Fence and Post Report

November 1999

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1.0 INTRODUCTION

1.1 Project Location And Description ..... -1-

1.2 Current Fence Project Site ..... -1-
1.3 Department of Defense Activities at the Project Site ..... -1-
1.3.1 TNT Strips ..... -6-
1.3.2 North Valley Area ..... -6-
1.3.2.1 Howitzer Test Facility ..... -6-
1.3.2.2 Ammunition Renovation/Primer Destruction Area ..... -6-
1.3.3 Demolition and Flare Area ..... -7-
1.3.3.1 Flare Site ..... -7-
1.3.3.2 Demolition Site #1 ..... -7-
1.3.3.3 Demolition Site #2 ..... -7-
1.3.3.4 Demolition Site #3 ..... -7-
1.3.4 Dynamite Burn Area ..... -7-
1.4 Past Grading Activities ..... -7-

2.0 EVALUATION OF NEED FOR FENCING ..... -9-

2.1 Lateral Extent of OE Kick-out ..... -9-
2.2 Proposed Fence Alignment and Access Points ..... -10-
2.3 Type of Fencing ..... -10-
2.4 Type of Posting ..... -10-

3.0 INSTALLATION OF FENCE ..... -11-

4.0 SECURITY MEASURES AND MAINTENANCE ..... -11-

5.0 SCHEDULE ..... -11-

6.0 REFERENCES ..... -12-

1.0 INTRODUCTION

This Fence and Post Report evaluates need for fencing and posting in the vicinity of the Tourtelot Property as required by the State of California, California Environmental Protection Agency, Department of Toxic Substances Control Order, Docket No. I/SE 98/99-011, paragraph 5.1.2, signed June 1, 1999 (the "Order"). In addition, this report describes the methods and procedures for installation, modification, or repair of fences, and posting of signs. These methods and procedures include security measures that may be implemented and inspection schedules required to ensure that all fencing and posting either newly installed or previously in place is properly maintained.

1.1 Project Location And Description

The property referred to in this report as the Tourtelot Cleanup Project (TCuP) Site lies completely within the City of Benicia, Solano County, California, approximately 30 miles northeast of San Francisco (Figure 1-1). Consisting of approximately 220 acres, it is partially within the boundaries of the Former Benicia Arsenal (Figure 1-2). The site has rolling topography that includes the "Ridge," which separates the North Valley and the South Valley, both of which have areas of steep terrain (Figure 1-3). Both the South and North Valleys contain wetlands, the one in the south valley being considerably larger. The site is bordered by the Southampton residential development to the west and south, the Exxon refinery to the south, industrial and commercial facilities to the east, and open space to the north and east. The elevation of the site varies from 75 feet above mean sea level (msl) in the southern region to 250 feet above msl in the northern region.

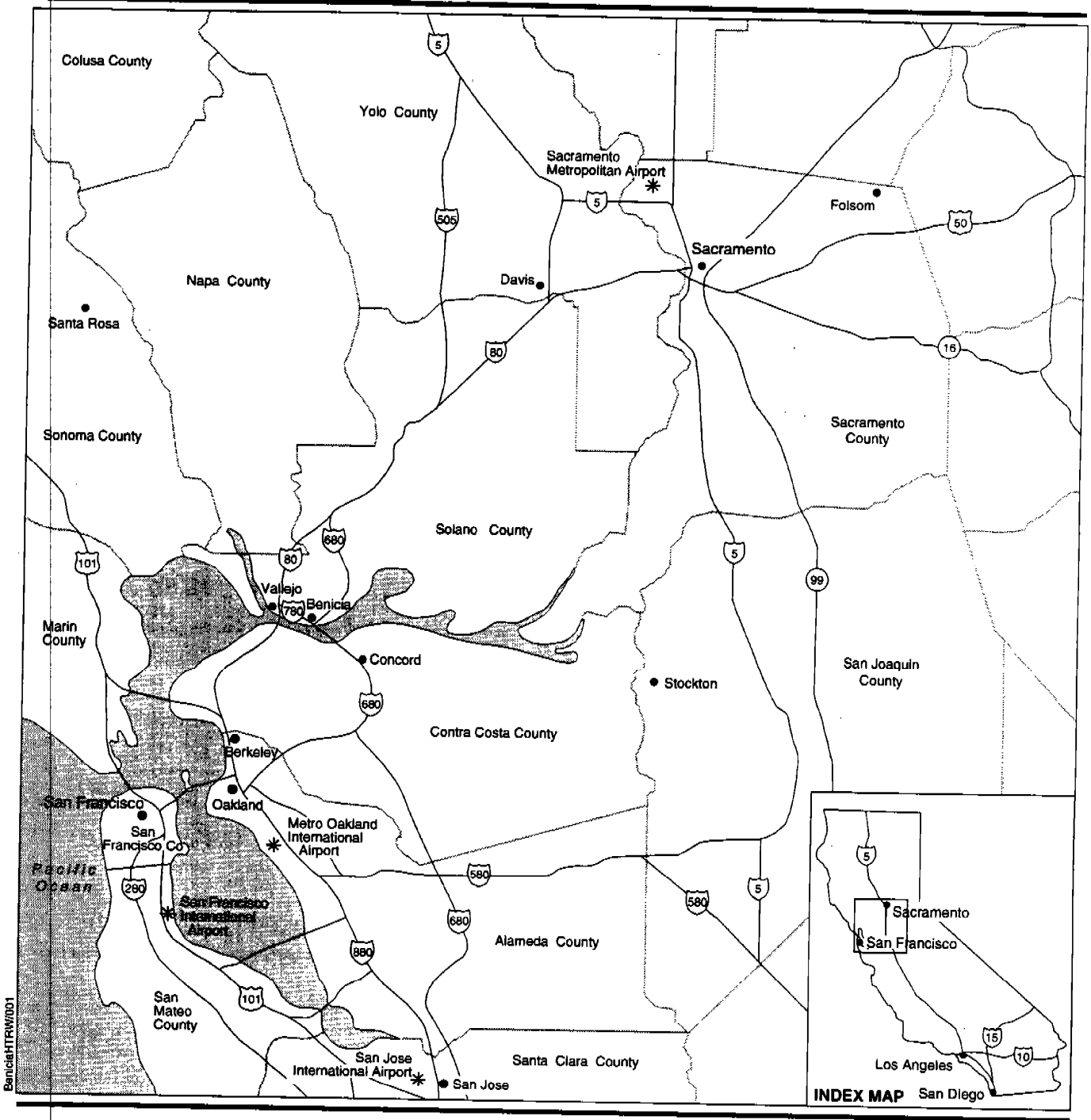
1.2 Current Fence Project Site

On June 30, 1999, Earth Tech conducted a visual assessment of the existing fencing within the TCuP Site. The purpose of this inspection was to determine the location and condition of fencing currently in place at the TCuP Site. Based upon a map of the TCuP Site, the existing fence line was delineated. A site map was annotated showing the locations of gates and the type of existing fence (Plate 1).

Several different types of fences were observed by Earth Tech during this investigation including barbed wire fences, chain-link fences, wooden fences with wire mesh, wood fences, and temporary fences. All portions of the existing fencing noted as needing maintenance, except for the landscape fences for the individual property owners, have been repaired as of September 25, 1999.

1.3 Department of Defense Activities at the Project Site

During the period when the TCuP Site was used by the Department of Defense (DOD), it accommodated a range of activities. Based on site inspection, data collected by the USACE for the Former Benicia Arsenal Engineering Evaluation/Cost Analysis (EE/CA) Report, review of historical aerial photographs, and review of geophysical data collected the majority of the TCuP Site several areas , which may have been impacted by past DOD activities were identified. Approximately 6 acres in the North Valley were developed by DOD with roads and structures where the accuracy of locally manufactured howitzer gun barrels were checked, ordnance was inspected and renovated, and primers were destroyed in a "burn cage." In the South Valley Demolition and Flare Area there were at least two demolition sites and a flare site. Demolition activities generally consist of placing various amounts of out-of-service munitions in a "pit" and placing a countercharge on top of the items and detonating them. Often these sites were used multiple times resulting in a deep pit or crater. The type of munitions placed in the demolition sites in the South Valley is unknown. Part of the Ridge was used to dispose of aged, out-of-service dynamite. The following



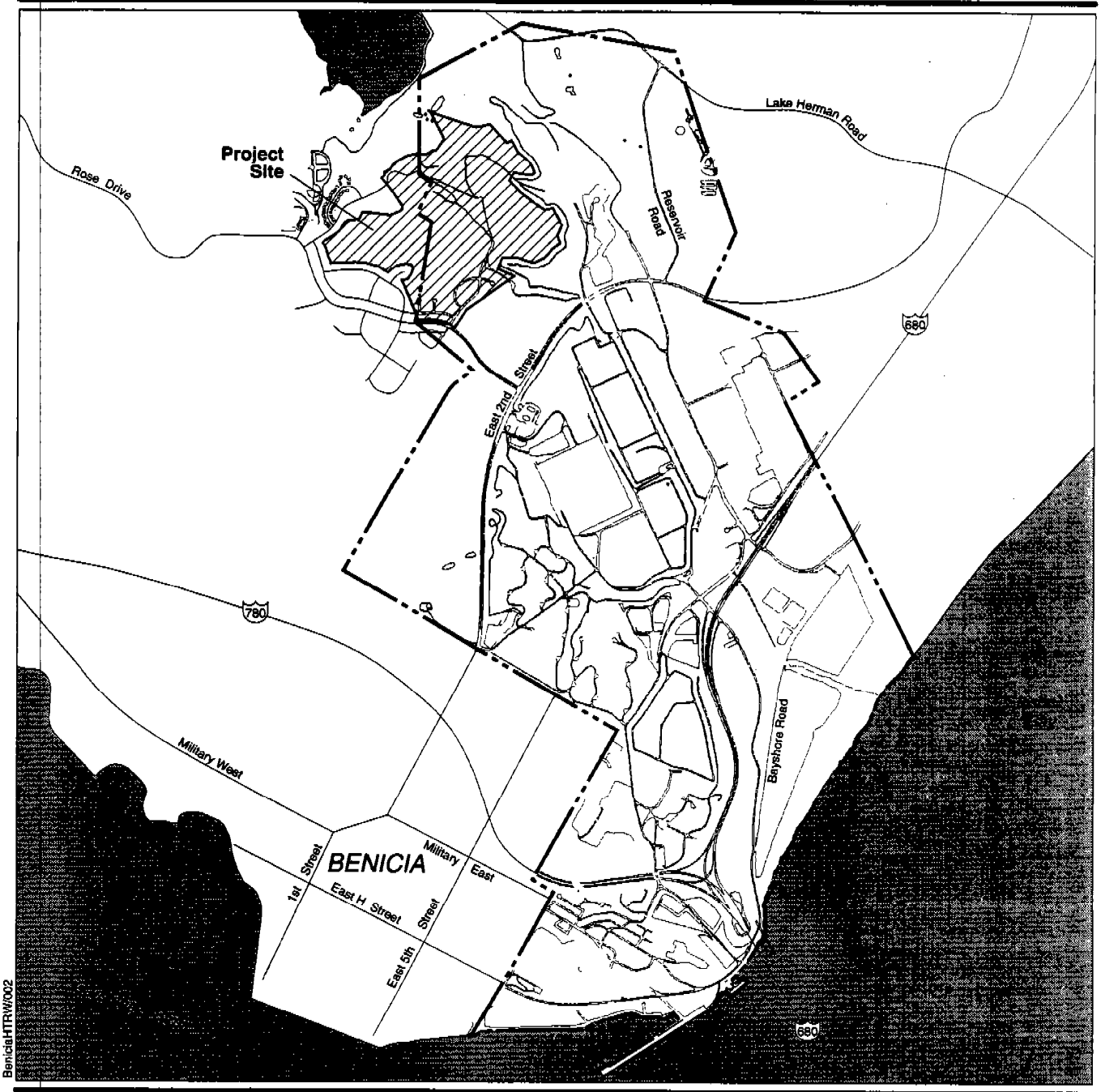
EXPLANATION

- Airports
- California State Highway
- U.S. Highway
- Interstate Highway
- County Boundary

0 3.5 7 14 Miles

Regional Map

Figure 1 -1



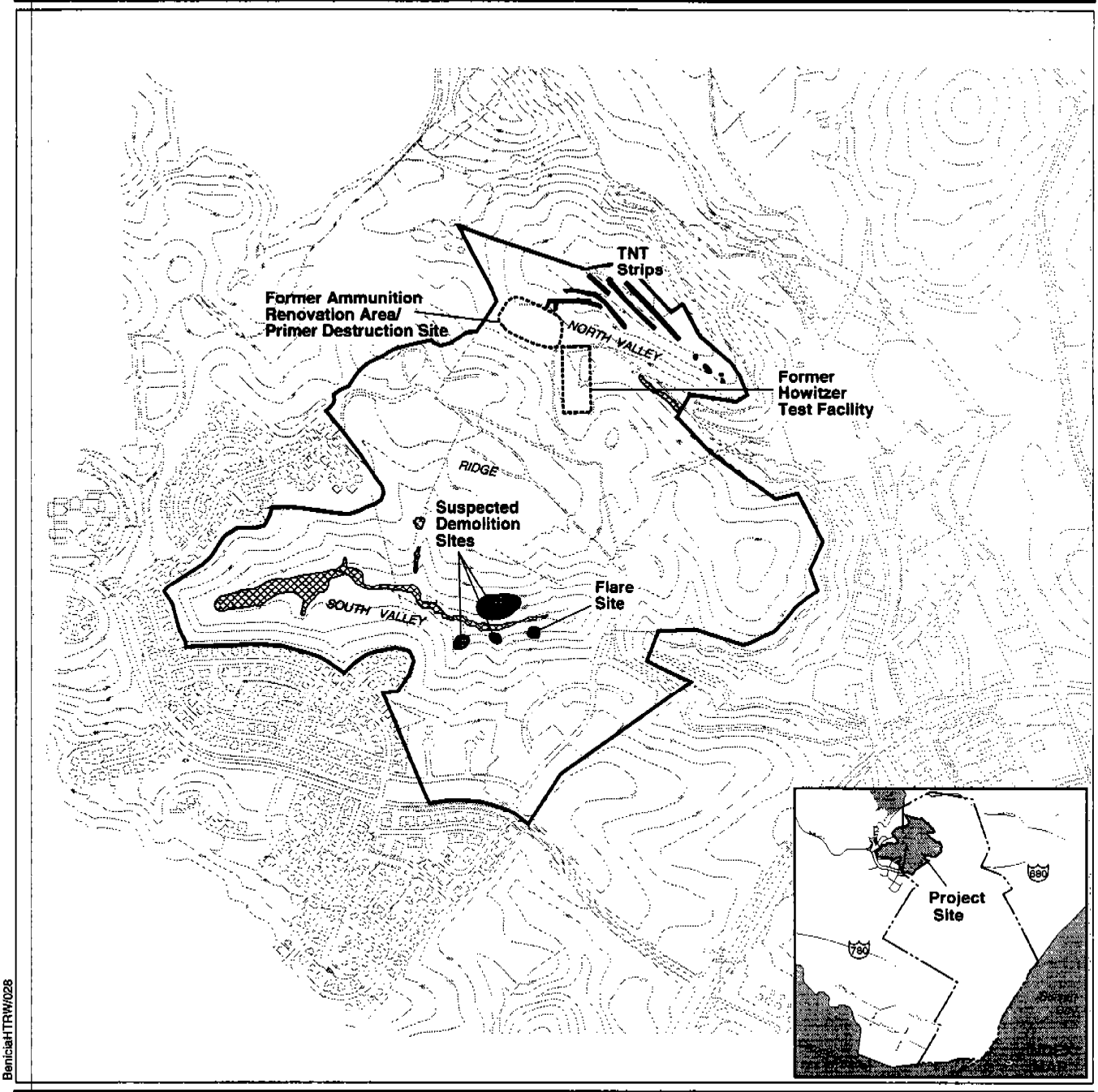
EXPLANATION

- 680 Interstate Highway
- Former Benicia Arsenal Boundary (estimated)
- Project Site

0 .125 .25 .5 Mile

Project Site Location Map

Figure 1 -2



BeniciaHTRW/028

EXPLANATION

Project Site Boundary

Wetland

Project Site Map

0 250 500 1000 Feet

Note: Contour interval equals 25 feet.

Figure 1 -3

subsections provide general information about each of the identified sites. The TNT Strips is referred to in the order as the trinitrotoluene (TNT) disposal strips. The Demolition and Flare Area is referred to in the order as the Open Burn/Open Detonation (OB/OD) Area.

13.1 TNT Strips

The TNT strips are on the hillside to the North of the North Valley. The Records Research Report (RRR) and the Archives Search Report (ASR) did not find anything in the available records stating what type of activities may have caused the scarring, now referred to as the "TNT strips." The strips are clearly visible as is evident by the pronounced lack of vegetation along the strips. There are five strips varying in length from 300 to 800 feet; each is approximately 6 feet wide. Exposed soil in the strips is characterized by a deep red color with crystalline materials observable in the dry season. Recently, additional fencing has been installed around the TNT strips to supplement the existing fencing. The newly installed fencing is indicated on Plate 1.

1.3.2 North Valley Area

1.3.2.1 Howitzer Test Facility

The Former Howitzer Test Facility consisted of three permanent structures in the North Valley (see Figure 1-3). Building 181 consisted of two parallel tunnels; each had a 10-foot by 10-foot opening and extended approximately 100 feet into the hillside. The second structure contained the open firing butts; a third building was a concrete powder loading room. A disposal area is believed to have been situated adjacent to the tunnels where shell casings, ordnance and explosives (OE) scrap, and debris were discarded. The facility was used to test howitzer barrels and propellant by firing various-sized howitzer projectiles filled with concrete or gravel. This was performed in order to determine if the barrels functioned correctly and whether the propellant was the right mixture. The facility was in operation from approximately 1945 to 1955.

In 1957 and 1958, a cement block test cell was built between the firing butts and the tunnels. Two buildings were constructed; one building pad was 12 feet by 20 feet, but there were no records of the size of the second building. Records do not clearly reveal what the test block was used for; however, a former employee interviewed for the Records Research Report (RRR) referred to this facility as the Calibration Facility (Jacobs Engineering, 1999). In mid-1996, during preliminary site preparation for development, all facilities in this area were dismantled, and most of the construction debris was removed from the area. Gravel and soil pile around the Howitzer test tunnels were screened under the observation of a qualified unexploded ordnance (UXO) expert. Several Howitzer shells were removed from the soils during this operation. An attempt was made to separate soils with a large amount of gravel and inert OE fragments from cleaner soils. The soil that was mounded around the tunnels is currently stockpiled in the North Valley along the side of the eastern Howitzer Test Facility Site.

1.3.2.2 Ammunition Renovation/Primer Destruction Site

The Ammunition Renovation/Primer Destruction Site is in the North Valley adjacent to the former Howitzer Test facility (see Figure 1-3). Typically, primers were destroyed by dumping them into a "burn cage" or metal tank. Primers for various munitions were pulled out and placed onto a conveyor belt and then dropped into a cage and burned. An oil burner was usually attached to the cage or tank and was left running constantly in order to ignite the primers. The burned primers, now inert scrap metal, were removed from the cage and recycled. The Primer Destruction Facility was used from 1945 to 1947.

The Ammunition Renovation facility consisted of two wooden buildings and two canvas shelters (Jacobs Engineering, 1999), which were used to inspect and refurbish ordnance items stored at the arsenal. The RRR stated that a canvas structure in the middle of the area was used for breakdown operations,

cleaning, and processing of ammunition casings in preparation for painting. The Ammunition Renovation facility was constructed in 1950. It is uncertain how long the facility was in operation.

Both of these facilities were removed during preliminary site development in 1996. During the removal of the foundations for the various facilities, soils in the area were disturbed. Some of the soils disturbed during the demolition of structures associated with the Ammunition Renovation facility were also stockpiled in the northeastern corner of the site

1.3.3 Demolition and Flare Area

1.3.3.1 Flare Site

The Flare Site is in the South Valley and is evident by the ash, OE scrap, and fragments recovered from the site. The Flare Site was used to burn and dispose of flares. This usually consisted of placing flares on the ground in rows, adding an accelerant, and igniting flares. It is uncertain if the Flare Site was used to dispose of ordnance. A relatively large number of anomalies is evident in the geophysical data, and the site is clearly visible in a number of the historical aerial photographs reviewed.

1.3.3.2 Demolition Site #1

No live ordnance items have been recovered from this site. However, OE scrap and fragmentation are visible in the side walls of the drainage containing the demolition site. A sampling grid, adjacent to this site, that was investigated during the Benicia Arsenal EE/CA fieldwork also recovered OE scrap. This site is evident in the geophysical data and appears disturbed in the historical aerial photographs.

1.3.3.3 Demolition Site #2

The suspected demolition site shows relatively little evidence of use. This site is on the south side of the South Valley between the Flare Site and the other demolition site (see Figure 1-3). The site is suspected because it appears disturbed or barren in several of the historical aerial photographs. Review of geophysical data does not indicate that the site has a high anomaly count similar to the other two demolition sites, and large amounts of OE scrap or fragments have not been observed during site visits.

1.3.3.4 Demolition Site #3

Several ordnance items were recovered from this site both by Granite Management Corporation (Granite) and the USACE. Also, an armored personnel vehicle was removed from this site, hauled up the north slope of the South Valley, and sliced into pieces that were recycled at a local metal fabrication shop. The site is evident in the geophysical data.

1.3.4 Dynamite Burn Area

On the Ridge, aged, out-of-service dynamite was reportedly disposed of through burning. Aged dynamite was burned by placing multiple sticks of dynamite in rows up to 100 feet long on a piece of paper and igniting the paper. This area is believed to have been used from 1947 to 1948. The area used for burning of dynamite was approximately one-half the size of a football field. The ridge used for the Dynamite Burn Area was used as a borrow site for soils during grading activities associated with the Southampton development in 1990 (see Section 1.4 regarding grading activities).

1.4 Past Grading Activities

Development of the area adjacent to the TCuP Site started in 1990. Review of rough grading plans, preliminary soils reports, testing and observation service reports, notes from the grading subcontractor,

and historical aerial photographs provides a good insight as to where the material was placed as fill. The basic assumption used to determine where soils were placed is that standard grading techniques call for establishing the shortest haul routes between cut and fill areas. Based on this assumption, review of available documents, professional judgment, and understanding of standard mass grading techniques, soils within the affected area were most likely moved as follows:

1. Rough grading for the Southampton development began in April 1990. Grading began in the area referred to as D-1 and D-2 on the grading plans (see Plate 1). The majority of D-1 was a cut area, and the majority of D-2 was a fill area. Standard grading techniques and aerial photographs and grading observation records confirm that the initial cut materials from D-1 most likely were placed in the D-2 fill sites.

2. The other major fill areas in the development are along the Panorama Drive and McCall Street, South of Kearney Street (see Plate 1). Fill for this area was most likely derived from the adjacent cut area to the east. Cutting and filling for this area appear to have begun shortly after D-1/D-2. The D-1/D-2 area continued to be active after grading began in this area.

3. There is an area referred to as the "East Crossing" in the final testing and observation reports for the Southampton development. Elevation of the compaction tests taken here and the geography of the development, suggest that the East Crossing was the "McAllister Drive Landbridge." Based on this assumption, preparatory work for the landbridge began as early as June 1990. However, the majority of the fill was placed in mid-to- late August 1990. During the August time frame, most of the other major fills in the development had little activity based on test results. After the completion of the McAllister Street landbridge, the major fills were once again active.

4. The Ridge between the North and South Valleys was used as a soils borrow area (see Plate 1). An estimated 600,000 cubic yards (cy) of soil, resulting in approximately 40 to 50 feet in elevation loss, was removed. The May 13, 1990, aerial photograph indicates that the soils borrow area is relatively undisturbed. The September 1990 aerial photograph shows that the soils from the Ridge down to approximately the 260' contour line had been removed, approximately the eastern 60% of the aerial photographic extent. It is evident from the aerial photographs that the soil (approximately 200,000 cy) was used to construct the McAllister Drive Landbridge. The remaining cut from the aerial extent of the borrow site was most likely deposited at the RoseDrive/Panorama Drive/McCall Street fill site after it became active. There is a road leading from the northwest end of the Ridge in both the May and September 1990 photographs. The observation and test results report indicates that during the construction of the landbridge, most of the other fill areas received little or no fill. Once the landbridge was completed, the D-2 and Rose Drive/Panorama Drive/McCall Street fill sites became active again. The remaining cut from the Ridge soils borrow area may have been used in these areas. After February 1991, the maximum extent of the Ridge borrow site appears unchanged.

5. Grading activities along the Kearney Street lots were completed between June 21, 1991, and September 3, 1993, based on aerial photography review.

6. In September 1993, the Ridge borrow site was being used as a soils stockpile area. The soil stockpiled on the Ridge appears to have been generated from development activities associated with the development of the Kearney Street lots.

7. The structures in the North Valley were removed in 1996 during preliminary site construction activities. Recyclable material, such as the concrete, culverts, and rebar from the buildings, was temporarily stockpiled in the area and hauled away. Disturbed soils are currently stockpiled in the North Valley.

2.0 EVALUATION OF NEED FOR FENCING

It is well documented that live OE has been encountered within the TCuP Site as reported by the property owner and the USACE. Additionally, as discussed in Chapter 1.0, several suspected or known sites impacted soil have been identified. The following subsection provides an evaluation of the possible need for additional fencing associated with the potential lateral extent of live OE kick-out.

2.1 Lateral Extent of OE Kick-Out

The lateral extent of the kick-out zone for the Demolition and Flare Area is difficult to calculate for a number of reasons. Records regarding the type of ordnance disposed of, the method of disposal, the amount of ordnance disposed of during a single shot, and the amount of explosives used as a counter charge to dispose of the items were not kept in sufficient detail to calculate the lateral extent of the kick-out.

The USACE was contacted to assist in determining, if possible, the lateral extent of the potential live ordnance kick-out from demolition operations. USACE have indicated that they have several engineering computer programs that can calculate fragmentation distances of various items, cratering that may be caused by demolition operations, and determination of safe public withdrawal distances for conducting demolition operations. However, because of the complexity of the way explosives react and interact with other explosives and the large number of unknown variables stated in the above paragraph, the USACE could not calculate the "kick-out" distances of live OE items that may have been ejected from the Demolition and Flare Area sites . The USACE did suggest that the best information regarding kick-out distance would be data collected from the site and the opinions of Explosive Ordnance Disposal (EOD) experts with experience working on demolition ranges.

Several EOD experts with experience working on demolition sites were consulted. (see Attachment 1) All of the EOD experts consulted agreed, based on their experience with the clean-up, inspection, and operation of demolition sites that it would be highly unlikely that any live ordnance items would kick-out more than 300 to 500 feet from a demolition operation. This estimated kick-out distance is consistent with the data presented in the Draft Benicia EE/CA Report and the distribution of OE items recovered by the USACE and Granite at the TCuP Site. Plate 1 shows the distribution of all the OE items recovered from the TCuP Site in comparison to a 500-foot kick-out radius from each of the sites within the Demolition and Flare Area . With the exception of the two OE items recovered on the ridge northeast of the Demolition and Flare Area , all OE items recovered to date on the TCuP Site were within a 500-foot radius of the Demolition and Flare Area sites. EOD experts and engineers consulted at the USACE agree that the two OE items outside of the 500 foot radius most likely did not come from the Demolition and Flare Area in the South Valley.

The origin of the two OE items on the northeast ridge of the South Valley is uncertain. Review of the geophysical data did not indicate that any demolition areas were present outside of the South Valley. Review of historical aerial photographs also did not indicate that any demolition areas were outside of the South Valley within or near the TCuP Site. Records related to whether these two items contained explosive materials are being requested from EOD Unit 3 in San Diego.

In summary, because the UXO kick-out distance cannot be calculated, a conservative kick-out distance of 500 feet is assumed. This is the greatest distance suggested based on the consensus of experienced UXO experts.

2.2 Proposed Fence Alignment and Access Points

Based on the above information and evaluation, existing conditions, site access, the desire to limit inadvertent access to the TCuP Site by the public, and the need to provide sufficient work space during remedial activities, the following fence alignment is proposed.

The alignment of the fence to limit public access to the TCuP Site is shown on Plate 1. The main access point to the TCuP Site has been established at the corner of McAllister and McCall Drives, adjacent to the current manned guard shack. Two secondary access gates are available. One access gate is located across McCall Drive on the western approach to Panorama Drive. This gate is visible from the guard shack at the main access point. The existing gate at the end of Kearney Street will also be used. The Kearney Street gate will be used only by remediation personnel and will remain locked at all times. The existing landscape fencing for the homes along the south and west rim of the South Valley will be raised to 5 feet and gates locked, as appropriate. However, DTSC has indicated that residents may opt not to have this fencing modification done. Notifications have bee distributed to all residents along the South Valley.

The existing fencing along the Tourtelot/City of Benicia Property boundary will be used along the northern border. The newly installed fencing aligned to extend at least 50 feet beyond the lateral extent of the TNT strips (see Plate 1) will be used as part of the northern boundary. The existing fence as aligned will be used to secure the eastern and southern boundaries of the TCuP Site. The existing wood fencing around area D-1 (undeveloped graded lots north of Rose Drive) has been realigned as shown on Plate 1 to include fill areas extending onto Exxon property. New fencing has been installed along the Tourtelot/Gonsalves property line as depicted in Plate 1. A fence with a gate has been installed at the west end of the sewer bench path (see Plate 1).

An interior fence is proposed to be constructed around the Demolition and Flare Area at a distance of 500 feet from each of the 4 sites within the area (see Plate 1). This fence will exclude the portions of the cut and fill areas that extend within the 500 feet. All other remaining interior fencing, with the exception of the newly installed fence around the TNT strips, will be removed.

2.3 Types of Fencing and Posting

Various types of fencing exist on the TCuP Site as depicted on Plate 1. Any existing fencing requiring repair in the future will be maintained by Granite. Any new fencing to be installed will consist of 6-foot-high, standard, chain-link fence, or equivalent. Standard steel fence posting will be either driven or bored into the ground will be used to secure the fence. A local fencing company will be subcontracted to install the fence. Installation procedures are discussed in the following section.

2.4 Type of Posting

Signs have been placed on the existing and new fencing along the northern, eastern and southern portions of the TCuP Site . These signs read "Keep Out, Former Military Property, Hazardous Conditions May be Present" in English and Spanish, and have been placed every 200 feet. Signs have also been placed every 100 feet along the perimeter fence contiguous with the TNT strips and along the new fence around the TNT strips. These signs read "Caution: Hazardous Substances Area, Unauthorized Persons Keep Out, Cal. EPA, DTSC – (916) 255-3545" in English and Spanish. These signs were attached to the fence, except along the fence on Rose Drive and Panorama Drive, where signs have been placed on stakes behind the fence.

In addition, signs that read "Caution: Hazardous Substances Area Unauthorized Persons Keep Out, Cal. EPA, DTSC (916) 255-3545" will be placed every 100 feet on the proposed fence around the Demolition and Flare Area.

3.0 INSTALLATION OF FENCE.

Fence and sign post installation will be accomplished by one of two methods, either by auger of 18-inch-deep by 8-inch-wide (approximate) holes or by driving the fence/sign post into the ground with a slide hammer. Prior to the installation of fence or sign posts, a surface OE/UXO clearance and, if appropriate, a vegetation clearance will be performed. During installation of fence, sign posts, or other activities requiring ground disturbance, OE avoidance procedures described in the Site-Specific Safety and Health Plan (SSHP) will be followed.

Any OE/UXO item encountered will be secured, the local authorities notified, and the closest DOD EOD unit will be contacted to make arrangements for proper disposal of the item.

4.0 SECURITY MEASURES AND MAINTENANCE

Granite will continue to support a private security force to patrol the entire TCuP Site. Patrol duties will include the following:

- Maintain a 24-hour-per-day security force on site consisting of at least two patrol officers. One officer will be posted at a guard shack near the public access point on McAllister Drive, the other officer will roam the TCuP Site on designated patrol routes that have been surface-cleared of ordnance. Proposed patrol routes are shown in Plate 1.

- A logbook will be maintained at the guard shack documenting the arrival and departure times of all visitors to the TCuP Site , the purpose of their visit, and the agencies or organizations they represent. A list of preauthorized personnel allowed to enter the TCuP Site will be kept at the guard shack. All other visitors must obtain authorization to enter from Granite. Unauthorized visitors will be escorted offsite by the patrol officer. Any unauthorized visitors refusing to leave the TCuP Site will be immediately reported to the City of Benicia Police Department.

- All fencing and posting onsite will be inspected on a weekly basis for breaches or disrepair . Any portions of the fence in need of repair will be noted and reported. Repairs or replacement of signs will be facilitated within 2 working days of reporting by Granite.

- Patrol officers will be required to carry radios and check with each other at least once per hour. A phone (cell or hardline) will be maintained at the guard shack at all times. A copy of the SSHP will be kept at the guard shack documenting procedures to be followed in case of an accident or in the event that any OE/UXO is encountered.

5.0 SCHEDULE

All additional fencing and posting will be completed within 30 days after approval of this report.

6.0 References

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