent injury. Cold may affect just the exposed body surfaces and extremities, or the deeper body tissues and the body core. The following paragraphs contain information about the most common cold stress disorders and their signs, symptoms, affects, and control techniques.

11.12.1 COLD STRESS DISORDERS

11.12.1.1 Immersion Foot or Trench Foot

These two cold injuries occur as a result of exposure to cool or cold weather and persistent dampness or immersion in water. Immersion foot usually results from prolonged exposure when air temperatures are above freezing, whereas trench foot normally occurs from shorter exposure at temperatures near freezing. The symptoms for each disorder are similar and include tingling, itching, swelling, pain in some cases or numbness in others, lack of sweating, and blisters.

11.12.1.2 Frostbite

Frostbite occurs when water contained in the body tissues freezes. This usually occurs when temperatures are below freezing, but excessive wind can result in frostbite even at ambient temperatures that are above freezing. Frostbite can occur from several types of cold exposure, such as: exposure of bare skin to cold and wind, exposure to extremely cold ambient temperatures, or skin contact with objects whose temperatures are below freezing. The extremities are usually affected first since they experience reduced blood flow and heat loss. The tissue damage caused by frostbite can be superficial; near the surface of the skin; or extend to deeper body tissues, which can cause severe tissue damage. The skin may first have a prickly or tingling sensation and later become numb with cold, and the appearance may range from superficial redness of the skin to white, hard, frozen-looking tissues.

11.12.1.3 Hypothermia

Hypothermia results when the body loses heat faster than it can produce it. When this occurs, the blood vessels in the skin and extremities constrict, reducing the flow of warm blood to those areas, thereby reducing the rate of heat loss. This reduction in blood flow usually affects the peripheral extremities first. Ears, fingers, and toes begin to experience chilling, pain, and then numbness due to loss of blood flow and heat. Shivering begins as the body's core temperature begins to drop, and the body uses the shivering to compensate and create metabolic heat. Shivering is often the first sign of hypothermia. The pain and numbness in the extremities is an indication that the heat loss is increasing, and, when shivering becomes uncontrollable, the heat loss in the body core has become

1.0 FIELD INVESTIGATION EQUIPMENT PLAN

1.1 The purpose of this field investigation equipment plan is to provide information of types and sources of equipment that will be required to complete the field investigation activities.

1.2 The field investigation activities for this EE/CA project will include conventional OE/UXO geophysical survey methods, OE/UXO excavation and removal as necessary, and OE/UXO handling/disposal procedures. OE/UXO sampling will be combined with surrounding sampling site features to produce sampling site maps depicting the information and data collected at each sampling site. These methods and procedures are detailed in Section 3.0 of the Work Plan.

1.3 All personnel will follow at all times the OE/UXO Operations Plan and Site Safety and Health Plan procedures outlined in the referenced Work Plan sections and appendices, unless the procedures are modified and agreed to by ESE and EOD subcontractor and approved in writing by the USAESCH representative. All equipment provided for field investigation activities for this project will be in strict accordance with these plans, in order to assure the safety of field personnel at all times. Personal protective equipment (PPE) is specified in the Site Safety and Health Plan rather than in this appendix.

1.4 If CWM materials are discovered during these field investigation activities, all work will cease, the site will be rendered safe using approved SSHP procedures, and the USAESCH representative will be contacted for further instructions. For that reason, this equipment plan does not specify equipment for CWM-type field investigation activities.

2.0 GEOPHYSICAL SENSOR SURVEY UNITS

2.1 GENERAL

The geophysical sensor surveys conducted at the EE/CA sampling sites will use a manual sensor survey system known as "mag and flag." This system consists of the use of an appropriate portable field magnetometer in a field sweep mode, following surveyed 5-ft wide lanes to thoroughly cover the sampling site layout.

2.2 GEOPHYSICAL EQUIPMENT REQUIREMENTS

During the implementation of an EE/CA investigation, a statistically significant number of the total anomalies detected will be excavated. The purpose of the EE/CA sampling is not to remove all ordnance items from the grid site. Therefore, there is no reduction of liability implied. With this in mind, standard detection equipment that will be easy to use on all grid site conditions encountered during an investigation with the reliability required for EE/CA sampling will be evaluated for use. The geophysical equipment selected for use at an EE/CA site must be able to detect most anomalies found at the site to a depth of 3 ft. The data obtained during this investigation are to be used for statistical purposes only.

2.2.1 GEOPHYSICAL EQUIPMENT EVALUATION

ESE reviewed current geophysical technologies to determine the type of equipment that will meet the requirements of ability to detect individual anomalies, reliability, portability (easy to handle through trees and shrubs), and cost. After review of available geophysical methods, ESE has selected the use of a hand-held magnetometer at Former Camp Croft.

2.2.1.1 Several hand-held magnetometers were evaluated based on portability, weight, reliability, and cost. These include the Schonstedt GA-72, Schonstedt GA-52, Magnatrac 102, and the Foerster MK26.

2.2.1.2 Portability is important due to the difficult terrain and location of most of the sites. The selected magnetometer must be easily manipulated in areas of brush, vines, and between trees. The instrument must be easy to carry through hilly terrain. The length of the instrument is important as an instrument too long will be difficult to operate in the forested areas, and a shorter length would require shorter lane widths.

2.2.1.3 The weight is an important criteria as heavier pieces of equipment will generate more strain on the operator and make it difficult for him to operate the equipment efficiently without rest or replacement. Therefore, the weight will decrease the productivity during the geophysical survey task.

2.2.1.4 The equipment must be reliable and rugged enough to perform in field conditions, and be able to detect OE buried up to 3 ft deep.

2.2.1.5 The cost is being evaluated based on the manufacturer price. ESE has contacted the manufacturers of the analyzed equipment for retail pricing. It is assumed that the rental rate of each piece of equipment will be directly related to the retail price.

2.2.1.6 The analyses are presented in Table 2-1. As a result, ESE has chosen the Schonstedt GA-52C, the Schonstedt GA-72C, or the Magnatrac 102 for the geophysical survey. OES selected to use a Schonstedt GA-72C as the primary geophysical instrument. This unit has been used in the industry for many years and has been proven reliable at the Former Camp Croft site during previous investigations. During the former EE/CA investigation at the Former Camp Croft site, all the anomalies from every seventh lane were entirely excavated. No anomalies were missed.

Table 2-1. Magnetometer Analysis

Instrument	Reliability	Portability	Weight	Cost
Schonstedt GA-52Cd	Previously used on sites to find items buried ± 2-ft depth. See CEHNC for test data/depth analysis.	Length-42.5 inches	3.0 lbs	$795
Schonstedt GA-72Cd	Previously used on sites to find items buried ± 2-ft depth.	Length-34.5 inches	2.5 lbs	$895
Magnatrac 102	See CEHNC for test data/depth analysis.	Length-42 inches	3.0 lbs	$550
Foerster MK-26*	See CEHNC for test data/depth analysis. Extremely reliable.	Probe-30.8 inches Handle-57.7 inches**	13.5 lbs	$16,515

*Foerster Ferrix L configuration is evaluated.

**Due to probe and handle configuration, the Foerster is cumbersome in forested terrain.

DRAFT FINAL EE/CA REPORT RESPONSES TO COMMENTS

REVIEWER	COMMENT NUMBER	DRAWING NO. OR REFERENCE	COMMENT	RESPONSE
Arkie Fanning	1	Page 2-4, 2.4.6.3, First sentence	Please add USAESCH to the sentence "The GridStats Software developed by..."	Agree. "USAESCH" has been added.
	2	Table 2-4	You need to separate 12A and 12B into 2 sectors since you are reporting different density values. The contractor can also do a hand calculation to get around the different grid sizes being input into SiteStats/GridStats. Also, please remove the statement that OECert requires a standard grid size.	The ordnance densities for the two grid sizes in sector 12 (100x100 and 50x50 ft) were combined prior to being input into SiteStats/GridStats. The statement that OECert requires a standard gridsize has been removed.
	3	Table 2-3	Please provide an expected density of OE/acre column.	Appendix E of the EE/CA provides the expected densities of sub-surface UXO items for each grid. Appendix E of the OECert Risk Report (which is Appendix F of the Draft Final EE/CA Report) provides the low, point, and high density estimates of UXO/Acre for each Sector/OOU ID.
	4	Risk Report, Page 1-1.	You state "sectors" generally correspond to areas where.... Is there a difference between sectors and OOU? If so, please state the difference and why there is a difference. Also, please show how individual sectors were chosen in an OOU.	Section 1.4 has been reworded. One or more sectors with similar characteristics (land use, OE found onsite, etc.) make up each OOU. Example: OOU9 consists of sectors A through H.
	5	Risk Report, Page 1-3.	There should be a table developed that shows the low, point, and high density.	See Page E-1 for Ordnance Density Estimates.

	6	Risk Report, Page 3-1, Section 3.1.1	Please remove all EPA references. This paragraph implies that OE follows EPA rules. This is not the case (at least currently) and it should not be implied. It is okay to state that the EPA uses a similar approach but the document should not imply it meets any EPA criteria that it has to have EPA approval.	Agree. References to the EPA have been removed.
	7	Page 3-1	Please remove 3.1.1.2. It does not contribute to the report at all. Also, please ensure that all references that refer to EPA requirements are deleted.	Agree. Paragraph 3.1.1.2 has been removed.
	8	General	The report is much easier to follow.	Thank you.
Mr. Sang	1	Para 1.3.5, Page 1-4	This paragraph stated that no UXO was found at this OOU11. However, the recommendation is to perform "Clearance for Use". Need more explanation and reasons why "Clearance for Use" is recommended.	ORS items were found at OOU11 that indicate high order detonations. Also UXO has been reportedly found and disposed by Cotton Creek Golf Course personnel.
	2	Table 2-2	Provide the unit of measurement (inches) for "Depth" column.	Agree. The unit of measurement has been added to Table 2-2.
	3	Table 2-3	Provide the unit of measurement (acre) for "Grid Size" column.	Agree. The unit of measurement has been added to Table 2-3

	4	General	Recommend that a map similar to Figure 3-1 be prepared to include all OE activities at the former Camp Croft. This should include the Phase I EE/CA, Phase II EE/CA and any TCRA conducted and plan to conduct in the near future. This information will help manage this FUDS site more effectively.	This recommendation is out-of-scope.
S. Sang	1	General	Based on coordination with PM; Sam Sang will hand carry comments prior to dry run meeting. EPUB has no further comment.	Accepted.
Lynn Helms	1	Fig. 2-2	North arrow is missing.	North arrow has been added.
	2	Fig. 2-5	Specify the point of coordination for geophysical surveys.	Point of coordination for geophysical surveys is the Site Manager.
	3	Para. 2.4.6.1.1	A. Present the required standard response for the magnetometer. Describe how this particular standard for magnetometers at Camp Croft was developed. B. Present the results of the daily magnetometer standards check for each instrument used.	A. See WP for standard. B. Field notes will be provided to the USAESCH PM.

	4	Para 1.2.1, 2.4.6.3.2, 2.4.3.1.1, 2.4.7.5.1.1, Table 2-3	The term "false positive" is used inaccurately as it pertains to OE. The context that "false positive" is used in, is geophysically misleading. "Magnetic rock", "....trash that includes nails staples and wire." And other minerals are geophysical anomalies just as OE is. To a geophysical statements that refer to minerals as a false positive are mutually contradictory. The result is: 1) an artificially high false positive rate; 2) a budding communication problem; 3) an indication that there is a problem with the geophysical instrument(s) selected for use on this project. Geophysically this is an analysis or processing problem. It may be more accurate to refer minerals and magnetic rock as false positive OE items.	The term "false positive" has been changed to "false positive OE."
	5	Table 2-2	A. We are given an anomaly description, source grid and depth. Provide the location of the anomaly B. We are provided the action taken, the shot number, and the noise level. Since this data is presumably recorded to document the blast effects of each shot, provide the ground motion experienced as the result of each blast.	A. The grid field maps show the number of anomalies in each grid lane. In some cases there are over 1000 anomalies in a single grid. Field data will be provided to the PM B. This data was not collected (not in statement-of-work).
	6	Para. 2.4.9	Document geophysical survey QC, data transfer QC, geophysical analysis/processing QC.	This information was provided to the USAESCH PM. The PM requested that field data be kept to a minimum in the EE/CA Report.

	7	Para. 2.4.9.1	Provide the standard response for each geophysical instrument used in the field.	The field data was provided to the USAESCH PM.
	8	Table 3-2	Locate each anomaly within the grid.	See response 5A.
	9	Table 3-5	Good presentation.	Thank you.
	10	Fig. 2-4	Enlarge the purple text to make it readable.	Purple text has been changed to blue for the Final EE/CA Report.
	11	Para. 5.1.1	The listing of systems for ordnance detection include "metal detector" as a system. All of the other systems are metal detectors or can detect metal. "Metal Detector" should be removed from the list of systems since it is a term that encompasses all of the other systems.	Agree. "Metal detector" has been removed.
	12	Para. 5.1.1.1	Please clarify.	Para 5.1.1.1 has been deleted.
	13	Para. 5.2.0.2.1	Clarify the statement addressing the removal of tree roots.	"tree roots..." has been changed to "light clearing of leaves, vines, and vegetation ground cover".
	14	Para. 6.1	Consider adding separation by specific gravity (vibrating table) as a removal response alternative.	Paragraph 6.1.3 (sifting) has been reworded to include "gravity separation using a vibrating table".
	15	Para. 6.4.1.2	The upward migration of OE resulting from soaking and drying, and freezing and thawing has not been discussed. Reconsider the upward migration of OE with respect to long term effectiveness.	A sentence has been added to include these factors.
	16	Para. 6.4, 6.4.3	Describe the source of the geophysical experience in this alternative.	Comment withdrawn by the USAESCH PM

	17	Para. 6.5	Document why only magnetic geophysical methods were considered.	See Work Plan.
	18	Table 8-2	Provide units on the column labeled "Exposure Reduction".	See footnote(s) of Table 8-2. Unit has been added.
Tommy Hunt	1	Figure 2-1	Add a north arrow and bar scale to the map.	Agree. The north arrow and bar scale have been added.
	2	Figure 2-2	Add a north arrow to the map.	Agree. The north arrow and bar scale have been added.
	3	Figures 2-3, 2-4, & 3-1	The map contains a scale and grid coordinates. However, what units are used on the grid coordinates? Are they meter or feet? Are they state plane or UTM coordinates?	Grid coordinates are state plane in feet. This has been noted on the final figures.
	4	Page 2-23, Para. 2.4.6.1	There is a reference in this paragraph to 3 ft-bgs. I can only assume that "bgs" is an abbreviation for "below ground surface". If so, state so!	The abbreviation "bgs" has been removed from the report and "below ground surface" is now used throughout the report.
	5	Figure 2-6	Good chart! Very beneficial in showing how man-hours are being used on a project.	Thank you. Agree.
	6	General	All previous comments developed during the initial draft of this report have been incorporated and accepted as written in this version of the report.	Agree.

Greg Parsons	1	General	This EE/CA address five OOU's (Ordence Operable Units) where OE/UXO was either previously confirmed or suspected. OOU10 lies entirely insith Camp Croft State Park. OOU9 contains property that lies within the park (OOU9A through OOU9E) and outside the park (OOU9F through OOU9H). The remaining three OOUs (OOU3, OOU11, and OOU1) are located in private property sites outside the park but within the former Camp Croft boundary. The following is a list of OOUs in alpha numerical order. OOU3. Concur with recommendations. OOU9 (A through E) Surface plus one foot clearance. OOU10 (A through D) Surface plus one foot clearance. OOU11 Concur with recommendations. OOU12 (A and B) Concur with recommendations.	OOU3; concur. OOU9A through E; Recommendation is NFA. Area is not frequently visited, nor does it appear to contain hazardous (OE) materials. USAESCH PM agrees (per conversation on 10/23/97). OOU9F through H; concur. OOU10A through D; recommendation and cost estimate is surface clearance to 6 inches. USAESCH PM agrees (per conversation on 10/15/97). OOU11A through D; concur. OOU12A through D; concur.