

**FINAL  
REMOVAL ACTION REPORT**

**AREA A – FORMER BAZOOKA RANGE  
FORMER CAMP GORDON JOHNSTON, FLORIDA**

*Prepared For:*

**U.S. Army Corps of Engineers  
Jacksonville District  
and  
U.S. Army Engineering and Support Center  
Huntsville**

**Contract No. DACA87-00-D-0038  
Delivery Order No. 0023  
FUDS Project Number 104FL011004**

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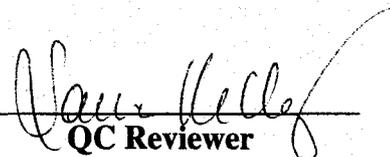
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**November 2004**

*"The views, opinions, and/or findings contained in the report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other documentation."*



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November 23, 2004

U.S. Army Engineering & Support Center  
ATTN: CEHNC-OE-DC (Terry Steuart)  
4820 University Square  
Huntsville, AL 35816-1822  
256-895-1562

Subject: Contract DACA87-00-D-0038, Delivery Order 0023  
Final Remedial Action Report – Area A  
Former Camp Gordon Johnston, Franklin County, Florida

Dear Mr. Steuart:

Enclosed please find four (4) copies of the Final Remedial Action Report for the Area A Former Bazooka Range, Former Camp Gordon Johnston Project, in accordance with the Scope of Work (SOW), dated May 31, 2002. Six (6) copies have simultaneously been forwarded to Mr. Robert Bridgers, USACE Jacksonville District. All Form 7 comments generated during review of the Draft document have been incorporated and the responses are included with this final submittal for the project file. This document has been prepared in accordance with the SOW requirements and DID OE-030. The final document has also been placed on CD and is included with the submittal.

As per our phone conversation on September 13, 2004, Parsons will not use the new terminology (MEC, MPPEH, etc) for consistency with the prior Final project documents and DIDs in force as part of the current SOW.

If you have any questions regarding this letter or need additional information, please contact me at (678) 969-2384 or (404) 606-0346 (cell).

Sincerely,

Parsons



Don Silkebakken, P.E.  
Project Manager

cc: Robert Bridgers (CESAJ – 6 copies)  
Ken Stockwell, (Parsons)  
Project File (742305)



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## LIST OF ACRONYMS AND ABBREVIATIONS

ASR	Archives Search Report
ATC	Amphibious Training Center
BATF	Bureau of Alcohol, Tobacco, and Firearms
bgs	below ground surface
BIP	blown in place
the Camp	Camp Gordon Johnston
CESAJ	Corps of Engineers, Jacksonville District
CWM	chemical warfare material
DDESB	Department of Defense Explosives Safety Board
DERP	Defense Environmental Restoration Program
DID	data item description
DoD	U.S. Department of Defense
EE/CA	Engineering Evaluation/Cost Analysis
ESS	Explosives Safety Submission
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FFP	Firm Fixed Price
FSU	Florida State University
FUDS	Formerly Used Defense Site
GIS	geographic information system
HE	high explosive
IC	institutional controls
mm	millimeter
MPM	most probable munition
MSD	minimum separation distance
NOES	non-OE scrap
NTCRA	non-time critical removal action

**LIST OF ACRONYMS AND ABBREVIATIONS**  
**(CONTINUED)**

NTP	notice to proceed
OE	ordnance and explosives
OES	ordnance and explosives scrap
Parsons	Parsons Corporation (formerly Parsons Engineering Science, Inc.)
QA	quality assurance
QC	quality control
QCS	quality control specialist
RA	removal action
SM	Site Manager
SOW	Scope of Work
SUXOS	Senior UXO Supervisor
TNT	trinitrotoluene
TPP	Technical Project Planning
TSD	Team Separation Distance
USA	USA Environmental, Inc.
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Corps of Engineers, Engineering and Support Center, Huntsville
UXO	unexploded ordnance
UXOSO	UXO Safety Officer
WP	Work Plan

## CHAPTER 1 INTRODUCTION

### 1.1 PROJECT AUTHORIZATION

1.1.1 Parsons Corporation (Parsons) received Contract No. DACA87-00-D-0038, Delivery Order No. 0023, from the United States Army Corps of Engineers, Engineering and Support Center, Huntsville (USAESCH) to perform a Removal Action (RA) on seven subareas within the former Camp Gordon Johnston (the Camp), in Franklin County, Florida (Appendix A). The approved project RA Work Plan (WP, Parsons, 2002) includes details of Ordnance and Explosives (OE) response actions for all seven subareas; however, this RA report documents the third of the funded sites (Area A – Former Bazooka Range). Additional OE response actions, in accordance with the approved Action Memorandum (USACE, 2002), Scope of Work (SOW), and project RA WP will be conducted as funds become available.

1.1.2 Parsons previously (2003) performed an RA on two subareas as part of the initial Task Order Award (Area B West and Area J4). Documentation of the RA is presented in the Final Removal Action Report, dated November 2003. Funding for Phase II RA was received on June 25, 2004 and included Area A – Bazooka Range and Area B East – Grenade Court. A subsurface removal action was conducted for Area A and the findings are presented in this report. For Area B East project work was temporarily halted shortly after intrusive activities commenced as the result of evidence of fill on the site. Area B East will not be further discussed in this report. Area A is located along U.S. Highway 98 on the southern/coastal perimeter of the former Camp Gordon Johnston and at the intersection of Lake Morality Road and the former Seaboard Airline Railroad tracks (Figures 1.1 and 1.2). The RA was conducted at Area A as a result of the OE findings during the Engineering Evaluation/Cost Analysis (EE/CA) and the proximity to residential dwellings in Lanark Village (Parsons, 2001). All work adhered to the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) and relevant U.S. Army regulations and guidance for OE programs.

1.1.3 As specified in the delivery order, this report is prepared to summarize the work performed during the RA and present an accounting of the OE recovered. This report is prepared in accordance with the Data Item Description (DID) OE-030, as required by the SOW, dated May 31, 2002 (Appendix A). All tasks for this project were awarded as Firm Fixed Price tasks; therefore, details regarding the costs incurred to perform the RA are not required in this report, per DID OE-030.

## 1.2 SITE HISTORY AND REASONS FOR REMOVAL ACTION

1.2.1 The former Camp Gordon Johnston, consisting of approximately 159,348 acres, is located approximately 60 miles southwest of Tallahassee, in Franklin County, Florida (Figure 1.1). The site is bordered to the north by the Apalachicola National Forest, to the south and east by the Gulf of Mexico, and to the west by Tate's Hell Swamp (excluding the City of Carrabelle). The former Camp includes Dog Island, part of the Gulf Barrier Chain, located approximately 3 miles south of Carrabelle (Figure 1.2).

1.2.2 The former Bazooka Range – Area A is located approximately 2.5 to 3 miles northeast of the City of Carrabelle near Lanark Village on the Pickett Bay and Carrabelle 7.5-minute Quadrangles in Sections 11 and 14, Township 7 South, Range 4 West (Figure 1.3). No current on-site or adjacent residential component is present; however, residential dwellings are present within 0.5 mile to the immediate northeast in Lanark Village. Construction of a new prison was observed during the EE/CA at the intersection of Lake Morality Road and County Road 67, approximately 1.5 miles to the northwest. The 50-acre tract is forested with immature pine trees planted in evenly-spaced rows planted by the owner, St. Joe Timber Land Company. The timber within Area A has been clear-cut on at least one occasion (and likely twice) since the Camp closed in 1946. Pedestrian access is basically unrestricted and signs present along the area boundary indicate hunting is conducted on the property (confirmed by the property owner). White sandy soil characteristic of Florida coastal areas is visible and there is minimal understory aside from some scrub oak. A small fresh water lake (Duck Lake) is located approximately 0.25 mile to the north.

1.2.3 During the EE/CA evaluation, various ordnance and explosive (OE) scrap was recovered from Area A including M6A1 2.36-inch practice rockets and one M68 81mm training mortar. Five OE fragments, indicative of high explosive (HE) detonations, were identified within the area confirming live rounds were used on the range. The OE recovery depths ranged from surface to a maximum depth of 30 inches, however most of the items were within the top 12 inches of soil. Historical records indicate that this area was used as a bazooka training range.

1.2.4 In April of 1942, Franklin County, Florida was selected by the War Department as the site of an Army amphibious training center. Site clearing began on July 8, 1942 and construction of the facility, originally known as Camp Carrabelle, commenced two weeks later. The mission of this Amphibious Training Center (ATC) was to teach, by academic and practical means, all phases of amphibious operations involving a shore-to-shore movement, and to outline the basic principles of ship-to-shore movements by lectures and conferences. The objective to be attained by each student division was the formation of a highly efficient, well-coordinated, hard-hitting, and fast-moving amphibious force, thoroughly qualified to act independently or in conjunction with other army troops and naval forces in a combined operation. The objective also included the mental and physical hardening of all officers and enlisted men for arduous field service and battle.

1.2.5 The instruction provided by the new training program emphasized loading and unloading landing craft quickly and quietly by day and night. This training consisted of boat discipline, including boat formations and control of landing craft, organization and control of troops during loading and unloading operations, and organization, tactical operation, and supply of combat teams. Seizure of the beachhead and the inland advance to the division objective included training in crossing beach obstacles and defensive works, clearing the beach of obstacles, demolitions, and the subsequent beach organization to support the operation. Other training activities included the use of smoke for screening, the use of chemicals for contamination purposes, air-ground support, anti-aircraft defense, battle firing, automatic weapons firing from landing craft, and combat in cities.

1.2.6 In addition to the amphibious training conducted at the Camp, the site also contained special training areas containing obstacle courses, grenade and bayonet courses, areas for judo, knife and bayonet fighting, hand-to-hand fighting, and demolitions training sites. Other training sites involved the use of live ammunition including the street fighting course, the infiltration course, battle firing, and firing from simulated landing craft.

1.2.7 The 38<sup>th</sup> Infantry Division was the first unit scheduled for training, arriving in late November 1942 and completing their training on December 30, 1942. In November 1942, tests were also conducted using the 4.2" chemical mortars mounted in landing craft firing high explosive (HE) and white phosphorus projectiles onto the shore. This work was done under the direction of the Chemical Warfare Amphibious Project. Companies of the 2nd and 3rd Chemical Battalions were rotated through the center from November 1942 to March 1943. On January 13, 1943, the post was officially renamed Camp Gordon Johnston to honor a distinguished cavalry officer. Also in January 1943, the 28<sup>th</sup> Infantry Division arrived to begin amphibious training. Other smaller units also received amphibious training at the Camp in early 1943. These units consisted of the 6<sup>th</sup> Communications Squadron, the 79<sup>th</sup> Smoke Generator Company, and the 377<sup>th</sup> Coast Artillery Battalion.

1.2.8 In June 1943, as a result of an agreement between the U.S. Army and the U.S. Navy that transferred the amphibious training mission to the Navy, the Amphibious Training Center was officially disbanded. In November of 1943, the 4<sup>th</sup> Infantry Division received amphibious training at the Camp under the supervision of the Navy. In late 1944 and early 1945, 50,000 acres west of the New River were released as activities at the Camp diminished. The post officially closed on May 1, 1946 with the 100,000 remaining acres of leased land returned to the original owners and sale of the purchased land and approximately 1,000 buildings located throughout the Camp by the War Assets Administration. In 1948 the last property was transferred and the Army's role ended.

1.2.9 Ordnance used at the former Camp Gordon Johnston included rockets, grenades, artillery rounds, mortars, and various initiating and priming material used as obstacles and mine field clearing devices. Unexploded ordnance (UXO)/OE that may be

encountered at the former Camp includes: 2.36" rockets (HE and practice), 4.5" rockets, HE grenades, 105-155mm HE artillery rounds, 4.2" HE mortars, 4.2" smoke and white phosphorous mortars, 81mm mortars (HE and practice), 60mm mortars (HE, white phosphorus, smoke, illuminating, practice), 37mm HE projectiles, practice antipersonnel mines, and practice antitank mines. Demolition materials used as obstacles and mine field clearing devices may include: various shape charges and trinitrotoluene (TNT) Blocks, cratering charges (40 lb), dynamite sticks, Block M3 explosive, Block M5A1 explosive, detonating cord, blasting caps, various firing devices, and bangalore torpedoes.

1.2.10 An expanded discussion of the history of the Camp is presented in the Final EE/CA Report (Parsons, 2001) and the Archives Search Report [(ASR) USACE, 1995a,b]. Additional details on both the EE/CA investigation and this RA are available on the project website at [www.projecthost.com](http://www.projecthost.com).

1.2.11 The RA was identified for Area A based on the EE/CA findings and the potential for complete public exposure pathways. Nearby existing residential dwellings as well as new development in the area also contributed to the RA selection. Significant OE scrap was recovered from the majority of the anomalies identified during the EE/CA investigation.

1.2.12 Parsons supported a 3-day onsite Technical Project Planning (TPP) meeting session and RA project fieldwork kickoff with USAESCH and U.S. Army Corps of Engineers (USACE), Jacksonville District (CESAJ) between March 3 and 5, 2003. Meetings/coordination was conducted with members of the local government and community to include the County Planner's Office, Camp Gordon Johnston Association, Franklin County Property Appraiser's Office, emergency response officials, St. Joe Timberland Company/Arvida, and St. James Bay Development representatives/BaysideRealty.

1.2.13 A project team meeting was held on March 3, 2003 at the Florida Department of Environmental Protection (FDEP) offices in Tallahassee, Florida in order to reacquaint the regulators with the Final EE/CA recommendations (Parsons, 2001) with respect to impending RA implementation at selected/funded sites. In addition, the selected institutional controls (IC) components were reviewed to include final wording for warning signage and public distribution brochures. The minutes for this meeting are presented in Appendix B.

1.2.14 A project update and status was also presented to the Franklin County Board of County Commissioners at their regular meeting on March 4, 2003 in advance of commencement of the Phase I RA field activities (Area B West and Area J4) at the request of Commissioner Cheryl Sanders. The minutes of this meeting are presented in Appendix B.

1.2.15 Prior to commencement of Phase II RA at Area A coordination was conducted with USAESCH, CESAJ, property owners, emergency responders, and local

officials. In addition, notification of the field effort was provided to the local community via newspaper and communication with the Camp Gordon Johnston Museum.

### 1.3 PURPOSE AND SCOPE

The purpose of the RA was to remove all UXO and inert OE scrap (OES) from the ground surface to the recommended clearance depth (Area A = subsurface) within the subarea identified for OE response action. The scope of the RA included the following:

- preparation of RA WP (finalized November 2002);
- locate, gain access, identify, recover, store, and apply final disposition of all metallic anomalies within the project area equal to or larger than the most probable ordnance anticipated for the subarea;
- collect and dispose of all OE scrap via an offsite smelter or shredder; and
- preparation of a Removal Report (this document) to summarize the findings of the RA.

### 1.4 PROJECT TEAM

The RA project team included Parsons and USA Environmental, Inc (USA). Parsons was the prime contractor to USAESCH and provided overall engineering support and coordinated all RA activities. Parsons' responsibilities included: providing UXO avoidance escort services for subcontractor brush cutting and land surveying activities, providing the UXO Safety and Quality Control personnel, conducting the intrusive investigation, interface and coordination of work process notifications, and control of project schedule and budget. USA was the UXO Subcontractor for Parsons. Services provided by USA included assisting Parsons in conducting the intrusive investigation, collection and storage of OE scrap, securing the exclusion area, and detonation of UXO items. Figure 1.4 is a project team chart showing key personnel and project team details.

### 1.5 TECHNICAL APPROACH

1.5.1 The approved RA WP (Parsons, 2002) included the plans listed below as required by DID OE-005-02.

- Technical Management Plan
- Explosives Management Plan
- Explosives Siting Plan
- Geophysical Investigation Plan
- Site Safety and Health Plan
- Location Surveys and Mapping Plan
- Work, Data, and Cost Management Plan
- Property Management Plan

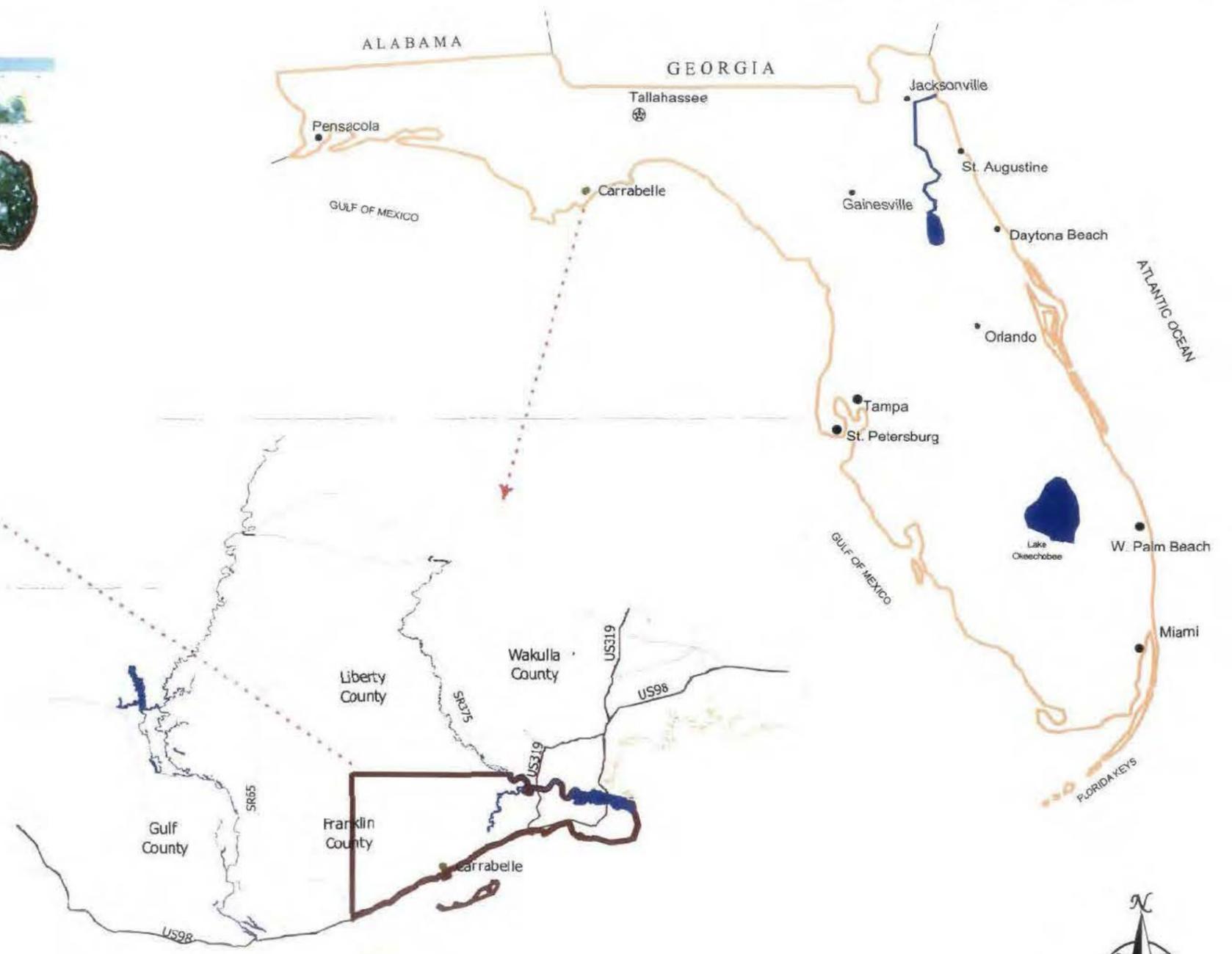
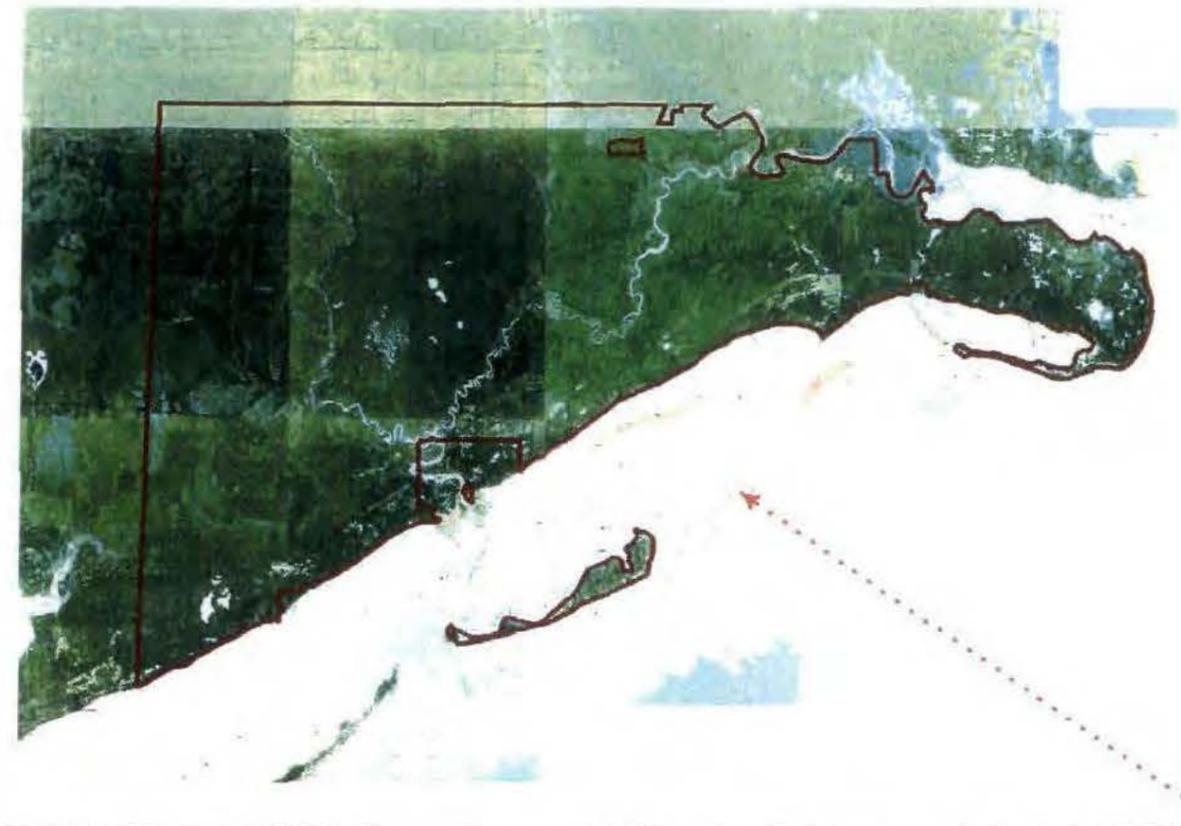
- Quality Control Plan
- Environmental Protection Plan
- Investigation Derived Waste Plan
- Geographic Information System (GIS) Management Plan

1.5.2 Each of these plans discussed in detail the aims and objectives; technical procedures; and facilities and equipment needed for implementation of various work elements of the removal action. Detailed field operating procedures for surveys, UXO identification, removal, transport and storage, and general operating procedures for OE/UXO areas were presented in the Geophysical Investigation Plan, Explosives Management and Explosive Siting Plans, and Site Safety & Health Plan.

## 1.6 PROBABILITY OF SOLUTION/ACCOMPLISHMENT

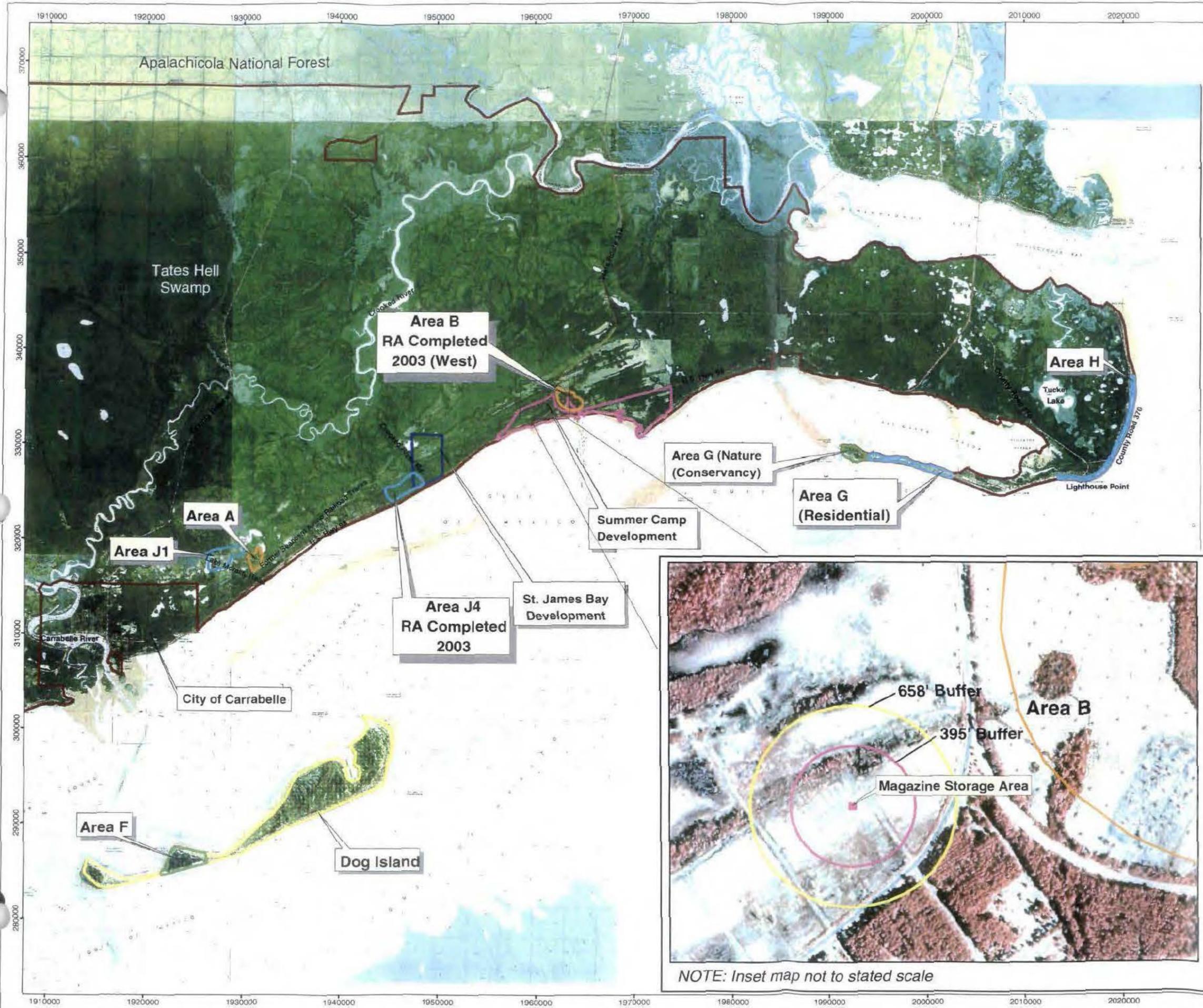
1.6.1 The anomalies identified at Area A as part of the subsurface RA were excavated "real-time" using audible signal (non-recording) Schonstedt's model instruments. Therefore, geophysical identification of anomalies and intrusive investigation were coincident. A 100-foot by 100-foot contiguous grid network (each grid with unique identifier) was established by a State of Florida certified professional land surveyor. All field activities were implemented using the procedures presented in the RA WP. This RA provided OE subsurface clearance at Area A with a high probability for successful removal of UXO/OE items utilizing proven techniques and reliable equipment.

Figure 1.1  
**General Location Map**  
 Former Camp Gordon Johnston  
 Franklin County, Florida



Source: Topo - Horizon Technologies  
 State and County Maps -  
 ESRI Data & Maps CD, 1998

# Figure 1.2

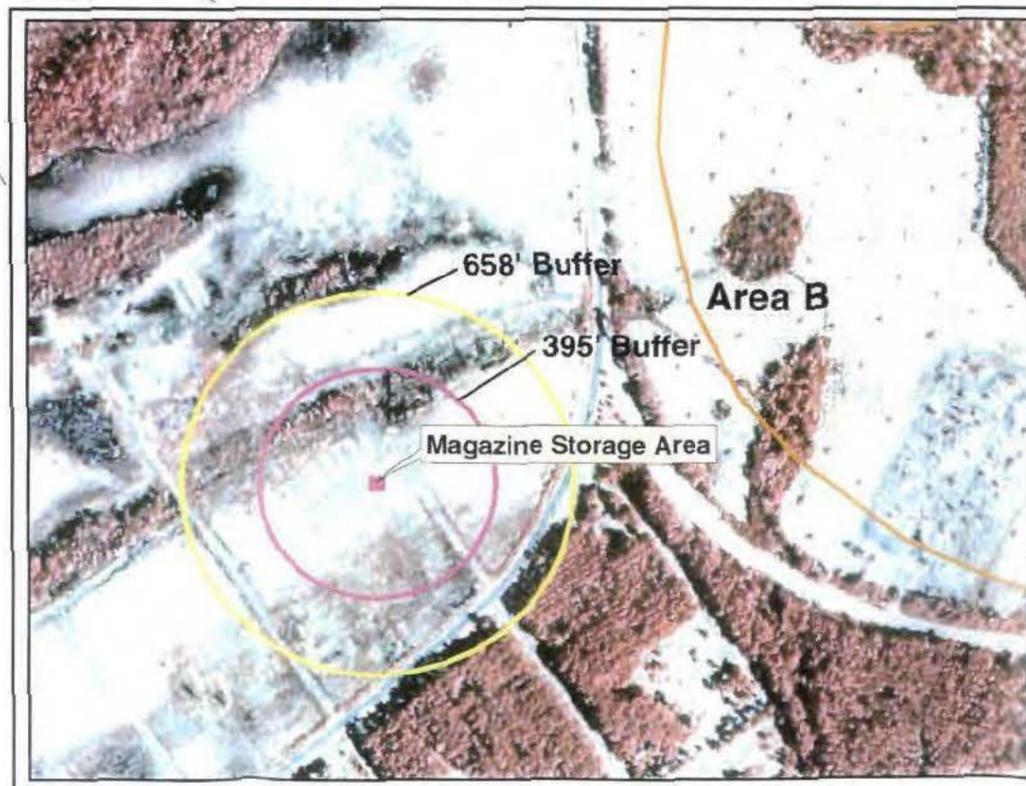


**LEGEND:**

**Area of Interest by Recommended Action:**

- No Department of Defense Action Indicated (NDAI)
- Surface Clearance and Institutional Controls (IC)
- Modified Surface Clearance\* and IC
- Clearance to Depth (4 feet) and IC
- St. James Bay Development
- Summer Camp Development
- Camp Boundary

\* NOTE: Modified Surface Clearance is defined as a one-time 100% geophysical mapping and surface removal.



NOTE: Inset map not to stated scale

Map Units: NAD 1983 Florida State Plane North (Feet)  
 10,000 5,000 0 10,000 Feet



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U.S. ARMY CORPS  
OF ENGINEERS  
HUNTSVILLE CENTER

DESIGNED BY:	BT	<b>Site Locations and OE Response Action Summary Former Camp Gordon Johnston Franklin County, Florida</b>	PROJECT NUMBER:	742305
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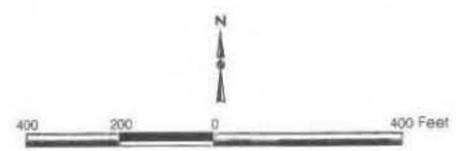
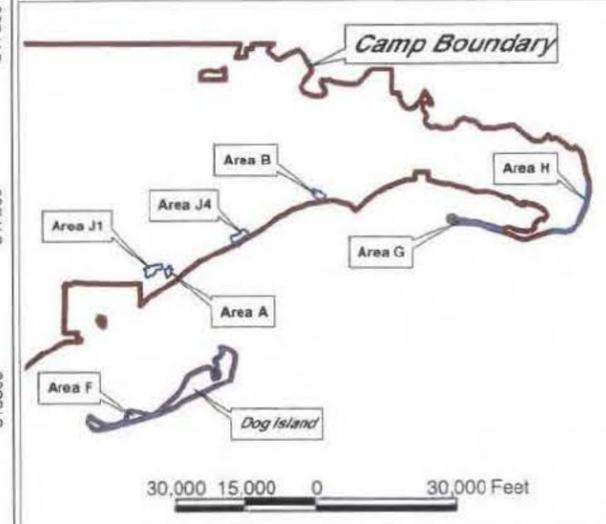




**Figure 1.3**

**LEGEND**

Area of Interest



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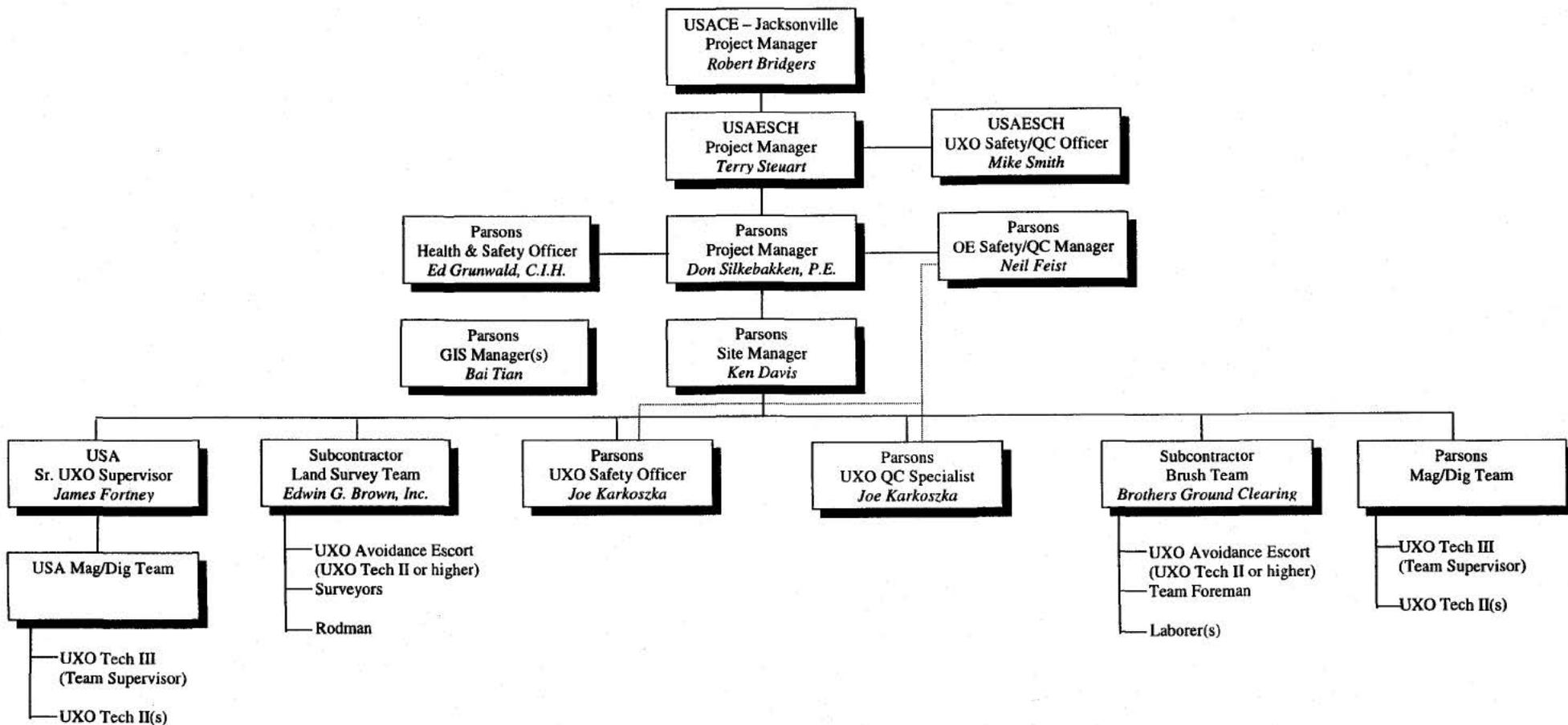
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DESIGNED BY:	BT
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CHECKED BY:	LK
SUBMITTED BY:	DS

<b>Area A</b>	
Bazooka Range	
Camp Gordon Johnston	
Franklin County, Florida	
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**Figure 1.4  
RA Organizational Structure**



## CHAPTER 2 DISCUSSION

### 2.1 INTRODUCTION

The first phase of the RA began on May 21, 2004 with arrival of Parson's personnel onsite following Notice to Proceed (NTP) granted by USAESCH to commence brush cut and land survey activities (Appendix C). During the first week RA activities were conducted at Area B East (addressed in a separate document). Following USAESCH direction, Parsons moved to the former Bazooka Range (Area A) on May 26 and initiated the approved RA in accordance with the Final WP (Parsons 2002). The Explosives Safety Submission (ESS) was prepared by Parsons and approved by the Department of Defense Explosives Safety Board (DDESB) prior to commencement of intrusive work at the site (Parsons, 2003).

### 2.2 WORK PERFORMED

2.2.1 The RA field effort commenced on May 26, 2004 with land survey. The professional land survey consisted of marking the perimeter boundary for both portions of the site and establishing a contiguous grid network. The grid network was comprised of 100 foot by 100 foot grids whose numbering system was dictated by the subdivision of the site. Two modified tractors, known as Kershaws, were subsequently used by the brush cut subcontractor to remove the small trees (less than 3 inches in diameter) and significant vegetation to the extent necessary to conduct the OE response action. Figure 2.1 depicts the grid layout for Area A. Parsons' subcontracted the land survey activities to a local professional land survey firm certified in the State of Florida, Edwin Brown and Associates, Inc. Brothers Land Clearing, Inc. was retained for the brush clearance work. Parsons provided direct UXO avoidance support and oversight of both the land survey and brush clearance efforts, conducted in accordance with DID OE-005-07 and the approved project WP (Parsons, 2002). Each subcontractor was provided a daily site safety briefing conducted by Parsons' UXO Safety Officer (UXOSO), with input from the Parsons' Site Manager (SM) and onsite USAESCH UXO Safety Specialist, as appropriate. The entire perimeter of the site was marked every 100 feet using blue flags and stakes.

2.2.2 Brush cut and land survey activities were simultaneously in progress during the preparatory activities. By overlapping these tasks, Parsons was able to compress the project schedule and minimize the inconvenience to vehicular traffic (i.e. road closure) along Lake Morality Road. Parsons coordinated with the local community regarding all phases of the project status. The property owner (St. Joe Timberland

Corporation) was contacted by Parsons prior to commencement of brush clearance activities for consent of all necessary brush removal. Brush cut activities were completed for Area A on June 15, 2004. Final installation of the grid network was completed on June 23, 2004.

2.2.3 Intrusive operations were initiated at Area A on May 27, 2004 and continued through August 3, 2004. The OE response action selected for this site included subsurface OE removal to depth using "mag and dig" investigation techniques. Parsons subcontracted USA to assist in conduct of the intrusive removal action. In addition, Parsons provided direct oversight and quality control (QC) of the intrusive effort, conducted in accordance with the approved RA WP (Parsons, 2002). USA personnel were provided a daily site safety briefing conducted by Parsons' UXOSO, with input from the Parsons' SM and onsite USAESCH UXO Safety Specialist, as appropriate.

2.2.4 During intrusive activities, each intrusive teams' UXO personnel lined up to form individual search lanes approximately 3 to 5 feet wide to systematically cover the grids from one base line to the opposing base line. Each team utilized Schonstedt magnetometers to locate suspect metallic items along the search lanes based on audible instrument signals. All located surface and subsurface metallic items were removed from the grid, UXO and OE scrap items were documented, and all UXO items (or suspect UXO items) were appropriately destroyed in place following notification procedures. Subsurface excavation of buried items was accomplished manually with shovels and trowels with the exception of one grid, A-13 (West), requiring a backhoe to excavate an OE burial cache.

2.2.5 Parsons secured the perimeter of the exclusion zone, or minimum separation distance (MSD), and employed traffic control procedures when intrusive activities were in progress, as applicable. All digging activities ceased during times when vehicles entered the MSD (809 feet), as reported via radio by road guards stationed around the site perimeter. Only after the "all clear" sign was given did intrusive activities recommence. The findings from the subsurface clearance of OE from Area A are discussed in subsequent sections of this chapter.

## **2.3 FIELD PROCEDURES**

### **2.3.1 Intrusive Removal Action**

2.3.1.1 Intrusive work began on May 27, 2004 following completion of the brush clearance and land survey tasks on the eastern portion of the site. Search operations consisted of those activities required to thoroughly investigate each operating grid to locate and/or identify both surface and subsurface UXO present. A total of 7,184 anomalies were identified and intrusively investigated.

2.3.1.2 UXO teams were composed of a UXO Technician III and up to five UXO Technician IIs. UXO teams performed all search operations and operated under the direct supervision of the Senior UXO Supervisor (SUXOS) and in accordance with the

approved RA WP (Parsons, 2002). A Parsons UXOSO monitored the safety of the two UXO Teams. The following subparagraphs describe the equipment and procedures the individual UXO Teams used to search the individual grids and to excavate subsurface anomalies.

### **2.3.1.1 Equipment**

The equipment requirements for this activity included:

- Schonstedt (Model GA-52Cx)
- Pre-marked baselines were used to subdivide the land-surveyed grid into individual search lanes;
- Rope reels containing nylon rope/twine (used to mark individual search lanes);
- Assorted colored pin flags were used to mark UXO items;
- Miscellaneous common hand tools (i.e. shovels, garden trowels etc.);
- Limited use of a backhoe for ordnance cache excavation (1 day);
- Forms and logbooks were used to record activities and UXO encountered; and
- OES and non-OES collection containers.

#### **2.3.1.1.1 Schonstedt GA-52CX Magnetometer (Schonstedt)**

The Schonstedt was used during the intrusive investigation for “mag and dig” operations at Area A and for QC surveys. This instrument was also used to aid in screening areas for brush cut and land survey as well as for UXO avoidance for advancement of survey stakes. The Schonstedt is a handheld magnetometer that detects subsurface ferrous metal items. The system utilizes fluxgate sensors organized in a gradiometer format. The two fluxgate sensors are aligned and mounted a fixed distance apart to detect changes in the earth’s ambient magnetic field caused by ferrous metal. The Schonstedt responds with an audio output when either of the two sensors is exposed to a disturbance of the earth’s ambient field associated with a ferrous target or the presence of a permanent field associated with a ferrous target.

#### **2.3.1.2 Analog Magnetometer Searches**

2.3.1.2.1 Magnetometer sweeps (i.e., mag & dig) were used for subsurface clearance of Area A, as identified in the SOW and the approved RA WP (Parsons, 2002).

2.3.1.2.2 The UXO Technician III (or higher) directed personnel within the team to establish individual search lanes approximately 3 to 5 feet wide and to begin searching each lane using a Schonstedt Model GA-52Cx magnetic locator. The intrusive team personnel started at one end of each lane and moved forward toward the opposing base line. During the forward movement each team member moved the magnetometer back and forth from one side of the lane to the other. Both forward movement and the swing of the magnetometer were performed at a pace, which ensured the entire lane was

searched and that the instrument was able to appropriately respond to anomalies. Whenever a metallic surface object was encountered the technician halted and investigated the anomaly real-time. Throughout this operation the UXO Technician III (or higher) closely monitored individual performance to ensure these procedures were being performed with due diligence and attention to detail. The maximum depth for subsurface removal was four feet for Area A; however, the deepest UXO item encountered was an intact M9 rifle grenade (Grid E-6) at 8 inches below ground surface (bgs). OES items were recovered from depths up to 48 inches bgs, although the majority was recovered at less than 24 inches depth.

### **2.3.1.3 Excavation of Anomalies**

2.3.1.3.1 The intrusive investigation teams excavated all metallic anomalies identified during the analog magnetometer searches of Area A. No investigation was terminated as a result of reaching the four foot maximum removal depth. For UXO items, description, location (grid ID), photographic documentation, weight, depth, orientation and other pertinent data was recorded. For OES items, description (if possible), depth, approximate size and weight was recorded. Excavation of anomalies utilized a trowel and shovel for all targets with the exception of Grid A-13 (western portion). A backhoe was utilized to excavate a burial cache to minimize schedule delays. Non-UXO items recovered were removed to the staging/processing area. Suspect UXO items were destroyed in-place and examined post-detonation.

2.3.1.3.2 The most probable munition (MPM), based on items encountered during the EE/CA, was a 2.36-inch high explosive (HE) rocket for Area A. An exclusion zone equivalent to the MSD for unintentional detonations (809 feet) was observed around all excavations within the Area A site during intrusive operations. No munitions with a larger MSD than that for which the MPM was determined for either site were discovered.

2.3.1.3.3 The team separation distance (TSD) between UXO teams was 200 feet (the minimum TSD in accordance with EP 385-1-95a, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations). The MSD for intentional detonations was reevaluated based on each actual UXO item recovered but was at no time less than 809 feet.

2.3.1.3.4 The MSD was carefully monitored to ensure nonessential personnel were kept out of the work area. The moderate use of Lake Morality Road mildly impacted the intrusive team's ability to perform intrusive operations. During the RA, temporary closure of this road was required during intrusive activities. Minimal work stoppage was necessary due to 4-wheelers and pedestrians within Area A during field operations. All work was halted until the exclusion zone was again secured.

### **2.3.1.4 Reacquisition of Anomalies**

The intrusive effort employed at Area A utilized real-time "mag and dig" techniques, thus reacquisition of anomalies was not required.

## 2.3.2 UXO Disposal Procedures

### 2.3.2.1 Demolition

All UXO and OE-related material containing explosives were blown in place (BIP) by detonation in accordance with the approved RA WP procedures (Parsons, 2002). Before each demolition operation the local police department, fire department, hospital, Federal Aviation Administration (FAA), and other pertinent agencies were notified of the operation. Then, all potential entry points at the applicable MSD were secured. No residential or commercial buildings required evacuation as part of the RA process. Appendix D includes photographs of various activities involved in demolition operations. Appendix E provides a summary of the UXO and OES items identified during the RA at Area A.

### 2.3.2.2 Demolition Materials

2.3.2.2.1 During demolition of the eighty-one suspect UXO items and three confirmed UXO items identified during the RA at Area A (Table 2.1), different explosives were used based on the most effective way to destroy the items. The explosives and related demolition materials used included the following:

- Detonation Cord (80 Grain);
- Cast, Boosters; and
- Jet Perforators; and
- Electric Detonators (blasting caps).

2.3.2.2.2 An explosives usage summary for the RA effort is provided in Table 2.2. The Daily Explosive Usage Record and Magazine Data Cards are included in Appendix F.

**Table 2.1**  
**Types and Amount of UXO and Suspect UXO Items Discovered\***

UXO or Suspect UXO Item	Grid/ Transect ID	Date	Action/ Disposition
1. 2.36" Rocket	A-15	6/3/04	BIP/Practice
2. 2.36" Rocket	B-15	6/3/04	BIP/Practice
3. 2.36" Rocket	B-15	6/3/04	BIP/Practice
4. 2.36" Rocket	B-15	6/3/04	BIP/Practice
5. 2.36" Rocket	B-15	6/3/04	BIP/Practice
6. 2.36" Rocket	B-15	6/3/04	BIP/Practice
7. 2.36" Rocket	B-15	6/3/04	BIP/Practice
8. 2.36" Rocket	C-4	6/1/04	BIP/Practice
9. M9/M11 Rifle Grenade	C-11	6/10/04	BIP/Practice

**Table 2.1 (Continued)**  
**Types and Amount of UXO and Suspect UXO Items Discovered\***

10. 2.36" Rocket	D-13	6/16/04	BIP/Practice
11. 2.36" Rocket	D-13	6/16/04	BIP/Practice
12. 2.36" Rocket	D-13	6/16/04	BIP/Practice
13. M9/M11 Rifle Grenade	E-6	6/3/04	<b>BIP/UXO</b> <b>Location: E7, Fig 2.2</b>
14. 2.36" Rocket	E-12	6/16/04	BIP/Practice
15. 2.36" Rocket	E-12	6/16/04	BIP/Practice
16. 2.36" Rocket	E-12	6/16/04	BIP/Practice
17. 2.36" Rocket	E-12	6/16/04	BIP/Practice
18. 2.36" Rocket	E-12	6/16/04	BIP/Practice
19. 2.36" Rocket	E-12	6/16/04	BIP/Practice
20. M9/M11 Rifle Grenade	BB-8	7/14/04	<b>BIP/UXO</b> <b>Location: BB9, Fig 2.2</b>
21. 2.36" Rocket	CC-8	7/15/04	BIP/Practice
22. 2.36" Rocket	CC-8	7/15/04	BIP/Practice
23. 2.36" Rocket	CC-8	7/15/04	BIP/Practice
24. 2.36" Rocket	CC-9	7/15/04	BIP/Practice
25. 2.36" Rocket	CC-9	7/15/04	BIP/Practice
26. 2.36" Rocket	CC-9	7/15/04	BIP/Practice
27. 2.36" Rocket	CC-13	7/6/04	BIP/Practice
28. 2.36" Rocket	CC-13	7/6/04	BIP/Practice
29. 2.36" Rocket	CC-13	7/6/04	BIP/Practice
30. 2.36" Rocket	CC-13	7/6/04	BIP/Practice
31. 2.36" Rocket	CC-13	7/6/04	BIP/Practice
32. 2.36" Rocket	CC-14	6/28/04	BIP/Practice
33. 2.36" Rocket	CC-14	6/28/04	BIP/Practice
34. 2.36" Rocket	CC-14	6/28/04	BIP/Practice
35. 2.36" Rocket	CC-14	6/28/04	BIP/Practice
36. 2.36" Rocket	CC-14	6/28/04	BIP/Practice
37. 2.36" Rocket	CC-15	6/24/04	BIP/Practice
38. 2.36" Rocket	CC-15	6/24/04	BIP/Practice
39. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
40. 2.36" Rocket	DD-13	6/30/04	BIP/Practice

**Table 2.1 (Continued)**  
**Types and Amount of UXO and Suspect UXO Items Discovered\***

41. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
42. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
43. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
44. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
45. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
46. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
47. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
48. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
49. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
50. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
51. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
52. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
53. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
54. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
55. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
56. 2.36" Rocket	DD-13	6/30/04	BIP/Practice
57. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
58. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
59. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
60. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
61. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
62. 2.36" Rocket	DD-14	6/24/04	BIP/Practice
63. 2.36" Rocket	DD-15	6/24/04	BIP/Practice
64. 2.36" Rocket	DD-15	6/24/04	BIP/Practice
65. 2.36" Rocket	DD-15	6/24/04	BIP/Practice
66. 2.36" Rocket	DD-15	6/24/04	BIP/Practice
67. AT M1 Mine, Practice	FF-6	7/6/04	<b>BIP/UXO</b> <b>Location: FF7, Fig 2.2</b>
68. 2.36" Rocket	GG-6	7/6/04	BIP/Practice
69. 2.36" Rocket	GG-6	7/6/04	BIP/Practice
70. 105mm Projectile	A-13	8/3/04	BIP/Practice
71. 105mm Projectile	A-13	8/3/04	BIP/Practice
72. 105mm Projectile	A-13	8/3/04	BIP/Practice

**Table 2.1 (Continued)**  
**Types and Amount of UXO and Suspect UXO Items Discovered\***

73. 105mm Projectile	A-13	8/3/04	BIP/Practice
74. 105mm Projectile	A-13	8/3/04	BIP/Practice
75. 105mm Projectile	A-13	8/3/04	BIP/Practice
76. 105mm Projectile	A-13	8/3/04	BIP/Practice
77. 105mm Projectile	A-13	8/3/04	BIP/Practice
78. 105mm Projectile	A-13	8/3/04	BIP/Practice
79. 105mm Projectile	A-13	8/3/04	BIP/Practice
80. 105mm Projectile	A-13	8/3/04	BIP/Practice
81. 105mm Projectile	A-13	8/3/04	BIP/Practice
82. 105mm Projectile	A-13	8/3/04	BIP/Practice
83. 105mm Projectile	A-13	8/3/04	BIP/Practice
84. 105mm Projectile	A-13	8/3/04	BIP/Practice

NOTE: All items designated as "practice" were intact and disposition could not be confirmed without detonation. See also Appendix D for additional details.

**Table 2.2**  
**Explosives Usage (Demolition Operation) Summary**

Date of BIP	Item Number(s) from Table 2.1	Explosives Type / Material			
		Electric Blasting Cap	Booster Cast	Primer (Det) Cord 80 Grain	Jet Perforators (Shaped Charge)
6/1/04	8	2		4	1
6/3/04	1-7, 13	4		190	8
6/10/04	9	2		3	1
6/16/04	10-12, 14-19	6		72	9
6/24/04	37, 38, 57-66	10		102	11
6/28/04	32-36	3		22	5
6/30/04	39-56	2	7	45	
7/6/04	27-31, 67-69	4	4	16	1
7/14/04	20	2	1	5	1
7/15/04	21-26	2		35	6
8/3/04	70-84	59	15	500	55

### **2.3.2.3 Scrap Management**

2.3.2.3.1 Temporary scrap metal and non-hazardous OE-related scrap collection points were established during the intrusive operation for each grid. The collection points were inspected and brought to a stockpile for a second inspection by the SUXOS and UXOSO to confirm that no explosives or other hazardous materials existed in the scrap. Segregation of OE scrap from non-OE scrap (NOES) was performed. Approximately 660 pounds of NOES was taken to the Franklin County Landfill and Recycling Center on June 18, 2004 (Appendix F). Drums were used to secure the OES awaiting final inspection and offsite transport. During the course of the intrusive investigation of Area A 8,156 pounds of OES were recovered. On August 5, 2004 the OES was shipped to Timberline Environmental Services, Inc in Cold Springs, California for demilitarization and destruction (see Appendix F).

2.3.2.3.2 Management of potentially hazardous OE scrap was performed by storing the items in secured 55-gallon drums (kept in the magazine storage area), conducting daily inspections, and subsequent shipment to the appropriate disposal facility. Scrap disposal records are provided in Appendix F.

### **2.3.3 Quality Control and Quality Assurance Surveys**

2.3.3.1 As a QC measure on the "mag and dig" survey, at least 10% of each grid was searched with a handheld magnetometer by the UXO Quality Control Specialist (QCS). All grids passed the quality control (QC) check; therefore, no additional sweeps were required. Appendix F includes a summary of the QC logs.

2.3.3.2 The USAESCH on-site representative performed quality assurance (QA) checks of all grids that passed the Parsons UXOQCS QC check. The Form 948 was used to document pass or failure of grids inspected by the USAESCH. The forms are provided in Appendix F. Grids that passed government QA meant no additional UXO clearance work was required for those grids. One grid within Area A did not pass the QA process (Grid EE-6) due to a high concentration of small metallic debris. This grid was re-swept and the QC check repeated. The subsequent QA check passed; therefore, no additional rechecks were required.

## **2.4 FACILITIES**

### **2.4.1 Project Field Office**

A dedicated project field office was established in an office in downtown Carrabelle and was maintained throughout the RA. The office was equipped with electrical and phone service and outfitted with computers, printers, and other office equipment. Toilet facilities were present at the field office; however, portable toilet facilities were also located at the site. The office also provided storage space for their equipment and important office conveniences for the management team in the day-to-day reporting and documentation requirements.

## 2.4.2 Explosive Magazines

Two explosive storage magazines (Photos 2.1 and 2.2) were brought on site to store hazardous materials and explosive components for the demolition operations. The magazines complied with all U.S. Department of Defense (DoD) regulations and thorough inventory checks were documented to ensure accountability for all explosives. The magazine storage area was located coincident with the approved location used during the 2003 RA and is depicted on Figure 1.2.



**Photos 2.1 and 2.2. Explosive Storage Magazine Area and Magazine Grounding.**

## 2.5 RESULTS (EXPECTED AND UNEXPECTED)

### 2.5.1 General

2.5.1.1 The intrusive removal action was conducted to depth at Area A. The objective of this action was to remove any immediate safety threat to the public and at the same time ensure that ordnance was removed given the active development in proximity to the site. Three confirmed UXO items and eighty-one suspect UXO items were recovered and detonated during the RA. In addition, hundreds of OES items were identified from Area A (Appendix E).

2.5.1.2 All three UXO items recovered from Area A were located in the southern half of the site and were present in sandy soils indicative of the coastal environment (Figure 2.2). One AT M1 landmine was recovered along the western boundary of the site (Grid FF-6). Two M9 rifle grenades were also recovered and BIP during the RA. One was located in the central portion of the former Bazooka Range (Grid BB-8), while the other was found in the southeastern portion of the site (Grid E-6). The majority of the rifle grenade debris was confined to the southwestern quadrant of the site suggesting that a dedicated secondary firing range may have been located in this area. The presence of the landmine in Grid FF-6 appears to be anomalous as no other landmines or landmine debris was recovered from the site.

2.5.1.3 The presence of 2.36" rocket debris is ubiquitously distributed throughout Area A, confirming the use of this area as a Bazooka Range. Sixty-five intact 2.36" rockets were BIP as suspect UXO during the RA; however, all were examined post-detonation and determined to be practice. In addition, hundreds of nearly intact rockets and large rocket components were recovered throughout the site (see Appendix E).

2.5.1.4 The RA findings confirm the northeastern, eastern and southern delineation of the site, as minimal or no OES was located in these boundary grids. However, the presence of OES was verified in almost all western boundary grids indicating the site boundary presented on historical maps may not fully depict the extent of the range in that direction. The original extent of Area A was determined during the archive search activities based on historical records, maps, and photographs. No evidence was discovered during the EE/CA investigation that contradicted the range footprint.

2.5.1.5 The presence of OES in the perimeter grids along the western boundary was not anticipated. The OES from these grids included 2.36" rockets, rifle grenades, and practice hand grenades. The tract of land between Lake Morality Road and the western site boundary may need to be further investigated to assure that the site has been fully remediated for the presence of OE contamination (see Figure 2.2).

## **2.5.2 Intrusive Investigation Findings**

2.5.2.1 A total of three UXO items and eighty-one suspect UXO items were recovered within Area A from 20 different 100 foot by 100 foot grids during the RA. UXO detonated at Area A included one landmine and two rifle grenades.

2.5.2.2 Approximately 8,156 pounds of primarily OES and some NOES scrap were shipped offsite for demilitarization and destruction to Timberline Environmental Services, Inc. in California. The diversity of UXO and OES types in Area A suggests the site was used for multiple purposes. Area A is designated in historical records as a bazooka rocket training range and, as expected, the RA findings confirmed the significant presence of rocket debris (all practice). The RA findings also indicate this range was used for rifle grenade and hand grenade training. In addition, unanticipated OES findings not consistent with the range designation included 60mm and 81mm mortars as well as 105mm projectiles. The concentrations of these items do not suggest extensive training exercises occurred at Area A with these munitions. Figure 2.2 depicts the types of UXO and OES by grid within Area A.

## **2.5.3 Recovered OE Items**

### **2.5.3.1 M1 Practice Landmine**

2.5.3.1.1 The M1 Practice Landmines are designed for training of effect against tanks and are laid to perform a definite tactical mission. The body of the mine is similar to that of an HE mine, differing only in that it is empty (no bursting charge). Also, it is provided with a cast iron form as a support to prevent crushing of the body. It has no filling hole. Five, equally spaced, 1-inch diameter holes may be found in the side of the

mine body. The diameter of the mine is 8.03 inches and is painted blue with white stenciling. The fuze has a red striker head.

2.5.3.1.2 The fuze is similar to the M1 HE fuze except that a .32cal blank cartridge replaces the detonator and a smoke-puff charge of black powder and red phosphorous replaces the booster. This mine can be used more than once by the provision of new fuzes and, when necessary, the replacement of bent or broken spiders.



**Photo 2.3. M1 Mine prior to detonation at Area A**

### **2.5.3.2 M9A1 Rifle Grenade/M11A1 Series Practice**

2.5.3.2.1 The M9A1 Rifle Grenade is a rifle-projected grenade consisting of a body, a stabilizer assembly, and a fin. The body is cylindrical; approximately 284mm in length. The fuze is a simple impact type. The grenade is fired from a rifle by means of a special launcher attachment and uses a special cartridge for propulsion. The M9A1 contains approximately 113 grams of TNT. The M11A1 Series Rifle Grenade is the practice version of the M9A1. Both were painted blue or black with white markings.

2.5.3.2.2 Photo 2.4 shows a M9 Series Rifle Grenade detonated during the intrusive investigation of Area A.



**Photo 2.4. M9 Series Rifle Grenade, Area A**

### **2.5.3.3 2.36-inch Bazooka Rocket**

2.5.3.3.1 The 2.36-inch M 6A1 antitank rocket is 21.6 inches long and has an average weight of 3.5 pounds. The components of the 2.36-inch M 6A1 consist of a hollow ogive crimped onto the body, a body union fitting into the base of the body with internal threads to receive the motor, the tail assembly consisting of nozzle and six fins, and a fuze located in the forward end of the motor tube. The bursting charge in this round consists of approximately 0.5 pounds of pentolite. Technical information concerning the 2.36-inch rocket states that high angles of impact with the ground will not ordinarily cause detonation. A low angle impact with the ground has a blast effect similar to that of a 75mm HE round.

2.5.3.3.2 The parts of the fuze are a spring restrained striker; a detonator of priming mixture, lead azide and tetryl; and a booster of tetryl. The striker is held in the unarmed position prior to loading into the launcher, by a safety pin which engages an annular groove in the striker as it passes through opposed holes in the fuze body. The safety pin clips to the stabilizer tube and must be removed prior to firing of the rocket. The fin assembly consists of three parts: the nozzle, which is a venturi tube; the trap, which is a spider ring closing the nozzle opening above the venturi and holding the propellant powder in place; and finally, the fins themselves. The fins are six metal blades, each blade is notched at a point opposite the lower extremity of the nozzle. These notches are unpainted and one of them serves as a contact for the electric safety match, one ignition wire being soldered to it. The other contact is made by means of an insulated (with a fiber strip) brass contact ring encircling the ogive. A brass connector strip runs from the end of the body to this ring. To the end of the connector strip is soldered the other ignition wire

from the electric safety match. This ignition wire is taped to the stabilizer tube midway between fins and body.

2.5.3.3.3 Photo 2.5 shows 2.36-inch rockets recovered during the removal action at Area A.



**Photo 2.5. 2.36-inch Bazooka Rockets, Area A, Grid DD-13**

#### **2.5.3.4 Mk II HE Hand Grenade/M21 Practice/Mk 1A1 Practice**

2.5.3.4.1 The Mk II is a fragmentation, antipersonnel, delay-detonating hand grenade which is commonly referred to as a “pineapple” because of its shape and external serration. The grenade is painted olive drab with a yellow band around the top of the fuze well. The Mk II grenade weighs approximately 590 grams, is 114mm in length, and 57mm in width at its largest diameter. The explosive filler consists of 56.7 grams of flaked TNT. The M21 is the practice version of the Mk II and contains a 1 gram black powder spotting charge. The M21 is painted blue with a brown or blue band. The Mk 1A1 is also a practice version of the Mk II HE grenade.

2.5.3.4.2 Photo 2.6 shows an Mk II Hand Grenade recovered during the removal action at Area A.



**Photo 2.6. Recovered Practice Hand Grenade, Area A**

### **2.5.3.5 M1 105mm Projectile, HE and Practice**

2.5.3.5.1 The 105mm projectile contains high explosive and is used for fragmentation, blast, and mining in support of ground troops and armored columns. It is 28.6 inches in length and weighs approximately 40 pounds. The projectile consists of a hollow steel forging with a boat tail base, a streamlined ogive, and gilding metal rotating band. A base cover is welded to the base of the projectile for added protection against the entrance of hot gases from the propelling charge during firing. The HE filler within the projectile may be either TNT or Composition B. The fuze cavity may be shallow or deep. A supplementary charge is placed in the fuze cavity of projectiles having deep cavities.

2.5.3.5.2 The cartridge case contains a percussion primer assembly and seven individually bagged and numbered propelling charge increments. The base of the cartridge case is drilled and the primer assembly is pressed into the base. The percussion primer assembly consists of a percussion ignition element and a perforated flash tube containing black powder. Impact of the weapon firing pin results in the initiation of the percussion primer which, in turn, ignites the black powder in the flash tube. The flash tube provides the uniform ignition of the propelling charge producing a rapid expansion of the propellant gas which propels the projectile out of the weapon tube. Engagement of the projectile rotating band with the rifling of the weapon tube imparts spin to the projectile providing inflight stability.

2.5.3.5.3 Photos 2.7 and 2.8 show a cache of 105mm projectiles recovered during the removal action at Area A.



**Photo 2.7. Cache of 105mm projectiles in Area A, Grid A-13**



**Photo 2.8. 105mm projectiles post-detonation from Area A, Grid A-13**

### 2.5.3.6 81mm Mortar

2.5.3.6.1 The 81mm mortar is 11.08 inches long and weighs 10.79 pounds. Unlike other mortar ammunition, the components of this round are issued separately to facilitate replacement of damaged, worn, or expended parts. The complete round consists of an inert projectile, a fin assembly, and an ignition cartridge. The pear-shaped, cast iron projectile has no provision for a fuze and is internally threaded at the base to accept the fin assembly.

2.5.3.6.2 When the cartridge is loaded it slides down the mortar tube until the percussion primer in the ignition cartridge strikes the firing pin in the base cap of the mortar. The primer ignites the ignition cartridge. Since this round is fired only at Charge 0, the gases from the ignition cartridge expel the projectile from the mortar tube and propel it to the target. The projectile is fin-stabilized in flight. Since the projectile is inert, there is no detonation upon impact, and the cartridge may be recovered for reuse.

2.5.3.6.3 Photos 2.9 and 2.10 show an 81mm mortar recovered during the removal action at Area A.



**Photo 2.9. 81mm mortar recovered during the RA at Area A**



**Photo 2.10. Base of 81mm mortar recovered in Area A**

#### **2.5.3.7 60mm Mortar, Training, M69**

2.5.3.8.1 The M69 60mm mortar is an inert practice round used for training in the loading and firing of 60mm mortars M2 and M19. It is 7.72 inches in length and weighs 4.43 pounds. The components of this round are issued separately, which facilitates replacement of damaged, worn, or expended parts. The complete round consists of an inert projectile, a fin assembly, an ignition cartridge, and a percussion primer. The pear-shaped, cast iron projectile has no provision for a fuze and is internally threaded at the base to accept the fin assembly.

2.5.3.7.2 When the cartridge is loaded it slides down the mortar tube until the percussion primer in the ignition cartridge strikes the firing pin in the base cap of the mortar. The primer ignites the ignition cartridge. Since this round is fired only at Charge 0, the gases from the ignition cartridge expel the projectile from the mortar tube and propel it to the target. The projectile is fin-stabilized in flight. Since the projectile is inert, there is no detonation upon impact, and the cartridge may be recovered for reuse.

2.5.3.7.3 Photo 2.11 shows the components of the 60mm mortar.



Photo 2.11. Components of the 60mm mortar

## 2.5.4 Scrap

During the intrusive investigation all scrap was thoroughly checked for explosive materials and stored in the magazine storage area. Upon completion of the intrusive investigation, all OES (totaling approximately 8,156 pounds) was given a final inspection and sealed for shipment to the destruction subcontractor (Timberline Environmental Services, Inc). Approximately 660 pounds of non-OES was collected and taken to the Franklin County Landfill and Recycling Center.

## 2.6 PUBLIC RELATIONS

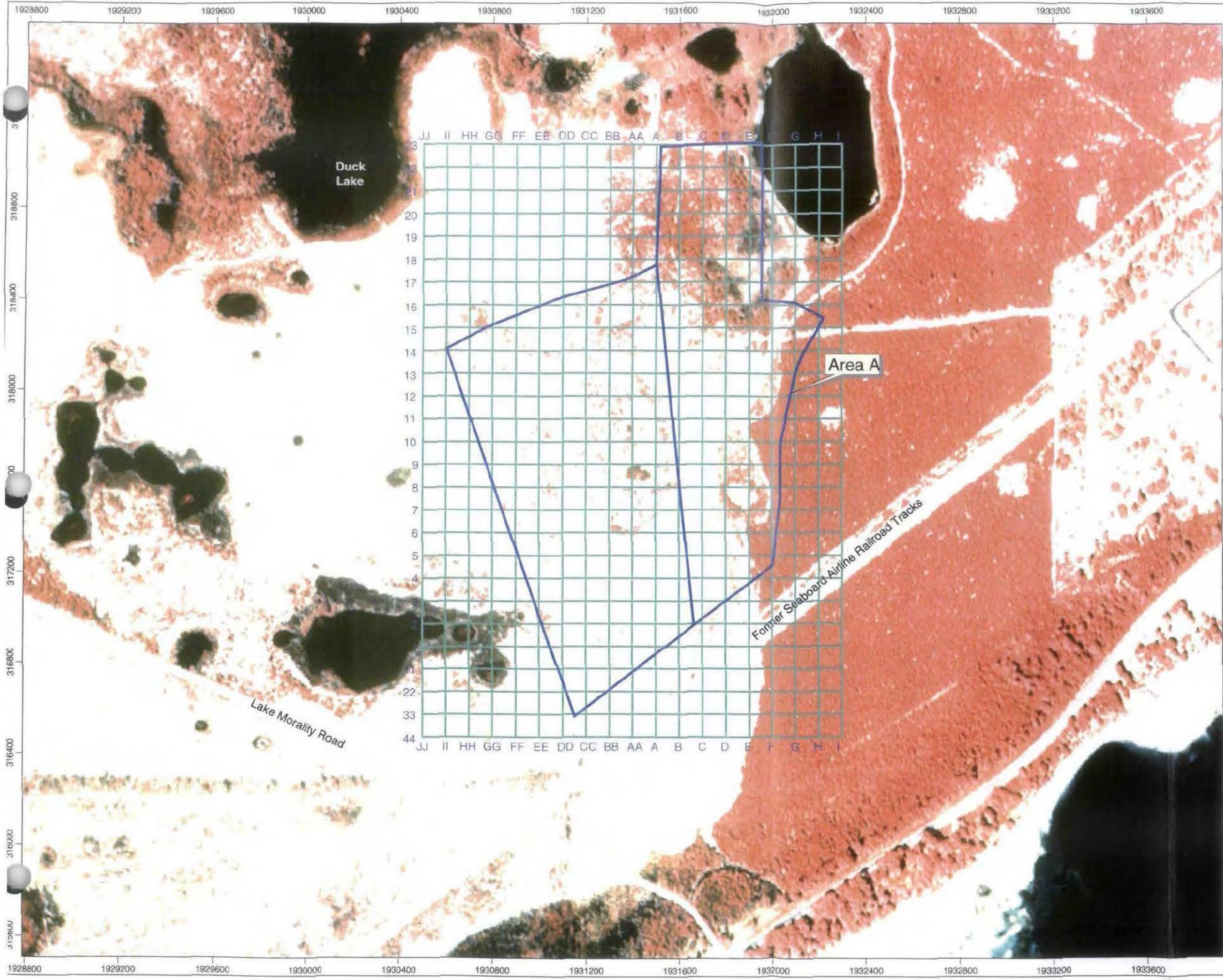
The CESAJ Project Manager was the overall coordinator for public affairs on this project. The following protocol was followed during execution of the RAWP. All communications and contacts with the public were under the direction of CESAJ. All public information contacts made during the project were documented and forwarded immediately to CESAJ and USAESCH. Parsons supported, attended and participated in the USAESCH public meetings held during the EE/CA effort prior to start up of the RA and coordinated logistics activities with the local community leaders. The support included preparation and delivery of briefings, graphics, presentations, and participation in site visits.

## 2.7 SITE SECURITY

2.7.1 In general, security on site was maintained by limiting personnel in the work area to those necessary to conduct the work. Given the non-residential nature of the site, no evacuations were required. During all project tasks the SM or UXOSO was present to monitor the field personnel. Due to the hazardous nature of the operations all personnel working on site were given a daily safety briefing to ensure awareness of the possible ordnance that might be encountered, as well as, any recent developments in the ongoing work.

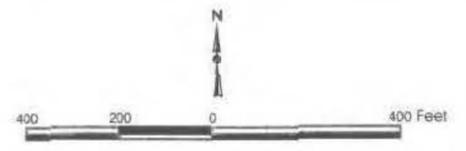
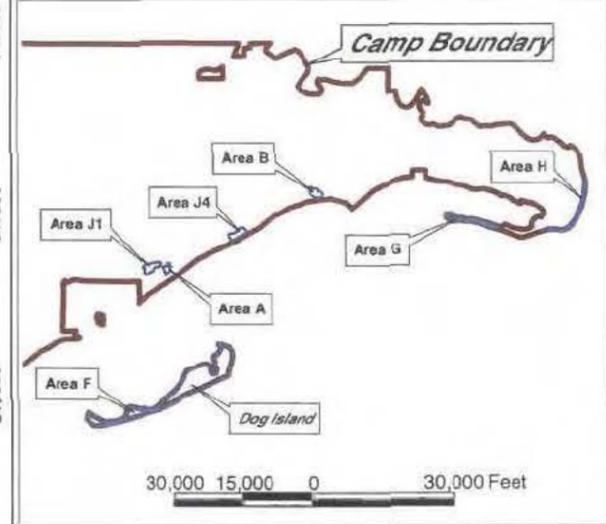
2.7.2 During intrusive activities the MSD was established during work hours. Only essential personnel remained in the work area. Guards were posted at the perimeter of the MSD (during intrusive operations) to keep the public away and monitor vehicular traffic. If the MSD was breached (such as to allow traffic to pass) all intrusive operations were temporarily stopped. The explosives storage magazines were located on St. Joe Timberland property (near Area B, Figure 1.3), checked regularly in accordance with the approved RA WP, and locked/sealed when not being accessed. Magazine Data Cards reflecting daily inventory of the magazines are included as Appendix F.

**Figure 2.1**



**LEGEND**

-  Surveyed Grid
-  Area of Interest



**PARSONS**

U.S. ARMY CORPS  
OF ENGINEERS  
HUNTSVILLE CENTER

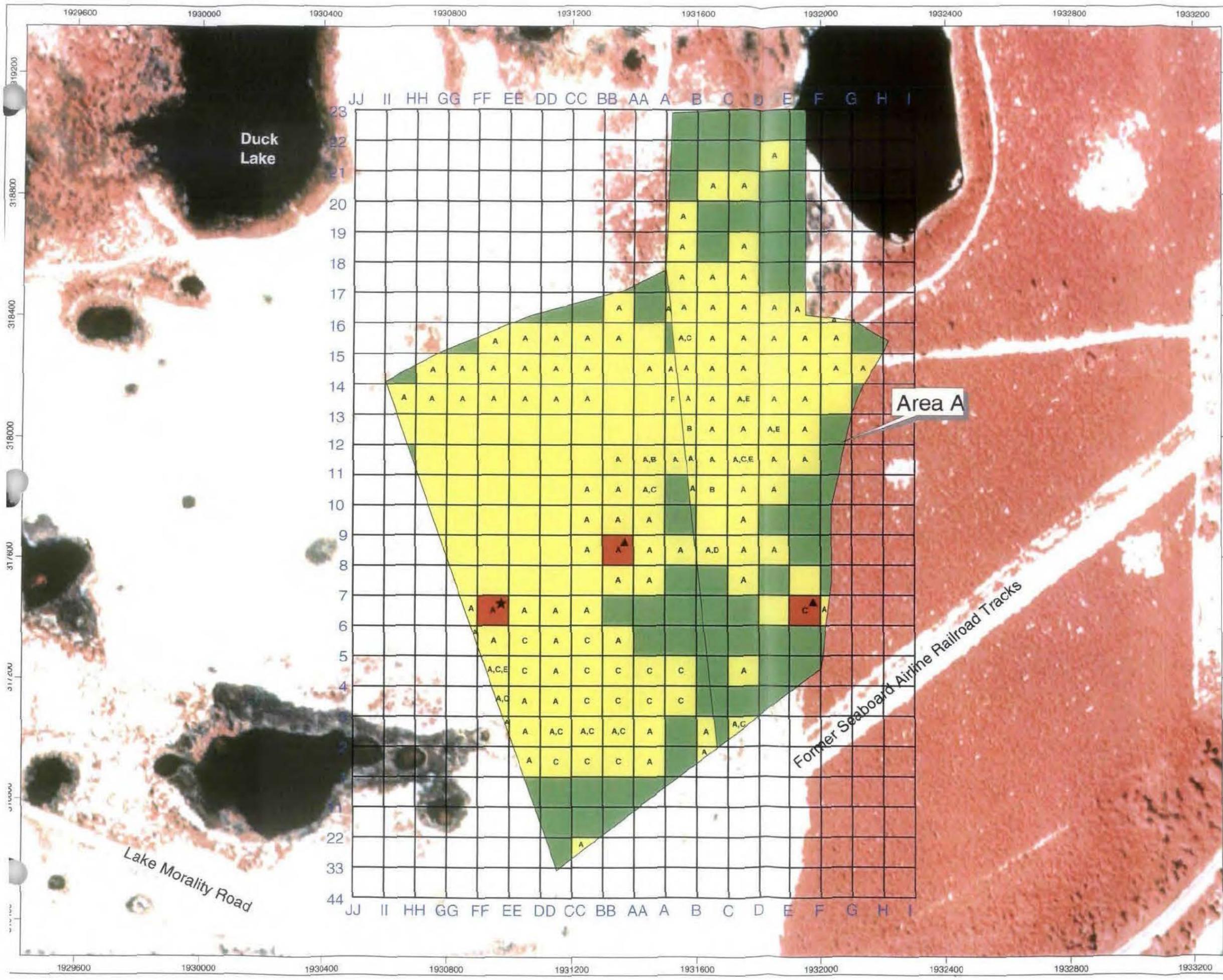
DESIGNED BY: BT  
DRAWN BY: BT  
CHECKED BY: DS  
SUBMITTED BY: DS

**Area A**  
Surveyed Grid Locations  
Camp Gordon Johnston  
Franklin County, Florida

PROJECT NUMBER: 742305  
SCALE: 1 inch equals 400 feet  
DATE: September 2004  
PAGE NUMBER: 2-21



**Figure 2.2**



**LEGEND**

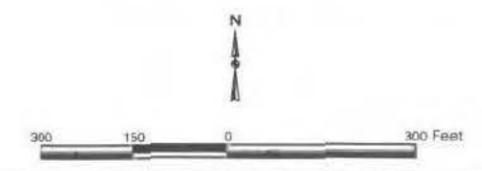
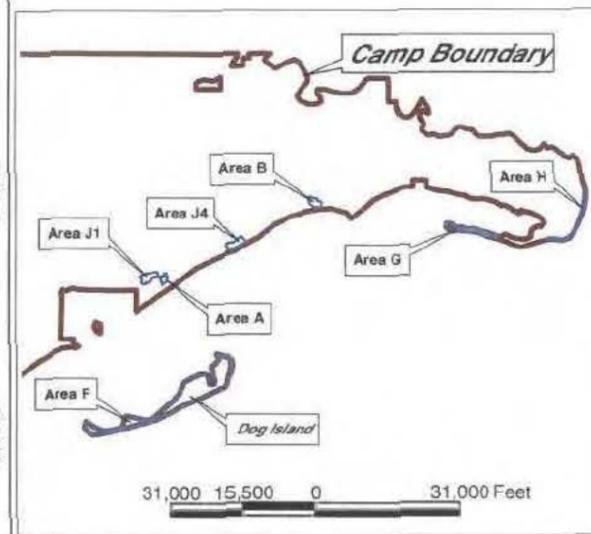
Type and Number of UXO Present

- ▲ M9 Rifle Grenade
- ★ M1 Landmine

Type of MD Present

- A 2.36" Rocket / Related
- B 60 mm Teardrop Mortar / Related
- C M11 Rifle Grenade / Related
- D 81 mm Projectile / Related
- E Hand Grenade / Related
- F 105 mm Projectile / Related

- Surveyed Grid
- Area of Interest
- Intrusively Investigated - No OES
- Intrusively Investigated - OES Present / No UXO
- Intrusively Investigated - UXO Present



<b>PARSONS</b>		U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER	
DESIGNED BY: BT	<b>Area A</b> Intrusively Investigated Results Camp Gordon Johnston Franklin County, Florida		
DRAWN BY: BT			
CHECKED BY: DS	SCALE: 1 inch equals 300 feet	PROJECT NUMBER: 742305	PAGE NUMBER: 2-22
SUBMITTED BY: DS	DATE: September 2004	FILE: K:\Gordon_Johnston_GIS\742305\GISMaps\RA_Area_A\Fig2_1.mxd	

## CHAPTER 3 DOCUMENTATION

### 3.1 INTRODUCTION

As part of the RA, extensive documentation was required for the day to day operations. All field operations and any correspondence related to the removal action were documented and a copy was kept at the site office. Only management had access to the documents which remained locked in the site office when unoccupied.

### 3.2 DAILY SAFETY BRIEFING AND DAILY FIELD REPORTS

3.2.1 Daily safety briefings were made by the Parsons UXOSO. Daily Field Reports were written by the Parsons SM and the USA SUXOS. These reports recorded, in summary form, the project progress and events that occurred daily. The Grid Operations Records and Daily Field Reports are provided in Appendix G and H, respectively.

3.2.2 The Parsons Daily Field Reports documented the weather, personnel on-site, and daily events. Detailed information was kept in the field SM log book. Some of the items documented on the Daily Field Reports included:

- health and safety briefing,
- team composition, equipment, and assignments,
- brush clearing events and locations,
- visitors encountered,
- intrusive investigation grids, UXO/OE scrap recovered, and detonation details,
- grids that failed QC, passed QC, and passed QA,
- instrument malfunctions and remedies, and
- work hours onsite.

3.2.3 The USA Daily Field Reports described the intrusive investigation activities and included:

- Work locations
- Weather

- Work summary
  - Work planned for the day,
  - Work accomplished,
  - Discrepancies, and
  - Inspection results.
- Instructions received from customer representatives (Parsons)
- UXO summary
  - Type, quantity, location, and disposition of UXO discovered,
  - Type and quantity of demolition supplies expended, and
  - Weight and type of scrap generated and disposed.
- Personnel/equipment utilization summary
  - Number of personnel per job description,
  - Number of hours worked,
  - Equipment on-site,
  - QC Effort, and
  - Other remarks.

### 3.3 DD FORM 1348-1

The DD Form 1348-1 was filled out for scrap removal. The form contained information such as the address from which the scrap was shipped, the address to which the scrap was shipped, the project name, the receiver's name and date, the inspector's name and date, the SUXOS' signature, etc. Other scrap information recorded was the type and total weight of scrap, the type and number of containers, the freight classification, and the date shipped. The DD Form 1348-1 and related documentation is included in Appendix F.

### 3.4 USAESCH FORM 948 (FORM 948)

The Form 948s were filled out by USACE and provided to Parsons' personnel to convey information about QC, safety, work plan, and other issues. Primarily, the forms were filled out to document which grids passed QA and address other QA/QC concerns for RA activities. The USAESCH Form 948s are located in Appendix F.

## CHAPTER 4 TESTS

### 4.1 INTRODUCTION

No sampling of environmental media was included in Parsons' SOW for site Area A for this RA project. As described in Chapter 2, 3 UXO items were identified and blown in place (BIP) during the subsurface removal action for Area A. None of the UXO items contained Chemical Warfare Materiel (CWM) or White Phosphorous, only conventional explosive compounds. After each BIP, the post-detonation hole was cleared of all visible debris. Any unexpended filler was collected and detonated with subsequent BIPs.

## CHAPTER 5 FINANCIAL BREAKDOWN

### 5.1 INTRODUCTION

All field tasks associated with this RA (Area A) were negotiated as Firm Fixed Price. Therefore, the financial breakdown of the costs expended is not required in accordance with DID OE-030, paragraph 10.3.7.

## CHAPTER 6 SUMMARY

6.1 Parsons was contracted by USAESCH to conduct a Removal Action at Area A Former Bazooka Range within the former Camp Gordon Johnston, Florida. The area of concern encompassed approximately 50 contiguous acres within a generally undeveloped tract along U.S. Highway 98 near Carrabelle. This NTCRA was conducted as a result of the EE/CA findings and recommendations (Parsons, 2002) and was selected and approved in the Final Action Memorandum issued by CESAJ.

6.2 Due to the extensive vegetation present within Area A, the site was brush cleared using mechanized equipment. Following completion of the brush removal effort, local land surveyors (certified in the State of Florida) established a grid network across the site to aid in tracking field progress and for QA/QC. For the subsurface clearance of Area A 232 100-foot by 100-foot grids (or partial grids) were used.

6.3 Parsons subcontracted USA Environmental, Inc. to assist in the RA intrusive operations. Removal action activities for Area A began on May 27, 2004 and were completed on August 3, 2004. Three confirmed UXO items (two M9A1 rifle grenades and one M1 AT practice landmine with live fuze and spotting charge) were recovered and detonated onsite from three different grids. Eighty-one "suspect" UXO items, almost exclusively intact 2.36-inch rockets, were identified and BIP as a precautionary safety measure. Because 2.36-inch rockets are difficult to conclusively ascertain their disposition as training or HE, and in light of the presence of HE fragments on the site, confirmation via detonation was the most appropriate course of action. All 81 rockets were verified as practice rounds during post-detonation inspection and treated as OES.

6.4 A total of 153 grids contained one or more OES items, with 3 grids containing UXO. Therefore, 156 of the 232 grids (67%) contained either UXO, OES, or both. Several OES items were recovered from the four-foot maximum remediation depth including a cache of unfired 105mm practice projectiles from Grid A-13, an M68 81mm training cartridge from within a trash pit in Grid B-8, and a 2.36-inch M7A1 rocket motor from Grid A-15. All other OES and UXO items were recovered from depths of less than 36 inches bgs (most less than 24 inches bgs).

6.5 The types of OES present within Area A were more diverse than anticipated indicating the range was more multi-purpose than a dedicated bazooka training range. As expected, the site was saturated with 2.36-inch rockets, although no specific target area could be verified from the RA data. However, none of the three UXO items confirmed onsite was a 2.36-inch rocket. Two of the three UXO items were M9A1

rifle grenades (Grids BB-8 and E-6). Numerous rifle grenade fragments and components (in addition to the two UXO) from both HE and training rounds were recovered in the southern portion of the site. The presence of the third UXO item, the M1 AT practice landmine (Grid FF-6), was not supported by any other landmine debris. Other OES recovered included 60mm and 81mm practice mortars and parts, unfired 105mm training projectiles, and MkIA1 training grenades.

6.6 Although 2.36-inch rockets and debris was located throughout the site, the density distribution indicates the northern and northeastern portion of the range was primarily targeted (Figure 2.2). Conversely, the rifle grenades are clustered on the extreme southern portion of the range suggesting a much closer target was used for rifle grenade training. Only a few 60mm projectiles and one 81mm projectile were found during the RA activities, both near the center of the range. Therefore, mortar training was likely a one-time event on the range. All fifteen of the unfired 105mm training projectiles were excavated from a cache in Grid A-13 located in the north-central extent of the former range. No other 105mm debris was identified on the site. It is unclear as to why these rounds were buried at the site let alone the center of the site which does not have an access road.

6.7 A total of 8 training hand grenades were recovered from the site from four different grids (Figure 2.2). Three of the grids (Grid C-11, Grid C-13, and Grid D-12) are located near the center of the former range. Each of these three grids contained multiple grenades. A single grenade was present in Grid FF-4, the outlier grid located along the western boundary. Although a dedicated grenade training range (Area B) and several Special Training Ranges (Area J1 and J4, see Figure 1.2) were present within the Camp, the findings suggest Area A was used on occasion. Since no shrapnel from HE hand grenades was identified the range's use was likely restricted to training grenades.

6.8 Several caches and burial pits were excavated during the RA. As mentioned above, a cache of unfired (some fuzed) 105mm training projectiles was discovered in a 30-foot diameter pit excavated in Grid A-13. This same hole also yielded in excess of 300 2.36-inch rockets. On the opposite side of the same grid another smaller cache of 2.36-inch practice rockets was also found. The rockets appeared to have been collected from the range and buried at the location. A large trash pit was excavated in Grid B-8 which contained some OES items to include the only 81mm projectile. The location of this grid is also near the center of the former range. A small cache of 2.36-inch rockets and rocket motors was excavated from Grid A-14. A six-foot by 50-foot shallow pit in an adjacent grid, Grid AA-14, contained various OES as well as a large amount of barbed wire and construction debris (Figure 2.2).

6.9 The original perimeter of Area A was determined during the archive search activities based on historic records and photographs. U.S. Highway 98 and Lake Morality Road were both present at their current location and offered access to the site. In addition, the Seaboard Airline Railroad tracks were present and active to the immediate south of the range. The presence of OES in 16 of 21 western perimeter grids

was not anticipated. The OES from these grids included rockets, rifle grenades, and a hand grenade. Furthermore, 1 of the 3 UXO items (the M1 AT practice landmine) was located very near the eastern range boundary. The tract of land between Lake Morality Road and the site boundary may need to be further investigated to ensure the range is fully remediated. Although a few OES items were present along the other range boundaries, the density and distribution evidence indicates that the range did not extend further in these directions.

6.10 Due to the large quantity of NOES accumulated during the field effort at Area A, one load (totaling 660 pounds) of NOES was taken to the Franklin County Landfill and Recycling Center on June 18, 2004. All OES and the last accumulation of NOES (8,156 pounds) was shipped offsite to Timberline Environmental Services, Inc. in Cold Springs, California for destruction/demilitarization on August 5, 2004. No OES was distributed to local scrap dealers.

## CHAPTER 7 REFERENCES

- Parsons, 2003b. *Final Removal Action Report, Area B West and Area J4, Former Camp Gordon Johnston*, Prepared for U.S. Army Engineering and Support Center, Huntsville, November 2003.
- Parsons, 2003a. *Final Explosives Safety Submission, Former Camp Gordon Johnston*, Prepared for U.S. Army Engineering and Support Center, Huntsville, March 2003.
- Parsons, 2002. *Final Work Plan for Removal Action, Former Camp Gordon Johnston*, Prepared for U.S. Army Engineering and Support Center, Huntsville, November 2002.
- Parsons Engineering Science, Inc. 2001. *Final Engineering Evaluation/Cost Analysis*. Former Camp Gordon Johnston, Franklin County, Florida. Prepared for U.S. Army Engineering and Support Center, Huntsville, June 2001.
- U.S. Army Corps of Engineers (USACE), Rock Island District. 1995a. *Ordnance and Explosive Archives Search Report Findings for the Former Camp Gordon Johnston*, September 1995.
- U.S. Army Corps of Engineers (USACE), Rock Island District. 1995b. *Ordnance and Explosive Archives Search Report Conclusions and Recommendations for the Former Camp Gordon Johnston*, September 1995.
- U.S. Army Corps of Engineers (USACE), Jacksonville District. 2002. *Engineering Evaluation/Cost Analysis Action Memo and Responsiveness Summary*. Former Camp Gordon Johnston, Franklin County, Florida. July 2002.