

FINAL REPORT
ORDNANCE AND EXPLOSIVES REMOVAL ACTIONS
SECTORS 2, 4, AND 5
FORMER BENICIA ARSENAL, BENICIA, CA

Prepared For:

Contracting Agency:
U.S. Army Engineering & Support Center,
Huntsville, Alabama



Geographical Corps District:
US Army Corps of Engineers, Sacramento District

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The Views, Opinions, and/or Findings Contained in This Report are those of the Author 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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ACRONYMS AND ABBREVIATIONS

| | |
|--------|--|
| ASR | Archives Search Report |
| CEHNC | U.S. Army Engineering and Support Center, Huntsville |
| CESPK | U.S. Army Corps of Engineers, Sacramento District |
| EODT | EOD Technology, Inc. |
| GMS | Global Mapping Systems |
| HTRW | hazardous, toxic, and radioactive waste |
| MSD | minimum separation distance |
| NTP | notice to proceed |
| OE | Ordnance and explosives |
| OERA | OE Removal Action |
| ORS | Ordnance-related scrap |
| RRR | Records Research Report |
| SOW | Scope of Work |
| SSHP | Site Safety and Health Plan |
| SUXOS | Senior UXO Supervisor |
| USACE | U.S. Army Corps of Engineers |
| UXO | Unexploded ordnance |
| UXOQCS | Unexploded Ordnance Quality Control Specialist |
| UXOSO | Unexploded Ordnance Safety Specialist |
| UXOT3 | Unexploded Ordnance Technician 3 |
| UXOT2 | Unexploded Ordnance Technician 2 |
| WP | Work Plan |

1 INTRODUCTION

1.1 GOVERNMENT AUTHORIZATION

1.1.1 EOD Technology, Inc. (EODT) under contract to the U.S. Army Engineering and Support Center, Huntsville (CEHNC) performed an Ordnance and Explosive Removal Action (OERA) at the Former Benicia Arsenal, Benicia, California. Authorization for performance of this project is contained in Contract DACA87-97-D-0005, Task Order 0019, which was issued 19 June 2000, by CEHNC and is contained in Appendix A.

1.1.2 Under CEHNC Contract DACA87-00-D-0037, a separate Task Order 0003 was issued to EODT on 19 March 2001 to perform a digital geophysical investigation in Sector 5 of the project site. This Task Order was to be performed concurrently with Task Order 0019 and was used as a visual aid to determine the potential for UXO along Interstate 680 and small businesses adjacent to Sector 5. This Scope of Work (SOW), and digital magnetic maps, is contained in Appendix J.

1.2 SITE LOCATION

1.2.1 The Former Benicia Arsenal encompasses 2,728 acres in the City of Benicia, Solano County, California, as shown on the site location map in Figure 1-1. The former Benicia Arsenal is situated along Interstate Highways 680 and 780 (I-680 and I-780), approximately 25 miles northeast of San Francisco. The Former Benicia Arsenal and surrounding area consists of industrial and residential areas with undeveloped marshland along the Carquinez Strait to the south and rolling hills to the north. The project area is composed of steep rolling hills and runoff collection areas that discharge into Suisun Bay.

1.3 SITE HISTORY

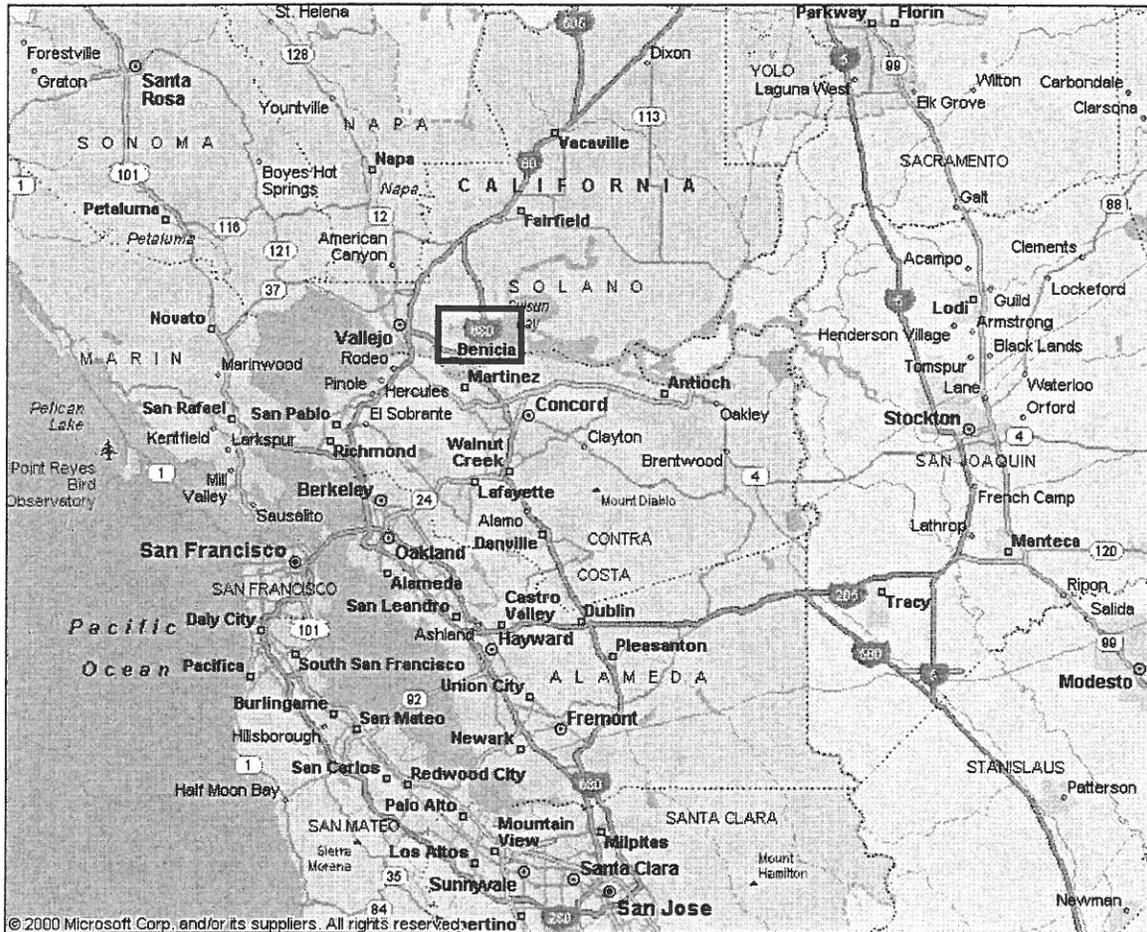
1.3.1 The Former Benicia Arsenal began as the Benicia Barracks in 1849. During its existence, the Benicia Arsenal supplied arms and serviced weaponry during the Civil War, the Spanish-American War, World Wars I and II and the Korean Conflict. The Arsenal manufactured targets for seacoast, field and mobile artillery firing practice. Testing of 155mm howitzers was performed on the arsenal using two large concrete test tunnels. In addition, the arsenal assembled powder charges and rapid-fire ammunition and filled armor-piercing projectiles with high explosives. As part of the Cold War build-up, the Benicia Arsenal reconditioned Nike Hercules guided missiles. Two Nike Hercules test sites were situated in the northwest portion of the arsenal.

1.3.2 In 1964, the DOD decommissioned and closed the Benicia Arsenal. Substantial site revision has eliminated most remnants of the arsenal facilities. Construction of Interstate highways and refinery facilities led to the demolition of many underground storage bunkers used during transshipping operations conducted at the arsenal. Current owners of the Benicia Arsenal include Benicia Industries, Inc., the City of Benicia, Exxon, Pacific Gas and Electric, Granite Management Corporation, Caltrans and numerous individuals.

1.3.3 Granite Management Corporation began development of the Former Benicia Arsenal in 1997 to the north and west of the Revetment Area (Tourtelot Property) until ordnance was encountered during excavation activities. Construction was halted, and the U.S. Army Corps of Engineers (USACE) performed additional research to determine the potential presence of OE, ordnance-related scrap (ORS), and hazardous, toxic or

radioactive waste (HTRW) within the Former Benicia Arsenal. The arsenal histories in the Records Research Report (RRR), Archives Search Report (ASR) and ASR Supplement indicate that a variety of ordnance items were handled, stored and destroyed at the Former Benicia Arsenal. These ordnance items included assorted fuzes, mortars, small arms ammunition, 37mm and 75mm projectiles.

**FIGURE 1-1
SITE LOCATION MAP
BENICIA, CALIFORNIA**



2 OBJECTIVE

2.1.1 The objectives of this OERA was to safely and efficiently locate and remove conventional unexploded ordnance (UXO) from a total of 135 acres at the former Benicia Arsenal in Benicia, California. Table 2-1 lists the separate areas of the arsenal by sector number, size and specific action(s) required and method used. Figure 2-1, depicts the geographic location of the sectors in relation to each other, and the site maps in Appendix B depict their size and their shape.

2.2 TECHNICAL APPROACH

2.2.1 EODT successfully completed all tasks described in the SOW except complete removal of all land mine fuzes from a burial pit. These fuzes had been burned to remove internal explosives and explosive residues, then buried as a means of final disposal. EODT removed and inspected 8,570 of these items and did not find evidence of explosives in any of the fuzes.

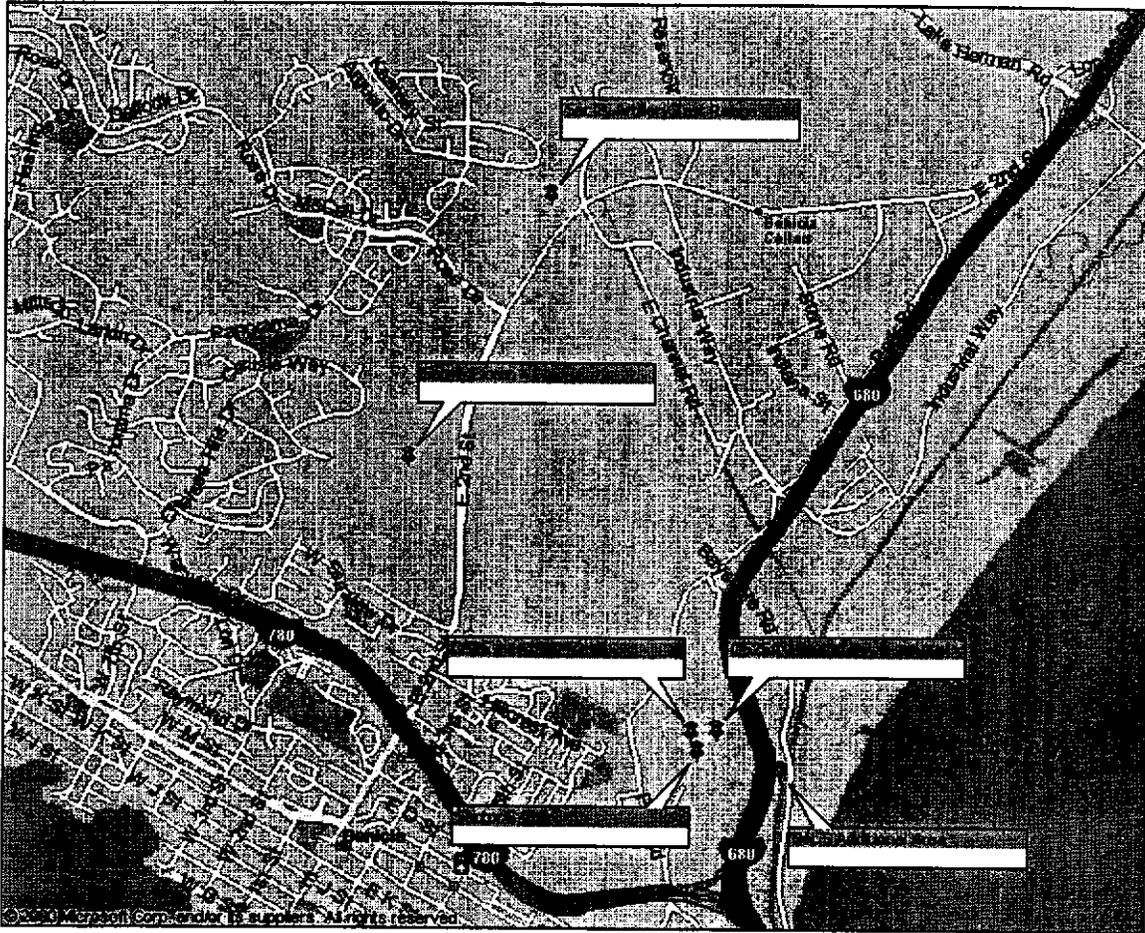
2.2.2 UXO-qualified EODT personnel performed all UXO work. Each team was equipped with Schonstedt 52Cx magnetometers, hand tools, first aid equipment, personal protective equipment and communications gear. In specific areas of Sector 5, a geophysical team used an EM61 to perform digital geophysical investigations.

2.2.3 A complete description of all field activities, including the quantity and types of ordnance and explosives (OE) and ordnance related scrap (ORS) located is contained in this report and its appendices.

**TABLE 2-1.
BENICIA ARSENAL CLEARANCE REQUIREMENTS**

| Sector | Acres | Action | Method |
|---------------|--------------|--|------------------------------|
| 2 | 16.8 | Surface / Subsurface, to depth of detection, mark subsurface anomalies on steep terrain, conduct erosion assessment. | Magnetometer |
| 4 | 58.1 | Surface only | Magnetometer assisted visual |
| 5 | 28.7 | Surface / Subsurface to depth of detection | Magnetometer |
| 5 Add | 16.4 | Surface / Subsurface to depth of detection | Magnetometer |
| OS25 | 10.7 | Digital geophysics, excavate pits / trenches | EM61 |
| OS25A | 7.1 | Digital geophysics, excavate pits / trenches | EM61 |
| 5 Geo | 25 | Digital Geophysics to reduce MSD | EM61 |

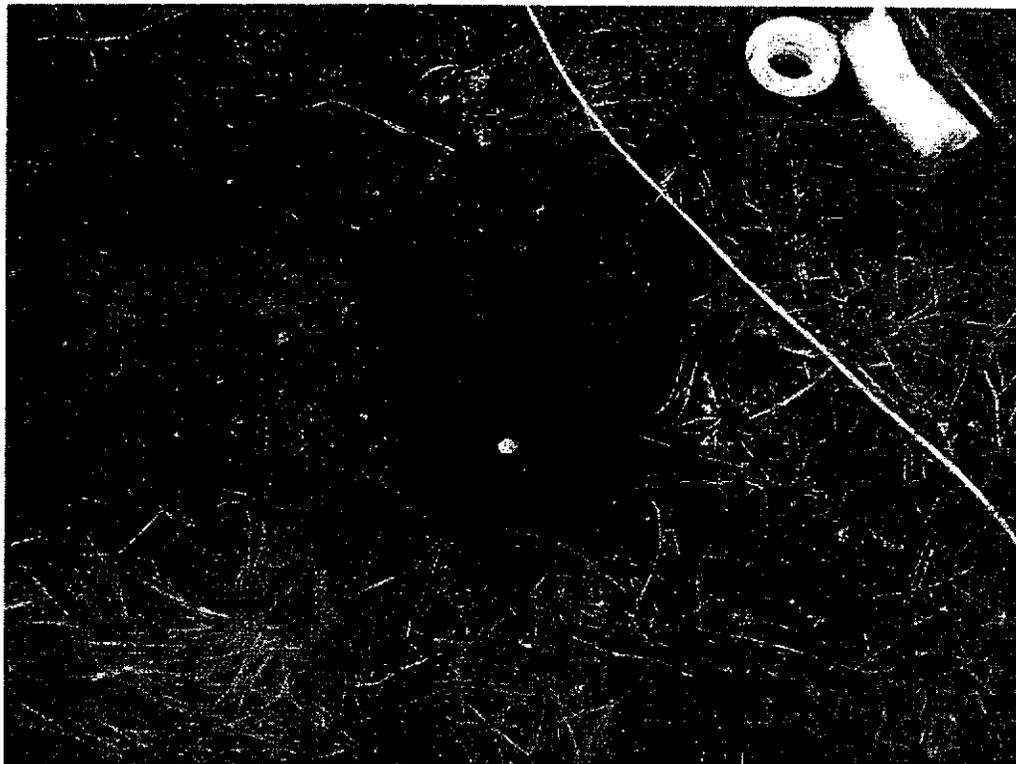
**FIGURE 2-1
LOCATION OF SECTORS AT THE FORMER BENICIA ARSENAL**



3 DISCUSSION

- 3.1** On 12 March 2001 EODT's Project Manager (PM), Senior UXO Supervisor (SUXOS), UXO Safety Officer (UXOSO), UXO Quality Control Specialist (UXOQCS), one UXO Technician 3 (UXOT3), and two UXO Technician 2's (UXOT2) mobilized to the site. All personnel reviewed the approved Work Plan (WP) and attended a safety briefing prior to performing field activities. A familiarization tour of the site was conducted and directions to the nearest medical facilities were distributed, and emergency procedures were discussed.
- 3.2** EODT contracted a professional land surveyor, Global Mapping Systems (GMS) to survey the boundary of each sector and establish a network of grids within each boundary. The grids in Sector 4 were 200 feet x 200 feet in size and all other grids were 100 feet x 100 feet in size. Additionally, within Sector 5, a geophysical test plot, 50 feet x 50 feet in size was surveyed in a flat anomaly free area.
- 3.3** Initial field activities consisted of equipment inspections and establishing a geophysical test plot. The test plot was established by burying steel pipe and pipe caps of the same size, shape and metal density as the smallest type of ordnance expected at the site, 37mm projectiles and VB rifle grenades. The items were buried at specific depths and angles in the test plot to simulate buried ordnance. Figure 3-1 is an example of an item placed in a vertical position, and Figure 3-2 details the location, depth, angle, and orientation of each item.
- 3.4** After the items were buried EODT's geophysics team tested the effectiveness of two different detectors, a Geonics EM61® metal detector and a G-858 cesium vapor magnetometer. Both instruments are capable of detecting subsurface anomalies and recording their size and location on a digital map. The test consisted of mapping the test plot and analyzing the data. EODT's geophysicist analyzed the results of the test and submitted the data to the CEHNC geophysicist with a recommendation that the Geonics EM61® metal detector be used. The G-858 was too magnetically sensitive to be effectively used at the site. CEHNC concurred with EODT and all geophysical data collected at the site was with a Geonics EM61® metal detector and processed / interpreted with Geosoft® data processing software with the UX-Detect® extension.
- 3.5** Upon CEHNC approval for using the Geonics EM61® metal detector, EODT proceeded with non-intrusive geophysical investigations. Prior to mobilization EODT had scheduled OS25 and OS25A for the first and second areas to be investigated. However, OS25, which is an asphalt parking area contained post accident vehicles in various conditions, and OS25A contained piles of asphalt, fill dirt, and other debris, which prohibited effective investigations.
- 3.6** Because the two priority areas were not available EODT began geophysical investigations within Sector 5, concentrating on grids within 313 feet of local businesses and I-680, which is the Minimum Separation Distance (MSD) based on a 4" Stokes High Explosive Mortar. I-680 borders Sector 5 on the east and borders the additional area of Sector 5 on the west, and local businesses are located west of the site as depicted in Figure 3-3.

Figure 3-1
Steel Pipe Placed Vertical (Nose Down) at a Depth of 16 Inches



**Figure 3-3
Sector 5 and Sector 5 Additional Area**

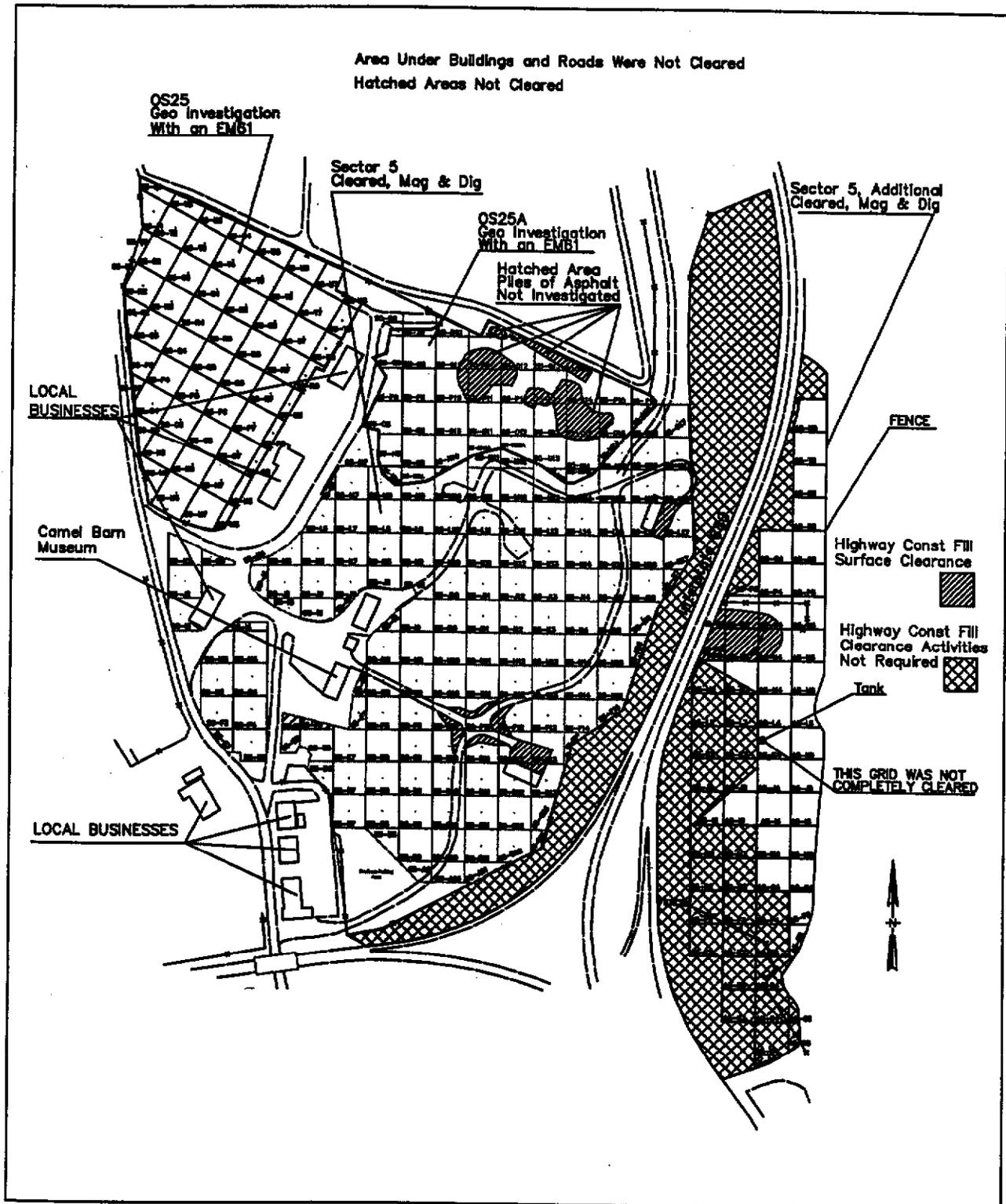
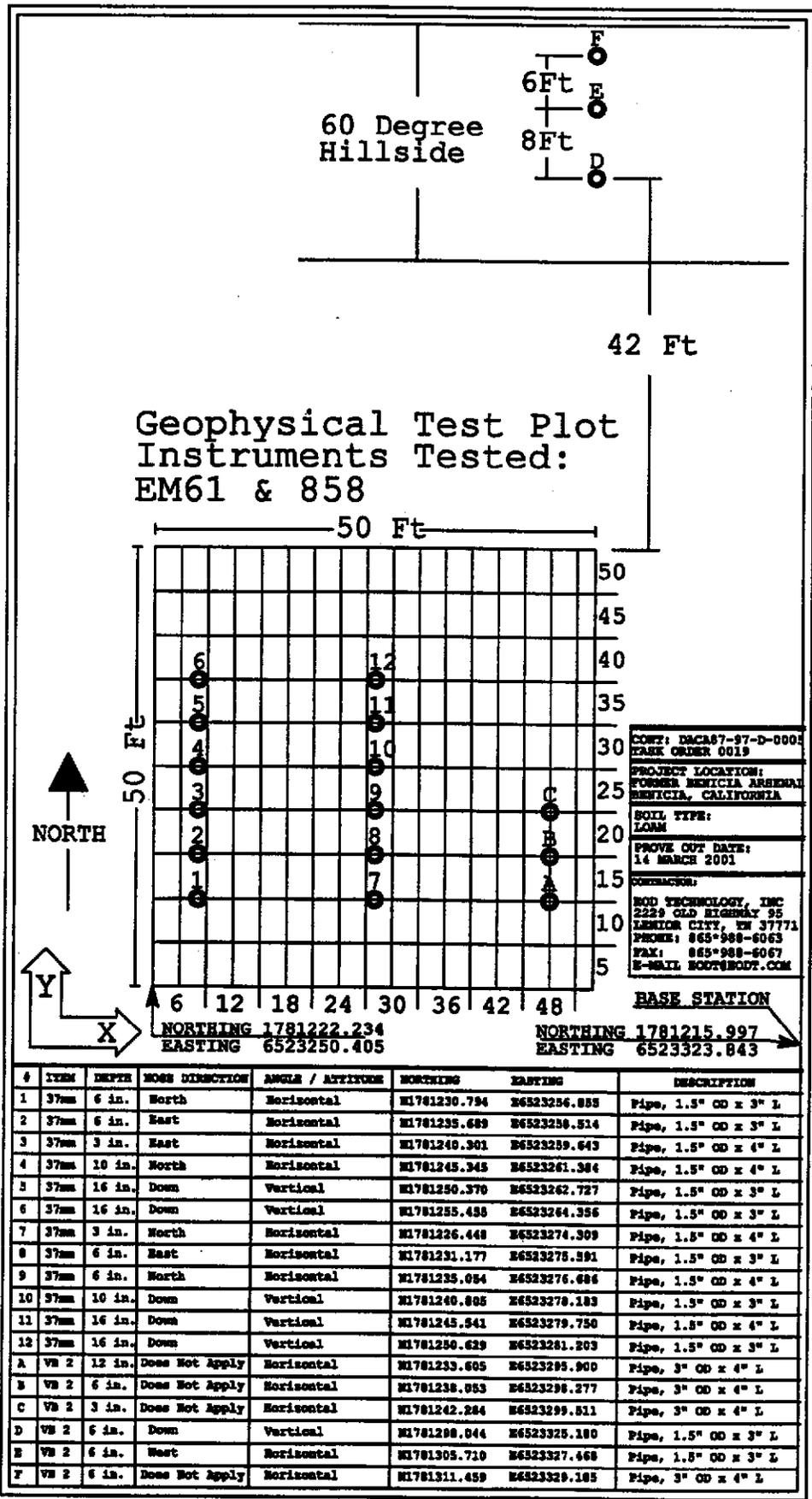


Figure 3-2
 Geophysical Test Plot



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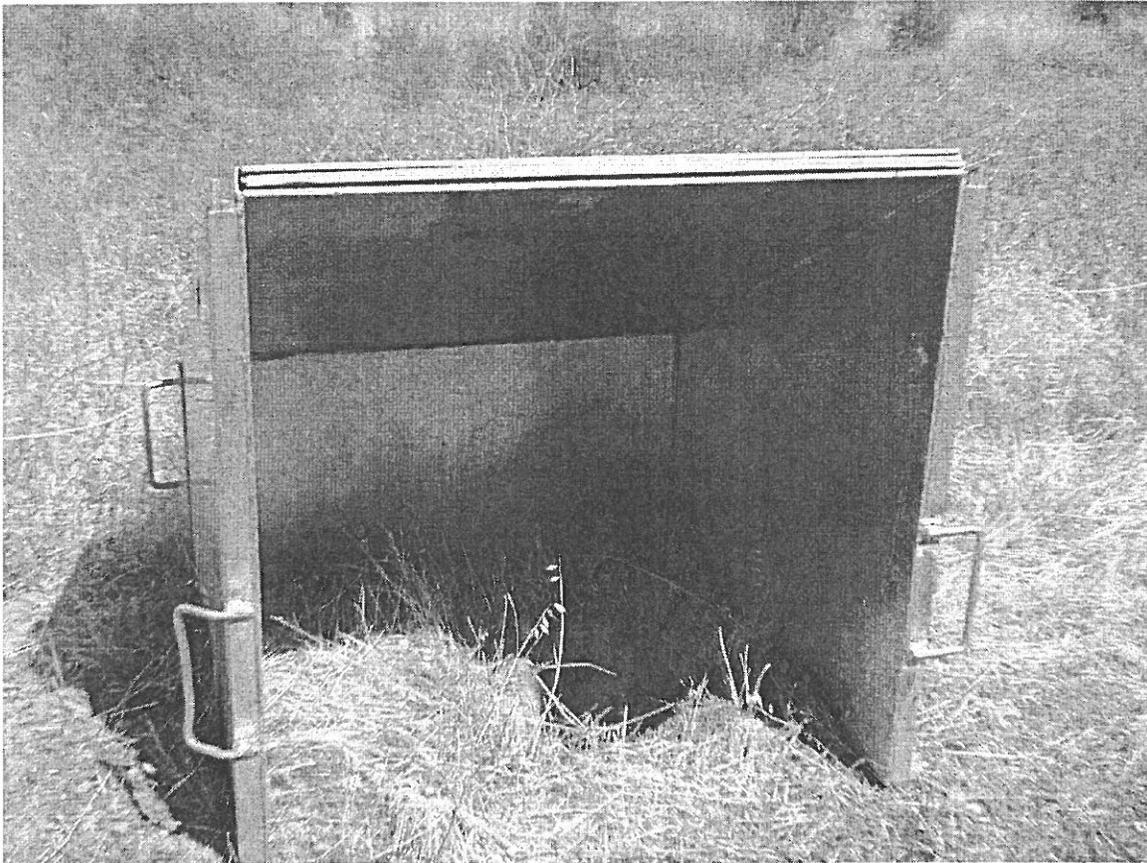
| | | | | |
|---|---|-----------------------------------|---|--------------------------|
|  <p>US ARMY CORPS OF ENGINEERS</p> | Project Title: SECTOR 5, SECTOR 5, ADDITIONAL AND OS25 AND OS25A | | CONTRACTOR: EOD TECHNOLOGY, INC. 2229 OLD HIGHWAY 95 LENOIR CITY, TN 37771 | <p>FIGURE 3-3</p> |
| | Project Location: FORMER BENICIA ARSENAL, BENICIA, CA | | | |
| | Client Name: U.S. ARMY ENGINEERING SUPPORT CENTER, HUNTSVILLE | | | |
| | Contract Number: DACA87-95-D-0005 | Task Order: # 0019 | | |
| | Scale: 1 Inch= 200 Feet | Paper Size: Metric Size A-1 | Drawing Date: 14 December 2001 | |

- 3.7** On 2 April 2001 eight UXO personnel mobilized to the site to begin intrusive UXO activities. On 6 April 2001 the personnel were demobilized to allow the Corps of Engineers more time to finalize rights of entry and complete the evacuation plan.
- 3.8** Non-intrusive geophysical investigations continued and on 25 April 2001 Mr. Bruce Handel, U.S. Army Corps of Engineers, Sacramento District (CESPK) Project Manager held a public meeting at the Benicia Public Library to inform the public of EODT's operations schedule and procedures for keeping the public safe and informed. The CEHNC Project Manager and OE Safety Specialist, and EODT's Project Manager and Senior UXO Supervisor attended the meeting, answered questions and explained in detail some of the procedures that would be used to ensure public safety with a minimum amount of inconvenience.
- 3.9** During this non-intrusive period EODT established contact with the current owner and management of the Arsenal, Benicia Industries, the Benicia Police Department, and City Maintenance Department who provided access to Sector 2, and Valero Refining Company who provided access to Sector 4. The Benicia Fire Marshall was briefed on the project as required and issued EODT a Fire Code Permit (#2001-05-001) to perform explosive operations in each of the Sectors. A copy of this permit is contained in Appendix I. Because I-680 is so close to Sector 5, EODT contacted the California Highway Patrol and made them aware of the planned removal activities.
- 3.10** Because the weather at the site was so dry and all of the Sectors were covered with tall dry grass and brush, EODT was very concerned about the potential fire hazard during routine field activities and especially during explosive operations. EODT discussed this potential hazard with the Benicia Fire Marshall and explained the preventive measures EODT would take to prevent a fire caused by explosive operations.
- 3.11** EODT used an engineering control designed by CEHNC to control the blast, retain fragments from the detonation, and prevent fires. The procedures for constructing this structure are in the document titled, Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions, Document Number: HNC-ED-CS-S 98-7, dated August 1998.
- 3.12** During the course of the project EODT completed 56 detonations without releasing any metallic fragments, starting a fire or any other related incident. Representatives of the California Department of Toxic Substance Control (DTSC) observed many of these operations and approved of all techniques and methods of performance used by the teams.
- 3.13** On 26 April 2001 the CEHNC PM and OE Safety Specialist, CESPK TM, EODT PM and SUXOS inspected certain areas of Sector 5 and Sector 5 Additional Area. The purpose of this inspection was to reduce the potential area of OE investigation by identifying specific areas of highway construction fill and other areas that could not contain OE because of their age, such as the road. The road network in Sector 5 was constructed long before the explosion that caused the OE contamination at the site.

These areas are depicted by cross-hatching on the site map of Sector 5 in Appendix B and were not cleared.

- 3.14** On 7 May 2001, eight UXO personnel mobilized to the site, received site specific briefings and began intrusive activities on 10 May, in Sector 5, grid K-10 where they located the first OE item, a MK VI Stokes Mortar Nose Fuze.
- 3.15** EODT performed removal activities in all three of the Sectors, 2, 4 and 5 concurrently. For this report the removal activities within the Sectors are discussed separately beginning with Sector 5, which was worked in first.
- 3.16** Additional UXO personnel mobilized to the site during the next several days and removal activities were expanded into Sectors 2 and 4. Removal activities in Sector 5 revealed more OE contamination than expected including burial pits that contained OE mixed with construction debris. EODT concentrated on clearing grids adjacent to the MSD to gather data on the concentration and type of OE. Within a short period EODT had obtained this information and applicable MSD values were adjusted to correspond with the type of OE located and allow removal activities to be performed without using engineering controls. Justification for this reduction is contained in Appendix I.
- 3.17** The engineering control that would be used is an aluminum structure that weighs approximately 200 pounds and is placed over subsurface anomalies by the UXO Team prior to excavation. This structure is called a "Miniature Open Front Barricade", and nicknamed "Bud Light". The barricade is directional and is designed to allow excavation within the MSD and protect the public from an accidental detonation. A picture of the barricade is at Figure 3-4, and additional information is in Appendix I.
- 3.18** During the week of 14 May the remaining members of the workforce mobilized to the site. After all site personnel read the WP/SSHP and received a safety briefing and a site-specific UXO briefing, they began removal activities.
- 3.19** Prior to performing intrusive activities in Sector 2 or 4, the Benicia Restoration Advisory Board (RAB) held a public meeting at the Benicia Public Library 16 May 2001. Mr. Bruce Handel, CESP, PM, Mr. Robert Nore, PM and Mr. Randy King, OE Safety Specialist CEHNC, and Mr. Dave Frandsen, EODT PM attended. Mr. Nore and Mr. Frandsen briefed the board on the progress of clearance activities in Sector 5 and answered specific questions about ordnance and explosive operations.

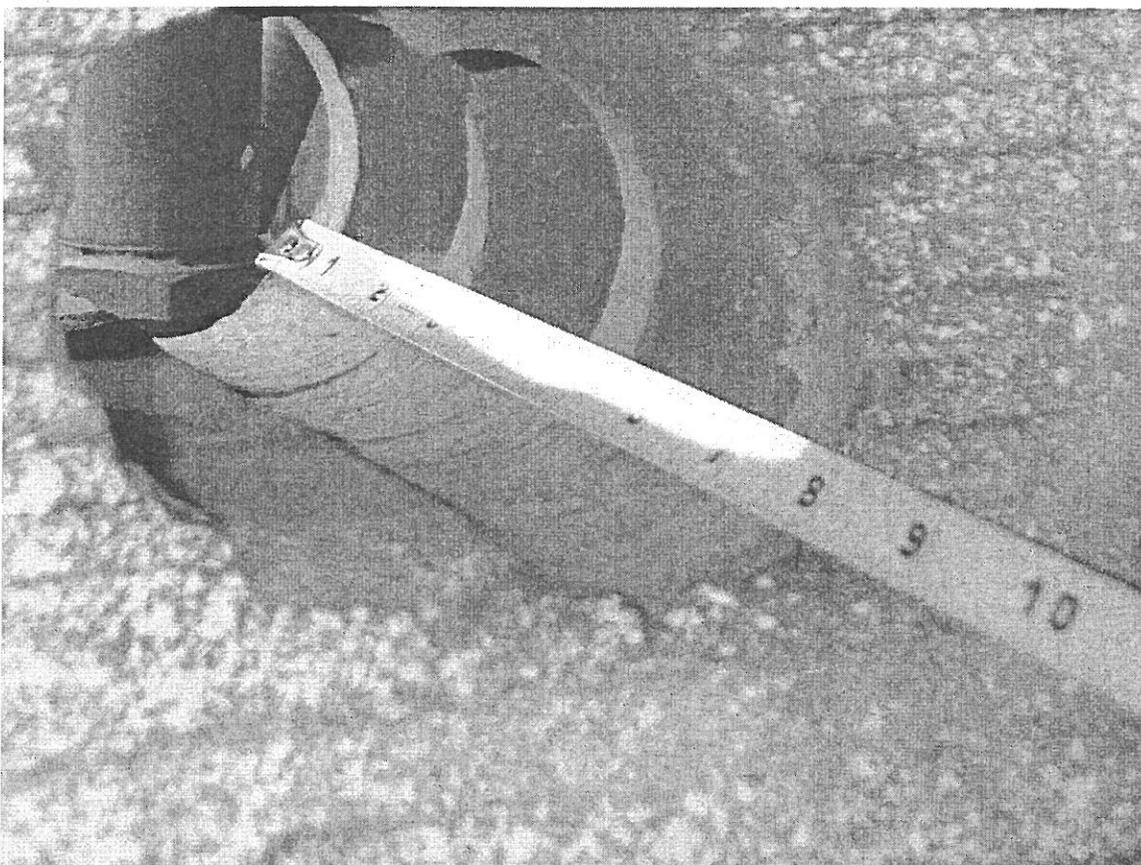
Figure 3-4
Miniature Open Front Barricade



- 3.20** The most significant concern by nearby business owners was being required to close during UXO clearance operations because they were within the MSD. The businesses were in buildings originally designed and used as explosive storage magazines. CEHNC personnel inspected one of these buildings to identify the type of materials used in construction with the possibility that the building would provide sufficient blast and fragment protection to allow the businesses to remain open provided the occupants remained inside the building during UXO removal activities.
- 3.21** The structural information and photographs, along with site-specific OE data were provided to CEHNC for analysis. The photograph, Figure 3-5 shows the material used for the wall construction is tile and approximately 8 inches thick. After reviewing the data, CEHNC concluded that the building would provide sufficient protection to further reduce the MSD to 75 feet providing the workers remained inside with doors and windows closed during removal activities. This reduced MSD allowed the businesses to remain open and productive during all phases of removal activities.

- 3.22 On 18 May 2001 EODT completed the geophysical investigation in Sector 5 and had collected sufficient data from clearance activities to present the results to CEHNC and request a change in the most probable munition (MPM). On 23 May EODT presented the data to CEHNC and requested the MPM be changed from a 4" Stokes HE Mortar to a VB Rifle Grenade. After discussions and in-depth review, the MPM was changed, which reduced the 1/600 MSD from 313 feet to 200 feet. Review of this data by CEHNC also authorized excavating up 25 feet from the inhabited above ground brick magazines, and within 200 feet of I-680 and I-780. This authorization is contained in Appendix I, pages I-12 through I-16

Figure 3-5
Measuring the Thickness of the Wall Construction

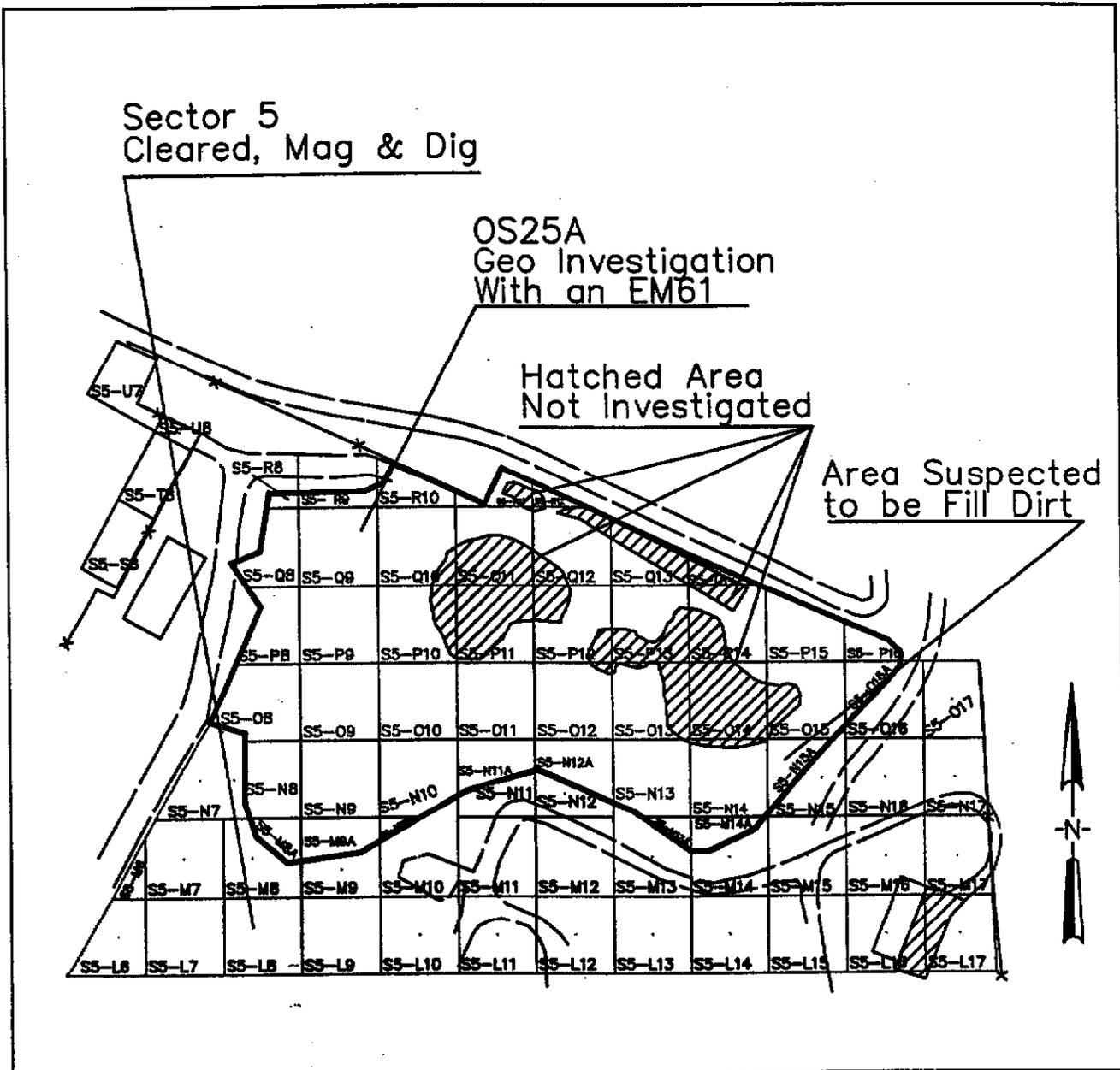


- 3.23** On 30 April 2001 the vehicles were removed from OS25 and EODT began geophysical investigations in the area. After completing the investigation the data was analyzed by EODT's geophysicist and CEHNC's geophysicist. The objective of this investigation was to produce a digital magnetic map of the area and determine if any UXO burial pits or trenches were under the asphalt, and none were detected. This map is contained in Appendix J.
- 3.24** OS25A contained numerous piles of construction debris and on 19 July 2001 was inspected by CEHNC, CESPCK and EODT, Figure 3-6 and 3-7. The inspection revealed that a sufficient amount of the area around the debris piles could be geophysically investigated with an EM61. The investigation was necessary to determine if UXO burial pits or trenches existed beneath the asphalt surface. The southern portion of the OS25A was fill-dirt and is the site's southern boundary. No UXO burial pits or trenches were located at OS25A.
- 3.25** The investigation was performed and a digital magnetic map was produced, analyzed, and determined by EODT and CEHNC that OS25A did not contain any burial pits or trenches. Additionally, it was confirmed that the southern boundary consisted of fill-dirt, which contained non-ordnance debris. This map is also contained in Appendix J.
- 3.26** Sector 5 proved to be more heavily contaminated with OE and construction debris than estimated. Burial pits of construction debris were located that also contained ordnance items. EODT used a backhoe to excavate the pits and separate the ordnance items from the debris.

**Figure 3-6
Piles of Debris and Asphalt in OS25A**



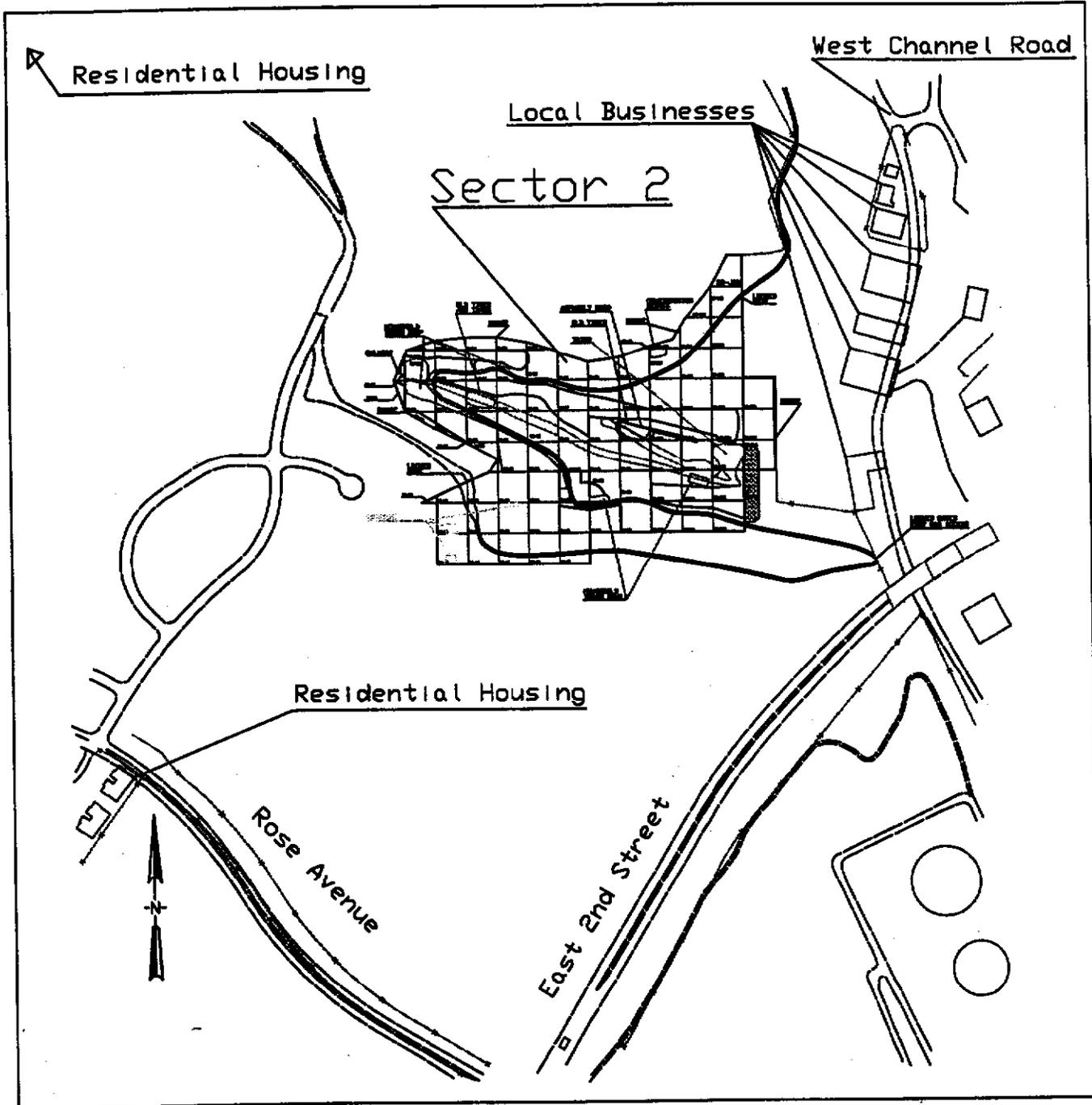
**Figure 3-7
OS25A and Location of Debris Piles**





3.27 Removal activities began concurrently in Sectors 2 and 4 on 22 May 2001 as requested by CESP. Sector 2 is located in a semi remote valley west of East 2nd Street and South of West Channel Road. A chain-linked fence, with a parking lot, bound the site and businesses to the north, see Figure 3-8.

**Figure 3-8
Sector 2 Showing the Businesses, Roads, and Residential Housing**



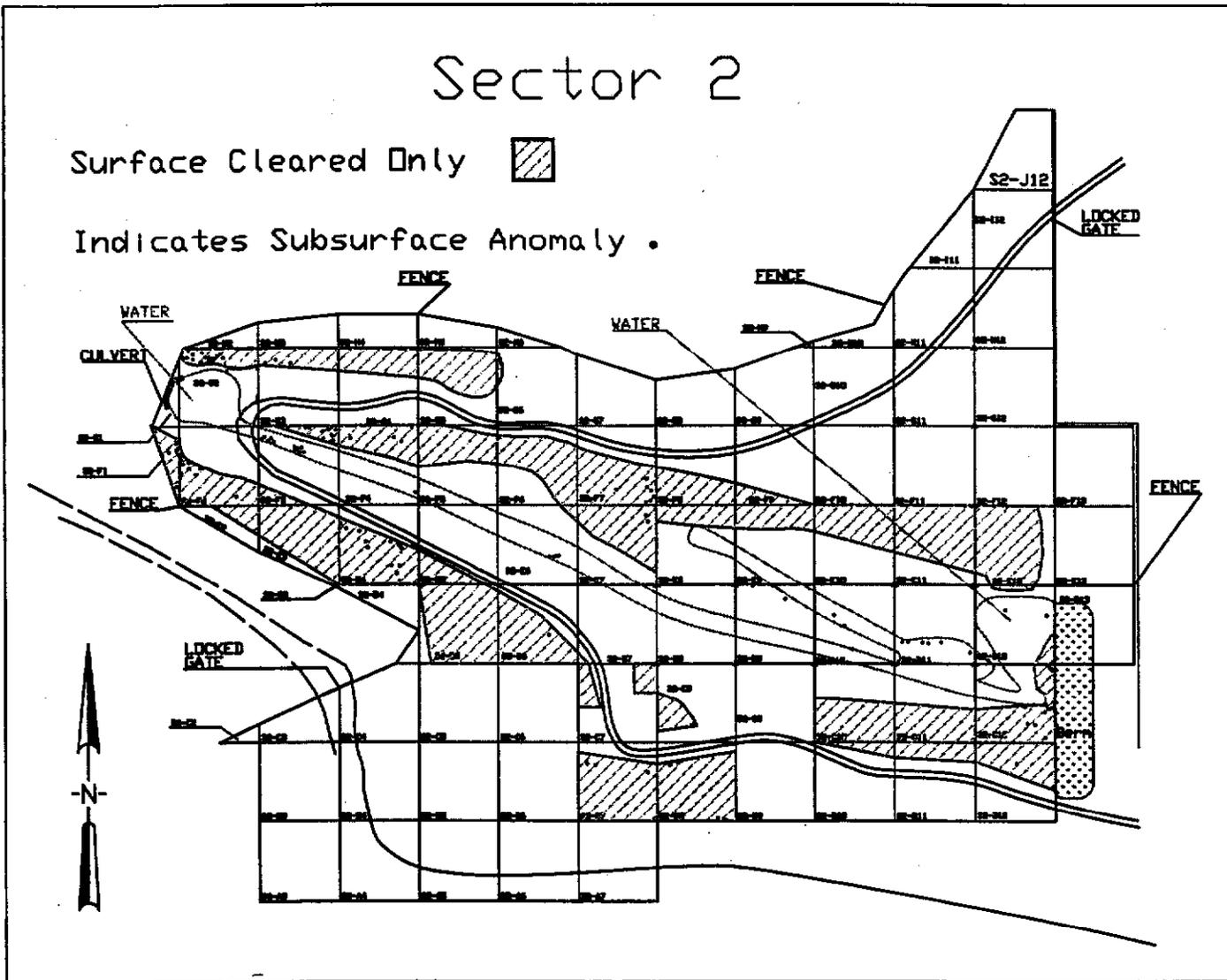
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|  <p>US ARMY CORPS OF ENGINEERS</p> | Project Title: SECTOR 2 | | | CONTRACTOR: EOD TECHNOLOGY, INC. 2229 OLD HIGHWAY 95 LENOIR CITY, TN 37771 |
| | Project Location: FORMER BENICIA ARSENAL, BENICIA, CA | | | |
| | Client Name: U.S. ARMY ENGINEERING SUPPORT CENTER, HUNTSVILLE | | | |
| | Contract Number: DACA87-95-D-0005 | Task Order: # 0019 | | |
| | Scale: 1 Inch=200 Feet | Paper Size: Metric Size A-1 | Drawing Date: 14 December 2001 | EODTDWG: AUTO CAD 14 |

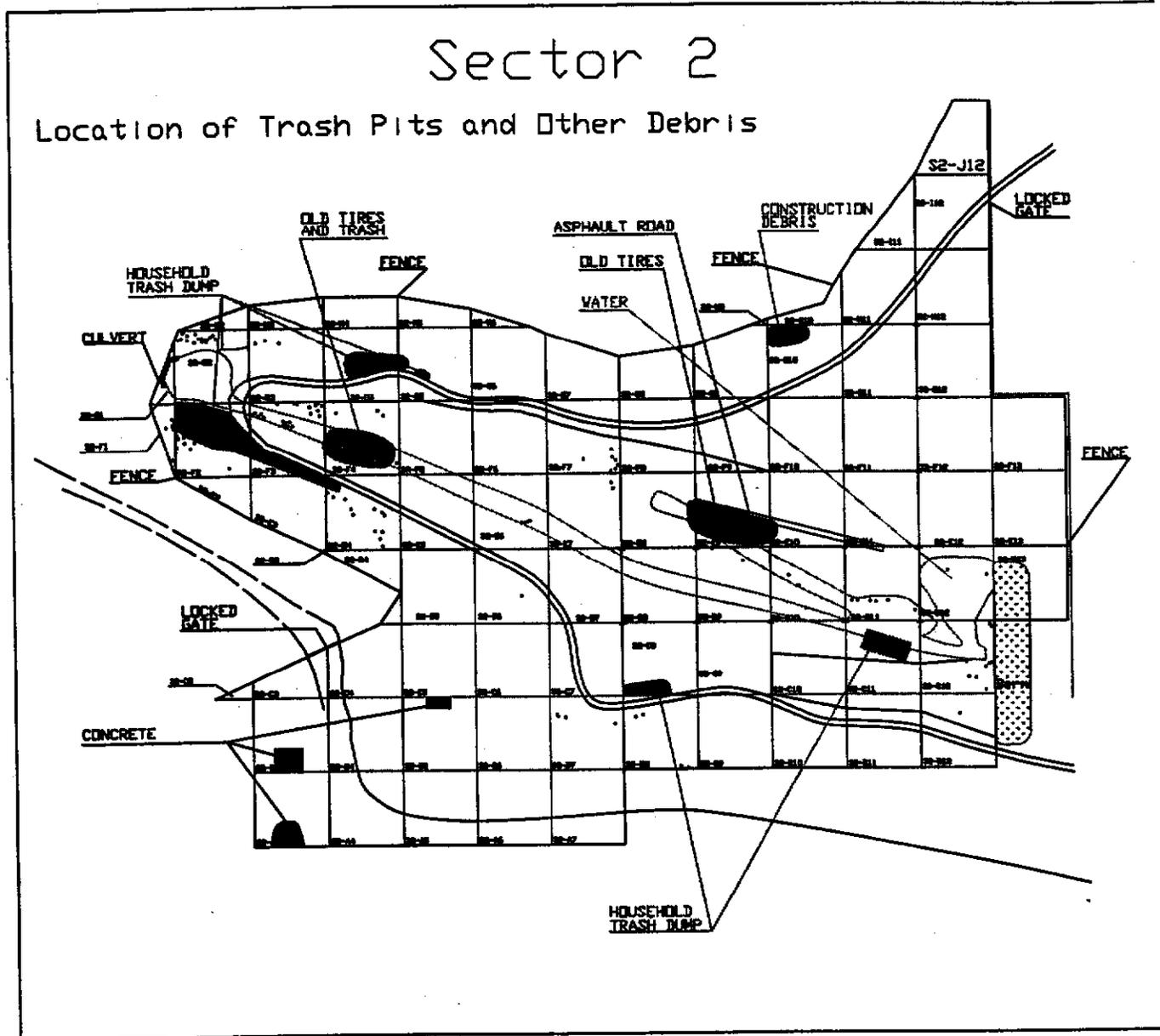
FIGURE 3-8

- 3.28 The terrain is hilly and covered with brush and tall grass with standing and slow moving water running south to north on the valley floor. Initial access to this site was difficult. There is a city road that runs adjacent to the eastern boundary of the site, which has limited access and is gated at both ends. The Benicia City Maintenance Department provided EODT with a key to the northern gate. Entry through this gate allowed limited access to the eastern boundary, which is at the top of the site approximately 200 feet above the valley floor. A second gate at the northern end provided access to the valley floor east of the water.
- 3.29 Because of the terrain, water, and chain-linked fence, access to the area west of the water was difficult. EODT requested permission from Ryder Trucking Company to enter the site through their parking lot and fence. They agreed and EODT cut an opening in the fence and upon completion of activities at Sector 2, EODT repaired the fence.
- 3.30 Removal activities in Sector 2 consisted of a surface clearance over areas of steep terrain, a subsurface clearance where excavations would not cause erosion, and in the water a clearance to a depth of approximately 18 inches. On steep terrain EODT did not investigate subsurface anomalies because of the concern about causing erosion, reference paragraph 3.4.1 of the SOW, Appendix A. EODT used plastic pin flags to mark the location of these anomalies and documented their location on grid sheets. In water too deep for investigation the location of anomalies were documented on grid sheets. The areas surface cleared only and anomaly locations are depicted in Figure 3-9. A small area outside the boundary was cleared and is depicted on the map in Appendix B.
- 3.31 Prior to performing any search activities in the water a field observation of the potential wetlands within Sector 2 was conducted. On 27 July 2001, John Esparza and Donald Lash, CESP, Randy King, CEHNC, and Kelly Groff, EODT, met at the site and inspected the area and discussed the clearance activities. Mr. Lash is an environmental scientist and after the visit provided EODT with written guidelines for entering the wetland-riparian zone, which is contained in Appendix L.
- 3.32 Additionally, Sector 2 contained several trash pits and dumpsites of drums, tires, and other debris. These pits were not cleared, nor was any of the debris removed. The specific location of these sites is depicted in Figure 3-10.
- 3.33 Clearance activities in Sector 2 resulted in the location and removal of 4 OE items, which required explosive venting and 24 expended items classified as ordnance related scrap (ORS), which were demilitarized with other ORS in Sector 5. A complete list of these items is provided the Grid Tracking Log in Appendix C. No explosive operations were performed in Sector 2.
- 3.34 Upon completion of Sector 2, digital photographs of each grid were taken from a known position and the direction of each photograph was recorded. These photographs were then sorted and compiled into a report suitable to monitor erosion, which is contained in Appendix G.

**Figure 3-9
Location Surface Cleared Areas and Subsurface Anomalies, Not Investigated**



**Figure 3-10
Location of Trash and Debris, Not Cleared**



- 3.35 Sector 4 is an open area consisting of rolling hills covered with tall grass and thick brush located west of East 2nd Street, South of Rose Avenue and bordered by private residential housing, see Figure 3-11. Access to the site was gained through a gate at the southeastern corner of the site. This site is suspected of being used to conduct explosive demilitarization of practice ordnance, however the exact location of demolition site has never been located. Therefore, a magnetometer assisted surface clearance was performed.
- 3.36 EODT began removal activities in Sector 4 on 22 May 2001 and located ORS and a fuze suspected of containing a live internal detonator, which was demilitarized with other ORS in Sector 5. This fuze was the only ordnance item located in Sector 4 that was suspected of containing any explosive components. A total of 1,146 pounds of ORS was located and removed from the site, see Figure 3-11 and 1,580 pounds of non-ORS was inspected and left in place. A map depicting the location of the grids cleared is contained in Appendix B.

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|  <p>US ARMY CORPS OF ENGINEERS</p> | Project Title: SECTOR 4 | | CONTRACTOR: | | <p>FIGURE 3-11</p> |
| | Project Location: FORMER BENICIA ARSENAL, BENICIA, CA | | EOD TECHNOLOGY, INC. 2229 OLD HIGHWAY 95 LENOIR CITY, TN 37771 | | |
| | Client Name: U.S. ARMY ENGINEERING SUPPORT CENTER, HUNTSVILLE | | | | |
| | Contract Number: DACA87-95-D-0005 | Task Order: # 0019 | | | |
| | Scale: 1 Inch= 200 Feet | Paper Size: Metric Size A-1 | Drawing Date: 14 December 2001 | EODTDWG: AUTO CAD 14 | |

- 3.38** This grid is located at the bottom of a valley, which would not allow the use of mechanical equipment for excavation. EODT removed and inspected 8,445 of these fuzes. Additionally, 19 each 20mm projectiles and 106 each 37mm projectiles were removed from the former burial pit. EODT inspected each fuze and projectile for the presence of explosives or explosive residues and none were present (see Figure 3-13).
- 3.39** During the course of the project, no trees, plants or animals were harmed and no areas were re-seeded. EODT did not perform any tests other than those planned to ensure equipment functioned properly.

Figure 3-12
Tank Body in Grid SA-K4, Without a Turret



Figure 3-13
Fuze and Projectile Burial Pit in Grid 5A-K4



3.40 PROJECT OBSTACLES

3.40.1 During the course of the project, EODT encountered several obstacles that were not known prior to mobilization. These obstacles are listed below in no order of precedence.

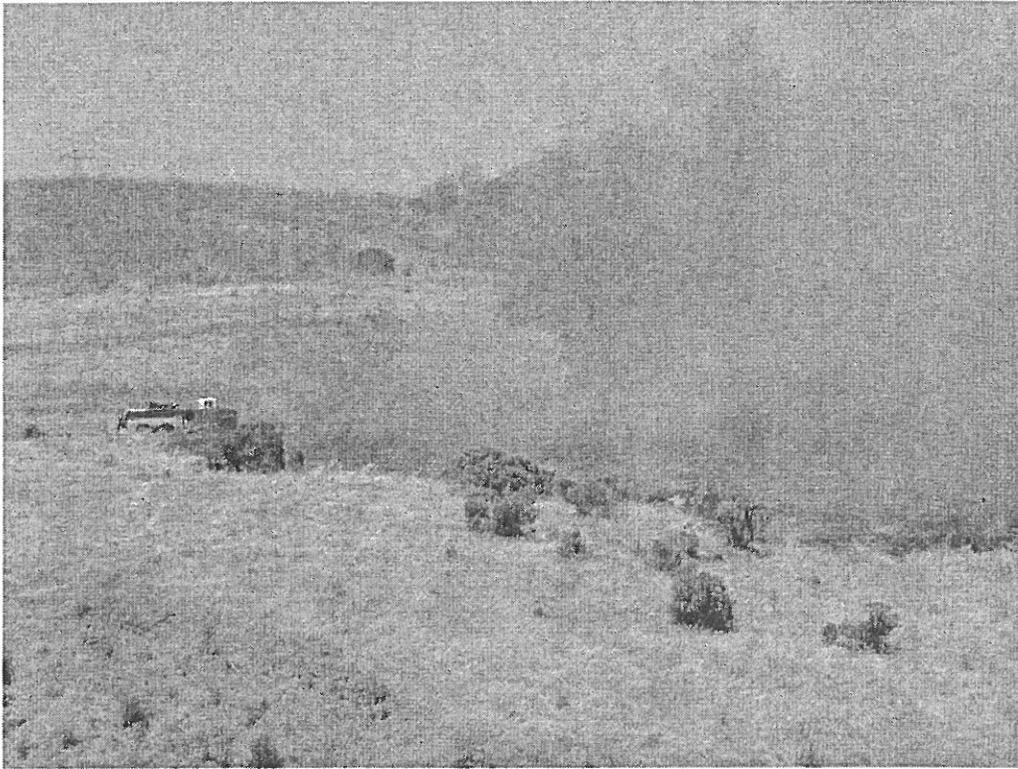
- a) During the beginning weeks of the project, rolling electrical blackouts in the area adversely effected project communications by shutting down cellular phone antennas and Internet servers. This problem was eliminated later in the summer after local energy problems were corrected.
- b) Field activities in Sector 4 were suspended for several days during the first two weeks of June because of controlled burns planned by the City of Benicia Fire Department. This did not increase the cost or time of removal activities in the Sector, only the date the Sector was completed.
- c) On 6 June, a brush fire started near Sector 2 by a welder and spread into the northeast portion of the Sector where UXO personnel were working. This caused the team to evacuate the area and lose some of their equipment to the fire. Fortunately the Benicia

Fire Department was in the field near the site and able to extinguish the fire before it caused any major damage. Production was slowed for only one day because of this brush fire. The burned area is shown in Figure 3-14.

- d) In Sector 5 removal activities were performed on a schedule that did not cause any of the local businesses to close or Camel Barn Museum to reschedule any planned tours or events. This cooperation with the public by the corps of engineers and EODT caused only minimum delay in fieldwork.
- e) The terrain in Sector 2 consisted of valley and flat area at the bottom was located within a locked chain linked fence. Initially there was no vehicular access to the flat area of the site, only access to the top of the valley. During the third week of fieldwork EODT located the custodian of the keys to the gates, which allowed access to the flat area of the Sector. This initial difficulty with ingress and egress to Sector 2 did reduce production somewhat.
- f) The vehicles in OS25 delayed geophysical investigations and the piles of asphalt and other debris in OS25A reduced the amount of area geophysically investigated by approximately 15 percent.
- g) The tank body in Grid SA-K4 prevented EODT from clearing the entire grid. The area under the tank body, which was left in place and within the tank's magnetic influence was not subsurface cleared; only a surface clearance was performed.

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**Figure 3-14
Grass Fire in Northeast portion of Sector 2**



Area of Sector 2 Burned by Grass Fire



3.41 DOCUMENTATION

- 3.41.1 The Work Plan was approved on 23 February 2001, which supported the all work performed during the project.
- 3.41.2 Chapter 6 of the WP contains the Site Safety and Health Plan (SSHP), which provided detailed safety procedures that were used to protect workers, the general public, and the environment during the course of the project.

3.42 SUPPORTING INFORMATION

- 3.42.1 The required supporting information for this report is provided in the following appendices.

| | |
|---|------------|
| Scope of Work | Appendix A |
| Site Maps | Appendix B |
| Daily Site Log | Appendix C |
| Grid/Ordnance Tracking Log | Appendix D |
| CEHNC 948 Quality Assurance Forms | Appendix E |
| Demolition Shot Records and Scrap Turn-In Records | Appendix F |
| Erosion Monitoring Data | Appendix G |
| Site Photographs | Appendix H |
| Miscellaneous Letters and Memorandums | Appendix I |
| Geophysical Investigations | Appendix J |
| Video Tape (supplied separately) | Appendix K |

4 SITE SAFETY

- 4.1 EODT's UXO Safety Officer (UXOSO) monitored site safety on a daily basis. Each morning prior to the start of work, a site-specific safety briefing was held and attended by all personnel working at the site. A variety of subjects were covered throughout the project, from ordnance safety and identification to personal health and safety subjects. During the course of the project, UXOSO performed safety inspections of site equipment, vehicles and work practices to ensure they conformed to the safety standards of EODT's Work Plan. There were no explosive accidents or injuries or other lost time accidents during the course of this project.

5 QUALITY CONTROL

- 5.1 EODT's UXO Quality Control Specialist ensured quality control during the project. Prior to the start of work each morning all Schonstedt Magnetometers were tested for proper sensitivity by locating buried inert ordnance items of the same type and depth anticipated within the clearance area. The geophysical team tested the EM61 each morning by locating buried inert ordnance items in a test grid that was established at the project start up. In addition to monitoring the daily instrument checks, the UXOQCS periodically inspected field equipment, checked administrative records and monitored removal activities that included search techniques and explosive disposal operations. Additionally, all grids were checked with a magnetometer by the UXOQCS after being cleared by EODT's UXO clearance team. The quality control documentation for this project is contained in the Grid/Tracking Log that is located in Appendix D.

**Table 6-1
 Ordnance Detonated by Sector**

| Sector 2 | Sector 4 | Sector 5 | OS25 | OS25A | Sector 5 Additional |
|----------|----------|----------|------|-------|---------------------|
| 3 | 2 | 187 | 0 | 0 | 0 |

**Table 6-2
 Explosives Used**

| Detonating Cord 80 Grain 500 Feet | Jet Perforator 22.6 Grain 200 Each | Pentolite Booster, 90 Gram 16 Each | Electric Detonator 112 Each |
|---|--|--|--------------------------------|
| | | | |

**Table 6-3
 Scrap**

| |
|---------------|
| Total Scrap |
| 30,669 Pounds |

**Table 6-4
 Mileage-Equipment-Fuel**

| Vehicle Distance | Mechanical Equipment Use | Fuel Used |
|------------------|--------------------------|---------------|
| 50,686 Miles | 985 Hours | 3,299 Gallons |

**Table 6-5
 Flight Data**

| Number of Commercial Flights | Flight Time |
|------------------------------|---------------|
| 45 Flights | 360 Man Hours |

**Table 6-6
 Field Work On Site**

| Field Work | Hours of Field Work |
|-------------------|---------------------|
| 110 Ten-Hour Days | 19,305 Hours |

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**Table 6-7
Accounting By Task**

| | Contr. No. DACA87-97-D-0005 DACA87-00-D-0037 Task Order No: 0019 Task Order No: 0003 Prepared By: Dave Frandsen | | Location: Benicia, CA Project: Former Benicia Arsenal | | |
|--|--|------------|--|----------------|-----------------------|
| | | | LABOR HOURS | | |
| SERV CLIN | LABOR CATEGORY | LABOR RATE | TASKS | TOTAL HOURS | COST |
| 0001 | Materials | | | | \$136,126.98 |
| 0002 | Travel | | | | \$422,987.68 |
| 0003 | Material Handling Fee - 7.5% | | | | \$10,639.99 |
| 0007 | Multiple Tasks | | | FFP | \$144,889.73 |
| 0100 | Field Office Admin | \$33.67 | | 702.5 | \$23,653.18 |
| | Program Admin | \$37.23 | | 504.0 | \$18,763.94 |
| | Word Processor | \$33.35 | | 37.5 | \$1,250.63 |
| | Program Manager | \$105.75 | | 19.0 | \$2,009.25 |
| | Project Mgr | \$87.30 | | 610.0 | \$53,253.00 |
| | Senior UXO Supervisor | \$67.54 | 5 | 1,216.0 | \$82,128.64 |
| | UXO Supervisor | \$55.77 | 5 | 2,916.0 | \$162,625.33 |
| | UXO Specialist | \$49.90 | 5 | 12,515.0 | \$624,498.50 |
| | Site Safety & Health Officer | \$55.77 | 5 | 1,070.5 | \$59,701.79 |
| | QA Control Specialist | \$55.77 | 5 | 880.0 | \$49,077.60 |
| | Certified Ind. Hygienist | \$82.21 | 5 | 204.0 | \$16,770.84 |
| | Program QA/QC | \$82.21 | 5 | 187.5 | \$15,414.38 |
| | LABOR W/FEE TOTALS | | | | \$1,109,147.08 |
| | Total for Task Order 0019 | | | | \$1,678,901.73 |
| 0008AA | Task 1 - Mob/Demob | | | FFP | \$1,525.02 |
| 0008AB | Task 2 - Geo Invest. & Eval | | | FFP | \$64,358.00 |
| | Total for Task Order 0003 | | | | \$65,883.02 |
| TOTAL COST FOR TASK ORDER 0019 AND 0003 | | | | | \$1,750,524.00 |

7 SUMMARY

7.1 The initial workforce mobilized to the site on 12 March 2001 and began surveying the boundaries of each sector, establishing a geophysical test plot and instrument prove out for digital geophysical investigations. An EM61 was selected as the most effective geophysical instrument and was used for all geophysical mapping. A public meeting was held on 25 April and intrusive activities began in Sector 5 on 10 May 2001. Field activities in Sector 2 and 4 started concurrently on 22 May 2001. Removal activities in Sector 4 were suspended for a short period of time while the Benicia City Fire Department performed controlled burns within the Sector for fire prevention. A total of two ordnance items were recovered from Sector 4 that required explosive demilitarization. Removal activities in Sector 2 revealed the presence of household trash and other piles of debris, which were not moved or cleared. A total of three ordnance items were recovered from Sector 2 that required explosive demilitarization. Removal activities in Sector 5 resulted in the removal of 187 OE items, which required explosive demilitarization and 1,059 pounds ORS, which was considerably greater than anticipated. Removal activities in Sector 5 Additional Area revealed the presence of a military tank body without the turret, which was used as a popping furnace for small arms and M1 Mine fuzes. A burial pit was located near the tank body, which contained the burned remains of these ordnance items. During an extensive clearance effort over a two-week period, 8,576 items were removed from the pit, of which none contained explosive residue. It was determined that the pit contains only OE scrap, and the clearance was discontinued. OS25 and OS25A were geophysically mapped and the subsurface magnetic maps revealed no burial pits or trenches were present in either area. EODT completed all areas and grids assigned with the exception of complete excavation of the burial pit in grid 5A-K4, which is depicted on the map in Appendix B. EODT demobilized the site on 29 September 2001.

8 CONCLUSIONS

8.1 The cooperation and scheduling between EODT, the Corps of Engineers, the Camel Barn Museum, Benicia Industries, local citizens, and local businesses permitted the removal action in all areas to be completed without added costs, closing businesses, or inconveniences to anyone. The OE and ORS located in Sector 2 was less than expected and not of the type found in an impact area. The ORS located in Sector 4 was from non-explosive training rounds that had been demilitarized in the area. The OE and ORS removed from Sector 5 was more than anticipated and was the type expected. The burial pit and tank body in Sector 5 Additional area was not expected. This tank body was inspected and found free of OE and ORS. After extensive clearance efforts over a two-week period it was determined that the pit contains only OE scrap, and the clearance was discontinued. The items remaining in the pit do not appear to present an explosive hazard. Digital Geophysical Mapping was performed in OS25 and OS25A with an EM61 and revealed no burial pits or trenches. The EM61 proved to be a very effective geophysical instrument.

APPENDIX A

**STATEMENT OF WORK
FOR NON-TIME CRITICAL
ORDNANCE & EXPLOSIVE
REMOVAL ACTIONS
Former Benicia Arsenal
Benicia, CA
22 Feb 00, R12: 11-Apr-0031 Oct 00**

1.0 OBJECTIVE.

The objective of this Task Order is for the Contractor to safely and efficiently locate and remove conventional unexploded ordnance (UXO) from a total of 135 acres at the former Benicia Arsenal in Benicia, California.

2.0 GENERAL STATEMENT OF WORK.

2.1 The work required under this Statement Work (SOW) falls under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS). Ordnance and Explosives (OE) exists on this property formerly owned or controlled by the Department of Defense and currently owned by Benicia Industries, Exxon, Pacific Bay Homes, and various individuals. The work described in the SOW will be performed in a manner that is consistent with the National Contingency Plan (NCP) and the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA). The applicable provisions of 29 CFR 1910.120 shall apply to all actions taken at this site.

2.2 Due to the inherent risk in this type of operation, the Contractor shall be limited to a 40-hour work week (either five 8-hour days or four 10-hour days). Unexploded Ordnance (UXO) personnel shall not perform OE-related tasks for more than 10 hours per day.

2.3 Chemical Warfare Materials. This site is not a suspected Chemical Warfare Material (CWM) site. However, if the Contractor or subcontractors encounter suspected CWM during any phase of work, they shall immediately withdraw upwind from the work area and notify the Project Manager and the Huntsville Center OE Safety Group. The Huntsville Center OE Safety Group will notify the Technical Escort Unit (TEU). This notification sequence shall be specified in the Work Plan.

3.0 SITE DESCRIPTION.

3.1 Site Location: The former Benicia Arsenal is located approximately 25 miles East-northeast of San Francisco. The project area is composed of steep rolling hills and runoff collection areas, which discharge to Suisun Bay.

3.2 Site Owners: Property within the former Benicia Arsenal is currently owned by Benicia Industries, Exxon, Pacific Bay Homes, and various individuals.

3.3 Site History: The site was established in 1849 to be used primarily as a shipping and receiving facility for military equipment and materiel manufactured within CONUS and destined

for military campaigns supported by the Port of San Francisco. Testing of 155-mm howitzers was performed on the Arsenal using two large concrete test tunnels. Additional details regarding site history are located in the "Benicia Arsenal Archive Search Report, March, 1994" and the "Supplement to the Benicia Arsenal Archive Search Report, May 1997". Substantial site revision has eliminated most remnants of the arsenal facilities. Construction of Interstate highway and refinery facilities led to the demolition of many underground storage bunkers used during trans-shipping operations conducted at the Arsenal.

3.4 Clearance Areas and Objectives: The Contractor shall perform project activities within the following areas:

3.4.1 Sector 2, Artillery Test Area, designated as "Limited Industrial/Open Space" land use. West Channel Road to the southeast, the fence alongside the McAllister Land Bridge to the west, the Sector 3A boundary to the north, and the top of the valley to the south define the sector boundaries. The majority of the sector is undeveloped and is characterized by steep terrain and scattered trees. Evaluations of this 15-acre area were limited, and did not expose UXO or related scrap. However, potential exists for the area to contain UXO. Apparently, sector 2 was only used to test firing mechanisms, but concern exists that up to 75-mm Projectiles may be encountered on the site. Due to the severe slopes, subsurface clearance of valley walls may produce erosion. Therefore, the Contractor shall locate and remove all OE and OE-scrap, along the valley floor (approximately six acres), and perform surface clearance of the remaining, sloping terrain in accordance with (IAW) the project performance standards in paragraph 3.5. Anomalies located but not excavated shall be marked on site maps and flagged in the field. The contractor shall perform an erosion assessment in accordance with National Forestry Standards (Ref 7.36) including photographic illustration of hillsides following surface removal activities to establish baseline conditions for future erosion assessments.

3.4.2 Sector 4, Exxon Property Demolition Site, designated as "Limited Industrial" land use. Sector boundaries are irregularly shaped based on topography of land owned by Exxon, and border East 2nd Street to the east, residential homes to the west and north, and Rose Drive to the northeast. Previous evaluations identify that only OE scrap was encountered in this 80-acre area, but it is suspected to possibly contain the following types of OE: 155-mm ballistic proof round (inert filled), 75-mm Projectiles, 37-mm Projectiles, and Grenades. The Contractor shall locate and remove geophysical anomalies at the surface that could be UXO, OE and/or OE-scrap, IAW the project performance standards in paragraph 3.5. It is anticipated that OE clearance actions will be concentrated in the southern portions of Sector 4. The contractor shall evaluate anomaly locations and provide recommendations for extending clearance operations based on professional judgment of observed conditions. Additionally, at the direction of the Contracting Officer, the contractor shall expand ordnance removal efforts in unitized increments in areas deemed to exhibit potential for UXO in accordance with Tasks 13 (Option 2) and 14 (Option 3). The contractor shall assume that actions will be performed in a single mobilization effort. Costs for removal expansion shall be provided on a unit basis in the contractor's proposal.

3.4.3 Sector 5, Camel Barn Area, designated as "Limited Industrial" land use. This area is suspected to have OE as a result of a 1922 fire and subsequent clean-up activities. Sector

boundaries are defined by Interstates I-680 and I-780, on the north by a fence and open storage area (formerly known as OS 25 and OS 25A). This 40-acre area is suspected to contain the following types of OE: 75-mm Projectiles, 37-mm Projectiles, Grenades, and/or Stokes Mortars. The Contractor shall locate and remove all UXO, as well as all OE and OE-scrap, IAW the performance standards in paragraph 3.5. Ordnance removal will not be performed within 5 feet of original Benicia Arsenal building foundations. Ordnance removal will also not be performed for areas covered by original Benicia Arsenal infrastructure (IE: roads). - Clearance over earth-covered igloos will be limited to surface only. Within the same mobilization effort and as directed by the Contracting Officer, the contractor shall perform geophysical mapping of paved areas in OS 25 (approximately 8 acres) to assess the likelihood of pits, trenches, or other evidence of OE or UXO under the pavement. Recommendations for removal shall be provided electronically to the Contracting Officer within 48 hours of completion of geophysical evaluations. Geophysical evaluation data (to include data QC actions required by DID OT-005-11, Quality Control Plan, to ensure achievement of standards defined in DID OT-005-05, Geophysical Investigation Plan) shall be provided to support recommendations within 96 hours of geophysical evaluations.

At the direction of the Contracting Officer, the contractor shall continue subsurface removal efforts in accordance with Task 14 (option 3).. Additionally, at the direction of the Contracting Officer, the contractor shall expand surface and subsurface ordnance location in unitized increments in accordance with Tasks 13 (option 2) and 14 (Option 3). The contractor shall assume that actions will be performed in a single mobilization effort.

3.5 Project Performance Standards.

3.5.1.1 Performance requirements for surface clearance. The contractor shall find and recover all UXO and OE, and all OE scrap of dimensions 1 inch by 4 inches or larger. Geophysical equipment will be used to assist in the detection of surface ordnance.

3.5.1.12 ~~Detection~~ Performance requirements for recovery of OE subsurface clearance. The contractor shall find and recover all surface and subsurface ~~{ferrous}/~~{metallic} UXO, OE and OE-Scrap (on the basis of mass/depth equivalent) to the standards identified in Table 7.32 of EM 1110-1-4009, Engineering and Design - Ordnance and Explosives Response, 23 June 2000.

having a diameter larger than 37 millimeters and lying above the following performance line:

$$\log(d) = 1.354 \log(\text{dia}) - 2.655 \text{ (for magnetometry)}$$

or

3.5.1.23 Detection requirements for Geophysical Mapping. The contractor shall ensure, through the Geophysical Investigation Prove Out (Section 4.5, Task 5), that electromagnetic equipment used for investigations meets the following performance standard: $\log(d) = 1.002 \log(\text{dia}) - 1.961$ (for electromagnetics) where "d" is the actual depth to the top of the buried item, in meters and "dia" is the diameter of the minor axis of the munition, in millimeters.

3.5.2.1.2.1 Location. Horizontally, 90% of all excavated items must lie within 30 cm of their reacquired and marked surface location, and 95% of all excavated items must lie within a 2 meter radius circle.

3.5.22 Corrective Actions. If the Government, through its Quality Assurance (QA) process, encounters any UXO, OE, or OE Scrap in any grid, which does not meet the project performance detection standard, then that grid will not be accepted by the Government. The Contractor shall dig additional anomalies as required to support the on-site OE safety specialist in conducting QA actions. The Contractor shall perform corrective actions, as the Government deems necessary, to achieve the detection performance standard. If more than 5% of the project grids fail initial Government QA checks, the Contractor will not be paid "fee" (profit) for corrective action activities on grids that subsequently fail.

4.0 DESCRIPTION OF SERVICES

4.1 (Task 1) Site Visit. A site visit not to exceed four days and using three contractor personnel will be performed. The Contractor will coordinate with the Project Manager at least ten (10) calendar days in advance of the site visit. The site visit team shall include the Contractor's Project Manager, Project Geophysicist registered in the state of California, and a Senior UXO Supervisor. The objective of the site visit is for the Contractor's team to gain familiarization with the site in general and to gather information required to assemble an acceptable and executable Work Plan. No UXO-related activities will be performed during the site visit. The Contractor shall prepare an Abbreviated Site Safety and Health Plan (ASSHP) and submit the plan to the Contracting Officer for review and approval prior to the visit. The ASSHP has a brief, fill-in-the-blank format, and may be obtained from the CEHNC OE Safety Group. The Contractor shall ensure that the visit is fully coordinated and that all members of the site visit team maintain compliance with the ASSHP. The Contractor shall also coordinate with the local points of contact prior to the site visit.

4.2 (Task 2) Prepare Work Plans. The Contractor shall prepare a Work Plan and related sub-plans that describe the Contractor's proposed methodology of accomplishing the objective. The Work Plan shall describe site management actions to be performed, including access control, scrap stockpiling, and erosion data collection. The Work Plan and related sub-plans shall be prepared in accordance with the guidance provided in their respective Data Item Descriptions. All OE related procedures shall comply with *CEHNC Safety Concepts and Basic Considerations for UXO*, 7 March 2000. The Contractor shall prepare the following documents describing the work necessary to respond to the requirements described in this SOW and Data Item Descriptions (DID), as follows:

4.2.1 Work Plan (DID OT-005-01)

4.2.2 Site Safety and Health Plan (DID OT-005-06)

4.2.3 Conventional Explosives Safety Submission (DID OT-060)

4.2.4 Work, Data and Cost Management Plan (DID OT-005-08)

4.2.5 Quality Control Plan (DID OT-005-11)

- 4.2.6 Site-Specific Environmental Protection Plan (DID OT-005-12)
 - 4.2.7 Property Equipment Plan (DID OT-005-09)
 - 4.2.8 Scrap Monitoring and Disposal Plan (DID OT-040)
 - 4.2.9 Chemical Data, Laboratory and Field Work Sampling Plan (DID OT-005-10)
 - 4.2.10 Investigative Waste Plan (DID OT-005-13)
 - 4.2.11 Explosives Management Plan (DID OT-005-03)
 - 4.2.12 Community Relations Plan (DID OT-045)
 - 4.2.13 Geophysical Investigation Plan (DID OT-005-05)
 - 4.2.14 Technical Management Plan (DID OT-005-02)
 - 4.2.15 Explosives Siting Plan (DID OT-005-04)
 - 4.2.16 Location Surveys and Mapping Plan (DID OT-005-07)
 - 4.2.17 Personnel/ Work Standards (DID OT-025)
- 4.3 (Task 3) Location Surveying and Mapping. The Contractor shall perform all location surveys and mapping required to establish boundaries of all areas specified in section 3.4 of this SOW and as required to support the project. During all field and intrusive activities, the survey crew shall be accompanied by a UXO specialist who will perform a UXO survey in each area prior to the surveyors starting work. Detection equipment shall be used to survey the location for the establishment of any monuments or markers. 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 Contractor's Site Safety and Health Officer (SSHO) and the USACE OE Safety Specialist who may rescind or modify it at any time. Grid corners shall be established using precision surveying methods. Each corner of each grid area shall be located by establishing the appropriate state plane grid system to the closest one (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. Staking shall be accomplished by driving a wooden or steel marker into the ground. Stakes shall be of sufficient size and emplaced to sufficient depth to ensure successful relocation of grid boundaries. The Contractor shall mark and survey the corners of the designated grids with stakes or other visible temporary markers. Individual locations of recovered UXO only shall be tape measured or the "x" & "y" distance estimated to obtain a horizontal accuracy of plus or minus one foot from the established grid corners. If subsurface UXO 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 on a "per-grid" basis and not

located by coordinates. The use of Total Station, GPS or other precision survey methods to locate individual UXO, UXO scrap, or geophysical anomalies within a grid is not necessary.

4.3.1 Items and data to be submitted as part of this task are as follows:

4.3.1.1 Control Points List. A tabulated list of all control points showing the adjusted coordinates established and/or used for this survey.

4.3.1.2 Grid Corners List. A tabulated list of all grid corners shall be provided.

4.3.1.2 Description Cards. A "Report of Establishment of Survey Mark" (Description Card) on each control point established and/or used for surveying. The Description Cards shall be 5" X 8" (12.7mm X 20.3mm) with one description per card. In addition to the name or ID number of the control points, the cards should show the adjusted coordinates, a written description for locating the control points, and a sketch showing how to locate the control points. Installation of concrete monuments will not be required; existing monuments will be described and referenced on the survey drawing.

4.3.1.3 Drawings. All maps shall be drawn at a scale no smaller than 1 inch = 400 feet (1:2400), referenced to the North American Datum of 1983 (NAD83), and provided on both reproducible (mylar) drawings and in a digital format. One original and two blue line prints of each final drawing shall be delivered to the Government. English units will be used.

4.3.2 Schedule. All work and services under this task shall be completed and submitted no later than the submission of the Geophysical Investigation Prove-out (task 5).

4.4 (Task 4) Vegetation Removal and Restoration.

4.4.1 Removal. The contractor shall furnish all personnel and equipment necessary to remove vegetation to the extent necessary to effectively locate, investigate and remove surface and subsurface anomalies.

4.4.2 Restoration. Upon conclusion of work at this site, the Contractor shall restore locations disturbed by operations, except those areas where brush/trees were removed. Excavated and trafficked areas shall be returned to natural grade and indigenous vegetation re-established by seeding or planting sprigs.

4.5 (Task 5) Geophysical Investigation Prove-out. The Contractor shall establish a site specific standardization test plot at an approved location on the project site. The test plot shall have dimensions of 50 feet by 50 feet and shall include approximately 12 inert OE items of the type and at the depth anticipated within the clearance area. The Contractor shall use this test plot to demonstrate the performance of the geophysical instruments and techniques used on the project. The Contractor shall geophysically map the test plot, analyze the data, and report the results with exactly the same detail and procedures as planned for the project area. Geophysical Investigations shall not begin in the project area until project objectives are demonstrated to be achieved within the test plot.

4.6 (Task 6) Geophysical Investigations.

4.6.1 General. The Contractor shall perform all geophysical investigations, mapping and evaluation of the project site. This work shall be accomplished in accordance with the approved work plan. The Contractor shall perform the geophysical investigation utilizing digital geophysical methods that integrates a navigation system that provides x-y positional accuracy to 0.25 meters, or better. The approved geophysical mapping technology shall digitally capture the instrument readings into a file coincident with state grid coordinates. All geophysical data, and coincident mapping data (in Intergraph .dgn format) shall be furnished to the Government no later than 30 calendar days after it is collected.

4.6.2 Dig-Sheets. The Contractor shall, using a qualified geophysicist, analyze the geophysical data, identify anomalies that may represent buried UXO, and provide "dig-sheets" containing the following information:
Unique Anomaly Identification Number
Northing, in State Grid Plane Coordinates;
Easting, in State Grid Plane Coordinates;
Instrument Reading at Target Location.
The dig sheets shall be prioritized and anomalies deemed more likely to be UXO ranked higher than anomalies less likely to be UXO.

4.6.3. Paragraph deleted.

~~4.6.3 Inaccessible Areas. Sub-areas within the area required to be geophysically mapped may be inaccessible to digital geophysical investigation equipment. If this occurs the Contractor may, with concurrence of the Project Manager, utilize analog geophysical approaches (e.g., "mag & flag") to clear these sub-areas. Geophysical mapping will not be performed within 20 feet of original Benicia Arsenal building foundations. Geophysical mapping will not be required for areas covered by original Benicia Arsenal infrastructure (i.e. roads).~~

4.7 (Task 7) Anomaly Reacquisition. The Contractor shall use precision surveying methods to reacquire the geophysical anomalies identified on the dig-sheets. Anomaly reacquisition is a two-step process. The first step is to locate the ground position as specified on the dig-sheet. The second step is to use appropriate hand-held geophysical instruments to identify the precise location on the ground where excavation for the anomaly should occur. The Contractor shall flag the actual field location of each anomaly shown on the dig-sheets and paint the ground at the flag location with high-visibility paint. The Contractor shall record and report all discrepancies between the dig-sheet locations and the actual reacquired location. The Contractor shall also report any anomalies that could not be reacquired.

4.8 (Task 8) Perform Clearance Action. This task shall be in accordance with the requirements of the Basic Contract and the approved Work Plan, SSHP, and Explosives Safety Submission for this site.

4.8.1. General. The following requirements will apply to all clearance activities covered under this SOW.

4.8.1.1 The Contractor shall provide all necessary personnel and equipment to perform a clearance of all anomalies identified for excavation.

4.8.1.2. Only USAESCH approved UXO personnel shall perform OE-related tasks.

4.8.1.3. Geophysical instruments may be used during excavations to assist the dig teams. Geophysical instruments used for QC shall be field tested daily to ensure they are operating properly. This shall be accomplished by using the established test plot located at the site or an approved alternate method. If the standard indication can not be attained, the instrument shall be re-calibrated, repaired or replaced.

4.8.1.4 If an excavation is required in an area of an endangered or protected plant or animal, excavation shall proceed only after coordination through the Project Manager or the on-site OE safety specialist.

~~OE removal will not be performed within 20 feet of original Benicia Arsenal building foundations.~~

4.8.1.5 All access/excavation/detonation holes shall be back-filled and revegetated in accordance with the requirements of Task 4.

4.8.1.6 The UXO Specialists that excavate the anomalies shall annotate their results. The results of the excavations will include all pertinent features of the anomaly to include items such as type, condition, actual location, depth, UXO depth at the nose and at the tail, size, mass and any other information that would significantly assist in classifying the geophysical anomaly.

4.9 (TASK 9) Final Disposition of AEDA / Range Residue. The Contractor shall furnish all necessary personnel and equipment to make final disposition on all recovered AEDA/Range Residue. The methodology to accomplish this task shall be proposed in the Work Plan.

4.9.1 The Contractor shall follow the provisions of DOD 4160.21-M when making final disposition of AEDA/Range Residue. The Contractor shall complete a DD Form 1348-1A. In the event that DRMO does not accept scrap or is not locally available, the Contractor shall arrange in advance for local scrap contractor to remove the scrap. The DRMO or local scrap dealer shall be identified in the Work Plan. The contractor will also include in the Work Plan the written direction from DRMO if directed to a local scrap dealer and a written statement from the dealer that the scrap will be processed through a smelter or furnace prior to resale or release. In the event that DRMO is not available, an approved local scrap dealer may be used. These documents are required even if The AEDA/Range Residue is conveyed to a local scrap dealer rather than DRMO.

4.9.2 Inspection/Certification of AEDA.

4.9.2.1 The UXO contractor shall ensure that this property is 100% properly inspected IAW the inspection procedures specified in the Work Plan. Qualified UXO personnel shall perform the inspection. UXO contractor personnel responsible for certifying AEDA/Range residue must meet the qualification requirements specified in DID OT-025. *AEDA/Range residue certification will be entered on the DD 1348-1A as follows:*

"This certifies that the AEDA residue, Range Residue, and/or Explosive Contaminated Property listed has been 100 percent properly inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related material."

The certification requires dual signatures. The SUXOS will sign as the certifier, and the USACE OE Safety Specialist will sign as the verifier.

4.9.2.2 All certificates must clearly show the typed/printed name, organization, signature, and phone number of the person certifying the inspection.

4.9.2.3 Material which cannot be certified as above shall be returned to the range and detonated and then re-inspected.

4.9.2.3 These procedures shall apply to AEDA/Range Residue turned into DRMO or a local scrap dealer. Once the inspection is completed, the contractor shall ensure the inspected AEDA/Range Residue is not mixed with other types of material. The contractor shall implement adequate controls to ensure that mixing does not occur.

4.9.2.4 Disposal documentation receipts shall be submitted as a component of the Removal Report.

4.10 (Task 10) Prepare and Submit Removal Report. At the conclusion of all field activities, the Contractor shall submit the Removal Report IAW DID OT-030. The report shall consist of the following:

4.10.1 Detailed accounting of all UXO and OE-related materials located and destroyed. This information will be provided from the Government maintained database.

4.10.2 A system of daily journals of all activities associated with this SOW. A daily journal for the site shall be opened upon first arrival for field operations and closed after contractor demobilization at the project site.

4.10.3 A recapitulation of exposure data. This shall include total number of man-hours worked on-site in OE related activities, total motor vehicle mileage, number of aircraft flights and total of man-hours flown to support the project.

4.10.4 QC documentation.

4.10.5 DRMO turn-in documentation.

4.10.6 The Contractor shall provide color digital pictures of sufficient quality to allow the Government to easily identify the item being photographed. The Contractor shall provide pictures of selected unexploded ordnance located during the clearance action, selected demolition shots (before and after explosion) and any significant events during the course of the field work. The digital pictures shall include the anomaly number in the file name for each picture. The pictures shall be imported into the text of the Removal Report. Further, a minimum of 45 minutes of narrated videotape depicting all major activities shall be provided in two copies.

4.10.7 A financial breakdown by area of all costs and labor hours used to perform this SOW.

4.11 (Task 11) Public Meetings and Technical Support. The Contractor shall provide technical support to CESPCK to assure appropriate and accurate data regarding the project is provided for CESPCK disposition in other site related documents. The Contractor shall attend three Public Meetings during the administration of the project.

4.12 Task 12 Additional Geophysical Investigation. At the direction of the Contracting Officer, the Contractor shall perform geophysical evaluations of additional areas as identified in Sections 3.4.2 in accordance with the requirements of Section 4.8 (Task 8). For contracting purposes, costs for this effort shall be provided on a unit basis in one-acre increments. It is anticipated that additional geophysical investigation will encompass 20 acres.

4.13 Task 13 Additional Surface Clearance Action. At the direction of the Contracting Officer, the Contractor shall perform surface clearance actions of additional areas as identified in Section 3.4.2 and in accordance with the requirements of Section 4.8 (Task 8). For contracting purposes, costs for this effort shall be provided on a unit basis in one-acre increments. It is anticipated that additional clearance will encompass 20 acres.

4.14 Task 14 Additional Subsurface Clearance Action. At the direction of the Contracting Officer, the Contractor shall perform subsurface clearance actions of additional areas as identified in Section 3.4.3 and in accordance with the requirements of Section 4.8 (Task 8). For contracting purposes, costs for this effort shall be provided on a unit basis in one-acre increments. It is anticipated that additional clearance will encompass 20 acres.

5.0 SUBMITTALS. The Contractor shall furnish copies of the plans and reports to each addressee listed below in the quantities indicated. One copy of the final work plan and the final report shall be sent to the Project Manager on 3.5 inch computer disk or CD ROM in an acceptable format in addition to the number of hard copies identified below. The Contractor shall use express mail services for delivering these plans and reports. Following each submission, comments generated as a result of their review shall be incorporated.

5.1 Addressees:

| | |
|--|---------------|
| Addressee | Copies |
| Commander | 3 |
| US Army Engineering and Support Center, Huntsville | |
| ATTN: CEHNC-OB-DC (Robert Nore) | |
| 4820 University Square | |
| Huntsville, AL, 35807-4361 35816-1822 | |
| Commander | 3 |
| US Army Corps of Engineers, Sacramento District | |
| ATTN: CESP-K-ED-E (Bruce Handel) | |
| 1325 J Street | |
| Sacramento, CA 95816-1822 | |
| Commander | 1 |
| 52nd EOD Group, Fort Gillem | |
| Building 736 | |
| Forest Park, Ga., 30050-50001 | |

5.2 Submittals and Due Dates

| DATA ITEM SUBMITTAL | DUE DATES |
|--|--|
| Draft Work Plan | 30 Jun 00 |
| Final Work Plan | 11 Aug 00 11 Nov 00 |
| Conventional Explosives Safety Submittal | 11 Aug 00 11 Nov 00 |
| Accident/Incident Report | Following Accidents |
| Cost/Schedule Status Reports | Monthly |
| Report/Minutes Record of Meeting | Following meetings |
| Telephone Conversation Correspondence | Monthly |
| Exposure Data Report | Monthly |
| Draft Removal Report | 5 Jan 01 1 May 01 |
| Final Removal Report | 15 Feb 01 16 Jun 01 |
| OT-085 Weekly Status Report | 1 st Working Day of following week |

5.3 Computer Hardware and Software.

5.3.1 All final text files generated by the Contractor shall be Word 97, IBM PC compatible format. The drawing and plot data shall be provided as coincident files in State Grid Plane Coordinates in MicroStation 95 CADD to run on typical properly configured Windows 95 and NT 4.0 PCs. The individual CADD files shall be referenced to a master file that allows simultaneous viewing of all historical layers and figures. Discussions shall be held on all non-CADD data to insure that its use and viewing is compatible with the Government's GIS workstations. HNC GIS workstations are Intergraph TDZ-425 dual 266 Pentium II with 128 megabytes of memory. The workstations run under the Windows NT. 4.0 operating system with

MicroStation 95 utilizing the MGE 6.0 complement of software and an Oracle 7.3 relational data base. Current other GIS project related software includes: IRAS B, IRAS C 5.04 and IRAS Engineer, DB Access, MGE Basic Nucleus, MGE Analysts, MGE Map Finisher, MGE Projection Manager, MGE Grid Analyst, MGE Modeler, Inroads, Base and Advanced Imager. All data for formal submittals shall be on either PC 3.5" floppies or PC CD-ROM. CD-ROM is the preferred format is required for data submission sizes from 5 to 600 MB. Three copies of each electronic submittal are required and are to be submitted in separate packages completely document and ready to run.

5.3.2 No digital data will be accepted until proven compatible with the Government's Graphics System. All revisions required to obtain compatibility with the Government's Graphics System shall be performed at Contractor's expense.

5.4 Mapping. All final mapping shall be created by Computer Aided Design and Drafting (CADD) and provided to the Government in MicroStation 95 two-dimensional digital design files on PC CD-ROM. All characteristics such as file naming and relationships, level structures, colors, line styles, weights, etc. shall be in accordance with the surveying and mapping requirements of the Tri-Service Spatial Data Standards (TSSDS) of the current release and shall be compiled in the design files. Site maps plotted from these design files shall be provided on reproducible (Mylar) standard metric A-1 size drawings which are 841 millimeters (mm) by 594mm in size (33.1 inches by 23.4 inches). The location, identification, and coordinates of all the control points, and boundary corners shall be plotted on the reproducible maps. Each control point shall be identified on the map by its name or number and the final adjusted coordinates and elevations to the closest 0.01 ft. Each sheet shall include a standard border, revision block, title block, complete index sheet layout, bar scale, grid north, a true north, and magnetic north arrow with the differences between them shown in minutes and seconds. Grid lines or tick marks in feet and at systematic intervals shall be shown with their grid values on the edges of the map. Also, a legend showing the standard National Geodetic Standard (NGS) symbols used for the mapping, a map index showing the site in relationship to all other sites within the boundary lines of the project area shall be included on each sheet.

6.0 PUBLIC AFFAIRS. The Contractor shall not make available or publicly disclose any data generated or reviewed under this contract or any subcontract unless specifically authorized by the Contracting Officer, the U.S. Army Engineer District, Sacramento, PAO and/or the OE Design Center PAO. When approached by any person or entity requesting information about the subject of this contract, the Contractor shall defer to the PAO for response. Reports and data generated under this contract shall become the property of the Government and distribution to any other source by the Contractor is prohibited unless authorized by the Contracting Officer.

7.0 REFERENCES:

- 7.1 DOD Manual 4160.21.M, Defense Utilization and Disposal Manual.
- 7.2 AR 200-1, Environmental Protection and Enhancement.
- 7.3 AR 385-40 with USACE Supplement.
- 7.4 AR 386-63, Policies and Procedures for Firing Ammunition for Training, Target Practice,

and Combat.

- 7.5 EM 385-1-1, CE Safety and Health Requirements Manual.
- 7.6 DA PAM 385-64, Ammunition and Explosive Safety Standards.
- 7.7 CEHND Safety Concepts and Basic Considerations for UXO.
- 7.8 DoD 6055.9 Std. DoD Ammunition and Explosive Safety Standards
- 7.9 TM 60A 1-1-31, Explosive Ordnance Disposal Procedures
- 7.10 National Contingency Plan, 40 CFR 300.
- 7.11 Federal Acquisition Regulation, F.A.R. Clause 52.236-13: Accident Prevention.
- 7.12 Army Corps of Engineers, ER-385-1-92, Appendix B, Safety and Occupational Health Document Requirements for Hazardous Toxic and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OE) Activities, 18 March 1994.
- 7.13 Occupational Safety and Health Administration (OSHA) General Industry Standards, 29 CFR 1910 and Construction Industry Standards, 29 CFR 1926; especially 196.120/29CFR1926.65-Hazardous Waste Site Operations and Emergency Response.
- 7.14 NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985. (DHHS/NIOSH) Publication No. 85-115).
- 7.15 CEHNC 1115-3-86, Ordnance and Explosives Cost-Estimating Risk Tool (OECert) Standing Operating Procedure (SOP), November 1996.
- 7.16 DID OT-005-01 Removal Action Work Plan (Required for sampling operations)
- 7.17 DID OT-005-02 Technical Management Plan
- 7.18 DID OT-005-03 Explosives Management Plan
- 7.19 DID OT-005-04 Explosives Siting Plan
- 7.20 DID OT-005-05 Geophysical Investigation Plan
- 7.21 DID OT-005-06 Site Safety and Health Plan
- 7.22 DID OT-005-07 Location Surveys and Mapping Plan
- 7.23 DID OT-005-08 Work, Data, and Cost Management Plan
- 7.24 DID OT-005-09 Property Management Plan (Government furnished equipment)
- 7.25 DID OT-005-10 Sampling and Analysis Plan (NOT REQUIRED FOR THIS SOW)
- 7.26 DID OT-005-11 Quality Control Plan
- 7.27 DID OT-005-12 Environmental Protection Plan
- 7.28 DID OT-15 Accident reports

- 7.29 DID OT-025 Personnel and Work Standards
- 7.30 DID OT-030 Site Specific Removal Report (Needed for sampling operations)
- 7.31 DID OT-040 Disposal Feasibility Letter Report (NOT REQUIRED FOR THIS SOW)
- 7.32 DID OT-045 Reports
- 7.33 DID OT-055 Telephone Conversations
- 7.34 DID OT-060 Conventional Safety Submissions
- 7.35 DID OT-085 Weekly Status Report
- 7.36 Hall, David E.; Long, Michael T.; Remboldt, Michael D., eds. 1994. Slope Stability Reference Guide for National Forests in the United States. Report EM-7170-13. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office Department of Engineering.
- 7.37 EM 1110-1-4009, Engineering and Design - Ordnance and Explosives Response, CEMP-RA, 23 June 2000

8.0 GOVERNMENT FURNISHED.

- 8.1 Access Agreements.
- 8.2 Engineering Evaluation/Cost Analysis, dated March 2000.
- 8.3 Action Memorandum, dated March 2000.
- 8.4 Pertinent UXO Technical publications/information as required.
- 8.6 Maps showing sectors.
- 8.7 Results of Geophysical Mapping.
- 8.8 Records Research Report for the Benicia Arsenal VOL 1-4, US Army Corps of Engineers, Sacramento District, April, 1999.

9.0 SPECIAL INSTRUCTIONS.

- 9.1 29 CFR 1926.100(a) requires personnel to wear protective helmets in areas where there is a possible danger of head injury from impact, from falling/flying objects, or from electrical shock and/or burns. During field activities on ordnance projects, hard hats need not be worn unless a head injury threat is present.

9.2 If the UXO personnel are on the CEHNC database, there is no requirement for the contractor to submit their resumes in the work plans. However, their name and UXO number must be listed and identified in the Work Plans.

APPENDIX B

Former Benicia Arsenal, Sector 2

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-A1 | NOT USED | |
| S2-A2 | NOT USED | |
| S2-A3 | 651 37 42.38 | 1799110.75 |
| S2-A4 | 651 38 42.38 | 1799110.75 |
| S2-A5 | 651 39 42.38 | 1799110.75 |
| S2-A6 | 651 40 42.38 | 1799110.75 |
| S2-A7 | 651 41 42.38 | 1799110.75 |
| S2-A8 | NOT USED | |
| S2-A9 | NOT USED | |
| S2-A10 | NOT USED | |
| S2-A11 | NOT USED | |
| S2-A12 | NOT USED | |
| S2-A13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-F1 | 651 36 08.55 | 1799711.23 |
| S2-F2 | 651 36 42.38 | 1799610.75 |
| S2-F3 | 651 37 42.38 | 1799610.75 |
| S2-F4 | 651 38 42.38 | 1799610.75 |
| S2-F5 | 651 39 42.38 | 1799610.75 |
| S2-F6 | 651 40 42.38 | 1799610.75 |
| S2-F7 | 651 41 42.38 | 1799610.75 |
| S2-F8 | 651 42 42.38 | 1799610.75 |
| S2-F9 | 651 43 42.38 | 1799610.75 |
| S2-F10 | 651 44 42.38 | 1799610.75 |
| S2-F11 | 651 45 42.38 | 1799610.75 |
| S2-F12 | 651 46 42.38 | 1799610.75 |
| S2-F13 | 651 47 42.38 | 1799610.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-B1 | NOT USED | |
| S2-B2 | NOT USED | |
| S2-B3 | 651 37 42.38 | 1799210.75 |
| S2-B4 | 651 38 42.38 | 1799210.75 |
| S2-B5 | 651 39 42.38 | 1799210.75 |
| S2-B6 | 651 40 42.38 | 1799210.75 |
| S2-B7 | 651 41 42.38 | 1799210.75 |
| S2-B8 | 651 42 42.38 | 1799210.75 |
| S2-B9 | 651 43 42.38 | 1799210.75 |
| S2-B10 | 651 44 42.38 | 1799210.75 |
| S2-B11 | 651 45 42.38 | 1799210.75 |
| S2-B12 | 651 46 42.38 | 1799210.75 |
| S2-B13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-G1 | 651 36 08.55 | 1799710.75 |
| S2-G2 | 651 36 42.38 | 1799710.75 |
| S2-G3 | 651 37 42.38 | 1799710.75 |
| S2-G4 | 651 38 42.38 | 1799710.75 |
| S2-G5 | 651 39 42.38 | 1799710.75 |
| S2-G6 | 651 40 42.38 | 1799710.75 |
| S2-G7 | 651 41 42.38 | 1799710.75 |
| S2-G8 | 651 42 42.38 | 1799710.75 |
| S2-G9 | 651 43 42.38 | 1799710.75 |
| S2-G10 | 651 44 42.38 | 1799710.75 |
| S2-G11 | 651 45 42.38 | 1799710.75 |
| S2-G12 | 651 46 42.38 | 1799710.75 |
| S2-G13 | 651 47 42.38 | 1799710.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-C1 | NOT USED | |
| S2-C2 | 651 36 42.38 | 1799310.75 |
| S2-C3 | 651 37 42.38 | 1799310.75 |
| S2-C4 | 651 38 42.38 | 1799310.75 |
| S2-C5 | 651 39 42.38 | 1799310.75 |
| S2-C6 | 651 40 42.38 | 1799310.75 |
| S2-C7 | 651 41 42.38 | 1799310.75 |
| S2-C8 | 651 42 42.38 | 1799310.75 |
| S2-C9 | 651 43 42.38 | 1799310.75 |
| S2-C10 | 651 44 42.38 | 1799310.75 |
| S2-C11 | 651 45 42.38 | 1799310.75 |
| S2-C12 | 651 46 42.38 | 1799310.75 |
| S2-C13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-H1 | NOT USED | |
| S2-H2 | 651 36 42.38 | 1799810.75 |
| S2-H3 | 651 37 42.38 | 1799810.75 |
| S2-H4 | 651 38 42.38 | 1799810.75 |
| S2-H5 | 651 39 42.38 | 1799810.75 |
| S2-H6 | 651 40 42.38 | 1799810.75 |
| S2-H7 | NOT USED | |
| S2-H8 | NOT USED | |
| S2-H9 | 651 44 20.38 | 1799810.75 |
| S2-H10 | 651 44 42.38 | 1799810.75 |
| S2-H11 | 651 45 42.38 | 1799810.75 |
| S2-H12 | 651 46 42.38 | 1799810.75 |
| S2-H13 | 651 47 42.38 | 1799810.75 |

Former Benicia Arsenal, Sector 2

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-D1 | NOT USED | |
| S2-D2 | NOT USED | |
| S2-D3 | 651 38 42.38 | 1799505.98 |
| S2-D4 | 651 39 13.38 | 1799410.75 |
| S2-D5 | 651 37 42.38 | 1799410.75 |
| S2-D6 | 651 38 42.38 | 1799410.75 |
| S2-D7 | 651 39 42.38 | 1799410.75 |
| S2-D8 | 651 40 42.38 | 1799410.75 |
| S2-D9 | 651 41 42.38 | 1799410.75 |
| S2-D10 | 651 42 42.38 | 1799410.75 |
| S2-D11 | 651 43 42.38 | 1799410.75 |
| S2-D12 | 651 44 42.38 | 1799410.75 |
| S2-D13 | 651 45 42.38 | 1799410.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-I1 | NOT USED | |
| S2-I2 | NOT USED | |
| S2-I3 | NOT USED | |
| S2-I4 | NOT USED | |
| S2-I5 | NOT USED | |
| S2-I6 | NOT USED | |
| S2-I7 | NOT USED | |
| S2-I8 | NOT USED | |
| S2-I9 | NOT USED | |
| S2-I10 | NOT USED | |
| S2-I11 | 651 45 63.38 | 1799910.75 |
| S2-I12 | 651 46 42.38 | 1799910.75 |
| S2-I13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-E1 | NOT USED | |
| S2-E2 | 651 36 08.55 | 1799711.23 |
| S2-E3 | 651 37 42.38 | 1799611.75 |
| S2-E4 | 651 38 42.38 | 1799511.75 |
| S2-E5 | 651 39 42.38 | 1799511.75 |
| S2-E6 | 651 40 42.38 | 1799511.75 |
| S2-E7 | 651 41 42.38 | 1799511.75 |
| S2-E8 | 651 42 42.38 | 1799511.75 |
| S2-E9 | 651 43 42.38 | 1799511.75 |
| S2-E10 | 651 44 42.38 | 1799511.75 |
| S2-E11 | 651 45 42.38 | 1799511.75 |
| S2-E12 | 651 46 42.38 | 1799511.75 |
| S2-E13 | NOT USED | |

| GRID | EASTING | NORTHING |
|-------------------------|--------------|------------|
| S2-J1 | 651 46 42.38 | 1800010.75 |
| NO OTHER "J" GRIDS USED | | |

Former Benicia Arsenal, Sector 4

| GRID | EASTING | NORTHING |
|----------|---------------|--------------|
| S4-DD0 | 651 7460 .80 | 178 .11 |
| S4-DD1 | 651 .80 | 178 .11 |
| S4-DD0 | 651 .80 | 178 .11 |
| S4-DD1 | 651 .80 | 178 .11 |
| S4-DD2 | 651 7860 .80 | 178 5973 .11 |
| S4-DD3 | 651 .80 | 178 .11 |
| S4-DD4 | 651 .80 | 178 .11 |
| NO OTHER | DD GRIDS USED | |

| GRID | EASTING | NORTHING |
|----------|--------------|--------------|
| S4-B00 | 651 .80 | 178 6373 .11 |
| S4-B0 | 651 .80 | 178 .11 |
| S4-B1 | 651 .80 | 178 .11 |
| S4-B2 | 651 7860 .80 | 178 6973 .11 |
| S4-B3 | 651 .80 | 178 .11 |
| S4-B4 | 651 .80 | 178 .11 |
| S4-B5 | 651 .80 | 178 .11 |
| S4-B6 | 651 .80 | 178 .11 |
| NO OTHER | B GRIDS USED | |

| GRID | EASTING | NORTHING |
|----------|---------------|----------|
| S4-CC0 | 651 .80 | 178 .11 |
| S4-CC1 | 651 .80 | 178 .11 |
| S4-CC2 | 651 .80 | 178 .11 |
| S4-CC3 | 651 .80 | 178 .11 |
| S4-CC4 | 651 .80 | 178 .11 |
| S4-CC5 | 651 .80 | 178 .11 |
| S4-CC6 | 651 .80 | 178 .11 |
| NO OTHER | CC GRIDS USED | |

| GRID | EASTING | NORTHING |
|----------|--------------|----------|
| S4-C0 | 651 .80 | 178 .11 |
| S4-C1 | 651 .80 | 178 .11 |
| S4-C2 | 651 .80 | 178 .11 |
| S4-C3 | 651 .80 | 178 .11 |
| S4-C4 | 651 .80 | 178 .11 |
| S4-C5 | 651 .80 | 178 .11 |
| S4-C6 | 651 .80 | 178 .11 |
| NO OTHER | C GRIDS USED | |

| GRID | EASTING | NORTHING |
|-----------|---------------|--------------|
| S4-BB0000 | 651 6945 .61 | 178 .11 |
| S4-BB000 | 651 7060 .80 | 178 .11 |
| S4-BB00 | 651 .80 | 178 .11 |
| S4-BB0 | 651 .80 | 178 .11 |
| S4-BB1 | 651 .80 | 178 .11 |
| S4-BB2 | 651 .80 | 178 .11 |
| S4-BB3 | 651 7860 .80 | 178 6373 .11 |
| S4-BB4 | 651 8060 .80 | 178 6373 .11 |
| S4-BB5 | 651 8260 .80 | 178 6373 .11 |
| S4-BB6 | 651 8460 .80 | 178 6373 .11 |
| S4-BB7 | 651 8660 .80 | 178 6373 .11 |
| NO OTHER | BB GRIDS USED | |

| GRID | EASTING | NORTHING |
|----------|--------------|--------------|
| S4-D0 | 651 .80 | 178 .11 |
| S4-D1 | 651 .80 | 178 .11 |
| S4-D2 | 651 7860 .80 | 178 7373 .11 |
| S4-D3 | 651 .80 | 178 .11 |
| S4-D4 | 651 .80 | 178 .11 |
| S4-D5 | 651 .80 | 178 .11 |
| S4-D6 | 651 .80 | 178 .11 |
| NO OTHER | D GRIDS USED | |

Former Benicia Arsenal, Sector 4

| GRID | EASTING | NORTHING |
|----------|--------------|------------|
| S4-AA000 | 651 7061 .49 | 178 .11 |
| S4-AA00 | 651 7260 .80 | 178 .11 |
| S4-AA0 | 651 | 178 .11 |
| S4-AA1 | 651 | 178 .11 |
| S4-AA2 | 651 | 178 .11 |
| S4-AA3 | 651 | 178 .11 |
| S4-AA4 | 651 | 178 .11 |
| S4-AA5 | 651 | 178 .11 |
| S4-AA6 | 651 | 178 .11 |
| S4-AA7 | 651 | 178 .11 |
| NO OTHER | AA | GRIDS USED |

| GRID | EASTING | NORTHING |
|----------|---------|------------|
| S4-E0 | 651 | 178 .11 |
| S4-E1 | 651 | 178 .11 |
| S4-E2 | 651 | 178 .11 |
| S4-E3 | 651 | 178 .11 |
| S4-E4 | 651 | 178 .11 |
| S4-E5 | 651 | 178 .11 |
| S4-E6 | 651 | 178 .11 |
| NO OTHER | E | GRIDS USED |

| GRID | EASTING | NORTHING |
|----------|---------|------------|
| S4-A000 | 651 | 178 .11 |
| S4-A00 | 651 | 178 .11 |
| S4-A0 | 651 | 178 .11 |
| S4-A1 | 651 | 178 .11 |
| S4-A2 | 651 | 178 .11 |
| S4-A3 | 651 | 178 .11 |
| S4-A4 | 651 | 178 .11 |
| S4-A5 | 651 | 178 .11 |
| S4-A6 | 651 | 178 .11 |
| S4-A7 | 651 | 178 .11 |
| NO OTHER | A | GRIDS USED |

| GRID | EASTING | NORTHING |
|----------|---------|------------|
| S4-F1 | 651 | 178 .11 |
| S4-F2 | 651 | 178 .11 |
| S4-F3 | 651 | 178 .11 |
| S4-F4 | 651 | 178 .11 |
| NO OTHER | F | GRIDS USED |

Former Benicia Arsenal, Sector 5

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-A1 | THIS GRID | NOT USED |
| S5-A2 | THIS GRID | NOT USED |
| S5-A3 | THIS GRID | NOT USED |
| S5-A4 | THIS GRID | NOT USED |
| S5-A5 | THIS GRID | NOT USED |
| S5-A6 | THIS GRID | NOT USED |
| S5-A7 | THIS GRID | NOT USED |
| S5-A8 | THIS GRID | NOT USED |
| S5-A9 | 652 3271 .64 | 178 0573 .13 |
| S5-A10 | 652 3309 .64 | 178 0573 .13 |
| S5-A11 | 652 3409 .64 | 178 0573 .13 |
| S5-A12 | THIS GRID | NOT USED |
| S5-A13 | THIS GRID | NOT USED |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-B1 | THIS GRID | NOT USED |
| S5-B2 | THIS GRID | NOT USED |
| S5-B3 | THIS GRID | NOT USED |
| S5-B4 | THIS GRID | NOT USED |
| S5-B5 | THIS GRID | NOT USED |
| S5-B6 | THIS GRID | NOT USED |
| S5-B7 | THIS GRID | NOT USED |
| S5-B8 | 652 3209 .64 | 178 0636 .13 |
| S5-B9 | 652 3209 .64 | 178 0636 .13 |
| S5-B10 | 652 3309 .64 | 178 0636 .13 |
| S5-B11 | 652 3409 .64 | 178 0636 .13 |
| S5-B12 | 652 3509 .64 | 178 0636 .13 |
| S5-B13 | 652 3609 .64 | 178 0665 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-C1 | THIS GRID | NOT USED |
| S5-C2 | THIS GRID | NOT USED |
| S5-C3 | THIS GRID | NOT USED |
| S5-C4 | THIS GRID | NOT USED |
| S5-C5 | THIS GRID | NOT USED |
| S5-C6 | THIS GRID | NOT USED |
| S5-C7 | 652 3013 .64 | 178 0736 .13 |
| S5-C8 | 652 3109 .64 | 178 0736 .13 |
| S5-C9 | 652 3209 .64 | 178 0736 .13 |
| S5-C10 | 652 3309 .64 | 178 0736 .13 |
| S5-C11 | 652 3409 .64 | 178 0736 .13 |
| S5-C12 | 652 3509 .64 | 178 0736 .13 |
| S5-C13 | 652 3609 .64 | 178 0736 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-D1 | THIS GRID | NOT USED |
| S5-D2 | THIS GRID | NOT USED |
| S5-D3 | THIS GRID | NOT USED |
| S5-D4 | THIS GRID | NOT USED |
| S5-D5 | THIS GRID | NOT USED |
| S5-D6 | 652 2909 .64 | 178 0836 .13 |
| S5-D7 | 652 3009 .64 | 178 0836 .13 |
| S5-D8 | 652 3109 .64 | 178 0836 .13 |
| S5-D9 | 652 3209 .64 | 178 0836 .13 |
| S5-D10 | 652 3309 .64 | 178 0836 .13 |
| S5-D11 | 652 3409 .64 | 178 0836 .13 |
| S5-D12 | 652 3509 .64 | 178 0836 .13 |
| S5-D13 | 652 3609 .64 | 178 0836 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-E1 | THIS GRID | NOT USED |
| S5-E2 | THIS GRID | NOT USED |
| S5-E3 | 652 2690 .46 | 178 0962 .09 |
| S5-E4 | 652 2709 .64 | 178 0961 .90 |
| S5-E5 | 652 2851 .26 | 178 0961 .61 |
| S5-E6 | 652 2938 .96 | 178 0936 .13 |
| S5-E7 | 652 3009 .64 | 178 0936 .13 |
| S5-E8 | 652 3109 .64 | 178 0936 .13 |
| S5-E9 | 652 3209 .64 | 178 0936 .13 |
| S5-E10 | 652 3309 .64 | 178 0936 .13 |
| S5-E11 | 652 3409 .64 | 178 0936 .13 |
| S5-E12 | 652 3509 .64 | 178 0936 .13 |
| S5-E13 | 652 3609 .64 | 178 0936 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-F1 | THIS GRID | NOT USED |
| S5-F2 | THIS GRID | NOT USED |
| S5-F3 | 652 2631 .75 | 178 1036 .12 |
| S5-F4 | 652 2709 .64 | 178 1036 .13 |
| S5-F5 | 652 2855 .64 | 178 1036 .13 |
| S5-F6 | 652 2909 .64 | 178 1036 .13 |
| S5-F7 | 652 3009 .64 | 178 1036 .13 |
| S5-F8 | 652 3109 .64 | 178 1036 .13 |
| S5-F9 | 652 3209 .64 | 178 1036 .13 |
| S5-F10 | 652 3309 .64 | 178 1036 .13 |
| S5-F11 | 652 3409 .64 | 178 1036 .13 |
| S5-F12 | 652 3509 .64 | 178 1036 .13 |
| S5-F13 | 652 3609 .64 | 178 1036 .13 |

Former Benicia Arsenal, Sector 5

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-G1 | THIS GRID | NOT USED |
| S5-G2 | THIS GRID | NOT USED |
| S5-G3 | 652 2609 .64 | 178 1136 .12 |
| S5-G4 | 652 2709 .64 | 178 1136 .13 |
| S5-G5 | 652 2809 .64 | 178 1136 .13 |
| S5-G6 | 652 2909 .64 | 178 1136 .13 |
| S5-G7 | 652 3009 .64 | 178 1136 .13 |
| S5-G8 | 652 3109 .64 | 178 1136 .13 |
| S5-G9 | 652 3209 .64 | 178 1136 .13 |
| S5-G10 | 652 3309 .64 | 178 1136 .13 |
| S5-G11 | 652 3409 .64 | 178 1136 .13 |
| S5-G12 | 652 3509 .64 | 178 1136 .13 |
| S5-G13 | 652 3609 .64 | 178 1136 .13 |
| S5-G14 | 652 3709 .64 | 178 1136 .13 |
| S5-G15 | 652 3709 .64 | 178 1136 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-H1 | 652 2409 .64 | 178 1236 .13 |
| S5-H2 | 652 2509 .64 | 178 1236 .13 |
| S5-H3 | 652 2609 .64 | 178 1236 .13 |
| S5-H4 | 652 2709 .64 | 178 1236 .13 |
| S5-H5 | 652 2809 .64 | 178 1236 .13 |
| S5-H6 | 652 2909 .64 | 178 1236 .13 |
| S5-H7 | 652 3009 .64 | 178 1236 .13 |
| S5-H8 | 652 3109 .64 | 178 1236 .13 |
| S5-H9 | 652 3209 .64 | 178 1236 .13 |
| S5-H10 | 652 3309 .64 | 178 1236 .13 |
| S5-H11 | 652 3409 .64 | 178 1236 .13 |
| S5-H12 | 652 3509 .64 | 178 1236 .13 |
| S5-H13 | 652 3609 .64 | 178 1236 .13 |
| S5-H14 | 652 3709 .64 | 178 1236 .13 |
| S5-H15 | 652 3809 .64 | 178 1236 .13 |
| S5-H16 | 652 3909 .64 | 178 1236 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-I1 | THIS GRID | NOT USED |
| S5-I2 | 652 2525 .24 | 178 1336 .14 |
| S5-I3 | THIS GRID | NOT USED |
| S5-I4 | 652 2709 .64 | 178 1336 .13 |
| S5-I5 | 652 2809 .64 | 178 1336 .13 |
| S5-I6 | 652 2909 .64 | 178 1336 .13 |
| S5-I7 | 652 3009 .64 | 178 1336 .13 |
| S5-I8 | 652 3109 .64 | 178 1336 .13 |
| S5-I9 | 652 3209 .64 | 178 1336 .13 |
| S5-I10 | 652 3309 .64 | 178 1336 .13 |
| S5-I11 | 652 3409 .64 | 178 1336 .13 |
| S5-I12 | 652 3509 .64 | 178 1336 .13 |
| S5-I13 | 652 3609 .64 | 178 1336 .13 |
| S5-I14 | 652 3409 .64 | 178 1336 .13 |
| S5-I15 | 652 3509 .64 | 178 1336 .13 |
| S5-I16 | 652 3609 .64 | 178 1336 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-J1 | 652 2409 .64 | 178 1436 .13 |
| S5-J2 | 652 2509 .64 | 178 1436 .14 |
| S5-J3 | 652 2609 .64 | 178 1436 .13 |
| S5-J4 | 652 2709 .64 | 178 1436 .13 |
| S5-J5 | 652 2809 .64 | 178 1436 .13 |
| S5-J6 | 652 2909 .64 | 178 1436 .13 |
| S5-J7 | 652 3009 .64 | 178 1436 .13 |
| S5-J8 | 652 3109 .64 | 178 1436 .13 |
| S5-J9 | 652 3209 .64 | 178 1436 .13 |
| S5-J10 | 652 3309 .64 | 178 1436 .13 |
| S5-J11 | 652 3409 .64 | 178 1436 .13 |
| S5-J12 | 652 3509 .64 | 178 1436 .13 |
| S5-J13 | 652 3609 .64 | 178 1436 .13 |
| S5-J14 | 652 3709 .64 | 178 1436 .13 |
| S5-J15 | 652 3809 .64 | 178 1436 .13 |
| S5-J16 | 652 4009 .64 | 178 1436 .13 |
| S5-J17 | 652 4109 .64 | 178 1436 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-K1 | 652 2409 .64 | 178 1536 .13 |
| S5-K2 | 652 2509 .64 | 178 1536 .14 |
| S5-K3 | 652 2609 .64 | 178 1536 .14 |
| S5-K4 | 652 2709 .64 | 178 1536 .13 |
| S5-K5 | 652 2809 .64 | 178 1536 .13 |
| S5-K6 | 652 2909 .64 | 178 1536 .13 |
| S5-K7 | 652 3009 .64 | 178 1536 .13 |
| S5-K8 | 652 3109 .64 | 178 1536 .13 |
| S5-K9 | 652 3209 .64 | 178 1536 .13 |
| S5-K10 | 652 3309 .64 | 178 1536 .13 |
| S5-K11 | 652 3409 .64 | 178 1536 .13 |
| S5-K12 | 652 3509 .64 | 178 1536 .13 |
| S5-K13 | 652 3609 .64 | 178 1536 .13 |
| S5-K14 | 652 3709 .64 | 178 1536 .13 |
| S5-K15 | 652 3809 .64 | 178 1536 .13 |
| S5-K16 | 652 4009 .64 | 178 1536 .13 |
| S5-K17 | 652 4109 .64 | 178 1536 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-L1 | 652 2409 .64 | 178 1636 .13 |
| S5-L2 | 652 2509 .64 | 178 1636 .13 |
| S5-L3 | 652 2609 .64 | 178 1636 .13 |
| S5-L4 | 652 2709 .64 | 178 1636 .13 |
| S5-L5 | 652 2809 .64 | 178 1636 .13 |
| S5-L6 | 652 2909 .64 | 178 1636 .13 |
| S5-L7 | 652 3009 .64 | 178 1636 .13 |
| S5-L8 | 652 3109 .64 | 178 1636 .13 |
| S5-L9 | 652 3209 .64 | 178 1636 .13 |
| S5-L10 | 652 3309 .64 | 178 1636 .13 |
| S5-L11 | 652 3409 .64 | 178 1636 .13 |
| S5-L12 | 652 3509 .64 | 178 1636 .13 |
| S5-L13 | 652 3609 .64 | 178 1636 .13 |
| S5-L14 | 652 3709 .64 | 178 1636 .13 |
| S5-L15 | 652 3809 .64 | 178 1636 .13 |
| S5-L16 | 652 4009 .64 | 178 1636 .13 |
| S5-L17 | 652 4109 .64 | 178 1636 .13 |

Former Benicia Arsenal, Sector 5

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-M1 | THIS GRID | NOT USED |
| S5-M2 | THIS GRID | NOT USED |
| S5-M3 | THIS GRID | NOT USED |
| S5-M4 | THIS GRID | NOT USED |
| S5-M5 | THIS GRID | NOT USED |
| S5-M6 | THIS GRID | NOT USED |
| S5-M7 | 652 3009 .64 | 178 1736 .13 |
| S5-M8 | 652 3109 .64 | 178 1736 .13 |
| S5-M9 | 652 3209 .64 | 178 1736 .13 |
| S5-M10 | 652 3309 .64 | 178 1736 .13 |
| S5-M11 | 652 3409 .64 | 178 1736 .13 |
| S5-M12 | 652 3509 .64 | 178 1736 .13 |
| S5-M13 | 652 3609 .64 | 178 1736 .13 |
| S5-M14 | 652 3709 .64 | 178 1736 .13 |
| S5-M15 | 652 3809 .64 | 178 1736 .13 |
| S5-M16 | 652 4009 .64 | 178 1736 .13 |
| S5-M17 | 652 4109 .64 | 178 1736 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-N1 | THIS GRID | NOT USED |
| S5-N2 | THIS GRID | NOT USED |
| S5-N3 | THIS GRID | NOT USED |
| S5-N4 | THIS GRID | NOT USED |
| S5-N5 | THIS GRID | NOT USED |
| S5-N6 | THIS GRID | NOT USED |
| S5-N7 | 652 3009 .64 | 178 1836 .13 |
| S5-N8 | THIS GRID | NOT USED |
| S5-N9 | THIS GRID | NOT USED |
| S5-N10 | THIS GRID | NOT USED |
| S5-N11 | 652 3409 .64 | 178 1836 .13 |
| S5-N12 | 652 3509 .64 | 178 1836 .13 |
| S5-N13 | THIS GRID | NOT USED |
| S5-N14 | THIS GRID | NOT USED |
| S5-N15 | 652 3809 .64 | 178 1836 .13 |
| S5-N16 | 652 4009 .64 | 178 1836 .13 |
| S5-N17 | 652 4109 .64 | 178 1836 .13 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| S5-O1 | THIS GRID | NOT USED |
| S5-O2 | THIS GRID | NOT USED |
| S5-O3 | THIS GRID | NOT USED |
| S5-O4 | THIS GRID | NOT USED |
| S5-O5 | THIS GRID | NOT USED |
| S5-O6 | THIS GRID | NOT USED |
| S5-O7 | THIS GRID | NOT USED |
| S5-O8 | THIS GRID | NOT USED |
| S5-O9 | THIS GRID | NOT USED |
| S5-O10 | THIS GRID | NOT USED |
| S5-O11 | THIS GRID | NOT USED |
| S5-O12 | THIS GRID | NOT USED |
| S5-O13 | THIS GRID | NOT USED |
| S5-O14 | THIS GRID | NOT USED |
| S5-O15 | THIS GRID | NOT USED |
| S5-O16 | 652 4009 .64 | 178 1936 .13 |
| S5-O17 | 652 4109 .64 | 178 1936 .13 |

| GRID | EASTING | NORTHING |
|------|-------------|----------|
| S5-P | THESE GRIDS | NOT USED |
| S5-Q | THESE GRIDS | NOT USED |
| S5-R | THESE GRIDS | NOT USED |
| S5-S | THESE GRIDS | NOT USED |
| S5-T | THESE GRIDS | NOT USED |
| S5-U | THESE GRIDS | NOT USED |
| S5-V | THESE GRIDS | NOT USED |
| S5-X | THESE GRIDS | NOT USED |
| S5-Y | THESE GRIDS | NOT USED |
| S5-Z | THESE GRIDS | NOT USED |

Former Benicia Arsenal, Sector 5 Additional

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| A5- I2 | 652 4100 .76 | 178 0757 .76 |
| A5- M2 | 652 4198 .79 | 178 1215 .76 |
| A5- N2 | 652 4125 .06 | 178 1257 .76 |
| A5- O2 | 652 4156 .45 | 178 1357 .76 |
| A5- I3 | 652 4198 .79 | 178 0757 .76 |
| A5- J3 | 652 4216 .92 | 178 0857 .76 |
| A5- M3 | 652 4298 .79 | 178 1157 .76 |
| A5- N3 | 652 4198 .79 | 178 1257 .76 |
| A5- O3 | 652 4198 .79 | 178 1357 .76 |
| A5- P3 | 652 4207 .79 | 178 1457 .76 |
| | | |
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| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| A5- E5 | 652 4399 .25 | 178 0357 .76 |
| A5- F5 | 652 4398 .79 | 178 0457 .76 |
| A5- G5 | 652 4398 .79 | 178 0557 .76 |
| A5- H5 | 652 4398 .79 | 178 0657 .76 |
| A5- I5 | 652 4398 .79 | 178 0757 .76 |
| A5- J5 | 652 4398 .79 | 178 0857 .76 |
| A5- K5 | 652 4398 .79 | 178 0957 .76 |
| A5- L5 | 652 4398 .79 | 178 1057 .76 |
| A5- M5 | 652 4398 .79 | 178 1157 .76 |
| A5- N5 | 652 4398 .79 | 178 1257 .76 |
| A5- O5 | 652 4398 .79 | 178 1357 .76 |
| A5- P5 | 652 4398 .79 | 178 1457 .76 |
| A5- Q5 | 652 4398 .79 | 178 1557 .76 |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| A5- G4 | 652 4298 .79 | 178 0557 .76 |
| A5- H4 | 652 4298 .79 | 178 0657 .76 |
| A5- I4 | 652 4298 .79 | 178 0757 .76 |
| A5- J4 | 652 4298 .79 | 178 0857 .76 |
| A5- K4 | 652 4298 .79 | 178 0957 .76 |
| A5- L4 | 652 4298 .79 | 178 1057 .76 |
| A5- M4 | 652 4298 .79 | 178 1157 .76 |
| A5- N4 | 652 4298 .79 | 178 1257 .76 |
| A5- O4 | 652 4298 .79 | 178 1357 .76 |
| A5- P4 | 652 4298 .79 | 178 1457 .76 |
| A5- Q4 | 652 4298 .79 | 178 1557 .76 |
| | | |
| | | |
| | | |
| | | |

| GRID | EASTING | NORTHING |
|--------|--------------|--------------|
| A5- R5 | 652 4398 .79 | 178 1657 .76 |
| A5- S5 | 652 4398 .79 | 178 1757 .76 |
| A5- T5 | 652 4398 .79 | 178 1857 .76 |
| A5- U5 | 652 4398 .79 | 178 1957 .76 |
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APPENDIX C

**EODT Senior UXO Supervisor Daily Log
OE Removal Action, Former Benicia Arsenal, Benicia, California**

| Date | Time | Event |
|-------------|-------------|---|
| 03/12/01 | Various | Mobilization of initial workforce: PM, SUXOS, UXOSSO/UXOQCS, 1-UXOT3, 2-UXOT2. |
| 03/13/01 | 0600 | PM provided brief on worksite. UXOSO conducted Daily Safety Brief. |
| | 0800 | Met with surveyors from Geophysical Mapping Services (Mike Green, Chris Meyer, Chuck Welk) at the Camel Barn Museum in Sector 5. |
| | 0900 | Met with Mr. Jim Triplett, Benicia Port, Director of Logistics. Discussed access issues, site trailer location, and gave him an overview of our operation. |
| | 0940 | Met with Mr. Pete Goodsen, President of the Camel Barn Museum. Discussed test plot location and access to the area. |
| | 1000 | Met with Valero Benicia Refinery personnel to discuss location and access to areas. |
| | 1030 | Viewed old Exxon property area (now Valero, Sector 4) with surveyors. |
| | 1230 | Test plot laid out in Sector 5 directly behind the Camel Barn Museum. Conducted equipment calibration and acquired background readings. Surveyors placed control points in Sector 4. |
| | 1630 | Secured for the day. |
| 03/14/01 | 0600 | Conducted Daily Safety Brief. |
| | 0630 | Buried test target items in the test plot IAW the Work Plan. Prepared and placed lines in test plot area. Verified targets using the EM-61. |
| | 0800 | Mobilization of one additional UXOT-2. Viewed parking lot areas in Sector 5 designated as OS 25 and OS25A. OS25 is filled with cars, and OS25A is 60%-70% filled with piles of asphalt and dirt, tires, plastic sheeting, and other debris. Additionally, there are some 55-gallon drums in the area, which may or may not contain hazardous materials. PM will contact Huntsville COE PM (Bob Nore) to discuss these issues. Purchased supplies. |
| | 1230 | Attempted to view Sector 2 but were unable to gain access. Surveyors started laying out grids in Sector 5. |
| | 1630 | Secured for the day. |
| 03/15/01 | 0600 | Conducted Daily Safety Brief. |

SUXOS/PM Signature
DACA87-97-D-0005
Task Order: 0019



**EODT Senior UXO Supervisor Daily Log
OE Removal Action, Former Benicia Arsenal, Benicia, California**

| Date | Time | Event |
|----------|------|---|
| | 0630 | Surveyors continued laying out the grid network. |
| | 0710 | Sacramento COE Project Manager, Mr. Bruce Handel visited the site and discussed various issues. |
| | 0815 | Mr. Bruce Handel departed the site. |
| | 0900 | Accepted delivery of the rental tractor (United Rentals) with grass cutter. Started grubbing operations with tractor in Sector 5 grids that will be geophysically surveyed. Surveyors continued laying out the grid network. Continued making arrangements to complete site setup. |
| | 0930 | Visited the Sector 2 area again and realized the only access to the area was through the housing area/land development off of Rose Drive. There is a security gate there maintained by Ligour Security Company. Met with the security company shift supervisor and gained access to Sector 2 through the security gate. He referred me to Mr. Ted Splitter of Environmental Technology, who is the site supervisor for the land development company. Discussed access issue to this area with Mr. Splitter and he will allow us continuous access through the security gate as long as we provide the gate guard with a list of personnel who will be requiring access. Viewed Sector 2 with surveyors. |
| | 1230 | Continued grubbing and grid network layout operations. Commenced geophysical survey of grids on the west side of highway I-680. |
| | 1600 | Secured for the day. |
| 03/19/01 | 0600 | Conducted Daily Safety Brief. |
| | 0630 | Continued grubbing, grid network layout, and geophysical surveying operation. Continued making arrangements to complete site setup. |
| | 0710 | Mr. John Esparza from the Sacramento COE visited the site and discussed various issues. |
| | 0825 | Mr. John Esparza departed the site. |
| | 0945 | Accepted delivery of a larger tractor (Hertz) with grass cutter. |
| | 1020 | Surveyors completed grid network layout. SUXOS viewed all sectors with the surveyors. |
| | 1200 | Lunch |



**EODT Senior UXO Supervisor Daily Log
OE Removal Action, Former Benicia Arsenal, Benicia, California**

| Date | Time | Event |
|----------|------|--|
| | 1230 | Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids B10, B11, and C11. Continued making arrangements to complete site set up. |
| | 1630 | Secured for the day. |
| 03/20/01 | 0600 | Conducted Daily Safety Brief. |
| | 0630 | Continued grubbing and geophysical survey operations in the grids west of highway I-680. Continued making arrangements to complete site setup. |
| | 1230 | Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids C10, D10, A10, A11, D11, and D12. |
| | 1410 | Accepted delivery of the port-a-pottie. |
| | 1630 | Secured for the day. |
| 03/21/01 | 0600 | Conducted Daily Safety Brief. |
| | 0630 | Conducted test grid prove out using the GS 858 magnetometer. Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Continued making arrangements to complete site setup. |
| | 0735 | Rental company (United Rentals) picked up small tractor with grass cutter and delivered weed eater with face shield and harness. |
| | 1230 | Accepted delivery of weed eater, harness, and face shield from rental company (Hertz). Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids B12, B13, C12, C13, G15, H15, J15, H16, and G16. |
| | 1425 | Accepted delivery of conex box (Hertz). |
| | 1630 | Secured for the day. |
| 03/22/01 | 0600 | Conducted Daily Safety Brief. |
| | 0630 | Conducted test grid prove out using the GS 858 magnetometer. Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Continued making arrangements to complete site set up. |
| | 0735 | Rental company (Hertz) picked up large tractor with grass cutter. |



**EODT Senior UXO Supervisor Daily Log
OE Removal Action, Former Benicia Arsenal, Benicia, California**

| Date | Time | Event |
|-------------|-------------|--|
| | 1230 | Continued grubbing and geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids D13, E11, E12, and E13. |
| | 1630 | Secured for the day. |
| 03/26/01 | 0600 | Daily Safety Brief |
| | 0630 | Continued geophysical surveying operations in the grids west of highway I-680. Continued with site setup. |
| | 1230 | Continued geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids A9, B9, C9, B8 and J16. Continued with site setup. |
| | 1630 | Secured for the day. |
| 03/27/01 | 0600 | Daily Safety Brief. |
| | 0630 | Encountered problems with the geophysical survey equipment: Husky data recorder batteries were weak. Conducted general site maintenance. Continued with site setup. |
| | 1230 | Continued with general site maintenance and site setup. Rental company (United Rentals) picked up the weed eater, harness, and face shield. |
| | 1630 | Secured for the day. |
| 03/28/01 | 0600 | Daily Safety Brief. |
| | 0630 | Continued to experience problems with the Husky data recorder. Geo Team attempted to repair unit, but were unsuccessful. Another unit was ordered and will be arriving tomorrow. Conducted administrative matters and continued with site setup. |
| | 1230 | Continued with administrative matters and site setup. |
| | 1630 | Secured for the day. |
| 03/29/01 | 0600 | Daily Safety Brief. |
| | 0630 | Received replacement Husky data recorder. Conducted geophysical surveying operations in the grids west of highway I-680. Continued with site setup. |
| | 1230 | Continued geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids K17, and L17. Continued with site setup. |
| | 1630 | Secured for the day. |

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| Date | Time | Event |
|-------------|-------------|--|
| 04/02/01 | 0600 | Daily Safety Brief for Geo Team. |
| | 0630 | Conducted geophysical surveying operations in the grids west of highway I-680. Mobilized seven UXO Technician IIs, and one UXO Technician III. The EODT Certified Industrial Hygienist (CIH), Mr. Drew Bryson, arrived to assist in presenting the Site Specific Safety and Health Plan (SSHP) and the OSHA 8-HR Refresher course. |
| | 1230 | Conducted administrative matters concerning the mobilization of the additional personnel. Continued geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids M17, and J15. |
| | 1630 | Secured for the day. |
| 04/03/01 | 0600 | Daily Safety Brief for Geo Team. |
| | 0630 | Conducted geophysical surveying operations in the grids west of highway I-680. |
| | 0700 | Site Specific Training commenced. SUXOS conducted "Welcome Aboard" and had all personnel complete administrative requirements (paperwork). EODT CIH commenced training per the SSHP. |
| | 0930 | Geophysical Team started but did not complete grid L15. The Rover batteries were weak and data could not be collected. Secured Geo Team for the day. They will work on Friday. |
| | 1230 | EODT CIH continued training per the SSHP. |
| | 1730 | Secured for the day. |
| 04/04/01 | 0600 | Daily Safety Brief for Geo Team. |
| | 0630 | Conducted geophysical surveying operations in the grids west of highway I-680. |
| | 0700 | EODT CIH continued training per the SSHP. |
| | 1230 | Continued geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grid L14, L15, K15 and J14. EODT CIH continued training per the SSHP. |
| | 1630 | Geo Team secured for the day. |
| | 1730 | Secured for the day. |
| 04/05/01 | 0600 | Daily Safety Brief for Geo Team. |



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| Date | Time | Event |
|----------|------|---|
| | 0630 | Conducted geophysical surveying operations in the grids west of highway I-680. |
| | 0700 | EODT CIH completed SSHP training. CIH conducted the OSHA 8-HR Refresher training, followed by a written examination. All personnel passed. Received word from the EODT Project Manager (PM), Mr. Dave Frandsen, that the site would be shutdown until 30 April. All personnel, with the exception of the Geo Team, SUXOS, UXOSO, and the UXOQC were to demobilize on Friday, 6 April. |
| | 1230 | Continued geophysical surveying operations in the grids west of highway I-680. Geophysical Team completed grids H14, H13, I14, I13, and J13. SUXOS conducted Site Specific Training using the Work Plan and maps of Sectors 2, 4, and 5. SUXOS then brought personnel to site and showed them the equipment storage conex, test plot, ORS storage magazine, and all three sectors. |
| | 1630 | Geo Team secured for the day. |
| | 1730 | Secured for the day. |
| 04/06/01 | 0600 | Daily Safety Brief for Geo Team. |
| | 0630 | The EODT CIH departed. Conducted survey of east side of Highway I-680. Identified all grids that could be mapped by attaching yellow construction ribbon to the SW corner grid stake. Conducted weed eating on the east side of I-680. |
| | 0700 | All personnel, with the exception the Geo Team, SUXOS, UXOSO, and the UXOQC demobilized. |
| | 1230 | Continued survey of east side of Highway I-680, identifying all grids that could be mapped by attaching yellow construction ribbon to the SW corner grid stake. Continued weed eating on the east side of I-680. |
| | 1630 | Geo Team secured for the day. |
| 04/9/01 | 0600 | Daily Safety Brief. |
| | 0630 | Conducted geophysical surveying operations in the grids west of highway I-680. SUXOS, UXOSO, and the UXOQC started setting up the site office, discussing Work Plan issues, and developing plans for the start of intrusive operations. |



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| Date | Time | Event |
|----------|------|--|
| | 1230 | Continued survey of east side of Highway I-680, identifying all grids that could be mapped by attaching yellow construction ribbon to the SW corner grid stake. Continued weed eating on the east side of I-680. |
| | 1630 | Secured for the day. |
| 04/10/01 | 0600 | Daily Safety Brief. |
| | 0630 | Conducted geophysical surveying operations in the grids east of highway I-680. The EODT Quality Assurance Manager (QAM), Mr. Tim Bohannon, arrived to provide training in the requirements for International Standards Organization (ISO) 2001. Additionally, the QAM held detailed discussions with the SUXOS, UXOSO, and UXOQC. A QA Audit Assist was completed and problem areas were identified and required corrective actions developed. |
| | 1230 | Continued geophysical surveying operations in the grids east of highway I-680. Geophysical Team completed grids H14, H3, G3, F3, F2, G2, and H2. Geo Team used Schonstedts to collect data from areas in the west side of Highway I680 that were inaccessible to the EM-61. |
| | 1630 | Secured for the day. |
| 04/11/01 | 0600 | Daily Safety Brief. |
| | 0630 | The EODT QAM departed. Conducted geophysical surveying operations in the grids east of highway I-680. Continued with weed eating on the east side of Highway I-680. |
| | 1230 | Met with Captain Pleasant, Security Officer for the Benicia Toll Bridge Authority, to discuss bridge fares for personnel returning from work on the east side of Highway I-680. Captain Pleasant arranged for all EODT personnel to have no cost travel across the bridge during working hours. Continued geophysical surveying operations in the grids east of Highway I-680. Geophysical Team completed grids O4, O5, and used Schonstedts to collect data from areas in the west side of Highway I-680 that were inaccessible to the EM-61. |
| | 1630 | Secured for the day. |
| 04/12/01 | 0600 | Daily Safety Brief. |



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| Date | Time | Event |
|----------|------|--|
| | 0630 | Completed geophysical surveying operations in the grids east of highway I-680. SUXSO, UXOSO, and UXOQC continued to set up office. |
| | 1230 | Continued using Schonstedts to collect data from areas in the west side of Highway I-680 that were inaccessible to the EM-61. |
| | 1630 | Secured for the day. |
| 04/16/01 | 0600 | Daily Safety Brief. |
| | 0630 | Conducted geophysical surveying operations in the Sector 5 grids adjacent to the Camel Barn Museum Building. |
| | 1230 | Continued geophysical surveying operations in Sector 5 grids adjacent to the Camel Barn Museum Building. |
| | 1630 | Secured for the day. |
| 04/17/01 | 0600 | Daily Safety Brief. |
| | 0630 | Continued conducting geophysical surveying operations in the Sector 5 grids adjacent to the Camel Barn Museum Building. |
| | 1045 | Received telephone call from Mr. John Esparza from Sacramento COE concerning Benicia site issues. Discussed evacuation plan being developed by Sacramento COE for demolition operations. Provided him with information concerning Benicia Fire Department providing primary firefighting capability during demolition operations. Told him we planned on using a water buffalo to wet down the demolition shot and surrounding area to help prevent fires from starting. |
| | 1330 | Received telephone call from Lt. Steve Mortensen, Officer-In-Charge of Patrol Division of the Benicia Police Department. He was called by Sacramento COE to discuss security during demolition operations. Set up a meeting with him, George Mackanin (UXOQC) and myself for Wednesday, 18 April at 1500. |
| | 1630 | Secured for the day. |
| 04/18/01 | 0600 | Daily Safety Brief. |
| | 0630 | Geo Team used Schonstedt magnetometers to map areas in Sector 5 grids adjacent to the Camel barn Museum buildings where the EM-61 was unable to be towed. |
| | 1500 | Met with LT Steve Mortensen of the Benicia Police Department concerning roadblock issues if we have demolition operations. |



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| Date | Time | Event |
|-------------|-------------|---|
| | 1630 | Secured for the day. |
| 04/19/01 | 0600 | Daily Safety Brief. |
| | 0630 | Continued to mow and weed eat in the Sector 5 |
| | 1230 | Continued to mow and weed eat in the Sector 5 |
| | 1630 | Secured for the day. |
| 04/23/01 | 0600 | Daily Safety Brief. |
| | 0630 | Continued to mow and weed eat in the Sector 5 grids |
| | 1230 | Continued to mow and weed eat in the Sector 5 |
| | 1445 | Met with Mr. Jim Triplett of AMPORTS and rented a magazine for storage of ORS scrap, gasoline, and weed eaters. |
| | 1500 | Contacted Mr. Simon Peterson (AMPORTS Maintenance Supervisor) per Jim Triplett's direction. Discussed repair and cleaning of the rented magazine vent system. |
| | 1630 | Secured for the day. |
| 04/24/01 | 0600 | Daily Safety Brief. |
| | 0630 | Continued to mow and weed eat in the Sector 5 Continued with site set up. AMPORTS maintenance personnel clean rented magazine vent shaft and install a new wind powered rotary ventilator. |
| | 1230 | Continued to mow and weed eat in the Sector 5. |
| | 1300 | UXOQC met with Mr. Chuck Shawe, Benicia Assistant-Fire-Chief. Gave him copies of Sector maps and Austin Powder permits for explosive delivery. Acquired emergency phone numbers and make appointment for site visit on 4/27/01. |
| | 1300 | Called Solano County Department of Environmental Management and talk with Mr. Dave Eubanks concerning combined storage of gasoline, weed eaters, POL in rented magazine. He said we were legal in doing it. However, from a compatibility standpoint we should contact the local Fire Department. |
| | 1630 | Secured for the day. |
| 04/25/01 | 0600 | Daily Safety Brief. |
| | 0630 | Mr. Bob Nore, Mr. Scott Bradley, and Dave Frandsen arrive for discussions about procedures for intrusive operations. |
| | 1410 | Continued discussions with Mr. Bob Nore, Mr. Scott Bradley, and Dave Frandsen concerning evening Town Meeting. |



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| Date | Time | Event |
|-------------|-------------|--|
| | 1700 | Meeting at conex with Mr. Nore, Mr. Bradley, Mr. John Esparza, Dave Frandsen about Town Meeting, and tomorrow's schedule, |
| | 1800 | Assist with set up of Town Meeting at the Benicia Public Library. |
| | 1830 | Attend Town Meeting and talk with various local government officials, business owners, and general public. |
| 04/26/01 | 0600 | Daily Safety Brief. |
| | 0630 | Mr. Chuck Welk of GMS, starts to lay grid network in OS25. Geo Team mapping grids in Sector 5. |
| | 0800 | Mr. Nore, Mr. Bradley, Mr. Esparza, Dave Frandsen, and SUXOS visit all sectors to discuss in detail exactly what areas will be worked, and exactly how they will be worked, what is considered fill and what is not. Areas of fill will not be cleared. |
| | 1700 | Secured for the day. |
| 04/27/01 | 0930 | UXOQC tours all sectors with Mr. Shawe, Benicia Assistant Fire Chief to identify and discuss fire issues during demolition operations. Additionally, discussed compatibility storage issues in the magazine. Our storage plan for the magazine is okay with him. |
| 04/30/01 | 0600 | Daily Safety Brief, field personnel began to mobilize |
| 5/1 | 0600 | Daily Safety Brief, held site familiarization for all personnel |
| 5/2 | 0600 | Daily Safety Brief, continued site specific training |
| 5/3 | 0600 | Daily Safety Brief, Began intrusive, located OE in Grid S5-K10 late in the day and was not able to perform disposal operations and hired a security guard to ensure the item was not moved. |
| 5/7 | 0600 | Daily Safety Brief, ID'ed the OE and was able to classify it as ORS |
| 5/8 | 0600 | Daily Safety Brief, continued Removal Activities |
| 5/9 | 0600 | Daily Safety Brief, continued Removal Activities |
| 5/10 | 0600 | Daily Safety Brief, continued Removal Activities |
| 5/14 | | Picked up a 500 gal water trailer and ¾ ton truck with hitch from Hertz. Water trailer is for fire suppression during demo ops. |
| | | |
| 5/15 | | Demo ops. First demo for the project. Benicia asst Fire Marshall Chuck Shawe was on-site to observe beginning of demo ops. Things went well and all OE and suspected OE was destroyed and misc ORS demilled by venting. |

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| Date | Time | Event |
|------|------|---|
| 5/16 | | Toured Sectors 2 and 4 with Bob Nore and Dave Frandsen. COE Geo and EODT corporate Geo also were on site. Bruce Handel visited |
| | 1530 | DTSC visited site at COB and was given a tour of the mag and a short brief on status by the SUXOS. |
| | | Bruce Handel visited site to meet with Dave Frandsen and Bob Nore |
| 5/17 | | |
| 5/18 | | Received call from Bob Nore about notification of Demo Ops. He wanted to know if Bruce Handel was on the notification. I told him know and agreed to add him to all demo notifications in the future. |
| | | Received a call from the Benicia City Attorney's office. She informed me that two people had called about the notifications they had received from COE (Sac). They had tried to call the number listed but were unable to get through. I agreed to pass this on to Handel. I left a msg for him on his cell phone and he returned my call. He had already received the same info and contacted both interested parties. |
| | | |
| 5/21 | | Met At Sector 4 with Benicia FD about controlled burns planned in area for 31 May – 9 Jun |
| | | Contacted HMT and Ryder Leasing about access through their property to access lower area of Sector 2. Ryder had the best location and gave permission to temporarily remove a section of their fence and to access through vehicle. They also said we could have a Porta-john placed on their lot. POC at Ryder was Tom Morrow (Service Team Leader) |
| | | Showed team leaders their starting areas in Sectors 2 and 4 to begin on 5/22. During walk through on Sector 4 we found ORS from 155mm projo |
| | | Returned call from Bruce Handel about controlled burns in area. I informed him that we were aware of it already and discussed the impact it would have on us both, pro and con. |
| 5/22 | | Started Sectors 2 and 4 with one team each. |



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| Date | Time | Event |
|------|------|--|
| 5/23 | | Received call from David Kersten (Benicia Herald 745-0733). He requested an interview. He was referred to Bruce Handel. |
| 5/24 | | Demo Day |
| 5/31 | | Demo day- Tm 1 was only team involved |
| 6/1 | 1230 | Terry Collins reported that the conex was open and reported it to the SUXOS. He looked around and thought that everything looked to be in place. Equipment was still neatly on shelves and no signs of ransacking were present. |
| 6/4 | 0600 | When teams arrived for work it became obvious that the conex had several items stolen from it. Major gear included 5 Schonstedts, the wet bulb thermometer, sound dosimeter, the team boxes containing numerous small items. The Benicia PD was notified and an officer came to the site and took a full report. |
| | | Teams were all in the field by 0730 after ensuring minimum safety gear was available. Local purchases of some equipment were made and other routine items were requested through Knoxville. |
| 6/5 | 1400 | An M1 Landmine was found in Sector 2 Grid S2-B4. The mine was unfuzed and the case disrupted and laid open. The filler was partially present. |
| 6/6 | | A brush fire started near Sector 2 and then continued to spread into the northeast portion of the sector. The Fire Dept traced the source to hot work being performed at a nearby workshop. Approx 6 grids in Sector 2 were partially burned off. Team 2 had to evacuate the area leaving some lines and tape measures in the grid. The lines and tapes were destroyed but all other equipment was saved. Total value of lost equipment was less than \$100. |
| 6/7 | 0700 | Demo day. All ordnance was destroyed in 3 shots |
| | | Drew Bryson, corporate CIH arrived. He will audit safety and conduct a OSHA refresher while here. |
| 6/8 | 0800 | Drew Bryson conducted an 8-hr OSHA refresher 8 June for 6 personnel. |
| | 1430 | Contact was made on 8 June between SUXOS (K. Groff) and Lucy & Co (Nikole Pock). General question were answered and some photos are to be selected and e-mailed to Ms. Pock by the SUXOS |



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| Date | Time | Event |
|------|------|---|
| 6/13 | | Benicia PD Investigator Tom McBroom visited site to interview EODT employees concerning equipment theft previously reported |
| | | We have received verbal notification that the exclusion zone distances will be reduced based on results of the meeting held in Huntsville on 6/12/01. |
| 6/14 | | 3 Demo shots were made on Thursday, June 14th without incident. 6 OE items were destroyed and 2 ORS items were vented/demilled. |
| 6/20 | | One 60mm HE Mortar in Sector 2 Grid S2-F4. Austin Powder was contacted and demo was done in the afternoon. This was the first demo done in Sector 2 |
| | | Bruce Handel (Sac COE) visited office 6/20 to pick up maps for RAB mtg. The RAB was not attended by EODT or Huntsville reps |
| 6/21 | | Two demo shots were made in Sector 5 Thursday; June 21st. 13 suspect OE and ORS items were vented/demilled. Mark Vest (Cal-EPA DTSC) was on site during demo ops 6/21. |
| 6/28 | | 2 demo shots were made in Sector 5 Thursday, June 28th. 7 suspect OE and 19 ORS items were vented/demilled |
| | | Bruce Handel (Sac COE), Mark Vest (DTSC) and Christine Parent (DTSC) were on-site to observe demo operations. Bruce Handel toured Sector 2 with SUXOS upon completion of demo. |
| 7/3 | | We have rented a backhoe and started clearing grids requiring excavations too time consuming to complete manually |
| | | Areas of Poison Oak patches are starting to be cleared by teams outfitted in appropriate PPE |
| 7/5 | | 1 demo shot was made in Sector 5 Thursday, July 5th. 3 suspect OE and 6 ORS items were vented/demilled. |
| 7/12 | | 7 demo shots were made in Sector 5 Thursday, July 12th. 22 suspect OE and 15 ORS items were vented/demilled |
| 7/19 | | 2 demo shots were made in Sector 5 Thursday, July 19th. 5 suspect OE and 9 ORS items were vented/demilled. |



**EODT Senior UXO Supervisor Daily Log
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| Date | Time | Event |
|------|------|---|
| | | A meeting was held Thursday 7/19 to discuss the remaining areas of concern. The following people attended: Bob. Nore (CEHNC PM), Bruce Handel (Sac COE), John Esparza (Sac COE), and Dave Frandsen (EODT PM) |
| 7/24 | | A projectile base fuze was found and explosively vented in Sector 2 Grid S2-E5. |
| 7/25 | | Terry Gleason visited Sector 5. No specific purpose. |
| 7/26 | | John Esparza and a biologist from Sacramento district visited Sector 2 on July 26th to evaluate the habitat around the water areas |
| 8/1 | | During a phone conversation Aug 1st Bruce Handel requested that the SUXOS not give any specific project info to DTSC if asked. Mr. Handel also requested that COE Safety be informed of his request. |
| 8/2 | | 3 demo shots were made in Sector 5 on Thursday, August 2. 16 suspect OE items were destroyed and 15 ORS items were vented/demilled |
| | | Christine Parent and Mark Vest (DTSC) were on site Aug 2nd during demolition operations. |
| 8/6 | | Nikole of Lucy & Co, the Sacramento, COE subcontractor for certain PAO functions, contacted SUXOS. Photos or diagrams of the OE being found were requested. They were e-mailed requested items the same day with an info copy to Bruce Handel. |
| 8/8 | | Bruce Handel visited the EODT field office Aug 8th. He picked up copies of photos for the RAB mtg scheduled for Aug 15th. Mr. Handel also delivered a memorandum from the Environmental Resources Branch concerning the Site visit to Sector 2 on July 27th |
| 8/13 | | Dave farmer arrived to conduct EM-61 survey of OS25A this week |
| 8/14 | | Sector 2 is complete and all grids have passed QA |
| 8/15 | | Bruce Handel picked up Sector maps to use at the RAB meeting this evening |
| 8/16 | | Geo Team was not able to complete OS25A. Farmer will stay for another week if necessary. |
| 8/20 | | Dave Frandsen (EODT PM) arrived in Benicia. He will be On-site all week. |



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| Date | Time | Event |
|------|------|---|
| 8/21 | | Bob Nore (Huntsville), Bruce Handel and John Esparza (Sacramento), and Dave Frandsen (EODT PM) met on Tues 8/21 to discuss the Erosion Report. |
| | | EM-61 Survey of OS25A completed. |
| 8/22 | | Dave Farmer transferred back to Ft Campbell |
| 8/23 | | 4 shots were conducted on Thu 8/23. 21 OE items were destroyed and misc ORS was vented/demilled |
| 8/27 | | Teams combined into two 7-man teams so team separation distances can be maintained. |
| 8/28 | | Sector 4 completed today. |
| 8/30 | | Terry Gleason (COE Sacramento) visited site |
| | | QA of Sector 4 was completed |
| | | UXOQCS demobed on 8/30/01 and we will have a combined SSO/QCS for the remainder of the job |
| 9/4 | | A burial pit was excavated in S5-M13 |
| 9/5 | | Bruce Handel and Terry Gleason (COE Sacramento) visited site. During visit Terry Gleason (Sacramento OE Safety Specialist) selected ORS for transfer to Sacramento District as authorized by Huntsville PM e-mail of 9 Aug 01 |
| | | |
| 9/12 | | In AS5 Grid K4 we found a few shallow pits of ORS that had apparently been disposed of by burning and discarded. This is near the old tank in the grids east of I680. |
| 9/13 | | Two transfers of ORS were done. 1760 lbs of ORS was turned in to ALCO Iron & Metal Co. of Vallejo, CA. 80 lbs of assorted frag and inert ordnance items were turned over to the COE Sacramento District. Both transfers were done using form DD 1348-1A |
| | | |
| | | |
| 9/18 | | The COE owned blast mitigation shelter (Bud Light) was transferred to the City of Benicia, Public Works Dept for storage; POC is Russ Clifton, ph 707-746-4297. Transfer was done using form DD 1348-1A. |



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| Date | Time | Event |
|------|------|---|
| 9/20 | | Three demo shots were made on Thu 9/20. Destruction of suspect OE and demil of all items recovered to date was completed. |
| | | Christine Parent and Mark Vest (DTSC) visited site on Thu 9/20. They stayed until after first demo shot was fired. |
| 9/24 | | Bruce Handel visited site 9/24 to get update on current status. He did not go down range or visit grid K4. |
| 9/26 | | Turn-in of scrap to ALCO Iron & Metal Co. of Vallejo, CA |
| 9/27 | | Two demo shots were made on Thu 9/27. All items destroyed were ORS that needed to be demilled |
| | | Final turn-in of scrap to ALCO Iron & Metal Co. of Vallejo, CA The two transfers on 9/26 and 9/27 totaled 4.950 lbs and was signed for using DD Form 1348-1A. Total scrap ORS turned in for the project was 6.710 lbs |
| | | Christine Parent and Mark Vest (DTSC) were on site 9/27. They observed the final demo shot and viewed the final load of ORS being turned in as scrap. |
| | | |

SUXOS/PM Signature
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APPENDIX D

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grubbed | Date Cleared | Mag or Gas | Dgn | ID# | Item ID, "M" No. If Available | Condition | X-Ft (East) | Y-Ft (North) | Z-depth (Deep) | Filler | OE Scrap | Other Scrap | Demo Date | Set Type | OC Date | CA Date |
|-------------|--------------|--------------|----------------------------------|------|-----|-------------------------------|-----------|-------------|--------------|----------------|--------|----------|-------------|-----------|----------|----------|----------|
| A3 | | 06/04/01 | Mag | 80 | | | | | | | | 2 | 6 | | LO | 06/18/01 | 06/19/01 |
| A4 | | 06/04/01 | Mag | 30 | | | | | | | | 1 | 10 | | LO | 06/18/01 | 06/19/01 |
| A5 | | 07/19/01 | Mag | 41 | | | | | | | | 0 | 4 | | LO | 07/24/01 | 07/31/01 |
| A6 | 06/26/01 | 07/19/01 | Mag | 17 | | | | | | | | 0 | 2 | | LO | 07/24/01 | 07/31/01 |
| A7 | 06/26/01 | 07/19/01 | Mag | 45 | | | | | | | | 0 | 6 | | LO | 07/24/01 | 07/31/01 |
| B3 | | 06/06/01 | Mag | 30 | | | | | | | | 0 | 10 | | LO | 06/18/01 | 06/19/01 |
| B4 | | 06/05/01 | Mag | 48 | 1 | Landmine, M1 | unfuzed | 48 | 28 | 22 | HE | 3 | 19 | 06/07/01 | LO | 06/18/01 | 06/19/01 |
| B5 | | 07/19/01 | Mag | 35 | | | | | | | | 1 | 7 | | LO | 07/25/01 | 07/31/01 |
| B6 | 07/26/01 | 08/02/01 | Mag | 48 | | | | | | | | 0 | 32 | | LO | 08/08/01 | 08/09/01 |
| B7 | | 08/06/01 | Mag | 111 | | | | | | | | 0 | 9 | | LO | 08/08/01 | 08/09/01 |
| | | | Subsurface Anomaly Left in Place | | 1 | Anomaly | | 87 | 61 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 2 | Anomaly | | 21 | 70 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 3 | Anomaly | | 10 | 72 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 4 | Anomaly | | 10 | 74 | Unknown | | | | | | | |
| B8 | | 08/06/01 | Mag | 23 | | | | | | | | 0 | 4 | | LO | 08/08/01 | 08/09/01 |
| | | | Subsurface Anomaly Left in Place | | 1 | Anomaly | | 19 | 74 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 2 | Anomaly | | 25 | 77 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 3 | Anomaly | | 72 | 6 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 4 | Anomaly | | 88 | 0 | Unknown | | | | | | | |
| B9 | | 05/31/01 | Mag | 45 | | | | | | | | 0 | 2 | | LO | 08/08/01 | 08/09/01 |
| B10 | | 05/31/01 | Mag | 39 | | | | | | | | 0 | 5 | | LO | 08/08/01 | 08/09/01 |
| B11 | 06/26/01 | 07/19/01 | Mag | 64 | | | | | | | | 0 | 39 | | LO | 07/25/01 | 07/28/01 |
| B12 | | 07/18/01 | Mag | 23 | | | | | | | | 5 | 7 | | LO | 07/25/01 | 07/26/01 |
| | | | Subsurface Anomaly Left in Place | | 1 | Anomaly | | 51 | 73 | Unknown | | | | | | | |
| C2 | | 07/18/01 | Mag | 1 | | | | | | | | 0 | 1 | | LO | 07/24/01 | 07/31/01 |
| C3 | | 08/06/01 | Mag | 27 | | | | | | | | 0 | 4 | | LO | 06/18/01 | 06/19/01 |
| C4 | | 08/06/01 | Mag | 26 | | | | | | | | 0 | 6 | | LO | 06/18/01 | 06/19/01 |
| C5 | | 07/26/01 | Mag | 3 | | | | | | | | 1 | 0 | | LO | 08/08/01 | 08/09/01 |
| C6 | | 07/12/01 | Mag | 120 | ORS | Mortar, 60mm Illum | Inert | | | | na | 5 | 30 | | LO | 07/25/01 | 07/31/01 |
| C7 | | 07/31/01 | Mag | 39 | ORS | Mortar, 60mm Illum | Inert | | | | na | 1 | 107 | | LO | 08/09/01 | 08/14/01 |
| C8 | 07/30/01 | 07/30/01 | Mag | 1500 | ORS | Mortar, 60mm Illum | Inert | | | | na | 6 | 115 | | LO | 08/09/01 | 08/14/01 |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| C9 | 07/30/01 | 08/02/01 | Mag | | ORS | Mortar, 60mm Illum | Inert | | | | na | 22 | 86 | | LO | 08/09/01 | 08/14/01 |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal
Contract Number: DACA87-97-D-0005 TO# 0019
Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grabbed | Date Cleared | Mag or Geo | Digs | ID# | Item ID, MP No. If Available | Condition | X-FT (East) | Y-FT (North) | Z-Inches (Deep) | Filler | OE Scrap | Other Scrap | Demo Date | Soft Type | QC Date | QA Date |
|-------------|--------------|--------------|------------|------|-----|----------------------------------|-----------|-------------|--------------|-----------------|--------|----------|-------------|-----------|-----------|----------|----------|
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| C10 | 08/01/01 | 08/02/01 | Mag | | ORS | Mortar, 60mm Illum | Inert | | | | na | 4 | 24 | | LO | 08/09/01 | 08/14/01 |
| | | | | | ORS | Mortar, 60mm Illum | Inert | | | | na | | | | | | |
| C11 | 06/26/01 | 08/06/01 | Mag | 103 | | | | | | | | 0 | 12 | | LO | 08/09/01 | 08/14/01 |
| C12 | 05/24/01 | 05/30/01 | Mag | 186 | ORS | Tail Boom, Mortar | Inert | | | | na | 1 | 95 | | LO | 08/07/01 | 07/26/01 |
| | | | | | | Subsurface Anomaly Left in Place | | | | | | | | | | | |
| | | | | | 1 | Anomaly | | 68 | 8 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 68 | 23 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 76 | 21 | Unknown | | | | | | | |
| | | | | | 4 | Anomaly | | 67 | 37 | Unknown | | | | | | | |
| | | | | | 5 | Anomaly | | 84 | 39 | Unknown | | | | | | | |
| | | | | | 6 | Anomaly | | 90 | 42 | Unknown | | | | | | | |
| | | | | | 7 | Anomaly | | 95 | 42 | Unknown | | | | | | | |
| | | | | | 8 | Anomaly | | 98 | 93 | Unknown | | | | | | | |
| | | | | | 9 | Anomaly | | 99 | 91 | Unknown | | | | | | | |
| D3 | | 06/07/01 | Mag | 30 | | | | | | | | 1 | 4 | | LO | 06/18/01 | 07/31/01 |
| D4 | | 06/07/01 | Mag | 15 | ORS | Projo, 37mm M54 | Inert | | | | na | 3 | 2 | | LO | 06/18/01 | 06/25/01 |
| D5 | | 07/26/01 | Mag | 19 | | | | | | | | 1 | 9 | | LO | 08/08/01 | 08/09/01 |
| D6 | 07/11/01 | 07/11/01 | Mag | 32 | ORS | Tail Boom, Mortar | Inert | | | | na | 2 | 22 | | LO | 07/25/01 | 07/31/01 |
| D7 | | 07/11/01 | Mag | 21 | | | | | | | | 0 | 3 | | LO | 07/25/01 | 07/31/01 |
| D8 | | 07/10/01 | Mag | 5 | | | | | | | | 0 | 1 | | LO | 07/25/01 | 07/31/01 |
| D9 | | 08/07/01 | Mag | 194 | | | | | | | | 0 | 67 | | LO | 08/09/01 | 08/14/01 |
| | | | | | 1 | Anomaly | | 22 | 99 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 55 | 100 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 82 | 82 | Unknown | | | | | | | |
| D10 | | 08/07/01 | Mag | 228 | | | | | | | | 0 | 204 | | LO | 08/09/01 | 08/14/01 |
| | | | | | 1 | Anomaly | | 25 | 60 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 31 | 41 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 47 | 23 | Unknown | | | | | | | |
| D11 | | 08/08/01 | Mag | 500 | | | | | | | | 0 | 106 | | LO | 08/09/01 | 08/14/01 |
| | | | | | 1 | Anomaly | | 22 | 36 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 24 | 33 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 37 | 17 | Unknown | | | | | | | |
| | | | | | 4 | Anomaly | | 60 | 27 | Unknown | | | | | | | |
| | | | | | 5 | Anomaly | | 78 | 30 | Unknown | | | | | | | |
| | | | | | 6 | Anomaly | | 84 | 29 | Unknown | | | | | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grubbed | Date Cleared | Mag or Gas | Digi | ID# | Item ID *M* No. If Available | Condition | X-Ft (East) | Y-Ft (North) | Z-Inches (Deep) | Filter | OE Scrap | Other Scrap | Demo Date | Soil Type | OC Date | QA Date |
|-------------|--------------|--------------|------------|------|-----|------------------------------|-----------|-------------|--------------|-----------------|--------|----------|-------------|-----------|-----------|----------|----------|
| D12 | | 08/08/01 | Mag | 97 | | | | | | | | 0 | 15 | | LO | 08/13/01 | 08/14/01 |
| | | | | | 1 | Anomaly | | 35 | 67 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 37 | 68 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 18 | 6 | Unknown | | | | | | | |
| D13 | | 08/09/01 | Mag | 221 | | | | | | | | 0 | 34 | | LO | 08/09/01 | 08/14/01 |
| E2 | | 06/07/01 | Mag | 10 | | | | | | | | 1 | 2 | | LO | 06/18/01 | 07/31/01 |
| E3 | 07/23/01 | 07/24/01 | Mag | 0 | | | | | | | | 0 | 1 | | LO | 07/25/01 | 07/31/01 |
| E4 | | 05/31/01 | Mag | 15 | | | | | | | | 0 | 3 | | LO | 06/19/01 | 06/25/01 |
| | | | | | 1 | Anomaly | | 76 | 5 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 72 | 16 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 78 | 92 | Unknown | | | | | | | |
| | | | | | 4 | Anomaly | | 75 | 96 | Unknown | | | | | | | |
| | | | | | 5 | Anomaly | | 75 | 26 | Unknown | | | | | | | |
| | | | | | 6 | Anomaly | | 66 | 26 | Unknown | | | | | | | |
| | | | | | 7 | Anomaly | | 66 | 68 | Unknown | | | | | | | |
| | | | | | 8 | Anomaly | | 36 | 46 | Unknown | | | | | | | |
| | | | | | 9 | Anomaly | | 34 | 56 | Unknown | | | | | | | |
| | | | | | 10 | Anomaly | | 21 | 69 | Unknown | | | | | | | |
| | | | | | 11 | Anomaly | | 5 | 88 | Unknown | | | | | | | |
| | | | | | 12 | Anomaly | | 3 | 79 | Unknown | | | | | | | |
| E5 | 07/23/01 | 07/26/01 | Mag | 114 | 1 | Fuze, projo BD | Fuzed | 11 | 30 | | 0 HE | 1 | 96 | 07/24/01 | LO | 08/08/01 | 08/09/01 |
| E6 | 07/23/01 | 07/30/01 | Mag | 60 | | | | | | | | 1 | 9 | | LO | 08/08/01 | 08/09/01 |
| | | | | | 4 | Anomaly | | 64 | 70 | Unknown | | | | | | | |
| | | | | | 5 | Anomaly | | 64 | 70 | Unknown | | | | | | | |
| | | | | | 6 | Anomaly | | 74 | 72 | Unknown | | | | | | | |
| | | | | | 7 | Anomaly | | 73 | 72 | Unknown | | | | | | | |
| E7 | 06/11/01 | 06/11/01 | Mag | 59 | ORS | Mortar, 60mm Illum | | | | | na | 1 | 17 | 06/28/01 | LO | 06/25/01 | 07/31/01 |
| | | | | | 2 | Anomaly | | 83 | 104 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 88 | 110 | Unknown | | | | | | | |
| E8 | | 06/12/01 | Mag | 10 | | | | | | | | 0 | 0 | | LO | 06/25/01 | 06/26/01 |
| E9 | | 06/12/01 | Mag | 19 | | | | | | | | 0 | 2 | | LO | 07/25/01 | 07/31/01 |
| E10 | | 06/12/01 | Mag | 11 | | | | | | | | 0 | 1 | | LO | 06/25/01 | 06/26/01 |
| E11 | | 06/13/01 | Mag | 8 | | | | | | | | 0 | 1 | | LO | 06/19/01 | 06/26/01 |
| E12 | 05/23/01 | 05/23/01 | Mag | 25 | | | | | | | | 0 | 145 | | LO | 06/07/01 | 06/26/01 |
| E13 | | 08/09/01 | Mag | 215 | | | | | | | | 0 | 65 | | LO | 08/09/01 | 08/14/01 |
| F1 | | 07/18/01 | Mag | 30 | | | | | | | | 0 | 65 | | LO | 07/25/01 | 08/09/01 |
| | | | | | 1 | Anomaly | | 81 | 16 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 99 | 72 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 81 | 77 | Unknown | | | | | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal
 Contract Number: DACA87-97-D-0005 TO# 0019
 Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grubbed | Date Cleared | Mag or Gas | Qty | ID# | Item ID: *M* No. If Available | Condition | X-Fe (East) | Y-Fe (North) | Z-Feet (Deep) | Filler | OE Scrap | Other Scrap | Demo Date | Soil Type | QC Date | QA Date |
|-------------|--------------|--------------|----------------------------------|-----|-----|-------------------------------|-----------|-------------|--------------|---------------|--------|----------|-------------|-----------|-----------|----------|----------|
| | | | Subsurface Anomaly Left in Place | | 4 | Anomaly | | 97 | 79 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 5 | Anomaly | | 100 | 80 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 6 | Anomaly | | 99 | 88 | Unknown | | | | | | | |
| F2 | | 07/23/01 | Mag | 172 | | | | | | | | 0 | 170 | | LO | 08/08/01 | 08/09/01 |
| | | | Subsurface Anomaly Left in Place | | 1 | Anomaly | | 1 | 61 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 2 | Anomaly | | 1 | 75 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 3 | Anomaly | | 12 | 66 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 4 | Anomaly | | 0 | 82 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 5 | Anomaly | | 28 | 71 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 6 | Anomaly | | 60 | 17 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 7 | Anomaly | | 36 | 94 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 8 | Anomaly | | 6 | 49 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 9 | Anomaly | | 1 | 38 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 10 | Anomaly | | 0 | 34 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 11 | Anomaly | | 41 | 55 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 12 | Anomaly | | 40 | 39 | Unknown | | | | | | | |
| F3 | | 07/25/01 | Mag | 126 | ORS | Mortar, 60mm HE | Inert | | | | | 0 | 77 | | LO | 08/08/01 | 08/09/01 |
| F4 | | 06/11/01 | Mag | 285 | 1 | Mortar, 60mm HE | unfuzed | 50 | 62 | 2 | HE | 1 | 52 | 06/20/01 | LO | 08/08/01 | 08/09/01 |
| F5 | | 06/12/01 | Mag | 20 | | | | | | | | 1 | 0 | | LO | 06/20/01 | 06/25/01 |
| F6 | 06/04/01 | 06/05/01 | Mag | 32 | | | | | | | | 0 | 7 | | LO | 06/20/01 | 06/25/01 |
| F7 | | 06/05/01 | Mag | 27 | | | | | | | | 0 | 16 | | LO | 06/20/01 | 07/31/01 |
| | | | Subsurface Anomaly Left in Place | | 1 | Pipe | | 89 | 35 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 2 | Anomaly | | 89 | 26 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 3 | Anomaly | | 57 | 26 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 4 | Anomaly | | 98 | 8 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 5 | Anomaly | | 99 | 3 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 6 | Anomaly | | 90 | 1 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 7 | Anomaly | | 99 | 4 | Unknown | | | | | | | |
| | | | Subsurface Anomaly Left in Place | | 8 | Anomaly | | 12 | 6 | Unknown | | | | | | | |
| F8 | | 06/06/01 | Mag | 12 | | | | | | | | 0 | 3 | | LO | 06/20/01 | 06/21/01 |
| F9 | | 06/06/01 | Mag | 12 | | | | | | | | 0 | 3 | | LO | 06/19/01 | 06/21/01 |
| F10 | | 05/30/01 | Mag | 15 | | | | | | | | 0 | 1 | | LO | 06/19/01 | 06/21/01 |
| F11 | | 06/11/01 | Mag | 110 | ORS | Projo, 37mm M54 | Inert | | | | na | 1 | 2 | | LO | 06/19/01 | 06/21/01 |
| F12 | | 06/13/01 | Mag | 17 | | | | | | | | 0 | 2 | | LO | 06/19/01 | 06/21/01 |
| F13 | NA | 08/13/01 | Mag | 75 | | | | | | | | 0 | 40 | | LO | 08/13/01 | 08/14/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grubbed | Date Cleared | Mag or Geo | Dogs | ID# | Item ID, "M" No. If Available | Condition | X-Pl (East) | Y-Pl (North) | Z-inches (Deep) | Filter | OE Scrap | Other Scrap | Demo Date | Soil Type | OC Date | OJA Date |
|-------------|--------------|--------------|------------|------|-----|-------------------------------|-----------|-------------|--------------|-----------------|--------|----------|-------------|-----------|-----------|----------|----------|
| G1 | NA | 07/17/01 | Mag | 114 | | | | | | | | 0 | 112 | | LO | 07/25/01 | 07/31/01 |
| G2 | | 07/23/01 | Mag | 109 | | | | | | | | 0 | 5 | | LO | 07/25/01 | 07/31/01 |
| | | | | | 1 | Anomaly | | 76 | 62 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 59 | 69 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 55 | 68 | Unknown | | | | | | | |
| | | | | | 4 | Anomaly | | 51 | 66 | Unknown | | | | | | | |
| | | | | | 5 | Anomaly | | 53 | 61 | Unknown | | | | | | | |
| | | | | | 6 | Anomaly | | 51 | 62 | Unknown | | | | | | | |
| | | | | | 7 | Anomaly | | 49 | 62 | Unknown | | | | | | | |
| | | | | | 8 | Anomaly | | 29 | 61 | Unknown | | | | | | | |
| | | | | | 9 | Anomaly | | 18 | 55 | Unknown | | | | | | | |
| | | | | | 10 | Anomaly | | 5 | 85 | Unknown | | | | | | | |
| | | | | | 11 | Anomaly | | 10 | 88 | Unknown | | | | | | | |
| | | | | | 12 | Anomaly | | 12 | 98 | Unknown | | | | | | | |
| | | | | | 13 | Anomaly | | 15 | 84 | Unknown | | | | | | | |
| | | | | | 14 | Anomaly | | 15 | 91 | Unknown | | | | | | | |
| | | | | | 15 | Anomaly | | 23 | 78 | Unknown | | | | | | | |
| | | | | | 16 | Anomaly | | 24 | 92 | Unknown | | | | | | | |
| G3 | | 07/23/01 | Mag | 100 | | | | | | | | 0 | 3 | | LO | 07/25/01 | 07/31/01 |
| | | | | | 1 | Anomaly | | 3 | 62 | Unknown | | | | | | | |
| | | | | | 2 | Anomaly | | 32 | 9 | Unknown | | | | | | | |
| | | | | | 3 | Anomaly | | 33 | 8 | Unknown | | | | | | | |
| G4 | | 06/12/01 | Mag | 10 | | | | | | | | 0 | 1 | | LO | 06/18/01 | 06/26/01 |
| G5 | | 06/12/01 | Mag | 17 | | | | | | | | 0 | 5 | | LO | 06/19/01 | 06/25/01 |
| G6 | 06/04/01 | 06/04/01 | Mag | 20 | | | | | | | | 0 | 55 | | LO | 06/19/01 | 06/25/01 |
| G7 | | 07/05/01 | Mag | 20 | | | | | | | | 1 | 2 | | LO | 07/24/01 | 07/26/01 |
| G8 | NA | 07/03/01 | Mag | 22 | | | | | | | | 0 | 2 | | LO | 07/24/01 | 07/26/01 |
| G9 | | 07/05/01 | Mag | 20 | ORS | Projo, 37mm M54 | Inert | | | | na | 0 | 2 | | LO | 07/24/01 | 07/26/01 |
| G10 | | 06/07/01 | Mag | 298 | | | | | | | | 0 | 60 | | LO | 06/11/01 | 06/21/01 |
| G11 | | 06/07/01 | Mag | 323 | 1 | Projo, 37mm M54 | unfuzed | 53 | 66 | 3 | HE | 0 | 11 | 06/14/01 | LO | 06/11/01 | 06/21/01 |
| G12 | | 06/13/01 | Mag | 21 | | | | | | | | 0 | 3 | | LO | 06/19/01 | 06/21/01 |
| H2 | NA | 07/17/01 | Mag | 15 | | | | | | | | 1 | 3 | | LO | 07/24/01 | 07/31/01 |
| H3 | | 06/12/01 | Mag | 7 | | | | | | | | 1 | 3 | | LO | 06/19/01 | 06/25/01 |
| H4 | 06/12/01 | 06/12/01 | Mag | 9 | | | | | | | | 0 | 2 | | LO | 06/19/01 | 06/25/01 |
| H5 | 06/12/01 | 06/12/01 | Mag | 3 | | | | | | | | 1 | 0 | | LO | 06/19/01 | 06/25/01 |
| H6 | | 06/12/01 | Mag | 1 | | | | | | | | 0 | 0 | | LO | 06/19/01 | 06/25/01 |
| H9 | NA | 07/16/01 | Mag | 0 | | | | | | | | 0 | 0 | | LO | 07/24/01 | 07/26/01 |
| H10 | NA | 07/16/01 | Mag | 54 | | | | | | | | | | | LO | 07/24/01 | 07/26/01 |
| H11 | | 06/11/01 | Mag | 16 | | | | | | | | 0 | 3 | | LO | 06/19/01 | 07/26/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal
 Contract Number: DACA87-97-D-0005 TO# 0019
 Surface and Sub-surface OE Clearance

Sector 2

| Grid Number | Date Grubbed | Date Cleared | Mag or Geo | Dgn | ID# | Item ID, "M" No. If Available | Condition | X-Ft (East) | Y-Ft (North) | Z-Depth (Depth) | Filter | OE Scrap | Other Scrap | Demo Date | Soil Type | CO Date | QA Date |
|---------------|--------------|--------------|------------|-------------|----------|-------------------------------|-----------|-------------|--------------|-----------------|--------|-----------|-------------|-----------|-----------|-----------|-----------|
| H12 | | 07/12/01 | Mag | 149 | | | | | | | | 0 | 16 | | LO | 07/24/01 | 07/28/01 |
| I11 | NA | 07/31/01 | Mag | 3 | | | | | | | | 0 | 1 | | LO | 08/08/01 | 08/09/01 |
| I12 | | 07/12/01 | Mag | 137 | | | | | | | | 0 | 24 | | LO | 07/24/01 | 07/28/01 |
| J12 | NA | 07/17/01 | Mag | 35 | | | | | | | | 0 | 6 | | LO | 07/24/01 | 07/28/01 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| TOTALS | | 88 | | 7026 | 3 | | | | | | | 70 | 2208 | | | 88 | 86 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface Clearance

Sector 4

| Grid Number | Date Grubbed | Date Cleared | ID # | Item ID, M No. # Available | Condition | Filler | X-Ft (East) | Y-Ft (North) | Z-Inches (Deep) | LBS OE Scrap | LBS Other Material | Demo Date | Soil Type | QC Date | QA Date |
|-------------|--------------|--------------|------|----------------------------|-----------|--------|-------------|--------------|-----------------|--------------|--------------------|-----------|-----------|----------|----------|
| AA0 | NA | 08/14/01 | ORS | Rocket, 3.5" (motor) | Inert | na | 165 | 42 | 0 | 3 | 8 | | LO | 08/15/01 | 08/20/01 |
| AA00 | NA | 08/23/01 | | | | | | | | 1 | 0 | | LO | 08/29/01 | 08/30/01 |
| AA000 | NA | 08/28/01 | | | | | | | | 0 | 0 | | LO | 08/29/01 | 08/30/01 |
| AA1 | NA | 08/13/01 | | | | | | | | 4 | 5 | | LO | 08/15/01 | 08/20/01 |
| AA2 | NA | 05/22/01 | | | | | | | | 100 | 2 | | LO | 06/11/01 | 06/12/01 |
| AA3 | NA | 05/30/01 | | | | | | | | 20 | 4 | | LO | 06/13/01 | 06/13/01 |
| AA4 | NA | 06/11/01 | | | | | | | | 15 | 8 | | LO | 06/26/01 | 06/26/01 |
| AA5 | NA | 06/12/01 | | | | | | | | 4 | 11 | | LO | 06/26/01 | 06/27/01 |
| AA6 | NA | 06/13/01 | | | | | | | | 0 | 1 | | LO | 06/26/01 | 06/27/01 |
| AA7 | NA | 06/14/01 | | | | | | | | 0 | 2 | | LO | 06/26/01 | 06/27/01 |
| BB0 | NA | 08/13/01 | | | | | | | | 0 | 3 | | LO | 08/16/01 | 08/16/01 |
| BB00 | NA | 08/23/01 | | | | | | | | 0 | 1 | | LO | 08/29/01 | 08/30/01 |
| BB000 | NA | 08/28/01 | | | | | | | | 0 | 20 | | LO | 08/29/01 | 08/30/01 |
| BB1 | NA | 08/09/01 | | | | | | | | 25 | 1 | | LO | 08/16/01 | 08/16/01 |
| BB2 | NA | 07/25/01 | | | | | | | | 340 | 20 | | LO | 08/16/01 | 08/16/01 |
| BB3 | NA | 05/30/01 | | | | | | | | 90 | 5 | | LO | 06/13/01 | 06/13/01 |
| BB4 | NA | 06/11/01 | | | | | | | | 5 | 10 | | LO | 06/26/01 | 06/26/01 |
| BB5 | NA | 06/12/01 | | | | | | | | 5 | 3 | | LO | 06/26/01 | 06/27/01 |
| BB6 | NA | 06/13/01 | | | | | | | | 1 | 10 | | LO | 06/26/01 | 06/27/01 |
| BB7 | NA | 06/25/01 | | | | | | | | 0 | 0 | | LO | 06/26/01 | 06/27/01 |
| CC0 | NA | 08/13/01 | | | | | | | | 0 | 10 | | LO | 08/14/01 | 08/16/01 |
| CC1 | NA | 07/23/01 | | | | | | | | 0 | 3 | | LO | 08/14/01 | 08/16/01 |
| CC2 | NA | 07/26/01 | | | | | | | | 20 | 5 | | LO | 08/14/01 | 08/16/01 |
| CC3 | NA | 07/30/01 | | | | | | | | 6 | 50 | | LO | 08/14/01 | 08/16/01 |
| CC4 | NA | 07/31/01 | | | | | | | | 0 | 7 | | LO | 08/14/01 | 08/16/01 |
| CC5 | NA | 08/02/01 | | | | | | | | 0 | 443 | | LO | 08/14/01 | 08/16/01 |
| CC6 | NA | 08/07/01 | | | | | | | | 0 | 184 | | LO | 08/14/01 | 08/30/01 |
| DD0 | NA | 07/23/01 | | | | | | | | 0 | 2 | | LO | 08/14/01 | 08/16/01 |
| DD1 | NA | 08/07/01 | | | | | | | | 0 | 2 | | LO | 08/14/01 | 08/16/01 |
| DD2 | NA | 08/08/01 | | | | | | | | 1 | 1 | | LO | 08/14/01 | 08/16/01 |
| DD3 | NA | 08/08/01 | | | | | | | | 0 | 1 | | LO | 08/14/01 | 08/16/01 |
| DD4 | NA | 08/09/01 | | | | | | | | 0 | 80 | | LO | 08/14/01 | 08/16/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal
 Contract Number: DACA87-97-D-0005 TO# 0019
 Surface Clearance
 Sector 4

| Grid Number | Date Grubbed | Date Cleared | ID # | Item ID, M No. If Available | Condition | Filter | X-Ft (East) | Y-Ft (North) | Z-Inches (Depth) | LBS DE Susp | LBS Other Material | Demo Date | Soil Type | CO Date | QA Date |
|-------------|--------------|--------------|------|-----------------------------|-----------|--------|-------------|--------------|------------------|-------------|--------------------|-----------|-----------|----------|----------|
| EE2 | NA | 08/22/01 | | | | | | | | 0 | 0 | | LO | 08/29/01 | 08/30/01 |
| A0 | NA | 08/14/01 | | | | | | | | 5 | 50 | | LO | 08/15/01 | 08/20/01 |
| A00 | NA | 08/23/01 | | | | | | | | 4 | 8 | | LO | 08/29/01 | 08/30/01 |
| A000 | NA | 08/23/01 | | | | | | | | 0 | 4 | | LO | 08/29/01 | 08/30/01 |
| A1 | NA | 08/13/01 | | | | | | | | 15 | 50 | | LO | 08/15/01 | 08/20/01 |
| A2 | NA | 05/23/01 | | | | | | | | 83 | 40 | | LO | 06/11/01 | 06/12/01 |
| A3 | NA | 05/29/01 | | | | | | | | 25 | 6 | | LO | 06/11/01 | 06/13/01 |
| A4 | NA | 07/03/01 | | | | | | | | 6 | 2 | | LO | 08/14/01 | 08/15/01 |
| A5 | NA | 07/05/01 | | | | | | | | 5 | 46 | | LO | 08/14/01 | 08/15/01 |
| A6 | NA | 08/22/01 | | | | | | | | 0 | 2 | | LO | 08/29/01 | 08/30/01 |
| B0 | NA | 08/15/01 | | | | | | | | 3 | 2 | | LO | 08/15/01 | 08/20/01 |
| B00 | NA | 08/28/01 | | | | | | | | 0 | 5 | | LO | 08/29/01 | 08/30/01 |
| B1 | NA | 07/12/01 | | | | | | | | 6 | 5 | | LO | 08/15/01 | 08/20/01 |
| B2 | NA | 05/23/01 | | | | | | | | 8 | 3 | | LO | 06/11/01 | 06/12/01 |
| B3 | NA | 05/29/01 | | | | | | | | 191 | 3 | | LO | 06/11/01 | 06/13/01 |
| B4 | NA | 07/02/01 | | | | | | | | 85 | 3 | | LO | 08/14/01 | 08/15/01 |
| B5 | NA | 07/05/01 | | | | | | | | 10 | 8 | | LO | 08/14/01 | 08/15/01 |
| B6 | NA | 08/22/01 | | | | | | | | 0 | 3 | | LO | 08/29/01 | 08/30/01 |
| C0 | NA | 08/15/01 | | | | | | | | 0 | 10 | | LO | 08/15/01 | 08/20/01 |
| C00 | NA | 08/28/01 | | | | | | | | 0 | 0 | | LO | 08/29/01 | 08/30/01 |
| C1 | NA | 07/12/01 | | | | | | | | 4 | 2 | | LO | 08/15/01 | 08/20/01 |
| C2 | NA | 05/23/01 | | | | | | | | 0 | 2 | | LO | 05/30/01 | 06/12/01 |
| C3 | NA | 05/24/01 | | | | | | | | 49 | 7 | | LO | 05/30/01 | 06/13/01 |
| C4 | NA | 06/27/01 | | | | | | | | 2 | 1 | | LO | 08/14/01 | 08/15/01 |
| C5 | NA | 07/10/01 | | | | | | | | 1 | 15 | | LO | 08/14/01 | 08/15/01 |
| C6 | NA | 08/21/01 | | | | | | | | 0 | 300 | | LO | 08/29/01 | 08/30/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface Clearance

Sector 4

| Grid Number | Date Grubbed | Date Cleared | ID # | Item ID, M No. if Available | Condition | Filter | X-Ft (East) | Y-Ft (North) | Z-Inches (Depth) | LBS OF Scrap | LBS Other Material | Demo Date | Soil Type | DO Date | QA Date |
|---------------|--------------|--------------|------|-----------------------------|-----------|--------|-------------|--------------|------------------|--------------|--------------------|-----------|-----------|----------|----------|
| D0 | NA | 08/15/01 | | | | | | | | 0 | 5 | | LO | 08/21/01 | 08/22/01 |
| D1 | NA | 07/12/01 | | | | | | | | 1 | 1 | | LO | 08/15/01 | 08/20/01 |
| D2 | NA | 05/23/01 | | | | | | | | 6 | 8 | | LO | 05/30/01 | 06/12/01 |
| D3 | NA | 05/24/01 | | | | | | | | 1 | 2 | | LO | 05/30/01 | 06/12/01 |
| D4 | NA | 06/26/01 | | | | | | | | 0 | 2 | | LO | 08/14/01 | 08/15/01 |
| D5 | NA | 07/10/01 | | | | | | | | 1 | 10 | | LO | 08/14/01 | 08/16/01 |
| D6 | NA | 08/21/01 | | | | | | | | 0 | 7 | | LO | 08/29/01 | 08/30/01 |
| E0 | NA | 08/15/01 | | | | | | | | 0 | 0 | | LO | 08/21/01 | 08/22/01 |
| E1 | NA | 08/16/01 | | | | | | | | 0 | 7 | | LO | 08/21/01 | 08/22/01 |
| E2 | NA | 08/20/01 | | | | | | | | 0 | 3 | | LO | 08/21/01 | 08/22/01 |
| E3 | NA | 05/23/01 | ORS | Fuze, Projo MT | Inert | | | | | 3 | 9 | | LO | 05/30/01 | 06/12/01 |
| E4 | NA | 07/11/01 | | | | | | | | 0 | 5 | | LO | 08/14/01 | 08/15/01 |
| E5 | NA | 07/11/01 | | | | | | | | 0 | 2 | | LO | 08/14/01 | 08/16/01 |
| E6 | NA | 08/21/01 | | | | | | | | 0 | 4 | | LO | 08/29/01 | 08/30/01 |
| F1 | NA | 08/16/01 | | | | | | | | 0 | 30 | | LO | 08/21/01 | 08/22/01 |
| F2 | NA | 08/16/01 | | | | | | | | 0 | 9 | | LO | 08/21/01 | 08/22/01 |
| F3 | NA | 08/20/01 | | | | | | | | 0 | 1 | | LO | 08/21/01 | 08/22/01 |
| F4 | NA | 08/20/01 | | | | | | | | 0 | 9 | | LO | 08/21/01 | 08/22/01 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| TOTALS | | 76 | 2 | | | | | | | 1146 | 1580 | | | 76 | 76 |

GRID / ORDNANCE TRACKING LOG

Former Banicia ArseNAI

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Granted | Date Cleared | Mag or Case | Dign | ID # | Quantity | Item Description | Condition | Fuz | X-F (East) | Y-F (North) | Z-Inches (Down) | LEB OE Feet | LEB Other Material | Demo Date | Soil Type | OC Date | QA Date |
|-------------|--------------|--------------|-------------|------|------|----------|--------------------------|-----------|-----|------------|-------------|-----------------|-------------|--------------------|-----------|-----------|----------|----------|
| A5- A9 | | 06/29/01 | Mag | 213 | | | | | | | | | 0 | 7 | | LO | 06/06/01 | 06/17/01 |
| A5- A10 | | 07/19/01 | Mag | 10 | | | | | | | | | 0 | 5 | | LO | 07/30/01 | 08/01/01 |
| A5- A11 | | 08/20/01 | Mag | 197 | | | | | | | | | 2 | 8 | | LO | 06/26/01 | 07/03/01 |
| A5- B8 | | 08/30/01 | Mag | 357 | | | | | | | | | 0 | 8 | | LO | 09/06/01 | 09/06/01 |
| A5- B9 | NA | 07/30/01 | Mag | 379 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 5 | 37 | 06/23/01 | LO | 06/15/01 | 06/20/01 |
| | | | | | 1 | 1 | Rifle GrenAde, French VB | Fuzed | HE | 82 | 28 | 4 | | | 07/19/01 | | | |
| | | | | | 2 | 1 | Rifle GrenAde, French VB | Fuzed | HE | 72 | 10 | 4 | | | 07/19/01 | | | |
| A5- B10 | | 07/17/01 | Mag | 298 | | | | | | | | | 2 | 18 | | | 08/15/01 | 08/20/01 |
| A5- B11 | | 07/19/01 | Mag | 198 | ORS | 0 | Rifle GrenAde, French VB | Inert | NA | | | | 4 | 38 | | | 07/23/01 | 07/28/01 |
| A5- B12 | | 06/25/01 | Mag | 500 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 7 | 135 | | LO | 06/26/01 | 07/03/01 |
| A5- B13 | NA | 06/21/01 | Mag | 107 | | | | | | | | | 1 | 6 | | LO | 06/26/01 | 07/03/01 |
| A5- C7 | NA | 06/27/01 | Mag | 796 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 60 | 0 | 1 | 0 | 125 | 06/23/01 | LO | 06/03/01 | 06/04/01 |
| | | | | | 2 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 60 | 0 | 1 | | | 06/23/01 | | | |
| | | | | | 3 | 1 | Rifle GrenAde, French VB | Fuzed | HE | 60 | 0 | 1 | | | 06/23/01 | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| A5- C8 | NA | 07/11/01 | Mag | 483 | 1 | 1 | Rifle GrenAde, French VB | Fuzed | HE | 95 | 20 | 6 | 2 | 50 | 07/12/01 | LO | 07/18/01 | 07/18/01 |
| A5- C9 | NA | 05/17/01 | Mag | 84 | | | | | | | | | 0 | 27 | | LO | 05/23/01 | 05/24/01 |
| A5- C10 | | 07/18/01 | Mag | 63 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 3 | 10 | | | 07/23/01 | 07/28/01 |
| A5- C11 | 08/15/01 | 08/16/01 | Mag | 328 | | | | | | | | | 2 | 78 | | LO | 08/22/01 | 08/23/01 |
| A5- C12 | 08/15/01 | 08/16/01 | Mag | 796 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 75 | 32 | 1 | 8 | 88 | 08/23/01 | LO | 06/03/01 | 06/04/01 |
| A5- C13 | NA | 06/25/01 | Mag | 82 | | | | | | | | | 20 | 17 | | LO | 06/26/01 | 07/03/01 |
| A5- D6 | | 09/05/01 | Mag | 387 | | | | | | | | | 0 | 517 | | LO | 09/06/01 | 09/17/01 |
| A5- D7 | NA | 06/23/01 | Mag | 1142 | | | | | | | | | 0 | 55 | | LO | 09/03/01 | 09/04/01 |
| A5- D8 | NA | 07/10/01 | Mag | 309 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 3 | 50 | | LO | 07/16/01 | 07/18/01 |
| A5- D9 | | 09/05/01 | Mag | 787 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 1 | 30 | | LO | 09/08/01 | 09/10/01 |
| | | | | | 1 | 1 | Rifle GrenAde, French VB | Fuzed | HE | 35 | 60 | 12 | | | 06/23/01 | | | |
| | | | | | 2 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 20 | 75 | 10 | | | 06/23/01 | | | |
| A5- D10 | NA | 05/17/01 | Mag | 52 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 0 | 36 | | LO | 05/23/01 | 05/24/01 |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| A5- D11 | 08/16/01 | 08/20/01 | Mag | 105 | | | | | | | | | 2 | 131 | | LO | 08/22/01 | 08/23/01 |
| A5- D12 | | 08/30/01 | Mag | 82 | | | | | | | | | 0 | 19 | | LO | 09/06/01 | 09/10/01 |
| A5- D13 | NA | 07/26/01 | Mag | 10 | | | | | | | | | 0 | 200 | | LO | 08/15/01 | 08/20/01 |
| A5- E3 | NA | 07/31/01 | Mag | 320 | | | | | | | | | 0 | 120 | | LO | 08/13/01 | 08/14/01 |
| A5- E4 | NA | 08/07/01 | Mag | 874 | | | | | | | | | 1 | 200 | | LO | 08/13/01 | 08/14/01 |
| A5- E5 | NA | 07/10/01 | Mag | 467 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 10 | 100 | | LO | 07/16/01 | 07/18/01 |
| A5- E6 | NA | 07/10/01 | Mag | 529 | | | | | | | | | 5 | 100 | | LO | 07/16/01 | 07/18/01 |
| A5- E7 | NA | 08/20/01 | Mag | 829 | 1 | 1 | Fuze, projo base | Fuzed | HE | 79 | 18 | 1 | 1 | 60 | 08/23/01 | LO | 09/03/01 | 09/05/01 |
| A5- E8 | | 07/09/01 | Mag | 612 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 69 | 15 | 6 | 10 | 200 | 07/12/01 | LO | 07/16/01 | 07/18/01 |
| | | | | | 2 | 1 | Fuze, projo base | Fuzed | HE | 10 | 30 | 6 | | | 07/12/01 | | | |
| | | | | | 3 | 1 | Fuze, projo base | Fuzed | HE | 33 | 82 | 6 | | | 07/12/01 | | | |
| A5- E9 | | 09/13/01 | Mag | 898 | | | | | | | | | 21 | 75 | | LO | 09/17/01 | 09/17/01 |
| A5- E10 | 05/21/01 | 09/04/01 | Mag | 223 | | | | | | | | | 5 | 136 | | LO | 09/05/01 | 09/06/01 |
| A5- E11 | NA | 05/16/01 | Mag | 491 | | | | | | | | | 4 | 43 | | LO | 06/06/01 | 06/07/01 |
| A5- E12 | NA | 08/14/01 | Mag | 335 | | | | | | | | | 0 | 87 | | LO | 08/21/01 | 08/23/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Gridset | Date Cleared | Mag or Qty | Digs | ID # | Quantity | Item Nomenclature | Condition | Fuz | X-F (East) | Y-F (North) | Z-F (Depth) | LOS-DE Type | ES Other Material | Damp Date | Set Type | GD Date | QA Date |
|-------------|--------------|--------------|------------|------|------|----------|--------------------------|-----------|-------|------------|-------------|-------------|-------------|-------------------|-----------|----------|----------|----------|
| A5- E13 | NA | 08/18/01 | Mag | 34 | | | | | | | | | 0 | 34 | | LO | 08/21/01 | 08/23/01 |
| A5- E14 | NA | 08/14/01 | Mag | 45 | | | | | | | | | 0 | 39 | | LO | 08/15/01 | 08/20/01 |
| A5- F3 | NA | 07/30/01 | Mag | 309 | | | | | | | | | 0 | 100 | | LO | 07/30/01 | 08/01/01 |
| A5- F4 | NA | 07/28/01 | Mag | 427 | 1 | 1 | Mortar, 60mm HE | Fuzed | HE | 82 | 35 | 2 | 80 | | 08/19/01 | LO | 07/30/01 | 08/01/01 |
| | | | | | | 0 | Fuze, Projo PD | Inert | NA | | | | | | | | | |
| A5- F5 | NA | 07/30/01 | Mag | 189 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 95 | 20 | 6 | 4 | 15 | 08/23/01 | LO | 07/30/01 | 08/01/01 |
| A5- F6 | NA | 07/11/01 | Mag | 31 | | | | | | | | | 0 | 25 | | LO | 07/18/01 | 07/18/01 |
| A5- F7 | NA | 07/11/01 | Mag | 578 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 2 | 101 | | LO | 07/23/01 | 07/28/01 |
| A5- F8 | | 08/03/01 | Mag | 2030 | | | | | | | | | 0 | 285 | | LO | 08/05/01 | 08/08/01 |
| A5- F9 | | 08/03/01 | Mag | 1745 | | | | | | | | | 7 | 218 | | LO | 08/05/01 | 08/08/01 |
| A5- F10 | NA | 08/22/01 | Mag | 348 | | | | | | | | | 5 | 113 | | LO | 08/03/01 | 08/05/01 |
| A5- F11 | 08/04/01 | 08/04/01 | Mag | 81 | | | | | | | | | 4 | 5 | | LO | 08/05/01 | 08/08/01 |
| A5- F12 | 05/21/01 | 05/21/01 | Mag | 316 | | | | | | | | | 1 | 55 | | LO | 05/23/01 | 08/07/01 |
| A5- F13 | | 07/18/01 | Mag | 239 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 4 | 8 | | | 07/23/01 | 07/25/01 |
| A5- F14 | | 07/18/01 | Mag | 150 | | | | | | | | | 3 | 3 | | | 07/23/01 | 07/25/01 |
| A5- F15 | NA | 08/25/01 | Mag | 18 | | | | | | | | | 3 | 1 | | LO | 07/02/01 | 07/03/01 |
| A5- G3 | | 07/19/01 | Mag | 1091 | | | | | | | | | 0 | 200 | | | 07/23/01 | 07/28/01 |
| A5- G4 | NA | 07/28/01 | Mag | 390 | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | 8 | 130 | | LO | 07/30/01 | 08/14/01 |
| A5- G7 | | 08/05/01 | Mag | 35 | | | | | | | | | 0 | 8 | | LO | 08/08/01 | 08/10/01 |
| A5- G8 | | 08/03/01 | Mag | 731 | | | | | | | | | 2 | 258 | | LO | 08/05/01 | 08/08/01 |
| A5- G9 | NA | 08/27/01 | Mag | 208 | | | | | | | | | 0 | 80 | | LO | 08/05/01 | 08/10/01 |
| A5- G10 | 08/27/01 | 08/28/01 | Mag | 849 | | | | | | | | | 4 | 147 | | LO | 08/03/01 | 08/05/01 |
| A5- G11 | NA | 08/21/01 | Mag | 215 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 52 | 19 | 3 | 58 | 17 | 08/21/01 | LO | 08/28/01 | 07/10/01 |
| | | | | | 2 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 32 | 71 | 2 | | | 08/21/01 | | | |
| | | | | | 3 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 84 | 72 | 4 | | | 08/21/01 | | | |
| A5- G12 | NA | 05/21/01 | Mag | 15 | | | | | | | | | 1 | 1 | | LO | 05/23/01 | 05/24/01 |
| A5- G13 | NA | 08/20/01 | Mag | 32 | | | | | | | | | 0 | 0 | | LO | 08/27/01 | 07/03/01 |
| A5- G14 | NA | 08/28/01 | Mag | 65 | | | | | | | | | 6 | 2 | | LO | 08/27/01 | 07/03/01 |
| A5- G15 | NA | 08/25/01 | Mag | 36 | | | | | | | | | 4 | 3 | | LO | 07/02/01 | 07/03/01 |
| A5- H3 | NA | 07/28/01 | Mag | 401 | | | | | | | | | 0 | 80 | | LO | 07/30/01 | 08/01/01 |
| A5- H4 | | 07/18/01 | Mag | 1032 | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | 5 | 35 | | | 07/23/01 | 07/28/01 |
| | | | | | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | | | | | | |
| A5- H8 | | 08/11/01 | Mag | 442 | | | | | | | | | 0 | 348 | | LO | 08/11/01 | 08/12/01 |
| A5- H9 | NA | 05/14/01 | Mag | 317 | 1 | 1 | | Fuzed | HE | 12 | 71 | 1 | 7 | 47 | 05/15/01 | LO | 05/23/01 | 08/13/01 |
| A5- | | | | | 2 | 1 | | Fuzed | HE | 22 | 80 | 2 | | | 08/07/01 | | | |
| | | | | | ORS | 0 | | Inert | NA | | | | | | | | | |
| A5- H10 | NA | 05/14/01 | Mag | 28 | | | | | | | | | 1 | 3 | | LO | 05/23/01 | 05/24/01 |
| A5- H11 | NA | 05/10/01 | Mag | 15 | | | | | | | | | 1 | 0 | | LO | 05/23/01 | 05/24/01 |
| A5- H12 | NA | 05/10/01 | Mag | 82 | | | | | | | | | 4 | 10 | | LO | 05/23/01 | 05/24/01 |
| A5- H13 | NA | 05/23/01 | Mag | 144 | 1 | 1 | | Fuzed | HE | 28 | 32 | 6 | 5 | 18 | 05/24/01 | LO | 08/08/01 | 08/07/01 |
| | | | | | 2 | 1 | | Fuzed | HE | 79 | 88 | 8 | | | 05/24/01 | | | |
| A5- H14 | NA | 08/18/01 | Mag | 139 | ORS | 0 | | Inert | NA | | | | 10 | 20 | | LO | 08/27/01 | 07/03/01 |
| A5- H15 | NA | 08/25/01 | Mag | 95 | ORS | 0 | | Unfuzed | empty | | | | 9 | 40 | | LO | 08/27/01 | 07/03/01 |
| | | | | | 1 | 1 | | Unfuzed | HE | 87 | 3 | 2 | | | 07/05/01 | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TOS 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Granted | Date Cleared | Mag or Cap | Dge | ID # | Quantity | Item Nomenclature | Condition | Filler | Z-FI (Inch) | Y-FI (Inch) | Z-FI (Inch) | DBP (Inch) | BS (Inch) | Other Material | Dem Date | Exp Type | CC Date | CA Date |
|-------------|--------------|--------------|------------|------|------|----------|----------------------------|-----------|--------|-------------|-------------|-------------|------------|-----------|----------------|----------|----------|----------|----------|
| A5- H16 | NA | 06/26/01 | Mag | 69 | 1 | 1 | | Unfuzed | HE | 12 | 96 | 6 | 10 | 1 | | 06/26/01 | LO | 06/27/01 | 07/03/01 |
| A5- 12 | | 06/05/01 | Mag | 601 | | | | | | | | | 0 | 30 | | | LO | 06/06/01 | 06/06/01 |
| A5- 14 | NA | 07/26/01 | Mag | 211 | | | | | | | | | 1 | 10 | | | LO | 07/30/01 | 08/01/01 |
| A5- 15 | NA | 06/04/01 | Mag | 754 | | | | | | | | | 2 | 50 | | | LO | 06/07/01 | 07/25/01 |
| A5- 16 | NA | 06/06/01 | Mag | 141 | | | | | | | | | 0 | 3 | | | LO | 06/07/01 | 07/25/01 |
| A5- 17 | NA | 06/06/01 | Mag | 122 | | | | | | | | | 2 | 30 | | | LO | 07/30/01 | 08/01/01 |
| A5- 18 | | 06/10/01 | Mag | 944 | | | | | | | | | 3 | 30 | | | LO | 06/11/01 | 06/12/01 |
| A5- 19 | 05/22/01 | 06/04/01 | Mag | 470 | 1 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 45 | 20 | 6 | 7 | 20 | | 06/07/01 | LO | 06/05/01 | 06/10/01 |
| | | | | | 2 | 1 | Fuze, PTF M1907 | Fuzed | HE | 35 | 40 | 6 | | | | 06/07/01 | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | | |
| A5- 110 | 06/22/01 | 06/01/01 | Mag | 340 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 55 | 60 | | | LO | 06/13/01 | 06/15/01 |
| | | | | | 1 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 25 | 87 | 0 | | | | 06/23/01 | | | |
| | | | | | ORS | 0 | Fuze, proj base | Inert | NA | | | | | | | | | | |
| | | | | | ORS | 0 | Rifle GrNAde, French VB | Inert | NA | | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, proj base | Inert | NA | | | | | | | | | | |
| A5- 111 | 07/31/01 | 07/31/01 | Mag | 211 | ORS | 0 | Rifle GrNAde, French VB | Inert | NA | | | | 40 | 0 | | | LO | 06/13/01 | 06/15/01 |
| | | | | | ORS | 0 | Booster Adapter for Stokes | Inert | NA | | | | | | | | | | |
| | | | | | 1 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 82 | 41 | 2 | | | | 06/23/01 | | | |
| | | | | | 2 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 65 | 83 | 0 | | | | 06/23/01 | | | |
| A5- 112 | 07/30/01 | 07/31/01 | Mag | 185 | | | | | | | | | 25 | 25 | | | LO | 06/13/01 | 06/15/01 |
| A5- 113 | NA | 05/09/01 | Mag | 153 | | | | | | | | | 5 | 10 | | | LO | 05/29/01 | 05/30/01 |
| A5- 114 | NA | 06/18/01 | Mag | 110 | 1 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 48 | 38 | 3 | 8 | 5 | | 06/21/01 | LO | 07/02/01 | 07/03/01 |
| A5- 115 | NA | 06/26/01 | Mag | 165 | | | | | | | | | 10 | 2 | | | LO | 07/02/01 | 07/03/01 |
| A5- 116 | NA | 06/26/01 | Mag | 91 | | | | | | | | | 23 | 5 | | | LO | 07/02/01 | 07/03/01 |
| A5- J2 | 06/01/01 | 06/14/01 | Mag | 738 | | | | | | | | | 0 | 500 | | | | 06/15/01 | 06/20/01 |
| A5- J4 | NA | 06/13/01 | Mag | 448 | | | | | | | | | 0 | 1 | | | LO | 06/13/01 | 06/15/01 |
| A5- J5 | NA | 06/08/01 | Mag | 1205 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 3 | 12 | 1 | 1 | 94 | | 06/23/01 | LO | 06/13/01 | 06/15/01 |
| | | | | | 2 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 65 | 4 | 1 | | | | 06/23/01 | | | |
| A5- J6 | NA | 06/04/01 | Mag | 419 | | | | | | | | | 1 | 2 | | | LO | 06/06/01 | 06/07/01 |
| A5- J7 | NA | 06/14/01 | Mag | 314 | ORS | 0 | Booster Adapter for Stokes | Inert | NA | | | | 4 | 40 | | | LO | 06/15/01 | 06/20/01 |
| A5- J8 | | 06/21/01 | Mag | 257 | 1 | 1 | Proj, 3" APHE | Fuzed | HE | 65 | 20 | 6 | 9 | 8 | | 06/21/01 | | 07/23/01 | 07/25/01 |
| A5- J8 | NA | 06/05/01 | Mag | 211 | 1 | 1 | Rifle GrNAde, French VB | Fuzed | HE | 48 | 84 | 2 | 2 | 10 | | 06/07/01 | LO | 06/06/01 | 06/07/01 |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | | |
| A5- J10 | 05/22/01 | 06/15/01 | Mag | 517 | ORS | 0 | Proj, 87mm | Inert | NA | | | | 40 | 28 | | | LO | 06/30/01 | 06/04/01 |
| | | | | | 1 | 1 | Fuze, PTF M1907 | Fuzed | HE | 25 | 70 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 2 | Fuze, PTF M1907 | Fuzed | HE | 52 | 32 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 3 | Fuze, PTF M1907 | Fuzed | HE | 85 | 60 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 4 | Fuze, Stokes Mk VI | Fuzed | HE | 30 | 16 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 5 | Fuze, Stokes Mk VI | Fuzed | HE | 40 | 35 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 6 | Fuze, Stokes Mk VI | Fuzed | HE | 60 | 40 | 1 | | | | 06/23/01 | | | |
| | | | | | 1 | 7 | Fuze, Stokes Mk VI | Fuzed | HE | 60 | 40 | 1 | | | | 06/23/01 | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Cleared | Date | Mag or GAO | Digs | ID # | Quantity | Item Description | Condition | Filler | Y-FI (Elev) | X-FI (Horiz) | 2-Inches (Dist) | LEB OE (Feet) | LEB Other Material | Demo Date | Soil Type | OC Date | OP Date |
|-------------|--------------|----------|------------|------|------|----------|----------------------------|-----------|--------|-------------|--------------|-----------------|---------------|--------------------|-----------|-----------|----------|----------|
| | | | | | 1 | 8 | Fuze, Stokes Mk VI | Fuzed | HE | 85 | 85 | 1 | | | 08/23/01 | | | |
| | | | | | 1 | 9 | Fuze, Stokes Mk VI | Fuzed | HE | 70 | 70 | 1 | | | 08/23/01 | | | |
| | | | | | 1 | 10 | Rifle GreNAde, French VB | Fuzed | HE | 32 | 30 | 1 | | | 08/23/01 | | | |
| | | | | | 1 | 11 | Rifle GreNAde, French VB | Fuzed | HE | 80 | 30 | 1 | | | 08/23/01 | | | |
| | | | | | 1 | 12 | Rifle GreNAde, French VB | Fuzed | HE | 78 | 27 | 1 | | | 08/23/01 | | | |
| A5- J11 | | 07/18/01 | Mag | 976 | ORS | 0 | Fuze, projo base | Inert | NA | | | | 8 | 50 | | | 07/17/01 | 07/17/01 |
| | | | | | ORS | 0 | Fuze, projo base | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | | | | | | |
| | | | | | 1 | 1 | Fuze, projo base | Fuzed | HE | 48 | 20 | 1 | | | 07/18/01 | | | |
| | | | | | 2 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 13 | 45 | 1 | | | 07/18/01 | | | |
| | | | | | 3 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 48 | 48 | 1 | | | 07/18/01 | | | |
| A5- J12 | | 08/20/01 | Mag | 304 | | | | | | | | | 2 | 20 | | LO | 08/27/01 | 07/10/01 |
| A5- J13 | NA | 07/10/01 | Mag | 375 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 35 | 50 | 0 | 6 | 85 | 07/12/01 | LO | 07/18/01 | 07/17/01 |
| | | | | | 2 | 1 | Booster Adapter for Stokes | Unfuzed | HE | 83 | 42 | 1 | | | 07/12/01 | | | |
| A5- J14 | NA | 05/23/01 | Mag | 388 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 29 | 95 | 10 | 35 | 7 | 05/24/01 | LO | 05/29/01 | 05/30/01 |
| A5- J15 | NA | 08/28/01 | Mag | 101 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 40 | 32 | 2 | 5 | 5 | 07/12/01 | LO | 07/18/01 | 07/17/01 |
| A5- J16 | NA | 08/25/01 | Mag | 218 | ORS | 0 | Fuze, PTF M1807 | Inert | NA | | | | 5 | 10 | | LO | 07/02/01 | 07/10/01 |
| A5- J17 | NA | 08/28/01 | Mag | 56 | | | | | | | | | 1 | 3 | | LO | 07/02/01 | 07/10/01 |
| A5- K2 | NA | 08/14/01 | Mag | 78 | | | | | | | | | 0 | 75 | | LO | 08/15/01 | 08/20/01 |
| A5- K3 | NA | 08/15/01 | Mag | 183 | | | | | | | | | 0 | 20 | | LO | 08/15/01 | 08/20/01 |
| A5- K4 | NA | 07/31/01 | Mag | 182 | | | | | | | | | 0 | 2 | | LO | 08/13/01 | 08/15/01 |
| A5- K5 | NA | 08/13/01 | Mag | 804 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 30 | 25 | 1 | 0 | 23 | 08/23/01 | LO | 08/13/01 | 08/15/01 |
| A5- K6 | NA | 07/31/01 | Mag | 1331 | | | | | | | | | 1 | 0 | | LO | 08/13/01 | 08/15/01 |
| A5- K7 | NA | 07/17/01 | Mag | 397 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 100 | 78 | 6 | 5 | 400 | 07/12/01 | | 07/23/01 | 07/25/01 |
| A5- K8 | NA | 08/04/01 | Mag | 398 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 4 | 15 | | LO | 07/23/01 | 07/25/01 |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| A5- K9 | NA | 08/05/01 | Mag | 255 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 51 | 18 | 6 | 5 | 20 | 08/07/01 | LO | 08/12/01 | 08/13/01 |
| | | | | | 2 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 83 | 22 | 4 | | | 08/07/01 | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| A5- K10 | NA | 05/16/01 | Mag | 80 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 4 | 16 | | LO | 05/29/01 | 05/30/01 |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| A5- K11 | 05/22/01 | 07/16/01 | Mag | 1373 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 2 | 98 | 1 | 8 | 75 | 07/12/01 | LO | 07/17/01 | 07/17/01 |
| | | | | | 2 | 1 | Booster Adapter for Stokes | Unfuzed | HE | 7 | 0 | 1 | | | 07/12/01 | | | |
| | | | | | 3 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 25 | 96 | 1 | | | 07/12/01 | | | |
| | | | | | 4 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 30 | 80 | 1 | | | 07/12/01 | | | |
| | | | | | 5 | 1 | GreNAde, MK 2 | Fuzed | HE | 25 | 70 | 1 | | | 07/12/01 | | | |
| | | | | | 6 | 1 | Projo, 37mm, MK II | Unfuzed | HE | 92 | 88 | 1 | | | 07/12/01 | | | |
| A5- K12 | NA | 07/10/01 | Mag | 788 | | | | | | | | | 3 | 17 | | LO | 07/16/01 | 07/17/01 |
| A5- K13 | NA | 05/03/01 | Mag | 245 | | | | | | | | | 6 | 21 | | LO | 07/30/01 | 08/01/01 |
| A5- K14 | NA | 05/14/01 | Mag | 180 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | 20 | 30 | | LO | 05/29/01 | 05/30/01 |
| | | | | | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | | | | | | |

GRID / ORDNANCE TRACKING LOG

Former Banica AreaNAI

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Granted | Date Cleared | Mag or Case | Digs | ID # | Quantity | Item Nomenclature | Condition | Fiber | XPI (East) | YPI (North) | Fathoms (Depth) | LEB OE Score | LEB Other Measure | Demo Date | Soil Type | OC Date | CA Date |
|-------------|--------------|--------------|-------------|------|------|----------|----------------------------|-----------|-------|------------|-------------|-----------------|--------------|-------------------|-----------|-----------|----------|----------|
| A5- K15 | NA | 06/18/01 | Mag | 189 | ORS | 0 | Proj, 37mm | Inert | NA | | | | 9 | 60 | | LO | 07/11/01 | 07/17/01 |
| A5- | | | Mag | | | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 91 | 49 | 5 | | | 06/21/01 | | | |
| A5- K16 | 06/27/01 | 07/03/01 | Mag | 656 | ORS | 0 | Proj, 37mm | Inert | NA | | | | | | | LO | 07/11/01 | 07/17/01 |
| | | | | | | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 80 | 57 | 6 | | | 06/28/01 | | | |
| A5- K17 | 06/27/01 | 07/03/01 | Mag | 448 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 29 | 29 | 6 | | | 06/28/01 | LO | 07/11/01 | 07/17/01 |
| | | | | | | 2 | Rifle GreNAde, French VB | Fuzed | HE | 48 | 97 | 10 | | | 06/28/01 | | | |
| | | | | | | 3 | Fuze, Stokes Mk VI | Fuzed | HE | 37 | 69 | 6 | | | 06/28/01 | | | |
| A5- L6 | | 08/10/01 | Mag | 996 | | | | | | | | | 2 | 147 | | | 08/11/01 | 08/12/01 |
| A5- L7 | | 08/12/01 | Mag | 484 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 70 | 25 | 8 | 3 | 32 | 07/12/01 | LO | 06/11/01 | 06/12/01 |
| | | | | | | 2 | Rifle GreNAde, French VB | Fuzed | HE | 25 | 30 | 18 | | | 07/12/01 | | | |
| | | | | | | 3 | Rifle GreNAde, French VB | Fuzed | HE | 25 | 30 | 18 | | | 07/12/01 | | | |
| | | | | | | 4 | Rifle GreNAde, French VB | Fuzed | HE | 25 | 30 | 18 | | | 07/12/01 | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| A5- L8 | NA | 05/30/01 | Mag | 262 | 1 | 1 | Proj, 75mm | Unfuzed | | 77 | 70 | 18 | 3 | 5 | 05/31/01 | LO | 07/23/01 | 07/25/01 |
| | | | | | | 2 | Rifle GreNAde, French VB | Fuzed | HE | 32 | 64 | 12 | | | 05/31/01 | | | |
| | | | | | | 3 | Rifle GreNAde, French VB | Fuzed | HE | 62 | 85 | 12 | | | 05/31/01 | | | |
| A5- L9 | 06/07/01 | 06/11/01 | Mag | 112 | 1 | 1 | Proj, 75mm | Unfuzed | HE | 13 | 42 | 5 | 2 | 0 | 06/14/01 | LO | 06/12/01 | 06/13/01 |
| A5- | | | Mag | | ORS | 0 | GreNAde, MK 2 practice | Inert | NA | | | | | | | | | |
| A5- L10 | 05/17/01 | 05/21/01 | Mag | 189 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 35 | 68 | 7 | 8 | 25 | 05/24/01 | LO | 07/30/01 | 08/01/01 |
| A5- L11 | 05/22/01 | 06/21/01 | Mag | 323 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 52 | 30 | 6 | 13 | 42 | 06/21/01 | LO | 07/30/01 | 08/01/01 |
| | | | | | | ORS | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | | ORS | Proj, 3" AP | Unfuzed | NA | | | | | | | | | |
| A5- L12 | 05/22/01 | 07/10/01 | Mag | 1344 | | | | | | | | | 8 | 75 | | LO | 07/18/01 | 07/17/01 |
| A5- L13 | NA | 05/21/01 | Mag | 561 | | | | | | | | | 18 | 72 | | LO | 06/06/01 | 06/01/01 |
| A5- L14 | 05/08/01 | 05/08/01 | Mag | 450 | ORS | 0 | Booster Adapter for Stokes | Inert | NA | | | | 38 | 65 | | LO | 05/29/01 | 05/30/01 |
| A5- L15 | NA | 06/20/01 | Mag | 303 | 1 | 1 | Fuze, Stokes Mk VI | Fuzed | HE | 90 | 82 | 4 | 40 | 11 | 06/21/01 | LO | 07/17/01 | 07/17/01 |
| | | | | | | 2 | Fuze, Stokes Mk VI | Fuzed | HE | 98 | 80 | 6 | | | 06/21/01 | | | |
| | | | | | | 3 | Fuze, Stokes Mk VI | Fuzed | HE | 87 | 75 | 5 | | | 06/21/01 | | | |
| | | | | | | 4 | Fuze, Stokes Mk VI | Fuzed | HE | 47 | 72 | 5 | | | 06/21/01 | | | |
| | | | | | | 5 | Fuze, Stokes Mk VI | Fuzed | HE | 20 | 20 | 6 | | | 06/21/01 | | | |
| | | | | | | 6 | Rifle GreNAde, French VB | Fuzed | HE | 19 | 56 | 7 | | | 06/21/01 | | | |
| A5- L16 | | 07/09/01 | Mag | 317 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 75 | 5 | 6 | 5 | 600 | 07/12/01 | LO | 07/11/01 | 07/17/01 |
| A5- | | | Mag | | 2 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 70 | 7 | 4 | | | 07/18/01 | | | |
| A5- L17 | 07/02/01 | 08/07/01 | Mag | 854 | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | 08/13/01 | 08/15/01 |
| | | | | | | ORS | Booster Adapter for Stokes | Inert | NA | | | | | | | | | |
| | | | | | | 1 | Rifle GreNAde, French VB | Fuzed | HE | 59 | 42 | 6 | 35 | 500 | 08/23/01 | LO | | |
| A5- M6 | | 09/10/01 | Mag | 1588 | | | | | | | | | 2 | 497 | | LO | 09/10/01 | 09/12/01 |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACAB7-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Gridset | Date Cleared | Mag or Case | Dega | ID # | Quantity | Item Description | Condition | Filler | Y/F (East) | Y/F (North) | 2nd/3rd (Depth) | LEP OF (Depth) | LEP OF (Width) | Temp. Date | Exp. Type | OC Date | CA Date |
|-------------|--------------|--------------|-------------|------|------|----------|--------------------------|-----------|--------|------------|-------------|-----------------|----------------|----------------|------------|-----------|----------|----------|
| A5- M7 | | 09/13/01 | Mag | 552 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 80 | 10 | 1 | 3 | 185 | | LO | 08/13/01 | 09/13/01 |
| A5- M8 | | 07/28/01 | Mag | 1892 | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | 10 | 48 | | LO | 07/30/01 | 08/01/01 |
| | | | | | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | GreNAde, MK 2 practice | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | GreNAde, MK 2 practice | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | GreNAde, MK 2 practice | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Proj, 37mm AP | Inert | NA | | | | | | | | | |
| | | | | | 1 | 1 | GreNAde, MK 2 | Fuzed | HE | 24 | 83 | 1 | | | 08/23/01 | | | |
| | | | | | 2 | 1 | GreNAde, MK 2 | Unfuzed | HE | 20 | 55 | 1 | | | 08/23/01 | | | |
| | | | | | 3 | 1 | GreNAde, MK 2 | Unfuzed | HE | 15 | 85 | 1 | | | 08/23/01 | | | |
| | | | | | 4 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 10 | 85 | 1 | | | 08/23/01 | | | |
| | | | | | 5 | 1 | Fuze, proj base | Fuzed | HE | 18 | 70 | 1 | | | 08/23/01 | | | |
| | | | | | 6 | 1 | GreNAde, MK 2 | Unfuzed | HE | 30 | 70 | 1 | | | 08/23/01 | | | |
| | | | | | 7 | 1 | GreNAde, MK 2 | Unfuzed | HE | 25 | 75 | 1 | | | 08/23/01 | | | |
| | | | | | 8 | 1 | GreNAde, MK 2 | Unfuzed | HE | 40 | 80 | 1 | | | 08/23/01 | | | |
| | | | | | 9 | 1 | GreNAde, MK 2 | Unfuzed | HE | 40 | 80 | 1 | | | 08/23/01 | | | |
| | | | | | 10 | 1 | GreNAde, MK 2 | Unfuzed | HE | 41 | 80 | 1 | | | 08/23/01 | | | |
| | | | | | 11 | 1 | GreNAde, MK 2 | Unfuzed | HE | 38 | 78 | 6 | | | 08/23/01 | | | |
| | | | | | 12 | 1 | GreNAde, MK 2 | Fuzed | HE | 41 | 80 | 1 | | | 08/23/01 | | | |
| A5- M9 | 06/07/01 | 06/11/01 | Mag | 81 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 10 | 21 | 6 | 10 | 5 | 06/14/01 | LO | 07/30/01 | 08/01/01 |
| A5- M10 | 05/08/01 | 05/08/01 | Mag | 21 | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | 1 | 3 | | LO | 05/22/01 | 05/23/01 |
| A5- | | | Mag | | ORS | 0 | Proj, 37mm AP | Inert | NA | | | | | | | | | |
| A5- M11 | NA | 05/15/01 | Mag | 108 | 1 | 1 | Proj, 37mm, MK II | Unfuzed | HE | 59 | 42 | 7 | 15 | 11 | 05/15/01 | LO | 05/22/01 | 05/23/01 |
| | | | | | 2 | 1 | Proj, 57mm, 8 pounder | Unfuzed | HE | 68 | 32 | 5 | | | 05/15/01 | | | |
| | | | | | 3 | 1 | Proj, 57mm, 8 pounder | Unfuzed | HE | 59 | 31 | 6 | | | 05/15/01 | | | |
| | | | | | 4 | 1 | Fuze, PTF M1907 | Fuzed | HE | 83 | 37 | 3 | | | 05/15/01 | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5

| Grid Number | Date Gridset | Date Cleared | Mag or Cap | Digs | ID # | Quantity | Item Nomenclature | Condition | Fuze | X-FI (East) | Y-FI (North) | Z-Inches (Down) | LOS OF Sight | OS Other Material | Demo Date | Set Type | OO Date | CA Date |
|-------------|--------------|--------------|------------|------|------|----------|--------------------------|-----------|-------|-------------|--------------|-----------------|--------------|-------------------|-----------|----------|----------|----------|
| | | | | | 5 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 65 | 22 | 4 | | | 06/15/01 | | | |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 57mm, 8 pounder | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 57mm, 8 pounder | Inert | NA | | | | | | | | | |
| A5- M12 | 06/22/01 | 07/09/01 | Mag | 785 | 1 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 12 | 83 | 1 | 11 | 197 | 08/14/01 | LO | 07/18/01 | 07/17/01 |
| | | | | | 2 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 14 | 87 | 2 | | | 08/14/01 | | | |
| | | | | | 3 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 14 | 87 | 2 | | | 07/05/01 | | | |
| | | | | | 4 | 1 | Projo, 57mm, 6 pounder | Unfuzed | HE | 5 | 73 | 2 | | | 07/05/01 | | | |
| | | | | | 5 | 1 | Projo, 3" APHE | Fuzed | HE | 3 | 76 | 2 | | | 07/05/01 | | | |
| | | | | | 6 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 0 | 72 | 2 | | | 07/05/01 | | | |
| | | | | | ORS | 0 | Mortar, Stokes 3" | Unfuzed | empty | | | | | | | | | |
| A5- M13 | 05/22/01 | 09/03/01 | Mag | 378 | ORS | 0 | Fuze, PTF M1907 | Unfuzed | empty | 75 | 33 | 12 | 70 | 25 | | LO | 08/05/01 | 08/06/01 |
| | | | | | ORS | 0 | Fuze, Stokes Mk VI | Unfuzed | empty | 62 | 37 | 12 | | | | | | |
| | | | | | 1 | 1 | Mortar, Stokes 3" | Unfuzed | | 18 | 10 | 36 | | | | | | |
| | | | | | 2 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 18 | 10 | 36 | | | | | | |
| | | | | | 3 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 18 | 10 | 36 | | | | | | |
| | | | | | 4 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 18 | 10 | 36 | | | | | | |
| | | | | | 5 | 1 | Rifle GreNAde, French VB | Fuzed | HE | 18 | 10 | 36 | | | | | | |
| | | | | | ORS | 0 | GreNAde, MK 2 | Unfuzed | empty | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 57mm, 8 pounder | Unfuzed | empty | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 3" APHE | Unfuzed | empty | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 3" APHE | Unfuzed | empty | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 3" AP | Unfuzed | NA | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Projo, 75mm Mk1 Shrapnel | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Rifle GreNAde, French VB | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |
| | | | | | ORS | 0 | Fuze, PTF M1907 | Inert | NA | | | | | | | | | |

GRID / ORDNANCE TRACKING LOG

Former Benicia Arsenal

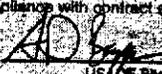
Contract Number: DACA87-97-D-0005 TO# 0019

Surface and Sub-surface OE Clearance

Sector 5 Additional (East of I-680)

| Grid Number | Date Gridded | Date Cleared | Mag or Det | Digs | Quantity | ID # | Item ID "M" No. If Available | Condition | Filter | X-FT (Cust) | Y-FT (Cust) | Z-Inches (Depth) | Lbs OE Sump | Lbs Other Sump | Demo Date | Soil Type | QC Date | QA Date |
|-------------|--------------|--------------|------------|------|----------|------|------------------------------|-----------|--------|-------------|-------------|------------------|-------------|----------------|-----------|-----------|----------|----------|
| E5 | NA | 06/13/01 | Mag | | 3 | | | | | | | | 1 | 0 | | LO | 08/06/01 | 08/06/01 |
| F5 | NA | 06/13/01 | Mag | | 5 | | | | | | | | 1 | 1 | | LO | 08/06/01 | 08/06/01 |
| G4 | 06/13/01 | 06/13/01 | Mag | | 26 | | | | | | | | 0 | 15 | | LO | 08/06/01 | 08/06/01 |
| G5 | 06/13/01 | 06/13/01 | Mag | | 64 | | | | | | | | 0 | 25 | | LO | 08/06/01 | 08/06/01 |
| H4 | 06/13/01 | 06/14/01 | Mag | | 41 | | | | | | | | 0 | 5 | | LO | 08/06/01 | 08/06/01 |
| H5 | 06/13/01 | 06/13/01 | Mag | | 31 | | | | | | | | 0 | 0 | | LO | 08/06/01 | 08/06/01 |
| I2 | NA | 09/18/01 | Mag | | 213 | | | | | | | | 0 | 22 | | LO | 09/18/01 | 09/19/01 |
| I3 | NA | 09/18/01 | Mag | | 37 | 1 | ORS Fuze, Stokes | Inert | | | | | 1 | 2 | | LO | 09/18/01 | 09/19/01 |
| I4 | 06/13/01 | 06/14/01 | Mag | | 20 | | | | | | | | 0 | 1 | | LO | 08/06/01 | 08/06/01 |
| I5 | 06/13/01 | 06/14/01 | Mag | | 36 | | | | | | | | 0 | 25 | | LO | 08/06/01 | 08/06/01 |
| J3 | NA | 09/18/01 | Mag | | 57 | | | | | | | | 1 | 3 | | LO | 09/18/01 | 09/19/01 |
| J4 | 06/14/01 | 06/14/01 | Mag | | 53 | | | | | | | | 0 | 8 | | LO | 09/18/01 | 09/19/01 |
| K4 | | | Mag | 3843 | 8450 | | ORS Fuze, M1 Landmine | Inert | | | | | 4200 | 315 | | LO | | |
| K4 | | | Mag | | 19 | | ORS Projo, 20mm | Inert | | | | | | | | | | |
| K4 | | | Mag | | 106 | | ORS Projo, 37mm | Inert | | | | | | | | | | |
| K5 | NA | 09/17/01 | Mag | | 615 | | | | | | | | 3 | 170 | | LO | 09/18/01 | 09/19/01 |
| L4 | 09/11/01 | 09/12/01 | Mag | | | | | | | | | | | | | LO | 09/18/01 | 09/19/01 |
| L5 | NA | 09/13/01 | Mag | | 1114 | | | | | | | | 4 | 451 | | LO | 09/18/01 | 09/19/01 |
| M2 | NA | 09/18/01 | Mag | | 5 | | | | | | | | 0 | 5 | | LO | 09/18/01 | 09/19/01 |
| M3 | NA | 09/18/01 | Mag | | 60 | | | | | | | | 3 | 2 | | LO | 09/18/01 | 09/19/01 |
| M4 | 06/20/01 | 06/25/01 | Mag | | 21 | | | | | | | | 1 | 4 | | LO | 08/06/01 | 08/06/01 |
| M5 | 09/11/01 | 09/11/01 | Mag | | 106 | | | | | | | | 6 | 39 | | LO | 09/18/01 | 09/19/01 |

APPENDIX E

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|--|--|----------------------|
| TO: EODT | DATE: 4 June 01 | TIME: 0730 |
| CONTRACT NUMBER: DACA 87-97D-0005 | PROJECT LOCATION: Benicia, CA | |
| DO #: 0019 | | |
| SUBJECT ITEM(S) (Check all that apply): | | |
| <input type="checkbox"/> Work Plan | <input type="checkbox"/> Quality Control | |
| <input type="checkbox"/> Safety Violation | <input type="checkbox"/> Other | |
| <input checked="" type="checkbox"/> Safety Comments | | |
| DESCRIPTION: Per the provisions of your reduced MSD access you must notify Mr. Major Galloway when any UXO or live munition is found. | | |
| <input checked="" type="checkbox"/> Prompt correction or compliance with contract specifications is requested. | | |
|  USAE Site Representative | | |
| RECEIPT ACKNOWLEDGED: K.R. [Signature] EODT Contractor's Representative | | |
| ACTION TAKEN: | | |
| SEINC FORM 848 (Revised) 1 APR 98 COPY 1 - Contractor's Representative | | |

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO: *EODT* DATE: *5/23/01* TIME: *1701*

CONTRACT NUMBER: *DACA 87-99D-0005* PROJECT LOCATION: *Former Benicia*
DO #: *TO # 0019* *Al. Benicia, Ca*

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: *QA d. grids # SS-M-10*
and SS-M-11. Both passed
QA inspections. 1
Nothing follows

(2 total) - Sector 5

Formal correction or compliance with contract specifications is requested
Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: *KR Staff*
Contractor's Representative

ACTION TAKEN:
Sector 5

CEMFC FORM 948 (Rev. 00) COPY 1 - Contractor's Representative
1 APR 00

Sector 5

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|---|--|----------------------|
| TO: ECOT | DATE: 30 May 01 | TIME: 0900 |
| CONTRACT NUMBER: DACA 87-97-D-0005 | PROJECT LOCATION: Former Bunkin Arsenal | |
| DO #: 0019 | | |
| SUBJECT ITEM(S) <input type="checkbox"/> Work Plan <input type="checkbox"/> Safety Violation <input type="checkbox"/> Safety Comments | (Check all that apply): <input checked="" type="checkbox"/> Quality Control <input type="checkbox"/> Other | |
| DESCRIPTION: The following S(P)C Section 5 subd issued OAs S5-K10 S5-T3, S5-J14, S5-K14 and S5-L4. | | |
| <input type="checkbox"/> Prompt correction or compliance with contract specifications is requested | | |
| <p style="text-align: center;"><i>[Signature]</i> USACE Site Representative</p> <p style="text-align: center;"><i>[Signature]</i> Contractor's Representative</p> | | |
| RECEIPT ACKNOWLEDGED | | |
| ACTION TAKEN: | | |
| <small>DEFINC FORM 146 (Revised) 1 APR 86</small> COPY 1 - Contractor's Representative | | |

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|---|------------------|---|
| TO: | EODT | DATE: TIME: 7 Dec 01 1030 |
| CONTRACT NUMBER: | DACA87-97-D-0005 | PROJECT LOCATION: |
| DO #: | 0019 | Beverly, CA |
| SUBJECT ITEM(S): | | (Check all that apply): |
| <input type="checkbox"/> Work Plan | | <input checked="" type="checkbox"/> Quality Control |
| <input type="checkbox"/> Safety/Inspection | | <input type="checkbox"/> Other |
| <input type="checkbox"/> Safety Comments | | |
| DESCRIPTION: The following 5 cards passed QA: 55-113, 55-111, 55-112, 55-29 and 55-116. | | |
| <input type="checkbox"/> Prompt correction or compliance with contract specifications is requested. | | |
|  USACE Representative | | |
| RECEIPT ACKNOWLEDGED:  Contractor's Representative | | |
| ACTION TAKEN: | | |
| OERNO FORM 888 (Revised) COPY 1 - Contractor's Representative 1 APR 98 | | |

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

| | | |
|---------------------------|--------------------------------|------------------------------|
| TO: <i>EODT</i> | DATE: <i>6/12/01</i> | TIME: <i>16:30</i> |
|---------------------------|--------------------------------|------------------------------|

| | |
|--|--|
| CONTRACT NUMBER: <i>DACA87-97-D-0005</i> | PROJECT LOCATION: <i>Benicia Arsenal Benicia, Ca</i> |
| DO #: <i>0019</i> | |

SUBJECT ITEM(S) (Check all that apply):

| | |
|---|---|
| <input type="checkbox"/> Work Plan | <input checked="" type="checkbox"/> Quality Control |
| <input type="checkbox"/> Safety Violation | <input type="checkbox"/> Other |
| <input type="checkbox"/> Safety Comments | |

DESCRIPTION: *QA' d arids 54-AA2,
54-A2, 54-B2, 54-C2, 54-D2,
54-D3 and 54-E3. All Passed
Nothing follows*

7 Total - Sector 4

Prompt correction or compliance with contract specifications is requested.

Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: *Paul C. Dull*
Contractor's Representative

ACTION TAKEN:

CEHC FORM 848 (Revised) 1 APR 98 **COPY 1 - Contractor's Representative**

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

TO: EODT DATE: 6-13-01 TIME: 16:30

CONTRACT NUMBER: DACA87-97-D-0005 PROJECT LOCATION: Farmel Benic in AR
 DO #: 0019 Benic 1a, Ca

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA'd grids 35-H9
55-L9, 55-K9, 54-AA3, 54-AB3
54-AB3, 54-B3 and 54-C3. All Passed
Nothing follows.

3 - Sector 5
5 - Sector 4

Prompt correction or compliance with contract specifications is requested.

Randall King
 USACE Site Representative

RECEIPT ACKNOWLEDGED: Kelly R. [Signature]
 Contractor's Representative

ACTION TAKEN:

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

TO: EODT DATE: 6-19-01 TIME: 15:30

CONTRACT NUMBER: DACA87-97-D-0005 PROJECT LOCATION: Fabaker Benicia Arsenal
Benicia Ca
 SSJ: TO 0019

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA'd grids 52-A3, 52-A4, 52-B3, 52-B4, 52-C3, and 52-C4. All Passed. Nothing follows.

6 Grids - Sector 2

Prompt correction or compliance with contract specifications is requested.

Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: [Signature]
Contractor's Representative

ACTION TAKEN:

CEVIC FORM 648 (Revised) 1 APR 88 COPY 1 - Contractor's Representative

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

| | | |
|---------------------|-------------------------|-----------------------|
| TO: <i>EOD-T</i> | DATE: <i>6-26-01</i> | TIME: <i>15:00</i> |
|---------------------|-------------------------|-----------------------|

| | |
|---|---|
| CONTRACT NUMBER: <i>DACA87-97-D-0005</i> | PROJECT LOCATION: <i>Former Benicia AB Benicia, Ca</i> |
| DOT: <i>TO# 0019</i> | |

SUBJECT ITEM(S) (Check all that apply):

| | |
|---|---|
| <input type="checkbox"/> Work Plan | <input checked="" type="checkbox"/> Quality Control |
| <input type="checkbox"/> Safety Violation | <input type="checkbox"/> Other |
| <input type="checkbox"/> Safety Comments | |

DESCRIPTION: *QA'd grids S2-G4 S2-E8, S2-E10, S2-E11, S2-E12, S4-BB4, and S4-AA4. All passed 1 - 1 - 1. Nothing follows 2 - 1 - 1*

*5 Grids - Sector 2
2 Grid - Sector 4*

Prompt correction or compliance with contract specifications is requested.

Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: *[Signature]*
Contractor's Representative

ACTION TAKEN:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO: EODT DATE: 7-10-01 TIME: 15:30

CONTRACT NUMBER: DACA87-97-D-0005 PROJECT LOCATION: Former Benicia AFB
Benicia Ca.
DOC: TO # 0019

SUBJECT ITEM(S): (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA'd Grid SS-G11
SS-312 SS-716 and SS-717
All passed, 1
Nothing Follows 1

4 Total - Sector 5
 Prompt correction or compliance with contract specifications is requested.
Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: KR [Signature] EODT
Contractor's Representative

ACTION TAKEN:

CE-51C FORM 848 (Revised) COPY 1 - Contractor's Representative
1 APR 88

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|--|---|----------------------|
| TO: <i>EODT</i> | DATE: <i>2-25-01</i> | TIME: <i>1600</i> |
| CONTRACT NUMBER: <i>DACA87-97-D-0005</i> | PROJECT LOCATION: <i>Former Benicia AK Benicia Ca.</i> | |
| BOF: <i>TO 0019</i> | | |
| SUBJECT ITEM(S) (Check all that apply): | | |
| <input type="checkbox"/> Work Plan | <input checked="" type="checkbox"/> Quality Control | |
| <input type="checkbox"/> Safety Violation | <input type="checkbox"/> Other | |
| <input type="checkbox"/> Safety Comments | | |
| DESCRIPTION: <i>QA grids SS-15, SS-16, SS-18, SS-19, SS-20, SS-21, SS-22 and SS-23. All Passed 1 - Nothing to list</i> | | |
| <input type="checkbox"/> Prompt correction or compliance with contract specifications is requested. | | |
| <i>2 Grids Sector 5</i> | <i>Randall King</i> USACE Site Representative | |
| RECEIPT ACKNOWLEDGED: | <i>[Signature]</i> Contractor's Representative | |
| ACTION TAKEN: | | |
| CEINC FORM 948 (Revised) 1 APR 98 | | |
| COPY 1 - Contractor's Representative | | |

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

TO: EODT DATE: 7-26-01 TIME: 1400

CONTRACT NUMBER: DACA87-97-D-0005 PROJECT LOCATION: Fahnestock, Benicia AR
TO 0019 Benicia, CA

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA'd arids SS-B11, SS-C19
SS-F7, SS-G3, SS-H4, SS-G7
SS-G8, SS-G9, SS-H9, SS-H10,
SS-H12, SS-H11, SS-B12, SS-J12,
SS-B11, SS-B12, SS-B12, SS-B11
Passed - Nothing Follows

Prompt correction or compliance with contract specifications is requested
5 Gals. Sect 5 Randall King
2 Gals. Sect 2 USACE Site Representative

RECEIPT ACKNOWLEDGED: [Signature]
 Contractor's Representative

ACTION TAKEN:

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|--|--|-----------------------|
| TO: EDDT | DATE: 7-3-01 | TIME: 15:30 |
| CONTRACT NUMBER: DACA87-97-D-0005 | PROJECT LOCATION: Former Benicia AR, Benicia, Ca | |
| DOI: TO 0019 | | |
| SUBJECT ITEM(S) (Check all that apply) | | |
| <input type="checkbox"/> Work Plan | <input checked="" type="checkbox"/> Quality Control | |
| <input type="checkbox"/> Safety Violation | <input type="checkbox"/> Other | |
| <input type="checkbox"/> Safety Comments | | |
| DESCRIPTION: QA'd grids SS-A11, SS-B12, SS-B13, SS-C13, SS-E15, SS-G13, SS-G14, SS-G15, SS-H14, SS-H15, SS-H16, SS-I14, SS-I15, and SS-IV. All Passed | | |
| 1 - 1 Attachment follows | | |
| 14 Grids - Sector 5 | | |
| <input type="checkbox"/> Prompt correction or compliance with contract specifications is requested | | |
| Randall King USACE Site Representative | | |
| RECEIPT ACKNOWLEDGED: Kelly R. Huff EDDT Contractor's Representative | | |
| ACTION TAKEN: | | |
| CEINC FORM 948 (Revised) 1 APR 98 | | |
| COPY 1 - Contractor's Representative | | |

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

TO: EODT DATE: 8-20-01 TIME: 1630

CONTRACT NUMBER: DACA87-97-D-0005 PROJECT LOCATION: Former Benicia AR
Benicia, Ca.
DOK: TO # 0019

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA Grids ASS-P4
ASS-P5, ASS-P9, ASS-Q5, ASS-R5,
ASS-S5, ASS-S6, ASS-T5, ASS-T6,
ASS-U5, ASS-U6, and ASS-V6.
All Passed - Nothing Follows

Prompt correction or compliance with contract specifications is requested.
12 Grids (ASS) Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: [Signature]
Contractor's Representative

ACTION TAKEN:

| U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE ORDNANCE AND EXPLOSIVE GROUP MEMO | | |
|---|---|--|
| TO: <i>EODT</i> | DATE: <i>8-2-01</i> | TIME: <i>16:40</i> |
| CONTRACT NUMBER: <i>DACA87-97-D-0005</i> <i>To 0019</i> | PROJECT LOCATION: <i>Fence Base AL</i> <i>Bonifida Ca</i> | |
| SUBJECT ITEM(S) <input type="checkbox"/> Work Plan <input type="checkbox"/> Safety Violation <input type="checkbox"/> Safety Comments | <input checked="" type="checkbox"/> Quality Control <input type="checkbox"/> Other (Check all that apply) | |
| DESCRIPTION: <i>QA of grids S2-F1, S2-F2, S2-F3, S2-F4, S2-F5, S2-E1, S2-F11, S2-C5, S2-D5, S2-B6, S2-B7, S2-B8, S2-B9 and S2-B10. All passed. Nothing follows.</i> | | |
| <i>14 grids - Sectors</i> | | |
| <input type="checkbox"/> Prompt correction or compliance with contract specifications is requested. | | |
| | | <i>Randall King</i> USACE Site Representative |
| RECEIPT ACKNOWLEDGED: | | <i>L. R. J. [Signature]</i> Contractor's Representative |
| ACTION TAKEN: | | |
| <small>CEMFC FORM 048 (Revised) 1 APR 98</small> COPY 1 - Contractor's Representative | | |

**U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO**

TO: EODT DATE: 8-22-01 TIME: 16:30

CONTRACT NUMBER: DACA87-97-D-0005
DO# TO# 0019

PROJECT LOCATION: Former Benicia Mc
Benicia, Ca

SUBJECT ITEM(S) (Check all that apply):
 Work Plan Quality Control
 Safety Violation Other
 Safety Comments

DESCRIPTION: QA'd grids S4-D0, S4-E0,
S4-E1, S4-E2, S4-F1, S4-F2,
S4-F3, and S4-F4. All Passed.
Nothing Follows

Prompt correction or compliance with contract specifications is requested.

Randall King
USACE Site Representative

RECEIPT ACKNOWLEDGED: KR
Contractor's Representative

ACTION TAKEN:

6 June 2001

U.S. Army Engineering and Support Center, Huntsville
ATTN: CEHNC-CT-E (Ms. Lydia Tadesse)
P. O. Box 1600 (4820 University Square)
Huntsville, Al 35807-4301

Re: Contract No. DACA87-97-D-0005; Task Order 0019, Former Benicia Arsenal,
Benicia, CA.

EODT Document Control No. 1392-0019-045

Dear Ms. Tadesse:

Please accept this letter as EOD Technology, Inc.'s (EODT) formal response to the CEHNC Form 948 (revised), issued on 4 June 2001 regarding a safety comment.

During an explosive demilitarization on 31 June 2001, the CEHNC on-site Safety Specialist suspected that one of the items demilitarized contained an explosive filler. Due to a misinterpretation of the reduced MSD requirement directing the contractor to notify Mr. Wayne Galloway, CEHNC-OE-S the SUXOS failed to contact the CEHNC Safety Office. In the future, the CEHNC Safety Office will be notified as soon as possible when any explosive ordnance item is located or is suspected of having an explosive filler during demilitarization operations.

If you have any comments or questions, please call me at 865-988-6063, or e-mail at djfrandsen@EODT.com. EODT appreciates the opportunity to be of continued service to the U.S. Army Engineering and Support Center, Huntsville.

Yours very truly,

EOD TECHNOLOGY, INC.

David Frandsen
Project Manager

cc: Mr. Wayne Galloway, CEHNC-OE-S
Mr. Robert Nore, CEHNC-OE-DC
Mr. Gregory Parsons, CEHNC-OE-S-P

1392-dbf

Mr. Gregory Bayuga, CEHNC-OE-S-P

June 6, 2001

U.S. Army Engineering and Support Center, Huntsville
ATTN: CEHNC-CT-E (Ms. Lydia Tadesse)
P. O. Box 1600
Huntsville, Al 35807-4301

Re: Contract No. DACA87-97-D-0005; Task Order 0019, Former Benicia Arsenal,
Benicia, CA 948 Response Letter.

EODT Document Control No.: 1397-0019-048

Dear Ms. Tadesse:

This letter serves as EOD Technology Inc.'s (EODT) response to the CEHNC Form 948 (revised) from Mr. Bob Selfridge of 25 May 2001 regarding normalization of geophysical data, which EODT received on 4 June 2001.

Chapter 5 of EODT's Work Plan (WP) for the referenced project was prepared prior to the selection of the specific geophysical instrument, which is based on the results of the Geophysical Test Plot. Therefore the WP must accommodate a wide variety of geophysical instruments, which may require different normalization procedures. EODT's WP outlines the most conservative normalization procedure for an unknown instrument. EODT's specific EM-61 procedure calls for normalization to be done during data collection.

Paragraph 5.4.5 of Chapter 5, refers to the software used for data processing, correction, and analysis. Sub topic 2 refers to normalization or leveling (removal of background), which is referenced on the CEHNC Form 948. The intent of this paragraph and the 12 sub topics is to describe the procedures EODT uses during processing to ensure the digital data collected in the field meets EODT's ISO 9001:2000 based quality standards. The type of instrument used for data collection will determine which of these procedures are necessary to meet these standards, and produce a subsurface magnetic map of the highest quality. The following paragraphs describe the procedures EODT uses to achieve high quality subsurface magnetic map.

Prior to the digital geophysical data collection of individual grids/areas, EODT's procedures dictate that the top and bottom nulling dials on the standard Geonics EM-61 are set at a value of 500, which is recommended by the manufacturer. The setting of 500 is actually the manufacturers zero setting for the standard Geonics EM-61. By setting

these dials at 500, or normalizing the instrument prior to data collection eliminates the need for post processing normalization.

Geophysical background response would not be recorded if each grid/area were zeroed out, which may also decrease anomaly identification in high geological response areas.

The geophysical data processed by EOD Technology has been normalized to the most effective level for data analysis. All anomalies of interest are reported in magnitude on the UXO Subsurface Anomaly Inspection Form (reacquisition sheet). If CEHNC would like EODT to conduct additional post processing, EODT will conduct post processing as detailed by CEHNC.

If you have any questions or comments, please call me at 865*988-6063, or e-mail at dgoehring@EODT.com. EODT appreciates the opportunity to be of continued service to the U.S. Army Engineering and Support Center, Huntsville.

Yours very truly,

EOD TECHNOLOGY, INC.

Doug Goehring
Geophysical Manager

cc: Mr. Robert Nore, CEHNC-OE-PM
Mr. Robert Selfridge, CEHNC-CS-G
Mr. Jon Durham, CEHNC-CS-G
Mr. Dave Frandsen, Benicia PM
EODT Contract Administration

1397djf

August 7, 2001

U.S. Army Engineering and Support Center, Huntsville
ATTN: CEHNC-CT-E (Ms. Lydia Tadesse)
P.O. Box 1600
Huntsville, AL 35807-4301

RE: Contract No. DACA87-97-D-0005; Task Order 0019; Former Benicia Arsenal,
Benicia, CA – Clarification to EODT 948 Response Letter Dated June 7, 2001

EODT Document Control No. 1468-0019-065

Dear Ms. Tadesse:

This letter is a follow up to the letter EOD Technology, Inc. (EODT) wrote dated 7 June 2001, in response to the CEHNC Form 948 issued May 25 regarding normalization of geophysical data. Our response, in part, addressed EODT's procedures for normalizing the EM-61 geophysical instrument.

This issue was addressed further in a meeting held July 26 in Huntsville between EODT (Pearse, Frandsen, and Goehring) and CEHNC (Nore, Selfridge, and geophysical staff). As a result of the meeting, EODT agreed to provide the geophysical data as Mr. Selfridge requested it (viz., by zeroing out the instruments prior to use and will remove background from previous data).

We have forwarded the data on CD ROM directly to Mr. Selfridge under separate cover, and believe no further action is required in this regard.

Please forward any questions to Doug Goehring. EODT appreciates the opportunity to be of continued service to the U.S. Army Engineering and Support Center, Huntsville, and values the inputs we receive through 948s and other documented means.

Yours very truly,

EOD TECHNOLOGY, INC.

David Frandsen
Project Manager

cc: Robert V. Nore, CEHNC-OE-PM
Robert Selfridge, CEHNC-CS-G
Doug Goehring
EODT Contract Administration

APPENDIX F

SEE ARSENAL BINDER FOR
APPENDIX F TASK ORDERS
0019 F-1 THROUGH F-14

DD FORM 1346-1A, JUL 91 (EO) ISSUE RELEASE/RECEIPT DOCUMENT

PERFORM (DIA)

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| <p>PROPERTY TRANSFER RECEIPT</p> <p>In Support of DACA87-97-D-0005 TO 0019, Former Kansas Arsenal Bonita, CA</p> <p>From EOD Technology, Inc.</p> <p>To: ALCO Inc. & Metall Co., 8145 675 Cedar Street, Menlo Park, VA 94041, CA</p> | | | <p>10. CITY, STATE, ZIP</p> <p>11. PART NAME</p> <p>12. PART WEIGHT</p> <p>13. PART QUANTITY</p> <p>14. PART QUANTITY</p> <p>15. UNIT QUANTITY</p> <p>16. UNIT QUANTITY</p> <p>17. UNIT QUANTITY</p> <p>18. UNIT QUANTITY</p> <p>19. UNIT QUANTITY</p> <p>20. UNIT QUANTITY</p> <p>21. UNIT QUANTITY</p> <p>22. UNIT QUANTITY</p> <p>23. UNIT QUANTITY</p> <p>24. UNIT QUANTITY</p> <p>25. UNIT QUANTITY</p> <p>26. UNIT QUANTITY</p> <p>27. UNIT QUANTITY</p> <p>28. UNIT QUANTITY</p> <p>29. UNIT QUANTITY</p> <p>30. UNIT QUANTITY</p> <p>31. UNIT QUANTITY</p> | | |
| <p>21. RECEIVED BY</p> <p>Printed Name: GRACE CLARSEN</p> <p>22. DATE RECEIVED</p> <p>Sep 12, 2001</p> | | | <p>23. TOTAL QUANTITY</p> <p>1760 lbs</p> | | |

Signature: *[Signature]*

Recipient's Signature: *[Signature]*

Recipient's Name: **GRACE CLARSEN**

Date: **Sep 12, 2001**

Copy 1 - EOD Technology

This certifies that the AEDA residue, Rupture Residue, and/or Explosive Contaminated Property listed has been 100 percent property inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related material.

[Signature]
K. King, BRANCH OF Safety Specialist

PERFORM (LJA)

PREVIOUS EDITION MAY BE USED

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PROPERTY TRANSFER RECEIPT
In support of DACA87-97-D-0005 (C) (U) (S), Foster-Benicia Arsenal Benicia, CA

From: BDD Technology Inc
To: US Army Corps of Engineers, Sacramento District

AUTHORIZATION
Presented this receipt of 9 Aug 01, 10:36 AM

The following items are transferred to USACE Sacramento District (Phone Area 0608)
 1 - 3" projectiles, wild or empty cavity
 1 - 4 powder (97mm) projectiles, empty
 1 - 7.62mm MK1 (Savage) projectile, empty
 1 - YR1000s Ordnance, empty
 1 - N1007 Piece
 1 - MK V1 Fuse for Sabot M793
 1 - All four Tail Finns, for 68mm Iban
 1 - 15 lbs the assumed GRS and Trng

This certifies that the AEDA reflects, Range Recorder, and/or Explosive
 Communication Property listed has been (00 percent) properly inspected
 and to the best of our knowledge and belief, are in the proper state of custody
 as related herein.

Rally R. [Signature]
 R. Grant, BDDT 60108

22. ADDITIONAL DATA

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Signature: *Bruce Hendrick*

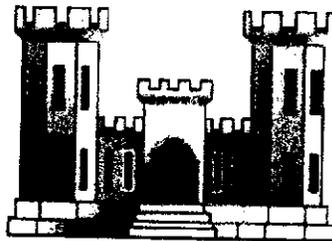
Signature: *Bruce Hendrick*

Copy 1 - BDDT

**EROSION ASSESSMENT REPORT
BASELINE CONDITIONS
FOR
SECTOR 2, ARTILLERY TEST AREA
FORMER BENICIA ARSENAL
BENICIA, CALIFORNIA**

Prepared For:

**U.S. ARMY CORPS OF ENGINEERS
ENGINEERING AND SUPPORT CENTER, HUNTSVILLE**



**DACA87-97-D-0005
Task Order: 0019**

Prepared by:

EOD TECHNOLOGY, INCORPORATED



December 2001

The views, opinions, and /or findings contained in this Erosion Report are those of the author and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other documentation.

**DACA87-97-D-0005
Task Order 0019**

**December 2001
Revision 01**

**EROSION ASSESSMENT REPORT
SHOWING BASELINE CONDITIONS
FOR
SECTOR 2, ARTILLERY TEST AREA
FORMER BENICIA ARSENAL
BENICIA, CALIFORNIA**

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| Weather Conditions | 1 |
| OE Removal Action | 1 |
| Baseline Photographs | 2 |
| Northings and Eastings | 3 |
| Photographs | 5 |

Introduction

This erosion assessment report has been produced to provide a photographic illustration of hillsides following surface and subsurface removal activities to establish baseline conditions for future erosion assessments to support long term monitoring.

Site Description

The Former Benicia Arsenal is located approximately 25 miles East- northeast of San Francisco. The project area is composed of steep rolling hills and runoff collection areas, which discharge to Suisun Bay.

The site was established in 1849 to be used primarily as a shipping and receiving facility for military equipment and materiel manufactured within CONUS and destined for military campaigns supported by the Port of San Francisco. Testing of 155-mm howitzers was performed on the Arsenal using two large concrete test tunnels. Additional details regarding site history are located in the "Benicia Arsenal Archive Search Report, March, 1994" and the "Supplement to the Benicia Arsenal Archive Search Report, May 1997". Substantial site revision has eliminated most remnants of the arsenal facilities. Construction of Interstate highway and refinery facilities led to the demolition of many underground storage bunkers used during trans-shipping operations conducted at the Arsenal.

Benicia Industries, Valero Refining Company, Pacific Bay Homes, and various individuals currently own property within the Former Benicia Arsenal.

Sector 2, Artillery Test Area is designated as "Limited Industrial/Open Space" land use. West Channel Road to the southeast, the fence alongside the McAllister Land Bridge to the west, the Sector 3A boundary to the north, and the top of the valley to the south define the sector boundaries. The majority of the sector is undeveloped and is characterized by steep terrain and scattered trees.

Weather Conditions

The weather during the removal action was dry and there was virtually no rain during the course of the clearance. The dry conditions contributed to the increased possibility of fire and on June 6th, 2001 a fire was started by a piece of machine shop equipment in the industrial area to the Northeast of the sector. The resulting fire spread to Sector 2 and approximately three acres of the sector were burned off.

OE Removal Action

Due to the severe slopes, subsurface clearance of valley walls was a concern because it could produce erosion. Therefore, the Scope of Work (SOW) tasked EODT to locate and remove all OE and OE-scrap, along the valley floor (approximately six acres), and perform surface clearance of the remaining, sloping terrain. Anomalies located but not excavated were marked on site maps and flagged in the field. Due to the expressed desire to maximize subsurface clearance by the client, it was decided to carefully excavate some of

the grids on the valley walls that would not cause erosion when they contained relatively few anomalies.

EE/CA evaluations of this 15-acre area were limited, and did not expose UXO or related scrap however a small amount of OE and ORS were found during the removal action including four OE items and 24 expended ordnance items. The OE removal Action was started in May 2001 and the completion of Sector 2 was in Aug 2001.

Baseline Photographs

The EODT SUXOS took all photographs between 20 August and 30 August 2001 using an Olympus C-2020Z digital camera.

The Photo Origin is the location of the camera when the picture was taken. The degrees are based on California State Plane with 00 being north, 90 east, 180 south and 270 west. The first seven photos are general site photos, which include areas outside the site boundary. All photos within the boundary of the site (Sector 2) show one or more grid stakes which are labeled with the grid number without the Sector number (S2) for identification purposes. The grid stakes referenced is the southwest corner of the referenced grid. Grid coordinates for the southwest corners of all grids within the site are listed in Table 1-1, northings and eastings.

NOTE: When a site requires a network of grids EODT places a digital grid pattern over the digital map of the site. For numerical continuity and tracking purposes the grid pattern is placed with the left edge of the pattern at the western boundary of the site and the bottom of the pattern at the southern boundary of the site. To maintain continuity (i.e. A1, A2, A3, B1, B2, B3) the grid numbers used for identification must start at the lower left corner of the grid network, which may be outside the boundary of the site. Unless the site is exactly the same shape and size of the grid network there will be grid numbers that are not used. I noted these grid numbers to ensure all grids within the network were accounted for, including the grid numbers not used.

**Table 1-1
Northings and Eastings
Former Benicia Arsenal, Sector 2
California State Plane Coordinates**

| GRID | EASTING | NORTHING | GRID | EASTING | NORTHING |
|--------|--------------|------------|--------|--------------|------------|
| S2-A1 | NOT USED | see note | S2-F1 | 651 36 08.55 | 1799711.23 |
| S2-A2 | NOT USED | pg G2 | S2-F2 | 651 36 42.38 | 1799610.75 |
| S2-A3 | 651 37 42.38 | 1799110.75 | S2-F3 | 651 37 42.38 | 1799610.75 |
| S2-A4 | 651 38 42.38 | 1799110.75 | S2-F4 | 651 38 42.38 | 1799610.75 |
| S2-A5 | 651 39 42.38 | 1799110.75 | S2-F5 | 651 39 42.38 | 1799610.75 |
| S2-A6 | 651 40 42.38 | 1799110.75 | S2-F6 | 651 40 42.38 | 1799610.75 |
| S2-A7 | 651 41 42.38 | 1799110.75 | S2-F7 | 651 41 42.38 | 1799610.75 |
| S2-A8 | NOT USED | | S2-F8 | 651 42 42.38 | 1799610.75 |
| S2-A9 | NOT USED | | S2-F9 | 651 43 42.38 | 1799610.75 |
| S2-A10 | NOT USED | | S2-F10 | 651 44 42.38 | 1799610.75 |
| S2-A11 | NOT USED | | S2-F11 | 651 45 42.38 | 1799610.75 |
| S2-A12 | NOT USED | | S2-F12 | 651 46 42.38 | 1799610.75 |
| S2-A13 | NOT USED | | S2-F13 | 651 47 42.38 | 1799610.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-B1 | NOT USED | |
| S2-B2 | NOT USED | |
| S2-B3 | 651 37 42.38 | 1799210.75 |
| S2-B4 | 651 38 42.38 | 1799210.75 |
| S2-B5 | 651 39 42.38 | 1799210.75 |
| S2-B6 | 651 40 42.38 | 1799210.75 |
| S2-B7 | 651 41 42.38 | 1799210.75 |
| S2-B8 | 651 42 42.38 | 1799210.75 |
| S2-B9 | 651 43 42.38 | 1799210.75 |
| S2-B10 | 651 44 42.38 | 1799210.75 |
| S2-B11 | 651 45 42.38 | 1799210.75 |
| S2-B12 | 651 46 42.38 | 1799210.75 |
| S2-B13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-G1 | 651 36 08.55 | 1799710.75 |
| S2-G2 | 651 36 42.38 | 1799710.75 |
| S2-G3 | 651 37 42.38 | 1799710.75 |
| S2-G4 | 651 38 42.38 | 1799710.75 |
| S2-G5 | 651 39 42.38 | 1799710.75 |
| S2-G6 | 651 40 42.38 | 1799710.75 |
| S2-G7 | 651 41 42.38 | 1799710.75 |
| S2-G8 | 651 42 42.38 | 1799710.75 |
| S2-G9 | 651 43 42.38 | 1799710.75 |
| S2-G10 | 651 44 42.38 | 1799710.75 |
| S2-G11 | 651 45 42.38 | 1799710.75 |
| S2-G12 | 651 46 42.38 | 1799710.75 |
| S2-G13 | 651 47 42.38 | 1799710.75 |

| GRID | EASTING | NORTHING |
|-------|--------------|------------|
| S2-C1 | NOT USED | |
| S2-C2 | 651 36 42.38 | 1799310.75 |
| S2-C3 | 651 37 42.38 | 1799310.75 |
| S2-C4 | 651 38 42.38 | 1799310.75 |
| S2-C5 | 651 39 42.38 | 1799310.75 |

| GRID | EASTING | NORTHING |
|-------|--------------|------------|
| S2-H1 | NOT USED | |
| S2-H2 | 651 36 42.38 | 1799810.75 |
| S2-H3 | 651 37 42.38 | 1799810.75 |
| S2-H4 | 651 38 42.38 | 1799810.75 |
| S2-H5 | 651 39 42.38 | 1799810.75 |

| | | | | | |
|--------|--------------|------------|--------|--------------|------------|
| S2-C6 | 651 40 42.38 | 1799310.75 | S2-H6 | 651 40 42.38 | 1799810.75 |
| S2-C7 | 651 41 42.38 | 1799310.75 | S2-H7 | NOT USED | |
| S2-C8 | 651 42 42.38 | 1799310.75 | S2-H8 | NOT USED | |
| S2-C9 | 651 43 42.38 | 1799310.75 | S2-H9 | 651 44 20.38 | 1799810.75 |
| S2-C10 | 651 44 42.38 | 1799310.75 | S2-H10 | 651 44 42.38 | 1799810.75 |
| S2-C11 | 651 45 42.38 | 1799310.75 | S2-H11 | 651 45 42.38 | 1799810.75 |
| S2-C12 | 651 46 42.38 | 1799310.75 | S2-H12 | 651 46 42.38 | 1799810.75 |
| S2-C13 | NOT USED | | S2-H13 | 651 47 42.38 | 1799810.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-D1 | NOT USED | |
| S2-D2 | NOT USED | |
| S2-D3 | 651 38 42.38 | 1799505.98 |
| S2-D4 | 651 39 13.38 | 1799410.75 |
| S2-D5 | 651 37 42.38 | 1799410.75 |
| S2-D6 | 651 38 42.38 | 1799410.75 |
| S2-D7 | 651 39 42.38 | 1799410.75 |
| S2-D8 | 651 40 42.38 | 1799410.75 |
| S2-D9 | 651 41 42.38 | 1799410.75 |
| S2-D10 | 651 42 42.38 | 1799410.75 |
| S2-D11 | 651 43 42.38 | 1799410.75 |
| S2-D12 | 651 44 42.38 | 1799410.75 |
| S2-D13 | 651 45 42.38 | 1799410.75 |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-I1 | NOT USED | |
| S2-I2 | NOT USED | |
| S2-I3 | NOT USED | |
| S2-I4 | NOT USED | |
| S2-I5 | NOT USED | |
| S2-I6 | NOT USED | |
| S2-I7 | NOT USED | |
| S2-I8 | NOT USED | |
| S2-I9 | NOT USED | |
| S2-I10 | NOT USED | |
| S2-I11 | 651 45 63.38 | 1799910.75 |
| S2-I12 | 651 46 42.38 | 1799910.75 |
| S2-I13 | NOT USED | |

| GRID | EASTING | NORTHING |
|--------|--------------|------------|
| S2-E1 | NOT USED | |
| S2-E2 | 651 36 08.55 | 1799711.23 |
| S2-E3 | 651 37 42.38 | 1799611.75 |
| S2-E4 | 651 38 42.38 | 1799511.75 |
| S2-E5 | 651 39 42.38 | 1799511.75 |
| S2-E6 | 651 40 42.38 | 1799511.75 |
| S2-E7 | 651 41 42.38 | 1799511.75 |
| S2-E8 | 651 42 42.38 | 1799511.75 |
| S2-E9 | 651 43 42.38 | 1799511.75 |
| S2-E10 | 651 44 42.38 | 1799511.75 |
| S2-E11 | 651 45 42.38 | 1799511.75 |
| S2-E12 | 651 46 42.38 | 1799511.75 |

| GRID | EASTING | NORTHING |
|-------------------------|--------------|------------|
| S2-J12 | 651 46 42.38 | 1800010.75 |
| NO OTHER "J" GRIDS USED | | |

| | | |
|--------|----------|--|
| S2-E13 | NOT USED | |
|--------|----------|--|

APPENDIX G

Sector 2

Not Hatched Grids Subsurface Cleared



Area Burned



Hatched Grids Surface Cleared Only



Carreful Excavation in Valley Walls



Indicates Position of Subsurface Anomaly Left in Place •

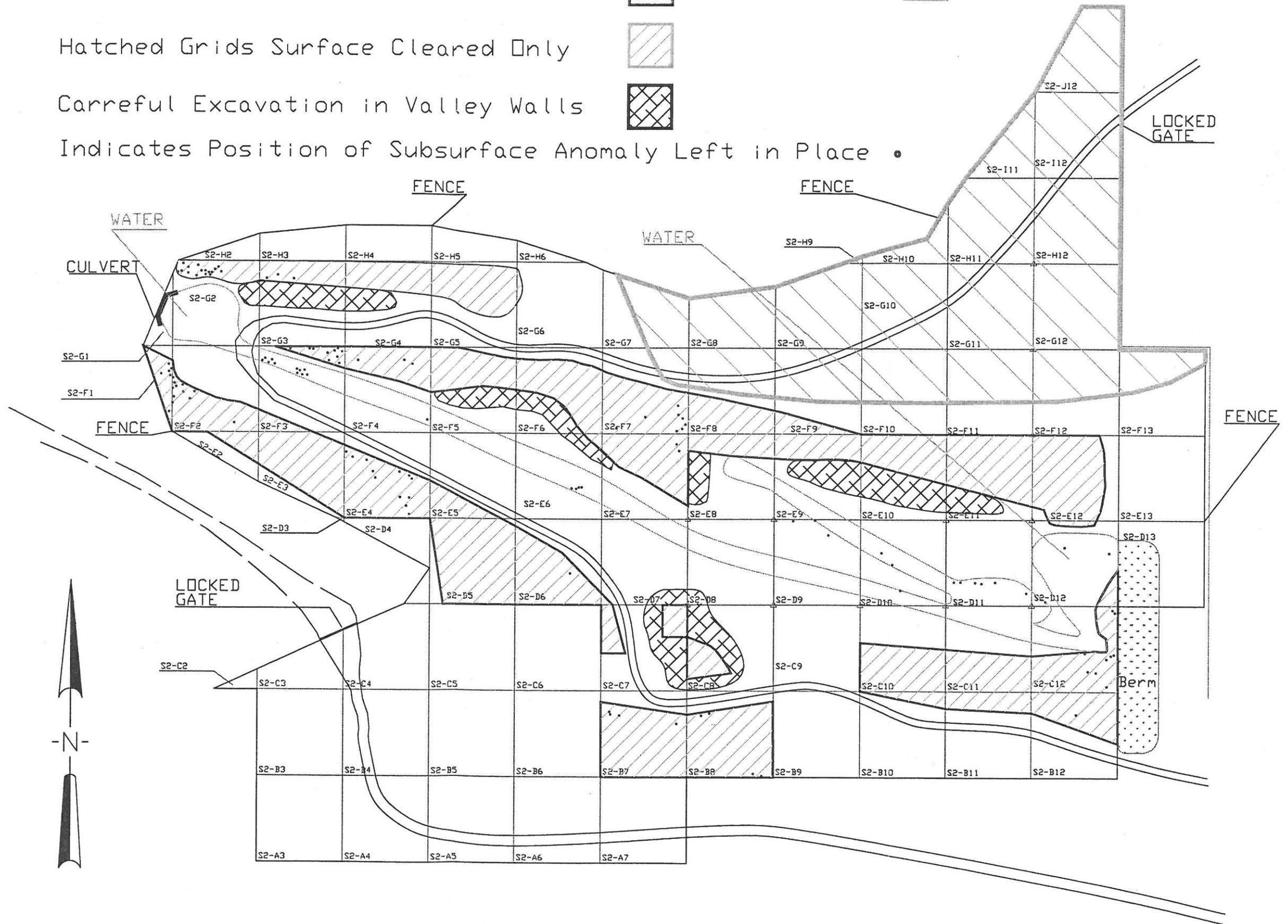




Figure 1, General Overview of the Site from Grid B5 @ 90 degrees



Figure 2, General Overview of the Site from Grid B5 @ 70 degrees

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December 2001
Revision 01



Figure 3, General Overview of the Site from Grid B5 @ 00 degrees



Figure 4, General Overview of the Site from Grid B11 @ 60 degrees



Figure 5, General Overview of the Site from Grid B11 @ 00 degrees



Figure 6, General Overview of the Site from Grid B11 @ 320 degrees



Figure 7, General Overview of the Site from Grid B11 @ 250 degrees



Figure 8, Within the Site from Grid Stake A7 @ 00 degrees



Figure 9, Within the Site from Grid Stake A8 @ 00 degrees

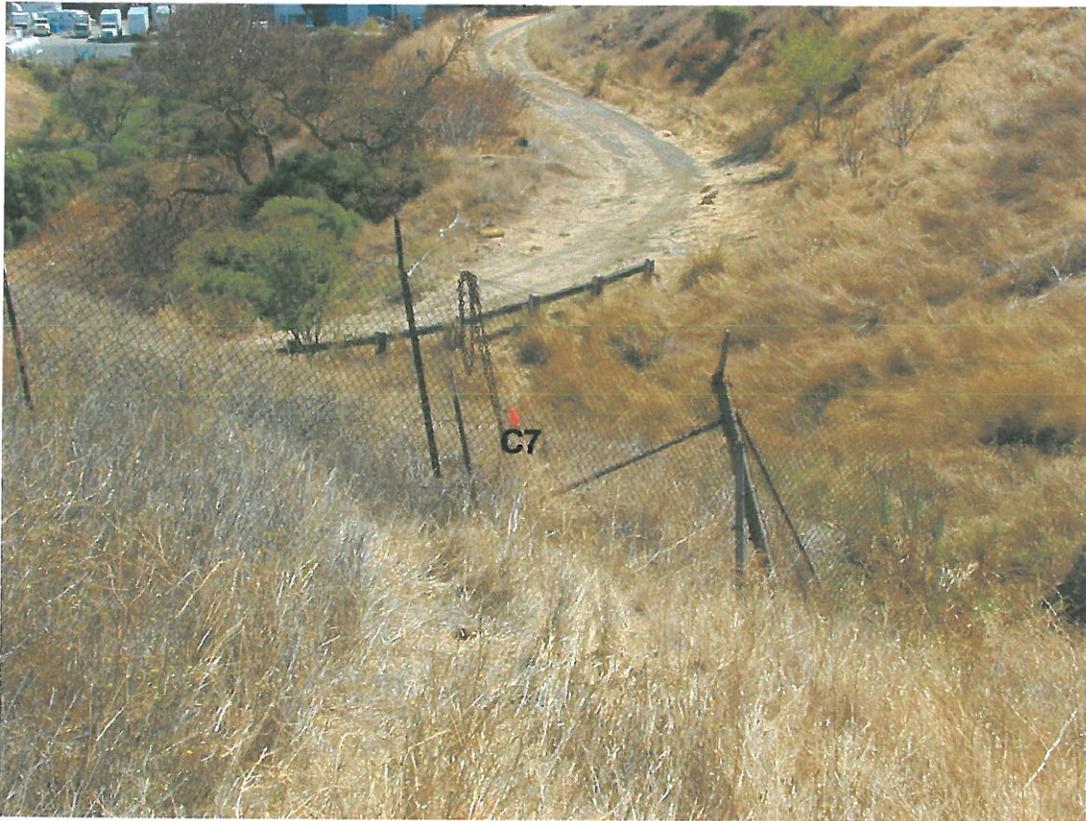


Figure 10, Within the Site from Grid Stake C6 @ 90 degrees



Figure 11, Within the Site from Grid Stake C8 @ 270 degrees



Figure 12, Within the Site from Grid Stake D8 @ 180 degrees



Figure 13, Within the Site from Grid Stake D6 @ 270 degrees

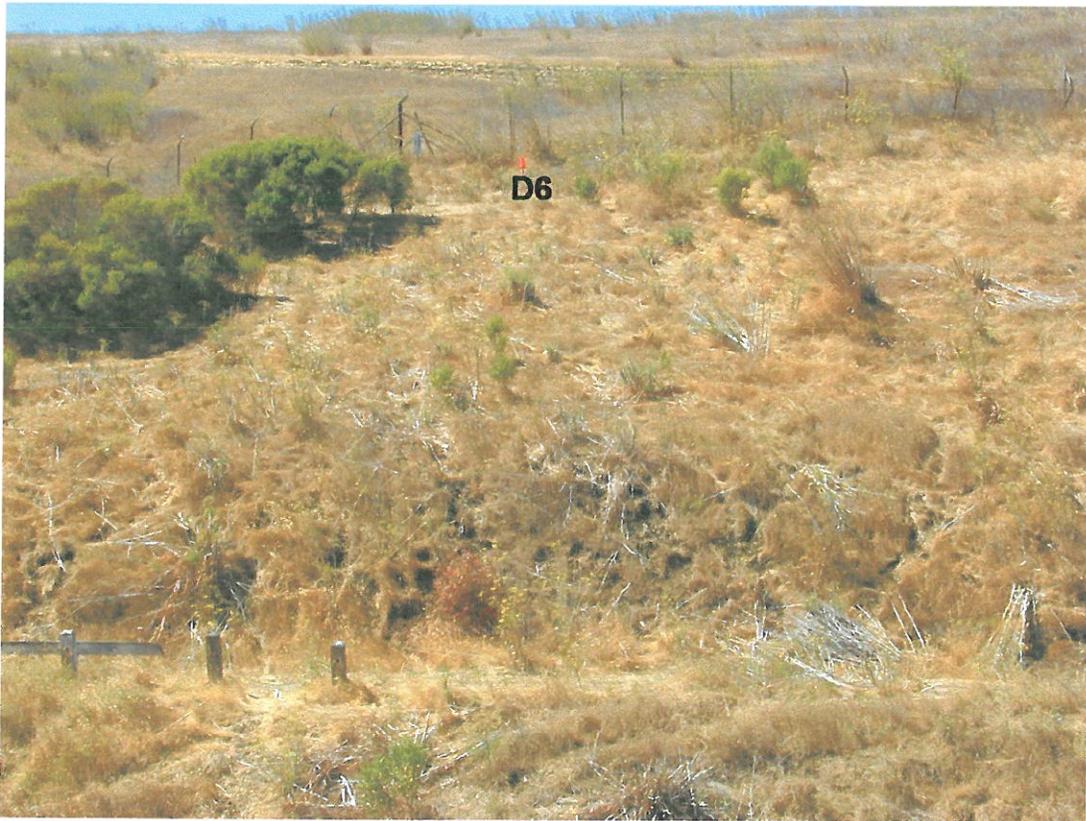


Figure 14, Within the Site from Grid Stake F7 @ 215 degrees



Figure 15, Within the Site from Grid Stake E8 @ 215 degrees



Figure 16, Within the Site from Grid Stake E5 @ 270 degrees



Figure 17, Within the Site from Grid Stake F7 @ 245 degrees



Figure 18, Within the Site from Grid Stake F7 @ 200 degrees



Figure 19, Within the Site from Grid Stake E8 @ 270 degrees



Figure 20, Within the Site from Grid Stake F7 @ 125 degrees

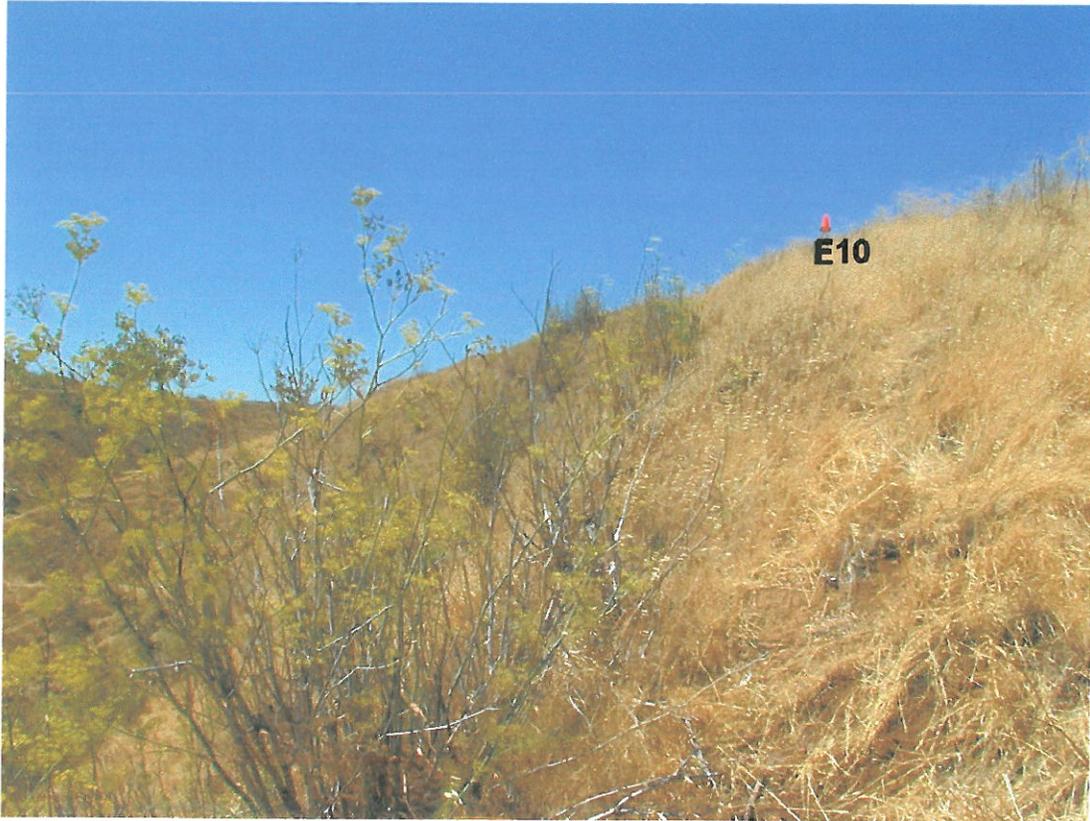


Figure 21, Within the Site from Grid Stake F10 @ 180 degrees



Figure 22, Within the Site from Grid Stake D12 @ 320 degrees



Figure 23, Within the Site from Grid Stake F10 @ 125 degrees



Figure 24, Within the Site from Grid Stake F13 @ 180 degrees



Figure 25, Within the Site from Grid Stake G3 @ 180 degrees



Figure 26, Within the Site from Grid Stake G3 @ 270 degrees



Figure 27, Within the Site from Grid Stake F4 @ 350 degrees



Figure 28, Within the Site from Grid Stake F4 @ 00 degrees



Figure 29, Within the Site from Grid Stake FS @ 45 degrees



Figure 30, Within the Site from Grid Stake G7 @ 225 degrees



Figure 31, Within the Site from Grid Stake G7 @ 300 degrees

APPENDIX H



Above: Establishing the Geophysical Test Plot

Below: Test Plot was seeded with items buried at various depths and orientations





Above: OS25 was surveyed with the EM-61 after the vehicles were removed

Below: OS25A was also surveyed with an EM-61





Above: Engineering controls were used in Sector 5 when required

Below: A tractor with bush hog was used in Sector 5 to permit the Geophysical Survey.





Above: Sandbag Mitigation and area watering were used for all demo shots.

Below: Sector 5 required extensive use of a backhoe to clear debris.





Above: Poison Oak grew in all sectors and did present a biological hazard.

Below: Subsurface Clearance in Sector 2 included in the water to a depth of 18 inches.



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Task Order 0019

25 October 2001
Revision 00



Above: Steep slopes in Sector 2 were surface cleared due to erosion concerns.

Below: Sector 2 had been used for dumping the past and had several areas of debris.





Above: A grass fire in the northeast part of Sector 2, which was started by others required EODT to evacuate and suspend activities for several hours.

Below: A Schonstedt-assisted surface clearance was performed in Sector 4.



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Task Order 0019

25 October 2001
Revision 00



Above: The terrain in Sector 4 was hilly with tall grass, poison oak, and heavy brush.

Below: An ordnance burial pit was located in Sector 5 Grid M13 and excavated.





Above: OE and ORS was excavated from the burial pit in Sector 5 Grid M13.

Below: Heavy vegetated and steep hill is the terrain in Sector AS5 (east of Hwy I680).





Above: A military tank body, which was used as a “popping furnace” was located in Grid K4 of AS5.

Below: A large burial pit of burned ORS was located next to the tank in AS5.



APPENDIX I



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2822

Rec'd 8/8/01

Environmental Resources Branch

Memorandum for CESPK-ED-E (John Esparza, Technical Team Lead)

Subject: Summary of Field Site Visit to Benicia Arsenal Explosive Ordnance Site, Sector 2

On Thursday July 27, 2001 John Esparza (USACE-SPK), Randy King (USACE-HNC), Kelly Groff (EODT), and myself met at the Former Benicia Arsenal Site to conduct a field observation of potential wetlands within Sector 2. The Former Benicia Arsenal is located in the city of Benicia, Solano County, California. The purpose of the project is to detect and remove Ordnances and Explosives (OE).

The purpose of the site visit was to identify wetland areas and assess potential habitat for threatened and/or endangered species that may occur in these wetlands (see photographs in Attachment 1). An initial assessment of potential threatened and/or endangered species is presented in the Final Engineer Evaluation/Cost Analysis (EE/CA) (ref 1) for the Former Benicia Arsenal. The wetlands are located in and adjacent to a creek traversing the property that conveys runoff from the surrounding hills down to Suisun Bay. These wetland areas consist mainly of palustrine emergent and riparian shrub-scrub vegetation growing along the banks. Standing and flowing water approximately 1 to 3 feet deep was observed in the wetland areas at the time of this survey. Pieces of industrial debris, broken concrete and asphalt, car parts, and tires were also observed in the wetlands and along the shoreline.

It was agreed by John Esparza, Randy King, Kelly Groff, and myself that any personnel entering the wetland-riparian zone to investigate the presence/absence of OE will not permanently fill and/or place structures within these sensitive areas during OE recovery operations. Workers will only enter the wetlands with hand held equipment and remove OE as necessary and avoid contact with threatened and/or endangered species. Contact includes the removal, harming, harassment, and endangerment of any threatened and/or endangered species that may be encountered on site. Workers will also be careful as to avoid damage to any potential threatened and/or endangered species habitat that may occur on site. Damage to habitat includes the removal, destruction, trampling, and disturbance of vegetation, water, water quality, burrows, and nests while working within the wetland-riparian zone.

It was also agreed by John Esparza, Randy King, Kelly Groff, and myself that objects and debris (not of OE origin) present within the wetland-riparian zone shall not be moved more than 3 feet from their original location. Workers may have to move these objects in order to determine the

presence/absence of OE underneath them. These objects will not be placed in areas that will damage vegetation and other habitat, block the flow of water, or change the quality of water in the wetland-riparian zone.

Attachment 2 depicts a list of threatened and/or endangered species and their habitat requirements that may occur within the wetland- riparian zone of Sector 2. Attachment 3 displays color photos of the sensitive species that may be encountered during OE recovery operations. This list as well as the photographs of the wetland-riparian areas and sensitive animal species shall be posted on the job site for staff to view. Workers shall be educated on the importance of avoiding threatened and/or endangered species and their habitat before entering the wetland-riparian zone. If you have any questions please call me at (916) 557-5172.

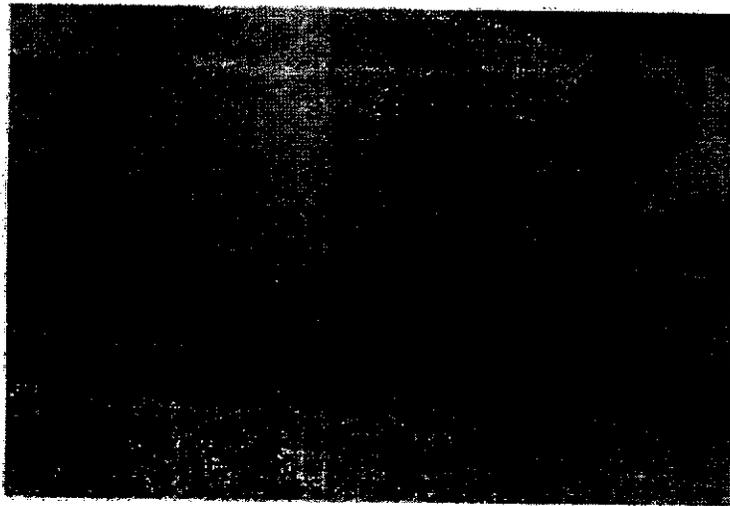
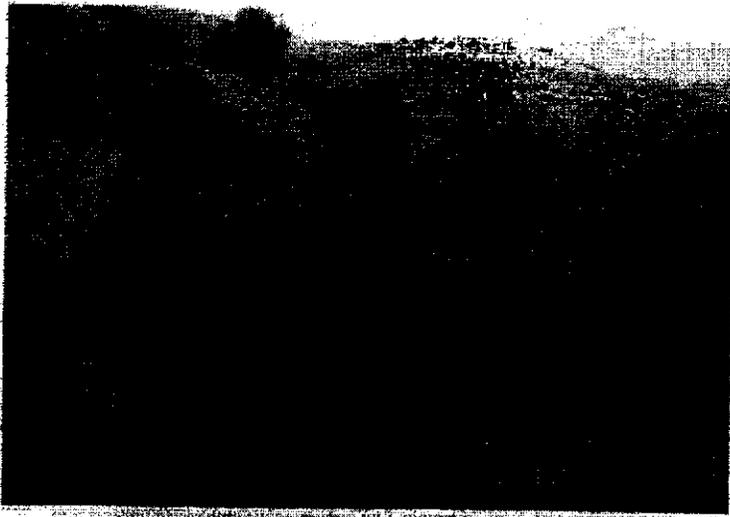
Sincerely,



Donald Lash
Environmental Scientist
Environmental Planning Section
US Army Corps of Engineers, Sacramento District

Copy Furnish:

Mr. Steve Essert, 2040 Peabody Road, Vacaville, CA 95687



ATTACHMENT 1



Threatened, Endangered, and Candidate Species that may occur on or near the Former Benicia Arsenal

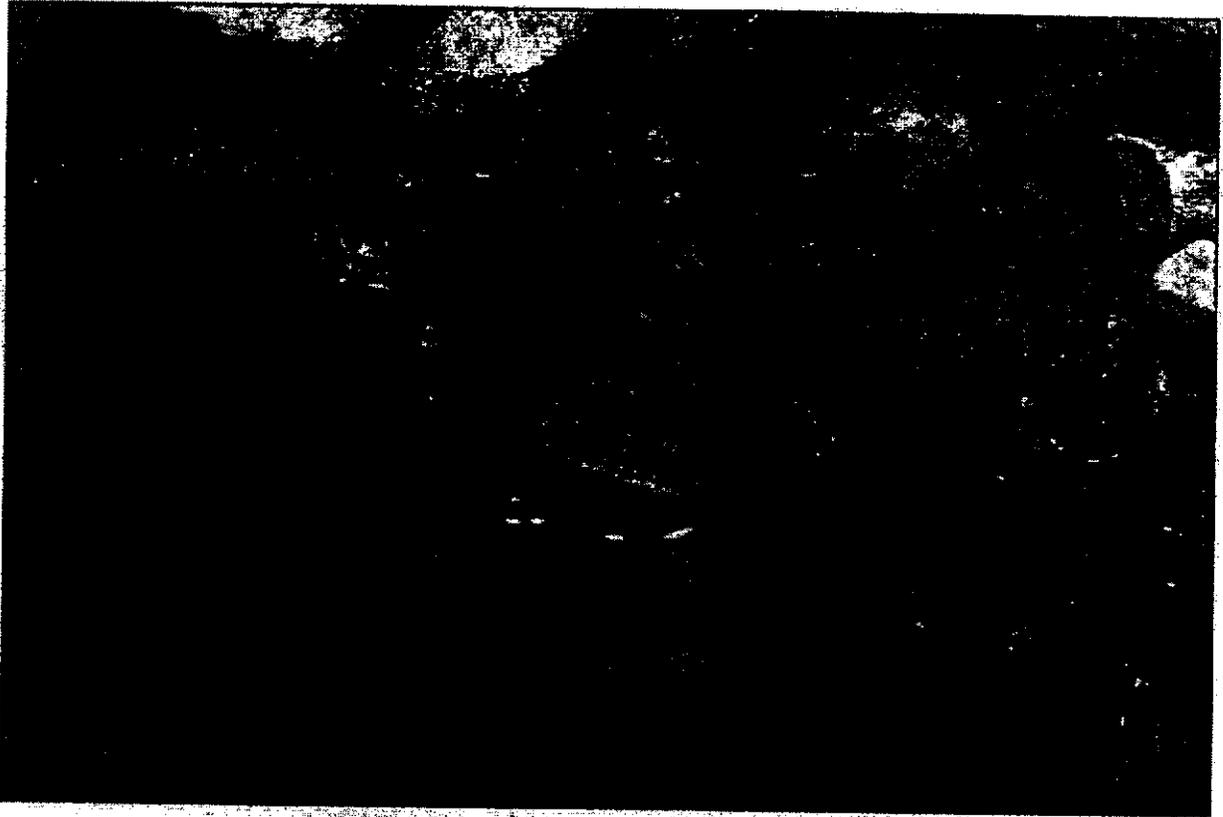
| Common Name | Scientific Name | Federal Status | Habitat at Former Benicia Arsenal |
|---|--|----------------|--|
| Mammals | | | |
| Salt marsh harvest mouse | <i>Reithrodontomys raviventris</i> | E | No habitat within EE/CA area |
| San Joaquin Valley woodrat | <i>Neotoma fuscipes sparsa</i> | C | Potentially occurring along streamside vegetation |
| Birds | | | |
| American peregrine falcon | <i>Falco peregrinus anatum</i> | E | May forage in grassland |
| California brown pelican | <i>Pelecanus occidentalis californicus</i> | E | No habitat within EE/CA area |
| California shrikes tail | <i>Lanius borealis californicus</i> | E | No habitat within EE/CA area |
| Western snowy plover | <i>Colaptes auratus nivosus</i> | T | No habitat within EE/CA area |
| Bald eagle | <i>Haliaeetus leucocephalus</i> | T | May forage in grassland |
| Reptiles | | | |
| Alameda red racer | <i>Masticophis lateralis snyderianus</i> | T | No habitat within EE/CA area |
| Giant garter snake | <i>Thamnophis couchii gigas</i> | T | Potentially occurring in drainages and swales |
| Amphibians | | | |
| California red-legged frog | <i>Rana aurora draytoni</i> | T | Potentially occurring in drainages and swales |
| California tiger salamander | <i>Ambystoma talpoianum</i> | C | Potentially occurring in swales |
| Fish | | | |
| White-run chinook salmon | <i>Oncorhynchus tshawytscha</i> | E | No fish habitat was disturbed by EE/CA activities |
| Water-run chinook salmon critical habitat | <i>Oncorhynchus tshawytscha</i> critical habitat | E | No fish habitat was disturbed by EE/CA activities |
| Delta smelt | <i>Hypomesus transpacificus</i> | T | No fish habitat was disturbed by EE/CA activities |
| Delta smelt critical habitat | <i>Hypomesus transpacificus</i> critical habitat | T | No fish habitat was disturbed by EE/CA activities |
| Central Valley steelhead | <i>Oncorhynchus mykiss</i> | PE | No fish habitat was disturbed by EE/CA activities |
| Sacramento splittail | <i>Pogonichthys macrolepidotus</i> | PT | No fish habitat was disturbed by EE/CA activities |
| Invertebrates | | | |
| Callippe silverspot butterfly | <i>Speyeria callippe callippe</i> | E | Potentially occurring in grasslands containing Johnny jump-up plants |
| California heathwaxer skipper | <i>Gyncois pacifica</i> | E | Potentially occurring in vernal filled swales and pools |
| Vernal pool fairy shrimp | <i>Branchinecta lynchi</i> | T | Potentially occurring in vernal filled swales and pools |

C = candidate for listing
 E = endangered
 EE/CA = engineering evaluation/cost analysis
 PE = proposed endangered
 PT = proposed threatened
 T = threatened

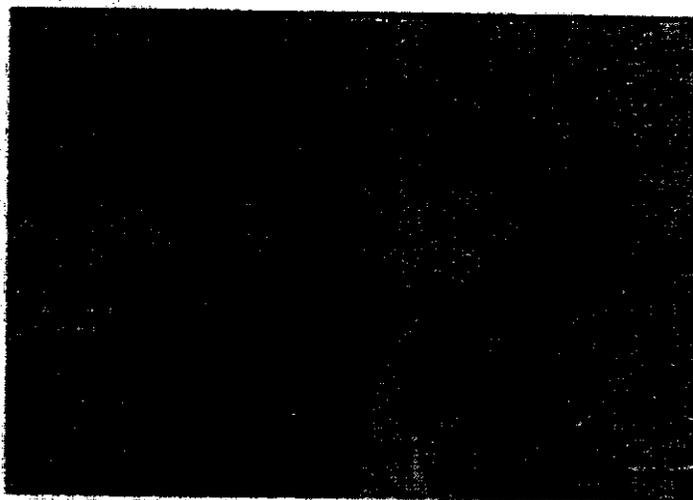
ATTACHMENT 2

**ATTACHMENT 3. Photographs of Threatened and/or
Endangered Animal Species that may Potentially Occur in
Sector 2, Benicia Arsenal Site, Benicia, California.**

California Red Legged Frog



California Red Legged Frog

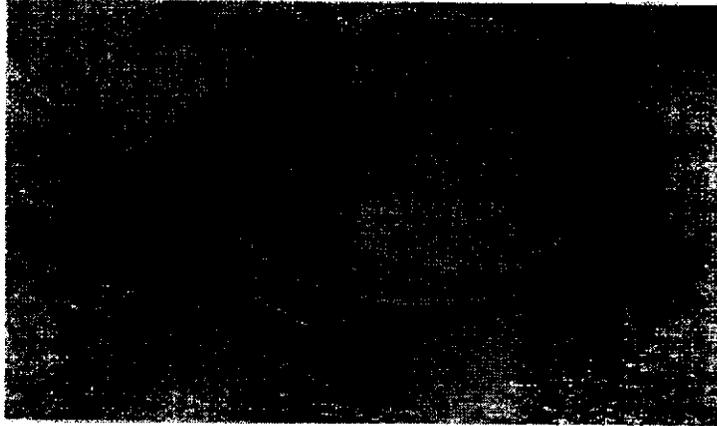


**Bull Frog (left), California Red Legged Frog (right) for
comparison**

California Tiger Salamander



Western Pond Turtle



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DEPARTMENT OF THE ARMY
MUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1800
MUNTSVILLE, ALABAMA 35507-4801

June 14, 2001

Design Center for Ordnance
and Explosives Directorate (200-1c)

SUBJECT: Contract DAC87-97-D-0005, Task Order 0019,
Removal Action, Former Benicia Arsenal, Benicia,
California

Mr. David Frandsen
EOD Technology, Incorporated
P.O. Box 24173,
Knoxville, Tennessee 37933-2173

Dear Mr. Frandsen:

You are approved to conduct ordnance and explosives intrusive activities in Sector 5 using a reduced Minimum Separation Distance (MSD) of 200 feet based on a change in Most Probable Munition from the current 4-inch Stokes mortar to the V2 grenade. The basis for this approval is explained at the enclosure.

The project Work Plan shall be revised immediately to reflect the new MSDs and other approved conditions. The revised pages must be approved, and the Unexploded Ordnance Teams trained in the revised procedures before work can proceed under the new conditions.

If you believe certain comments included herein constitute a change to your contract, do not proceed with performance. Instead, formally notify me of the basis of your position and await instructions. I may (1) confirm that it is a change, direct the mode of further performance, and plan for its funding; (2) countermand the alleged change; or (3) notify you that no change is considered to have occurred. Proceeding with performance without first notifying me of your position will be at your own risk.

-2-

Your point of contact for this issue is Mr. Robert
Nora, Project Manager, at 256-895-1507, or facsimile
256-895-1378.

Sincerely,

Eduardo A. Marrero
EDUARDO MARRERO
CONTRACTING OFFICER

Enclosure

Copy Furnished:

Commander, U.S. Army Engineer District, Sacramento,
ATTN: CS87K-KD-E (Mr. Bruce Mandel), 1325 J Street,
Sacramento, CA 95816-1822

CEHNC-CE-S (200-1c)

14 June 2001

MEMORANDUM FOR CEHNC-CE-DC (Mr. Robert Nore)

SUBJECT: Change of Post Probable Munition (MPM) for USACE Removal Action at Former Benicia Arsenal, CA

1. References:

- a. CEHNC-CE-DC, Memorandum, 13 June 2001, SAB.
- b. CEHNC-EC-CS-S, Calculation Sheet, 24 July 2000.

2. Your request to change the MPM to the VB Rifle Grenade for intrusive work at Sector 5 (Canal Barn Area) former Benicia Arsenal, CA, is approved. You may use the 1/500 Minimum Separation Distance (MSD) for the VB Rifle Grenade for non-essential project personnel in the open. The 1/500 distance is 200 feet.

3. We concur with the CEHNC-ED-CS-S MSD to dig up to 25 feet of the inhabited brick above ground magazines. The 1/500 distance of 200 feet shall be implemented for non-essential project personnel in the open.

4. Additionally, we concur with your request to dig from 0 to 200 feet along Park Road, I-680, and I-780 without engineering controls until the anomaly is identified as OE. Once the anomaly is identified as OE, the appropriate engineering controls shall be erected. As an effort to maintain minimal personnel exposure, the team separation distance shall remain at 200 feet. This only applies to those grids located at 200 feet or less from Park Road, I-680, and I-780. All grids located in other areas shall maintain the 200 feet MSD.

5. Should any live munitions other than the VB Rifle Grenade be discovered, all intrusive work will cease and this office notified. The MSD will be required to be reevaluated by this office.

Encl

CEO

CSHHC-0E-8 (200-1c) 14 June 2001
SUBJECT: Change of Most Probable Munition (MPM) for USACE
Removal Action at Former Benicia Arsenal, CA

6. Questions regarding this matter should be directed to Mr.
Greg Bayuga, OE Safety Group, at 255-895-1596.

Encls

Wayne H. Galloway
WAYNE H. GALLOWAY
Chief, Safety Group for
Ordnance and Explosives Directorate

CF:
OE-DC Read
OE Read
OE-S Read
ED File/Read

 Bayuga/jc/1596/MPM-Benicia-14 Jun 01.doc

CRMC-08-DC (200-15)

13 June 2001

MEMORANDUM FOR CRMC-08-S (Galloway)

SUBJECT: Change of Most Probable Munition (MPM) for USMC Removal Action at Former Benicia Arsenal, Benicia, California

1. Request approval to change the MPM in Sector 5 from 4-inch Stokes mortar to VB rifle grenade.
2. After 5 weeks and over 2,000 digs in Sector 5, no 4-inch Stokes mortar rounds or pieces have been found. No 3-inch mortar rounds have been found, only base plates and fuzes. One 37 mm contained residual explosive. Five 57 mm and one 75 mm projectile were inert. All projectiles were found near the center of Sector 5. Eighteen full-up VB rifle grenades have been found, making the VB grenade the MPM.
3. Request approval to use the 25-foot calculated Minimum Separation Distance (MSD) (see enclosure) for VB grenade around the brick magazine buildings in order to avoid evacuations of businesses located within the buildings.
4. For grids along the perimeter of Sector 5 (bordering Park Road and Interstates 680 and 780), field data indicates low probability of OE discoveries. Such discoveries would be the low-sensitivity fuzes or VB grenades. According to the contractor, VB grenade fuzing is unsophisticated and insensitive. The contractor's careful and methodical excavation techniques will ensure safe identification and recovery. Request approval to perform intrusive activities along the perimeter without engineering controls, with the understanding that if an OE item is identified, engineering controls will be installed to complete the dig. This will allow us to complete the project without disrupting traffic.
5. Should any OE other than fuzes or the VB rifle grenade be found, all intrusive work in the immediate area will cease and your office will be notified.

Encl

of: OE Read
OE-DC Read/Worn
ED File


 ROBERT NORE, P.E.
 Project Manager, OE Design Center



DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4901

Kelly

May 10, 2001

REPLY TO
ATTENTION OF:

Design Center for Ordnance
and Explosives Directorate (280-1c)

SUBJECT: Contract DACA87-97-D-0005, Task Order 0019,
Removal Action, Former Benicia Arsenal, Benicia,
California

Mr. David Frandsen
EOD Technology, Incorporated
P.O. Box 24173,
Rockyville, Tennessee 37933-2173

Dear Mr. Frandsen:

You are approved to conduct ordnance and explosives intrusive activities using a reduced Minimum Separation Distance of 175 feet around the brick magazine buildings in Sector 5. Approval is based on the 4-inch Stokes mortar, the current Most Probable Munition. The basis for this approval is explained at the enclosure. The enclosure shall become a part of the project Work Plan.

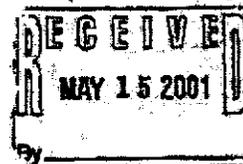
If you believe certain comments included herein constitute a change to your contract, do not proceed with performance. Instead, formally notify me of the basis of your position and await instructions. I may (1) confirm that it is a change, direct the mode of further performance, and plan for its funding; (2) countermand the alleged change; or (3) notify you that no change is considered to have occurred. Proceeding with performance without first notifying me of your position will be at your own risk.

Please coordinate your mobilization with Mr. Robert Nore, Project Manager, at 256-895-1507, or facsimile 256-895-1378.

Sincerely,

Lydia Tadessa
Lydia Tadessa
Contracting Officer

Enclosure



Copy Furnished:
Commander, U.S. Army Engineer District Sacramento,
ATTN: CBSPK-ED-E (Mr. Bruce Handel), 1325 J St.,
Sacramento, CA 95816-1822

CEHNC-OR-S (200-1c)

8 May 2001

MEMORANDUM FOR CEHNC-OR-DC (Mr. Robert Nore)

SUBJECT: Reduction of Minimum Separation Distance (MSD) for USACE Removal Action at Former Benicia Arsenal, Benicia, CA

1. References:

- a. CEHNC-OR-CX, Interim Guidance Document 00-01, 2 March 2000.
- b. CEHNC-OR-DC, Memorandum, 4 May 2001.
- c. CEHNC-ED-S, Benicia Arsenal Worksheet, 2 May 2001.

2. Your request to reduce the (MSD) for intrusive work at brick magazine buildings in Sector 5 (Camel Barn Area) former Benicia Arsenal, CA, is approved. You may use the 175 foot MSD for the 4" Stokes mortar for personnel in the brick magazine buildings.

3. This reduced distance is based on the following:

- a. Personnel are in the brick magazine building.
- b. The steel window covers are properly closed.
- c. No intrusive operations take place between 0 feet and 175 feet of the brick magazines.
- d. Personnel in the open are greater than 313 feet away.

4. Should any live munitions be discovered, all intrusive work will cease and this office shall be notified immediately. This office will reevaluate the MSD and determine the appropriate MSD.

CEMNC-0E-S (200-1C)

8 May 2001

SUBJECT: Reduction of Minimum Separation Distance (MSD) for USACE Removal Action at Former Benicia Arsenal, Benicia, CA

5. Questions regarding this matter should be directed to Mr. Greg Bayuga, OE Safety Group, at 256-895-1596.

Encl

Wayne H. Galloway
WAYNE H. GALLOWAY
Chief, Safety Group for
Ordnance and Explosives Directorate

CF:
OE-DC Read
OE Read
OE-S Read
ED File/Read

07 Bayuga/c/1596/MSDoeeltr-Benicia-8 May 01.doc

CEHNC-OR-DC (200-1c)

4 May 2001

MEMORANDUM FOR CEHNC-OR-S (Galloway)

SUBJECT: Reduction of Minimum Separation Distances (MSD)
for UEACE Removal Action at Former Benicia
Arsenal, Benicia, California

1. Request approval to use the calculated MSDs (Enclosure 1) in order to avoid evacuations of businesses located inside the brick magazine buildings in Sector 5 (Camel Barn Area).
2. We are currently using the approved 1/500 MSD for the 4-inch Stokes mortar, which limits us to working within 313 feet of these buildings if they are occupied. I am also requesting approval for the V3 Rifle Grenade in case I am able to justify the grenade as the Most Probable Munition for this sector in the future. Approval of the reduced MSDs will allow us to get much closer to the buildings without seriously disrupting business operations for extended periods of time.



ROBERT NORE, P.E.
Project Manager, OE Design Center

3 Encl.

cf. OE Read
OE-DC Read/Nore
ED File

Benicia Arsenal**2 May 2001****Intrusive Work Around Buildings in Camel Barn Area**

The buildings in this area are above ground brick magazines that are now used for administrative personnel. The windows have steel plates which may be closed to protect the windows. These plates must be closed when OE work is being performed and the buildings are within the minimum separation distance for the most probable munition.

Considering the protection provided by the building, the following distances may be used for unintentional detonations (intrusive work) around the buildings.

VB Rifle Grenade

Minimum Separation Distance From Building For Unintentional Detonation = 25
ft

4" Stokes Mortar

Minimum Separation Distance From Building For Unintentional Detonation = 175
ft

These distances are based on the greater of K50 overpressure distance or the distance at which fragments will not cause spall on the interior of the brick walls.

These distances only apply when no non-UXO personnel are outside the buildings. Work must stop if when personnel are outside the buildings.

Michelle Lusk 5/26/01
Subject Matter Expert Date

Michelle Lusk 5/26/01
acting ED-CS-S Branch Chief Date

FIRE CODE PERMIT

PERMIT NUMBER

2001-05-001

PERMITTEE: EOD Technology, Inc. (EODT)

ISSUED: May 1, 2001

EXPIRES: April 30, 2002

SITE ADDRESS: Former Benicia Arsenal: Multiple Sites (per grids provided)

PERMIT DESCRIPTION: Explosive and UXO/QE Operations - Demolition/Disposal

The operations authorized by this permit shall comply with the requirements of the Uniform Fire Code, amended to the 1994 California Fire Code, as amended by City of Benicia Ordinance No. 99-12.

The permittee shall comply with all other rules, regulations, and laws that may be required by other regulating agencies.

The permittee shall keep this permit posted and must be shown to any authorized representative of the Fire Chief or law enforcement officer on demand.

The Fire Code Permit terminates with the sale or transfer of the business. The new owner intending to continue operation of the business must contact the City of Benicia and obtain their own permit.

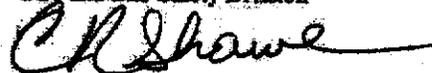
Please advise the City if your business changes its use at your location. (For example, warehousing to manufacturing). If you change location or discontinue business activities altogether, please return your Permit to the City with a notation as to your new location or the date the business closed.

THIS PERMIT IS GRANTED UPON THE EXPRESS CONDITION THAT THE PERMITTEE SHALL BE RESPONSIBLE FOR ALL CLAIMS AND LIABILITIES ARISING OUT OF THE OPERATIONS CONDUCTED UNDER THE PERMIT. THE PERMITTEE SHALL, AND BY ACCEPTANCE OF THE PERMIT AGREE TO, DEFEND, INDEMNIFY, SAVE AND HOLD HARMLESS THE CITY, ITS OFFICERS AND EMPLOYEES, FROM AND AGAINST ANY AND ALL SUITS, CLAIMS OR ACTIONS BROUGHT BY ANY PERSON FOR OR ON ACCOUNT OF ANY BODILY INJURIES, DISEASE OR ILLNESS, OR DAMAGES TO PERSONS AND/OR PROPERTY SUSTAINED OR ARISING IN THE OPERATIONS OR WORK PERFORMED UNDER THE PERMIT.

If you have any questions regarding your Fire Code Permit, call the Fire Department at (707) 746-4273.

FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND THE UNIFORM FIRE CODE WILL BE CAUSE FOR REVOCATIONS OF THE PERMIT.

City of Benicia Fire Department
Fire and Life Safety Division



Assistant Fire Marshal

Minimum Separation Distances
Former Benicia Arsenal
VB Rifle Grenade
26 September 2000

The required sandbag thickness and the sandbag throw distance were calculated IAW CEHNC-ED-CS-S-98-7. The minimum separation distance is based on the largest of the sandbag throw distance from test data based on the total NEW (munition plus donor charge) or 200 ft. A copy of HNC-ED-CS-S-98-7, "Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions" must be available on site. This report may be downloaded from the USAESCH homepage at <http://www.hnd.usace.army.mil> Select "Product Lines", "Ordnance and Explosives", "Innovative Technology", then "Analytical Tools". The first time you access the site you will have to register. You will be notified by e-mail when your login and password have been activated. You must have a login and password to download the report.

MINIMUM SEPARATION DISTANCES WHILE USING MOFB DURING INTRUSIVE ACTIVITIES

Design of the Miniature Open Front Barricade (MOFB) is in accordance with HNC-ED-CS-S-98-8, "Miniature Open Front Barricade". This document was approved by the DDESB. This report may be downloaded from the USAESCH homepage at <http://www.hnd.usace.army.mil/ocw/tech/AnalyticalTools/analindx.htm>. The first time you access the site you will have to register. You will be notified by e-mail when your login and password have been activated. You must have a login and password to download the report. DDESB has placed certain restrictions on the approved usage of the MOFB. These are listed in the approval letter in the front of the report.

Thickness of Aluminum Required to Prevent Perforation = 0.50 in

The MOFB is designed to defeat fragments to the rear and sides of the MOFB in the case of an accidental/unintentional detonation during intrusive activities. The fragment distances to the front of the MOFB are the same as the fragment distances without the MOFB (see figure). The MOFB is not designed to reduce the effects of blast overpressure. The MOFB may not be used for intentional detonations. The minimum separation distances to the rear and sides of the MOFB must be maintained based on the expected throw distance of the MOFB itself. Testing of the MOFB using a 60 mm mortar (NEW = 0.49 lbs TNT equivalent) resulted in a total displacement of the intact MOFB of 2.5 ft.

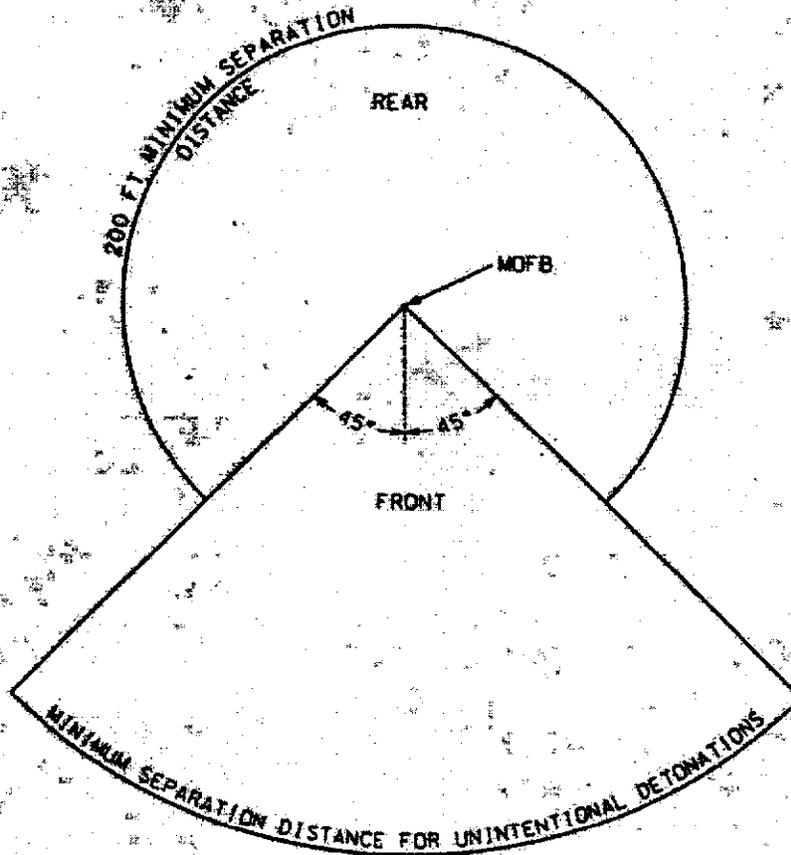
Minimum Separation Distance to sides and rear = 50 ft (requires concurrence of OE-S)

Minimum Separation Distance to front (using max frag) = 716 ft

Minimum Separation Distance to front (using 1/600) = 200 ft

K50 distance = 24 ft

Minimum Separation Distances
Former Benicia Arsenal
VB Rifle Grenade
26 September 2000



MINIMUM SEPARATION DISTANCE FOR UNINTENTIONAL DETONATIONS
USING MINIATURE OPEN-FRONT BARRICADE DURING INTRUSIVE ACTIVITIES

SIGNATURES:

Michelle Bull 9/26/00
Subject Matter Expert

William H. Zink 26 Sep 00
CEHNC-ED-C&S Branch Chief

3 of 3

| | | | |
|--|--|---|--|
| <p>PROPERTY TRANSFER RECEIPT In support of DACA87-97-D-0005 TO 0019, Fortas-Bassick Animal Services, CA. From: 2000 Technology, Inc. To: City of Benicia, Public Works Department.</p> | | <p>1. TOTAL PRICE: 00.00 2. DATE FROM: 2000 Technology, Inc., Benicia, CA 3. DATE TO: City of Benicia, Public Works Dept.</p> | |
| <p>4. CITY: BEND 5. STATE: CA 6. ZIP: 94924</p> | | <p>7. TYPE: EQUIP 8. TYPE: DARGO 9. PS</p> | |
| <p>10. CITY: BEND 11. STATE: CA 12. ZIP: 94924</p> | | <p>13. DATE: 9/17/01 14. TIME: 4:03 PM</p> | |
| <p>15. SIGNATURE: <i>[Signature]</i> 16. TITLE: K. GALT, EDDY SUPERVISOR</p> | | <p>17. ITEM NO. & DESCRIPTION: <i>[Blank]</i> 18. TOTAL WEIGHT: <i>[Blank]</i> 19. TOTAL CUBE: <i>[Blank]</i></p> | |
| <p>20. RECEIVED BY: <i>[Signature]</i> 21. DATE RECEIVED: <i>[Blank]</i></p> | | <p>22. RECEIVED BY: <i>[Signature]</i> 23. DATE RECEIVED: <i>[Blank]</i></p> | |

APPENDIX J

1 INTRODUCTION

EODT conducted a geophysical investigation at Benicia California. Three separate areas were investigated for two different purposes. Two parking lots, which were previously used as open storage areas (OS25 and OS25A) during the period when the arsenal was active were investigated for the presence of ordnance burial pits and/or trenches. The other area investigated was Sector 5. This area bordered Interstate 680 and was less than 200 feet from the Camel Barn Museum and several businesses. The investigation here was more strategic in nature using the geophysical data for the purpose of reducing the MSD.

2 METHODS

2.1 Three phases were outlined to conduct the geophysical investigations. First, a geophysical "prove-out" grid was established with seeded ordnance items. Second, two separate geophysical instrument were used to determine the best suitable method and amplitude threshold. Third, the digital data was processed and compared for instrument selection

2.2 The equipment considered for the investigation at Benicia California was the Geonics EM61 electromagnetic instrument, and a Geometrics G-858 magnetometer. After collecting, processing, and reporting the seeded prove-out data with both methods, the EM61 was selected for the survey based upon the results. EM data was collected at Benicia with the EM61 in auto mode with a sample interval of 5 readings a second. Survey lines spaced 2 feet apart with ropes were used to increase accuracy in positioning. The Ashtech Reliance GPS with 20cm accuracy using post-processing was mounted in the center of the EM61.

2.2.1 Geonics EM61

The EM61 instrument generates an electromagnetic signal that induce eddy currents in the subsurface. When the signal is shut off, the eddy currents decay and induce a secondary magnetic field that is monitored by two receiving coils. When mounted on the wheel assembly, the transmitter coil is located 45 centimeters (cm) above the ground. The second receiver coil is located 85 cm above the ground. The information recorded is the time-integrated voltage (recorded in MilliVolts mV) induced in the receiving coils by the secondary magnetic field. The time-integrated voltage response is recorded from both coils simultaneously.

2.2.2 Magnetic Instrument (Magnetometer)

The G-858 cesium vapor magnetometer is a self-oscillation split beam cesium vapor (nonradioactive) magnetometer sensor that produces a signal proportional to the intensity of the ambient magnetic field. The sensitivity of the instrument is 0.005 nT (nanoTesla) and it can read as fast as 10 times per second.

2.2.3 Ashtech Reliance (GPS)

The Ashtech Reliance system was used for data collection with the EM61. Ashtech Reliance software was used to post-process the rover and base data to achieve centimeter accuracy. GPS accuracy was checked by verifying PDOP or HDOP and two known GPS points daily before data collection began. If GPS was off more than 20cm, data was not collected until better accuracy could be accomplished. Mission Planner® 4.10 software was used to check satellite availability.

3 PROVE OUT

3.1 General: The test plot covered a 50-foot by 50-foot area. The area was initially surveyed with an EM61, and the data processed using Geosoft® software. All significant anomalies were investigated and removed prior to the seeding of the test grid. EODT and CEHNC provided the locations, depths, descriptions, and orientations of the test items to be seeded. The ordnance items selected were representative of the types historically used within Benicia.

3.2 Results: The EM61 was selected as the preferred instrument for this investigation, following analysis of the data collected with both instruments. It showed a greater sensitivity in the near surface and excellent spatial resolution. Additionally, the EM61 is capable of detecting aluminum items, while the magnetometer is limited to detection of ferrous metals. The 858 magnetometer detected the parking lot and building debris and caused masking of the 37mm.

4 QUALITY CONTROL

4.1 Static Instrument Tests

Daily static instrument test were performed on each geophysical instrument. A static test was performed by setting the instrument in an anomaly free area over a period of approximately three minutes without moving. After the three minutes, a large metallic item (pipe) was placed under the geophysical instrument, then removed to determine response. The data was then processed to verify that each geophysical detector was operating within manufactures specification.

4.2 Lag Lines

A lag test was performed on a daily basis to insure equipment was operating correctly and lag correction can be applied to geophysical data. The first lag line was approximately 100ft in an area lacking anomalous responses and collected in opposite directions. One or more calibration object(s) was then placed on the line to create a recognizable anomaly. Data was then collected once traveling slowly and once traveling fast approximately 100ft in length over the calibration object(s) in opposite directions. A total of six lines were collected for lag correction for each detector.

4.3 Heading Test

A Heading test was performed by each magnetometer operator to determine the amount of correction applicable to each data set. The geophysical operator and instrument was turned in a circle, revolving slowly around the sensor, which is in a fixed position in an area lacking anomalous responses. The sensor head was placed in a hole on top of a non-magnetic pipe. The operator recorded fiducial marks at the moment the operator was facing the desired directions.

4.4 General Quality Control

- The geophysical instrument operator verified that the instrument was recording data that, to their best knowledge was within instrument specifications.
- Data was processed the same day to verify that there was no GPS or geophysical instrument data collection problems.
- GPS accuracy was checked by verifying PDOP or HDOP and by using Mission Planner® 4.10 software to check satellite availability.

5 GEOPHYSICAL DATA PROCESSING

Data was exported into a XYZ format from Geonics Dat61mk2, and Geometrics MagMapper software. The XYZ data file was then imported into Geosoft Oasis Montaj/UX Detect processing package. Data was leveled, processed, and anomalies were selected by contouring, profiling, and target analyses. Raw and final data in California State Plane Coordinates was then exported as a space separated file (.prn).

6 CONCLUSIONS

It was recommended that the EM61 be used for geophysical subsurface detection based on the prove-out results. The EM61 demonstrated to be an efficient geophysical detector for subsurface investigation at Benicia California.

**SCOPE OF WORK
FOR
GEOPHYSICAL MAPPING
AT THE FORMER BENICIA ARSENAL
BENICIA, SOLANO COUNTY, CALIFORNIA**

20 February 2001

1.0 BACKGROUND AND OBJECTIVE

1.1 The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program (DERP) and the Formerly Used Defense Site (FUDS) program. Ordnance and Explosives (OE) may exist on property that was formerly owned, used or controlled by the Department of Defense. The framework underlying this response is the National Contingency Plan (NCP).

1.2 OE is a safety hazard and may constitute an imminent and substantial endangerment to site personnel and the local population. This action will be performed in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Sections 104 and 121; Executive Order 12580; the National Contingency Plan (NCP). In addition, all activities involving work in areas potentially containing unexploded ordnance hazards shall be conducted in full compliance with CEHNC, USACE, DA and DoD requirements regarding personnel, equipment and procedures. 29 CFR 1910.120 shall apply to all actions taken at this site.

1.3 The objective of this delivery order is for the Contractor to perform geophysical mapping of selected areas (total of approximately 25 acres) and provide the analysis of the data to the Government for use under Contract # DACA87-97-D-0005, D.O. 19.

2.0 INTRODUCTION

2.1 Background. The former Benicia Arsenal is located approximately 25 miles northeast of San Francisco. The arsenal area is composed of steep rolling hills and runoff collection areas,

Project: Benicia Arsenal
2/20/01

- 1 -

which discharge to Suisun Bay. The site was established in 1849 to be used primarily as a shipping and receiving facility for military equipment and materiel manufactured within CONUS and destined for military campaigns supported by the Port of San Francisco. Sector 5, the area of interest for this project, is owned by Benicia Industries, CALTRANS, and Exxon Oil Company.

2.2. Chemical Warfare Materiel. The site is not suspected to contain Chemical Warfare Materiel (CWM). However, if suspect CWM is encountered during any phase of site activities the Contractor shall withdraw upwind from the work area, secure the site and contact CEHNC.

2.3. Areas For Evaluation. The areas requiring geophysical mapping are located in Sector 5 (Camel Barn area). They are the areas between the outside edge of the traveling surface of Interstate Highway 680 and the 313 foot MSD along both sides of Interstate I-680, as well as an area approximately 400 feet by 1000 feet along the southern boundary of Sector 5, all as shown on the attached map.

3.0 SPECIFIC REQUIREMENTS

3.1. Work Plan. Procedures for this task order shall be in accordance with the approved *Work Plan for Ordnance and Explosives Removal Actions for Sectors 2, 4, and 5, Former Benicia Arsenal, July 2000*. A work plan submittal is not required under this delivery order, except for a revised Sector 5 drawing as described below. Submittal formats and addresses are also as described in the approved Work Plan.

3.2. (Task 1) Geophysical Investigation and Evaluation. The Contractor shall implement digital geophysical investigations and evaluations as described in the Geophysical Investigation subplan of the approved Work Plan and in accordance with the following:

3.2.1. Investigation. The total area to be geophysically mapped is anticipated to be no more than 25 acres. The Contractor shall perform the minimum amount of work necessary to clear the areas of vegetation, surface OE and OE scrap where these impede the progress, effectiveness or

safety of the geophysical investigation team. Geophysical mapping will not be performed within 5 feet of original Benicia Arsenal building foundations. Geophysical mapping will not be required for areas covered by roads and pavement. Geophysical mapping shall not be performed in areas subjected to cut or fill actions during interstate construction. Determinations to exclude cut and fill areas shall be coordinated with the Contracting Officer. Areas proposed as inappropriate to map for the above reasons shall be identified on the work plan map of Sector 5, and approved prior to start of geophysical mapping.

3.2.2 Evaluation. After the site is geophysically mapped, the Contractor shall utilize a qualified geophysicist to analyze the geophysical data collected. Draft digital geophysical data will be delivered to CEHNC for review within 36 hours after collection per Data Item Description OE-005-05, Section 10.6.1. Based on the analysis, the Contractor shall prepare grid maps and dig sheets showing predicted location and character of all suspected anomalies. Grid maps and dig sheets for each grid shall be submitted within 5 working days of the actual field mapping exercise for that grid. All other submittals shall be in accordance with the Geophysical Investigation subplan.

3.2.3 Anomaly Identification. Anomalies suspected of being the size of a VB rifle grenade and larger shall be identified on the dig sheets and the geophysical maps. Performance criteria shall be as referenced in the approved Work Plan.

1 INTRODUCTION

EODT conducted a geophysical investigation at Benicia California. Three separate areas were investigated for two different purposes. Two parking lots, which were previously used as open storage areas (OS25 and OS25A) during the period when the arsenal was active were investigated for the presence of ordnance burial pits and/or trenches. The other area investigated was Sector 5. This area bordered Interstate 680 and was less than 200 feet from the Camel Barn Museum and several businesses. The investigation here was more strategic in nature using the geophysical data for the purpose of reducing the MSD.

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3.2 **Results:** The EM-61 was selected as the preferred instrument for this investigation, following analysis of the data collected with both instruments. It showed a greater sensitivity in the near surface and excellent spatial resolution. Additionally, the EM-61 is capable of detecting aluminum items, while the magnetometer is limited to detection of ferrous metals. The 858 magnetometer detected the parking lot and building debris and caused masking of the 37mm.

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A lag test was performed on a daily basis to insure equipment was operating correctly and lag correction can be applied to geophysical data. The first lag line was approximately 100ft in an area lacking anomalous responses and collected in opposite directions. One or more calibration object(s) was then placed on the line to create a recognizable anomaly. Data was then collected once traveling slowly and once traveling fast approximately 100ft in length over the calibration object(s) in opposite directions. A total of six lines were collected for lag correction for each detector.

4.3 Heading Test

A Heading test was performed by each magnetometer operator to determine the amount of correction applicable to each data set. The geophysical operator and instrument was turned in a circle, revolving slowly around the sensor, which is in a fixed position in an area lacking anomalous responses. The sensor head was placed in a hole on top of a non-magnetic pipe. The operator recorded fiducial marks at the moment the operator was facing the desired directions.

4.4 General Quality Control

- The geophysical instrument operator verified that the instrument was recording data that, to their best knowledge was within instrument specifications.
- Data was processed the same day to verify that there was no GPS or geophysical instrument data collection problems.
- GPS accuracy was checked by verifying PDOP or HDOP and by using Mission Planner® 4.10 software to check satellite availability.

5 GEOPHYSICAL DATA PROCESSING

Data was exported into a XYZ format from Geonics Dat61mk2, Geonics Dat31w, and Geometrics MagMapper software. The XYZ data file was then imported into Geosoft Oasis Montaj/UX Detect processing package. Data was processed and anomalies were selected by contouring, profiling, and target analyses. Raw and final data in California State Plane Coordinates was then exported as a space separated file (.prn).

6 CONCLUSIONS

It was recommended that the EM-61 be used for geophysical subsurface detection based on the prove-out results. The EM-61 demonstrated to be an efficient geophysical detector for subsurface investigation at Benicia California.

AVAILABLE FOR VIEWING IN THE CITY ATTORNEY'S OFFICE.

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|  <p>US ARMY CORPS OF ENGINEERS</p> | Project Title: GEOPHYSICAL SUBSURFACE MAGNETIC MAP FOR SECTOR 5 | | CONTRACTOR: EOD TECHNOLOGY, INC. 2229 OLD HIGHWAY 95 LENOIR CITY, TN 37771 |
| | Project Location: FORMER BENICIA ARSENAL, BENICIA, CA | | |
| | Client Name: U.S. ARMY ENGINEERING SUPPORT CENTER, HUNTSVILLE | | |
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APPENDIX K