OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

M60050.001993

OHM TRANSMITTAL/DELIVERABLE RECEIPT

CONTRACT N68711-93-D-1459 **DOCUMENT CONTROL NO: SW3888**

TO: Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Dave Jespersen, Code 57CS1.DJ
Building 131
1220 Pacific Highway
San Diego, California 92132-5187

Date: 23-Sep-97

D.O.: 59

Location: MCAS EL TORO

FROM: James Franklin FOR
Stewart Bornhoft, Program Manager

Ginger James, Contracts Manager

DESCRIPTION OF ENCLOSURE: **On-Scene Coordinator Report, Non-Time Critical Removal Action for Site 19, Unit 2, Aircraft Expeditionary Refueling Site, dated September 23, 1997.**

TYPE: Contract Deliverable ( ) ($) D. O. Deliverable (**X**) (Tech) Request for Change ( ) Other ( )

VERSION: DRAFT **REVISION** 1

ADMIN RECORD: Yes ( ) No (**X**) Category ( ) Confidential ( )

SCHEDULED DELIVERY DATE: 23-Sep-97 **ACTUAL DELIVERY DATE:** 23-Sep-97

NUMBER OF COPIES SUBMITTED TO THE NAVY: 1/O, 4/C, 3/E
[AS REQUIRED/DIRECTED BY THE (SOW)]

COPIES TO:

SWDIV	OHM	OTHER
Name, Code	Name, Location	Name, Company, Location
J. Rogers, 57C3.JR (1C/1E)	File (1C/1E)	ROICC, El Toro (1E)
L. Hornecker, 56MC.LH (1C/1E)	Chron (1C)	Mr. Burr, El Toro (1E)
A. Piszkin, 56MC.AP (1C/1E)	W. Sedlak, Irv (1C/1E)	W. Lee, El Toro (1E)
D. Broussard, 56MC.TB (1C)	D. Rawal, Irv (1C/1E)	J. Joycer, El Toro (1E)
		B. Coleman, (AR) BNI (2E)

Date/Time Received: 97 SEP 24 PM 3:45

RECEIVED COTR

Doc Class: D-03

UNITED STATES MARINE CORPS
HEADQUARTERS MARINE CORPS AIR STATION EL TORO
PO BOX 95000
SANTA ANA CA 92709-5000

IN REPLY REFER TO:
6284
1AU
23 SEP 1997

U. S. Environmental Protection Agency
Region IX, SFD-8-2
Attn: Mr. Glenn Kistner
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Kistner:

Transmitted for your information are two (2) copies of the "On-Scene Coordinator Report, Non-Time Critical Removal Action for Site 19, Unit 2, Aircraft Expeditionary Refueling Site, Marine Corps Air Station, El Toro, California" (OHM, September 1997) as the enclosure.

If you have any questions, please do not hesitate to call me at (714) 726-3470.

Sincerely,

JOSEPH JOYCE
Base Realignment and Closure
Environmental Coordinator
By direction of
the Commanding General

Encl:
On-Scene Coordinator Report (OHM, September 1997)

Copy to:
Mr. Larry Vitale, RWQCB
Mr. Tayseer Mahmoud, Cal-EPA

UNITED STATES MARINE CORPS
HEADQUARTERS MARINE CORPS AIR STATION EL TORO
PO BOX 95000
SANTA ANA CA 92709-5000

IN REPLY REFER TO:
6284
1AU
23 SEP 1997

State of California Environmental Protection Agency
Department of Toxic Substances Control, Region 4
Attn: Mr. Tayseer Mahmoud
Site Mitigation Branch
Base Closure Unit
245 W. Broadway, Suite 425
Long Beach, CA 90802-4444

Dear Mr. Mahmoud:

Transmitted for your information are two (2) copies of the "On-Scene Coordinator Report, Non-Time Critical Removal Action for Site 19, Unit 2, Aircraft Expeditionary Refueling Site, Marine Corps Air Station, El Toro, California" (OHM, September 1997) as the enclosure.

If you have any questions, please do not hesitate to call me at (714) 726-3470.

Sincerely,

JOSEPH JOYCE
Base Realignment and Closure
Environmental Coordinator
By direction of
the Commanding General

Encl:
On-Scene Coordinator Report (OHM, September 1997)

Copy to:
Mr. Larry Vitale, RWQCB
Mr. Glenn Kistner, USEPA

UNITED STATES MARINE CORPS
HEADQUARTERS MARINE CORPS AIR STATION EL TORO
PO BOX 95000
SANTA ANA CA 92709-5000

IN REPLY REFER TO:
6284
1AU
23 SEP 1997

Santa Ana Regional Water Quality Control Board
Attn: Mr. Larry Vitale
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Dear Mr. Vitale:

Transmitted for your information are two (2) copies of the "On-Scene Coordinator Report, Non-Time Critical Removal Action for Site 19, Unit 2, Aircraft Expeditionary Refueling Site, Marine Corps Air Station, El Toro, California" (OHM, September 1997) as the enclosure.

If you have any questions, please do not hesitate to call me at (714) 726-3470.

Sincerely,

Joseph Joyce

JOSEPH JOYCE
Base Realignment and Closure
Environmental Coordinator
By direction of
the Commanding General

Encl:
On-Scene Coordinator Report (OHM, September 1997)

Copy to:
Mr. Tayseer Mahmoud, Cal-EPA
Mr. Glenn Kistner, USEPA

On-Scene Coordinator Report

Non-Time Critical Removal Action for Site 19, Unit 2
Aircraft Expeditionary Refueling Site
Marine Corps Air Station
El Toro, California

SWDIV Contract No. N68711-93-D-1459, Delivery Order No. 0059
OHM Project No. 18233
Document Control No. SW3888
Revision 1
September 23, 1997

OHM Remediation Services Corp.

1202 Kettner Boulevard
San Diego, California 92101

Prepared by:

Dhananjay B. Rawal
Project Engineer

Approved by:

William L. Sedlak, P.E.
Project Manager

\prod\reports\do59\18233\OSCR_d.tem

Executive Summary of Removal Action

The Marine Corps Air Station (MCAS), El Toro encompasses approximately 4,700 acres and is located in south central Orange County, California. MCAS is bordered on the northwest, the south, and the west by the City of Irvine and on the east by the City of Lake Forest. Installation Restoration Program (IRP) Site 19 is located in the southeast quadrant of MCAS, southwest of Buildings 404 and 414. IRP Site 19 is also referred to as the Aircraft Expeditionary Refueling (ACER) Site and was used as an aircraft refueling facility prior to the removal of fuel bladders in 1986. The facility consisted of a flat ground surrounded by a concrete apron, a taxiway, and refueling equipment. Unit 2 is the excavated Fuel Bladder Revetment Area in the western portion of Site 19.

This On-Scene Coordinator (OSC) Report summarizes the field activities conducted for the non-time critical Removal Action at the ACER Site, Fuel Bladder Revetment Area (former IRP Site 19, Unit 2) of MCAS El Toro, California. The objective of this Removal Action was to reduce the potential for human exposure to polychlorinated biphenyl (PCB)-contaminated soil.

This Removal Action was completed on November 27, 1996 pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act and the National Oil and Hazardous Substances Pollution Contingency Plan under the delegated authority of the Office of the President of the United States by Executive Order 12580. This order authorizes the Department of Navy (DON) to conduct and finance Removal Actions. The DON identified applicable or relevant and appropriate requirements (ARARs) in the Final Action Memorandum (Bechtel National, Inc. 1996c). As the lead state agency, the Department of Toxic Substances Control identified state ARARs. The Removal Action was implemented following the closure of the public review and comment period on November 10, 1996 on the Action Memorandum.

The Removal Action objectives were met by covering PCB contaminated soil with approximately 336 tons of imported nonimpacted soil to a depth of at least 10 feet.

This Removal Action substantially eliminated the identified pathways of exposure to hazardous substances and chemicals of concern that may impact human health and the environment.

Table of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

ACER	Aircraft Expeditionary Refueling
ARAR	applicable or relevant and appropriate requirements
BNI	Bechtel National, Inc.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DON	Department of the Navy
IRP	Installation Restoration Program
JEG	Jacobs Engineering Group Inc.
MCAS	Marine Corps Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OHM	OHM Remediation Services Corp.
PCB	polychlorinated biphenyl
PRG	Preliminary Remediation Goal
SWDIV	Southwest Division Naval Facilities Engineering Command

I. Summary of Events

A. Site Conditions

The following section describes the conditions at IRP Site 19, Unit 2 for the non-time critical Removal Action.

1. Site Location

a) Facility Location

The Marine Corps Air Station (MCAS), El Toro encompasses approximately 4,700 acres and is located in south central Orange County, California. The station is bordered on the northwest, the south, and the west by the City of Irvine and on the east by the City of Lake Forest (Figure 1, Vicinity Map - Installation Restoration Program [IRP] Site 19, Unit 2).

b) Site Location, Area, and Structures

IRP Site 19 is located in the southeast quadrant of MCAS (Figure 2, Location Map - IRP Site 19, Unit 2), southwest of Buildings 404 and 414 (Figure 3, Site Plan - IRP Site 19, Unit 2). IRP Site 19 is also referred to as the Aircraft Expeditionary Refueling (ACER) Site. The refueling facility consisted of an unpaved area surrounded by a concrete apron, taxiway, and refueling equipment. Unit 2 is the excavated Fuel Bladder Revetment Area in the western portion of Site 19.

The surface soil at IRP Site 19 is classified as Sorrento Loam Series, which is the typical soil type of alluvial fan deposits. The site grade generally ranges from 0 to 2 percent. The upper 72 inches of soil is characterized by a permeability ranging from 0.6 to 2.0 inches per hour, and a moisture-holding capacity ranging from 0.16 to 0.21 inch per inch (Bechtel National, Inc. [BNI], 1995). The soil at IRP Site 19 is classified as Hydrologic Group B, which has a moderate infiltration rate when saturated (Jacobs Engineering Group Inc. [JEG], 1993a). Surface elevation at the site is approximately 300 feet above mean sea level. Depth to groundwater is approximately 150 feet below ground surface (JEG, 1993b).

2. Past History of Operations and Pollution Generating Activities

The ACER site was used as an aircraft refueling facility prior to the removal of fuel bladders. Approximately 15,000-gallons of JP-5 fuel were spilled at Unit 2 in 1986 after a bladder ruptured. An investigation following the fuel rupture indicated that petroleum hydrocarbon concentrations of 11,300 milligrams per kilogram were detected in the site soil. Fuel bladder revetments were removed in 1986, and an area approximately 300 feet long, 60 feet wide, and 2 feet deep was excavated. Within these boundaries, an additional area of approximately 30 feet wide by 30 feet long was excavated to a depth of 15 feet (BNI, 1996c). The soil was disposed in a Class I landfill.

Soil previously removed from Site 8 at the Station was used to backfill the 30-foot by 30-foot by 15-foot excavation at IRP Site 19. Thirteen soil samples were analyzed from the Site 8 soil before it was placed at IRP Site 19 (BNI, 1996c). The sample locations were randomly selected from a stockpile of approximately 299 cubic yards of soil. Data from the Site 8 soil samples indicated polychlorinated biphenyls (PCBs) were detected at concentrations exceeding the Preliminary Remediation Goals (PRGs) of the United States Environmental Protection Agency. The 2-foot deep excavated area of Unit 2 was not backfilled at that time and became partially covered with vegetation (JEG, 1993 a, b).

3. Summary of Field Data and Risks to Human Health and the Environment

a) Nature and Extent of Contamination

Table 1, Concentrations of PCBs in the Soil Disposed at IRP Site 19, Unit 2 (BNI, 1996c), lists the concentrations of PCBs in the Site 8 soil disposed of at Site 19, Unit 2. The February 1, 1995 industrial PRG for PCBs is 0.34 milligrams per kilogram.

b) Human Health Risk Assessment Summary

The potential risks to human health at this site are summarized in the Action Memorandum (BNI, 1996C).

c) Environmental Risk Summary

The potential risks to the environment at this site are summarized in the Action Memorandum (BNI, 1996c).

B. Organization of the Removal Action

The following section describes the organization of the Removal Action.

1. Lists of Points of Contact

Table 2, Points of Contact, provides the names, phone numbers, affiliations, addresses, and titles for the points of contact for this project

2. Significant and Applicable or Relevant and Appropriate Requirements

This non-time critical Removal Action was completed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) under the delegated authority of the Office of the President of the United States by Executive Order 12580. This order authorizes the Department of Navy (DON) to conduct and finance Removal Actions. The DON identified applicable or relevant and appropriate requirements (ARARs) in the Final Action Memorandum. OHM Remediation Services Corp. (OHM) implemented the field activities associated with the Removal Action in accordance with the ARARs identified in the Final Action Memorandum (BNI, 1996c).

Section 300.415(I) of the NCP provides that Removal Actions must attain ARARs to the extent practicable considering the exigencies of the situation. As the lead federal agency, the DON identified federal ARARs for the selected Removal Action alternative. As the lead state agency, the Department of Toxic Substances Control has the responsibility for identifying state ARARs. The ARARs for this Removal Action are addressed in Section 7 of the Final Action Memorandum (BNI, 1996c).

Table 1
Concentrations of PCBs in the Soil Disposed at IRP Site 19, Unit 2 (BNI, 1996c)

Sample Identification	PCB Concentration (mg/kg)
Q1-1	4.6
Q1-4	17.1
Q2-2	6.0
Q2-4	12.0
Q2-6	20.0
Q3-1	10.0
Q3-4	5.9
Q3-5	3.7
Q4-7	1.7
Q4-8	0.5
I-1	0.1u
I-2	0.9
I-3	0.4

Note:
The Preliminary Remediation Goal of the United States Environmental Protection Agency issued on February 1, 1995 for PCBs under the industrial scenario is 0.340 mg/kg.

Explanation:
mg/kg - milligrams per kilogram
PCB- polychlorinated biphenyl
PRG - Preliminary Remediation Goal
u - value is less than the instrument detection limit (IDL)

Table 2
Points of Contact

Name/Title	Affiliation/Address	Phone Number
Joseph Joyce Marine Corps OSC, BRAC Environmental Coordinator	Marine Corps Air Station, El Toro P.O. Box 95001 Santa Ana, CA 92709	(714) 726-3470
Glenn Kistner Remedial Project Manager	United States Environmental Protection Agency Region IX Hazardous Waste Management Division 75 Hawthorne St. San Francisco, CA 94105	(415) 744-2210
Tayseer Mahmoud	Department of Toxic Substances Control 245 W. Broadway. Suite 350 Long Beach, CA 90802	(562) 590-4891
Lawrence Vitale Remedial Project Manager	California Regional Water Quality Control Board Santa Ana Region 3737 Main St., Suite 500 Riverside, CA 92501	(909) 782-4998
Lynn Marie Hornecker Remedial Project Manager	Southwest Division Naval Facilities Engineering Command Code 56MC.LMH 1420 Kettner Blvd., Suite 507 San Diego, CA 92101	(619) 556-0250 x241
William Sedlak, P.E. Project Manager	OHM Remediation Services Corporation 2031 Main St. Irvine, CA 92714	(714) 263-9124 x403

Explanation:

BRAC - Base Realignment and Closure Act
OSC - On-Scene Coordinator

This Removal Action was implemented following the closure of the public review and comment period on November 10, 1996 on the Action Memorandum. No comments were received from the public. The public notices for the Action Memorandum are reproduced in Appendix A, Public Notice.

3. Objectives of the Removal Action

The objective of the Removal Action is to protect human health by eliminating the identified pathways of exposure to the chemicals of concern.

4. Selected Remedial Technology

The selected remedial technology was identified in the Action Memorandum (BNI, 1996c). The recommended technology considered use of imported, nonimpacted soil to cover the contaminated soil with a minimum thickness of 10 feet of clean fill and backfill the excavation at IRP Site 19, Unit 2 to match the surrounding grade. The proposed implementation of this remedial technology was described in the Construction Work Plan (OHM 1996). Responses to review comments provided by the regulators on the Work Plan and the Final Action Memorandum are included in Appendix B, Regulatory Agency Review Comments.

C. Chronology of the Removal Action

The following section describes the chronology of events concerning the Removal Action.

1. Main Phases Leading to the Removal Action

The main phases of the Removal Action were as follows:

- Geophysical Survey. MCAS personnel and Underground Service Alert were contacted to mark existing, known utilities in the site area prior to mobilization at the site. Geo Vision was subcontracted to perform a geophysical survey to identify unmarked utilities in the vicinity of the site.
- Land Survey. A land surveyor licensed in the state of California was contracted to map significant site features such as the excavation boundaries, buildings, utilities, and other physical structures prior to mobilization at the site.
- Mobilization and Site Preparation. A site superintendent, site health and safety officer, various equipment operators, and earth-moving equipment were mobilized to the site to perform the Removal Action. Site preparation activities included procuring the backfill material, establishing a temporary stockpile area for the imported fill, establishing personnel and equipment decontamination facilities, and clearing and grubbing the site.
- Backfilling the Site. The site was backfilled to match the surrounding grade.

- Waste Management. Brush and vegetation collected from the excavation bottom was disposed of as a Class III municipal waste. Wastewater generated from the decontamination of the backfill equipment was discharged to the MCAS central treatment facility and was treated through the existing CERCLA carbon adsorption treatment system.

- Land Survey. A land surveyor licensed in the state of California was contracted to survey the site following completion of the backfill. The surveyor recorded the final excavation grades and mapped significant site features such as buildings, utilities, other physical structures.

- Demobilization. Equipment and personnel were demobilized from the site following completion of the site activities.

2. Actual Work Performed

November 14, 1996. A geophysical survey was conducted by Geo Vision. Appendix C, Geophysical Survey Results, contains a copy of the geophysical survey report.

November 15, 1996. An initial land survey was conducted by Towill, Inc., a California-registered land surveyor. The survey identified and marked the survey benchmarks and existing site features.

November 18, 1996. OHM mobilized heavy equipment to Site 19, Unit 2. The heavy equipment consisted of a CAT 966 loader and a CAT 446 backhoe with a compaction wheel.

November 19, 1996. The site was prepared for backfilling by clearing brush and vegetation from the bottom of the excavation. Red caution tape was placed at the bottom of the excavation prior to backfilling.

November 20 and 21, 1996. The site was backfilled to surface grade level so that a minimum thickness of 10 feet of clean fill covers the contaminated soils. Approximately 336 tons of nonimpacted, clayey soil from Robertson's Star Plant and Production Facility in Riverside, California was used to backfill the site. The nonimpacted soil was compacted in 12-inch lifts using a compaction wheel. A copy of the geotechnical data on the backfill material is presented in Appendix D, Geothechnical Data on Backfill Material.

November 22, 1996. The equipment was demobilized from the site

November 22, 1996. The brush and vegetation was disposed of as municipal waste. Wastewater generated during the field activities was transported to the central treatment facility at MCAS El Toro and was treated through the existing CERCLA carbon adsorption treatment system.

November 27, 1996. A final land survey was conducted by Towill, Inc., a California-registered land surveyor, following completion of the backfilling. A copy of the land survey is included in Appendix E, Land Survey Report.

D. Photo Log

Photographs documenting the Removal Action are provided in Appendix F, Photographs.

E. Cost of the Removal Action

The cost of implementation of this Removal Action is approximately $52,000.

F. Public Information/Community Relations Activities

Copies of the public notices of the review and comment period on the Action Memorandum are provided in Appendix A.

II. Effectiveness of the Removal Action

This Removal Action substantially eliminated the identified pathways of exposure to hazardous substances and chemicals of concern that may impact human health and the environment.

Certification of the nonimpacted backfill material is provided in Appendix E. The Removal Action was completed on November 27, 1996 in compliance with the recommendations of the Action Memorandum (BNI, 1996c).

III. References

Bechtel National, Inc. 1995. *Final Engineering Evaluation/Cost Analysis, IRP Site 19, MCAS El Toro California.* September.

Bechtel National, Inc. 1996a. *Final Position Paper of Cleanup levels for Polychlorinated Biphenyls (PCBs) Unit 2 of IRP Site 19, MCAS El Toro, California.* March.

Bechtel National, Inc. 1996b. *Technical Memorandum Background and Reference Levels Remedial Investigation, MCAS El Toro, California.* June.

Bechtel National, Inc. 1996c. *Final Action Memorandum Non-Time-Critical Removal Action for Unit 2 of IRP Site 19 - Aircraft Expeditionary Refueling Site MCAS El Toro, California.* October.

BNI. See Bechtel National, Inc.

Jacobs Engineering Group, Inc. 1993a. *Installation Restoration Program, Phase I Remedial Investigation, Technical Memorandum, Marine Corps Air Station El Toro, California.* May.

Jacobs Engineering Group Inc. 1993b. *Installation Restoration Program, Phase II Remedial Investigation/Feasibility Study, Work Plan, Marine Corps Air Station El Toro, California.* November.

Jacobs Engineering Group Inc. 1993c. *Installation Restoration Program, Final Resource Conservation and Recovery Act (RCRA) Facility Assessment Report, Marine Corps Air Station El Toro, California.* July.

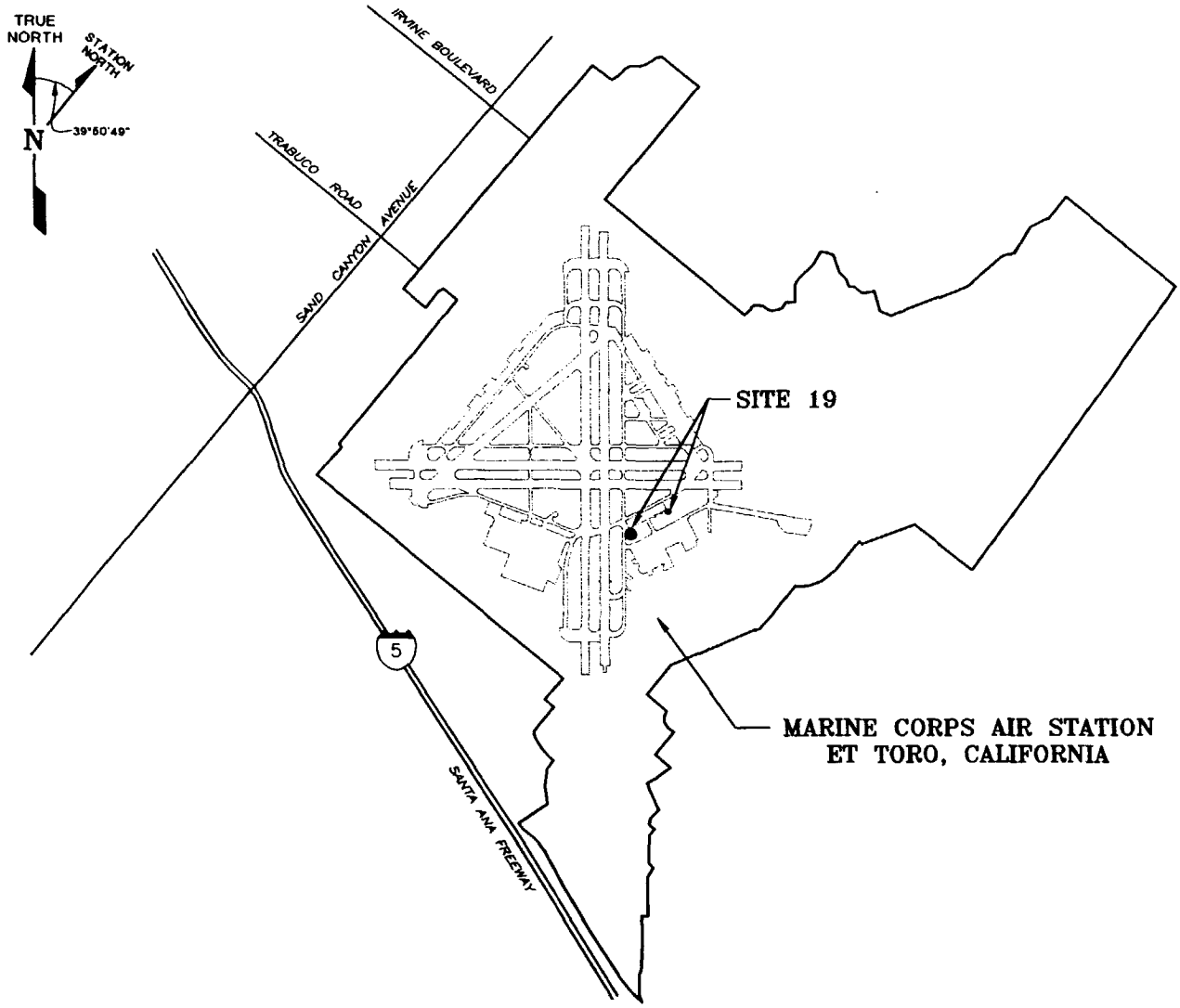
Jacobs Engineering Group Inc. 1995. *Marine Corps Air Station El Toro, El Toro, California. Installation Restoration Program, Final Temporary Site Facilities Operation and Maintenance Manual.* September.

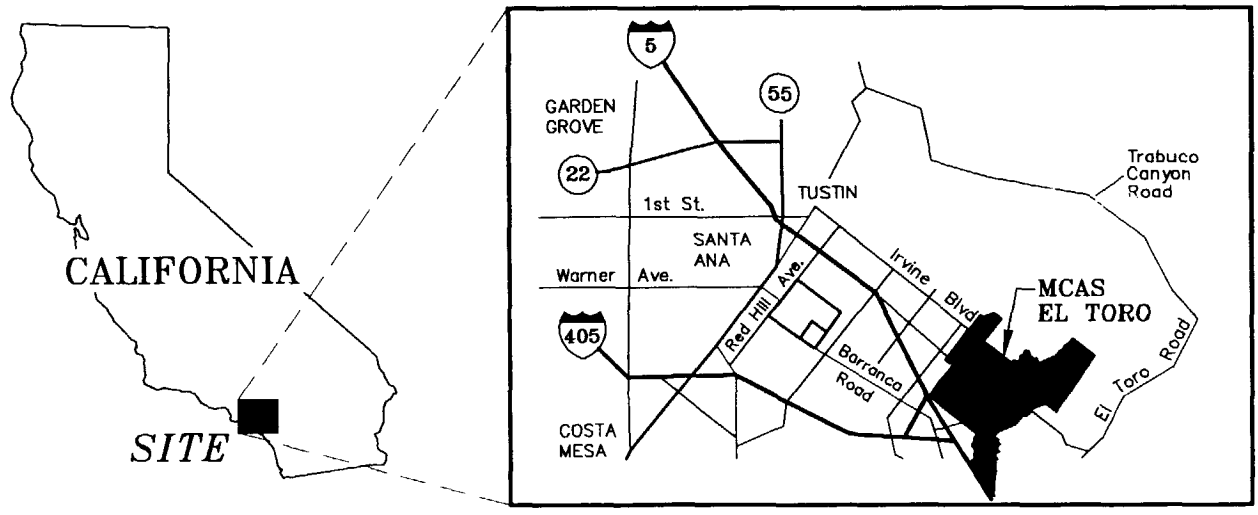
JEG. See Jacobs Engineering Group.

OHM. See OHM Remediation Services Corp.

OHM Remediation Services Corp. 1996. *Construction Work Plan, Non-Time Critical Removal Action for Unit 2 of Site 19, Aircraft Expeditionary Refueling Site, Marine Corps Air Station, El Toro, California.* November.

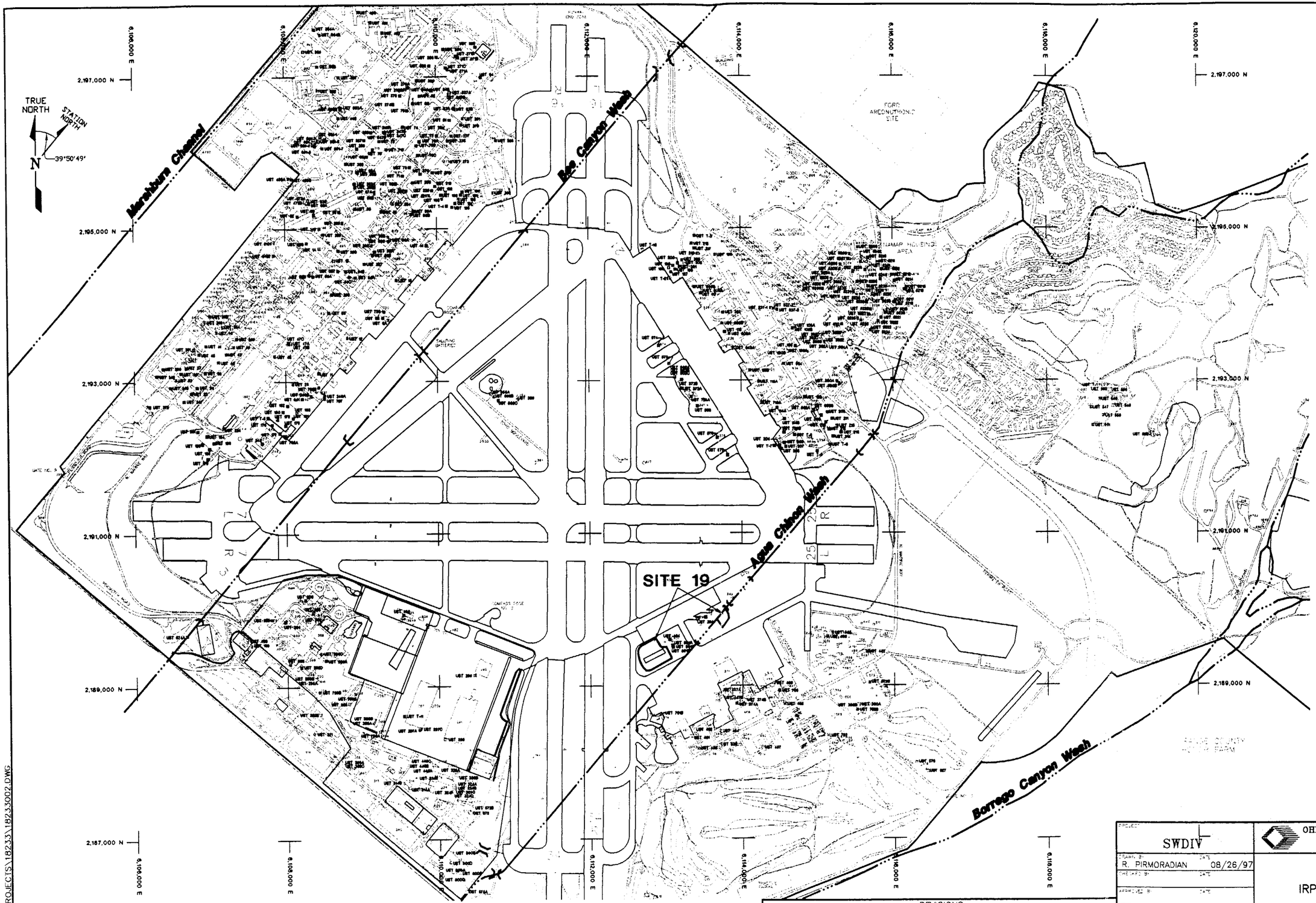
Figures





OHM Remediation Services Corp. A Subsidiary of OHM Corporation, SAN DIEGO, CA				DRAWN BY: R. PIRMORADIAN	DATE: 08/26/97	VICINITY MAP IRP SITE 19, UNIT 2		
				CHECKED BY	DATE			
				APPROVED BY	DATE			
CONTRACT NAME: SWDIV				PROJECT MANAGER	DATE	MARINE CORPS AIR STATION EL TORO, CALIFORNIA		
AUTOCAD FILE No.: 18233001.DWG	PLOT SCALE	SHEET	OF	SCALE: NONE	DOCUMENT CONTROL No.: SW3888	OHM PROJECT No.: 18233	FIGURE No.: FIG 1	REVISION: 0

8/26/97 G:\PROJECTS\18233\18233001.DWG



REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED

PROJECT	SWDIV
DRAWN BY / DATE	R. PIRMORADIAN 08/26/97
CHECKED BY / DATE	
APPROVED BY / DATE	
PROJECT MANAGER / DATE	
AUTOCAD FILE NO.	18233002.DWG

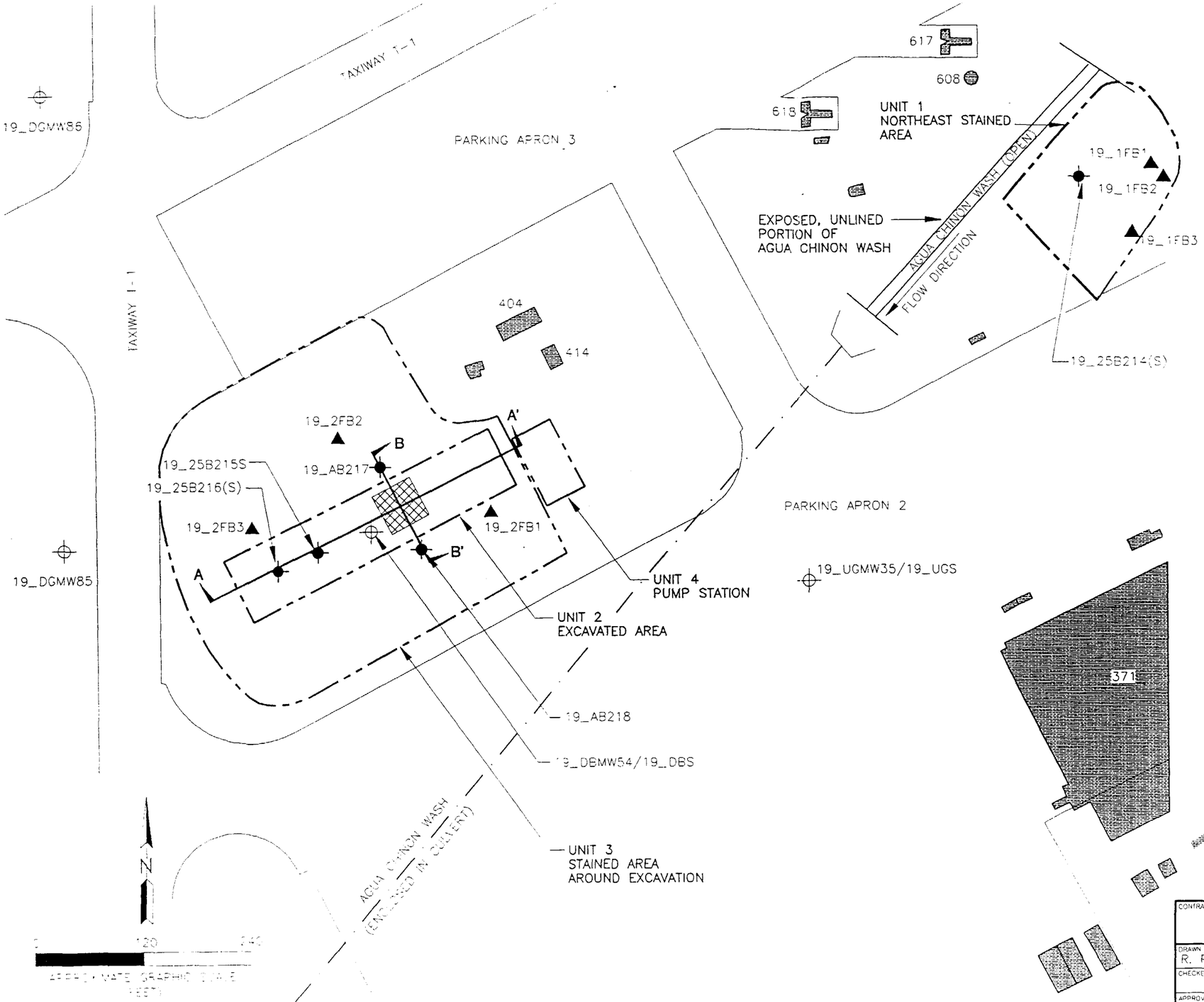
OHM Remediation Services Corp.
A Subsidiary of OHM Corporation
SAN DIEGO, CA

LOCATION MAP
IRP SITE 19, UNIT 2

MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

SCALE	SHEET	OF	DOCUMENT CONTROL NO.	OHM PROJECT NO.	DRAWING NO.
1"=600'	1	1	SW3888	18233	FIG 2

8/26/97 G:\PROJECTS\18233\18233002.DWG



LEGEND:

- 10 — BUILDING OR PAD
- PHASE I UNIT BOUNDARY
- PHASE I RI DEEP BORING/MONITORING WELL
- PHASE I RI SURFACE/SHALLOW SOIL SAMPLES
- PHASE I RI 25' BORING OR ANGLE BORING
- APPROXIMATE LIMIT OF AREA DESIGNATED FOR REMOVAL (BACKFILL MATERIAL CONTAINING PCBs AND NATIVE SOIL)
- A A' — APPROXIMATE LOCATION OF CROSS SECTION

SOURCE: BN 1996c

REVISIONS			
REV. No	DESCRIPTION	DATE	APPROVED

CONTRACT NAME	SWDIV
DRAWN BY	R. PIRMORADIAN
DATE	08/26/97
CHECKED BY	
DATE	
APPROVED BY	
DATE	
PROJECT MANAGER	
DATE	
AUTOCAD FILE No.	18233003.DWG
SCALE	AS NOTED
SHEET	1
OF	1
DOCUMENT CONTROL No.	SW3888
OHM PROJECT No.	18233
DRAWING No.	FIG 3

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

SITE PLAN
IRP SITE 19, UNIT 2

MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

8/26/97 G:\PROJECTS\18233\18233003.DWG

Appendix A
Public Notice

ORANGE COUNTY

reverse the trends, I do not know."

Bork is scheduled to give a public lecture at the Nixon Library & Birthplace in Yorba Linda today followed by a book-signing.

Fountain Valley Candidates Gather Tonight for Forum

FOUNTAIN VALLEY—The Fountain Valley Chamber of Commerce is sponsoring an election forum at 7 tonight in City Hall, 10200 Slater Ave.

Six of the seven candidates seeking two open City Council seats plan to participate, organizers said.

Expected to attend are incumbent James D. Petrikin; Doug Bannister, a business owner; Virginia Harter, a business owner; Barry G. Migliorini, a businessman; Mark R. Matthews, an attorney; and Chuck Conlosh, a police officer.

Candidate Larry R. Crandall, a trustee with the Fountain Valley School District, said he cannot join his opponents because of a scheduling conflict with tonight's school board meeting. Sandra Crandall, the candidate's wife, will represent him tonight.

Two-minute speeches from each of the candidates will open the forum. A question-and-answer session will follow. The public is invited but cannot ask candidates questions during the event.

PUBLIC NOTICE

MARINE CORPS AIR STATION (MCAS) EL TORO

Removal Actions at Magazine Road Landfill and Communication Station Landfill and Removal Action at Aircraft Expeditionary Refueling (ACER) Site

The U.S. Marine Corps is encouraging public review and comments on removal actions at Installation Restoration Program (IRP) Site 2 (Magazine Road Landfill) and IRP Site 17 (Communication Station Landfill) at the Marine Corps Air Station El Toro. The removal actions include the construction of security fencing to restrict access to the landfill sites, the construction of erosion protection structures to abate the erosion of landfill materials by surface runoff, and the relocation of previously eroded landfill debris to central locations within each landfill site. The implementation of the removal actions will substantially reduce potential human exposure to hazardous substances associated with the landfill debris. The removal actions are intended as interim measures to protect human health and the environment until the final remedies are implemented at each site. The removal actions are intended, to the extent practicable, to contribute to the efficient performance of any long-term remedial actions at each site. The removal actions are described in an Action Memorandum which is available to the public at the Information Repository. All supporting documents associated with the removal actions have also been placed in the Information Repository for pubic review.

Additionally, the U.S. Marine Corps has made the Action Memorandum for the removal action at IRP Site 19, Unit 2 (Aircraft Expeditionary Refueling (ACER) Site) available for pubic review at the Information Repository. The Action Memorandum describes a removal action to backfill and cover soil contaminated with polychlorinated biphenyls (PCBs) located in a large pit with a 10-foot deep layer of clean soil. This action will meet U.S. Environmental Protection Agency (USEPA) requirements for PCB-contaminated soil.

PUBLIC REVIEW AND COMMENT PERIOD
October 10, 1996 – November 10, 1996

The public is invited to review and provide comments on the removal actions. Documents pertaining to IRP Sites 2, 17 and 19 are available for review at the following location:

INFORMATION REPOSITORY
Irvine Heritage Park Regional Library
14361 Yale Avenue
Irvine, California 92604
(714) 551-7151

Written comments on the removal actions must be postmarked no later than November 10, 1996 and be submitted to:

Commanding General
ACS, Environment and Safety (IAU)
Attn: Mr. Joseph Joyce,
Base Realignment and Closure, Environmental Coordinator
MCAS El Toro, P.O. Box 95001
Santa Ana, CA 92709-5001
Comments may also be faxed to (714) 726-6586

For further information regarding this activity, please contact Mr. Joseph Joyce at (714) 726-3470 or the following representatives from USEPA, or California Environmental Protection Agency (Cal-EPA):

Ms. Bonnie Arthur, Remedial Project Manager (USEPA)	(415) 744-2368
Mr. Fraser Felter, Community Relations Coordinator (USEPA)	(800) 231-3075
Ms. Marsha Mingay, Public Participation Specialist (Cal-EPA)	(310) 590-4881

after ricochet from friend's alleged gunshot into ground to scare off children

BY LESLIE BERESTEIN
The Orange County Register

The parents of Marco Antonio Fuentes, a college student killed by a stray bullet Sept. 28 as he studied in his Fullerton garage, filed a wrongful-death lawsuit Wednesday against the neighbor accused of firing the shot.

Catalino and Maria Fuentes filed the 29-page suit in Orange County Superior Court against Eleuterio Ocampo, 67.

Ocampo said he fired into the ground to scare off children who were stealing fruit from his yard in the 600 block of West Elm Avenue. Police believe that the bullet ricocheted off the ground and teses' garage across the street, striking Marco Fuentes, 22.

Ocampo was arrested the next day. He is charged with involuntary manslaughter and faces up to 14 years in prison if convicted.

The complaint, which alleges negligence, assault and battery and infliction of emotional distress, seeks unspecified damages.

"We just want to get this cleared up as soon as possible," said Maria Aguirre, 22, Fuentes' fiancee. "I want to support (the family) as best I can."

Fuentes' parents declined to comment.

In an interview at the Orange County Jail last week, Ocampo wept as he told The Orange County Register that Fuentes was a good friend who helped him read and translate correspondence.

"I loved him a lot," Ocampo said in Spanish. "I'm sorry about (what happened to) that boy."

PUBLIC NOTICE

MARINE CORPS AIR STATION (MCAS) EL TORO

REMOVAL ACTIONS AT MAGAZINE ROAD LANDFILL AND COMMUNICATION STATION LANDFILL AND REMOVAL ACTION AT AIRCRAFT EXPEDITIONARY REFUELING (ACER) SITE

The U.S. Marine Corps is encouraging public review and comments on removal actions at Installation Restoration Program (IRP) Site 2 (Magazine Road Landfill) and IRP Site 17 (Communication Station Landfill) at the Marine Corps Air Station El Toro. The removal actions include the construction of security fencing to restrict access to the landfill sites, the construction of erosion protection structures to abate the erosion of landfill materials by surface runoff, and the relocation of previously eroded landfill debris to central locations within each landfill site. The implementation of the removal actions will substantially reduce potential human exposure to hazardous substances associated with the landfill debris. The removal actions are intended as interim measures to protect human health and the environment until the final remedies are implemented at each site. The removal actions are intended, to the extent practicable, to contribute to the efficient performance of any long-term remedial actions at each site. The removal actions are described in an Action Memorandum which is available to the public at the Information Repository. All supporting documents associated with the removal actions have also been placed in the Information Repository for public review.

Additionally, the U.S. Marine Corps has made the Action Memorandum for the removal action at IRP Site 19, Unit 2 (Aircraft Expeditionary Refueling (ACER) Site) available for public review at the Information Repository. The Action Memorandum describes a removal actio to backfill and cover soil contaminated with polychlorinated biphenyls (PCBs) located in a large pit with a 10-foot deep layer of clean soil. This action will meet U.S. Environmental Protection Agency (USEPA) requirements for PCB-contaminated soil.

PUBLIC REVIEW AND COMMENT PERIOD
OCOTBER 10, 1996 - November 10, 1996

The public is invited to review and provide comments on the removal actions. Documents pertaining to IRP Sites 2, 17, and 19 are available at the following location:

INFORMATION REPOSITORY
IRVINE/HERITAGE PARK REGIONAL LIBRARY
14361 YALE AVENUE, IRVINE, CALIFORNIA 92604
(714) 551-7151

Written comments on the removal actions must be postmarked no later than November 10, 1996 and be submitted to:

Commanding General
AC/S, Environmental and Safety (1AU) Attn: Mr. Joseph Joyce
Base Realignment and Closure, Environmental Coordinator
MCAS El Toro, P.O. Box 95001, Santa Ana, CA 92709-5001
Comments may also be faxed to (714) 726-6586

For further information regarding this activity, please contact Mr. Joseph Joyce at (714) 726-3470 or the following representatives from USEPA, or California Environmental Protection Agency (CAL-EPA)

Ms. Bonnie Arthur, Remedial Project Manager (USEPA)	(415) 744-2368
Mr. Fraser Felter, Community Relations Coordinator, (USEPA)	(800) 231-3075
Ms. Marsha Mingay, Pacific Participation Specialist (CAL EPA)	(310 590-4881

Published: October 10, 1996, The Orange County Register, A77900800

137578

Appendix B
Regulatory Agency Review Comments

SOUTHWESTNAVFACENGCOM
Code 56MC.LMH
San Diego, CA

File: S19RESP.DOC

RESPONSES TO COMMENTS

DRAFT CONSTRUCTION WORK PLAN, NON-TIME CRITICAL REMOVAL ACTION FOR UNIT 2 OF SITE 19, AIRCRAFT EXPEDITIONARY REFUELING SITE, MARINE CORPS AIR STATION, EL TORO (OHM, NOVEMBER 1996)

Comment	Response
ORIGINATOR: Larry Vitale, California Regional Water Quality Control Board, Santa Ana Region To: Mr. Joseph Joyce, Marine Corps Air Station, El Toro Date: November 15, 1996 [Via Letter from Tayseer Mahmoud, California Environmental Protection Agency, Department of Toxic Substances Control of November 19, 1996]	
Section 6, page 6-1, Import of Backfill Material, states that, "imported backfill will be certified as clean (i.e., as containing nondetectable PCBs)". Please note, certification of clean fill material should include all contaminants or pollutants that could impact surface or groundwater quality, for example, total dissolved solids (TDS), nitrates, metals, petroleum hydrocarbons, etc..	Information pertaining to the characteristics of the backfill material will be included in the On-Scene Coordinator (OSC) Report on the implementation of the removal action.

Date: 8 Aug 97

SOUTHWESTNAVFACENGCOM
Code 56MC.LMH
San Diego, CA

File: S19RESP.DOC

RESPONSES TO COMMENTS

DRAFT FINAL ACTION MEMORANDUM, NON-TIME CRITICAL REMOVAL ACTION FOR UNIT 2 OF SITE 19, AIRCRAFT EXPEDITIONARY REFUELING SITE, MARINE CORPS AIR STATION, EL TORO (BECHTEL, JUNE 1996)

Comment	Response
ORIGINATOR: Bonnie Arthur, United States Environmental Protection Agency To: Mr. Joseph Joyce, Marine Corps Air Station, El Toro Date: August 6, 1996	
EPA has reviewed the "Draft Final Action Memorandum, Non-Time Critical Removal Action for Unit 2 of Site 19" for MCAS El Toro, received on July 2, 1996. The report does not require revision, however, the following issues must be addressed in a letter: Page 11; EPA does not agree that soil "containing less than 1 part per million PCBs" qualifies as clean fill. Either offsite, certified clean fill or onsite soil may be used, provided the onsite soil is sampled and the levels are acceptable to the BCT. Page 11; A deed restriction is stated as required in the "Post-removal site control" section, however, this should be further evaluated and included in the Operable Unit (OU) 3 RI/FS.	The Navy/Marine Corps determined that backfill material from an offsite source would be utilized. Information pertaining to the characteristics of the backfill material will be included in the On-Scene Coordinator (OSC) Report on the implementation of the removal action. The text of page 11, Post-removal site control has been modified as follows: "The intent of the proposed removal action is to limit contaminant mobility and the potential for environmental exposure. Thus, disclosure of administrative site controls, through deed notification, may be required."

Date: 8 Aug 97

Appendix C
Geophysical Survey Results

GEOVision
geophysical services
a division of Agbabian Associates

GEOPHYSICAL SURVEY RESULTS FOR SITE 19

MARINE CORPS AIR STATION, EL TORO
SANTA ANA, CALIFORNIA

Prepared for

OHM Remediation Services Corporation
Irvine, California

Prepared by

GEOVISION GEOPHYSICAL SERVICES
1785 Pomona Road, Suite B
Corona, California, 91720

November 14, 1996

GEOVISION JOB NUMBER: 97206

1.0 Introduction

A geophysical investigation was carried out on November 14, 1996 for OHM Remediation Services Corporation at site 19, located at Marine Corps Air Station (MCAS) El Toro, Santa Ana, California. The investigation was conducted to verify and accurately locate the presence of all detectable underground utilities.

2.0 Field Procedures

GEOVision's standard clearance procedures were used to survey the site to accurately locate underground utilities in the surrounding area. GEOVision field teams used the attached GEOPHYSICAL CLEARANCE FORM to ensure that all appropriate procedures were followed. Procedures that were not appropriate for the site were lined out. The GEOVision field team was not able to review base utility maps prior to investigating this site.

A GSSI SIR-2 digital Ground Penetrating Radar (GPR) system was used to collect GPR profiles surrounding the site. The profiles were conducted along a rectangular perimeter encircling the site, so that all incoming utility lines would be located. The enclosed site map shows the locations of all profiles. Profiles were collected using either a 300 MHz or 500 MHz antenna, depending on which antenna gave the best depth penetration and resolution for the soil conditions beneath the site. A marker switch on the antenna handle was used to place 5' spaced distance marks on each profile as the antenna was pulled along the ground around the area to be screened. All GPR records were stored on the system's hard drive for later processing and archiving, and were printed out onsite using a portable printer. Representative GPR profiles, hand annotated by the operator in the field, are attached.

The field team then inspected the site and traced all pipes and utilities evident from field observations (i.e. manhole, vault, valve, cracked/patched asphalt, vent line, etc.).

We also swept the area using an EM-31 terrain conductivity meter. This system consists of a boom with a source coil which transmits energy to a receiver coil. The electrical field at the receiver is sensitive to large metallic objects such as drums, ordnance, or pipes. The EM-31 was monitored for indications of any conductive pipes or buried conductive objects. Two profiles were taken across the proposed access for the backfill operation at this site, in addition to a survey encircling the proposed backfill area, as shown on the accompanying geophysical survey map.

An accurate, scaled geophysical survey map was then drawn on the back of the GEOPHYSICAL CLEARANCE FORM. All landmarks in the vicinity were drawn in and labeled. All GPR and EM-31 traverses are shown on the map.

3.0 Conclusions

We found only one underground line, using the EM-31 method. It does not appear to enter the GPR surveyed pit boundary. It appears to connect an adjacent fenced fuel area to a fuel hose which protrudes from the ground on a flat area to the northeast of the pit. A manhole nearby was also examined. A drain line at a depth of about 5 feet appears to trend in the general direction of the site. We saw no clear evidence of a subsurface line in this direction in the pit area. As the pit is more than 10 feet deep, we believe it is unlikely that the drain transects the excavated portion of the survey area. Refer to the base sewer/storm drain utility maps for this area before beginning any excavation.

GE Vision

geophysical services
a division of Agbabian Associates

GEOPHYSICAL CLEARANCE FORM

PROJECT NAME: OHM - EL TORO PROJECT NUMBER 97206
LOCATION MCAS EL TORO
DATE 4NOV96 TIME 1230h
SITE DESCRIPTION: SITE 19, NEAR FLIGHTLINE

GEOPHYSICAL EQUIPMENT

GROUND PENETRATING RADAR (GPR) UNIT: SIR2 MAGNETOMETER: —
ELECTROMAGNETIC (EM): — EM LINE TRACER (LT): 9890
METAL DETECTOR (MD): FISHER OTHER: —

PROCEDURES

(1)

☐ 1. Inspect available utility maps and trace all recorded utilities in the vicinity of the proposed drilling location using LT, and if necessary GPR.

~~☐ 2. Review~~ available geophysical data: ☐ Magnetic ☐ EM-31 ☐ EM-61

☑ 3. Inspect site and trace all pipes evident from field observations (ie. manhole, vault, valve, cracked asphalt, pipe at surface, etc)

~~☐ 4. Sweep~~ proposed drilling location with LT in 50/60 Hz mode

~~☐ 5. Hold LT~~ transmitter over proposed drilling location and circle at about a 40 foot radius with reciever tracing all utilities encountered.

☑ 6. Conduct two perpendicular GPR profiles through proposed borehole.
GPR antenna: 300/500
GPR range: 50nsec / 30nsec Estimated depth penetration *: 4'/4'
* utility lines below this depth cannot be detected using GPR ALONG

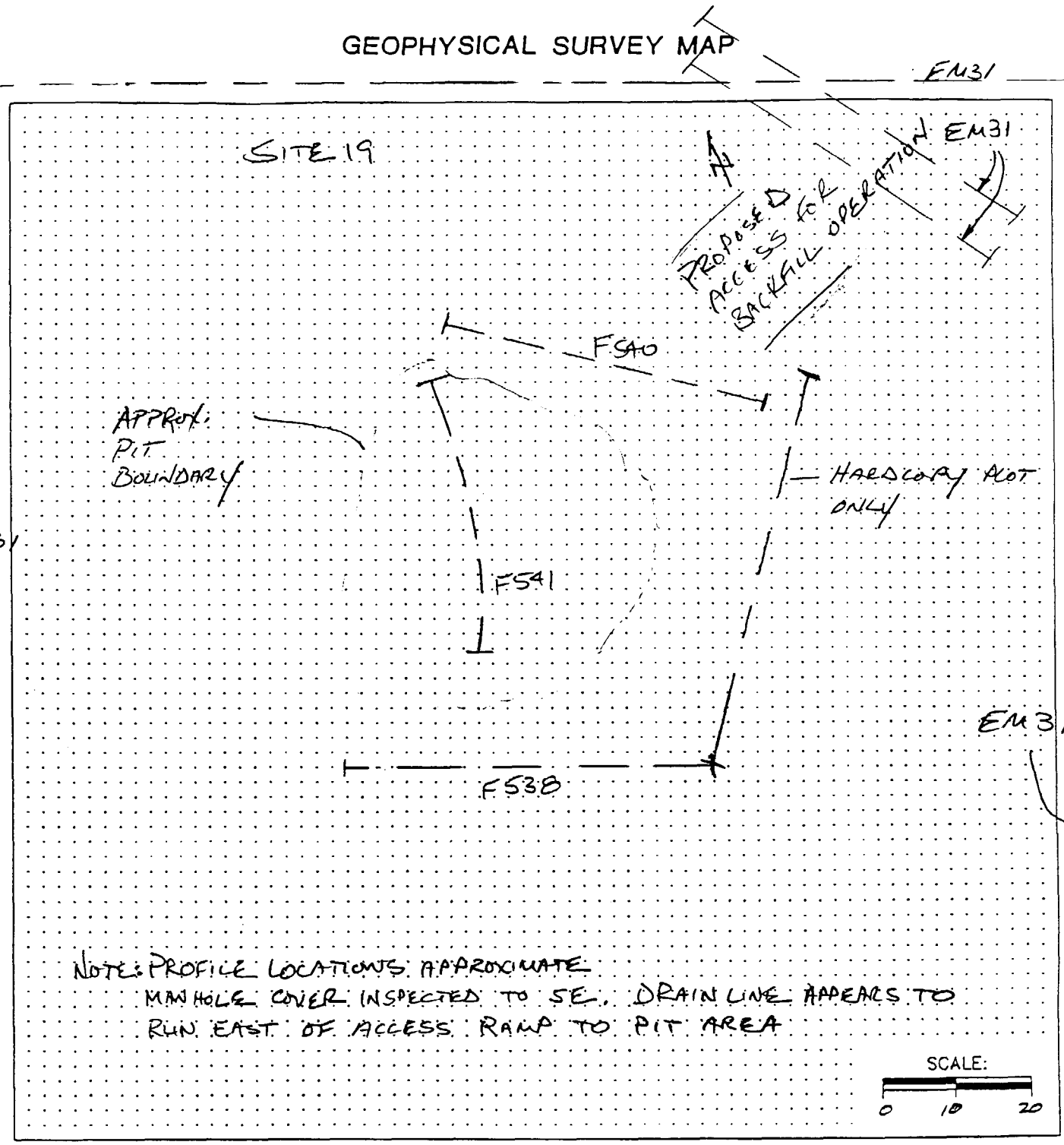
☑ 7. Other GPR AROUND PERIMETER AND ~~DOWN~~ CHANNEL BOTTOM.
EM-31 AROUND PERIMETER

FIELD PERSONNEL: R.A. MERRILL / H. QUIN

SIGNATURE: R A Quin

(1) NOT AVAILABLE AT TIME OF GEOPHYS. SURVEY.

GEOPHYSICAL SURVEY MAP



LEGEND

GEOPHYSICAL TRAVERSE

UTILITY:
E = ELECTRICAL, T = TELEPHONE,
G = GAS, S = SEWER, SD = STORM DRAIN,
W = WATER, P = PRODUCT LINE,
V = VENT LINE, L = UNKNOWN LINE

Site 19
Line 3A
E-W
5' bcks
300 MHz

Scan/Sec 32.0 Bits 16
Dielectric 1.00

Position 0.0nS Range: 50.0nS
Range Gain =1 6 24 37 38
V(IIR LP N=1 F=1100)
V(IIR HP N=2 F=50)

Table #15, Transform #1

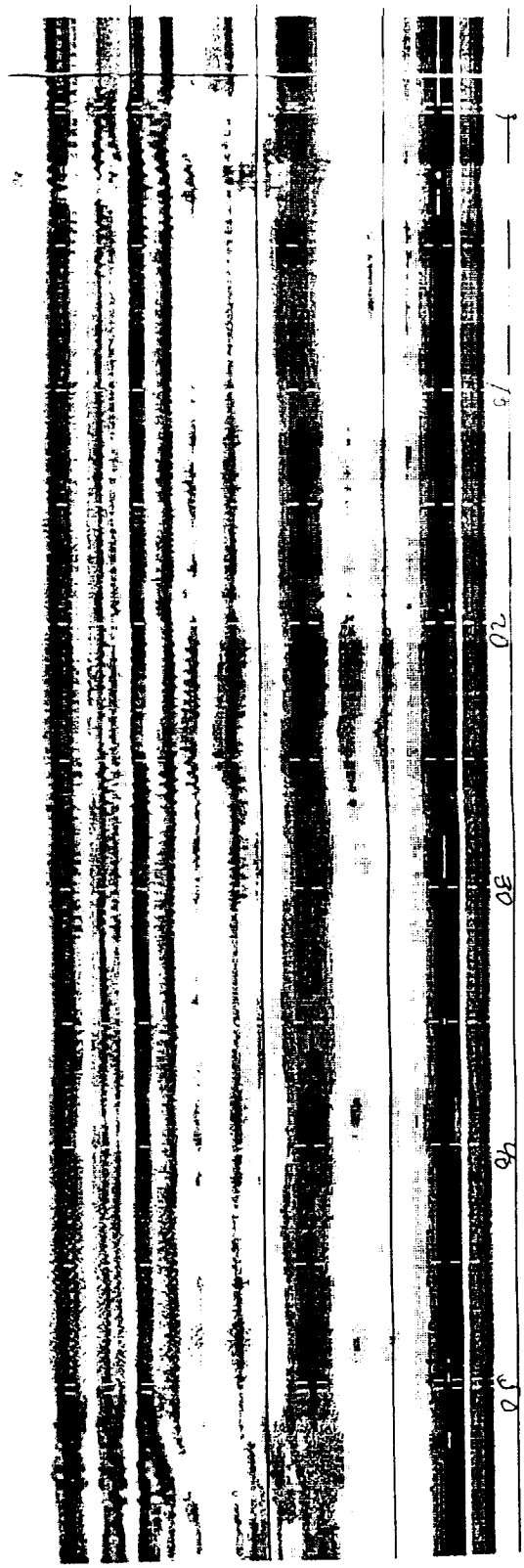
37.50ns 25.00ns 12.50ns 0.00ns

Site 19
W-E
5' bcks

Scan/Sec 32.0 Bits 16

Table #15, Transform #1

37.50ns 25.00ns



Appendix D
Geotechnical Data on Backfill Material

ROBERTSON'S

ROCK ▪ SAND ▪ BASE MATERIALS ▪ ASPHALT
READY MIX CONCRETE

January 13, 1997

O.H.M. REMEDIATION

RE: CLAY SOIL - COMMODITY CODE #588
P.O.# 1030417, DELIVERY NO. 059

We hereby certify that all Clay Soil from Robertson's Star Plant Production Facility, located at 24000 Santa Ana Canyon Road, Anaheim Hills, has been removed from a naturally occurring site. It has been determined by a previous geophysical examination, (see the enclosed report) to contain no hazardous materials, and as such is free of all deleterious substances, contaminants and oil based products.

Sincerely,

ROBERTSON'S

Robbie Rain
Technical Services

6830 Van Buren Blvd. ▪ Riverside, CA 92509
P.O. Box 33140 ▪ Riverside, CA 92519
(909) 685-2200 ▪ Fax (909) 360-8883

ROBERTSON'S

ROCK • SAND • BASE MATERIALS • ASPHALT
READY MIX CONCRETE

November 19, 1996

OHM REMEDIATION SERVICES
2031 Main Street
Irvine, CA 92714

Attention: Lynn Valor

RE: MISCELLANEOUS FILL

Dear Lynn:

We hereby certify that all Miscellaneous Fill material from Robertson's Star Plant Production Facility has been removed from a naturally occurring site. It has been determined by a previous geophysical examination to contain no hazardous materials, and as such is free of all deleterious substances, contaminants and oil based products.

Sincerely,

ROBERTSON'S

Robbie Rain
Technical Services

6830 Van Buren Blvd. • Riverside, CA 92509
P.O. Box 33140 • Riverside, CA 92519
(909) 685-2200 • Fax (909) 360-8883

Job No. 96321-5-B

MATERIAL TEST REPORT
ON
CONCRETE AGGREGATES
CONFORMANCE
WITH THE REQUIREMENTS OF
ASTM C 33-93
FOR
ROBERTSON'S READY MIX CONCRETE
STAR PRODUCTION PLANT
ANAHEIM, CALIFORNIA

TESTED BY

C. H. J., INCORPORATED

COLTON, CALIFORNIA

1. OBJECT

To ascertain the conformance of Robertson's Star Quarry Concrete Aggregates with the requirements of ASTM C 33-93 "Standard Specification for Concrete Aggregates".

2 SCOPE

The properties of the concrete aggregates including grading and quality of fine and coarse aggregate are compared to specified requirements to determine the compliance of the aggregates.

3. LABORATORY

The tests were performed by C.H.J., Incorporated, Colton, California. The laboratory is qualified to test concrete aggregates and is in compliance with ASTM E 329-93 "Specification for Minimum Requirements for Agencies Engaged in the Testing and Inspection of Materials Used in Construction" and was examined by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology.

4. REFERENCE DOCUMENTS

ASTM STANDARD (Current 1995 Edition)

C 40	Test Method for Organic Impurities in Fine Aggregates for Concrete
C 88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
C 117	Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
C 123	Test Method for Lightweight Pieces in Aggregate
C 127	Test Method for Specific Gravity and Absorption of Coarse Aggregates
C 128	Test Method for Specific Gravity and Absorption of Fine Aggregates
C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

C 136	Sieve Analysis of Fine and Coarse Concrete Aggregates
C 142	Test Method of Clay Lumps and Friable Particles in Aggregates
C 289	Test Method for Potential Reactivity of Aggregates (Chemical Method)
D 75	Practice for Sampling Aggregates
D 3665	Practice for Random Sampling of Construction Materials

5. LABORATORY EQUIPMENT

a. Sample Splitter - Manufactured by Soiltest

b. Aggregate Sample Splitter - Manufactured by Gilson Screen Company

c. Fine Aggregate Shaker - Manufactured by Soiltest

d. Coarse Aggregate Shaker - Manufactured by Gilson Screen Company

e. Fine Aggregate Sieves - U.S. Standard Sieves Manufactured by Soiltest

f. Coarse Aggregate Sieves - U.S. Standard Screens Manufactured by Gilson Screen Company

g. Los Angeles Abrasion Machine - Manufactured by Soiltest

h. Drying Oven - Industrial Oven Model ED-2825-B Manufactured by Pacific Combustion Engineering Corporation

i. Scale - 302 pounds, Model #4103132 - Manufactured by Ohms

j. Scale - 51 pounds, Model #51 HH - Manufactured by Ohms

k. Scale - 45 pounds, Manufactured by Ohms

l. Digital Scales - 6100 gram capacity

6. SAMPLING

The concrete aggregates were sampled from stockpiles at Robertson's Star Quarry Production Plant at Anaheim, California on June 28, 1996 by a C.H.J., Incorporated representative.

7. SUMMARY OF TEST RESULTS

a. Fine Aggregate - Washed Concrete Sand

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
U.S. Standard Sieves	Percent Passing	Percent Passing
3/8 inch	100	100
No. 4	95 - 100	98
No. 8	80 - 100	85
No. 16	50 - 85	60
No. 30	25 - 60	41
No. 50	10 - 30	19
No. 100	2 - 10	5
Fineness Modulus	2.3 - 3.1	2.92

Deleterious Substances

Material Finer Than No. 200 Sieve	5.0 percent maximum	2.9 percent
Organic Impurities	Must be lighter than standard	Lighter than standard
Clay Lumps & Friable Particles	3.0 percent maximum	1.8 percent
Coal and Lignite	0.5 percent maximum	0.1 percent

Soundness

Sodium Sulfate (Loss)	10 percent maximum	1.3 percent *

* This meets the requirement of 10 percent maximum, therefore freezing and thawing tests are not required.

Potential Reactivity (ASTM C-289)

Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 73 Sc = 28

Specific Gravity and Absorption

Specific Gravity, Bulk SSD	2.60
Absorption	1.3 percent

b. Coarse Aggregate - One and Half Inch Maximum Aggregate (#2)

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
U.S. Standard Sieves	Percent Passing ASTM Size #4	Percent Passing
2 inch	100	100
1 1/2 inch	90 - 100	96
1 inch	25 - 55	31
3/4 inch	0 - 15	13
1/2 inch	-	7
3/8 inch	0 - 5	5

Deleterious Substances		
Material Finer Than No. 200 Sieve	1.0 percent maximum	0.1 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.1 percent
Coal and Lignite	0.5 percent maximum	0.2 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	24.7 percent
Soundness		
Sodium Sulfate (Loss)	12 percent maximum	2.4 percent
Potential Reactivity (ASTM C-289)		
Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 90 Sc = 31
Specific Gravity and Absorption		
Specific Gravity, Bulk SSD		2.63
Absorption		1.1 percent

c. Coarse Aggregate - One Inch Maximum Aggregate (#3)

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
U.S. Standard Sieves	Percent Passing ASTM Size #56	Percent Passing
1 1/2 inch	100	100
1 inch	90 - 100	99
3/4 inch	40 - 85	81
1/2 inch	10 - 40	35
3/8 inch	0 - 15	14
No. 4	0 - 5	1

Deleterious Substances		
Material Finer Than No. 200 Sieve	1.0 percent maximum	0.3 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.2 percent
Coal and Lignite	0.5 percent maximum	0.1 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	24.7 percent
Soundness		
Sodium Sulfate (Loss)	12 percent maximum	2.4 percent
Potential Reactivity (ASTM C-289)		
Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 90 Sc = 31
Specific Gravity and Absorption		
Specific Gravity, Bulk SSD		2.62
Absorption		1.3 percent

d. Three-Eighths Inch Maximum Aggregate (#4)

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
	Percent Passing	
U.S. Standard Sieves	ASTM Size #8	Percent Passing
1/2 inch	100	100
3/8 inch	85 - 100	97
No. 4	10 - 30	28
No. 8	0 - 10	2
No. 16	0 - 5	1

Deleterious Substances		
Material Finer Than No. 200 Sieve	1.0 percent maximum	0.1 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.1 percent
Coal and Lignite	0.5 percent maximum	0.1 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	24.7 percent
Soundness		
Sodium Sulfate (Loss)	12 percent maximum	2.4 percent
Potential Reactivity (ASTM C-289)		
Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 90 Sc = 31
Specific Gravity and Absorption		
Specific Gravity, Bulk SSD		2.65
Absorption		1.9 percent

8. TEST RESULTS FOR CRUSHED AGGREGATES

a. Three-Quarter Inch Maximum Crushed (3/4")

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
	Percent Passing	
U.S. Standard Sieves	ASTM Size #6	Percent Passing
1 inch	100	100
3/4 inch	90 - 100	90
1/2 inch	20 - 55	28
3/8 inch	0 - 15	6
No. 4	0 - 5	1

Deleterious Substances		
Material Finer Than No. 200 Sieve	1.0 percent maximum	1.0 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.3 percent
Coal and Lignite	0.5 percent maximum	0.2 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	21.1 percent
Soundness		
Sodium Sulfate (Loss)	12 percent maximum	1.5 percent
Potential Reactivity (ASTM C-289)		
Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 70 Sc = 32
Specific Gravity and Absorption		
Specific Gravity, Bulk SSD		2.65
Absorption		1.2 percent

b. Half Inch Maximum Crushed (1/2")

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
	Percent Passing	
U.S. Standard Sieves	ASTM Size #67	Percent Passing
3/4 inch	90 - 100	100
1/2 inch	-	89
3/8 inch	20 - 55	21
No. 4	0 - 10	1
No. 8	0 - 5	1

Deleterious Substances

Material Finer Than No. 200 Sieve	1.0 percent maximum	0.7 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.5 percent
Coal and Lignite	0.5 percent maximum	0.2 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	21.1 percent

Soundness

Sodium Sulfate (Loss)	12 percent maximum	1.5 percent

Potential Reactivity (ASTM C-289)

Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 70 Sc = 32

Specific Gravity and Absorption

Specific Gravity, Bulk SSD	2.64
Absorption	0.7 percent

c. Three-Eighths Inch Maximum Crushed (3/8")

Parameter	ASTM C 33-93 Requirements	Test Results
	Grading - Sieve Analysis	
	Percent Passing	
U.S. Standard Sieves	ASTM Size #8	Percent Passing
1/2 inch	100	100
3/8 inch	85 - 100	96
No. 4	10 - 30	25
No. 8	0 - 10	3
No. 16	0 - 5	1

Deleterious Substances		
Material Finer Than No. 200 Sieve	1.0 percent maximum	1.0 percent
Clay Lumps & Friable Particles	2.0 percent maximum	0.8 percent
Coal and Lignite	0.5 percent maximum	0.2 percent
Abrasion Loss after 500 Revolutions	50 percent maximum	21.1 percent
Soundness		
Sodium Sulfate (Loss)	12 percent maximum	1.5 percent
Potential Reactivity (ASTM C-289)		
Chemical Method	Must not be considered as potentially reactive	Considered Innocuous Rc = 70 Sc = 32
Specific Gravity and Absorption		
Specific Gravity, Bulk SSD		2.62
Absorption		0.9 percent

9. CONCLUSIONS

Robertson's, Washed Concrete Sand, One and Half Inch Maximum (#2), One Inch Maximum (#3) and Three-Eighths Inch Maximum (#4) Concrete Aggregates and 3/4", 1/2" and 3/8" Crushed Aggregates from Star Production Plant meet the requirements of ASTM C 33-93 "Standard Specifications for Concrete Aggregates".

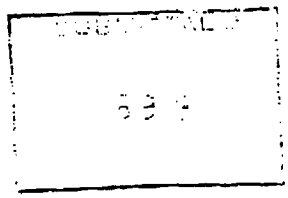
Registered Civil Engineer

Date: July 18, 1996

William Y. Liu, R.C.E. 38420
Registration Expires 3/31/97

REGISTERED PROFESSIONAL ENGINEER
WILLIAM Y. LIU
No. 38420
3-31-97
CIVIL
STATE OF CALIFORNIA

AGGREGATE TEST DATA
OWL NEW STAR PRODUCTION FACILITY
GYPSUM CANYON, CALIFORNIA



prepared for

OWL ROCK PRODUCTS
P.O. BOX 1146
VICTORVILLE, CA 92392

prepared by
CONCRETE ENGINEERING SERVICES, INC.
FONTANA, CALIFORNIA

CONCRETE ENGINEERING SERVICES, INC.
P.O. Box 1708, 9774 Calabash, Fontana CA 92334
(909) 428-9010

November 15, 1993

Mr. Marc Robert
Owl Rock Products
P.O. Box 1146
Victorville, CA 92392

CES 9360

Reference: New Star Aggregate Production Facility, Gypsum Canyon, California

Gentlemen:

In response to your request, Concrete Engineering Services, Inc. has performed a series of aggregate tests and evaluations of coarse and fine concrete aggregates from the New Star Aggregate Production Facility at Gypsum Canyon, California. The materials were sampled at the facility on October 19, 1993 by our staff. This examination and petrographic analysis was performed to evaluate the material for use in Portland Cement Concrete. The aggregates were evaluated for durability, deleterious materials and potential alkali-silica reactivity. Physical testing of the aggregates was performed in accordance to ASTM C33-90 "Standard Specification for Concrete Aggregates"(PLATES 1-4). The Petrographic Analysis was performed using the procedures prescribed in ASTM C295 " Standard Guide for Petrographic Examination of Aggregates for Concrete" (PLATES 5-7). These procedures include both megascopic and microscopic identification of particles. Potential alkali-silica reactivity of the aggregates was also tested by ASTM method C289 "Potential Reactivity of Aggregates (Chemical Method)".

A summary of our findings follow with complete test and petrographic data presented in the appendix.

COARSE AGGREGATE

The coarse aggregate examined is a crushed gravel primarily derived from a conglomerate consisting of sedimentary, igneous and metamorphic rock types. The facility is located on the north flank of the Santa Ana Mountains near the mouth of Gypsum Canyon in north Orange County, California. Fractured faces are evident on approximately 35% of the pieces examined. The aggregate pieces are primarily sub-rounded to angular with elongated and flake particles estimated at 3% of the pieces examined. A very small number of coarse aggregate pieces contain ferric compounds that may cause rust staining when exposed aggregate surfaces are permitted to weather without a suitable protective sealant. The aggregate contains a significant amount of material derived from igneous sources and subjected to varying degrees of metamorphism. None of the aggregate particles examined were considered to be potentially reactive to alkalis in cement. However, individual mineral constituents of the aggregate pieces may contain small amounts of reactive material. The results of the Petrographic Examination and the values obtained from the ASTM C289 Test indicate a low potential for alkali-silica reaction in

Portland Cement Concrete. In addition, aggregates from this area of the Santa Ana Mountains have historically shown little or no problems for use in Portland Cement Concrete. It is our opinion that this coarse aggregate material is suitable for use in the manufacture of Portland Cement Concrete.

FINE AGGREGATE: WASHED CONCRETE SAND

The fine aggregate material primarily consists of metamorphic sand particles along with quartz and feldspars derived from the matrix of the source conglomerate and the crushing of the coarse aggregates. The material is generally sub-rounded to sub-angular. The coarser sand particles primarily consist of pieces that can be identified as a specific rock types while the finer materials are more commonly individual mineral types with quartz predominating. The potential for alkali-silica reaction in Portland Cement Concrete is considered low based upon the petrographic examination, the results of the ASTM C289 test and the historic use of the material in Portland Cement Concrete. Therefore it is our opinion that this sand material is suitable for use in the manufacture of Portland Cement Concrete.

If you have any questions or require additional information, please contact us at your convenience.

Concrete Engineering Services, Inc. appreciates the opportunity to provide professional services to OWL Rock Products.

Respectfully submitted,

CONCRETE ENGINEERING SERVICES, INC.

William Wygle, RCE #43621
Senior Materials Engineer

Alan F. Keltyka, RCE #42370, CEG #1337
Principal Engineer and Geologist

cc: (3) Submitted

enc

RECEIVED
JUN 07 1996

PETROGRAPHIC EXAMINATION OF COARSE AGGREGATE
OWL ROCK PRODUCTS, NEW STAR PRODUCTION FACILITY
GYPSUM CANYON, CALIFORNIA

PLATE

Aggregate Description	Particle Counts ±1/2	±3/8"	% of Sample
Quartz Latite Porphyritic Gneiss gray to gray-brown, medium to fine grained, altered with feldspar and quartz phenocrysts	39	56	26.6
Quartz Latite Porphyritic Gniess light to dark gray, medium to fine grained, sheared and stretched, elongated and feldspar porphyroblasts	31	51	23.0
Meta Quartz Latite light gray brown, epidote rich	1	2	<1
Quartz Diorite medium gray, medium to coarse grained, some moderate weathering.	4	4	2.2
Meta Volcanic Porphyritic Rhyolite light gray to purple gray, fine grained, feldspar and quartz phenocrysts	29	20	13.7
Meta Volcanics gray-brown to yellow brown, medium to coarse grained, moderate to highly weathered	20	28	13.4
Meta Volcanics greenish-gray, fine grained, with epidote	1	-	>1
Meta Volcanics medium gray, fine grained, with pyrite	1	-	>1
Meta Volcanics pink-gray, fine grained, altered	1	-	>1
Meta Volcanic Porphyritic Andesite purplish gray, fine to medium grained, with feldspar phenocrysts	10	14	6.7
Quartzite milky white to brown-gray, fine grained.	9	9	5.0
Meta Sandstone and Schist medium gray-brown, fine grained, bedded with trace chert	2	5	2.0
Meta Sandstone dark gray-brown, micaceous, altered	2	3	1.4

SUBMITTAL

RECEIVED
JUN 07 1996

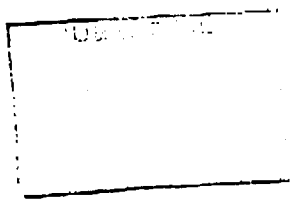
PETROGRAPHIC EXAMINATION OF COARSE AGGREGATE (continued)
OWL ROCK PRODUCTS, NEW STAR PRODUCTION FACILITY
GYPSUM CANYON, CALIFORNIA

Aggregate Description	Particle Counts ±1/2	Particle Counts +3/8"	% of Sample
Quartz milky white to clear, vein variety	5	5	2.8
Quartz clear, with black tourmaline	1	-	<1
Quartz and Epidote light gray	2	1	<1
Quartz and Epidote medium gray to gray brown, altered	1	-	<1
Diabase Dike Rock medium gray, fine grained	-	1	<1
TOTAL PARTICLE COUNTS	158	199	357

POTENTIALLY REACTIVE AGGREGATES: Individual Constituents of the Schists, Gneiss, and Meta Volcanics estimated @ 4% of the sample examined.

POTENTIALLY UNSOUND AGGREGATES: Weathered Schists, Gneisses and Meta Volcanics estimated @ 11% of the sample examined.

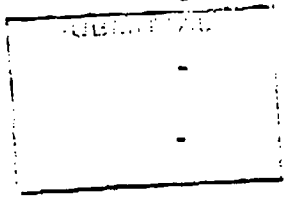
EXAMINATION PERFORMED OCTOBER 1993 BY H. QUINN and A. KELTYKA



PETROGRAPHIC EXAMINATION OF WASHED CONCRETE SAND
OWL ROCK PRODUCTS, NEW STAR PRODUCTION FACILITY
GYPSUM CANYON, CALIFORNIA

PLATE 1

Aggregate Description	Particle Counts Sieve Sizes +# 8	+#16	+#30	-#30	% of sample
Quartz Latite Gneiss	210	241	222	15	37.5
Meta Volcanic Rhyolite	40	33	18	9	5.5
Meta Volcanics	36	15	18	-	3.8
Meta Volcanic Andesite	11	8	9	2	1.6
Quartzite	16	66	119	291	26.8
Quartz	10	46	71	120	13.5
Granodiorite/Quartz Diorite	2	1	-	-	<1
Quartz and Epidote	1	1	-	-	<1
Quartz and Tourmaline	-	1	-	-	<1
Meta Sandstone	3	5	4	-	<1
Epidote rich Altered Meta Volcanics	2	1	-	-	<1
Feldspar	-	10	56	74	7.6
Biotite	-	-	11	18	1.6
Magnetite	-	-	6	7	>1
TOTAL PARTICLE COUNTS	331	428	534	541	1834



POTENTIALLY REACTIVE SANDS:
none observed

POTENTIALLY UNSOUND SANDS:
Weathered Meta Volcanics and Gneisses and estimated @ 4% of total sample

EXAMINATION PERFORMED OCTOBER 1993 BY H. QUINN and A. KELTYKA

Results of Laboratory Tests

#4 (3/8") CONCRETE AGGREGATE
OWL ROCK, STAR FACILITY
Anaheim, California

SIEVE SIZE	% PASSING	ASTM C33	SSPWC
3/4"	100		100
1/2"	100	100	
3/8"	95	85–100	85–100
#4	16	10–30	0–30
#8	2	0–10	0–10
#16	1	0–10	
#30	0		
#50	0		
#100	0		
#200	0		0–2

SPECIFIC GRAVITY (ASTM C127)	2.62		2.58 min
ABSORPTION (ASTM C127)	1.4%		
SOUNDNESS (ASTM C88)			
5 CYCLES. %LOSS	2.4%	12% max	
LIGHTWEIGHT PIECES (ASTM C123)	0%	1% max	
FRIABLE PARTICLES (ASTM C142)	1.2%	10% max	
L.A. ABRASION (ASTM C131)			
100 REV.	5.7%		15% max
500 REV.	25.0%	50% max	52% max

RECEIVED
JUN 07 1996

Testing Performed November, 1993

AGG019

CONCRETE ENGINEERING SERVICES, INC.

Results of Laboratory Tests

WASHED CONCRETE SAND
OWL ROCK, STAR FACILITY
Anaheim, California

SIEVE SIZE	% PASSING	ASTM C33	CALTRANS	SSPWC
3/8"	100	100	100	100
#4	97	95–100	93–100	95–100
#8	82	80–100	61–99	75–90
#16	63	50–85	55–75	55–75
#30	40	25–60	34–45	30–50
#50	16	10–30	16–29	10–25
#100	2	2–10	1–12	2–10
#200	1		0–7	0–5
SPECIFIC GRAVITY (ASTM C128)	2.60			
ABSORPTION (ASTM C128)	1.3%			
SOUNDNESS (ASTM C88) 5 CYLCES, %LOSS	5.9%	10% MAX		10% max
LIGHTWEIGHT PIECES (ASTM C123)	0%	1% max		
FRIABLE PARTICLES (ASTM C142)	0.7%	3% max		3% max
ORGANIC IMPURTIES (ASTM C40)	(1) SATISF.		Satisf.	Satisfactory
SAND EQUIVALENT (CA 217)	78		75 min	70 min

SUBMITTAL

Testing Performed November, 1993

RECEIVED
JUN 07 1996

AGG019

CONCRETE ENGINEERING SERVICES, INC.

AGRA
Earth & Environmental

AGRA Earth &
Environmental, Inc.
1290 North Hancock Street
P.O. Box 19079
Anaheim, CA 92817
Tel (714) 779-2591
Fax (714) 779-8377

October 21, 1996
Job No. 6-212-104800

Robertson's Ready Mix
6830 Van Buren Boulevard
Riverside, California 92509

Attention: Mr. Mark Raigosa

Re: P.O. #23218-15. Soil Tests

As requested, the following tests were performed on the clay sample delivered to AGRA Earth & Environmental, Inc. on September 26, 1996.

1. Moisture/Density Relations Curve - ASTM D1557.
2. Material Finer Than The #200 Sieve - ASTM D1140.
3. Liquid Limit & Plasticity Index - ASTM D4318.
4. Hydraulic Conductivity - ASTM D5084.

The tests were performed as directed in the "Material Requirements" specification furnished by the Client.

Test results can be found in the attached page A-1.

Respectfully submitted,

AGRA Earth & Environmental, Inc.

Robert J. Nagle
Laboratory Manager
RJN/ljo

Encl.: Laboratory Test Results (Page A-1)

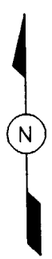
c: Mr. Mark Raigosa, Addressee (2)

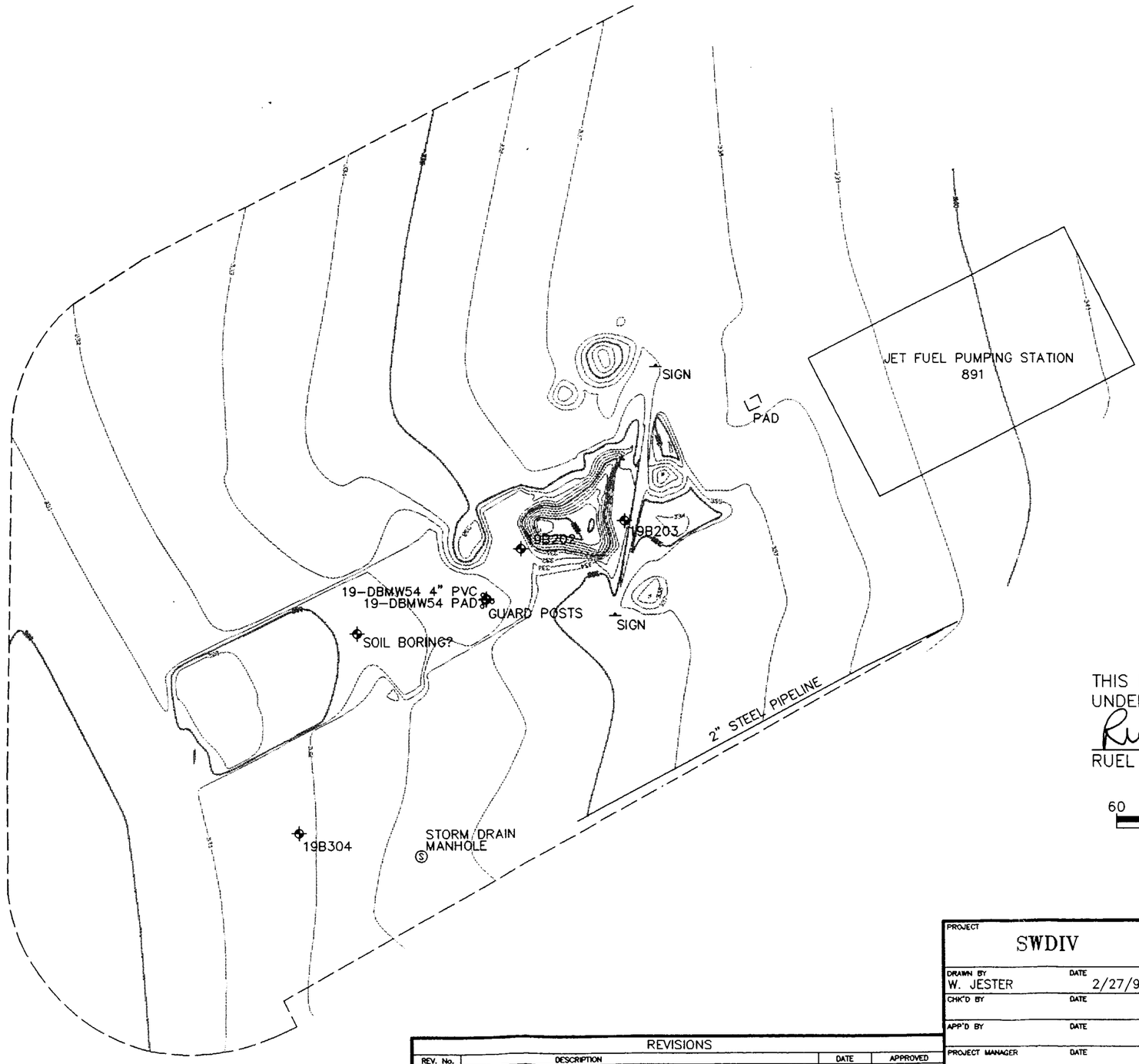
01/6-1048/10-21-96

ROBERTSON'S READY MIX		P.O. # 23218-15
SAMPLE NO.		Stockpile
DESCRIPTION/CLASSIFICATION		SILTY CLAY CH-MH
MATERIAL FINER THAN #200 SIEVE	(ASTM D1140)	
Amount Passing #200 Sieve	(%)	87
ATTERBERG LIMITS	(ASTM D4318)	
Liquid Limit		54
Plastic Limit		29
Plasticity Index		25
MOISTURE/DENSITY CURVE	(ASTM D1557)	
Maximum Dry Density	(pcf)	113.0
Optimum Moisture	(%)	16.0
HYDRAULIC CONDUCTIVITY	(ASTM D5084)	
Initial Diameter X Length	(in.)	2.88 x 2.0
Initial Moisture Content	(%)	17.3
Initial Dry Density	(pcf)	101.7
Initial Percent Maximum Density	(%)	90.0
Final Diameter X Length	(in.)	2.90 x 2.06
Final Moisture Content	(%)	27.0
Final Dry Density	(pcf)	97.4
Final Percent Maximum Density	(%)	86.2
Confining Pressure	(psi)	3
Hydraulic Gradient		13.4
Hydraulic Conductivity (K)	(cm/sec.)	3.9×10^{-7}

Appendix E
Land Survey Report

OHM PROJECT & DRAWING No.
XXXXX FIG X-X





STATE OF CALIFORNIA
LICENSED LAND SURVEYOR
RUEL DEL CASTILLO
EXP. 6/30/00
L.S. 4212

THIS REPRESENTS A SURVEY DONE UNDER MY SUPERVISION.

RUEL DEL CASTILLO, L.S. 4212

60 30 0 60
SCALE: 1"=60'

REVISIONS

REV. No.	DESCRIPTION	DATE	APPROVED

PROJECT: SWDIV	OHM Remediation Services Corp. A Subsidiary of OHM Corporation SAN DIEGO, CA
DRAWN BY: W. JESTER — DATE: 2/27/97	SITE 19
CHK'D BY — DATE	
APP'D BY — DATE	
PROJECT MANAGER — DATE	MARINE CORPS AIR STATION EL TORO, CALIFORNIA
AUTOCAD FILE No.: SITE19REV01.DWG	

SCALE	SHEET	OF	DOCUMENT CONTROL No.	OHM PROJECT No.	DRAWING No.	REVISION
1" = 60'	1	1	XXXXX	XXXXX	FIG X-X	-

PLOT SCALE: 1=1
RO 0:1:43:02 9/5/96 13:37:14 C:\TBLOCKS\B-SIZE

Towill, Inc.
15405 Redhill, Suite A
Tustin, Ca 92780
(714) 566-9280
Thu Aug 21 14:44:21 1997

SITE 19 COORDINATE LISTING PROJECT: G:\SURV\965232\MAIN.PRO

Point Coordinates Listing

Point	North	East	Elev	Name
173	2189510.82	6112996.32	338.42	60d NAIL
3728	2189464.58	6112913.33	334.41	%TOP %CLS
3729	2189459.35	6112920.18	335.07	TOP
3782	2189452.54	6112917.45	333.70	TOP
3783	2189429.28	6112914.76	333.41	TOP
3784	2189414.12	6112919.35	333.51	TOP
3791	2189406.17	6112910.66	332.89	TOP
3837	2189406.10	6112906.40	334.16	TOP
3838	2189405.57	6112901.60	333.77	TOP
3856	2189400.27	6112896.12	334.77	TOP
3858	2189398.28	6112876.86	334.32	TOP
3860	2189410.31	6112873.54	332.25	TOP
3949	2189426.27	6112865.67	332.52	TOP
3973	2189432.14	6112866.63	332.71	TOP
3974	2189441.04	6112879.58	333.26	TOP
3987	2189437.94	6112886.30	332.41	TOP
3988	2189446.10	6112895.93	333.26	TOP
3989	2189452.00	6112902.52	334.92	TOP
3990	2189461.35	6112905.41	334.56	!TOP !CLS
3991	2189460.29	6112917.97	330.20	%TOE %CLS
3992	2189455.34	6112913.32	328.36	TOE
3993	2189439.93	6112905.21	326.31	TOE
3994	2189432.40	6112898.57	325.38	TOE
3995	2189428.10	6112889.47	324.73	TOE
3996	2189427.08	6112877.45	323.06	TOE
4288	2189422.61	6112878.35	322.96	TOE
4289	2189420.90	6112888.94	324.69	TOE
4290	2189417.09	6112901.17	325.04	TOE
4291	2189412.20	6112907.88	327.00	TOE
4293	2189418.42	6112908.57	325.42	TOE
4294	2189427.45	6112905.31	324.85	TOE
4295	2189435.84	6112907.78	326.27	TOE
4359	2189438.87	6112911.87	329.08	TOE
4631	2189442.45	6112910.73	327.18	TOE
4632	2189454.41	6112914.89	328.69	TOE
4633	2189459.15	6112919.01	330.27	!TOE !CLS
4634	2189427.67	6112921.36	333.55	19B203
4635	2189408.32	6112899.42	332.04	%GB
4636	2189411.93	6112888.76	330.86	GB
4637	2189411.11	6112880.17	330.91	!GB
4638	2189413.54	6112868.00	332.27	19B202
4779	2189462.20	6112895.60	336.36	%TOP %TOE
4780	2189461.61	6112901.82	334.58	TOE
4781	2189465.04	6112901.17	336.53	TOP
4782	2189472.44	6112913.92	336.95	TOP
4783	2189467.57	6112912.93	335.06	TOE
4784	2189480.58	6112938.18	334.44	TOE
4785	2189485.38	6112936.49	337.23	TOP
4786	2189483.11	6112942.93	337.24	TOP
4787	2189461.49	6112952.38	337.54	TOP
4788	2189467.03	6112945.11	333.90	TOE
4789	2189460.25	6112948.82	334.59	TOE
4790	2189452.53	6112953.27	336.32	TOE
4791	2189437.35	6112957.99	334.08	TOE
4792	2189444.05	6112963.23	337.24	TOP
4793	2189443.85	6112972.57	337.09	TOP
4794	2189439.52	6112980.43	336.86	TOP*TOE
4795	2189431.03	6112981.22	336.63	TOP*TOE

Towill, Inc.
15405 Redhill, Suite A
Tustin, Ca 92780
(714) 566-9280
Thu Aug 21 14:44:21 1997

SITE 19 COORDINATE LISTING PROJECT: G:\SURV\965232\MAIN.PRO

Point Coordinates Listing

Point	North	East	Elev	Name
5232	2189425.31	6112971.46	336.60	TOP
5233	2189429.89	6112969.32	334.63	TOE
5234	2189419.92	6112948.99	333.81	TOE
5235	2189416.90	6112950.43	336.83	TOP
5236	2189397.70	6112912.57	335.57	TOP
5237	2189403.00	6112913.72	333.07	TOE
5238	2189403.16	6112907.28	334.59	!TOP !TOE
5239	2189440.52	6112956.74	334.12	%TOE
5240	2189434.25	6112941.09	334.15	TOE
5241	2189434.29	6112930.99	334.04	TOE
5242	2189442.67	6112926.73	333.85	TOE
5243	2189452.75	6112924.52	333.70	TOE
5244	2189457.31	6112925.53	334.85	TOE
5245	2189464.03	6112925.33	333.82	TOE
5246	2189463.12	6112945.69	333.80	!TOE
5247	2189460.24	6112928.16	335.81	%GB
5248	2189455.45	6112933.75	337.01	GB
5249	2189451.89	6112941.19	340.16	GB
5250	2189450.50	6112948.04	338.15	GB
5438	2189447.78	6112949.71	337.82	GB
5439	2189449.37	6112945.88	338.21	GB
5440	2189448.05	6112940.25	339.76	GB
5441	2189445.53	6112934.27	337.58	!GB
5442	2189444.41	6112879.14	335.16	%TOP %TOE
5443	2189441.48	6112876.25	333.03	TOE
5444	2189441.07	6112871.01	332.72	TOE
5445	2189443.67	6112867.88	332.95	TOE
5446	2189444.13	6112872.40	334.59	TOE
5447	2189448.73	6112867.58	335.84	TOP
5448	2189437.31	6112846.28	335.19	TOP
5449	2189434.42	6112843.90	335.27	TOP
5450	2189424.86	6112845.85	336.63	TOP
5451	2189420.32	6112847.70	336.46	TOP
5452	2189414.90	6112841.29	336.75	TOP
5453	2189410.80	6112839.51	336.98	TOP
5454	2189414.92	6112838.17	336.95	TOP
5455	2189425.43	6112836.19	335.28	TOP
5456	2189429.06	6112829.30	334.12	TOP
6395	2189431.82	6112849.63	332.50	TOE
8854	2189418.12	6112854.65	332.33	TOE
8855	2189404.84	6112850.36	332.20	TOE
8856	2189400.10	6112840.40	331.94	TOE
8857	2189402.62	6112829.06	331.58	TOE
8858	2189411.18	6112825.70	331.86	TOE
8859	2189421.70	6112823.96	331.79	TOE
8860	2189404.65	6112785.25	333.34	TOP
8861	2189401.36	6112787.17	330.96	TOE
8862	2189376.58	6112740.32	329.46	TOE
8863	2189380.92	6112738.00	332.54	TOP
8864	2189356.69	6112688.07	331.62	TOP
8865	2189348.60	6112683.40	331.21	TOP
8866	2189351.63	6112692.69	328.45	TOE
8867	2189346.03	6112690.03	328.41	TOE
8868	2189318.62	6112703.39	328.35	TOE
8869	2189313.28	6112709.92	328.62	TOE
8870	2189311.11	6112698.94	331.02	TOP
8871	2189302.76	6112689.96	330.83	TOP*TOE
8872	2189290.80	6112698.62	330.98	TOP*TOE

Towill, Inc.
15405 Redhill, Suite A
Tustin, Ca 92780
(714) 566-9280
Thu Aug 21 14:44:21 1997

SITE 19 COORDINATE LISTING PROJECT: G:\SURV\965232\MAIN.PRO

Point Coordinates Listing

Point	North	East	Elev	Name
8873	2189302.65	6112718.11	328.57	TOE
8874	2189299.00	6112719.87	331.36	TOP
8875	2189322.27	6112763.86	332.11	TOP
8876	2189324.29	6112762.98	329.75	TOE
8877	2189340.65	6112802.40	333.16	TOP
8878	2189344.21	6112802.83	330.58	TOE
8879	2189340.30	6112807.56	330.10	TOE
8880	2189343.82	6112815.79	330.96	TOE
8881	2189350.60	6112815.49	330.69	TOE
8882	2189332.36	6112807.64	332.95	TOP
8883	2189339.23	6112821.69	333.14	TOP
8884	2189349.70	6112818.87	332.99	TOP
8885	2189363.14	6112845.01	333.93	TOP
8886	2189365.34	6112843.98	331.76	TOE
8887	2189378.83	6112868.65	332.29	TOE
8888	2189386.97	6112871.31	332.20	TOE
8889	2189377.84	6112874.32	334.87	TOP
8890	2189391.05	6112878.58	334.60	TOP
8891	2189397.47	6112876.67	334.42	!TOP
8892	2189397.79	6112872.41	332.46	TOE
8893	2189409.10	6112873.09	332.38	!TOE
8895	2189387.71	6112850.11	332.43	19-DBMW54 4" PVC
8896	2189387.28	6112849.75	331.99	19-DBMW54 PAD
8897	2189389.86	6112848.25	331.68	GP
8898	2189384.02	6112847.83	331.54	GP
8899	2189386.36	6112852.95	331.73	GP
8900	2189385.84	6112828.63	331.35	NG
8901	2189370.11	6112782.95	330.24	SOIL BORING?
8902	2189344.02	6112741.53	329.21	NG
8903	2189391.37	6112922.31	336.31	%TOE %CLS
8904	2189401.68	6112935.12	336.52	TOE
8905	2189397.65	6112943.94	336.59	TOE
8906	2189389.58	6112946.09	336.20	TOE
8907	2189379.36	6112942.91	335.89	TOE
8908	2189378.23	6112930.69	335.70	TOE
8909	2189385.24	6112922.57	336.17	!TOE !CLS
8910	2189387.22	6112928.79	338.37	GB
8911	2189388.36	6112933.82	339.15	GB
8912	2189392.62	6112937.83	338.46	GB
8913	2189396.99	6112937.23	338.35	GB
8914	2189488.81	6112983.42	338.19	%PAD %CLS
8915	2189483.85	6112985.80	338.25	PAD
8916	2189487.10	6112992.76	338.27	PAD
8917	2189492.45	6112990.38	338.41	!PAD !CLS
8918	2189514.12	6112979.84	338.17	NG
8919	2189559.08	6112955.23	337.65	NG
8920	2189558.81	6112898.49	337.33	NG
8921	2189527.72	6112854.92	336.37	NG
8922	2189490.61	6112822.92	335.62	NG
8923	2189465.70	6112775.14	334.45	NG
8924	2189439.84	6112725.27	333.13	NG
8925	2189408.05	6112653.79	331.35	NG
8926	2189391.32	6112609.99	330.12	NG
8927	2189323.55	6112628.61	329.79	NG
8928	2189265.88	6112650.19	329.62	NG
8929	2189220.04	6112669.35	329.99	NG
8930	2189247.65	6112728.85	331.40	NG
8931	2189267.62	6112752.14	331.81	19B304

Towill, Inc.
15405 Redhill, Suite A
Tustin, Ca 92780
(714) 566-9280
Thu Aug 21 14:44:21 1997

SITE 19 COORDINATE LISTING PROJECT: G:\SURV\965232\MAIN.PRO

Point Coordinates Listing

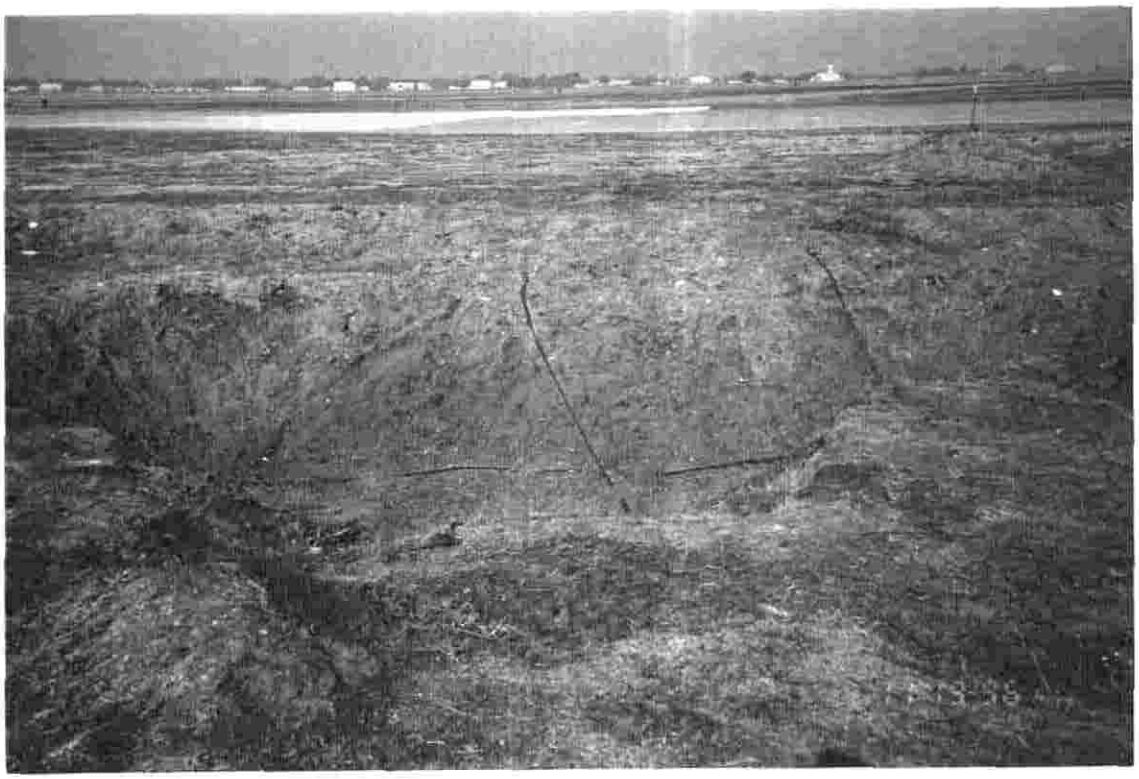
Point	North	East	Elev	Name
8932	2189269.86	6112780.84	332.38	NG
8933	2189296.30	6112827.26	333.39	NG
8934	2189321.12	6112877.07	334.10	NG
8935	2189346.19	6112924.63	335.11	NG
8936	2189369.10	6112972.79	336.43	NG
8937	2189383.79	6113006.73	337.03	NG
8938	2189398.74	6113034.65	337.67	NG
8939	2189445.61	6113012.94	337.64	NG
8940	2189472.62	6113001.31	337.36	NG
8941	2189520.39	6112930.19	337.08	%TOE %CLS
8942	2189525.58	6112914.63	337.30	TOE
8943	2189524.09	6112902.39	337.47	TOE
8944	2189512.78	6112892.37	337.24	TOE
8945	2189506.19	6112889.52	337.08	%GB*TOE
8946	2189499.52	6112897.45	337.21	GB
8947	2189491.31	6112881.48	336.74	TOE
8948	2189483.41	6112887.41	336.85	TOE
8949	2189484.81	6112898.26	336.70	TOE
8950	2189491.01	6112904.05	336.63	!GB*TOE
8951	2189496.37	6112917.70	337.46	TOE
8952	2189503.56	6112926.81	336.91	TOE
8953	2189515.07	6112931.07	336.93	!TOE !CLS
8954	2189517.84	6112925.69	338.77	%GB %CLS
8955	2189515.99	6112915.78	341.10	GB
8956	2189513.96	6112911.01	342.90	GB
8957	2189507.93	6112912.79	342.72	GB
8958	2189508.89	6112918.70	340.65	!GB !CLS
8959	2189523.87	6112924.81	337.14	%TOE
8960	2189534.46	6112926.85	337.03	TOE
8961	2189536.49	6112921.31	337.38	TOE
8962	2189533.14	6112915.83	337.49	TOE
8963	2189526.12	6112914.43	337.19	!TOE
8964	2189529.89	6112920.43	338.51	TOP
8965	2189493.82	6112892.30	339.96	%TOP %CLS
8966	2189494.36	6112889.79	339.80	TOP
8967	2189490.96	6112889.67	339.78	!TOP !CLS
8968	2189511.05	6113016.58	338.33	%891 Z %CLS Z
8969	2189439.82	6113052.82	338.55	891 Z
8970	2189507.35	6113184.21	341.32	891 Z
8971	2189578.79	6113147.93	340.94	!891 Z !CLS Z
8972	2189374.92	6113091.35	338.84	%PIPELINE
8973	2189364.71	6113100.40	339.67	%EP Z
8974	2189352.48	6113045.01	338.18	PIPELINE
8975	2189273.05	6112896.26	334.89	!PIPELINE
8976	2189255.61	6112815.41	333.73	SDMH
8977	2189181.77	6112743.44	331.65	EP Z
8978	2189168.23	6112750.08	331.82	EP Z
8979	2189163.70	6112740.06	331.59	BC
8980	2189154.79	6112707.84	330.88	POC
8981	2189156.82	6112672.60	329.96	POC
8982	2189170.48	6112643.04	329.42	POC
8983	2189195.98	6112617.48	329.07	POC
8984	2189213.20	6112607.66	329.06	POC
8985	2189238.03	6112601.44	329.03	EC
8986	2189303.84	6112601.78	329.42	EP Z
8987	2189477.08	6112605.79	331.04	BC
8988	2189523.14	6112621.62	331.72	POC
8989	2189540.76	6112638.06	332.00	EC

Towill, Inc.
15405 Redhill, Suite A
Tustin, Ca 92780
(714) 566-9280
Thu Aug 21 14:44:21 1997

SITE 19 COORDINATE LISTING PROJECT: G:\SURV\965232\MAIN.PRO

Point Coordinates Listing

Point	North	East	Elev	Name
8990	2189563.09	6112673.67	332.12	EP Z
8991	2189606.20	6112760.31	333.53	EP Z
8992	2189692.93	6112928.04	337.33	!EP Z
8993	2189507.51	6112937.87	336.89	SN
8994	2189379.40	6112916.17	335.81	SN
9051	2189259.66	6112696.19	*	RP
9052	2189251.59	6112698.46	*	RP
9053	2189245.67	6112684.61	*	RP
9054	2189472.78	6112693.24	*	RP
19293	2189464.88	6112918.05	333.45	FILLED AREA
19294	2189443.78	6112925.19	334.21	FILLED AREA
19295	2189413.05	6112934.61	333.46	FILLED AREA
19296	2189404.30	6112911.09	332.84	FILLED AREA
19297	2189407.30	6112874.79	332.48	FILLED AREA
19298	2189431.83	6112869.46	332.24	FILLED AREA
19299	2189435.56	6112895.18	332.50	FILLED AREA
19300	2189421.71	6112908.53	332.73	FILLED AREA



Photograph No. 1: IRP Site 19, Unit 2, following clearing and grubbing.

Photograph No. 2: Imported backfill material.

Photograph No. 3: Backfilling IRP Site 19, Unit 2.

Photograph No. 4: IRP Site 19, Unit 2, after site restoration.