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REMEDIAL INVESTIGATION SERVICES FOR SUSPECTED SOIL CONTAMINATION AND UST SITES

PARKS RESERVE FORCES TRAINING AREA

DUBLIN, CALIFORNIA

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1.0
INTRODUCTION

1.1 PROJECT BACKGROUND

The scope of this project is to execute recommendations of the May 1994 Preliminary Assessment (PA) by means of the following tasks: (1) investigate suspected underground storage tanks (USTs) using ground penetrating radar (GPR) or a similar non-intrusive technique; (2) locate, field screen, estimate volume, and stake the area of the site with possible or known soil contamination for removal by others; and (3) evaluate sites such as surface impoundments or hazardous materials use areas needing further analysis.

This report is organized in the following sections. Section 1.0 presents background information, scope of services, and methodology. Section 2.0 presents our findings. Section 3.0 presents our conclusions and recommendations and Section 4.0 provides a discussion of limitations. Photographs and a corresponding photographic log are provided as Appendix A. A memorandum describing soil removal activities at Buildings 860 and the Regional Training Site - Medical (RTS-Med) Motorpool is provided as Appendix B.

Parks Reserve Forces Training Area (PRFTA) is located in Township 3 South, Range 1 East on the Dublin 7.5 minute topographic quadrangle in Alameda County, California (Figure 1). PRFTA occupies approximately 2,800 acres in Alameda and Contra Costa Counties. From October 1993 through March 1994, a facility-wide Preliminary Assessment (PA) was conducted by Woodward-Clyde Federal Services (WCFS). The goal of the PA was to assess the potential for soil, groundwater, or surface water contamination resulting from PRFTA and tenant past or current operations. The PA identified areas of environmental concern which included: underground and aboveground storage tanks; landfills and disposal areas; petroleum, oil, and lubricant (POL) use areas; wash racks; oil/water separators, pits, and vaults; and other suspected release sites. This report addresses the suspected UST sites, suspected areas of soil contamination, and sites selected by the U.S. Army Corps of Engineers, Sacramento District (USACE) which need further evaluation. These site were itemized in the June 16, 1994 Scope of Work (SOW). The sites were originally identified

in the May 1994 PA conducted by WCFS. The selected sites are identified on Tables 1, 2, and 3 in Section 2.0. The specific scope and activities conducted in this investigation are described below.

1.2 SCOPE OF SERVICES AND METHODOLOGY

To complete the activities described in the June 16, 1994 SOW, WCFS conducted the following tasks at PRFTA from July 12 through July 14, 1994:

- Task 1 included an investigation of suspected UST locations using GPR or similar non-intrusive techniques such as magnetometer and electromagnetic field devices.

- Task 2a included an investigation of the selected sites with potential soil contamination. The investigation included locating the potential soil contamination, field screening using an HNu and Petro RISc soil kits for total petroleum hydrocarbons-diesel (TPH-diesel) levels in soil, estimation of volume of contaminated soil to be removed, and staking of the area of soil to be removed.

- Task 2b included an investigation of sites identified in the PA which needed further evaluation. These sites included surface impoundments and hazardous materials use areas.

The goals of the remedial investigation consisted of the following:

- Investigate selected suspected UST sites using GPR or other non-intrusive technique,

- Investigate selected suspected and known areas or soil contamination,

- Make recommendations regarding the need for further analysis at each site.

1.2.1 Methodology for Task 1

Task 1 involves the use of geophysical techniques for underground site characterization. During this phase of the project, 18 sites at PRFTA were investigated to assess whether previously suspected USTs were present. The sites are listed in Table 1 below. The following techniques were utilized: magnetic and electromagnetic surveys to identify subsurface disturbance and to locate and delineate USTs; ground penetrating radar (GPR) surveys to define the characteristics of underground anomalies; and utility (pipe and cable) identification and tracing.

Table 1. Selected Suspected UST Sites Investigated at PRFTA in July 1994.

SITE	DESCRIPTION
B180*	B Co 319 Battalion office. Potential UST fill pipe.
B200	Military police station. Potential UST fill and vent pipes.
B232	Former mess hall.
B250	Former mess hall.
B251	Former mess hall.
B305	Formerly used for radiological experiments.
B331	Mess hall.
B332	Mess hall.
B691	Former mess hall.
B870	Building under demolition. Potential UST fill pipe.
B888*	Gas station. Potential UST fill pipe.
B940	Former mess hall.
B941	Former mess hall.
B1100	Single family home. Potential UST vent pipe.

SITE	DESCRIPTION
B1135*	Former single family home. Potential UST fill and vent pipes.
B1136*	Former single family home. Potential UST fill and vent pipes.
B1189	Former single family home. Potential UST fill pipe.
NRL #1	Formerly used for radiological experiments. Potential UST fill pipe.

* Site added after June 16, 1994 SOW.

Terrain conductivity surveying and electromagnetic (EM) techniques provide a rapid method of site characterization. In urban settings, terrain conductivity studies are used to locate disturbed areas which are not visible from the surface. Metallic objects such as landfill deposits, buried tanks, point sources (buried drums, etc.), and pipelines are easily identified, pinpointing areas of modern site disturbance. Other areas of disturbance that may be identified include backhoe trenches, test pits, and regions of anomalous values which are generally associated with unusual soil conditions such as brine deposits, petroleum product contamination, or buried "trash". In addition, the subsurface geological conditions of large areas may be rapidly characterized using electromagnetic techniques associated with occasional "ground truth" reference points such as soil borings or seismic refection profiles at periodic intervals along the EM traverse. The results obtained from these studies provide critical decision-making information to aid in the placement of subsurface test excavations.

A Geonics EM-31 Terrain Conductivity Meter, which is a controlled-source, induction-type instrument, was used to characterize subsurface deposits at PRFTA. The EM-31 is a portable two-part instrument which includes a 3.7-meter long boom containing transmitting and receiving loop antennas at either end, and an electronics console with an analog display for continuous readout of ground conductivities. The EM-31 is responsive to the electrical properties of the upper 16 to 18 feet of soil, with most of the response being derived from the upper 6 feet.

A Geonics EM-38 was used for localized detection and boundary delineation of USTs. The EM-38 is similar to the EM-31 except that it has a 1-meter coil spacing and is responsive to the electrical properties of the upper 3 to 4 feet of soil.

GPR uses high frequency electromagnetic waves to provide information on the nature and geometry of subsurface reflecting horizons and to delineate underground structures such as buried tanks, pipeline, and other utilities. Energy is radiated downward into the subsurface from a transmitting antenna which is moved slowly across the surface of the ground. This electromagnetic energy is differentially reflected back to a receiving antenna, where variations in the return signal are continuously recorded on a graphic recorder. The refections produce a continuous cross-sectional profile of the shallow subsurface conditions. The vertical axis represents the two-way travel time of the reflected radar signal and may be calibrated to depth by obtaining information over known sources.

The response variation of the return signal are caused by radar wave reflections from distinctive interfaces of materials having different electrical properties. Such reflections are often associated with natural geologic conditions such as bedding, cementation, moisture and clay content, voids, fractures, and intrusions, as well as man-made objects such as USTs, pipelines, etc. Detectability is strongly controlled by interrelated factors such as size, contrast in properties, sharpness of the change, and the smoothness of the reflecting surface. A 500-MHz antenna was used to obtain the radar profiles to more accurately define electromagnetic anomalies.

Electromagnetic pipe and cable locators are used for the detailed tracing of individual utility conductors such as underground electrical conduits, water and sewer lines, and chemical or product lines associated with USTs. These instruments are capable of tracing individual lines in highly congested areas. Generally, a transmitter is used to inject an audio-frequency signal into a metallic conductor such as a pipeline through inductive or conductive coupling. The conductor simulates a large antenna and radiates this signal, which may be traced with an acoustic receiver, thereby outlining the buried conductor.

Gradient magnetics was used to locate buried iron and steel objects and to define the edges of buried storage tanks. This magnetometer detects the natural magnetic gradient associated

with the metallic objects and is capable of working in relatively close proximity to objects with known high-field gradients.

1.2.2 Methodology for Task 2a

A number of sites were identified in the PA and selected by the USACE as suspected sites with possible or known current or historical soil contamination. The name of each site corresponds to a building associated with the site or the closest adjacent building. The 18 sites investigated as part of Task 2a are listed in Table 2 below:

Table 2. Selected Sites With Current or Historical Soil Contamination Investigated at PRFTA in July 1994.

Site	Description
B180	B Co 319th Signal Battalion. Soil stains and odors near concrete pad.
B312	U.S. Border Patrol. Aboveground storage tank (AST) overfill stains on soil next to concrete pad.
B331/B332	6237th USAR School. Stains in parking area between B331 and B332. Possible paint wash area.
B334	6237th USAR School. Abandoned hydraulic lift.
B636	PRFTA Fire Station. Possible wash area.
B730	124th ARCOM ECS 30. Wash rack and drainage ditch.
B761	Former AST storage area. Possible AST leaks.
B790 Haz Waste Stg Area	PRFTA hazardous waste storage area. Possible runoff of hazardous materials into drainage ditch.
B791	PRFTA maintenance shop. Possible refueling and wash areas.
B792	124th ARCOM ECS 30. Abandoned hydraulic lift.

Site	Description
B794	Former quonset hut utilized by B Co 319th Signal Battalion. Stains on asphalt.
B860	RTS-Med. Former diesel spill location.
B1162-B1175	Former POW and kennel area. Unknown concerns.
B1180	Former single family home. AST overfill stains on soil next to concrete pad.
B1184	Stressed vegetation east of B1184.
B1196	PRFTA Range. Former diesel spill.
RTS-Med Motorpool	RTS-Med. Former diesel spill.
Fire Training Area fire pit	Former PRFTA fire training pit.

For each site with potential soil contamination the following criteria was used as a methodology for evaluating the site and deciding if field screening or staking of the area was warranted. An initial site survey of the potential contaminated area was conducted to evaluate whether visual or olfactory indicators of hydrocarbon contamination were present. If a stained area was observed or hydrocarbon odors were noted in the area, a soil sample was collected from the area judged to have the highest potential for contamination. The sample was then screened with a photo-ionization detector (HNu). If the results of the HNu screening indicated the potential presence of contamination (VOC reading greater than 10 ppm), a hand auger boring was advanced at the location of the potential contamination and soil samples were collected and screened at intervals of every 0.5 feet. If the screening results indicated the potential presence of contamination, a soil sample was analyzed in the field using the >10 ppm and >100 ppm total petroleum hydrocarbons-diesel (TPH-diesel) Petro RISc soil kit. Additional hand auger borings were advanced in the vicinity of the contamination and screened with the HNu to estimate the size and volume of the apparent contamination. Values of less than 10 ppm on the HNu in soil samples collected were used

to estimate the approximate boundary and volume of the soil to be removed. The estimated areas of potential contamination were delineated using wooden stakes.

1.2.3 Methodology for Task 2b

Several surface impoundments and hazardous materials use sites were identified in the PA and selected by the USACE as sites needing further review. Each site's name corresponds to a building associated with the site or the closest adjacent building. The four sites investigated as part of Task 2b are listed in Table 3.

Table 3. Selected Surface Impoundments and Hazardous Materials Use Sites Investigated at PRFTA in July 1994.

Site	Description
B521	PRFTA Combined Open Mess. Vault near boiler room.
B781-B784	124th ARCOM ECS 30G storage area. Reported oil/water separator.
B1160	PRFTA. Active oil/water separator.
Helipad #1	PRFTA. Metal cover east of Helipad #1.

Each surface impoundment or hazardous materials use site identified in the June 16, 1994 SOW was visited and observed. The current or historical use of each surface impoundment was identified and potential environmental issues pertaining to the structure were evaluated. The hazardous materials use areas were also examined and evaluated for visual or olfactory indications of potential contamination. If indications of potential petroleum hydrocarbon contamination were observed, the methodology as described for Task 2a was used to approximate the boundary of soil to be removed.

2.0
FINDINGS

To maintain consistency with the PA report prepared by WCFS in May 1994 the findings for the sites included in this report are divided into the following four categories: Category 1 - Suspected UST Sites; Category 2 - Sites with Suspected Soil Contamination; Category 3 - Sites with Known Soil Contamination; and Category 4 - Surface Impoundments and Hazardous Materials Use Sites. Sites identified on Attachment 1 of the June 16, 1994 SOW are discussed in this report and are provided in Tables 1, 2, and 3 in Section 2.0. Several additional sites were identified during the field investigation portion of the project. These additional sites have been included in this report. The following sections describe the investigations and the results of those investigations by category.

2.1 CATEGORY 1 - SUSPECTED UST SITES

Thirteen suspected UST sites were originally identified in the June 16, 1994 SOW. The 13 original UST sites are located at the following buildings or former building locations: B200, B282, B250, B251, B305, B381, B382, B870, B940, B941, B1100, B1189, NRL Site #1. At WCFS's recommendation five additional sites were added to this list during the course of the investigation. The five additional sites are located at B180, B888, B691, B1135, and B1136. The suspected UST sites described in this section were evaluated under Task 1 using the methodologies described in Section 2.1. The following sections are organized in numerical order by building number.

2.1.1 Suspected UST Site B180

Building 180 is occupied by B Company 319th Signal Battalion as an office and signal equipment operations area. During the July 1994 site investigation, a potential UST fill pipe was observed at the south side of the building. A 13-inch high pipe was located approximately 10 inches from the south side of Building 180 to the west of the rear entrance stairs. During an EM search, the pipe was identified to be an abandoned 1-1/4 inch wrapped natural gas supply line. The pipe was observed to run south 5 feet and turn east and extend

to Evans Avenue, where it crossed the street. A UST was not identified to be associated with this pipe.

2.1.2 Suspected UST Site B200

Building 200 is the PRFTA military police station. During the February 1994 site reconnaissance activities for the PA, WCFS personnel observed potential UST vent and fill pipes and an asphalt patch adjacent to the building. During the July 1994 site investigation, the two pipes, originally reported in the PA, located on the north side of Building 200 were identified as a vent pipe and a fill pipe for a UST located approximately 3-1/2 feet north of the pipes (Figure 2). GPR profiles across the identified UST are shown in Figure 2. The UST had an electromagnetic footprint approximately 50 inches square and is most likely a 320-gallon heating oil tank typical of those installed at this facility during the early 1940s. An electromagnetic search of the area to the north, east of the perimeter fence where several pads of old concrete exist, revealed no anomalies that would indicate the presence of additional buried tanks within this area.

2.1.3 Suspected UST Sites B232, B250, B251, B691, B940, and B941

Buildings 232, 250, 251, 691, 940, and 941 were former mess halls prior to their demolition in 1993-1994. During the demolition of Building 691 in 1993, a UST was uncovered by the excavation crew. The tank was located near the boiler room end of the structure, suggesting that other mess halls might have been similarly fitted with oil-fired boilers during the World War II period prior to the availability of natural gas at PRFTA. Therefore, the presence of an underground oil storage tank located at the boiler end of each structure, either outside or inside of the building's original footprint is possible. Historical background research and interviews with PRFTA personnel indicated that all of the mess halls were built by the U.S. Air Force during the Korean War period, circa 1951-1952.

WCFS conducted an electromagnetic search within the area of the suspected USTs at each mess hall. Two anomalies were located at the former location of Building 691 where the excavation crew unearthed the UST (Figure 3). Anomalies suggesting the presence of underground pipelines or utilities were observed at B691. However, neither anomaly appeared to enter the footprint of the original structure. Anomalies suggestive of the

presence of a buried tank were not observed at the five other locations. Isolated, low intensity electromagnetic anomalies were also observed at some former mess hall locations, always within the original footprint. These anomalies suggest the presence of miscellaneous demolition materials and do not appear to be indicative of the type of underground tanks that would have been installed for the mess hall boilers.

The locations of five of the six mess halls were identified on an historic map of the facility. This map, entitled "Map of U.S. Construction Battalion Replacement Depot, Camp Parks, California showing conditions on June 30, 1945" showed the presence of buildings prior to the renovation of the base by the Air Force in the 1950s. Other structures were present during 1945 at the location of five of the mess halls under investigation. An historic map of the area of Building 691 was not available.

The UST located at Building 691 is apparently an anomaly. Natural gas was available to these sites in 1951 and the boilers were most likely gas fired. Although underground or aboveground oil storage tanks may have been installed for the 1940s era buildings at the six mess hall sites, it appears that if present these tank were removed during the 1950s construction activities.

2.1.4 Suspected UST site B305

Building 305 was utilized for radiological plant uptake experiments prior to its demolition. During the February 1994 site reconnaissance activities for the PA, WCFS personnel observed two steel plates within a concrete pad at the former location of Building 305. During the site investigation in July 1994, closer observation indicated the existing structure at B305 consisted of three north/south oriented steel-reinforced concrete pads each approximately 20 feet square. Two-foot wide steel lids were observed in the center of the end of the two outermost pads. The southernmost pad appeared to have been covered with a structural framework to cover shelving or work benches in the past. Removal of the metal covers revealed 20-inch wide circular holes providing access to an underground vault(s) of unknown dimensions. This vault(s) was completely filled with a liquid which appeared to be water. The liquid had no obvious odor. An electromagnetic search of the perimeter of the pads did not detect any metallic piping leading from the pads.

2.1.5 Suspected UST sites B331 and B332

Buildings 331 and 332 are Korean War era mess hall buildings built by the Air Force in 1951-1952. During the July 1994 site investigation, a visual and electromagnetic search of the boiler room area of each building was conducted, both inside and outside of the building. Visual indications of USTs were not observed at either location and no electromagnetic anomaly indicative of a buried tank of the type expected to be associated with the boiler complex was noted. A small EM anomaly was recorded outside the northwest corner of Building 332 (Figure 4). The anomaly's size was further defined with a gradient magnetometer. Electronic signatures suggest that this anomaly may be due to a buried concrete slab. However, since the physical size of the anomaly is similar to those observed at the known location of 320-gallon heating oil tanks (B200, B1135, B1136, and B1180), the presence of a UST possible dating from the World War II era cannot be precluded.

The boiler room complexes of Buildings 331 and 332 are virtually identical. According to Mr. Dave Small of PRFTA, Buildings 331 and 332 were built in the 1950s by the Air Force after natural gas was available at PRFTA. This fact was confirmed during discussions with Mr. Bob Decker, PRFTA Maintenance Facilities Manager. The Model R-12 boilers installed in these buildings were manufactured by Gabriel Fabrication Co., Portland, Oregon in 1951. Close inspection of the burners and associated equipment confirm that these boilers have always been gas fired, and therefore fuel oil USTs are not likely to have been installed for this equipment.

2.1.6 Suspected UST site B870

During the July 1994 site investigation, Building 870, an abandoned building, was under demolition. However, previously during the February 1994 site reconnaissance activities for the PA, WCFS personnel observed piping associated with a boiler room that indicated the possible presence of a UST. In this investigation an electromagnetic search was conducted to evaluate the piping. An electromagnetic anomaly was identified in the southwest corner of the eastern open area of Building 870. This anomaly was identified just east of the footprint of a small service room. Although the anomaly was not as strong as that caused by other USTs in the area, the possibility of a buried tank at this location cannot be precluded. The location of this anomaly is shown in Figure 5. The presence of extensive

demolition debris (reinforced concrete, metal sheeting, etc.) in the area prevented a more definitive location.

2.1.7 Suspected UST site B888

Building 888 is an active service station with two 10,000-gallon USTs. During the February 1994 site reconnaissance activities for the PA, a waste oil UST was observed northwest of the garage area. In addition, a potential oil/water separator was also observed to the north of Building 888. During the July 1994 site investigation, a 36-inch high vent pipe was observed approximately 3 feet east of the northwest corner of Building 888. An electromagnetic search was performed and confirmed that this vent line ran west along the base of the building approximately 8 feet into a waste oil tank. To the north of this vent the location of an underground oil/water separator was also confirmed. A 4-inch pipe plug was identified 12 inches south of the separator, towards the building. This plug appeared to be fitted into a 4-inch wide cast iron sewer cleanout as part of a waste line running from the oil/water separator to a sewer line adjacent or under the building.

2.1.8 Suspected UST site B1100

Building 1100 is a single family home. During the February 1994 site reconnaissance for the PA, WCFS personnel observed a potential UST vent pipe at the north side of the building. During the July 1994 site investigation, a 2-inch wide cast iron vent pipe was observed on the north side of Building 1100. This pipe was identified as a 2-inch sewer vent pipe and did not appear to be associated with a UST. An electromagnetic search of the immediate area revealed no anomalies. A visual search of the building's perimeter failed to locate any additional evidence that a UST might be located at this site.

2.1.9 EM search for USTs at sites B1135 and B1136

During the February 1994 site reconnaissance for the PA, WCFS identified USTs at Buildings 1135 and 1136. During the interim between February and July 1994, the structures were demolished and all visual indications of the USTs were removed. During the July 1994 site investigation, an electromagnetic search was conducted to define the locations of the buried 320-gallon heating oil tanks (Figure 6). A prominent tree located on

the north side of the original garage area was used as a reference marker to locate the tanks. Relative to this marker, the EM search showed that the UST at Building 1135 was found to be 94 feet on a bearing of 176 degrees True and the UST at Building 1136 was found to be 22 feet on a bearing of 357 degrees True.

2.1.10 Suspected UST site B1189

Building 1189 was a residential building prior to its demolition by fire. During the February 1994 site reconnaissance activities for the PA, WCFS personnel observed a potential UST vent pipe at the west side of the building's former location. During the site investigation in July 1994, several vertical pipes were observed at the former location of Building 1189. Several concrete pads were observed at the site, one of which appeared to be related to a former garage. The previous use of the other pads was not identified. No clearly-defined footprint of a residential structure was noted. An approximate 5-foot high 1-1/2 inch pipe was observed at the northeast corner of an 8-1/2 foot by 24-1/2 foot concrete pad. Similar pipes were observed in the other three corners of the pad, but cut off as ground level. These pipes appeared to be the remains of a pipe framework that was over the slab, possibly to support a roof. These pipes did not appear to be associated with a UST.

An 18-inch high by 2-inch pipe was observed just west of the above-referenced concrete slab. It did not appear to be associated with a UST. Magnetic and electromagnetic surveys of the area did not reveal any anomalies that would indicate the presence of a buried tank at this site. Since a UST had not been located, reports that the former resident of Building 1189 heated the structure with oil suggests that an aboveground tank may have been used.

2.1.11 Suspected UST site NRL #1

NRL #1 was a research site utilized by Stanford Research Institute under contract to the Naval Research Laboratory (NRL) until the 1980s. During the February 1994 site reconnaissance for the PA, WCFS personnel observed a potential UST fill pipe next to a burn pit area. During the site investigation in July 1994, an 11-foot high by 2-inch wide pipe was observed along the western perimeter of an approximate 20-foot diameter burn pit. A similar pipe was identified along the opposite side of the complex, but was capped and only 4 inches high. Electromagnetic signatures outlined an underground structure about 2

feet by 3 feet associated with each pipe. The signatures were more suggestive of a concrete vault or thick reinforced concrete pad than a buried tank. Numerous clamps located at the base of each pipe, along with the geometrical relationship to the burn pit structure, suggested that these pipes may have been part of a support system for the burn pit.

Six pipes were located inside the south entrance door of the NRL #1 site. Two were 3-inch pipes and four were 2-inch pipes, all rising approximately 2 inches above the concrete floor. Electromagnetic tracing indicated that these pipes did not exit the building complex. They appeared to be electrical conduit pipes running between various areas within the complex and did not appear to be associated with a UST.

2.2 CATEGORY 2 - SITES WITH SUSPECTED SOIL CONTAMINATION

Fifteen suspected soil contamination sites were identified for further evaluation in the June 16, 1994 SOW. The 15 sites are located at the following buildings or former building locations: B180, B312, B331/B332, B334, B636, B730, B761, B790, B791, B792, B794, B1162-B1166, B1168, B1172-B1175 (B1162-B1175 are considered one site), B1180, B1184, and the fire training area. The following sections describe the findings of each site investigation.

2.2.1 Building 180

Building 180 is an office and signal equipment operations area occupied by B Company 319th Signal Battalion. According to site personnel, the concrete pad south of Building 180 was used as a motor vehicle refueling area. During site reconnaissance activities in February 1994 for the PA, an area of stained soil (approximately 3 feet by 2 feet) and distressed vegetation was observed west of the concrete pad by WCFS personnel.

During the site investigation activities on July 13, 1994, WCFS collected five soil samples at the location of the previously identified soil stained area west of the concrete slab at Building 180. To collect the soil samples, two hand auger borings (boring SB-1 and boring SB-2) were advanced to depths of 1.5 and 0.5 feet below ground surface (bgs), respectively. The location of the hand auger borings are shown on Figure 7.

During field screening of the soil samples, up to 90 ppm of VOCs were measured using the HNu in boring SB-1 at a depth of 0.9 feet bgs (sample 180-2). However, less than 15 ppm of total petroleum hydrocarbons (TPH) as diesel were detected in sample 180-2 using the Petro RISc soil test. Field screening of boring SB-2 using the HNu detected up to 40 ppm of VOCs at the ground surface (sample 180-3), but no VOCs were detected at a depth of 0.5 feet bgs (sample 180-4). Soil staining was noted at the ground surface in the area of boring SB-2. Petroleum odors were not noted in the soil samples collected during the investigation. The subsurface soil was silty clay to a depth of approximately 1.0 feet bgs, underlain by a sandy layer. Due to the localized nature of the VOC readings and the <15 ppm TPH-diesel value in the sample analyzed, the area was not staked. A summary of the screening results is presented below in Table 4.

Table 4. Summary of Screening Results of Soil Samples Collected During the Field Investigation at Building 180.

Boring No.	Sample No.	Depth in Feet (bgs)	HNu VOCs (ppm)	Petro RISc TPH Diesel (ppm)	Soil Type	Petroleum Odor	Soil Staining
SB-1	180-1	0.4	45	NT	silty clay	no	no
	180-2	0.9	90	<15	silty clay	no	no
	180-5	1.5	0	NT	sand	no	no
SB-2	180-3	0.0	40	NT	silty clay	no	yes
	180-4	0.5	0	NT	silty clay	no	no

Note: 1) NT = Not tested
2) bgs = below ground surface
3) ppm = parts per million

2.2.2 Building 312

Building 312 is occupied by the U.S. Border Patrol and consists of offices, a detention facility, and a vehicle storage area enclosed by a chain-link fence. A 50-gallon diesel aboveground storage tank (AST) used for fueling an emergency generator was observed outside Building 312 near the southeast corner. During site reconnaissance activities in February 1994 for the PA, WCFS personnel observed a 1 to 2-foot diameter dark and oily stain on the concrete pad underneath the AST and on the surface of the soil next to the eastern edge of the pad.

During the site investigation activities on July 13, 1994, WCFS collected six soil samples in the previously identified soil stained area east of the concrete pad and AST at Building 312. To collect the soil samples, three hand auger borings (borings SB-1, SB-2, SB-3) were advanced to depths of 0.7, 1.6, and 0.1 feet below the top of the concrete pad, respectively. The locations of the hand auger borings are shown on Figure 8.

During field screening of the soil samples, 45 ppm of VOCs were measured using the HNu in the sample collected from boring SB-1 at a depth of 0.7 feet bgs (sample 312-1). However, no VOCs were detected at a depth of 1.1 feet bgs in boring SB-1. Field screening of the sample collected from boring SB-2 showed up to 60 ppm of VOCs and greater than 100 ppm of TPH as diesel at a depth of 0.6 feet bgs (sample 312-3) using the Petro RISc soil test. VOC concentrations were an order of magnitude less in soil samples collected in SB-2 at depths greater than 0.6 feet bgs. Low concentrations of VOCs (3 ppm) were measured using the HNu in the soil sample (sample 312-6) collected from SB-3. Soil staining was noted at the ground surface in the area of borings SB-1 and SB-2. Petroleum odors were noted in the soil samples collected from SB-1 at 0.7 bgs and in SB-2 at depths of 0.6 and 1.2 feet bgs. The subsurface soil was clay to a depth of approximately 1.0 feet bgs and underlain by a sandy layer. Due to the close proximity of the contaminated soil to the concrete pad and the small size of the area, it was not staked. A summary of the screening results is presented below in Table 5.

Table 5. Summary of Screening Results of Soil Samples Collected During the Field Investigation at Building 312.

Boring No.	Sample No.	Depth in Feet (btp)	HNu VOCs (ppm)	Petro RISc TPH Diesel (ppm)	Soil Type	Petroleum Odor	Soil Staining
SB-1	312-1	0.7	45	NT	clay	yes	
	312-2	1.1	0	NT	sand	no	no
SB-2	312-3	0.6	60	>100	clay	yes	
	312-4	1.2	2	NT	sand	yes	no
	312-5	2.0	4	NT	sand	no	no
SB-3	312-6	0.5	3	NT	clay	no	no

Note: 1) NT = Not tested
2) btp = below top of concrete pad
3) ppm = parts per million

2.2.3 Buildings 331/332

Buildings 331 and 332 are multi-use buildings used by the 6237th USAR School for offices, equipment, storage, vehicle maintenance, and a dining facility. The area of asphalt and gravel pack between Buildings 331 and 332 is used by the 6237th USAR School for vehicle storage. During the site reconnaissance activities in February 1994 for the PA, WCFS personnel observed paint and washwater on the surface soil in the vicinity of a water faucet at Building 332. During the PA, an oily sheen was observed on several standing water puddles at the motor vehicle parking area.

During the site investigation activities on July 13, 1994, indications of releases of hazardous materials to the ground surface at the wash area previously identified in the PA (beneath the spigot at Building 332) were no longer present and were not observed by WCFS. WCFS observed that the area between Buildings 331 and 332 was currently used for vehicle storage and only stains indicative of a parking area were observed. WCFS also observed that drip pans were in use underneath several of the parked vehicles to help minimize oil releases to the asphalt. Standing water puddles were not observed during the July 1994 investigation. WCFS did not collect soil samples for field screening purposes since areas of petroleum hydrocarbon contamination in soil were not observed.

2.2.4 Building 334

Building 334 is occupied by the 6237th USAR School and used as a storage facility. In the PA, a abandoned hydraulic floor lift was identified. USAR School personnel said that the lift had not been used since the 1960s. The hydraulic lift is located in a concrete slab floor, therefore, observation of the condition of the lift and the collection of samples were not possible during the July 1994 investigation.

2.2.5 Building 636

Building 636 is the PRFTA fire station. During site reconnaissance activities in February 1994 for the PA, WCFS personnel observed a wash area used for cleaning fire vehicles located west of Building 636. A collection system for wash water was not observed during the site reconnaissance.

During the site investigation activities in July 14, 1994, WCFS personnel interviewed Mr. William Laconte of the PRFTA Fire Department. Mr. Laconte stated that only soap and water are used to wash fire vehicles. Degreasers or solvents are not used for washing the vehicles. WCFS personnel observed that wash water from the wash area flows down the concrete driveway at the fire station to the gutter on 5th Street. WCFS personnel did not collect soil samples for field screening purposes because the wash water flow path is asphalt and concrete and hazardous substances are not used when the vehicles are washed.

2.2.6 Building 730

Building 730 is occupied by the 124th Army Command (ARCOM) ECS 30G and is utilized as a motor and track vehicle maintenance and storage area. During site reconnaissance activities in February 1994 for the PA, WCFS personnel observed a wash rack northwest of Building 730. According to ECS 30G personnel, vehicle wash water from the rack emptied in to the adjacent unlined surface water drainage ditch north of the wash rack. The ground surface at the wash rack outfall slopes down toward the bottom of the drainage ditch with a change in elevation of approximately 3 feet.

During the site investigation activities on July 12 and 13, 1994, WCFS collected 11 soil samples in the wash rack outfall area and unlined surface water drainage ditch. To collect the soil samples, 8 hand auger borings were advanced to depths between 0.4 feet bgs and 1.9 feet bgs. The location of the hand auger borings are shown on Figure 9. During field screening with the HNu, several soil samples collected from the wash rack outfall area showed elevated levels of VOCs. HNu readings of greater than 2,000 ppm of VOCs were measured in soil samples collected from borings SB-1, SB-3, and SB-4 at depths between 1 and 2 foot bgs (samples 730-3, 730-5, and 730-7). However, less than 15 ppm of TPH as diesel was detected in sample 730-5 using the Petro RISc soil test. Readings on the HNu were greatly reduced in the soil samples collected from the bottom of the drainage ditch. Soil samples collected from borings SB-5 and SB-6 in the bottom of the drainage ditch, showed HNu values of 150 ppm and 30 ppm VOCs, respectively.

Soil staining or odors were not observed in the soil samples collected during field screening. The subsurface soil was varied from silt to clayey silt. The subsurface soil in the bottom of the drainage ditch was hard pan at a depth of 0.5 feet bgs. The perimeter of the area

estimated to have the highest levels of VOCs on the HNu was delineated with wooden stakes. A summary of the screening results is presented below in Table 6.

Table 6. Summary of Screening Results of Soil Samples Collected During the Field Investigation at Building 730.

Boring No.	Sample No.	Depth in Feet (bgs)	Depth in feet (btp)	HNu VOCs (ppm)	Petro RISc TPH Diesel (ppm)	Soil Type	Odor	Soil Staining
SB-1	730-1(1)	0.9	0.7	700	NT	silt	no	no
	730-2(2)	1.4	1.2	200	NT	clayey silt	no	no
	730-3(4)	1.9	1.7	>2,000	NT	clayey silt	no	no
SB-2	730-4(10)	0.9	0.8	0	NT	silt	no	no
SB-3	730-5(11)	1.3	1.3	>2,000	<15	clayey silt	no	no
SB-4	730-6(3)	0.9	1.2	500	NT	clayey silt	no	no
	730-7(5)	1.9	2.2	>2,000	NT	clayey silt	no	no
SB-5	730-8(7)	0.5	3.2	150	NT	silt	no	no
SB-6	730-9(9)	0.8	3.5	30	NT	silt	no	no
SB-7	730-10(6)	1.0	1.0	250	NT	clayey silt	no	no
SB-8	730-11(8)	0.4	-	1	NT	silt	no	no

Note: 1) NT = Not tested
2) btp = below top of outfall pipe
3) bgs = below ground surface
4) ppm = parts per million

2.2.7 Area 761

Area 761 is located on Fernandez Avenue south of 4th Street. Area 761 was historically used as an AST fuel storage area. In 1993 three aboveground storage tanks (ASTs) were removed. During site reconnaissance activities in February 1994 for the PA, WCFS personnel observed no visual indications of fuel releases to the surface soil. However, the PA stated that the potential exists for fuel releases to have occurred in the past.

During the site investigation activities on July 13, 1994, WCFS personnel observed no visual indications of a fuel release, however the area was used for the storage of large containers. Due to the large number of containers which were stored in close proximity to each other, the ground surface could not be completely viewed. The soil in the area appeared uniform

in color. The ground surface was well graded. WCFS personnel did not collect soil samples for field screening purposes because no obvious contamination was observed. In addition, the size of the area precluded the collection of samples which would be expected to provide a cost effective screening of the area.

2.2.8 Area Southeast of Building 790 - Hazardous Waste Storage Area

East of PRFTA Headquarters Building 790 is an enclosed, asphalt-paved temporary storage area for hazardous waste. The PA identified that there is no secondary containment for the storage area and that stormwater runoff could enter the adjacent drainage ditch. During the July 1994 site investigation, it was observed that the hazardous materials were storage in drums on wooden pallets. It was observed that 2/3 of the area drained to the west towards a asphalt parking area while 1/3 drained to the east toward the drainage ditch. Discolored vegetation or soil staining in the vicinity of the storage area or in the adjacent drainage ditch were not observed.

The soil in the adjacent drainage was observed to not have any odor and to not be discolored when compared to the surrounding soil. WCFS personnel did not collect soil samples for field screening purposes since contamination was not observed in the soil adjacent to the hazardous waste storage area.

2.2.9 Building 791

Building 791 is the PRFTA maintenance and repair shop. In the PA, the area south of Building 791 was reportedly used for vehicle washing and a refueling area with drums on racks was observed. During the July 1994 site investigation, it was observed that the entire area south of Building 791 is asphalt paved and the refueling area was no longer present. In addition, visual indications of vehicle washing were not observed. Since the fuel area is gone and washing activities were not observed, indications of hazardous materials release to the asphalt were not observed. In addition, due to the asphalt paving covering the entire area, confirmation soil screening activities could not be conducted.

2.2.10 Building 792

Building 792 is used by the 124th ARCOM ECS 30 for storing equipment. During the site reconnaissance for the PA, four hydraulic floor lifts were observed. The hydraulic lifts are located in a concrete slab floor, therefore, observation of the condition of the lifts was not possible during the July 1994 site investigation and soil screening activities were not conducted.

2.2.11 Building 794

Building 794 was utilized by Company B 319th Signal Battalion prior to its demolition in May 1994. During the site reconnaissance for the PA, minor dark and oily surface stains and hydrocarbon odors were observed on the asphalt surface in the vicinity of Building 794. During the site investigation activities in July 1994, similar staining of the asphalt surface was observed in the former location of Building 794. However, soil screening activities could not be conducted at this location due to the asphalt paving which covered the entire site.

2.2.12 Buildings 1162 - 1175

These buildings made up the POW camp and kennel area used in the 1950s in conjunction with radiological experiments. The PA did not identify any specific areas of environmental concern except to identify a potential unknown concern associated with past activities at this location. The concern identified in the PA was related to the radiological experiments which were discussed in Appendix A of the PA. During the site investigation activities in July 1994, it was observed that the majority of the structures at this location had been demolished and the area graded. A series of concrete trenches and catch basins were observed which appeared to be related to the kennel. Areas of potential releases of petroleum hydrocarbons to the surface soil were not identified, therefore, soil screening activities were not conducted by WCFS personnel.

2.2.13 Building 1180

Building 1180 was an abandoned residential building located at the western boundary of PRFTA in the Range Area. During site reconnaissance activities in February 1994 for the PA, site personnel observed a 300-gallon fuel oil AST located outside the eastern side of Building 1180. Dark and oily surface stains and hydrocarbon odors were observed on the concrete pad and soil underneath the tank.

During the site investigation activities on July 13, 1994, WCFS personnel observed that Building 1180 had been demolished. The 300-gallon AST had been moved approximately 50 feet to the north and placed on polyethylene sheeting. Debris from the building demolition, including the AST's concrete pad, has been removed from the site. The area had been graded and bulldozed. The ground surface appeared to be a mixture of asphalt, soil, and gravel. No native soil was observed at the ground surface at the former location of Building 1180.

WCFS personnel did not collect soil samples for field screening purposes since the surface stained area identified in the PA could not be located due to the demolition of the building. In addition, asphalt particles at the ground surface could interfere with the results on field screening performed on soil samples collected from the area.

2.2.14 Building 1184

Building 1184 was located on Arnold Road in the Range Area prior to its demolition. During site reconnaissance activities in February 1994 for the PA, WCFS personnel observed stressed vegetation on the slope leading from the former location of Building 1184.

During the site investigation activities on July 13, 1994, WCFS personnel observed that the "stressed vegetation" noted in the PA appeared to be very dry vegetation indicative of the surrounding area. No soil staining or petroleum odors were observed in the soil at the ground surface. WCFS personnel observed that the soil at the ground surface was a dark gray colored clay. However, the gray color of the soil matched the color of the exposed soil of the roads in the surrounding area. WCFS personnel did not collect soil samples for field screening purposes since stressed vegetation was not observed.

2.2.15 Fire Training Area (FTA)

The fire training area (FTA) is an open field located between 6th and 7th Streets and Loring and Monroe Avenues (Figure 10). This area was used by the PRFTA Fire Department for fire suppression training. Between 1979 and 1992, a burn pit in the fire training area was used for fire suppression exercises on wood fuels. Gasoline was reportedly used to ignite the wood material. During site reconnaissance activities in February 1994 for the PA, Captain Woolson and Captain Wallace, with the PRFTA Fire Department, informed WCFS personnel that ninety-nine percent of the time water was used as the method of suppression and on rare occasions aqueous film forming foam (light water) was used for training. Light water is a flammable liquid fire-suppression agent. Both Captain Woolson and Captain Wallace stated that the burn pit was never filled with flammable liquids during fire training exercises.

On July 14, 1994, WCFS personnel interviewed Mr. Mike Hamilton and Mr. William Laconte of the PRFTA Fire Department. Mr. Hamilton identified the location of the fire pit. WCFS personnel marked the boundaries of the fire pit, as identified by Mr. Hamilton, with 6-inch wooden stakes and orange tape. According to Mr. Hamilton, the fire pit was a 20 foot by 20 foot crater approximately 10 to 12-feet deep. The soil excavated from the pit during its construction was stockpiled around the pit and acted as a berm. The dimensions and location of the fire pit are shown on Figure 10. Mr. Hamilton indicated that fire suppression training occurred approximately once every eight months. Excess building materials such as wood, furniture, and vegetation would be collected in the pit. Once the pit was full the PRFTA Fire Department would obtain a burning permit from the Bay Area Air Quality Management District (BAAQMD) and the debris would be burned for fire suppression training. A small amount of a gasoline and diesel fuel mixture was used as a method of ignition. The gasoline/diesel fuel mixture is assumed to have been consumed in the fire. In 1992, the fire pit was backfilled because the burning permits could no longer obtained from BAAQMD. The remaining ash was left in the place and fire pit was backfilled using the stockpiled soil that acted as a berm around the pit. Due to the depth of the fill in the fire pit (approximately 10 to 12 feet), WCFS personnel did not collect soil samples for field screening purposes.

2.3 CATEGORY 3 - KNOWN SITES WITH SOIL CONTAMINATION

Three sites with known soil contamination were identified in the June 16, 1994 SOW. The three sites are located at the following locations: B860, B1196, and RTS-Med motorpool.

2.3.1 Building 860

Building 860 is occupied by RTS-Med and is utilized for offices, hospital equipment maintenance and calibration, and equipment storage. As discussed in the May 1994 PA, a release of approximately 2 gallons of diesel fuel to the surface soil occurred February 7, 1994 near the north gate entrance to Building 860 and WCFS personnel observed hydrocarbon odors at the location of the release. During the site investigation in July 1994, WCFS personnel learned from Mr. Jerry Beene, Spill Response Team Safety Office at RTS-Med, that the area identified in the PA had already been excavated and the contaminated soil had been removed in May 1994. A memorandum detailing the soil removal activities was provided to WCFS and is included in this report as Appendix B. The excavated area was observed by WCFS to have been recompacted and covered with new gravel.

2.3.2 Building 1196

Building 1196 is a quonset hut utilized as a maintenance shop located on Arnold Road in the Range Area. A known release, of approximately 1 to 2 gallons of diesel fuel, reportedly occurred near Building 1196 during the week of February 28, 1994. During site reconnaissance activities in February 1994 for the PA, site personnel informed WCFS that the release occurred within a secondary containment area surrounded by sand bags and that the contaminated soil was immediately excavated and drummed. Documentation of the soil removal was not provided to WCFS personnel.

During the site investigation activities on July 13, 1994, WCFS personnel did not observe visual indications of surface soil staining. The soil in the area did not have a hydrocarbon odor and appeared uniform in color. The ground surface was hard pan with gravel. Soil screening samples were not collected at this location.

2.3.3 RTS-Med Motorpool

The RTS-Med Motorpool is located southwest of Building 860 and has been active since June 1993. The motorpool is utilized for diesel refueling, generator storage, and vehicle parking. As discussed in the May 1994 PA, a diesel release of approximately 5 gallons occurred on February 16, 1994 at the motorpool. As described in the PA, WCFS observed dark and oily stains and hydrocarbon odors at the location of the spill. During the site investigation in July 1994, WCFS personnel learned from Mr. Jerry Beene, Spill Response Team Safety Office at RTS-Med, that the area identified in the PA had already been excavated and the contaminated soil removed in May 1994. A memorandum detailing the soil removal activities was provided to WCFS and is included in this report as Appendix B. The excavated area was observed by WCFS to have been recompacted and covered with new gravel.

2.4 CATEGORY 4 - SURFACE IMPOUNDMENTS

Four surface impoundment sites requiring further investigation were identified in the June 16, 1994 SOW. The four sites are located at the following locations: B521, B781-B784 (one site), B1160, and Helipad #1. The sites were investigated using the methodology for Task 2b as described in Section 2.3.

2.4.1 Building 521

Building 521 is the Combined Open Mess. During the site reconnaissance for the May 1994 PA, WCFS personnel observed a wood cover over what appeared to be a pit or vault. The wood cover was observed to the east of the Building 521 boiler room. During the site investigation in July 1994, WCFS observed that a concrete catch basin was located underneath the wood cover. According to Mr. Les Kennedy, PRFTA Range Control, the catch basin was used as a collection point for water pumped from a floor sump in the Building 521 boiler room. The floor sump reportedly collected overflow water from the steam generation boiler. The catch basin is believed to connected to the sanitary sewer via a gravity feed. Indications of a hazardous materials release in the vicinity of the catch basin were not observed.

2.4.2 Buildings 781-784

Buildings 781-784 were demolished prior to the site reconnaissance for the PA. A combination of asphalt, concrete, and unpaved areas are present at the former locations of Buildings 781-784. The 124th ARCOM ECS 30G currently occupies this site and utilizes the area for vehicle parking and large equipment storage. The PA identified an oil/water separator in the area. During the site investigation activities in July 1994, WCFS personnel observed an area that may have been used for vehicle washing or for drainage. A pipe was observed at the south end of a concrete pad located near the southeast corner of the site. The pipe appeared to extend from the concrete pad, underneath the southern fence, and towards the drainage ditch located south of the site. Indications of stressed vegetation, soil staining, or hydrocarbon odors were not observed in the vicinity of the pipe or concrete pad. No other areas were observed that may have been related to vehicle washing or drainage. Surface indications of an oil/water separator were not observed at this location.

2.4.3 Area 1160

Area 1160 is a vehicle wash rack with associated oil/water separator. According to PRFTA personnel, the facility has been used for the past 40 years. In the PA, it was recommended that the integrity of the oil/water separator be evaluated. During the site investigation activities in July 1994, the wash rack and oil/water separator were observed. The wash rack area was observed to be concrete with 1.5-foot wide concrete berm around the perimeter. The chambers of the oil/water separator were observed to be filled with water. Indications of hazardous materials release in the vicinity of the wash rack were not observed. The integrity of the oil/water separator could not be evaluated under the provisions of the June 16, 1994 SOW.

2.4.4 Helipad #1

Helipad #1 is utilized as a helicopter landing area. During the site reconnaissance for the May 1994 PA, WCFS personnel observed a yellow metal cap plate near an asphalt patch. During the site investigation in July 1994, WCFS personnel investigated the origin of the metal cap and discovered that it is a fire hydrant outlet that is currently not in use. Mr.

Robert Decker, with PRFTA, confirmed that the cap was associated with a water line for a fire hydrant.

3.0
CONCLUSIONS AND RECOMMENDATIONS

The Remedial Investigation Services for Suspected Soil Contamination and UST Sites at PRFTA were performed in accordance with the scope of work dated June 16, 1994. The conclusions and recommendations presented below are based on the site reconnaissance, PRFTA personnel interviews, and results of field activities.

The goals of the remedial investigation consisted of the following:

- Investigate selected suspected UST sites using GPR or other non-intrusive technique,
- Investigate selected suspected and known areas or soil contamination,
- Make recommendations regarding the need for further analysis at each site.

UST sites and areas of suspected soil contamination were evaluated during the field remediation service activities conducted by WCFS at PRFTA in July 1994. Based on the results of this investigation the following actions are recommended. The recommendations are also summarized in Table 7 and cross referenced with the photographic log (Appendix A).

Recommended Actions

The following recommended actions are listed and prioritized based on the compliance requirements of local, state, and federal agencies.

Recommendation 1 USTs were positively identified at the following locations: B200, B691, B888 (previously identified waste oil tank), B1135, and B1136. It is recommended that these five USTs be removed according to local and state regulations.

Recommendation 2 Anomalies which may suggest the presence of a UST were observed at B332 and B870. Since B870 is being demolished, it is recommended that construction monitoring be conducted for B870, specifically in the location of the EM anomaly. For Building 332, it is recommended that an intrusive investigation be performed to verify the presence or absence of a UST at the location of the EM anomaly.

Recommendation 3 Soil screening activities at the location of the wash rack and drainage ditch at Building 730 appear to indicate that soil contamination may be present at the location of the outfall piping from the wash rack to the drainage ditch. HNu values exceeding 2,000 ppm were recorded at this location. Although the Petro RISc soil test for TPH diesel did not detect concentrations greater than 10 ppm, it is possible that an unknown volatile organic compound (VOC) may be present in the soil beneath the outfall pipe. It is recommended that the contaminant in the soil be characterized using a state certified analytical laboratory and the contaminated soil be excavated and removed.

Recommendation 4 Although soil screening at the PRFTA fire training area (FTA) fire pit was not conducted, it is believed that contamination may be present beneath the 12 feet of fill at the FTA fire pit. It is recommended that additional soil investigation activities, possibly soil borings, be conducted at the location of the fire pit to evaluate the condition of the native soil below the fill.

Recommendation 5 Soil screening activities at Building 312 identified a isolated area of soil contamination related to the aboveground diesel storage tank. Using the HNu and the Petro RISc soil kit for TPH diesel, an area of soil directly adjacent to the concrete pad below the tank was identified at contain TPH diesel at concentrations greater than 100 ppm. It is recommended that the contaminated soil be excavated using a shovel or other hand held implement and properly disposed of according to local, state, and federal agency guidance.

Recommendation 6 Soil screening activities at Building 180 identified an area of possible soil contamination with HNu readings of 90 ppm. Although the analysis of the soil using the Petro RISc soil kit for TPH diesel identified concentrations of less than 10 ppm, it is believed that a VOC may be present in the soil at the location of the previously identified soil stain. It is recommended that additional samples be collected and analyzed for VOCs using a state registered analytical laboratory equipped to perform such analyses.

Recommendation 7 Due to the lack of specific information regarding the dimensions of the underground structure(s) at B305, it is recommended that the dimensions of the structure(s) be measured and that the liquid inside the structure(s) be sampled and analyzed for characterization purposes.

Recommendation 8 The oil/water separators identified in the PA and discussed in this report at B888 and B1160 still need further characterization. It is recommended that the two oil/water separators be further characterized for integrity. In addition, it is recommended that the oil/water separator at B888 be closed if it is no longer used.

Recommendation 9 For sites where soil contamination was not observed or where tanks were not identified, a no further action recommendation was assigned. The following sites were categorized with a no further action recommendation: B232, B250, B251, B331, B334, B521, B636, B761. B781-784, B790, B791, B792, B794, B860, B940, B941, B1100, B1162-1175, B1184, B1189, B1196, RTS-Med Motorpool, NRL #1, and Helipad #1.

Table 7. Recommendations by Site

Site	Recommendation
B180 (photo 1)	Collect soil samples and analyze for VOCs to further evaluate type of contamination present if any. Excavate and removal of any known contamination. UST not identified.
B200 (photo 2)	Remove UST according to local and state agency guidance.
B232	UST not identified. No further action.
B250	UST not identified. No further action.
B251	UST not identified. No further action.
B305 (photo 3)	Evaluate size and contents of structure.
B312 (photo 4)	Hand dig visibly discolored soil and soil with hydrocarbon odors. Backfill with clean fill.
B331	UST not identified. No further action.
B332 (no photo)	EM anomaly identified. Intrusive investigation recommended.
B334	No further action.
B521	No further action.
B636	No further action.
B691 (no photo)	Two EM anomalies identified. Intrusive investigation recommended.
B730 (photos 5 & 6)	Soil sample collection and analysis for VOCs. Further evaluation and characterization of vertical & lateral extent of contamination. Excavation and removal of any known contamination.
B761	No further action.
B781-B784	No further action.

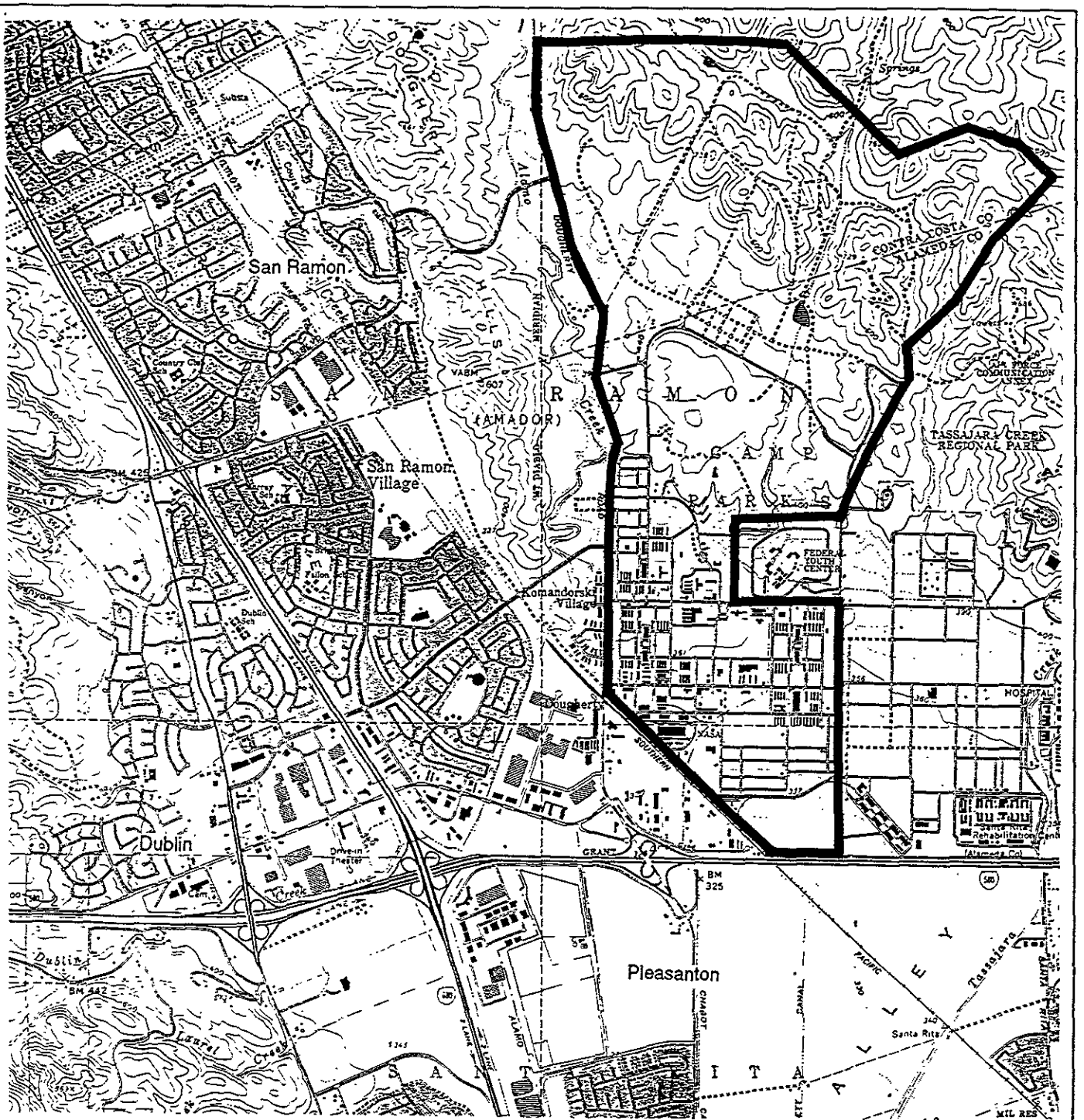
Site	Recommendation
B790	No further action.
B791	No further action.
B792	No further action.
B794	No further action.
B860	No further action.
B870	EM anomaly identified. Intrusive investigation recommended.
B888 (photo 7 & 8)	Remove UST according to local and state agency guidance. Close oil/water separator if no longer in use.
B940	UST not identified. No further action.
B941	UST not identified. No further action.
B1100	UST not identified. No further action.
B1135 (photo 9)	Remove UST according to local and state agency guidance.
B1136 (photo 10)	Remove UST according to local and state agency guidance.
B1160 (photo 11)	Evaluate integrity of the oil/water separator.
B1162-B1175	No further action.
B1180 (photo 12)	Remove AST according to local and state agency guidance.
B1184	No further action.
B1189	UST not identified. No further action.
B1196	No further action.
RTS-Med Motorpool	No further action.
NRL #1	No further action.

Site	Recommendation
FTA fire pit (photo 13)	Soil Borings & soil sampling and analysis to greater than 12 feet to evaluate native soil. Excavate and remove contaminated soil if present.
Helipad #1	No further action.

4.0
UNCERTAINTIES AND LIMITATIONS

This report describes our interpretation of the data collected during our field investigation from July 12 to July 14, 1994. Task 2a of the investigation was limited to using field screening techniques to evaluate the presence of petroleum hydrocarbon contamination at the locations identified in the June 16, 1994 SOW.

Soil conditions and the behavior of contaminants in the soil are highly variable in nature. The results obtained in this investigation are based upon limited sampling and analyses. The interpretations and conclusions presented in this report are limited by the degree to which the samples collected are representative of actual site conditions. The services WCFS provided and the judgments rendered on this project are presented within the limits prescribed by the client and meet current professional standards at the time the investigation was performed. No other warranty or guarantee is either expressed or implied.

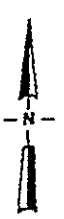


Legend

Site Boundary

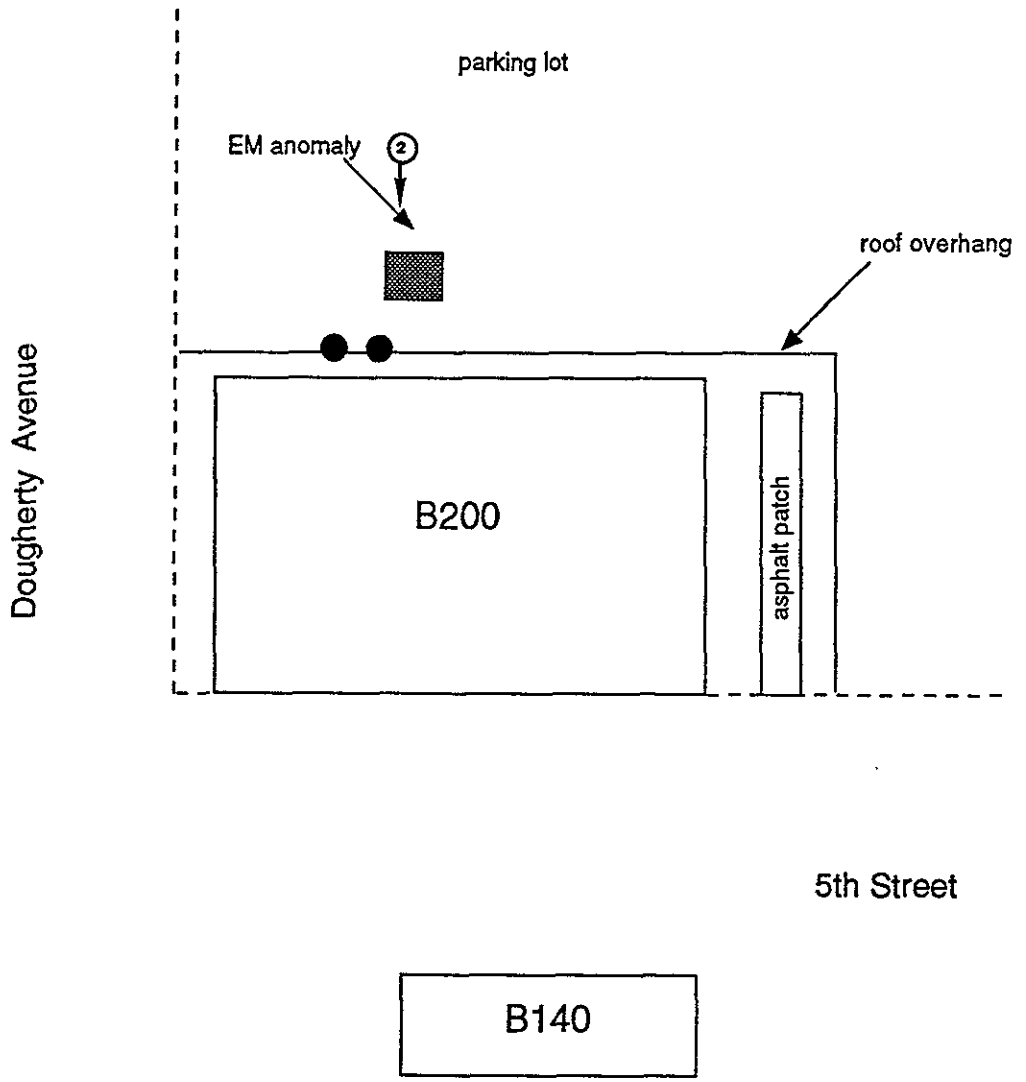
0 1 MILE

SCALE 1: 48,000

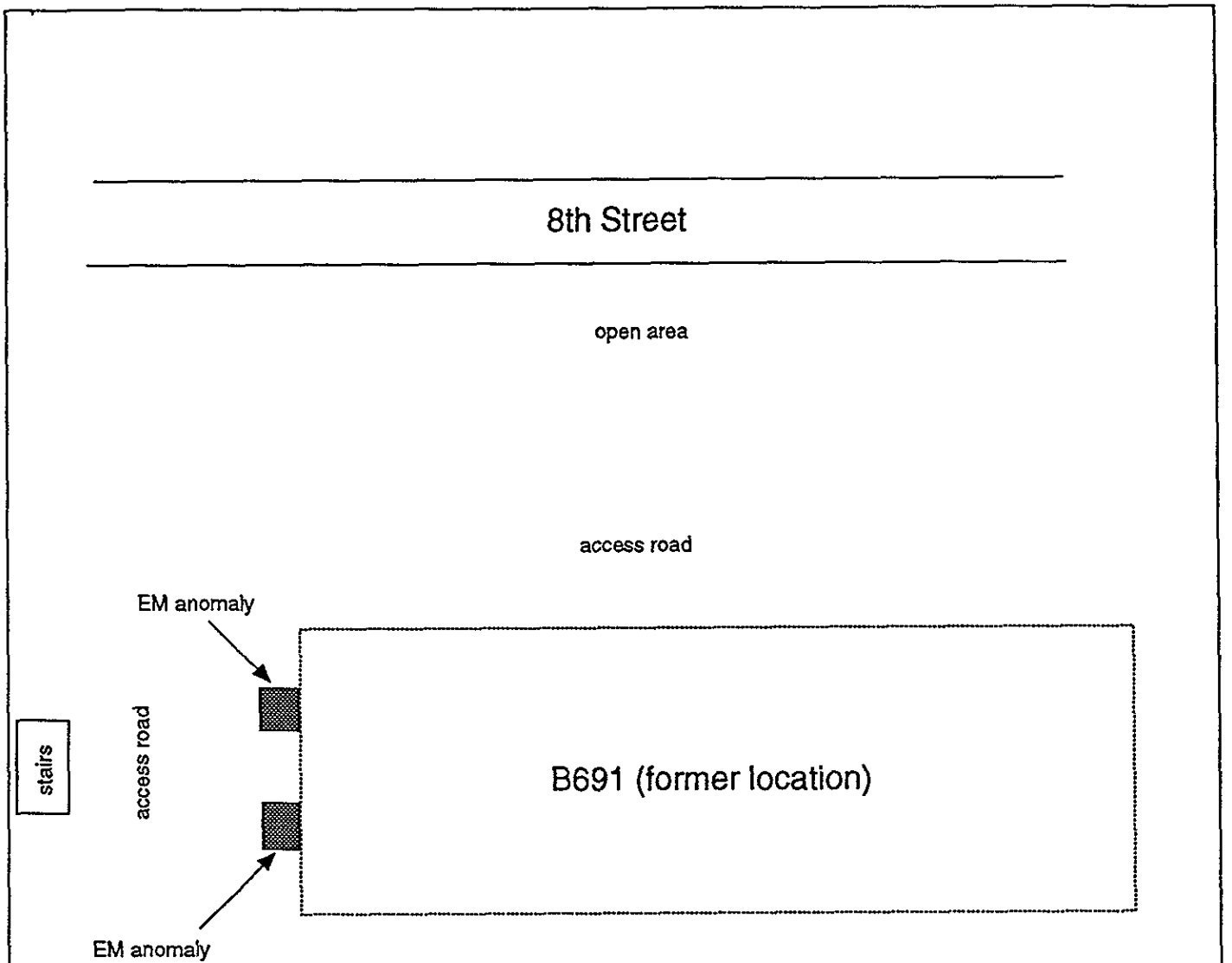


Note: Base Map from Dublin Quadrangle,
7.5 Minute Series (Topographic) 1961, Photorevised 1980

Project No. 7127	Parks Reserve Forces Training Area	SITE LOCATION MAP PARKS RESERVE FORCES TRAINING AREA DUBLIN, CALIFORNIA	Figure 1
Woodward-Clyde			



Project No. 7127	Parks Reserve Forces Training Area Dublin, California	**SITE LOCATION MAP FOR SUSPECTED UST SITE AT BUILDING 200**	**Figure 2**
Woodward-Clyde			



Legend

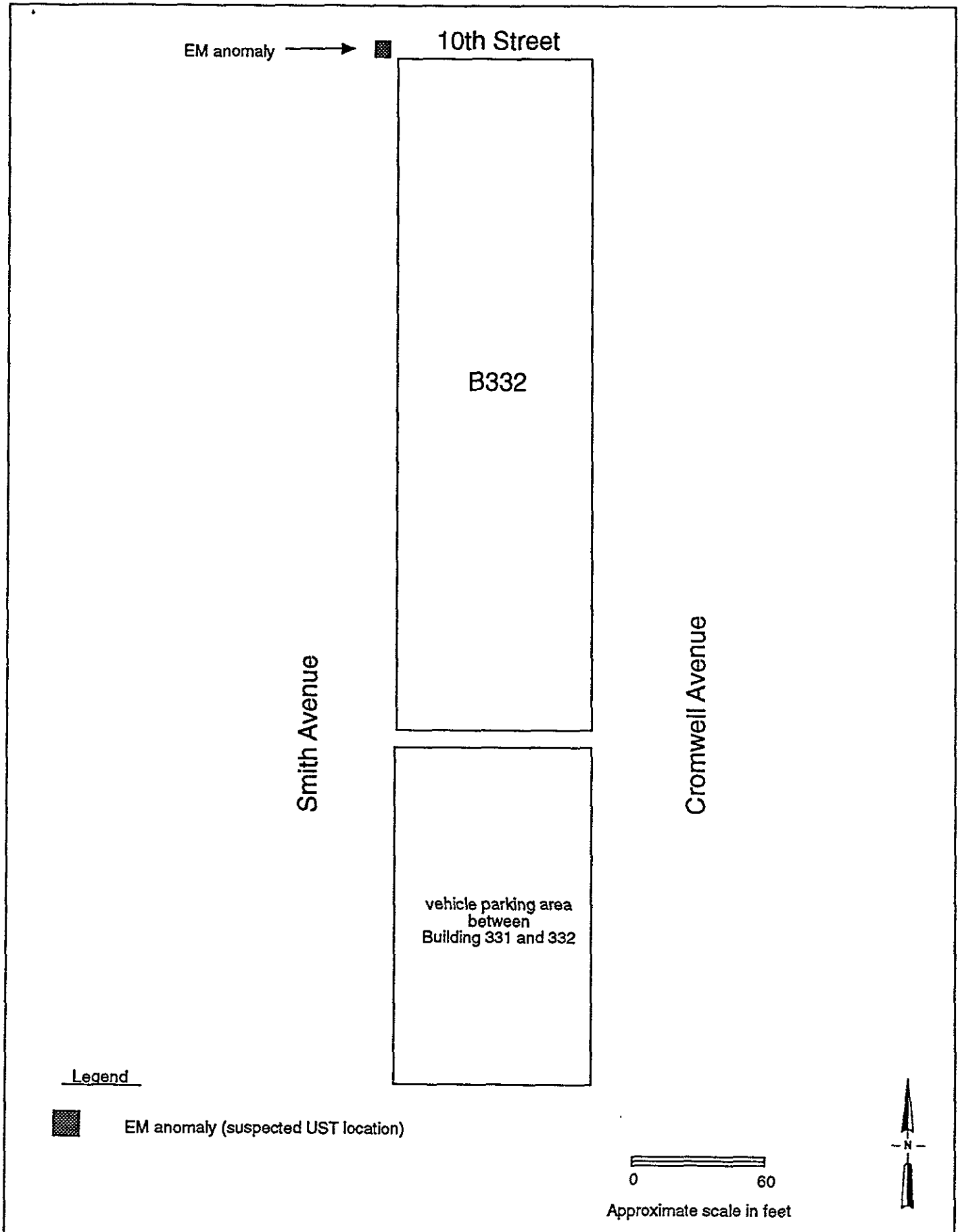
EM anomaly (suspected UST location)

0 60

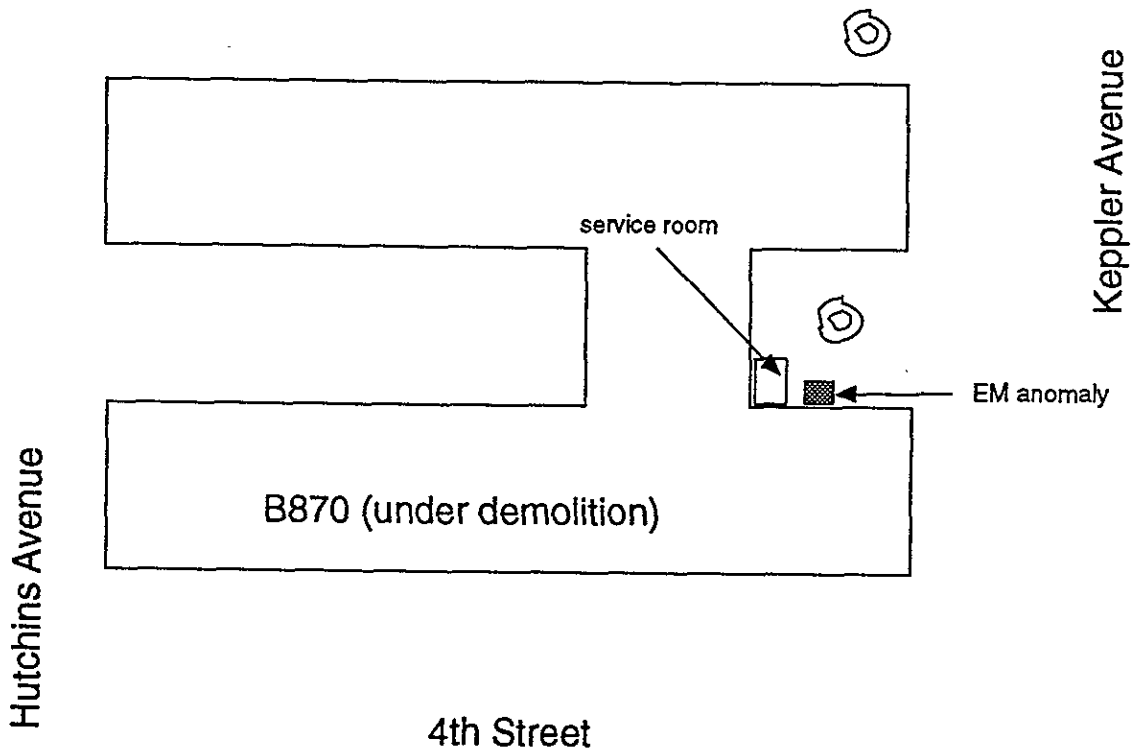
Approximate scale in feet

N

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR SUSPECTED UST SITE AT BUILDING 691	Figure 3
Woodward-Clyde			



Project No. 7127	Parks Reserve Forces Training Area Dublin, California	**SITE LOCATION MAP FOR SUSPECTED UST SITE AT BUILDING 332**	**Figure 4**
Woodward-Clyde			



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EM anomaly (suspected UST location)

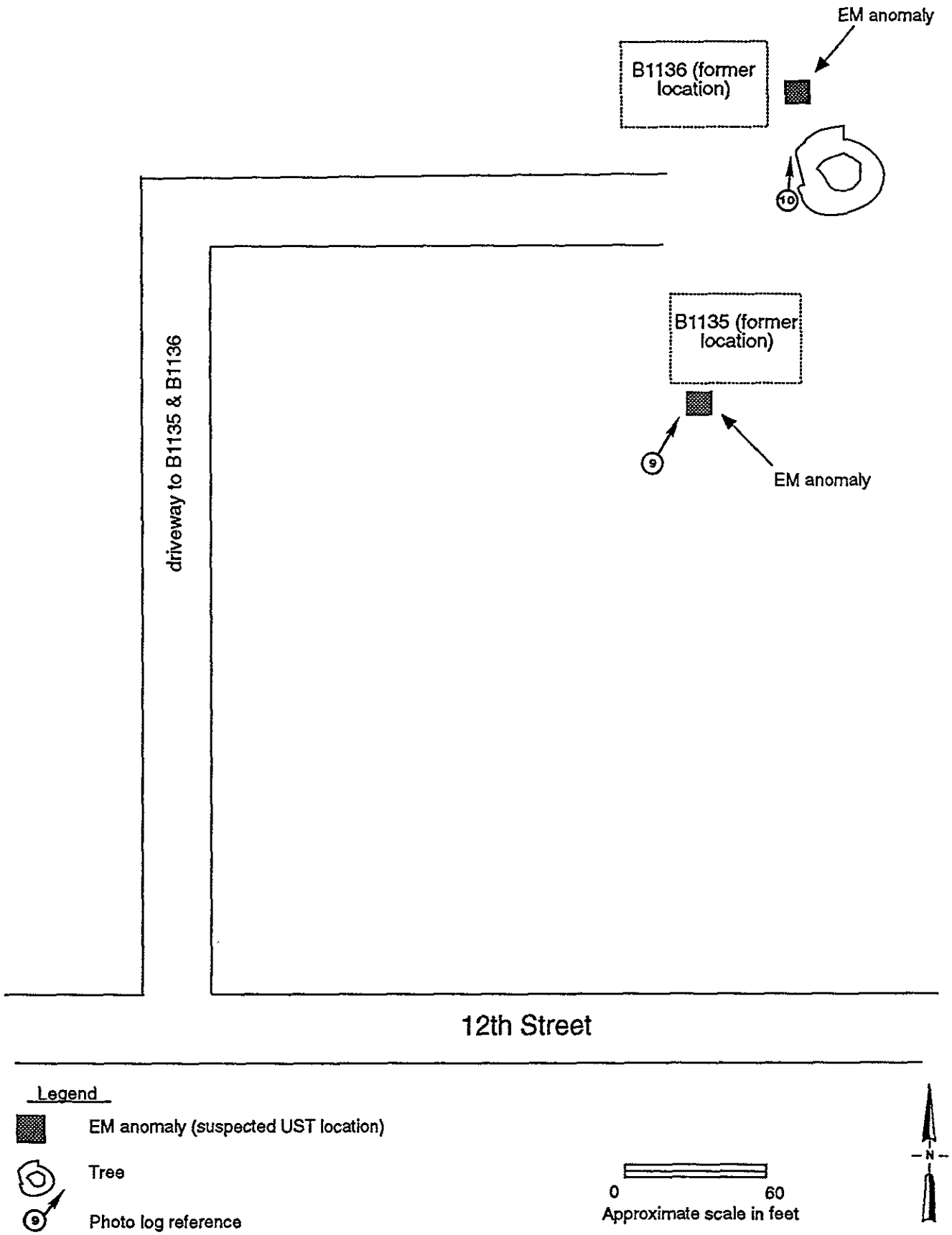
Tree

0 60

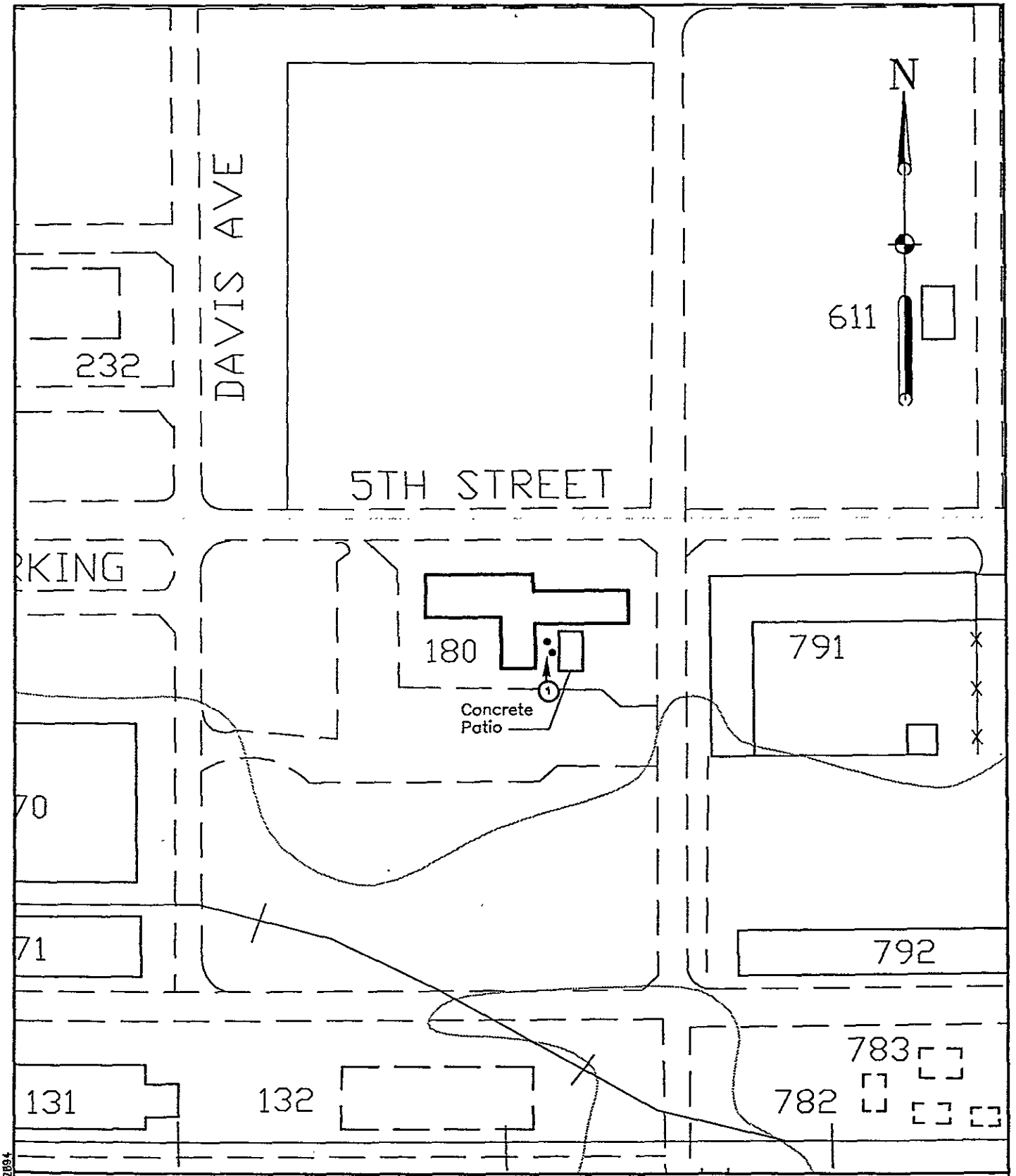
Approximate scale in feet

N

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	**SITE LOCATION MAP FOR SUSPECTED UST SITE AT BUILDING 870**	**Figure 5**
Woodward-Clyde			

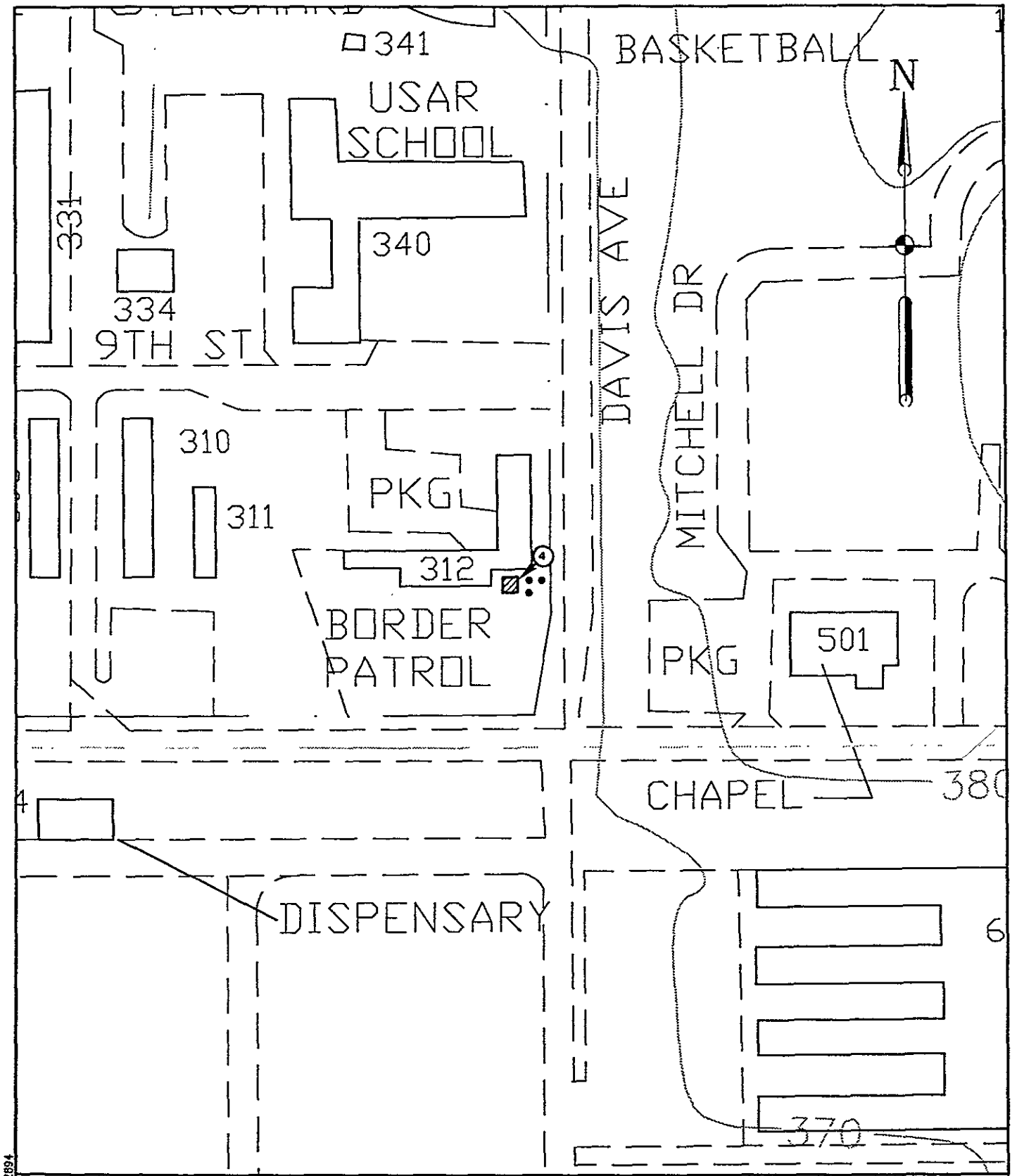


Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR UST SITES AT BUILDINGS1135 AND 1136	Figure 6
Woodward-Clyde			



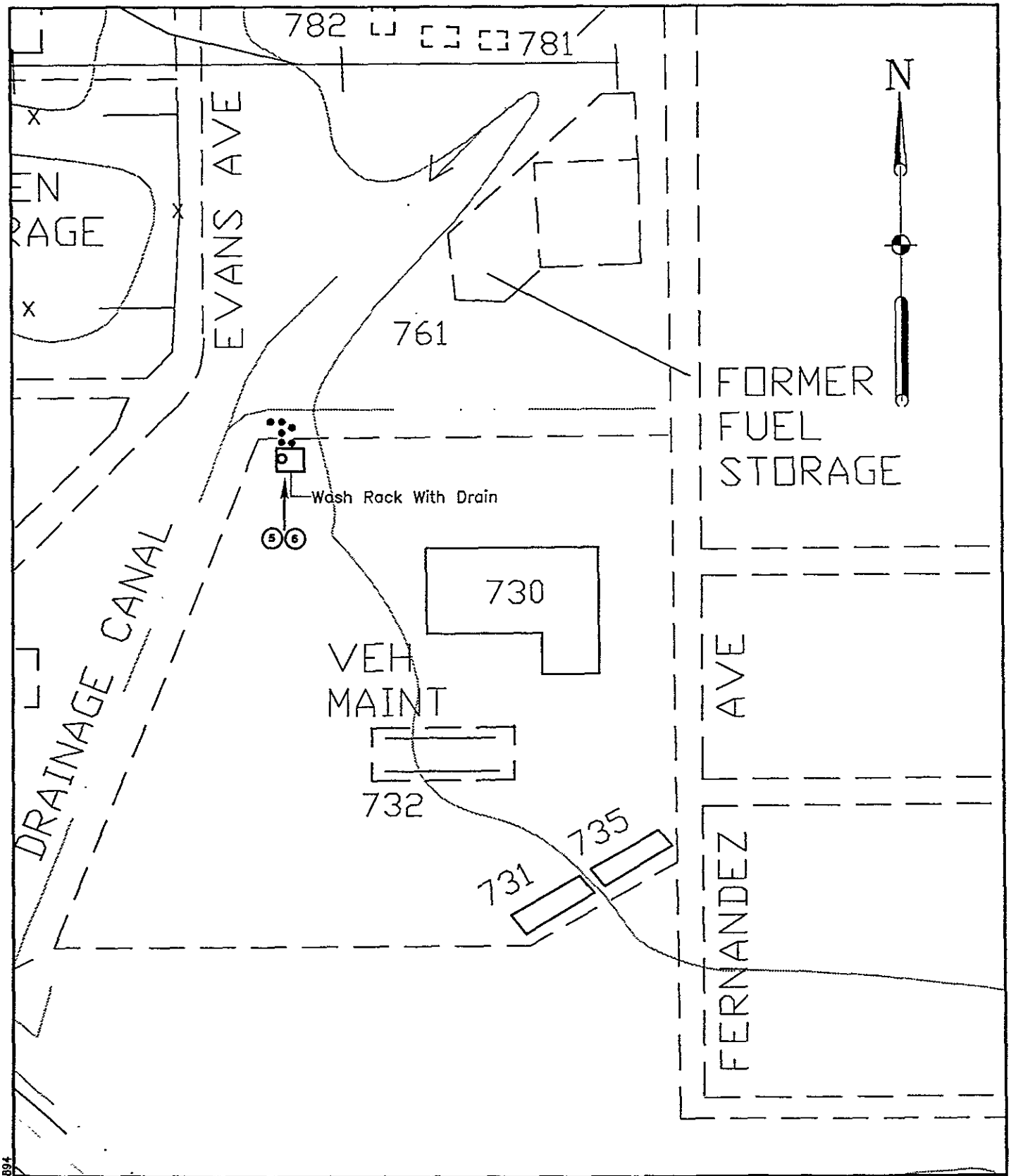
PARK-14 (180) 072894

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR BUILDING 180	Figure 7
Woodward-Clyde			



PARK-14 (312) 072894

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR BUILDING 312 AST	Figure 8
Woodward-Clyde			

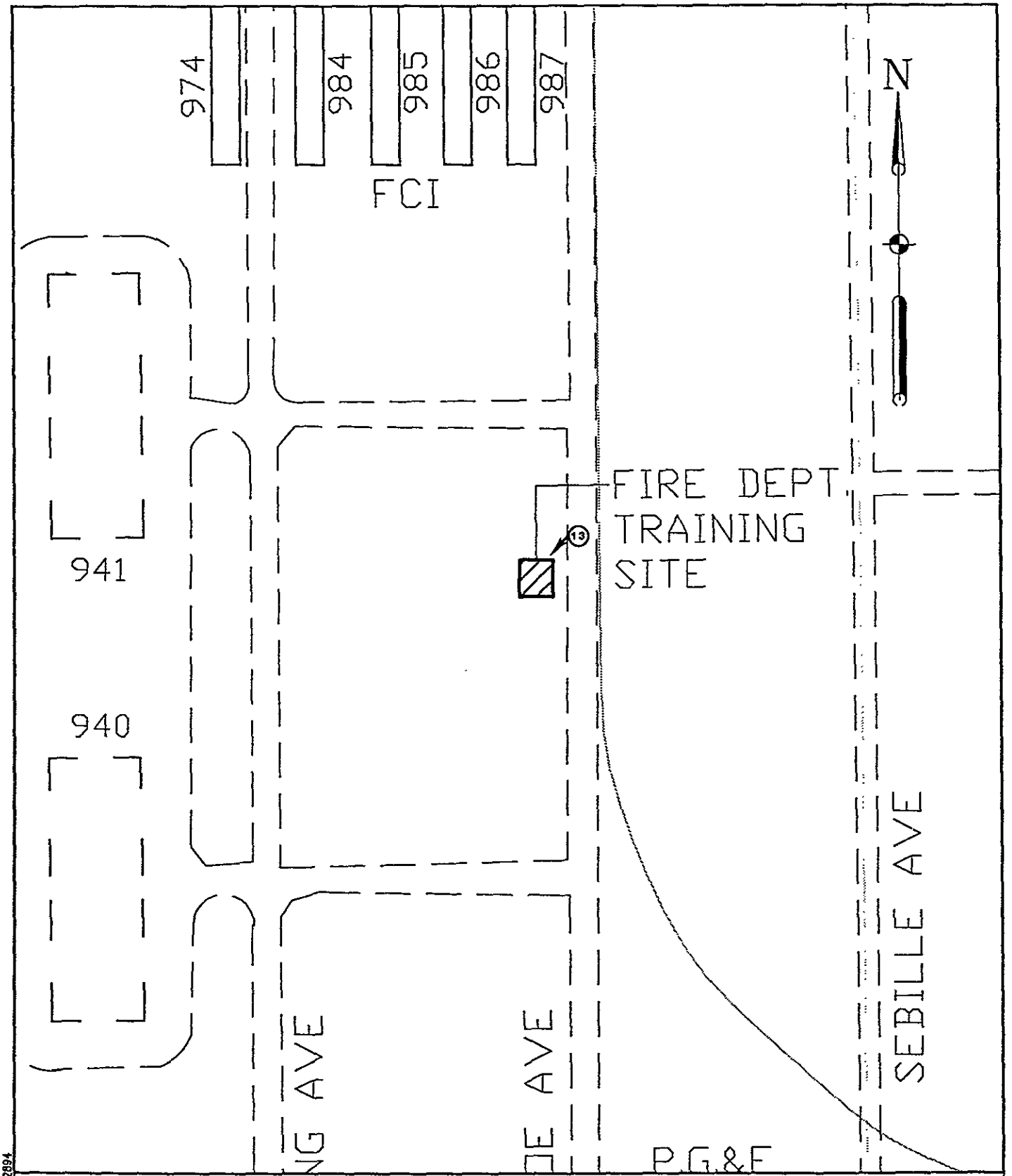


- Soil Sample Location
- Wash RacK With Drain
- (5) Photo log reference

100 0 100 200
Scale in feet

PARK-14 (730) 072894

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR BUILDING 730 WASH RACK	Figure 9
Woodward-Clyde			



Fire Pit

13 Photo log reference

100 0 100 200

Scale in feet

PARK-14(FIREPIT) 072894

Project No. 7127	Parks Reserve Forces Training Area Dublin, California	SITE LOCATION MAP FOR FIRE TRAINING AREA FIRE PIT	Figure 10
Woodward-Clyde			

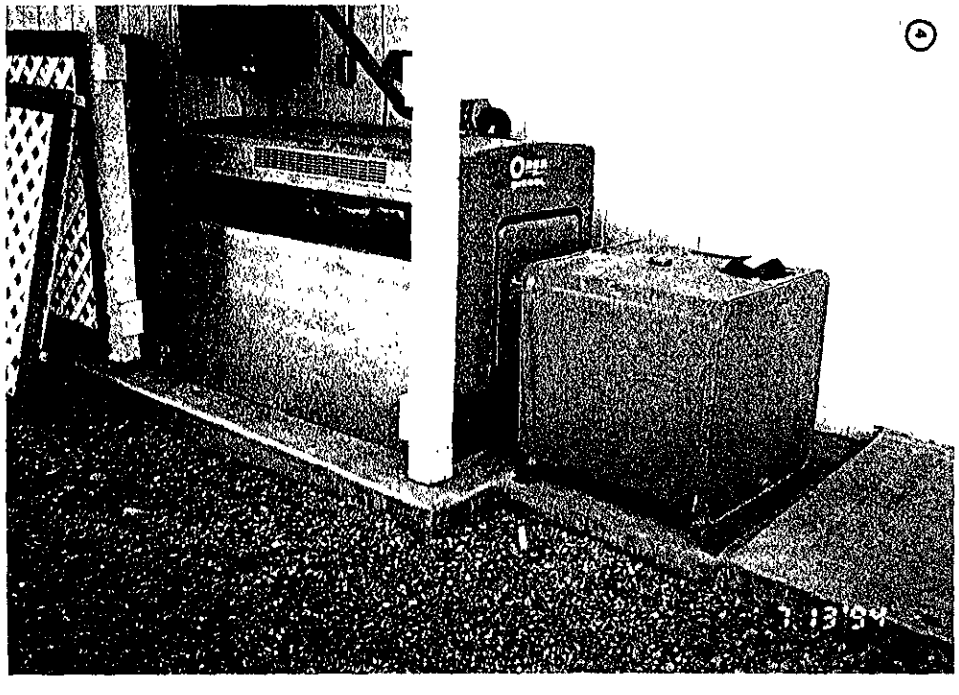
APPENDIX A
PHOTOGRAPHIC LOG

APPENDIX A

PHOTOGRAPHIC LOG

The photographs listed below were taken during the July 1994 site investigation at PRFTA performed by Laurie Israel, Suzanne Felice, and Robert Beer with WCFS.

Photo 1	-	Location of soil boring in the soil stained area south of Building 180. View to the north.
Photo 2	-	UST site identified to the north of Building 200. View to the south.
Photo 3	-	Structure 305 - underground vaults. View to the north.
Photo 4	-	Emergency generator and associated AST at the southeast corner of Building 312. View to the southwest.
Photo 5	-	Wash rack and drainage ditch northwest of Building 730. View to the north.
Photo 6	-	Washwater outfall pipe at the northwest corner of the wash rack at Building 730. View to the north.
Photo 7	-	Oil/water separator identified at B888.
Photo 8	-	Waste oil UST identified at B888. View to the southwest.
Photo 9	-	UST identified with wooden stakes at the former location of B1135. View to the north.
Photo 10	-	UST identified with wooden stakes at the former location of B1136. View to the north.
Photo 11	-	Wash rack and associated oil/water separator at Area 1160. View to the west.
Photo 12	-	Former location of Building 1180 and AST. View to the southwest.
Photo 13	-	Former location of the fire training area fire pit. The boundaries of the area are marked with wooden stakes and orange tape. View to the southwest.



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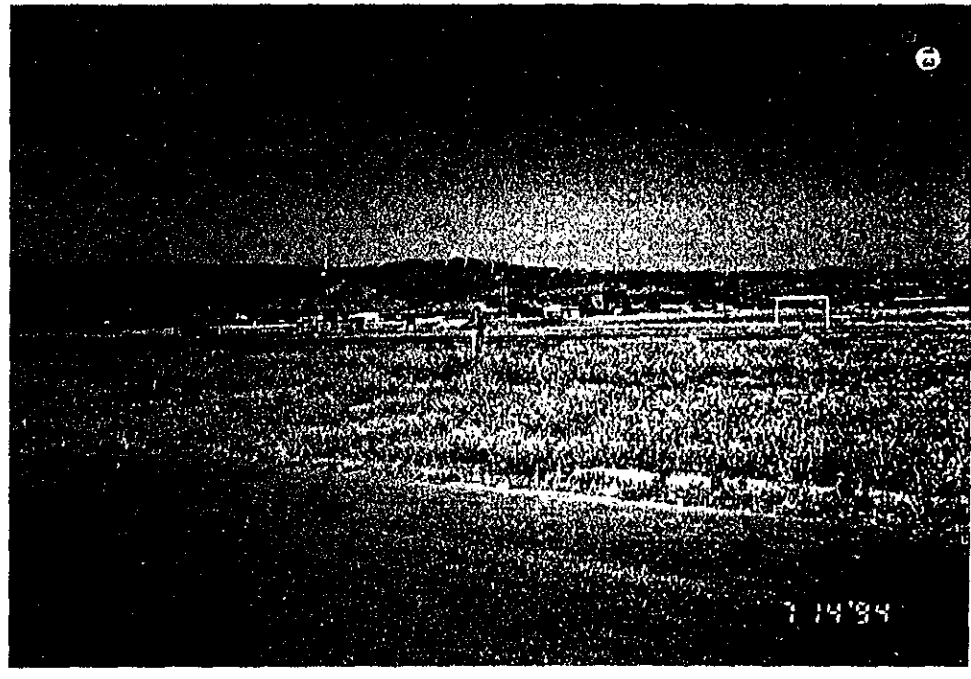
7 14'94

APPENDIX B
RTS-MED MEMORANDUM

REGIONAL TRAINING SITE - MEDICAL
Camp Parks Reserve Forces Training Area
P.O. Box 2816
Dublin, CA 94568
Phone (510) 551-7130 FAX (415) 561-3057
DSN 586-3153 FAX 586-3057

RTS-MED

Memorandum

To: SEE DISTRIBUTION

From: QUALITY CONTROL AND SAFETY SPECIALIST

Copies: FILE

Date: February 8th, 1994

Subject: Spill Response Team Operation

1. The Parks' Regional Training Site-Medical (RTS-MED) Spill Response Team was called into action on February 7th at approximately 11:55 am to react to a minor fuel spill that occurred in front of building #860, RTS-MED, Parks, California. The weather was misty and cool with a light wind from the east. There was no danger to site personnel or equipment. An expeditious cleanup was required and proper disposal necessary. Upon notification by Training, the spill was determined manageable by internal resources so the RTS-MED Spill Response Team was notified and sprung into action.

2. The following Team members participated in the minor spill reaction operation:

a. Spill Response Team Leader - Mr. Joe Pound, EMS-Mt. Lead,
b. Spill Response Team Safety Off. - Mr. Jerry Beene, QCS,
c. Spill Response Team Member - Mr. Jerry Clements, EMS-Motor Mt.
d. Spill Response Team Assistant - Mr. Dave Eclips.

3. A summary of events began with the RTS-MED's GSA 1 1/4 ton truck being dispatched to the Training Section to transport several items of training equipment to building #860. Two unsecured five gallon cans with diesel fuel were in the truck bed. One of the two was capped properly with the other having a pouring spout mounted for refueling operations. As the truck came to a stop, the can with the spout tipped over spilling approximately 1/2 gallon of diesel into the bed of the truck. The driver quickly began cleaning the spilled fuel from the truck bed and notified QCS of the event.

4. After a review of the area with the Leads of Training and Maintenance, it was determined that the soil underneath the vehicle had in fact been contaminated with the fuel run off and would require excavation. At this time, the Spill Response Team had been assembled and went to work completing the minor clean up within the hour.

5. The RTS-MED Spill Response Team used the Bobcat to dig up the area directly contaminated by the fuel as well as an area approximately six to eight inches around the spill. A 55 gallon drum was capped, labeled and readied for turn-in to the installation as diesel contaminated soil for hazardous waste distribution.

6. During the response operation, another area in the temporary motor park was identified by the Team Leader as a minor spill of less than a half gallon resulting from routine maintenance of a 100K generator. This area also required minor excavation of approximately six to eight inches around the spill area and four to six inches deep. Again the area was cleaned with the use of the Bobcat and the soil was collected for transfer to the installation for proper disposal.

7. Lessons Learned from the operation were:

a. When in doubt about whether a spill response and notification is required, always notify your supervisor and report the spill.

b. When transporting any POL product, always have it properly capped and secured so as to prevent possible spills.

c. Upon discovery of a spill, always follow the acronym SIN, meaning Safety first, Isolate and deny entry (to the area), and make Notification (your supervisor). Ensure the first responder uses safety first last and always. Try and isolate the affected area until a complete situation assessment can be accomplished. Always notify the next level of authority whether it is the immediate supervisor or the next higher level in management. When in doubt, notify.

d. Notification should include your immediate supervisor. If the supervisor is not available, start up the chain of management. The QC/Safety, and management will coordinate Government notification. Once the alarm is initiated, management notification of the Spill Response Team may be accomplished. Management will coordinate with the Government to ensure additional notification of installation assets (such as the Post Fire Department).

e. The Spill Response Team will coordinate with the QC/Safety and Management in order to initiate a complete cleanup and disposal of the hazardous waste. A letter of agreement with the installation is recommended to facilitate disposal operations.

f. The Spill Response Team should be augmented with spill response kits for small, minor spills. An alternate Team should be designated for backup or alternate members appointed as required.

g. Conduct quarterly spill response training and drills in coordination with the Installation Fire Department.

8. All Spill Response Team operations should be coordinated with the Spill Response Team Leader, EMS, or the Quality Control and Safety Specialist. The Site Administrator and the Site Director and staff will be notified of any training or actual spill response operations.

DISTRIBUTION:
1-Site Director
1-Site Administrator
1-EMS/TNG Sup.
1-Response Team Leader
1-QCS

ANNEX B (Hazardous Waste Turn-in Receipt) to RTS-MED Parks Hazardous Waste Management SOP

HAZARDOUS WASTE TURN-IN AND RECEIPT DOCUMENT

DATE	NOMEN-CLATURE	QUANTITY	TURNED IN BY	RECEIVED BY
7/27/93	55 Gal Drum	1	Frank Lie	H. Crawford
"	Black Dispersant	1	Frank Lie	H. Crawford
"	Oil Filters	1 Bag	Frank Lie	H. Crawford
2/7/94	Diesel Cont Soil	1 x 55 Gal Drum	K Brown	D. Small
4/13/94	Oil/Oil Filters	35 Gallons/10 Filters	S. Stoffel	MA Stansberry
5/4/94	Diesel Contam Soil	4 x 55 Gal Drums	V Reeves	M. Ellis

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-94)
Please print or type. Form designed for use on elite (12-pitch) typewriter.

See Instructions on back of page 6.

Department of Toxic Substances C...
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.
	D15814 10		

3. Generator's Name and Mailing Address

CAAF FAFBS-DEPT OF ARMY
4. Generator's Phone ( ) 94568-5201

5. Transporter 1 Company Name | 6. US EPA ID Number

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address | 10. US EPA ID Number

Laidlaw Environmental Services (GS), Inc.
3556 Tice Road
Kettleman Ja 93653

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. SODIUM SULFITE, NON-RCRA HAZARDOUS WASTE, SOLID					
b. SPILL RESIDUE, NON-RCRA HAZARDOUS WASTE, SOLID					
c. OIL, NON-RCRA HAZARDOUS WASTE, LIQUID					
d. RELEASE, NON-RCRA HAZARDOUS WASTE, SOLID					

[illegible]

15. Special Handling Instructions and Additional Information

24 HR EMERG 510-329-8998 TRUCK # 1504 TRL # 40458 SEAL # 64-295-1
D1A288-92-B-8863
DOT 8271
laidlaw is the contractor for disposal of this waste. Please route all e-mail and other correspondence to 24 Hour Log Specialist
Guide 141 Guide 141 Guide 141 Guide 141

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable federal, state and international laws.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
MERVIN ALLEY	Mervin Alley	10	15	93

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible]	[illegible]	10	15	93

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR

TRANSPORTER

FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESP... CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-75...

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (7/92)
EPA 8700—22

Yellow: GENERATOR RETAINS