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MCAS EL TORO
SSIC #5090.3

Comprehensive Long-Term Environmental Action Navy (CLEAN) II
Contract No. N62742-94-D-0048
Contract Task Order No. 0072

Amendment to Work Plan

Phase II Remedial Investigation

IRP Site 1, Explosive Ordnance Disposal Range
Marine Corps Air Station, El Toro, California

Prepared for

Department of the Navy
Commander, Southwest Division
Naval Facilities Engineering Command
San Diego, California 92132-5190

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February 2001

earthtech for the planet.
engineering and technology

DRAFT WORK PLAN PHASE II
REMEDIAL INVESTIGATION, EXPLOSIVE
ORDNANCE DISPOSAL RANGE

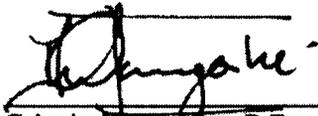
DATED SEPTEMBER 2000

IS ENTERED IN THE DATABASE AND FILED AT
ADMINISTRATIVE RECORD NO. **M60050.000529**

**Amendment to Work Plan
Phase II Remedial Investigation
Site 1-Explosive Ordnance Disposal Range
MCAS El Toro, California**

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Reviews and Approvals:



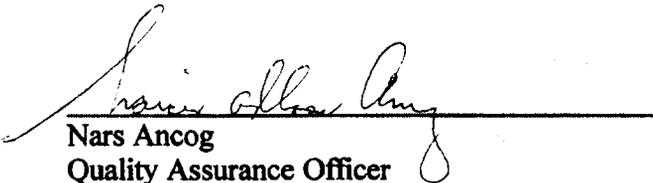
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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BNI	Bechtel National, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	chain of custody
COPCs	chemicals of potential concern
CTO	contract task order
DQO	data quality objective
Earth Tech	Earth Tech, Inc.
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
EWI	Environmental Work Instructions
FOST	Finding of Suitability to Transfer
FSP	field sampling plan
IRP	Installation Restoration Program
MCAS	Marine Corps Air Station
mV	millivolt
NCP	National Contingency Plan
PACNAVFACENGCOM	Pacific Division, Naval Facilities Engineering Command
pH	negative log of the hydrogen ion concentration
PRE	preliminary risk evaluation
PRG	preliminary remediation goal
QA	quality assurance
QAPP	quality assurance project plan
RI	remedial investigation
SARA	Superfund Amendments and Reauthorization Act
SOP	standard operating procedure
SSEBS	Site-Specific Environmental Baseline Survey
SWDIV	Southwest Division, Naval Facilities Engineering Command
SVOC	semivolatile organic compound
TEF	toxicity equivalency factor
TPH	total petroleum hydrocarbons
TPH(e)	total petroleum hydrocarbons (extractable)
TPH(v)	total petroleum hydrocarbons (volatile)
VOC	volatile organic compound

1. INTRODUCTION

An amendment to the *Work Plan, Phase II Remedial Investigation, IRP Site 1, Explosive Ordnance Disposal Range, Marine Corps Air Station (MCAS) El Toro, California (Work Plan)* (Earth Tech 2001) is required to document changes to the planned work. The Navy is considering allowing the Department of Justice to use a portion of Installation Restoration Program (IRP) Site 1 for training activities. This portion of Site 1 encompasses approximately five acres located southwest of the area that was historically used for Explosive Ordnance Disposal (EOD) training operations. This amendment details additional sampling and analysis to evaluate site conditions for the 5-acre area. The additional work will be conducted as part of the Site-Specific Environmental Baseline Survey (SSEBS) and will be incorporated into the Finding of Suitability to Transfer (FOST) for Site 1. The SSEBS which will address the entire Site 1 will include the results of the sampling of the 5-acre area.

This amendment is not a stand-alone document, and must be used in conjunction with the *Work Plan*. It presents only those elements relevant to the additional sampling effort in a format consistent with the *Work Plan*.

This amendment has been prepared in accordance with Southwest Division Naval Facilities Engineering Command's (SWDIV) Environmental Work Instruction (EWI)-#2 review, approval, revision, and amendment of field sampling plans (FSP) and quality assurance project plans (QAPP), dated 18 October 1999 (SWDIV 1999).

Preparation of this amendment was authorized by the U.S. Navy, Pacific Division, Naval Facilities Engineering Command (PACNAVFACENGCOM) under contract task order (CTO) no. 0072 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) II program, contract number N62742-94-D-0048. It complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) in Title 40 of the Code of Federal Regulations (CFR), Part 300.

2. SITE BACKGROUND AND SETTING

The background and setting are presented in the *Work Plan*. No revisions to the site location and setting, summary of previous site characterization, or discussion of ongoing and concurrent work is required.

3. WORK PLAN APPROACH

3.1 DATA QUALITY OBJECTIVES

The data quality objective (DQO) process discussion as presented in the *Work Plan* is amended with the following additions. The *Work Plan* was developed in accordance with the United States Environmental Protection Agency (EPA) guidance for the DQO process (EPA 2000).

3.1.1 Problem Statement

The *Work Plan* problem statement is amended to include the following:

The Navy is considering allowing a federal agency to use an approximately 5-acre area of Site 1 (located in the southwesternmost portion of Site 1) for EOD training while the remedial investigation activities are being conducted. The current environmental condition of this 5-acre area, with respect to the surface and subsurface soil, must be evaluated in order to establish the baseline risk prior to authorizing use.

3.1.2 Project Decisions

An additional decision question is posed for the revised scope of work:

Is the environmental condition of the 5-acre parcel acceptable for unconditional release, or will the Navy be required to conduct further investigation? An unconditional release will be based upon the determination of whether significant environmental impacts have occurred in accordance with the decision rules presented here and the in the *Work Plan*.

3.1.3 Decision Inputs

Soil samples from the 5-acre parcel will be analyzed to resolve the principal study question. The inputs are similar to those established in the *Work Plan*. The critical data that will serve as input to the decision are listed below.

1. Analytes which are characteristic of releases during EOD operations will serve as chemicals of potential concern (COPCs). The chemical groups of analytes are metals, general chemistry, explosives, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), dioxins, furans, and petroleum hydrocarbons. Target analytes within chemical groups are listed in the QAPP section of the *Work Plan*.
2. Results of the geophysical survey that was conducted for the southwestern area of Site 1 which included the 5-acre area; no geophysical anomalies were evidenced in this area (Figure 3-1 and Appendix).
3. A cumulative cancer risk factor and hazard index (i.e. baseline risk) will be calculated in accordance with the conservative assumptions used for preliminary risk evaluation. The risk estimation will be conducted to document the current condition of the property. Currently accepted residential exposure assumptions will be used to calculate the baseline risk. However, if necessary, anticipated land-use exposure assumptions could be used if the outcome of the investigation warrants.

3.1.4 Study Boundaries

Spatial Boundaries. The 5-acre area of Site 1 is shown on Figure 3-2. During the preliminary soil sampling conducted in the geophysical anomaly areas identified in the northern and southern EOD range, soil samples were collected at depths ranging from 1 foot to 5 feet bgs (bgs). The sampling depths were selected based upon the scope of historic EOD training activities, associated disking of the soil (which took place for all of Site 1, including the 5-acre area), and the results of the geophysical survey. Accordingly, soil samples will be collected at depths of 1.5 feet and 5 feet bgs as described in the discussion of the Tier 1 sampling design (section 3.3.7.1 of the *Work Plan*).

Temporal Boundaries. This investigation is intended to document the current environmental condition of the property at the time when the Phase II assessment is conducted. It will be assumed that any increase in the cumulative risk or hazard after the transfer will be a result of future site activities.

3.1.5 Decision Rule

The following decision rule is applicable to the additional investigation:

If the investigation identifies issues of concern, *then* the transfer will include provisions that will allow the Navy to resolve the questions as part of the Site 1 remedial investigation (RI).

The other decision rules presented in the *Work Plan* will also be applied.

3.1.6 Decision Error Limits

The probability of a decision error presented in the *Work Plan* is applicable to all work presented in this amendment.

3.1.7 Sampling Design

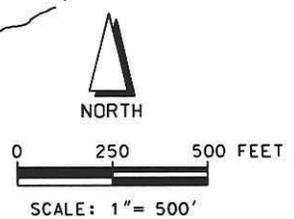
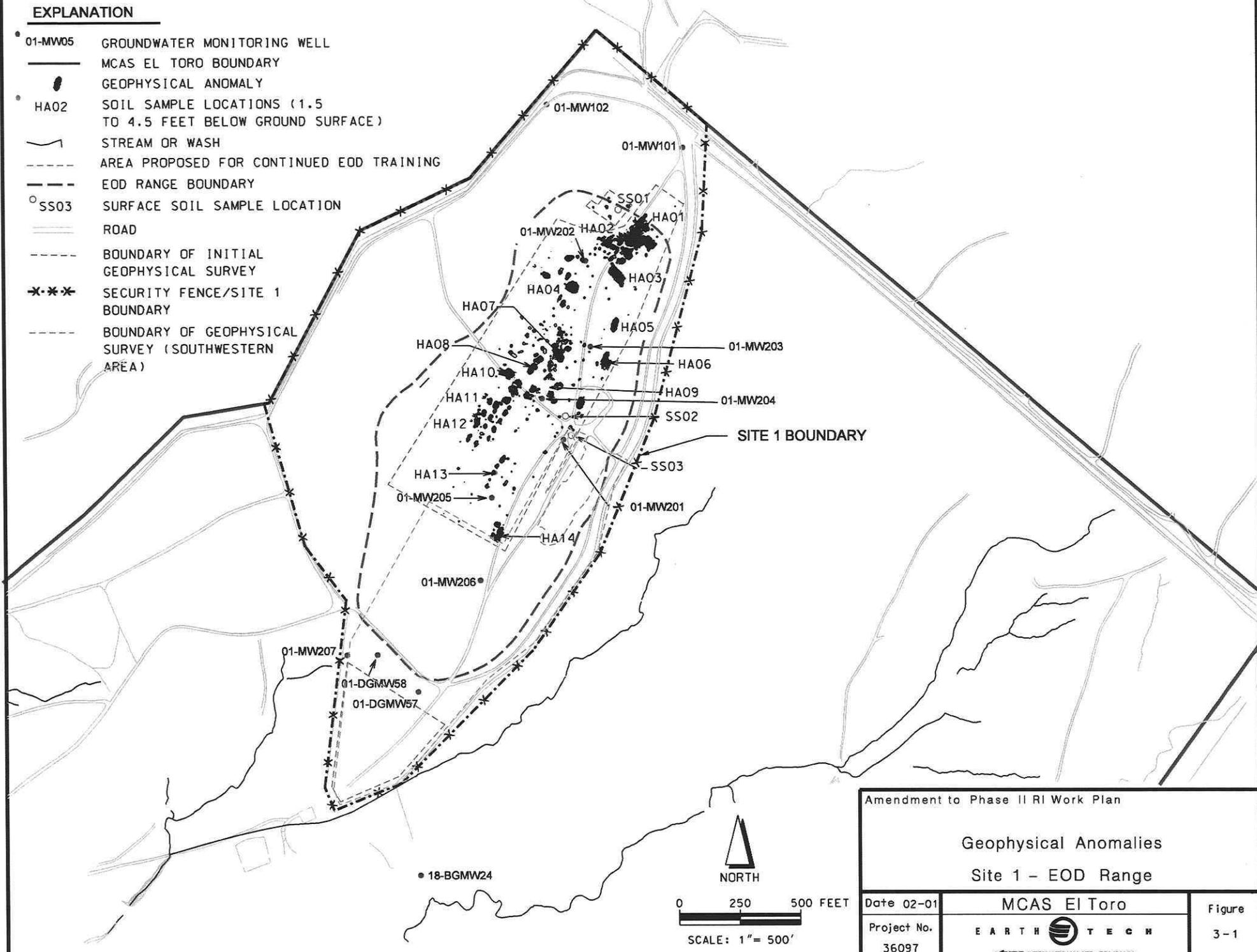
The Sampling Design presented in the *Work Plan* will be augmented with the following additional samples, applicable only to investigation of the 5-acre area. Details of the sampling design procedures are presented in the *Work Plan*, Section 4, Field Sampling Plan.

Systematic grid sampling of the 5-acre area of Site 1 will be performed. Sample depths will be consistent with the Tier I sampling plan detailed in the *Work Plan*. Two soil samples will be collected at each location at depths of approximately 1.5 feet and 5 feet bgs. Samples will be collected from 17 locations evenly distributed over the study grid (Figure 3-2). The geophysical survey conducted in the southwestern portion of Site 1 encompassed the subject 5-acre parcel. The geophysical survey did not yield evidence of any significant subsurface anomalies (Figure 3-1). The geophysical investigation results are provided in the Appendix.

EXPLANATION

- 01-MW05 GROUNDWATER MONITORING WELL
- MCAS EL TORO BOUNDARY
- GEOPHYSICAL ANOMALY
- HA02 SOIL SAMPLE LOCATIONS (1.5 TO 4.5 FEET BELOW GROUND SURFACE)
- STREAM OR WASH
- - - AREA PROPOSED FOR CONTINUED EOD TRAINING
- - - EOD RANGE BOUNDARY
- SS03 SURFACE SOIL SAMPLE LOCATION
- ROAD
- - - BOUNDARY OF INITIAL GEOPHYSICAL SURVEY
- *-*-* SECURITY FENCE/SITE 1 BOUNDARY
- - - BOUNDARY OF GEOPHYSICAL SURVEY (SOUTHWESTERN AREA)

3-3



Amendment to Phase II RI Work Plan		
Geophysical Anomalies		
Site 1 - EOD Range		
Date 02-01	MCAS El Toro	Figure
Project No. 36097	 <small>A tyco INTERNATIONAL LTD. COMPANY</small>	3-1

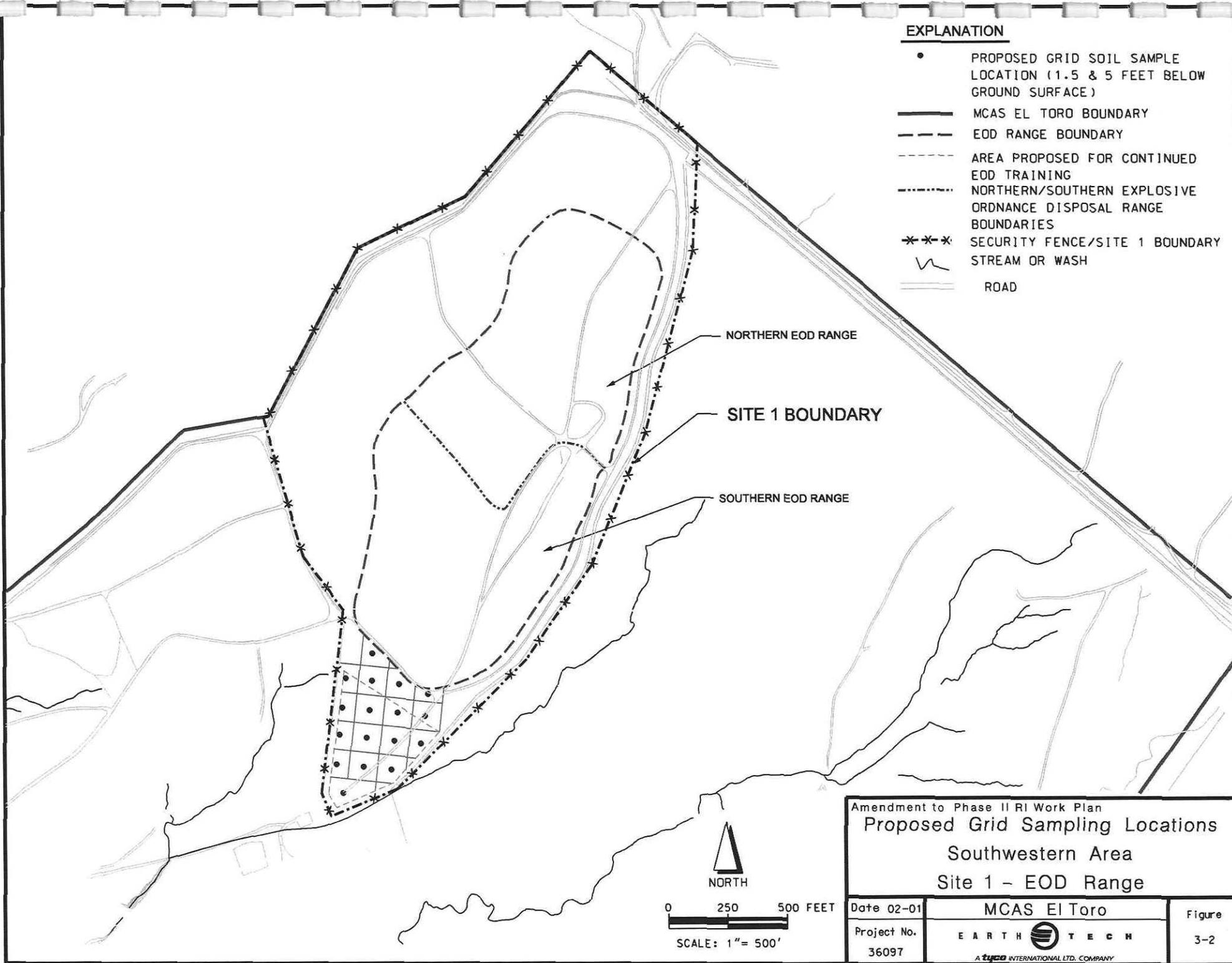
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3-5

EXPLANATION

- PROPOSED GRID SOIL SAMPLE LOCATION (1.5 & 5 FEET BELOW GROUND SURFACE)
- MCAS EL TORO BOUNDARY
- - - EOD RANGE BOUNDARY
- - - - AREA PROPOSED FOR CONTINUED EOD TRAINING
- · - · - · NORTHERN/SOUTHERN EXPLOSIVE ORDNANCE DISPOSAL RANGE BOUNDARIES
- * * * SECURITY FENCE/SITE 1 BOUNDARY
- ~ STREAM OR WASH
- == ROAD



Amendment to Phase II RI Work Plan
Proposed Grid Sampling Locations
 Southwestern Area
 Site 1 - EOD Range

Date 02-01	MCAS El Toro	Figure
Project No. 36097	EARTH TECH <small>A tyco INTERNATIONAL LTD. COMPANY</small>	3-2

4. FIELD SAMPLING PLAN

4.1 SAMPLING OBJECTIVES FOR THE FIVE-ACRE AREA AT SITE 1

Samples will be collected to characterize the baseline conditions at the site prior to a federal agency to federal agency transfer. Due to the field activities proposed, and consistent with the *Work Plan*, a habitat assessment of Site 1 is currently underway and will be completed prior to sampling activities within the five-acre area.

Two soil samples from each location will be analyzed for volatile organic compounds (VOCs), total extractable and total volatile petroleum hydrocarbons [TPH(e) and TPH(v), respectively], explosives, metals, pH, nitrate, and perchlorate. Select samples will be analyzed for SVOCs, dioxins, and furans. The analytical methods and target analyte list were selected based upon:

- the best information available on the activities that would result in additional risk at the site,
- the list of analytes and methods historically used to perform initial assessments, and
- commercially available standard target lists that are consistent with Navy investigations at other sites.

This approach will comprehensively address the objective of documenting the environmental condition of the 5-acre area prior to transfer. Table 4-1 summarizes the analytical methods and schedule that will be used to characterize the baseline conditions in this area.

Table 4-1: Soil Sampling and Analysis Summary - 5-Acre Area

Analysis	Method ^a	Number of Samples				Total
		Field Samples	Field Duplicates	Field Blanks ^b	Equipment Rinsates ^c	
SVOCs	SW8270C	34	4	0	3	41
VOCs	SW8260B	34	4	0	3	41
TPH(e)	SW8015B	34	4	0	3	41
TPH(v)	SW8015B	34	4	0	3	41
Dioxins/ furans	SW8290C	4	1	0	1	6
Explosives	SW8330	34	4	0	3	41
Metals	SW6010/ 7000	34	4	0	3	41
pH	SW9045C	34	4	0	3	41
Nitrate	WW300 or WW352.1	34	4	0	3	41
Perchlorate	METHCLO ₄ ^d or WW314.1	34	4	0	3	41

Notes:

^a Methods citations are for clarification. Specifications for preparation and requirements for analysis are presented in detail in Section 5 of the Work Plan

^b The approved draft sampling design included the required field blank.

^c Based on predicted number of field days/shipping events.

^d California Department of Health Services.

SVOCs = semivolatile organic compounds

VOCs = volatile organic compounds

TPH(e) = total petroleum hydrocarbons (extractable)

TPH(v) = total petroleum hydrocarbons (volatile)

4.2 FIELD METHODS AND PROCEDURES

All procedures described in the *Work Plan* will be followed for the work described in this amendment.

At each location, the first sample will be collected at a depth of 1.5 feet bgs. The second sample will be collected at 5 feet bgs. Soil samples will be collected with a hand-auger and slide hammer. Sampling will be performed in accordance with CLEAN standard operating procedure (SOP) 4, *Soil Sampling* (BNI 1999). Samples will be collected in stainless steel liners (with Teflon™-lined caps) or 16-ounce glass jars (with Teflon™-lined lids), depending upon field conditions. VOC samples will be collected with Encore® samplers in accordance with EPA Method 5035. Samples will be labeled and placed in coolers with ice and shipped cold to the laboratory under chain of custody (COC) in accordance with CLEAN SOP 10, *Sample Custody, Transfer, and Shipment* (BNI 1999).

The following updates are incorporated into the *Work Plan*. Analysis for dioxins and furans will only be conducted on four (10 percent of the total number of samples) selected samples based on the results of the SVOC analysis. Samples with the highest aggregate SVOC measurements will be submitted for analysis of dioxins and furans.

5. QUALITY ASSURANCE PROJECT PLAN

All elements of Section 5 of the *Work Plan* shall be applicable to the work presented in this amendment.

6. RISK EVALUATION

The analytical data from soil samples collected within the 5-acre area will be used to establish the baseline risk in this area. The risk evaluation will follow conservative assumptions to assess whether potential receptors could be impacted by identified site contaminants and whether contamination poses a significant risk to human health. Currently accepted residential exposure assumptions will be used to calculate the baseline risk. However, if necessary, anticipated land-use exposure assumptions could be used if the outcome of the investigation warrants.

The risk estimation will be conducted following the methodology used to develop the EPA Region IX/Cal-EPA modified preliminary remediation goals (PRGs) (EPA 1999) and in accordance with the screening preliminary risk evaluation (PRE) procedures that are discussed in Section 6 of the *Work Plan*.

7. REFERENCES

- Bechtel National, Inc. (BNI). 1999. *CLEAN II Program Procedures Manual*. San Diego, CA.
- Earth Tech. 2000. *Work Plan, Phase II Remedial Investigation, IRP Site 1, Explosive Ordnance Disposal Range, Marine Corps Air Station El Toro, California*. Draft. Honolulu. June.
- Environmental Protection Agency (EPA). 1999. EPA Region 9 Preliminary Remediation Goals (PRGs). Site is located at EPA Internet home page: <http://www.epa.gov/region09/waste/sfund/prg/>. October.
- . 2000. *Guidance for the Data Quality Objectives Process*. EPA QA/G-4. Washington, D.C. August.
- Southwest Division Naval Facilities Engineering Command (SWDIV). 1999. *Environmental Work Instruction 4EN.2*. October.

Geophysical Survey Report



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Project No. 00-306

Attn: Mr. William Sedlak

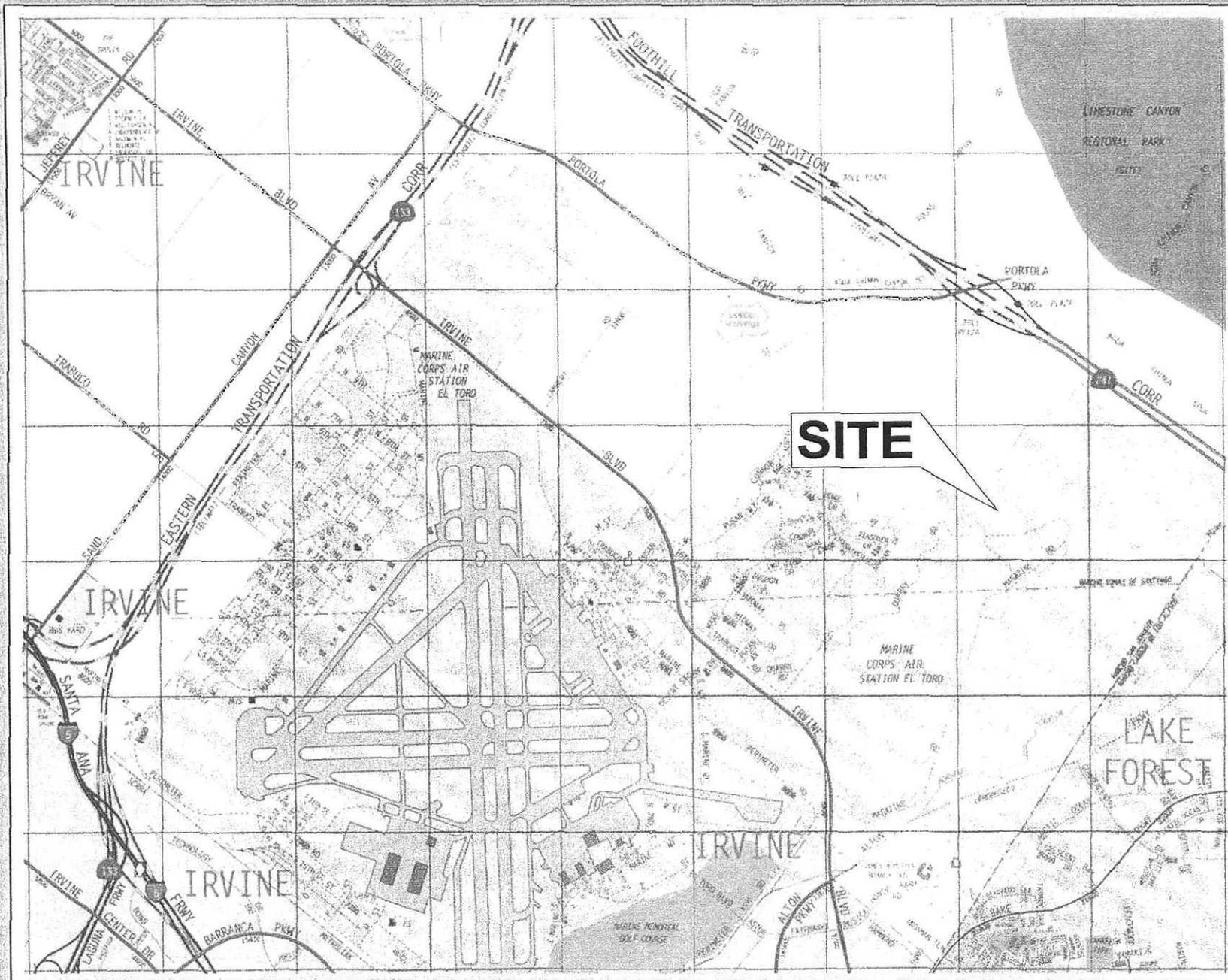
Re: Geophysical Investigation Report, Southern Extension-EOD Range, Marine Corps
Air Station, El Toro, California

This report is to present the results of our geophysical surveys carried out over portions (Southern Extension) of the Explosive Ordnance Disposal Range (EOD), located at the Marine Corps Air Station, El Toro California (Figure 1) on September 6, 7, 8, 11, 12, 13, 14, and 18, 2000. Extensive use of the range in the past has resulted in buried concentrations of explosive fragments and other metallic debris. The purpose of the geophysical surveys was to scan selected portions of the range using time-domain, pulse electromagnetic (EM) instrumentation in an effort to delineate the affected areas. The area selected for our surveys measured approximately 18 acres.

Survey Design – The northern portion of the EOD range was partially surveyed by Sanford Cohen and Associates (SC&A) between October 13 and 15, 1999, with the remainder completed by Subsurface Surveys between October 27 and November 19, 1999, utilizing Geonics EM-61 instrumentation. For the current survey of the Southern Extension, the formal rectilinear grid (500 X 1600 feet) established for our earlier survey was extended to the south measuring approximately 700 X 1800 feet to guide data acquisition over this portion of the range. For our survey, EM-61 Data were collected at stations every 0.6 feet along southwest-northeast oriented survey lines spaced three feet apart.

Brief Description of the Geophysical Methods Applied - The EM61 instrument is a high resolution, time-domain device for detecting buried conductive objects. It consists of a powerful transmitter that generates a pulsed primary magnetic field when its coils are energized, which induces eddy currents in nearby conductive objects. The decay of the eddy currents, following the input pulse, is measured by the coils, which in turn serve as receiver coils. The decay rate is measured for two coils, mounted concentrically, one above the other. By making the measurements at a relatively long time interval (measured in milliseconds) after termination of the primary pulse, the response is nearly independent of the electrical conductivity of the ground. Thus, the instrument is a super-sensitive metal detector. Due to its unique coil arrangement, the response curve is a single well-defined positive peak directly over a buried conductive object. This facilitates quick and accurate location of targets.

SITE LOCATION MAP



2

FIGURE 1

Findings and Conclusions –Site conditions over the EOD range are illustrated on Figure 2 (upper photo). Subsurface Surveys established a formal rectilinear grid with survey lines extending along the long axis of the site (y-axis). The grid was tied to an existing concrete block building shown on Figure 2 (lower photo). Production over the site varied mostly due to terrain and ground surface condition (low grass, hard soil, and disked soil) (Figure 3).

The EM-61 data collected over the site were transferred to a computer in the field at the end of each day and monitored for positioning and data quality. In this way, the geophysical crew was also able to review the resulting data in contour format as the survey progressed. Upon completion of our survey, the EM-61 data was transformed from the X-Y coordinate system established in the field to the northing-easting coordinate system (NAD 83) utilized in the earlier investigations of the site using survey coordinates of selected points on our grid.

Based on inspection of the EM-61 data collected during our earlier investigation (North Portion), concentrations of metal fragments and debris were clearly evident (Figure 3). A contour interval of 50 mVolts was utilized in the preparation of the data display illustrated in Figure 4. This view clearly shows both large and small accumulations of buried metal. It should be noted, however, that even smaller metal fragments are seen when the data is contoured at a finer interval.

In contrast, the data shown in contour map format for the Southern Extension presents a much different interpretation (Figure 5). With the exception of the effect of a concrete pad located along the access road, an existing debris pile, power pole support cable, and monitoring wells, the data suggests only a few small anomalies indicative of metal debris either on the surface or buried in the shallow subsurface. The anomaly pattern expressed could easily represent the distribution of metal debris fragments resulting from soil disking activities as well as debris originating from vehicles traveling along the dirt access road.

All data acquired in these surveys are in confidential file in this office, and are available for review by your staff, or by us at your request, at any time. We appreciate the opportunity to participate in this project. Please call, if there are questions.



Lawrence J. Favilla, GP 969
Senior Geophysicist

SITE PHOTOGRAPHS

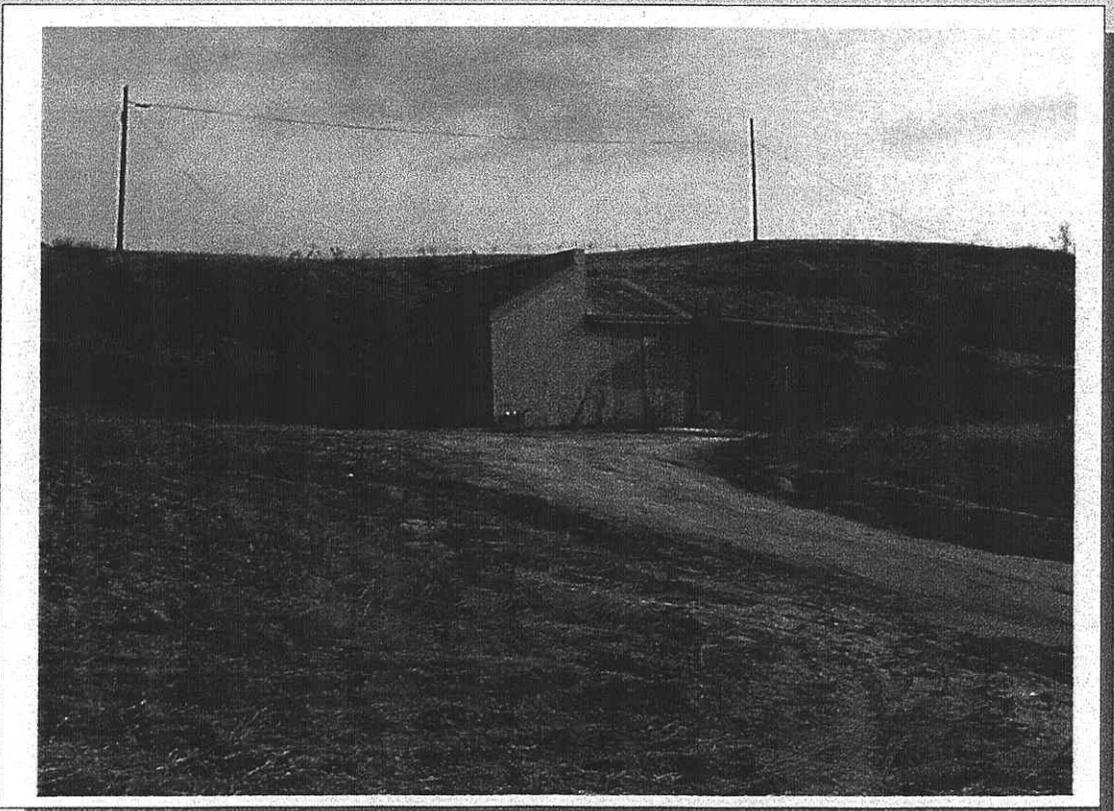
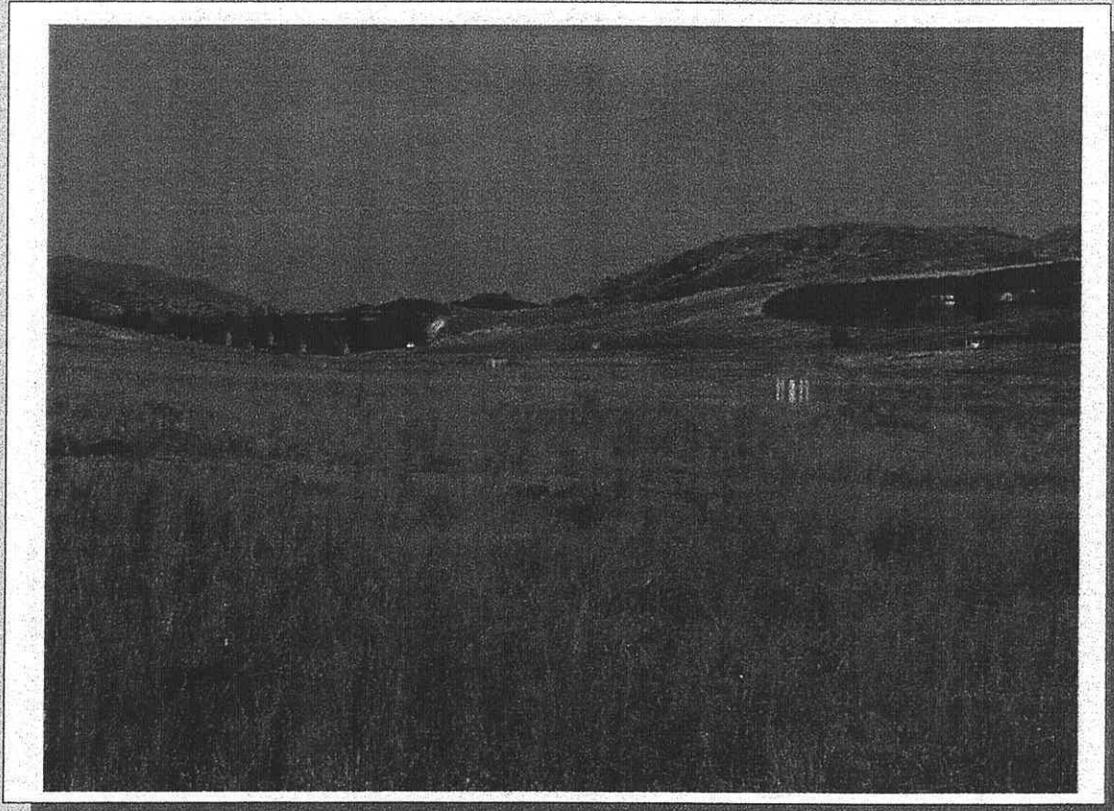


FIGURE 2

SITE PHOTOGRAPHS

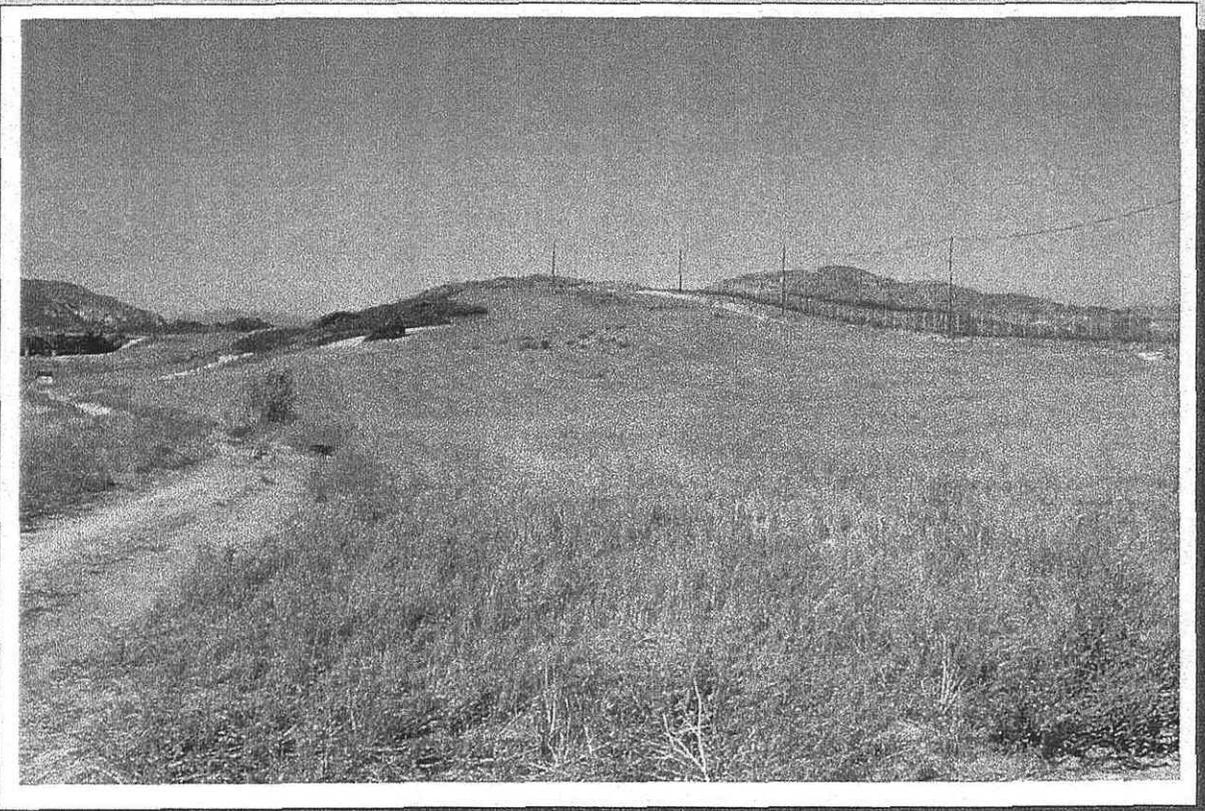
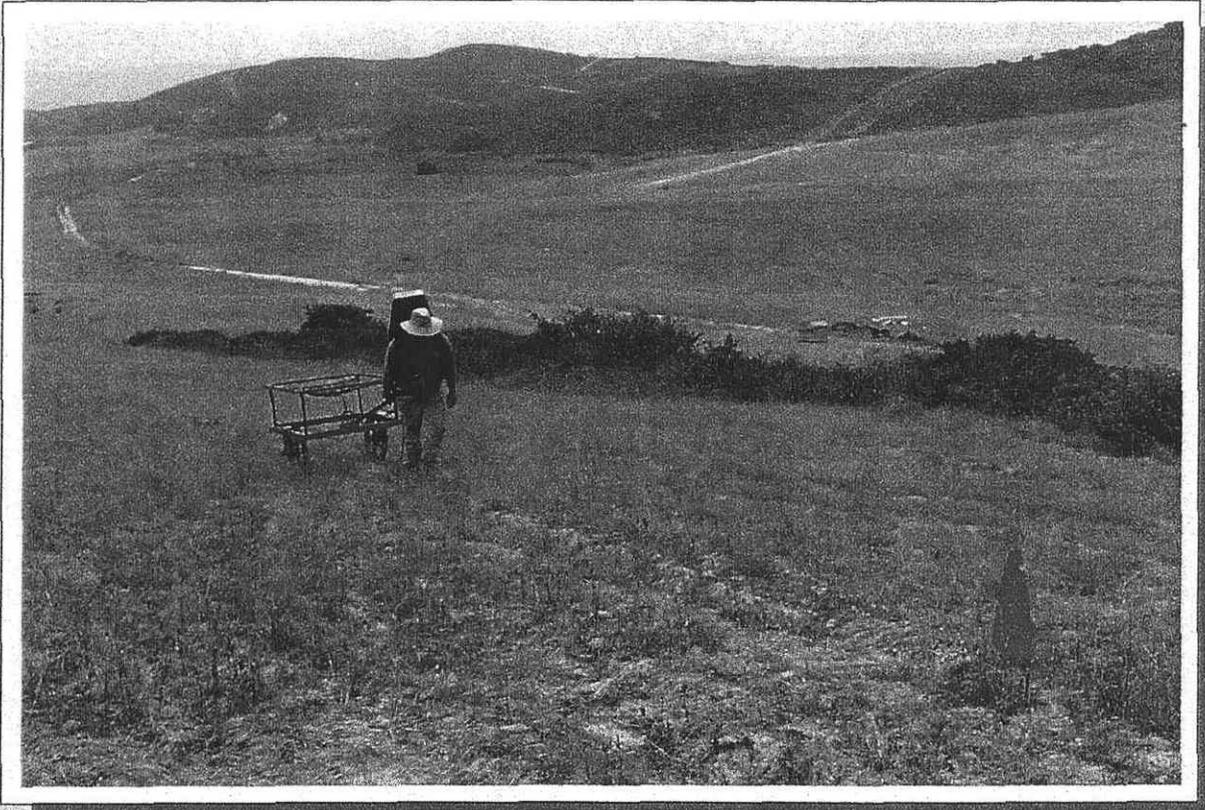
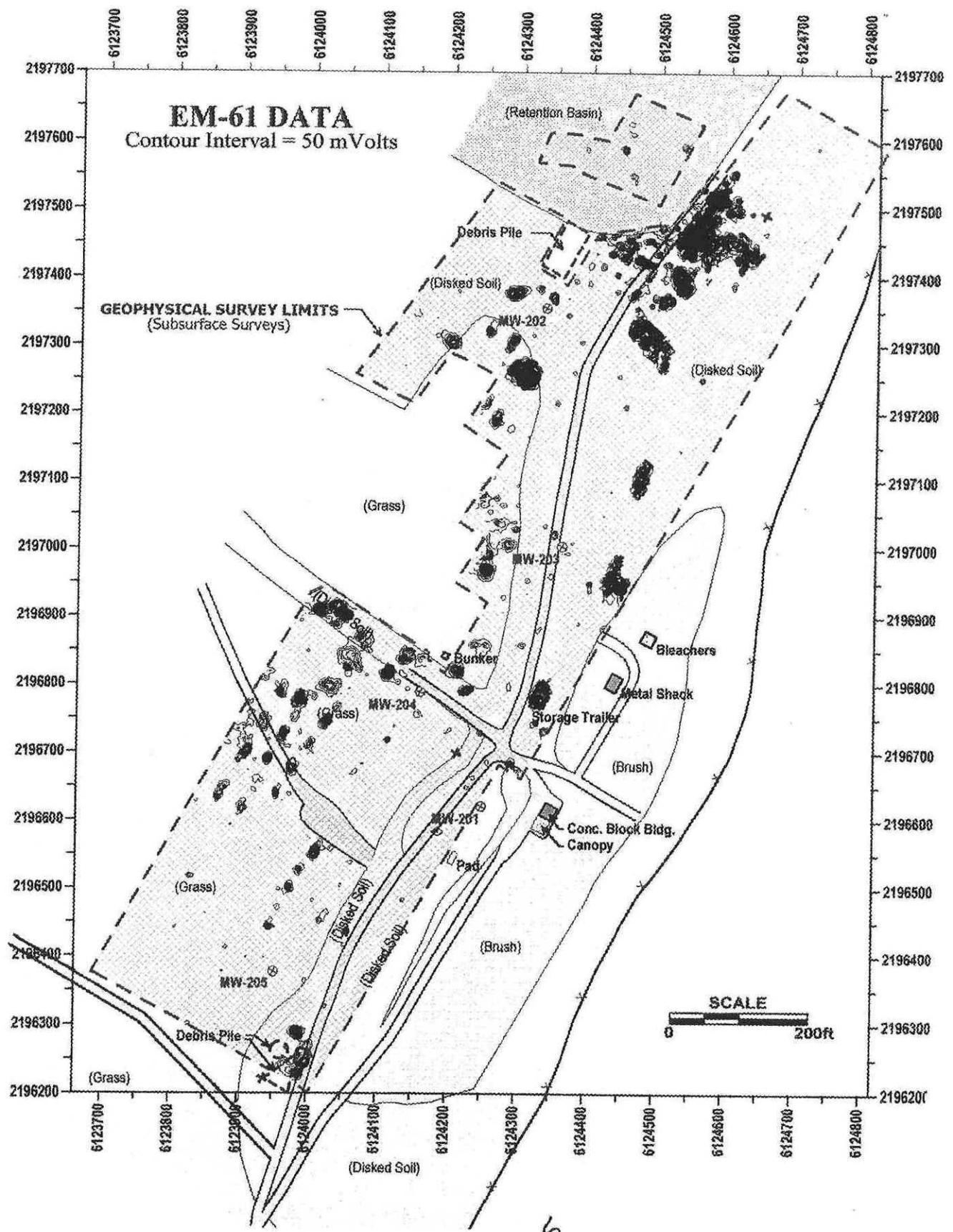


FIGURE 3

SITE INTERPRETATION MAP

MARINE CORPS AIR STATION, EL TORO, CA

NORTH PORTION





SITE INTERPRETATION MAP



MARINE CORPS AIR STATION, EL TORO, CA SOUTHERN EXTENSION

