M60050.000721
MCAS EL TORO
SSIC NO. 5090.3

Site Assessment Report

Oil/Water Separator Site 673A
Marine Corps Air Station (MCAS), El Toro, California

12 April 1999

Prepared by
Southwest Division, Naval Facilities Engineering Command
BRAC Operations Office
San Diego, California

SOUTHWESTNAVFACENGCOM
CODE 56MC.LMH
1401 KETTNER BLVD, SUITE 507
SAN DIEGO, CA 92101
Telephone: (619) 532-4162; FAX (619) 532-4160

File: 244LTR2.DOC

TRANSMITTAL

Date: 12 April 1999

From: Lynn Marie Hornecker

To: Major Matthews (MCAS El Toro)

Subj: Site Assessment Report, Oil/Water Separator (OWS) Site 673A
Marine Corps Air Station, El Toro (SWDIV, April 1999)

The purpose of this transmittal is to provide you with copies of the subject Site Assessment Report for OWS Site 673A located in the southeastern section of the Marine Corps Air Station, El Toro. OWS 673A was identified as Solid Waste Management Unit (SWMU) 179 during the Resource Conservation and Recovery Act Facility Assessment.

We collected soil samples from four borings located adjacent to OWS 673A (also known as SWMU 179) and we have not found evidence of a significant release of petroleum hydrocarbons. Motor oil was identified at a maximum concentration of 420 milligrams per kilogram in one sample collected at a depth of approximately 14 feet. Benzene and Methyl Tertiary Butyl Ether (MTBE) were not detected at or above laboratory detection limits in any of the samples. The release of petroleum hydrocarbons appears to be limited to an area approximately 10 feet wide by 10 feet long by 20 feet deep. Ground water is located at approximately 155 feet below ground surface at OWS Site 673A, and the residual petroleum hydrocarbons are not anticipated to pose a significant risk to ground water quality. Due to the proximity of nearby subsurface utility conduits and structures, we have abandoned OWS 673A in place by filling the tank with a cement slurry.

Due to the absence of evidence of a significant release of petroleum hydrocarbons and the completion of the field activities to close OWS 673A in place, it is recommended that the Station request closure of this site from the Regional Water Quality Control Board, Santa Ana Region.

Please do not hesitate to call me at (619) 532-4162 if you have questions pertaining to this project. Thank you very much.

Atch
Site Assessment Report, OWS Site 673A

CF:
Project File (RAC I DO #112)

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

IN REPLY REFER TO:
6284F
1AU-ELT

20 APR 1999

California Regional Water Quality Control Board
Santa Ana Region
Attention: Ms. Patricia Hannon
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Dear Ms. Hannon:

We are requesting permanent closure of oil water separator (OWS) site 673A at Marine Corps Air Station El Toro.

The enclosed Site Assessment Report provides supporting documentation for permanent closure including a summary of record search and field verification activities and results of soil sampling. We believe that the results will satisfy the Regional Water Quality Control Board that no further action is necessary for former oil water separator sites 673A.

Please contact Maj. Jeff Matthews at (949)726-6607 if you have any questions.

Sincerely,

MICHAEL A. CARR
Deputy Assistant Chief of Staff
Environment and Safety
By direction of
the Commanding Officer

Encl:
(1) Site Assessment Report for former OWS 673A

Copy to:
Orange County Health Care Agency,
Environmental Health Division w/o encl
L. Hornecker, SWDIV w/o encl
S. Kehe, ROICC w/o encl

TABLE OF CONTENTS

Section		*Page*
1	**Introduction**	1
2	**Field Activities and Previous Investigations**	1
3	**Conclusions and Recommendations**	5
4	**References**	6
Table 1.	Summary of Analytical Test Results for OWS Site 673A	9

Figures

Figure 1. Vicinity Map
Figure 2. Tentative Reuse Parcel Locations
Figure 3. Sample Locations
Figure 4 Conceptual Site Model

Appendices

A Site Verification Information
Site Photographs
Various Exhibits
Chain of Custody Documentation, Laboratory Test Reports, etc.)
B Historical Records from Previous Investigations

Section 1
Introduction

The purpose of this Site Assessment Report is to present information pertaining to the investigation of Oil/Water Separator (OWS) Site 673A at the former Ground Support Equipment Shop (Building 673) at the Marine Corps Air Station (MCAS), El Toro. The oil/water separator, identified as Solid Waste Management Unit (SWMU) Number 179 during the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA), has been taken out of service and is being closed in place. A release of petroleum hydrocarbons was identified during the field sampling activities, and the maximum petroleum hydrocarbon concentration of 420 milligrams per kilogram (as motor oil) was identified at a depth of approximately 14 feet below ground surface. The release appears to be limited to a vertical extent of approximately 20 feet and an areal extent of approximately 400 square feet. This report also includes a brief discussion of the information collected during previous investigations and a recommendation that closure be requested for this unauthorized release.

The Marine Corps Air Station, El Toro, also known as the Station, comprises approximately 4,700 acres and is located in eastern Orange County approximately 45 miles southeast of Los Angeles, California. Building 673 and the adjacent OWS Site 673A are located near El Toro Boulevard and East Marine Way as shown on Figure 1.

The Station is preparing for closure in July 1999 in accordance with the Base Closure and Realignment Act of 1993 (BRAC III). OWS Site 673A is located within a seven-acre parcel identified for future use by the Irvine Ranch Water District according to the El *Toro Community Reuse Plan, 1997 Working Map, Land Uses/Conveyances* (County of Orange, 1997) as shown on Figure 2. The County of Orange issued *The Airport and Open Space Plan* (also known as Concept C) in August 1998, and this plan identifies the area surrounding OWS Site 673A as an airline or airport maintenance area as shown on the exhibit in Appendix A.

Section 2
Field Activities and Previous Investigations

OWS Site 673A is located near the southwest corner of Building 673 near the equipment washrack. The BRAC Cleanup Plan (BCP) indicates that the OWS was installed in approximately 1982. Equipment maintenance operations at Building 673 were discontinued in 1998 in preparation for Station closure. OWS 673A, an underground concrete tank with an estimated capacity of 895 gallons (approximate

dimensions: 95 inches by 52 inches by 48 inches), was part of the equipment washrack facility. OWS 673A was a three-stage gravity oil/water separator. Waste liquids were discharged from the washrack through OWS 673A to the sanitary sewer. Photographs of the site are provided in Appendix A and a construction drawing of the OWS is presented in Appendix B.

Nearby Environmental Locations of Concern
The former hazardous waste storage area at Building 673-T3 is located adjacent to and southwest of Building 673. The former hazardous waste storage area achieved regulatory closure by the State of California, Department of Toxic Substances Control in 1996.

The environmental location of concern, MSC D1 (the Desert Storm Staging Area), is located northeast of OWS 673A and is tentatively scheduled for field work in 1999.

A *suspected* underground storage tank (UST) 673B was reported to be located adjacent to OWS 673A, however, this UST was designated a *phantom* site and was deleted from the BRAC Cleanup Plan Update of 1999 based upon visual inspections and information from historical construction plans.

2.1 Tank Abandonment and Site Verification Activities

Tank Abandonment
Due to the proximity of existing underground utilities and the adjacent washrack structure, it was determined that excavation and removal of OWS 673A was not practicable. OWS 673A was filled with cement slurry in December 1998 in order to prepare for site verification activities and closure in place.

The liquid contents of the tank and rinsate (approximately 1,600 gallons) were removed by Geofon under Navy Contract N68711-97-D-8702, Delivery Order 19 in December 1998. Waste liquids, characterized as non-RCRA hazardous waste liquids (oily water), were transported to an off-site facility (Demenno Kerdoon of Compton, California) for treatment. Following the removal of liquids, the tank was filled with approximately eight (8) cubic yards of cement slurry to prevent future use. Extracts from the field report are presented in Appendix A.

Site Verification Activities
Site verification activities were conducted by OHM Remediation Services Corporation under Navy Contract N68711-93-D-1459, DO #112 in March 1999. Sampling activities were conducted in accordance with the procedures identified in the *Draft Work Plan, Remediation of Various Underground Storage Tanks at the Marine Corps Air Station, El Toro* (OHM, 1995). A geophysical survey was

conducted prior to beginning the field sampling activities, and the results of the survey are presented in Appendix A. The geophysical survey confirmed that only one underground tank (OWS 673A) is located at the site.

Historical construction as-built drawings (circa 1985) indicate that a former industrial waste receptor was removed from the site prior to installation of OWS 673A. The as-built drawings indicate that contaminated soil (a volume approximately 20 feet wide by 20 feet long by 16 feet deep) was removed prior to the installation of OWS 673A. The drawings also indicate that the excavation was partially filled with asphalt pavement and soil prior to installation of OWS 673A. The presence of the subsurface asphalt pavement impeded the collection of samples from areas immediately adjacent to OWS 673A, and the boring 673A SB-03 was placed approximately 20 feet north-northwest of the edge of the tank in order to avoid the subsurface pavement.

Soil samples were analyzed by United States Environmental Protection Agency (EPA) Method 8015 Modified for total petroleum hydrocarbons (diesel and motor oil) and by EPA Method 8260 for methyl-tert butyl ether (MTBE), benzene, toluene, ethylbenzene, xylenes (BTEX compounds), and other volatile organic compounds. Test results are summarized in Table 1 and laboratory reports are presented in Appendix A. Sample locations are shown on Figure 3.

Nine (9) soil samples were collected from three borings near OWS Site 673A, and petroleum hydrocarbons as diesel and motor oil (diesel with hydrocarbons in the C_{26} to C_{28} range and diesel/JP-5 mixture) were detected at concentrations from 50 to 420 milligrams per kilogram. BTEX compounds, MTBE, trichloroethylene, and tetrachloroethylene were not detected at or above laboratory reporting limits in samples collected from the three borings. Two of the borings were advanced with a hand-auger, and one of the borings was advanced with a limited-access drilling rig.

Boring 673A-HA-01 was advanced to a depth of approximately 14.5 feet with a hand-auger, and samples were collected from depths of 10 feet and 14 feet. Petroleum hydrocarbons as diesel and motor oil were reported at maximum concentrations of 160 and 265 milligrams per kilogram, respectively. Boring 673A-HA01 was located within approximately 5 feet of the northeast end of the oil/water separator.

BTEX compounds and MTBE were not detected at or above laboratory reporting limits. Volatile organic compounds, with the exception of acetone and 2,butanone, were not detected at or above laboratory reporting limits. The acetone and 2,butanone detections are believed to be laboratory contaminants.

Boring 673A-HA02 was advanced to a depth of approximately 14.5 feet with a hand-auger, and samples were collected from depths of 13 feet and 14 feet. Petroleum hydrocarbons as diesel and motor oil were reported at maximum concentrations of 260 and 420 milligrams per kilogram, respectively. Boring 673A-HA02 was located within approximately 5 feet of the northwest end of the oil/water separator.

BTEX compounds and MTBE were not detected at or above laboratory reporting limits. Methylene chloride was reported in the 14-foot samples, however, it is considered a potential laboratory contaminant.

Boring 673A-SB-03 was advanced to a depth of approximately 40 feet with a limited-access drilling rig, and samples were collected from depths of approximately 10 feet, 21 feet, 31 feet, 41 feet, and 41.5 feet (field duplicate). Petroleum hydrocarbons, BTEX compounds, and MTBE were not detected at or above laboratory reporting limits. Boring 673ASB-03 was advanced approximately twenty (20) feet north-northwest of the northwest end of the oil/water separator. Subsurface soils were identified as silty sands and sandy clays.

Borings were filled with cement bentonite grout following the collection of soil samples and boring locations were identified by a land surveyor.

2.2 Resource Conservation and Recovery Act (RCRA) Facility Assessment

OWS 673A was identified as Solid Waste Management Unit (SWMU) 179 during the Resource Conservation and Recovery Act Facility Assessment (RFA). The RFA included a visual site inspection in May 1991 and a sampling visit in 1992. Five (5) soil samples were collected from a twenty-five foot deep boring – Boring 179B1 – located on the northwest side of OWS 673A. Samples were collected from depths of 5 feet, 10 feet, 15 feet, 20 feet, and 25 feet for analysis by EPA Method 418.1 (Total Recoverable Petroleum Hydrocarbons (TRPH)), and TRPH was not detected at or above laboratory reporting limits. Toluene and carbon tetrachloride were identified at estimated concentrations of 6 micrograms per kilogram (qualified "J") and 2 micrograms per kilogram (qualified "J") at a depth of 15 feet below ground surface. Selected results from the sampling activities at SWMU 179 are presented in Table 1. Subsurface soils were identified as clay with sand, silt, and silty sand.

Results of the RFA were published in the *Installation Restoration Program, Final Resource Conservation and Recovery Act Facility Assessment Report for Marine Corps Air Station, El Toro, California* (Jacobs Engineering Group, 1993), and extracts from the RFA documentation are included in Appendix B.

2.3 Ground Water Conditions

Ground water conditions were investigated in the vicinity of OWS Site 673A during the Remedial Investigation of Installation Restoration Program (IRP) Site 19 - the Aircraft Expeditionary Refueling (ACER) Site. The location of OWS 673A relative to the nearest monitoring well for IRP Site 19 is shown in an exhibit in Appendix A. IRP Site 19 achieved no further action status when the Comprehensive Environmental Response, Compensation, and Liability Act Record of Decision was signed in September 1997 (USMCAS El Toro, 1997).

One monitoring well, 19_UGMW35, is located approximately 2,400 feet west-northwest of and approximately downgradient of OWS Site 673A. Ground water is located approximately 145 feet below ground surface based upon measurements at this well. Trichloroethylene (TCE) and tetrachloroethylene (PCE) were detected at low concentrations (less than 5 micrograms per liter) in water samples collected from Well 19_UGMW35 during one or more sampling events. Ground water quality information and water level measurements are presented in Appendix B.

One monitoring well, T390 MW-03, for the underground storage tank program is located approximately 300 feet east-southeast of OWS 673A. T390 MW-03 was constructed and monitored during the investigation of former UST Sites 390A and 390B, and ground water is located approximately 160 feet below ground surface. Petroleum hydrocarbons have not been detected in samples collected from well T390 MW-03.

The depth to ground water at OWS Site 673A is estimated at approximately 155 feet below ground surface based upon the water level measurements at nearby wells T390 MW-03 and 19_UGMW35. The nearest agricultural production well, TIC-55, is located more than 8,000 feet west-northwest of OWS Site 673A. A conceptual site model of OWS Site 673A is shown on Figure 4.

Section 3
Conclusions and Recommendations

The following conclusions and recommendations are based upon information from the recently completed field investigations and historical information:

- Ground support equipment maintenance activities at the Building 673 washrack were discontinued in 1998, and liquid wastes are no longer discharged from the washrack through OWS 673A to the sanitary sewer. OWS 673A has been filled

with cement slurry to prevent future use and the washrack has been taken out of service in preparation for Station closure.

- Benzene was not detected at or above laboratory reporting limits in five (5) samples collected from a soil boring adjacent to OWS Site 673A during the RFA.
- Nine (9) samples were collected from three shallow borings during 1999. Benzene and MTBE were not detected at or above laboratory reporting limits. Petroleum hydrocarbons as diesel and motor oil were detected at concentrations from 55 to 420 milligrams per kilogram at depths from 10 to 14 feet below ground surface. Based upon the results of samples from three soil borings, the release appears to consist of diesel to motor oil range hydrocarbons and the release is limited to an area of approximately 20 feet by 20 feet by 20 feet deep.
- Groundwater quality, based upon monitoring information from a downgradient well, does not appear to have been impacted by releases from OWS Site 673A, and the low residual concentrations of petroleum hydrocarbons at OWS Site 673A are not anticipated to pose a significant risk to ground water quality.

Based upon the absence of evidence of a significant release of petroleum hydrocarbons to the vadose zone at OWS Site 673A, the absence of benzene and MTBE in the residual petroleum hydrocarbons, and the completion of the field activities to inspect and close the OWS unit in place, it is recommended that the Station request closure of OWS Site 673A (also known as SWMU 179) from the Regional Water Quality Control Board, Santa Ana Region.

Section 4
References

Bechtel National, Incorporated. 1997. Draft Final Phase II Remedial Investigation Report, Operable Unit 3A, Marine Corps Air Station, El Toro, California. [Navy Contract N68711-92-D-4670, Contract Task Order 79]

CDM Federal Programs Corporation. 1998. Final Groundwater Monitoring Report, October 1997 Sampling Round, Groundwater Monitoring Program for Marine Corps Air Station, El Toro. March. [Navy Contract N68711-96-D-2029, Delivery Order 5]

County of Orange. 1997. Alternative A, El Toro Community Reuse Plan, 1997 Working Map, Land Uses/Conveyances, Gross Acres. [Prepared by P&D Consultants for the County of Orange, March 1997.]

County of Orange. 1998. The Airport and Open Space Plan, Year 2020, Concept C [El Toro Reuse Plan]. August.

Department of the Navy, Naval Facilities Engineering Command, Western Division. 1981. Marine Corps Air Station, El Toro, Industrial Waste Collection Improvements, Plan and Detail, Site No's 11 & 12, Sheet C-8. [Navy Contract N62474-80-C-9175 (record drawing stamped 1985)]

Department of the Navy, Naval Facilities Engineering Command, Western Division. Circa 1985. Marine Corps Air Station, El Toro, Industrial Waste Collection Improvements, Historical Mechanical Drawing. [As-built construction drawing]

Geofon, Incorporated. 1999. Summary Report, Closure in Place of OWS 673A and Washrack Repairs at Buildings 386 and 761, Marine Corps Air Station, El Toro, California. February. [Navy Contract N68711-97-D-8702, Delivery Order 19]

Idaho National Engineering Laboratory (INEL). 1990. USMC MCAS El Toro Underground Storage Tank Survey Report. DE-AC07-76ID01570.

Jacobs Engineering Group (JEG). 1993. Installation Restoration Program, Final Resource Conservation and Recovery Act Facility Assessment Report for Marine Corps Air Station, El Toro, California. [Navy Contract N68711-89-D-9296, Contract Task Order 193]

Law/Crandall, Incorporated (LCI). 1993. Oil/Water Separator Survey, El Toro Marine Corps Air Station, El Toro, California for Department of the Navy, Southwest Division, Naval Facilities Engineering Command, IQ Contract No. 68711-92-D-4652, Delivery Order No. 001 (Law/Crandall, Incorporated (LCI), April.

OHM Remediation Services Corporation. 1999. Technical Information Package, OWS Site 673A. [package includes analytical data, land survey data, geophysical survey data]

OHM Remediation Services Corporation. 1997. Technical Memorandum, Groundwater Monitoring Report, Petroleum Storage Facilities at Various Locations. November. [Navy Contract N68711-93-D-1459, DO #50]

OHM Remediation Services Corporation. 1995. Draft Work Plan, Remediation of Various Underground Storage Tanks at the Marine Corps Air Station, El Toro. [Navy Contract N68711-93-D-1459, Delivery Order 24]

United States Marine Corps Air Station, El Toro. 1997. Proposed Plan, Operable Units 2A and 3A, Eleven No Further Action Sites, Marine Corps Air Station, El Toro, California. June 1997.

United States Marine Corps Air Station, El Toro. 1997. Draft Final Record of Decision, Operable Units 2A and 3A, No Action Sites, Marine Corps Air Station, El Toro, California. September.

United States Marine Corps Air Station, El Toro. 1998. Proposed Plan, Closure of Inactive Landfills at Marine Corps Air Station, El Toro, California. May.

United States Marine Corps Air Station, El Toro. 1999. Base Realignment and Closure (BRAC) Cleanup Plan.

United States Marine Corps Air Station, El Toro. 1998. Extracts from OWS maintenance service contract.

TABLE 1. Summary of Analytical Test Results for OWS Site 673A

Marine Corps Air Station, El Toro

Soil Boring and/or Sample Number	Sample Depth (Feet Below Ground Surface)	Northing (feet) [North American Datum (NAD 83)]	Easting (feet) [North American Datum (NAD 83)]	Total Petroleum Hydrocarbons (TPH) (milligrams/ Kilogram) [EPA Method 8015 Modified or other method, as noted]	Benzene (B), Toluene (T), Ethylbenzene (E), Xylenes (X), and Methyl Tertiary Butyl Ether (MTBE) [EPA Method 8260] (all concentrations in milligrams/kilogram)
Site Verification Activities of March 1999 **Boring 673A-HA01 [673-SB-01]** Sample 20242-712	10	2189028.45	6115688.25	TPH-Diesel: 55 TPH-motor oil: 200 [b]	BTEX: ND MTBE: ND
Boring 673A-HA01 Sample 20242-713	14	"	"	TPH-Diesel: 160 [a] TPH-motor oil: 265 [b]	BTEX: ND MTBE: ND Note: acetone and 2-butanone were detected.
Boring 673A-HA02 [673-SB-02] Sample 20242-714	13	2189023.76	6115680.86	TPH-Diesel: 150 [a] TPH-motor oil: 220 [b]	BTEX: ND MTBE: ND
Boring 673A-HA02 Sample 20242-715	14	"	"	TPH-Diesel: 260 [a] TPH-motor oil: 420 [b]	BTEX: ND MTBE: ND Note: Methylene Chloride was detected.
Boring 673A-SB03 Sample 20242-745	10	2189037.38	6115674.38	TPH-Gasoline: ND TPH-Diesel: ND TPH-motor oil: ND	BTEX: ND MTBE: ND
Boring 673A-SB03 Sample 20242-746	21	"	"	TPH-Gasoline: ND TPH-Diesel: ND TPH-motor oil: ND	BTEX: ND MTBE: ND
Boring 673A-SB03 Sample 20242-747	31	"	"	TPH-Gasoline: ND TPH-Diesel: ND TPH-motor oil: ND	BTEX: ND MTBE: ND
Boring 673A-SB03 Sample 20242-748	41	"	"	TPH-Gasoline: ND TPH-Diesel: ND TPH-motor oil: ND	BTEX: ND MTBE: ND
Boring 673A-SB03 Sample 20242-749	41.5	"	"	TPH-Gasoline: ND TPH-Diesel: ND TPH-motor oil: ND	BTEX: ND MTBE: ND

Explanation:

[a] Result included some unknown peaks at about $C_{26} - C_{28}$ range.

[b] Mixture of compounds in the JP-5/diesel range.

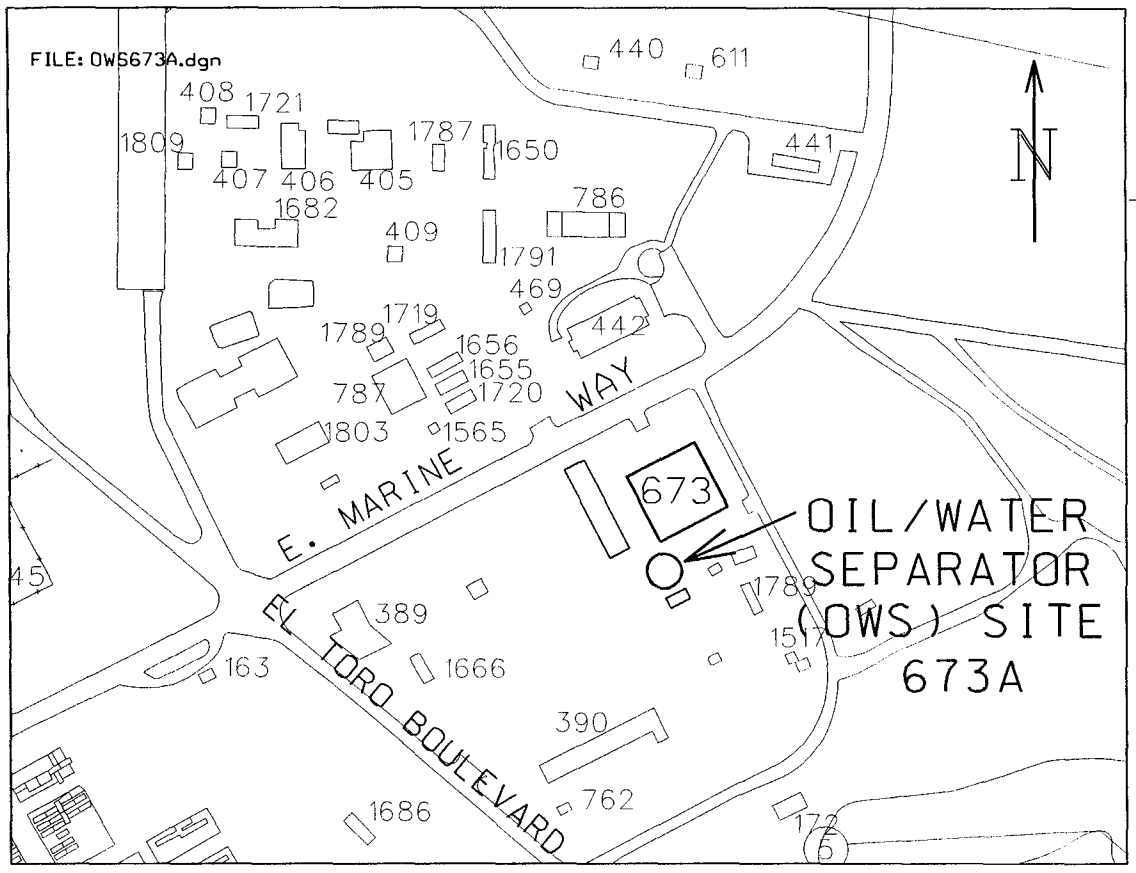
ND Not detected at or above the laboratory reporting limit.

TABLE 1 (continued)

Soil Boring and/or Sample Number	Sample Depth (Feet Below Ground Surface)	Northing (feet) [North American Datum (NAD 83)]	Easting (feet) [North American Datum (NAD 83)]	Total Petroleum Hydrocarbons (TPH) (milligrams/ Kilogram) [EPA Method 8015 Modified or other method, as noted]	Benzene (B), Toluene (T), Ethylbenzene (E), Xylenes (X), and Methyl Tertiary Butyl Ether (MTBE) [EPA Method 8260 or other method] (all concentrations in milligrams/kilogram)
RFA Sampling Visit of 1992 SWMU 179 B1	5	Not available-locations estimated	Not available-locations estimated	TRPH by EPA METHOD 418.1: ND	BTEX: ND
SWMU 179 B1	10	"	"	TRPH by EPA METHOD 418.1: ND	BTEX: ND
SWMU 179 B1	15	"	"	TRPH by EPA METHOD 418.1: ND	BEX: ND T: 0.006 "J" CCl_4: 0.002 "J"
SWMU 179 B1	20	"	"	TRPH by EPA METHOD 418.1: ND	BTEX: ND
SWMU 179 B1	25	"	"	TRPH by EPA METHOD 418.1: ND	BTEX: ND

Note: The RFA Sampling Visit results for SWMU 179 identified acetone and methylene chloride at low levels in the field samples; the compounds were also present in the laboratory blanks.

Figures



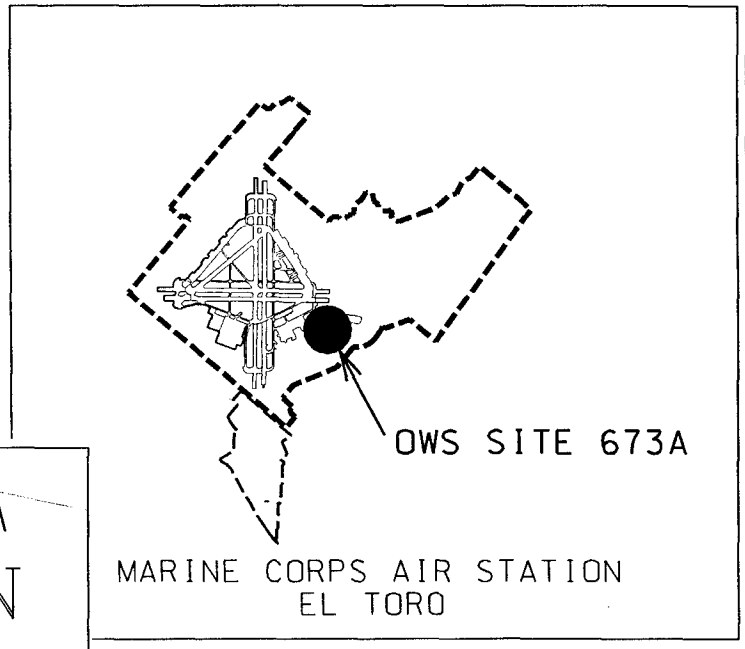
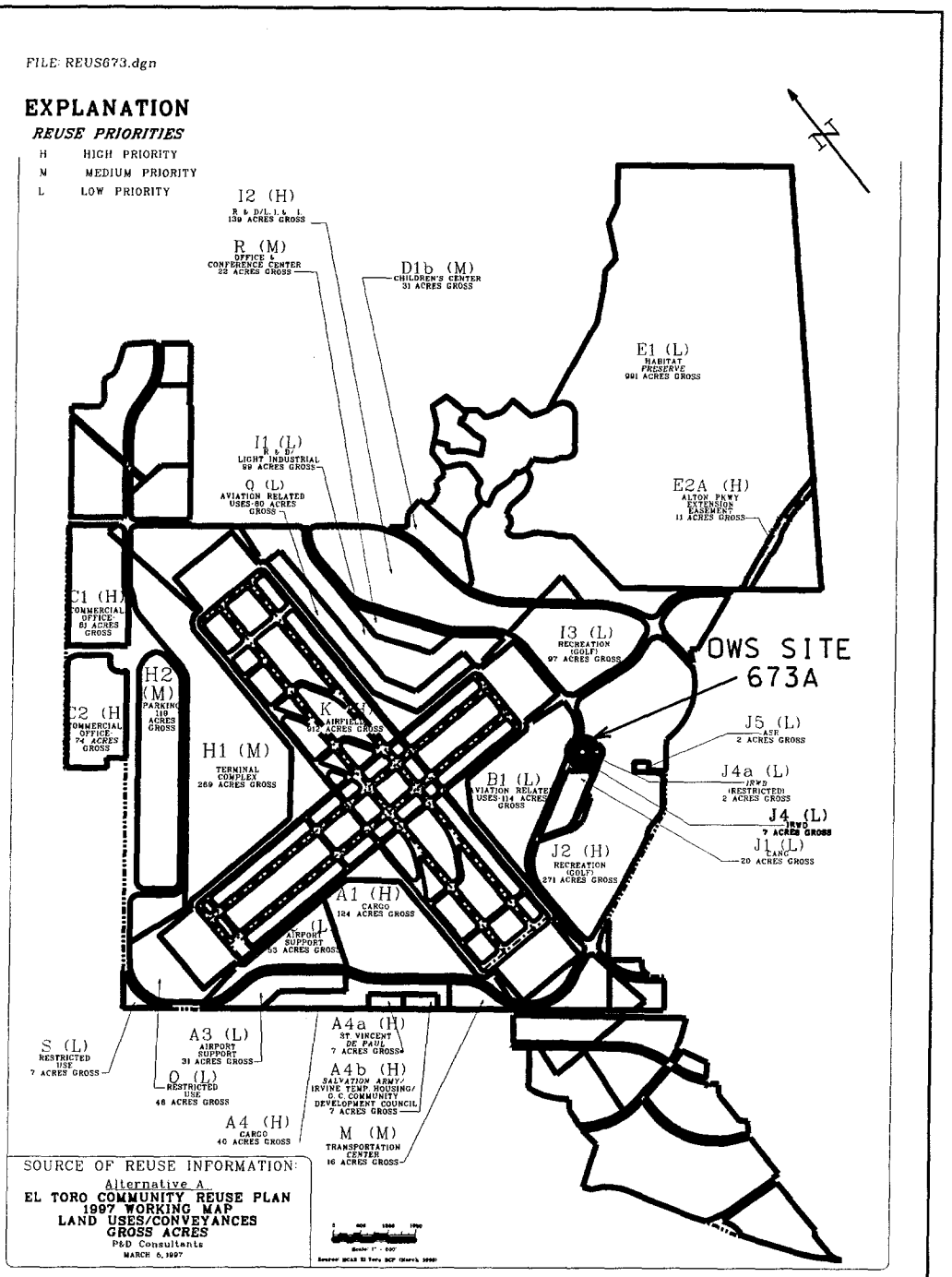


Figure 1.

OIL/WATER SEPARATOR (OWS) SITE 673A

VICINITY MAP

MARINE CORPS AIR STATION, EL TORO



SOURCE: COUNTY OF ORANGE, 1997

Figure 2.

OIL/WATER SEPARATOR (OWS) SITE 673A

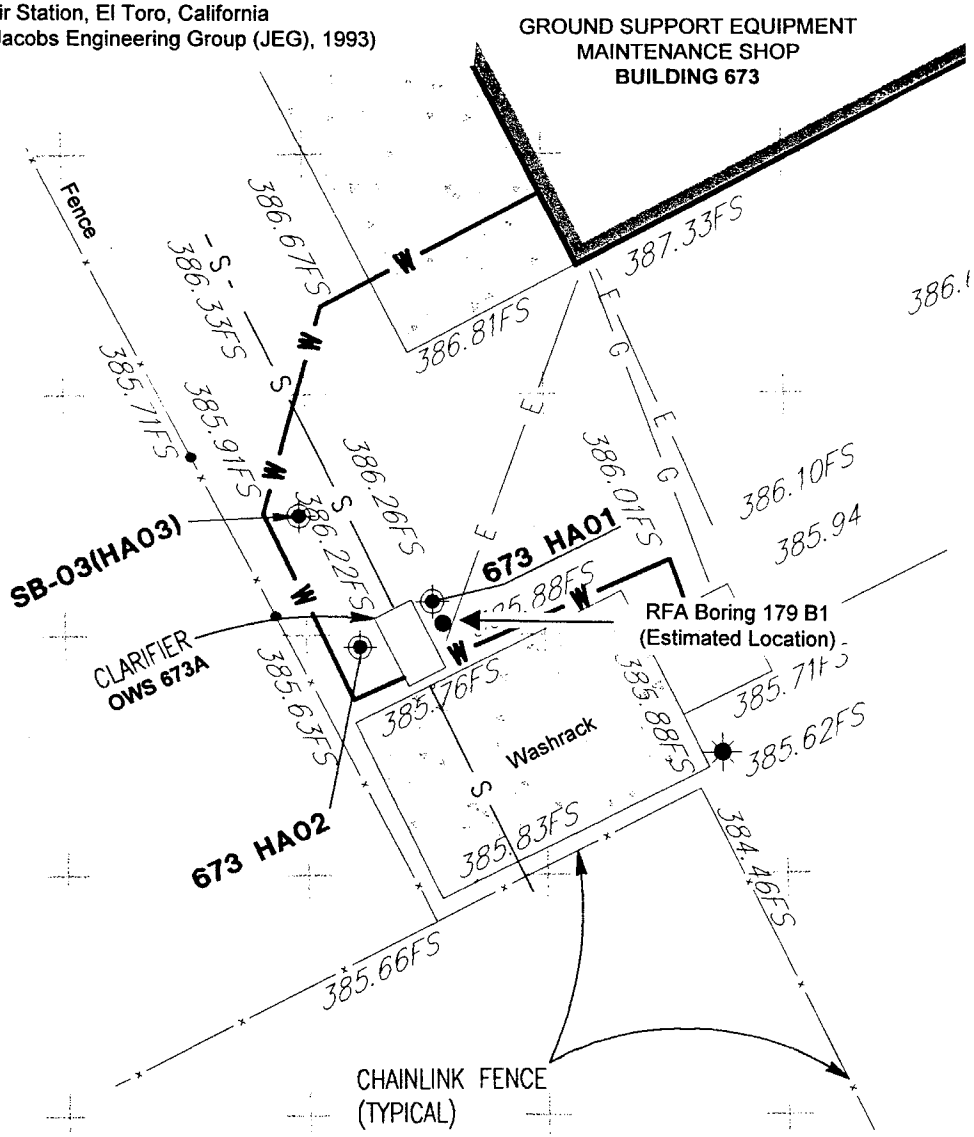
TENTATIVE REUSE PARCEL LOCATIONS

MARINE CORPS AIR STATION, EL TORO

Sources of Map Information:

- Technical Information Package (OHM, 1999)
- Installation Restoration Program,

Final Resource Conservation and Recovery Act Facility Assessment Report for Marine Corps Air Station, El Toro, California (Jacobs Engineering Group (JEG), 1993)



LEGEND

●	SAMPLE POINTS
FL	FLOW LINE
FS	FINISH SURFACE
— G —	GEOPHYSICAL LINE (GAS)
— W —	GEOPHYSICAL LINE (WATER)
— E —	GEOPHYSICAL LINE (ELEC.)
— S —	GEOPHYSICAL LINE (SEWER)

Graphic Scale

20 0 10 20 40

(In Feet)

Figure 3.

OIL/WATER SEPARATOR (OWS) SITE 673A

SAMPLE LOCATIONS

MARINE CORPS AIR STATION, EL TORO

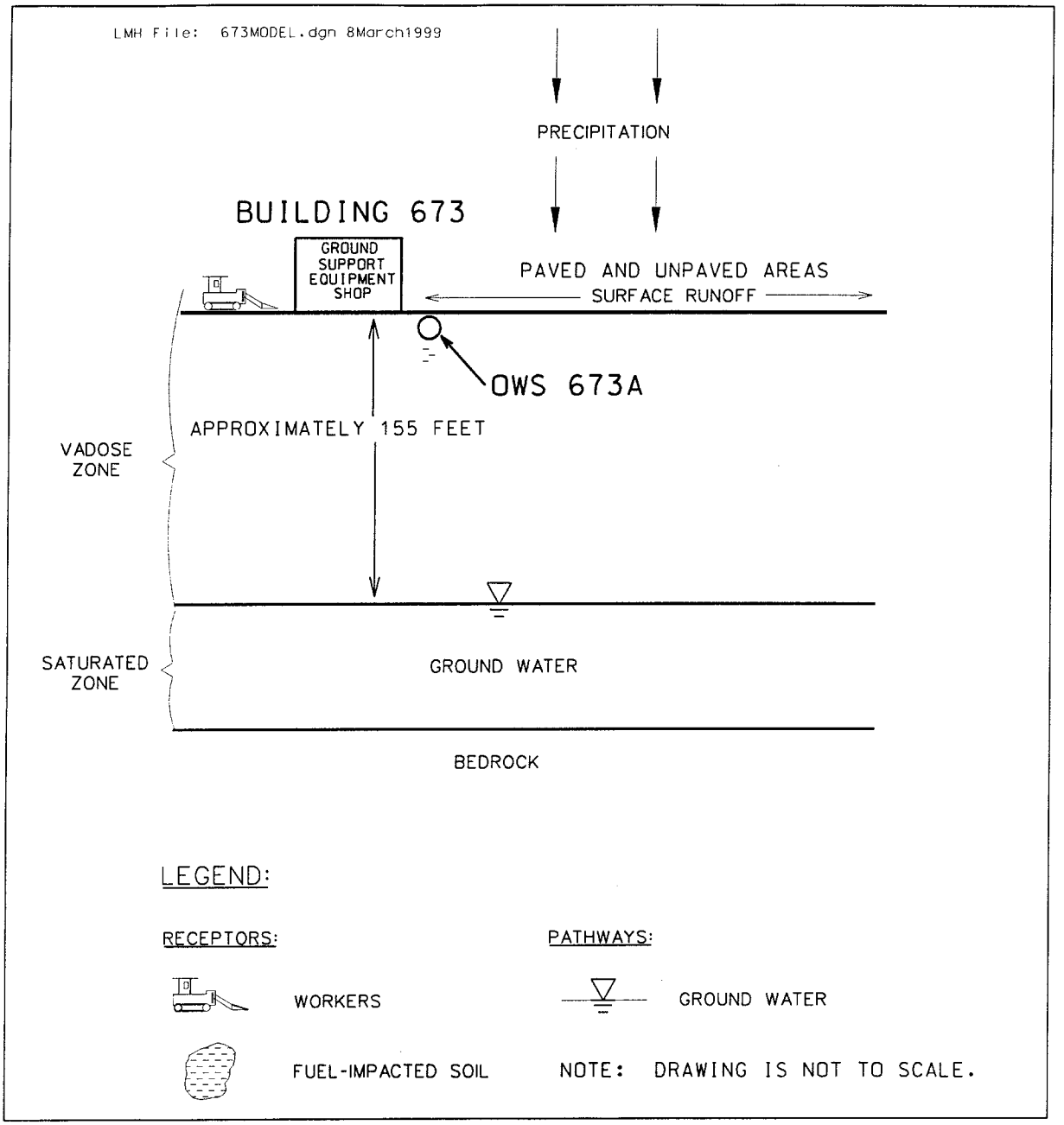


Figure 4.

OIL/WATER SEPARATOR (OWS) SITE 673A

CONCEPTUAL SITE MODEL

MARINE CORPS AIR STATION, EL TORO

Appendices

Appendix A

Site Verification Information

- Site Photographs
- Various Exhibits (location maps)
- Site Verification Information (chain of custody documentation, laboratory test results, geophysical survey results, boring locations)

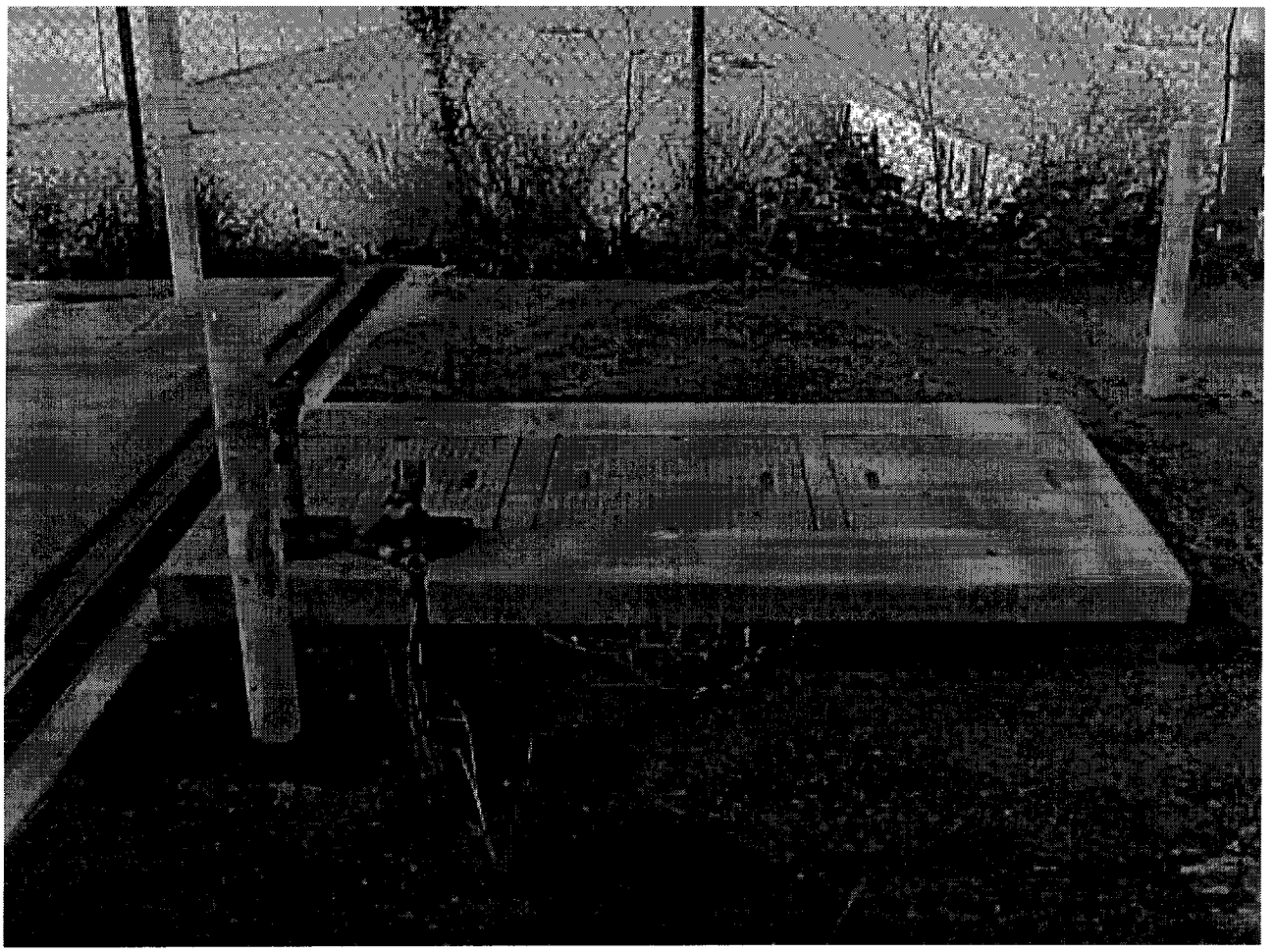
M60050.000721
MCAS EL TORO
SSIC # 5090.3

SITE PHOTOGRAPHS

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

Photograph 1. Oil/Water Separator (OWS) Site 673A
Marine Corps Air Station, El Toro



Photograph 2. Oil/Water Separator (OWS) Site 673A
Marine Corps Air Station, El Toro

VARIOUS EXHIBITS (LOCATION MAPS)

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

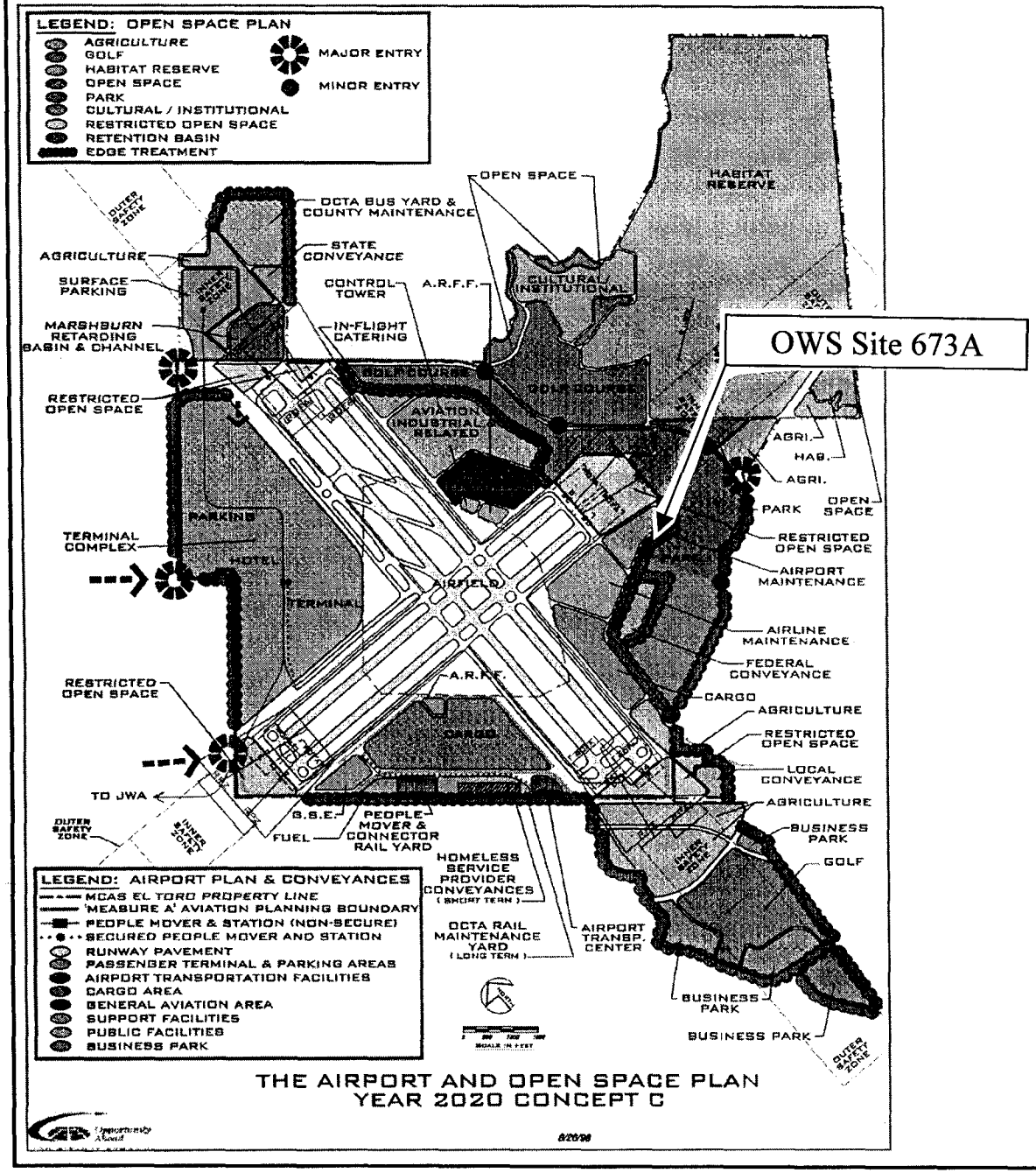


Exhibit A-1.

OIL/WATER SEPARATOR (OWS) SITE 673A

CONCEPT C REUSE PARCEL LOCATIONS

MARINE CORPS AIR STATION, EL TORO

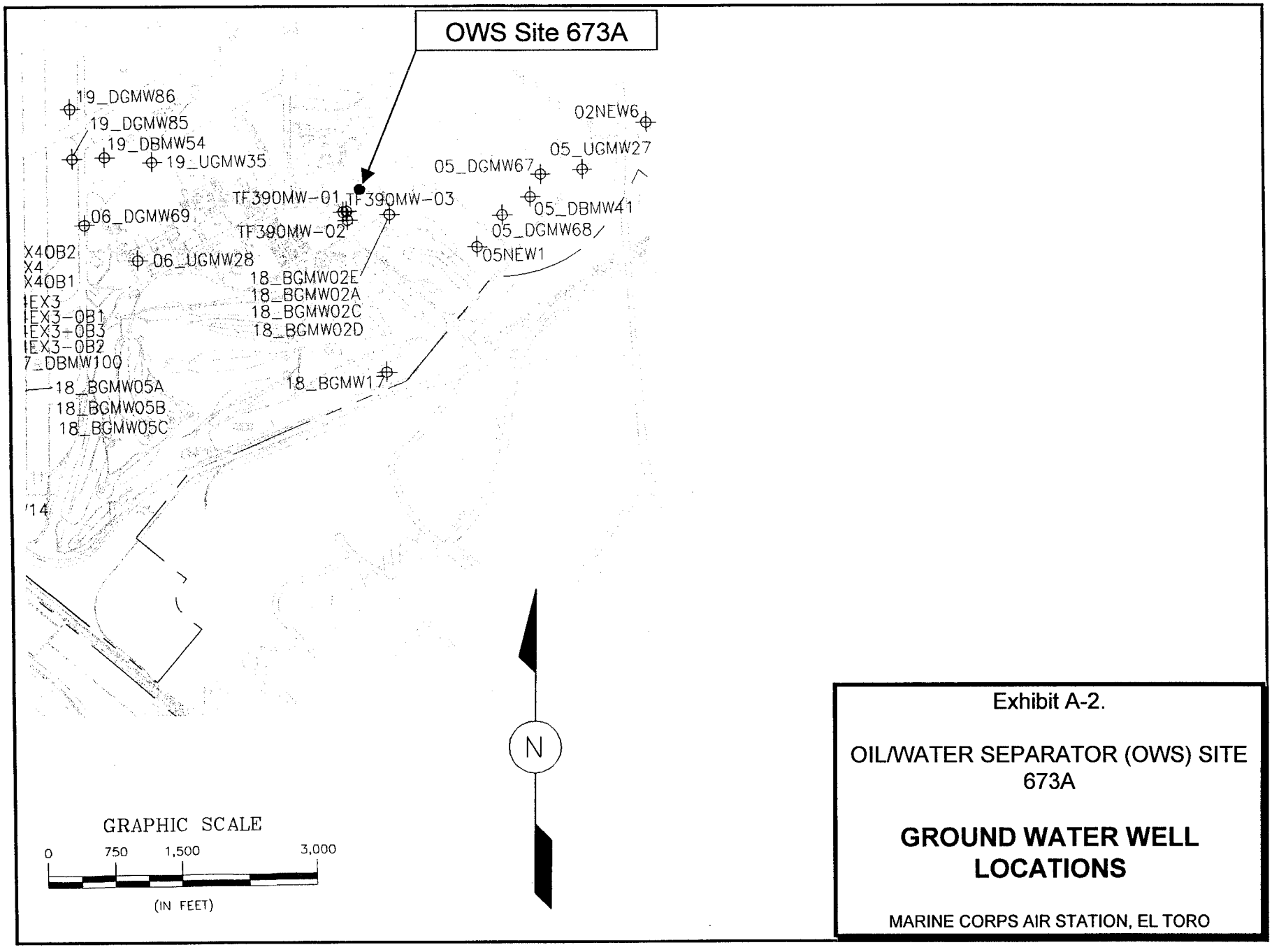


Exhibit A-2.

OIL/WATER SEPARATOR (OWS) SITE 673A

GROUND WATER WELL LOCATIONS

MARINE CORPS AIR STATION, EL TORO

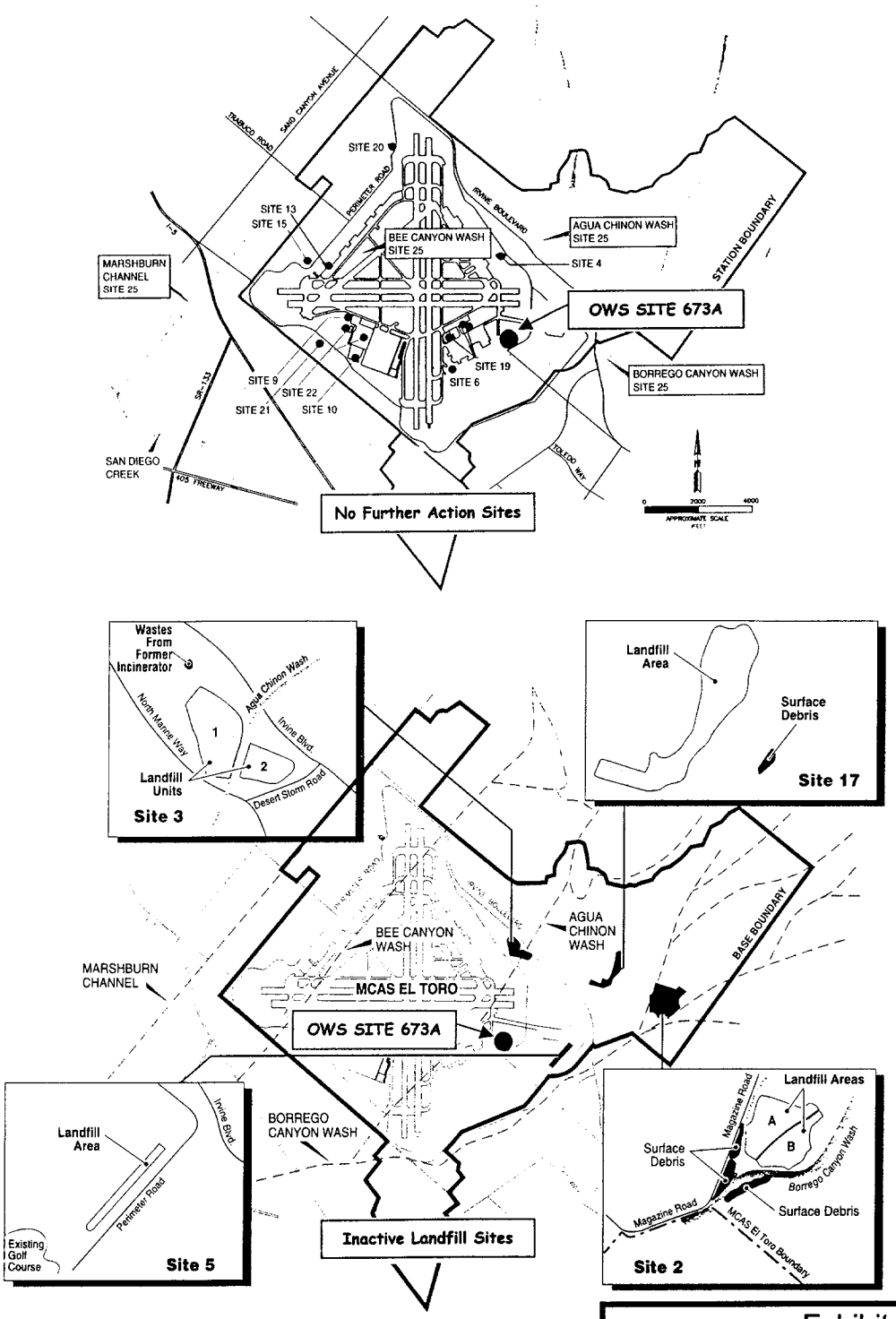


Exhibit A-3.

OIL/WATER SEPARATOR (OWS) SITE 673A

NEARBY ENVIRONMENTAL LOCATIONS OF CONCERN

MARINE CORPS AIR STATION, EL TORO

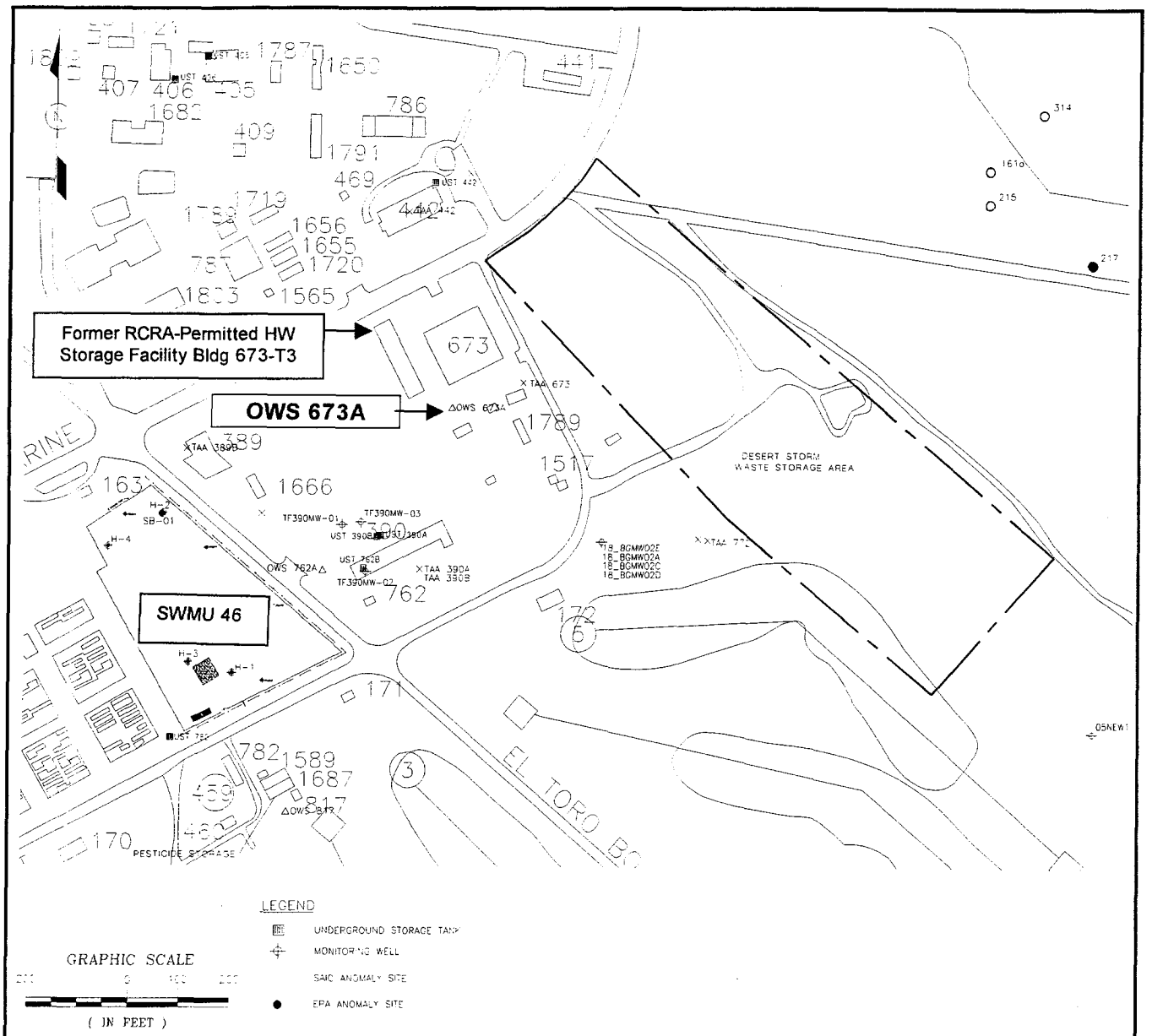
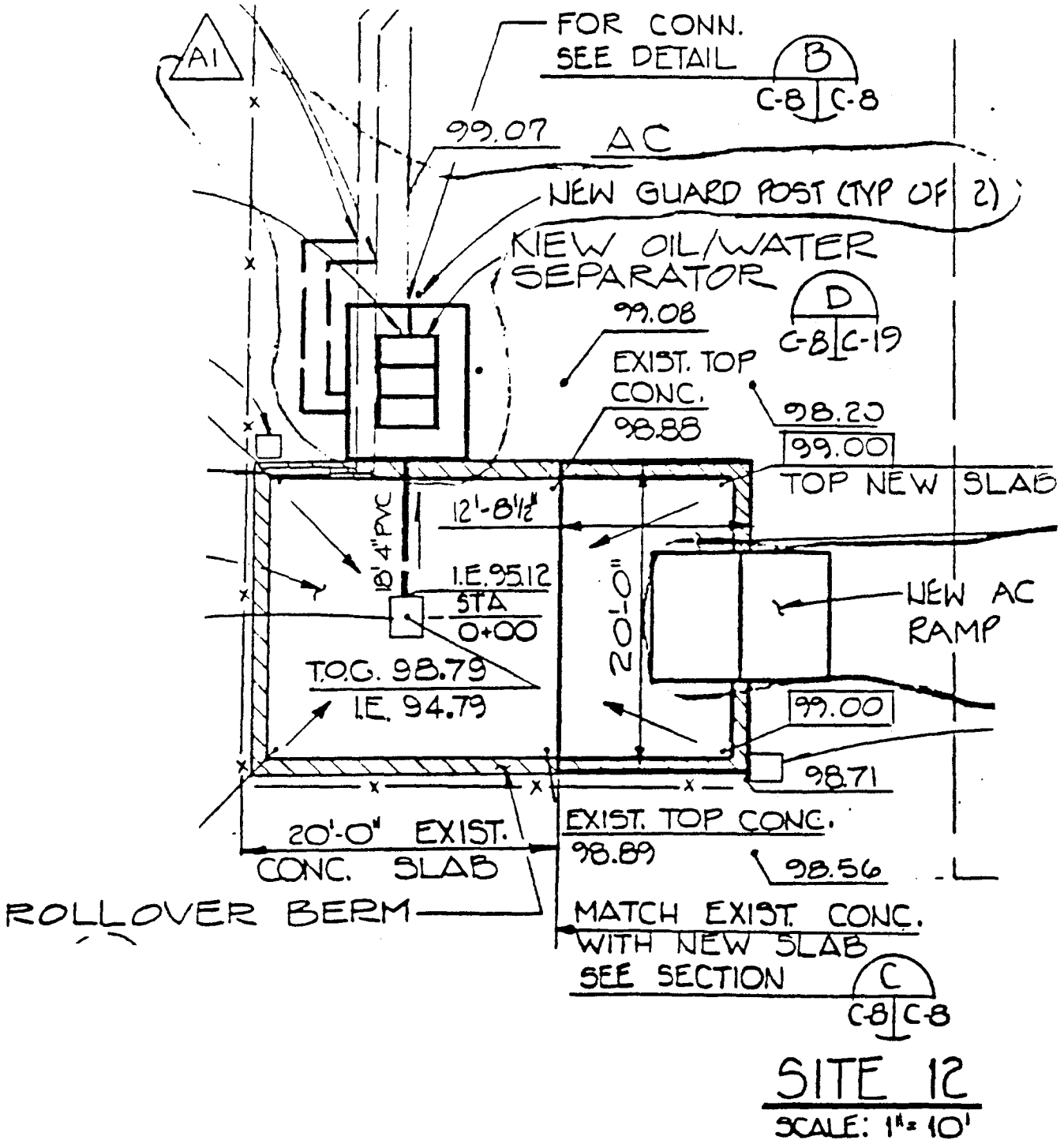


Exhibit A-4.

OIL/WATER SEPARATOR (OWS) SITE 673A

NEARBY FEATURES

MARINE CORPS AIR STATION, EL TORO



SITE 12

SCALE: 1" = 10'

Exhibit A-5.

OIL/WATER SEPARATOR (OWS) SITE 673A

CONSTRUCTION AND UTILITY DETAILS

MARINE CORPS AIR STATION, EL TORO

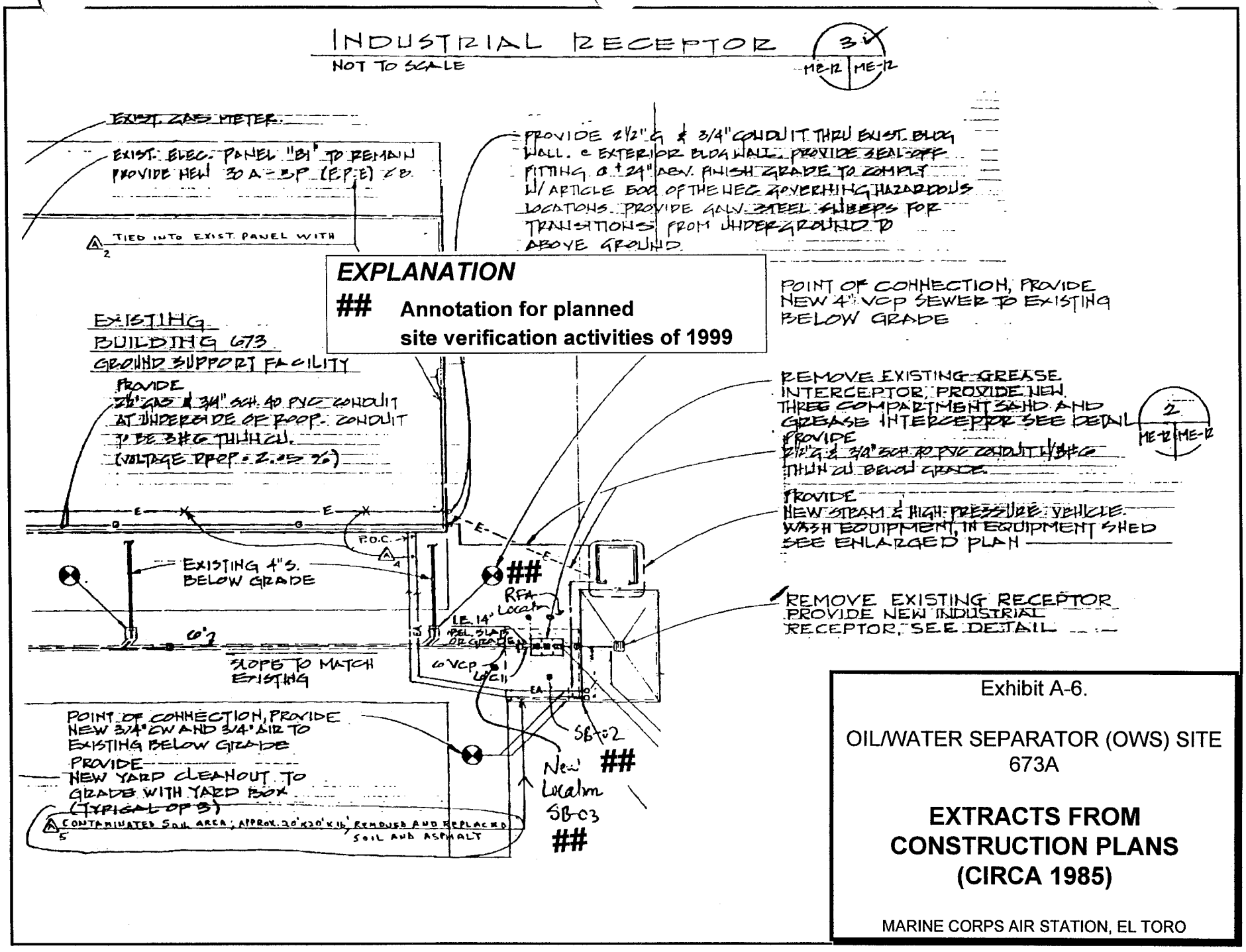


Exhibit A-6.

OIL/WATER SEPARATOR (OWS) SITE 673A

EXTRACTS FROM CONSTRUCTION PLANS (CIRCA 1985)

MARINE CORPS AIR STATION, EL TORO

SOUTHWESTNAVFACENGCOM
CODE 05BME.LMH
SAN DIEGO, CA 92101

Site Verification Information

Chain of Custody Documentation
Laboratory Test Reports
Field Survey Data and Field Notes

M60050.000721
MCAS EL TORO
SSIC # 5090.3

CHAIN OF CUSTODY DOCUMENTATION

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

No TCLP/SPLP
needed per D. Perrial
(W) 3/10/99

OHM Remediation Services Corp.
Subsidiary of OHM Corporation
U.S. Route 224 East • Findlay, Ohio 45840 • (419) 423-3526

CHAIN-OF-CUSTODY RECORD

PROJECT DATA MANAGER'S COPY
217186
FORM 0019 REV. 2-97

OHM's LAB COORDINATOR: TIFFANY TAYLOR-WILLIAMS	LAB COORDINATOR'S PHONE: 949-660-5300	LAB COORDINATOR'S FAX: 949-475-5433	LABORATORY SERVICE ID: 992200	LABORATORY CONTACT: ~~MARIA JONES~~	MAIL REPORT (COMPANY NAME): OHM REMEDIATION
PROJECT NAME: HAND AUGERING	PROJECT LOCATION: MCAS ELTORO	PROJECT NUMBER: 20242	LABORATORY PHONE: ~~714-368-8616~~	LABORATORY FAX: 714-590-1828	RECEIPT TO: DWAYNE ISHIDA
PROJECT CONTACT: —	PROJECT PHONE NUMBER: —	PROJECT FAX: —	LABORATORY NAME: ~~QUANTERRA~~ APCL	ADDRESS: 3347 MICHELSON DR #200	
PROJECT ADDRESS: MCAS ELTORO	CITY, STATE AND ZIP CODE: SANTA ANA, CA.	CLIENT: RYND ARNECKER-SWDIV	CITY, STATE AND ZIP CODE: ~~SANTA ANA, CA~~ MAGNOLIA, CHINA	CITY, STATE, AND ZIP CODE: IRVINE, CA.	
PROJECT MANAGER: BILL SEOLAR	PROJECT MANAGER'S PHONE: 949-660-5300	PROJECT MANAGER'S FAX: 949-475-5433			

Item	Sample Identifier	Matrix	Date 1999	Time	Preserved	# of Cont.	QC Level	T.A.T.	Analyses: TPH-EXTRACTABLE	Analyses: 8260 SMTBE	Comments
1	20242-707	W	3-3	0800	HCL	1	III	5A		X	
2	20242-708	S	3-3	0815	—	1	III	5DA	X	X	
3	20242-709	S	3-3	0905	—	1	III	5DA	X	X	
4	20242-710	W	3-3	0930	HCL	4	III	5DA	X	X	
5	20242-711	S	3-3	1015	—	1	III	5DA	X	X	
6	20242-712	S	3-3	1300	—	1	III	5DA	X	X	
7	20242-713	S	3-3	~~1445~~ 1345	—	1	III	5DA	X	X	
8	20242-714	S	3-3	1415	—	1	III	5DA	X	X	
9	20242-715	S	3-3	1420	—	1	III	5DA	X	X	
10											

SAMPLES COLLECTED BY: C. PARRISH
RELINQUISHED BY: Craig Parrish
COURIER AND AIR BILL NUMBER:
RECEIVED BY: [signature]
DATE: 3-3-99 TIME: 1580
COOLER TEMPERATURE UPON RECEIPT:
SAMPLE'S CONDITION UPON RECEIPT:

Distribution: White - Laboratory (To be returned with Analytical Report); Goldenrod - Project File; Yellow - Project Data Manager

Project Information Section
For Project Personnel Only
Do Not Submit to Laboratory

OWS626-4-HA02
OWS626-5-HA
OWS673A-HA

Sample Point Location	G	C	F	QC
1. ~~RINSATE~~ TRIP BLANK	X			X
2. 626-4-HA02 10-10.5 FT BGS	X			
3. 626-4-HA02 20-20.5 FT BGS	X			
4. RINSATE	X			X
5. 626-5-HA03 20-20.5 FT BGS	X			
6. 673-HA01 10-10.5 FT BGS	X			
7. 673-HA01 14-14.5 FT BGS	X			
8. 673-HA02 13.5-14	X			
9. 673-HA02 DUP 14-14.5	X			X

Comments

Sample Type: G - Grab, C - Composite, F - Field Sample, QC - Quality Control Sample

'M Remediation
rvices Corp
Subsidiary of OHM Corporation
U.S. Route 224 East • Findlay, Ohio 45840 • (419) 423-3526

CHAIN-OF-CUSTODY RE[illegible]D

LABORATORY COPY

222466

FORM 0019 REV. 2-97

OHM's LAB COORDINATOR: Thizar Tintut-Williams	LAB COORDINATOR'S PHONE: (949) 660-5300	LAB COORDINATOR'S FAX: (949) 475-5433	LABORATORY SERVICE ID: 992810	LABORATORY CONTACT: JIM LIN	MAIL REPORT (COMPANY NAME): OHM Remediation
PROJECT NAME: OWS673A vertical drilling	PROJECT LOCATION: MCAS EL TORO	PROJECT NUMBER: 20242	LABORATORY PHONE: (909) 590-1828	LABORATORY FAX:	RECIPIENT NAME: Dwayne Ichida
PROJECT CONTACT: Thizar Tintut-Williams	PROJECT PHONE NUMBER: (949) 660-5300	PROJECT FAX: (949) 475-5433	LABORATORY ADDRESS: APCL		ADDRESS: 3347 Michelson Dr. #200
PROJECT ADDRESS: MCAS EL TORO	CITY, STATE AND ZIPCODE: Santa Ana, CA	CLIENT: Lynn Hornecker-SWDIV.	CITY, STATE AND ZIPCODE: Chino, CA		CITY, STATE AND ZIPCODE: Irvine, CA
PROJECT MANAGER: BILL SEDLAK	PROJECT MANAGER'S PHONE: (949) 660-5300	PROJECT MANAGER'S FAX: (949) 475-5433			

Item	Sample Identifier	Matrix	Date	Time	Preserved	# of Cont.	QC Level	T.A.T.	Analyses: 8260+NTBE	TPH-Purgeable	TPH-Extractable	8270/TPH-G						Comments
																		Analye 'x'end
1	20242-745	Soil	4/1/99	1115	4°C	1	III	5-DAY	X	X	X							
2	20242-746	Soil	4/1/99	1200	4°C	1	III	5-DAY	X	X	X							
3	20242-747	Soil	4/1/99	1210	4°C	1	III	5-DAY	X	X	X							
4	20242-748	Soil	4/1/99	1220	4°C	1	III	5-DAY	X	X	X							
5	20242-749	Soil	4/1/99	1221	4°C	1	IV	5-DAY	X	X	X							
6	20242-750	Water	4/1/99	1230	4°/HCl	2	III	5-DAY	X	X								
7																		
8																		
9																		
10																		

4/1/99

SAMPLES COLLECTED BY	COURIER AND AIR BILL NUMBER	COOLER TEMPERATURE UPON RECEIPT

RELINQUISHED BY	RECEIVED BY	DATE	TIME	SAMPLE'S CONDITION UPON RECEIPT
[signature]		4/1/99		

Distribution: White - Laboratory (To be returned with Analytical Report); Goldenrod - Project File; Yellow - Project Data Manager

Project Information Section
For Project Personnel Only
Do Not Submit to Laboratory

Sample Point Location	Sample Type: G	C	F	QC
1. OWS673A-SB01 @ 9.5-10'	X		X	
2. OWS673A-SB01 @ 20.5-21'	X		X	
3. OWS673A-SB01 @ 30.5-31'	X		X	
4. OWS673A-SB01 @ 40.5-41	X		X	
5. OWS673A-SB01 @ 41-41.5	X		X	
6. Trip Blank	X			X

Comments

① by handauger

② ③ are duplicates.

Sample Type: G - Grab, C - Composite, F - Field Sample, QC - Quality Control Sample

M60050.000721
MCAS EL TORO
SSIC # 5090.3

LABORATORY TEST REPORTS

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1408

APCL Analytical Report

Submitted to:
OHM Remediation Services (Irvine)
Attention: Dwayne Ishida
3347 Michelson Dr. Ste 200
Irvine CA 92612-1692
Tel: (949)660-7594 Fax: (949)475-5433

Service ID #: 801-992200
Collected by: C.Parrish
Collected on: 03/03/99

Received: 03/03/99
Extracted: 03/04-06/99
Tested: 03/04-08/99
Reported: 03/10/99

Sample Description: Water and Soil from MCAS El Toro
Project Description: 20242 Hand Angaring

Analysis of Water and Soil Samples

I . Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-710 99-02200-4
Dilution Factor				1
TPH AS DIESEL	M8015E	mg/L	0.5	< 0.5
Dilution Factor				1
TPH AS MOTOR OIL	M8015E	mg/L	0.5	< 0.5

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-707 99-02200-1	20242-710 99-02200-4
VOLATILE ORGANICS					
Dilution Factor				1	1
ACETONE	8260	µg/L	50	< 50	< 50
BENZENE	8260	µg/L	5	< 5	< 5
BROMODICHLOROMETHANE	8260	µg/L	5	< 5	< 5
BROMOFORM	8260	µg/L	5	< 5	< 5
BROMOMETHANE	8260	µg/L	5	< 5	< 5
2-BUTANONE (MEK)	8260	µg/L	50	< 50	< 50
CARBON DISULFIDE	8260	µg/L	5	< 5	< 5
CARBON TETRACHLORIDE	8260	µg/L	5	< 5	< 5
CHLOROBENZENE	8260	µg/L	5	< 5	< 5
DIBROMOCHLOROMETHANE	8260	µg/L	5	< 5	< 5
CHLOROETHANE	8260	µg/L	5	< 5	< 5
2-CHLOROETHYL VINYL ETHER	8260	µg/L	50	< 50	< 50
CHLOROFORM	8260	µg/L	5	< 5	< 5
CHLOROMETHANE	8260	µg/L	5	< 5	< 5
1,1-DICHLOROETHANE	8260	µg/L	5	< 5	< 5
1,2-DICHLOROETHANE	8260	µg/L	5	< 5	< 5
1,1-DICHLOROETHENE	8260	µg/L	5	< 5	< 5
CIS-1,2-DICHLOROETHENE	8260	µg/L	5	< 5	< 5
TRANS-1,2-DICHLOROETHENE	8260	µg/L	5	< 5	< 5
1,2-DICHLOROPROPANE	8260	µg/L	5	< 5	< 5

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-707 99-02200-1	20242-710 99-02200-4
CIS-1,3-DICHLOROPROPENE	8260	µg/L	5	< 5	< 5
TRANS-1,3-DICHLOROPROPENE	8260	µg/L	5	< 5	< 5
ETHYLBENZENE	8260	µg/L	5	< 5	< 5
2-HEXANONE	8260	µg/L	50	< 50	< 50
METHYLENE CHLORIDE	8260	µg/L	5	< 5	< 5
4-METHYL-2-PENTANONE (MIBK)	8260	µg/L	50	< 50	< 50
METHYL TERT-BUTYL ETHER	8260	µg/L	10	< 10	< 10
STYRENE	8260	µg/L	5	< 5	< 5
1,1,2,2-TETRACHLOROETHANE	8260	µg/L	5	< 5	< 5
TETRACHLOROETHENE	8260	µg/L	5	< 5	< 5
TOLUENE	8260	µg/L	5	< 5	< 5
1,1,1-TRICHLOROETHANE	8260	µg/L	5	< 5	< 5
1,1,2-TRICHLOROETHANE	8260	µg/L	5	< 5	< 5
TRICHLOROETHENE	8260	µg/L	5	< 5	< 5
VINYL ACETATE	8260	µg/L	50	< 50	< 50
VINYL CHLORIDE	8260	µg/L	5	< 5	< 5
XYLENES (TOTAL)	8260	µg/L	15	< 15	< 15

II . Analysis of Soil Samples

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-708 99-02200-2	20242-709 99-02200-3	20242-711 99-02200-5
MOISTURE	ASTM-D2216	%Moisture	0.5	15.4	7.3	7.6
Dilution Factor				1	1	1
TPH AS DIESEL	M8015E	mg/kg	10	< 12	< 11	< 11
Dilution Factor				1	1	1
TPH AS MOTOR OIL	M8015E	mg/kg	10	< 12	< 11	< 11
VOLATILE ORGANICS						
Dilution Factor				1	1	1
ACETONE	8260	µg/kg	50	< 59	< 54	< 54
BENZENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
BROMODICHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
BROMOFORM	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
BROMOMETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
2-BUTANONE (MEK)	8260	µg/kg	50	< 59	< 54	< 54
CARBON DISULFIDE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
CARBON TETRACHLORIDE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
CHLOROBENZENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
DIBROMOCHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-708 99-02200-2	20242-709 99-02200-3	20242-711 99-02200-5
CHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
2-CHLOROETHYL VINYL ETHER	8260	µg/kg	50	< 59	< 54	< 54
CHLOROFORM	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
CHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,1-DICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,2-DICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,1-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
CIS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
TRANS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,2-DICHLOROPROPANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
CIS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
TRANS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
ETHYLBENZENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
2-HEXANONE	8260	µg/kg	50	< 59	< 54	< 54
METHYLENE CHLORIDE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
4-METHYL-2-PENTANONE (MIBK)	8260	µg/kg	50	< 59	< 54	< 54
METHYL TERT-BUTYL ETHER	8260	µg/kg	10	< 12	< 11	< 11
STYRENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,1,2,2-TETRACHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
TETRACHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
TOLUENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,1,1-TRICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
1,1,2-TRICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
TRICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
VINYL ACETATE	8260	µg/kg	50	< 59	< 54	< 54
VINYL CHLORIDE	8260	µg/kg	5	< 5.9	< 5.4	< 5.4
XYLENES (TOTAL)	8260	µg/kg	15	< 18	< 16	< 16

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-712 99-02200-6	20242-713 99-02200-7	20242-714 99-02200-8	20242-715 99-02200-9
MOISTURE	ASTM-D2216	%Moisture	0.5	14.7	8.8	9.7	4.8
Dilution Factor				1	1	1	5
TPH AS DIESEL	M8015E	mg/kg	10	55	160 [a]	150 [a]	260 [a]
Dilution Factor				1	1	1	5
TPH AS MOTOR OIL	M8015E	mg/kg	10	200 [b]	265 [b]	220 [b]	420 [b]

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-712 99-02200-6	20242-713 99-02200-7	20242-714 99-02200-8	20242-715 99-02200-9
VOLATILE ORGANICS							
Dilution Factor				1	1	10	10 (e)
ACETONE	8260	µg/kg	50	< 59	78	< 550	< 530
BENZENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
BROMODICHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
BROMOFORM	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
BROMOMETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
2-BUTANONE (MEK)	8260	µg/kg	50	< 59	39J	< 550	< 530
CARBON DISULFIDE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CARBON TETRACHLORIDE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CHLOROBENZENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
DIBROMOCHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
2-CHLOROETHYL VINYL ETHER	8260	µg/kg	50	< 59	< 55	< 550	< 530
CHLOROFORM	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CHLOROMETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,1-DICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,2-DICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,1-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CIS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
TRANS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,2-DICHLOROPROPANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
CIS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
TRANS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
ETHYLBENZENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
2-HEXANONE	8260	µg/kg	50	< 59	< 55	< 550	< 530
METHYLENE CHLORIDE	8260	µg/kg	5	< 5.9	< 5.5	< 55	35J
4-METHYL-2-PENTANONE (MIBK)	8260	µg/kg	50	< 59	< 55	< 550	< 530
METHYL TERT-BUTYL ETHER	8260	µg/kg	10	< 12	< 11	< 110	< 110
STYRENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,1,2,2-TETRACHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
TETRACHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
TOLUENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,1,1-TRICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
1,1,2-TRICHLOROETHANE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
TRICHLOROETHENE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
VINYL ACETATE	8260	µg/kg	50	< 59	< 55	< 550	< 530

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-712 99-02200-6	20242-713 99-02200-7	20242-714 99-02200-8	20242-715 99-02200-9
VINYL CHLORIDE	8260	µg/kg	5	< 5.9	< 5.5	< 55	< 53
XYLENES (TOTAL)	8260	µg/kg	15	< 18	1J	< 170	< 160

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.

J: Reported between PQL and MDL.

† All results are reported on dry basis for soil samples.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

(a) Result included some unknown peaks at about C26-C28 range.

(b) Mixture of compounds in JP-5/Diesel range.

(c) Preliminary results reported, re-analysis in progress.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:
OHM Remediation Services (Irvine)
Attention: Dwayne Ishida
3347 Michelson Dr. Ste 200
Irvine CA 92612-1692
Tel: (949)660-7594 Fax: (949)660-5382

Service ID #: 801-992810
Collected by: Thuzar TW
Collected on: 04/01/99

Received: 04/01/99
Extracted: 04/02/99
Tested: 04/02-09/99
Reported: 04/09/99

Sample Description: Soil and Water from MCAS El Toro
Project Description: 20242 OWS 673A Verification Drilling

Analysis of Water and Soil Samples

I . Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-750 99-02810-6
Dilution Factor				1
GASOLINE	M8015V	mg/L	0.05	0.03J
VOLATILE ORGANICS				
Dilution Factor				1
ACETONE	8260	µg/L	50	*
BENZENE	8260	µg/L	5	*
BROMODICHLOROMETHANE	8260	µg/L	5	*
BROMOFORM	8260	µg/L	5	*
BROMOMETHANE	8260	µg/L	5	*
2-BUTANONE (MEK)	8260	µg/L	50	*
CARBON DISULFIDE	8260	µg/L	5	*
CARBON TETRACHLORIDE	8260	µg/L	5	*
CHLOROBENZENE	8260	µg/L	5	*
DIBROMOCHLOROMETHANE	8260	µg/L	5	*
CHLOROETHANE	8260	µg/L	5	*
2-CHLOROETHYL VINYL ETHER	8260	µg/L	50	*
CHLOROFORM	8260	µg/L	5	*
CHLOROMETHANE	8260	µg/L	5	*
1,1-DICHLOROETHANE	8260	µg/L	5	*
1,2-DICHLOROETHANE	8260	µg/L	5	*
1,1-DICHLOROETHENE	8260	µg/L	5	*
CIS-1,2-DICHLOROETHENE	8260	µg/L	5	*
TRANS-1,2-DICHLOROETHENE	8260	µg/L	5	*
1,2-DICHLOROPROPANE	8260	µg/L	5	*
CIS 1,3 DICHLOROPROPENE	8260	µg/L	5	*
TRANS-1,3-DICHLOROPROPENE	8260	µg/L	5	*
ETHYLBENZENE	8260	µg/L	5	*
2-HEXANONE	8260	µg/L	50	*
METHYLENE CHLORIDE	8260	µg/L	5	*
4-METHYL-2-PENTANONE (MIBK)	8260	µg/L	50	*
METHYL TERT-BUTYL ETHER	8260	µg/L	10	*
STYRENE	8260	µg/L	5	*
1,1,2,2-TETRACHLOROETHANE	8260	µg/L	5	*
TETRACHLOROETHENE	8260	µg/L	5	*
TOLUENE	8260	µg/L	5	*
1,1,1-TRICHLOROETHANE	8260	µg/L	5	*
1,1,2-TRICHLOROETHANE	8260	µg/L	5	*
TRICHLOROETHENE	8260	µg/L	5	*
VINYL ACETATE	8260	µg/L	50	*
VINYL CHLORIDE	8260	µg/L	5	*
XYLENES (TOTAL)	8260	µg/L	15	*

II . Analysis of Soil Samples

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-745 99-02810-1	Analysis Result 20242-746 99-02810-2
MOISTURE	ASTM-D2216	%Moisture	0.5	9.7	12.8
Dilution Factor				1	1
GASOLINE	M8015V	mg/kg	1	<1.1	<1.1
Dilution Factor				1	1
TPH AS DIESEL	M8015E	mg/kg	10	<11	<11
Dilution Factor				1	1
TPH AS MOTOR OIL	M8015E	mg/kg	10	<11	<11
VOLATILE ORGANICS					
Dilution Factor				1	1
ACETONE	8260	µg/kg	50	<55	<57
BENZENE	8260	µg/kg	5	<5.5	<5.7
BROMODICHLOROMETHANE	8260	µg/kg	5	<5.5	<5.7
BROMOFORM	8260	µg/kg	5	<5.5	<5.7
BROMOMETHANE	8260	µg/kg	5	<5.5	<5.7
2-BUTANONE (MEK)	8260	µg/kg	50	<55	<57
CARBON DISULFIDE	8260	µg/kg	5	<5.5	<5.7
CARBON TETRACHLORIDE	8260	µg/kg	5	<5.5	<5.7
CHLOROBENZENE	8260	µg/kg	5	<5.5	<5.7
DIBROMOCHLOROMETHANE	8260	µg/kg	5	<5.5	<5.7
CHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
2-CHLOROETHYL VINYL ETHER	8260	µg/kg	50	<55	<57
CHLOROFORM	8260	µg/kg	5	<5.5	<5.7
CHLOROMETHANE	8260	µg/kg	5	<5.5	<5.7
1,1-DICHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
1,2-DICHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
1,1-DICHLOROETHENE	8260	µg/kg	5	<5.5	<5.7
CIS-1,2-DICHLOROETHENE	8260	µg/kg	5	<5.5	<5.7
TRANS-1,2-DICHLOROETHENE	8260	µg/kg	5	<5.5	<5.7
1,2-DICHLOROPROPANE	8260	µg/kg	5	<5.5	<5.7
CIS-1,3-DICHLOROPROPENE	8260	µg/kg	5	<5.5	<5.7
TRANS-1,3-DICHLOROPROPENE	8260	µg/kg	5	<5.5	<5.7
ETHYLBENZENE	8260	µg/kg	5	<5.5	<5.7
2-HEXANONE	8260	µg/kg	50	<55	<57
METHYLENE CHLORIDE	8260	µg/kg	5	<5.5	<5.7
4-METHYL-2-PENTANONE (MIBK)	8260	µg/kg	50	<55	<57
METHYL TERT-BUTYL ETHER	8260	µg/kg	10	<11	<11
STYRENE	8260	µg/kg	5	<5.5	<5.7
1,1,2,2-TETRACHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
TETRACHLOROETHENE	8260	µg/kg	5	<5.5	<5.7
TOLUENE	8260	µg/kg	5	<5.5	<5.7
1,1,1-TRICHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
1,1,2-TRICHLOROETHANE	8260	µg/kg	5	<5.5	<5.7
TRICHLOROETHENE	8260	µg/kg	5	<5.5	<5.7
VINYL ACETATE	8260	µg/kg	50	<55	<57
VINYL CHLORIDE	8260	µg/kg	5	<5.5	<5.7
XYLENES (TOTAL)	8260	µg/kg	15	<17	<17

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-747 99-02810-3	20242-748 99-02810-4	20242-749 99-02810-5
MOISTURE	ASTM-D2216	%Moisture	0.5	9.9	13.9	19.6
Dilution Factor				1	1	1
GASOLINE	M8015V	mg/kg	1	< 1.1	< 1.2	< 1.2
Dilution Factor				1	1	1
TPH AS DIESEL	M8015E	mg/kg	10	< 11	< 12	< 12
Dilution Factor				1	1	1
TPH AS MOTOR OIL	M8015E	mg/kg	10	< 11	< 12	< 12
VOLATILE ORGANICS						
Dilution Factor				1	1	1
ACETONE	8260	µg/kg	50	< 55	< 58	< 62
BENZENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
BROMODICHLOROMETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
BROMOFORM	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
BROMOMETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
2-BUTANONE (MEK)	8260	µg/kg	50	< 55	< 58	< 62
CARBON DISULFIDE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CARBON TETRACHLORIDE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CHLOROBENZENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
DIBROMOCHLOROMETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
2-CHLOROETHYL VINYL ETHER	8260	µg/kg	50	< 55	< 58	< 62
CHLOROFORM	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CHLOROMETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,1-DICHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,2-DICHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,1-DICHLOROETHENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CIS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
TRANS-1,2-DICHLOROETHENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,2-DICHLOROPROPANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
CIS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
TRANS-1,3-DICHLOROPROPENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
ETHYLBENZENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
2-HEXANONE	8260	µg/kg	50	< 55	< 58	< 62
METHYLENE CHLORIDE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
4-METHYL-2-PENTANONE (MIBK)	8260	µg/kg	50	< 55	< 58	< 62
METHYL TERT-BUTYL ETHER	8260	µg/kg	10	< 11	< 12	< 12
STYRENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,1,2,2-TETRACHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
TETRACHLOROETHENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
TOLUENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
1,1,1-TRICHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2

Component Analyzed	Method	Unit	PQL	Analysis Result 20242-747 99-02810-3	20242-748 99-02810-4	20242-749 99-02810-5
1,1,2-TRICHLOROETHANE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
TRICHLOROETHENE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
VINYL ACETATE	8260	µg/kg	50	< 55	< 58	< 62
VINYL CHLORIDE	8260	µg/kg	5	< 5.5	< 5.8	< 6.2
XYLENES (TOTAL)	8260	µg/kg	15	< 17	< 17	< 19

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit. "-": Analysis is not required.

J: Reported between PQL and MDL.

† All results are reported on dry basis for soil samples.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

* - Analyses in progress.

Respectfully submitted,

Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

M60050.000721
MCAS EL TORO
SSIC # 5090.3

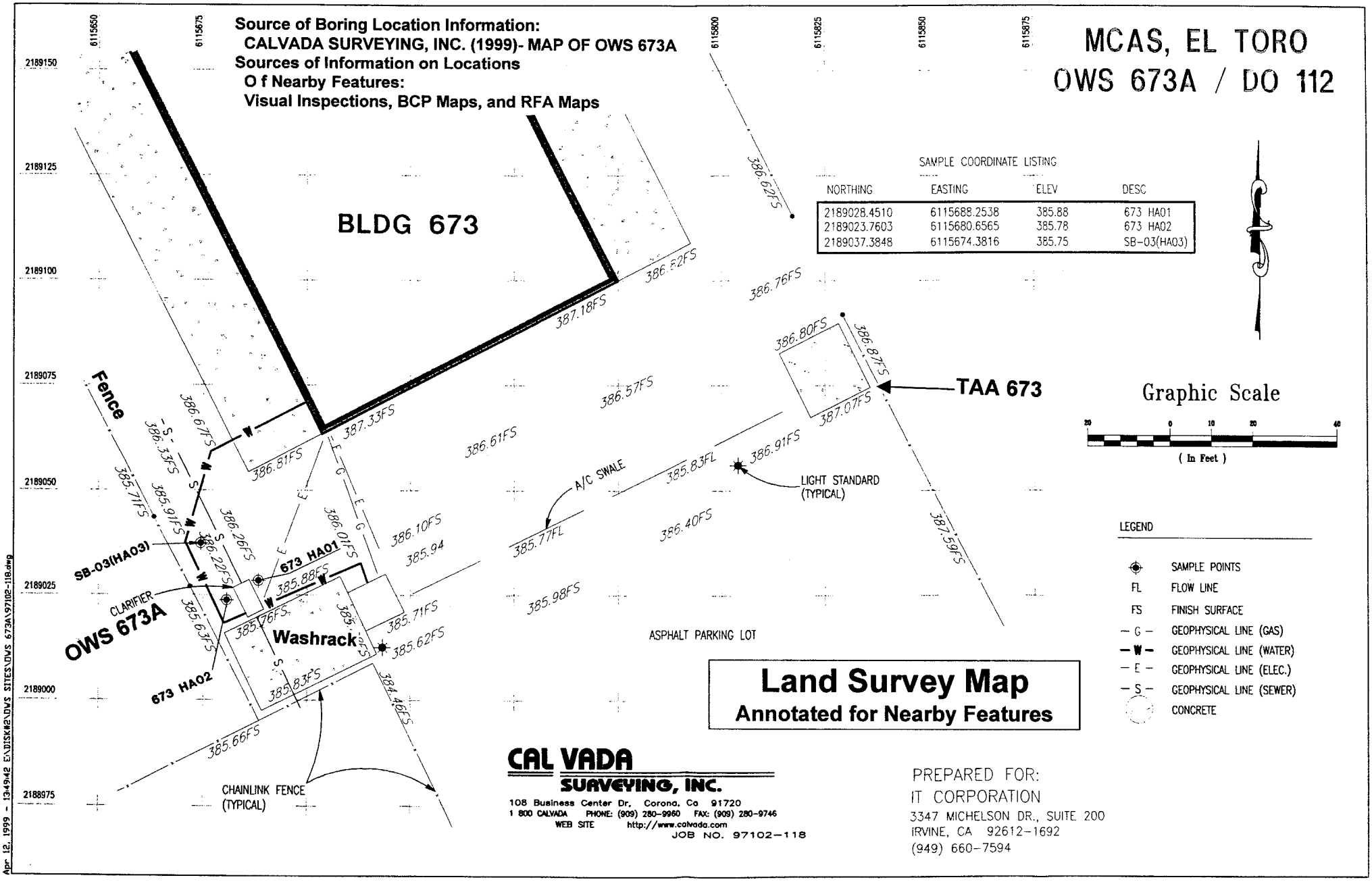
FIELD SURVEY DATA AND FIELD NOTES

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

MCAS, EL TORO
OWS 673A / DO 112

Source of Boring Location Information:
CALVADA SURVEYING, INC. (1999)- MAP OF OWS 673A
Sources of Information on Locations
O f Nearby Features:
Visual Inspections, BCP Maps, and RFA Maps



SAMPLE COORDINATE LISTING

NORTHING	EASTING	ELEV	DESC
2189028.4510	6115688.2538	385.88	673 HA01
2189023.7603	6115680.6565	385.78	673 HA02
2189037.3848	6115674.3816	385.75	SB-03(HA03)

Land Survey Map
Annotated for Nearby Features

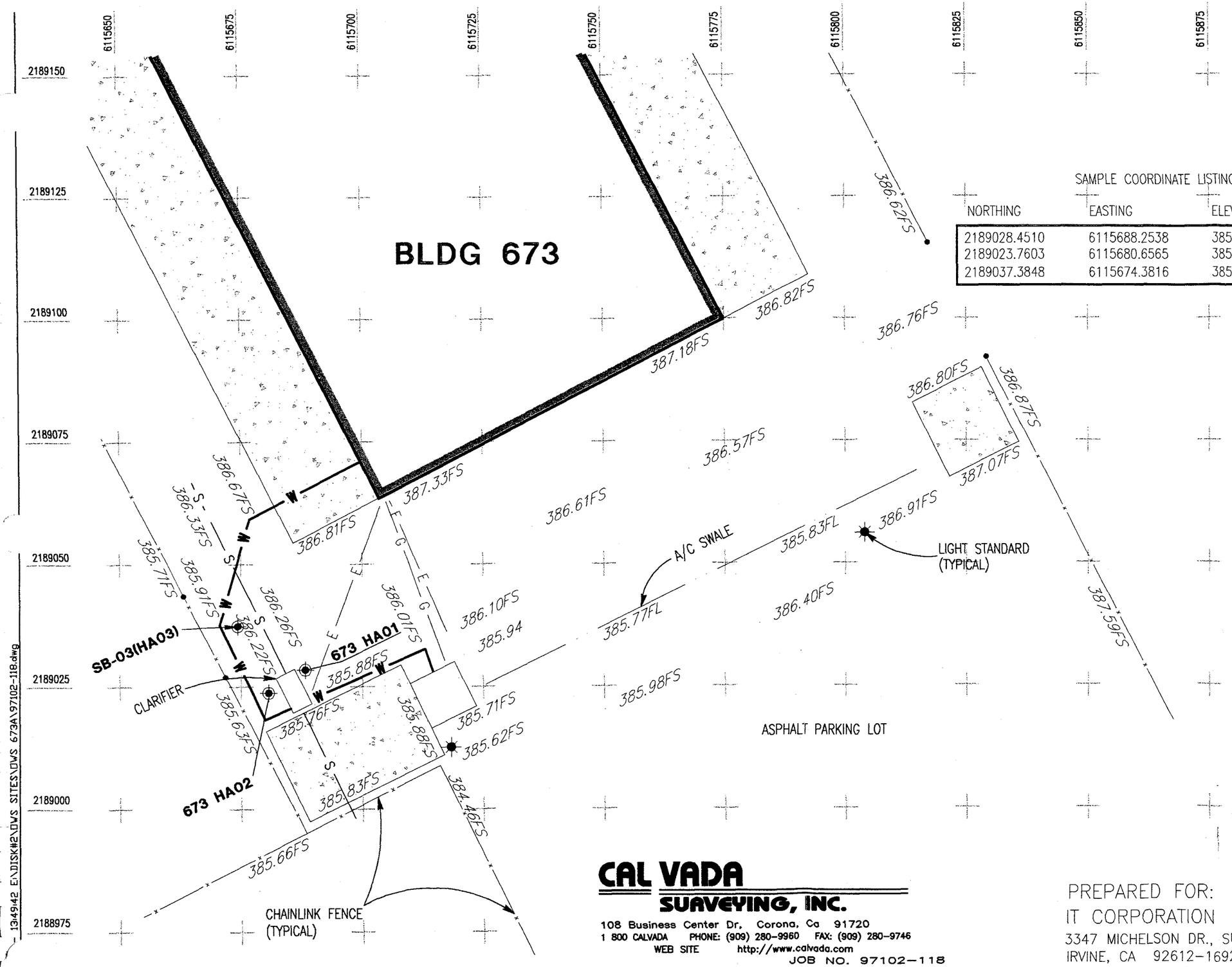
CAL VADA SURVEYING, INC.
108 Business Center Dr. Corona, Ca 91720
1 800 CALVADA PHONE: (909) 280-9960 FAX: (909) 280-9746
WEB SITE http://www.calvada.com

JOB NO. 97102-118

PREPARED FOR:
IT CORPORATION
3347 MICHELSON DR., SUITE 200
IRVINE, CA 92612-1692
(949) 660-7594

Apr 12, 1999 - 13:49:42 E:\DISK#2\DWS SITES\DWS 673A\97102-118.dwg

MCAS, EL TORO
OWS 673A / DO 112



SAMPLE COORDINATE LISTING

NORTHING	EASTING	ELEV	DESC
2189028.4510	6115688.2538	385.88	673 HA01
2189023.7603	6115680.6565	385.78	673 HA02
2189037.3848	6115674.3816	385.75	SB-03(HA03)

Graphic Scale

20 0 10 20 40

(In Feet)

1 inch = 20 ft.

LEGEND

- SAMPLE POINTS
- FL — FLOW LINE
- FS — FINISH SURFACE
- — G — GEOPHYSICAL LINE (GAS)
- — W — GEOPHYSICAL LINE (WATER)
- — E — GEOPHYSICAL LINE (ELEC.)
- — S — GEOPHYSICAL LINE (SEWER)
- CONCRETE

CAL VADA SURVEYING, INC.
108 Business Center Dr, Corona, Ca 91720
1 800 CALVADA PHONE: (909) 280-9960 FAX: (909) 280-9746
WEB SITE http://www.calvada.com

JOB NO. 97102-118

PREPARED FOR:
IT CORPORATION
3347 MICHELSON DR., SUITE 200
IRVINE, CA 92612-1692
(949) 660-7594

Apr 12, 13:49:42 E:\DISK#2\DWS SITES\DWS 673A\97102-118.dwg

CALVADA SURVEYING INC.
108 Business Center Dr
Corona, CA 91720
(909) 280-9960
Fax (909) 280-9746

facsimile transmittal

To:	Dhananjay Rawal	Fax:	949-474-8309
Company Name:	IT/ OHM	Date:	03/22/99
From:	Jesse Lugo	Pages:	1
Re:	Sites 673, 626 4&5 (D.O. 112)		

☐ Urgent X For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycl

Below are the values of the sample location for the two above sites surveyed on March 4,1999.

N	E	ELEV.	DESC.
2189028.45	6115688.25	385.88	HA01 (673)
2189023.76	6115680.66	385.78	HA02 (673)
2197260.62	6110663.79	334.05	626-4-1
2197255.09	6110675.84	333.89	626-4-2
2197311.51	6110612.87	332.02	626-5-1
2197304.83	6110606.82	332.63	626-5-2
2197309.78	6110613.39	332.98	626-5-3

If you have any question please call.

Jesse

CALVADA SURVEYING, INC.

Title: SITE 673 D.O. 112

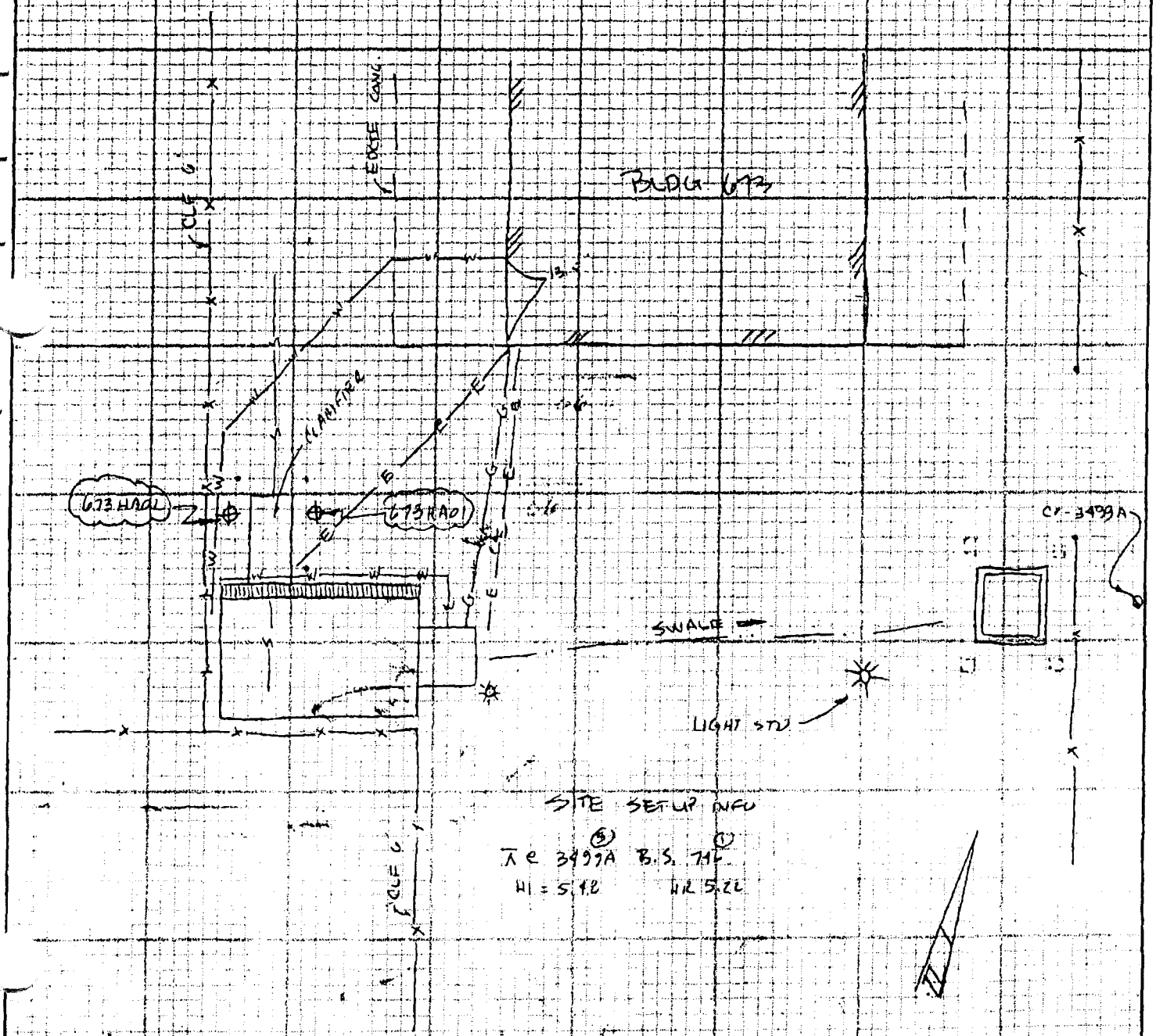
Prepared by: J. LUGO / C. WERETKA

Date: 3-4-99 Job Number: 97102-118

TR. 746 ① B.S. T-24 ② CHECK INTO T-114 ③

HI = 5.34 B.S. HI = 5.27 HR = 5.33

H.Z.	H. DIST.	V. DIF	DESC.
⊘	817.06	-19.43	B.S. CHECK
HI 5.33 ④ 132-17-47	1334.26	+26.12	CHK INTO T-114
" ⑤ 120-36-11	1915.14	+33.18	CP 3499A (SET N/INN NEAR SITE 673)



SITE SETUP INFO

TR 3499A ⑤ B.S. 746 ①

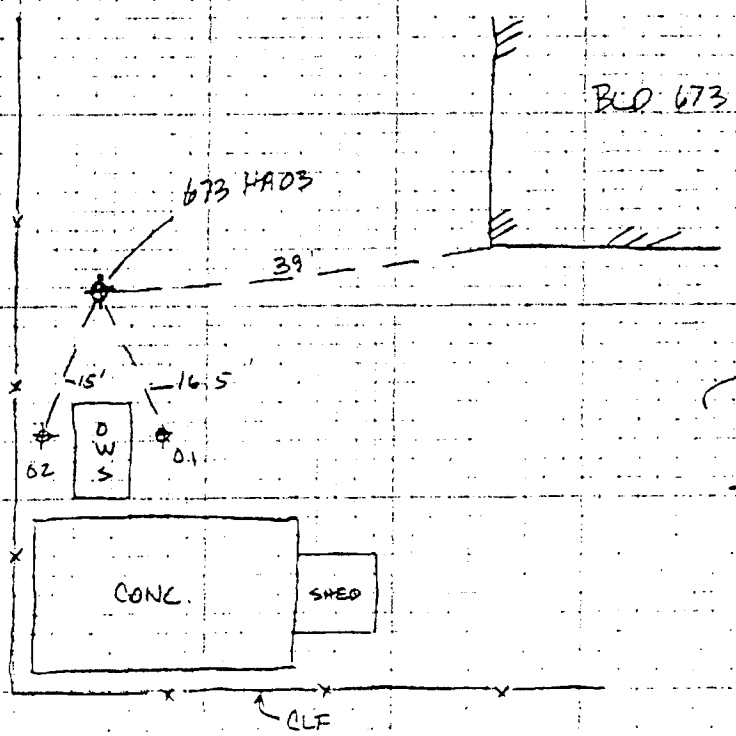
HI = 5.42 HR 5.22

SURVEYING, INC.
108 BUSINESS CENTER DRIVE
CORONA, CA 91720
PHONE: (909) 280-9960
FAX: (909) 280-9746

DATE: 4-5-99
JOB #: 97102-118

ADDITIONAL SAMPLE LOCATION

5.98 391.86 385.88 673 HA01
5.07 385.99 673 HA03
6.11 385.75 673HA02 (CHECK)
385.78
-0.03



D0112

12

WEATHER: CREW: SHEET # OF

673A-SB-03

OHM REMEDIATION SERVICES CORP.

Geologic Log

BOREHOLE NUMBER: 673-SB-03

SHEET 1 OF ___

PROJECT NO.	920242	DATE: 4-1-99	
CLIENT:	SWDIV-MCAS-El Toro	DRILLNG CO.:	BC²
LOCATION:	OWS 673A	DRILL RIG MODEL:	CME 75 - lim access
LOGGED BY:	G Berger	DRILLER:	Ramon Zepeda
		DRILLING METHOD:	HSA/SS
		HOLE DIAMETER:	8"

BORING COMPLETION DATA:

DEPTH TO WATER:				
TIME				
DATE				

TIME	DEPTH	PID/FID HNU OVA (PPM)	BLOWS/ 6 IN PRESSURE (PSI)	RECOVERY	SAMPLE NUMBER	SAMPLE INTERVAL	WELL DETAIL	SOIL/ROCK SYMBOL	GRAPHIC LOG	
										Hand auger to 10', collect sample, then auger to 15'
	5									
					20844					
		2000			745					
	10	1								10-10.5 Silty SAND (SM): 10YR 4/6; 85-95% fine qtz. sand; 5-15% silt; micaceous, moist, no odor.
1115		1						SM		
	15									Hand auger to 15', then drill out
	20									

REMEDIATION SERVICES CORP.

LOCATION: OWS - 673A
DATE: 4-1-99

BOREHOLE NUMBER: 673-SB-03
SHEET ___ OF ___

TIME	DEPTH	PID/FID HNU OVA (PPM)	BLOWS/ 6 IN PRESSURE (PSI)	RECOVERY	SAMPLE NUMBER	SAMPLE INTERVAL	WELL DETAIL	SOIL/ROCK SYSMBOL	GRAPHIC LOG	FIELD SOIL DESCRIPTION
	20									
1130		3.0	41 50		1			CL-SC		20-21 Sandy Clay ~~[illegible]~~ (CL-SC): 10YR 4/4; 60-80% salty Clay, 30-40% silty Sand - fine ~~to~~ grained; appears to be ~~old~~ paleosoil horizon (B?); mottled with iron deposits or fractures.
					20R42 746					
	5									
					20R42 747					
	30									
1206		1.0	35 50					SM		30-31 silty SAND (SM): 10YR 4/4 80% fine to medium sand; 20% silt; loose, moist, no odor micaceous
	5									
	40									
		9.1	12 17 21							40-41.5 Sandy silty Clay (CL): 10YR 5/4; 60%-70% silty Clay mod plasticity (Close to CH): 30-40% silty ~~SAND~~ - sandy SILT. Moist. Mottled with iron. - may be paleo soil horizon.
										Boring end at 40'
	5									

OHM
Remediation
Services Corp.

LETTER OF TRANSMITTAL

Form 0017
Facilities Maintenance
Rev. 10/89

TO: Lynn Hornecker, SWDIV
BRAC Office
San Diego, California

FROM: Dhananjay Rawal, Project Engineer
OHM Remediation Services Corp.
3347 Michelson Drive, Suite 200
Irvine, CA 92612

DATE: 3/24/99	JOB NO. 20242, DO 112
ATTENTION: Ms Lynn Hornecker	
RE: Oil/Water Separator 673A Geophysical Survey Report	
SWDIV Contract No. N68711-93-D-1459	
Delivery Order 112	

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
One	3/24/99	1	Oil/Water Separator 673A Geophysical Survey Report

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit ___ copies for approval

☒ For record ☐ Approved as noted ☐ Submit copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return corrected prints

☐ For review and comment ☐ Distribution to the following listed:

REMARKS

COPY TO Bill Sedlak and OHM File

SIGNED Dhananjay Rawal

Dhananjay Rawal

SPECTRUM

Results of Subsurface Investigation

Site 673
Marine Corps Air Station El Toro
Irvine, California

Prepared for: OHM Remediation Corporation
Irvine, California

Date of Investigation: February 26, 1999

Prepared by:

Jim Pfoser
Project Manager
Spectrum-Gasch Geophysics
15260 Sky High Road
Escondido, CA 92025

Laura Cathcart
Registered Geophysicist No. 1017

REGISTERED GEOPHYSICIST
LAURA A. CATHCART
No. 1017
Exp. 12/99
STATE OF CALIFORNIA

Warranty:

Spectrum-Gasch Geophysics was retained to conduct a subsurface investigation of the above facility to characterize the shallow subsurface. Our findings are subject to certain limitations due to site conditions and the instruments employed. We conducted this investigation in a manner consistent with our profession using similar methods. No other warranty as to the performance or deliverables is expressed or implied.

Contents

Introduction

Methods

Results and Conclusions

Figure 1 — Area of Subsurface Investigation, Site 673, MCAS El Toro, Irvine, California

Appendix A — Base Utility Maps for Site 673

Results of Subsurface Investigation
Site 673
MCAS El Toro
Irvine, California

Introduction

On February 26, 1999 Spectrum-Gasch Geophysics conducted a subsurface investigation of Site 673 at MCAS El Toro in Irvine, California. The purpose was to investigate one area, approximately 50 by 60 feet, for detectable subsurface utilities.

Methods

The equipment used in this investigation included a Fisher TW-6 shallow-focus terrain conductivity meter, Dynatel 500A cable locator, Radiodetection RD400 utility locator, and a GSSI SIR-3 ground penetrating radar (GPR) unit coupled to a 500 MHz antenna.

GPR and EM utility-locating methods were used in the area of interest to delineate the surface trace of detectable conduits and to identify buried objects having no surface expression. The following paragraphs discuss the methods used.

1.) The area was investigated for detectable subsurface utilities or other buried features. Utilities which were exposed above ground in the vicinity of each area were directly connected to, traced out, and mapped on a site map (Figure 1).

2.) The area was investigated with a passive electromagnetic receiver tuned to 50/60 Hz, radio, and audio frequencies to detect buried utilities that might reradiate an electromagnetic field.

3.) The area was investigated with two crew members operating a matched frequency transmitter and receiver. We conducted bidirectional traverses to detect increases in signal strength which might suggest subsurface utilities. Each suspected signal increase was further investigated to discern a signal-propagating utility.

4.) GPR data from ten traverses were collected. A map of these traverses is presented in Figure 1. GPR data were produced in the form of vertical cross sections and interpreted in the field for anomalies whose signatures might indicate the presence of subsurface conduits or other features of interest.

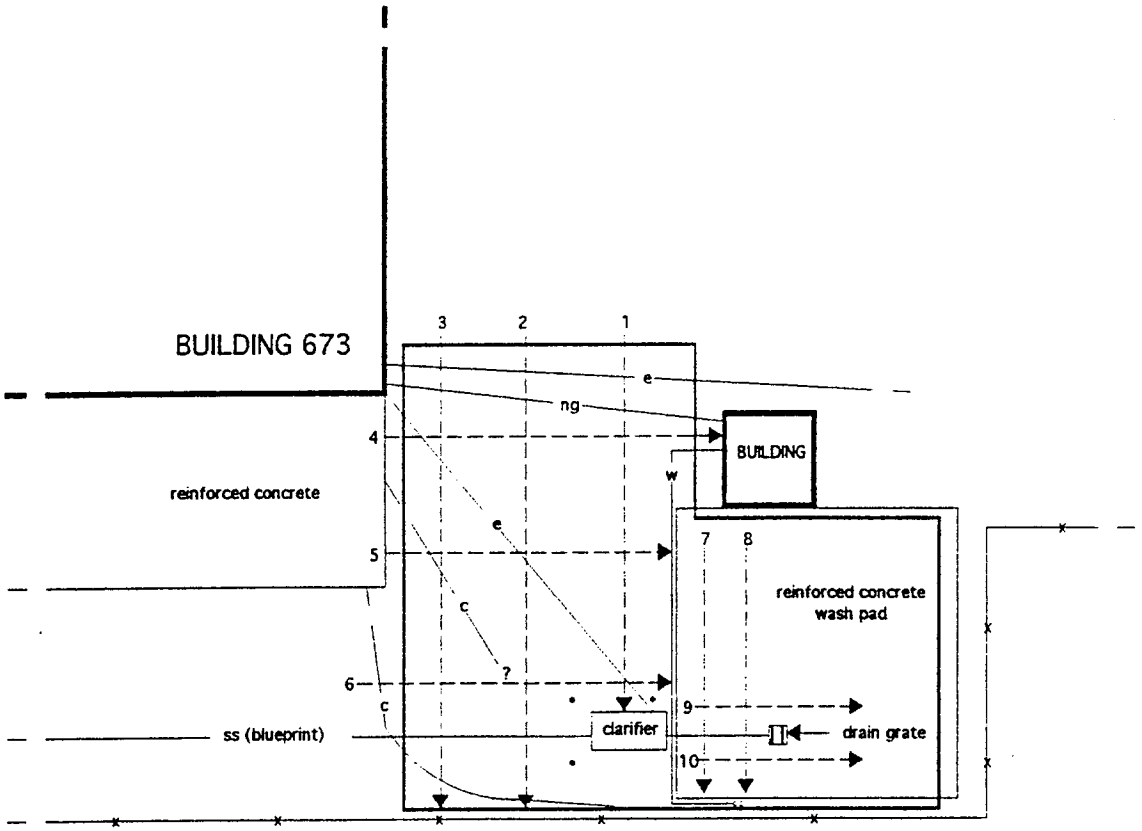
Results and Conclusions The surface trace of detected utilities was marked on the ground with spray paint using a color code established by the American Public Works Association. A site map with geophysical interpretation of the area investigated is presented in Figure 1. Drilling and excavation activities should be kept a minimum of two feet away from detected utilities.

The penetration depth of the GPR signal was approximately 1-2 feet in the area investigated. As a consequence, some subsurface utilities may not have been detected due to the shallow penetration of the GPR. Because of this limitation, Spectrum cannot guarantee that all nonmetallic conduits, such as sewers and pvc water lines, have been identified within the area of investigation.

Base utility maps for this area are included in Appendix A.

FIGURE 1
AREA OF SUBSURFACE INVESTIGATION
SITE 673
MCAS EL TORO
IRVINE, CALIFORNIA

SPECTRUM
GEOPHYSICS
15260 Sky High Road
Escondido, California 92025



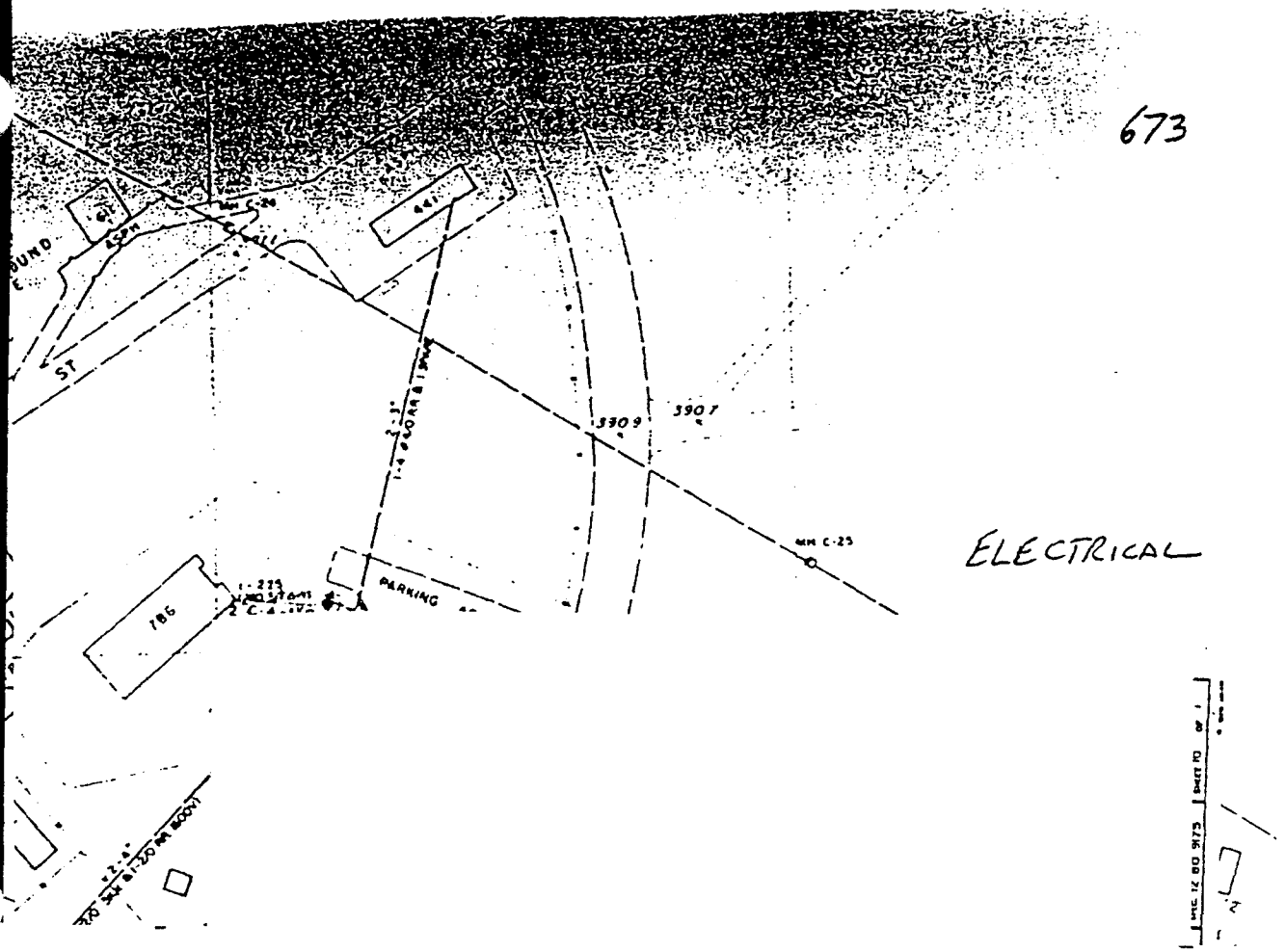
LANATION

Area of subsurface investigation	—w—	Water	
GPR traverse with number	—ng—	Natural gas	
Traffic guards	—e—	Electric	
Chain-link fence	—ss—	Sanitary sewer	
	— —	Trend continues	

N

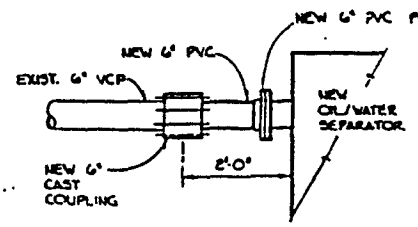
0 10 20
One inch equals approximately 20 feet

Project Number: 9902263F
Date of Investigation: February 26, 1999
Map by J. Pfoser

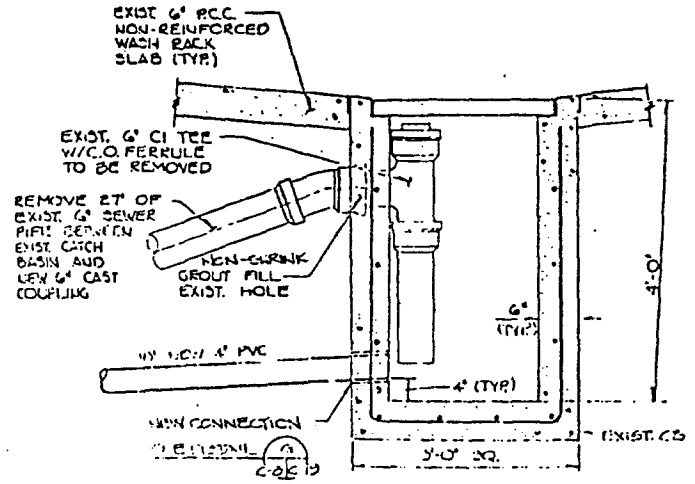


APPENDIX A

REVISIONS					
SYM	DESCRIPTION	PREPD BY	DATE	APPROVED
A-1	"AS BUILT" RELOCATED SEPARATOR	JBY	4/5/85	
A-2	"AS BUILT" ADDED RAMP	JBY	"	
A-3	"AS BUILT" INSTALLED RCC BERMS	JBY	"	
A-4	"AS BUILT" ADDED GUARD POSTS	JBY	"	
A-5	"AS BUILT" INSTALLED RCC BERMS	JBY	"	

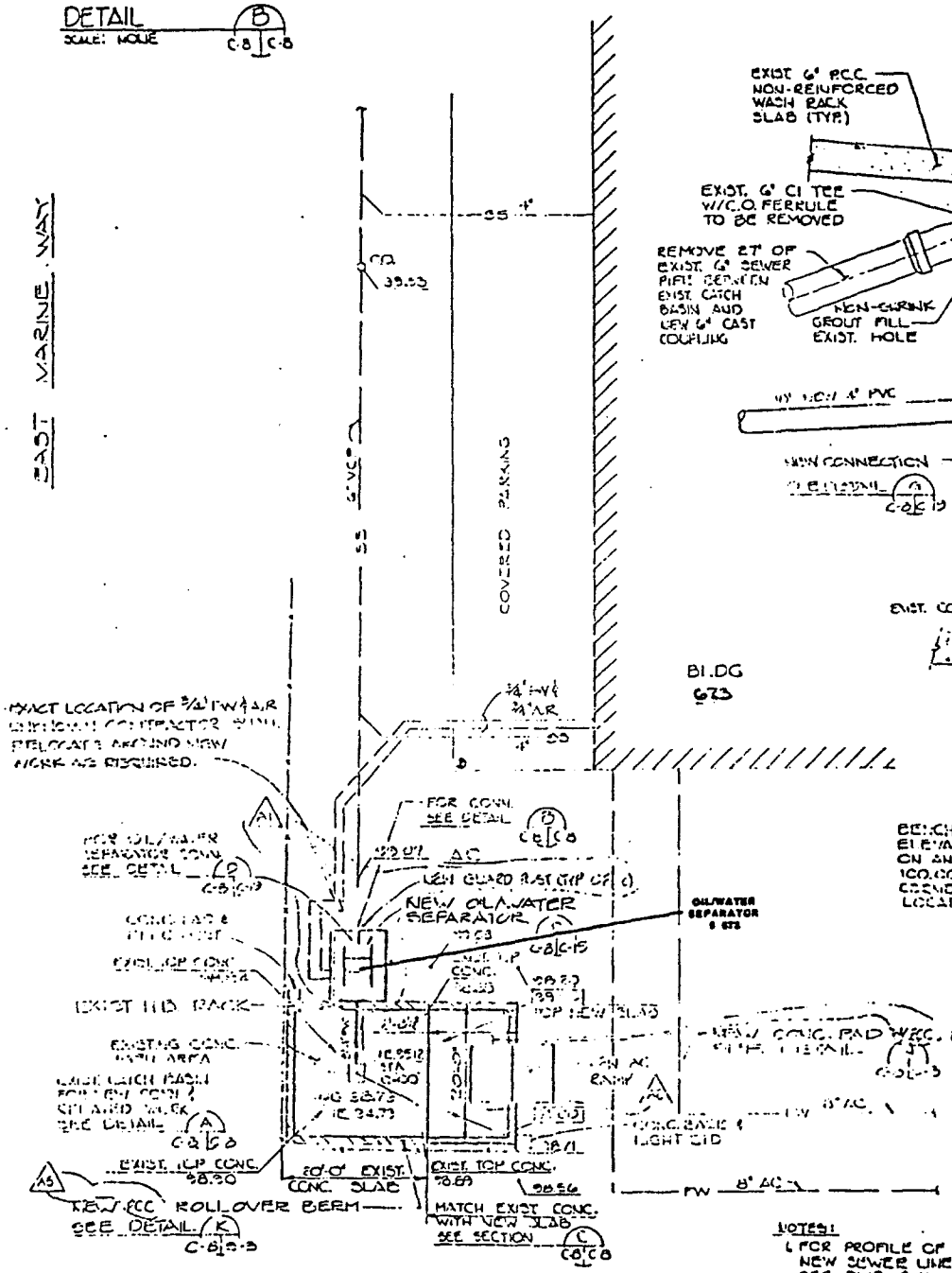


DETAIL B
SCALE: NONE
C-8 | C-8



DETAIL A
SCALE: NONE
C-8 | C-8

SECTION C
SCALE: NONE
C-8 | C-8



SITE 12
SCALE: 1" = 10'

NOTES:
1. FOR PROFILE OF NEW SEWER LINE SEE DWG. C-16
2. FOR PAVEMENT REPAIR SEE DETAILS C & C
C-8 C-17 C-8 C-20

RECORD
10 47
FEB 13 1985
25 MM

EL TORO MCAS
OIL/WATER SEPARATOR
390/762 673

FIGURE 8.1

NOTE:
CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

IF SHEET IS LESS THAN 28" X 40" IT IS A REDUCED PRINT — SCALE REDUCED ACCORDINGLY

C-8

GRAPHIC SCALE
0 10' 20' 30'
SCALE - 1" = 10'

Pounsney & Young, Inc.
Consulting Engineers

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
WESTERN DIVISION
SAN BRUNO, CALIFORNIA

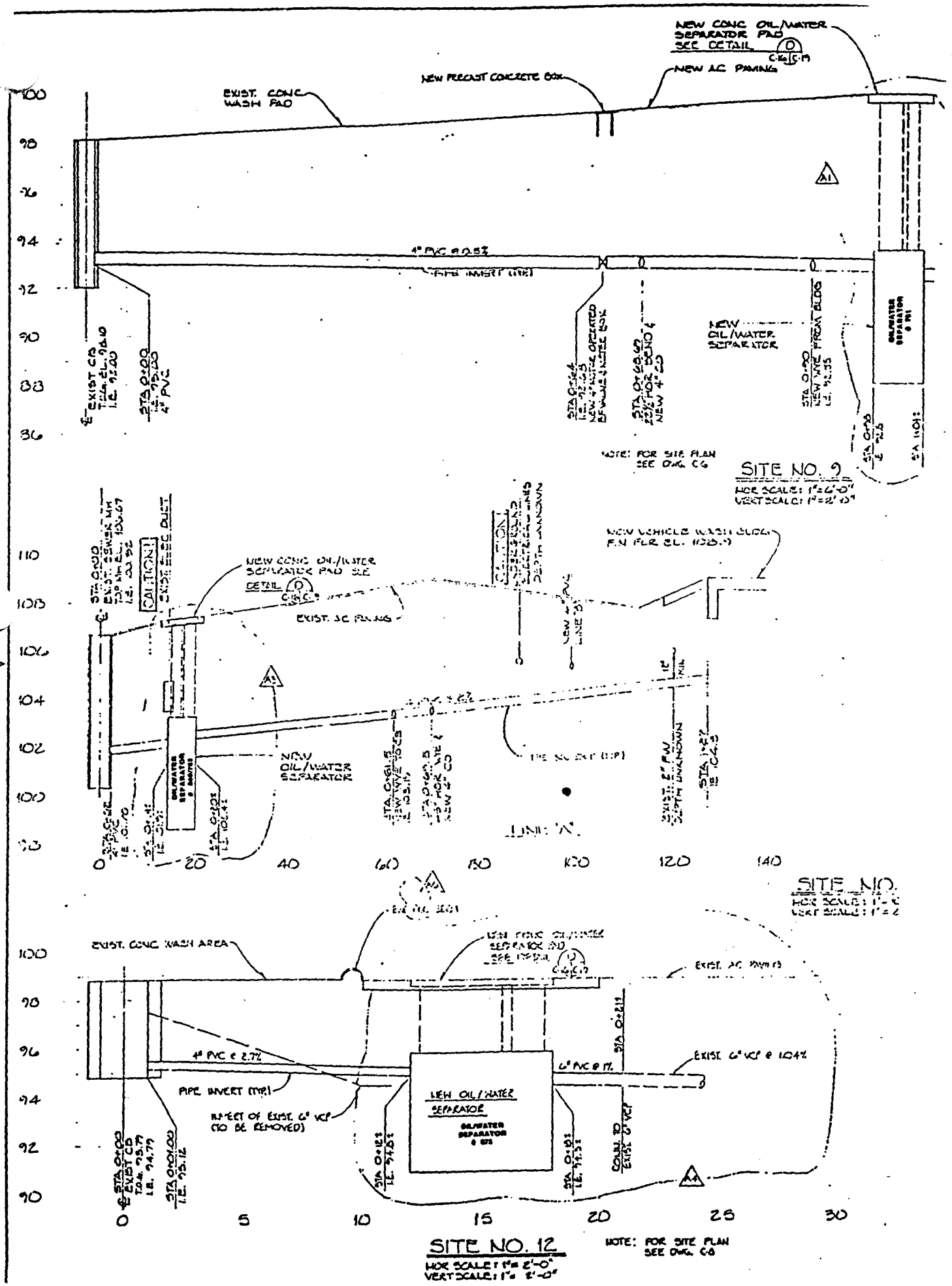
DRN WFA | DR. JAC | CHK WEF

MARINE CORPS AIR STATION EL TORO, CALIF
INDUSTRIAL WASTE COLLECTION IMPROVEMENTS, P-325

PLAN & DETAIL
SITE NO'S 11 & 12

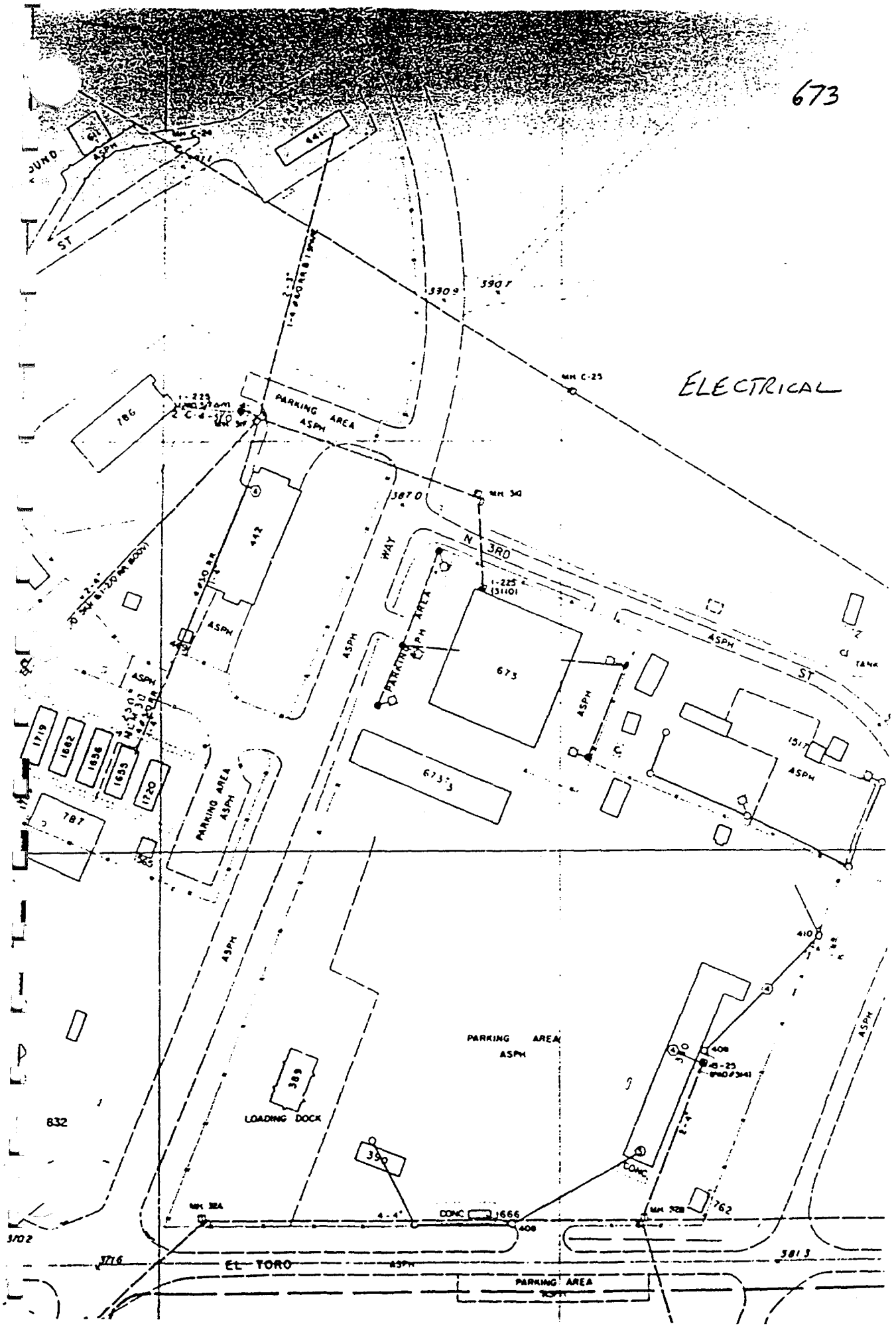
SIZE F | CODE IDENT. NO. 80091 | MAPING DRAWING NO. 6147727

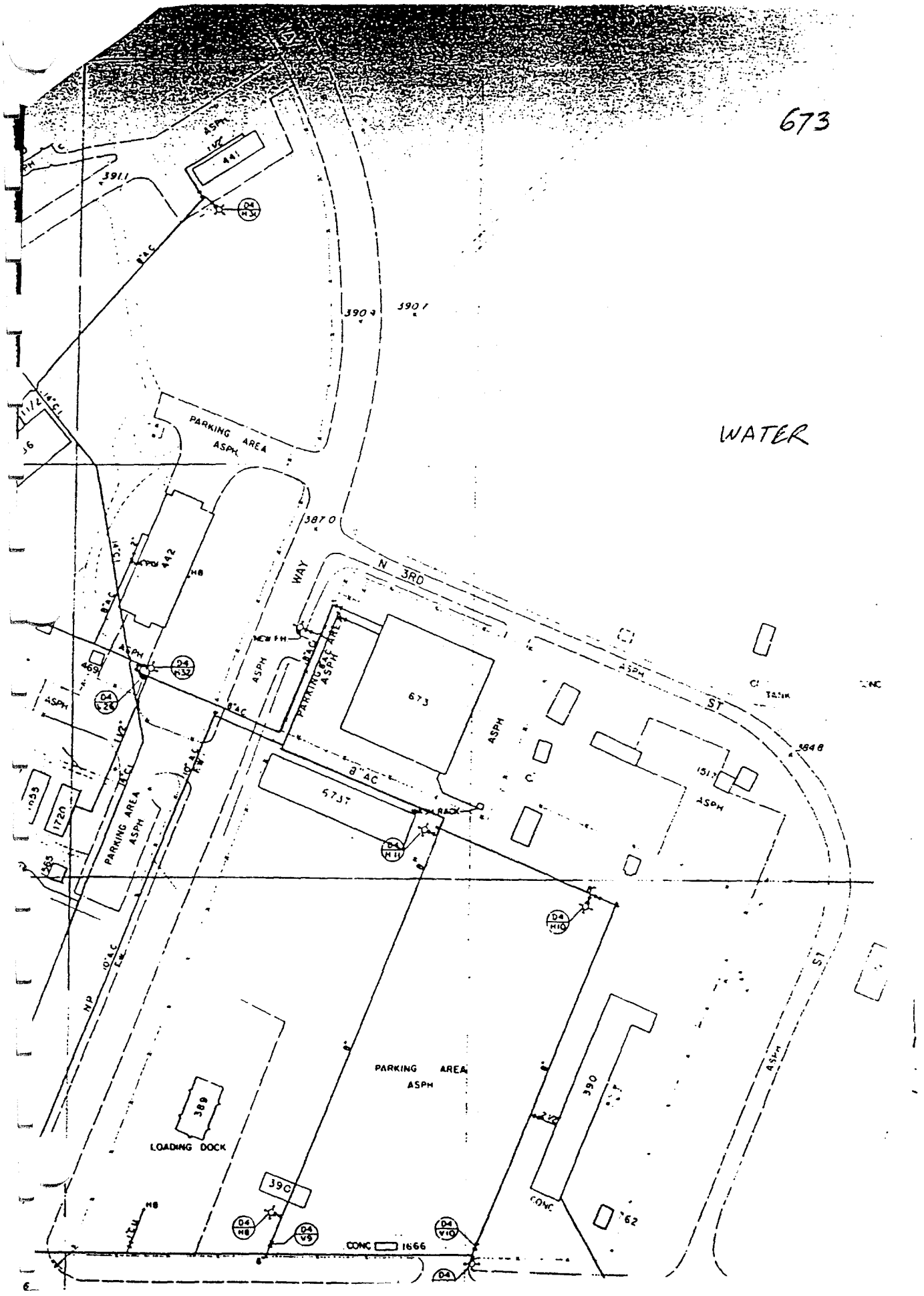
CONST. CONTR. NO. N62474-80 — 9173

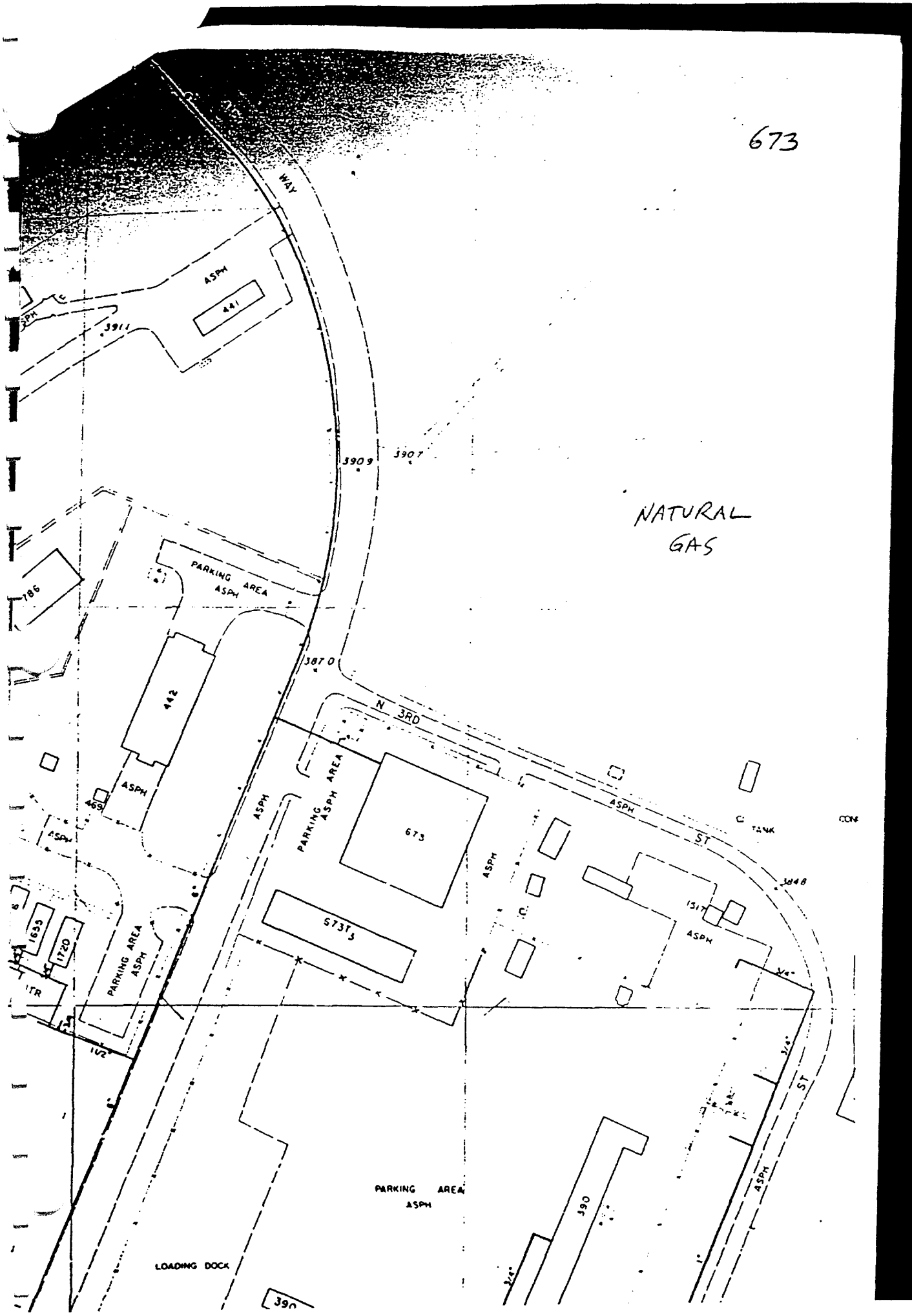

NEW CONC OIL/WATER SEPARATOR PAD SEE DETAIL
NEW PRECAST CONCRETE BOX
NEW AC PAVING
EXIST. CONC WASH PAD
4" PVC @ 0.5%
PIPE INVERT (TYP)
NEW OIL/WATER SEPARATOR
NOTE: FOR SITE PLAN SEE DWG. C-6
SITE NO. 9
HOR SCALE: 1"=6'-0"
VERT SCALE: 1"=2'-0"
NEW CONC OIL/WATER SEPARATOR PAD SEE DETAIL
EXIST. AC PAVING
NEW VEHICLE WASH BLDG.
NEW OIL/WATER SEPARATOR
SITE NO.
EXIST. CONC WASH AREA
EXIST. AC PAVING
4" PVC @ 2.7%
6" PVC @ 1%
EXIST. 6" VCP @ 104%
PIPE INVERT (TYP)
INVERT OF EXIST. 6" VCP (TO BE REMOVED)
NEW OIL/WATER SEPARATOR
OIL/WATER SEPARATOR
CONN. TO EXIST. 6" VCP
SITE NO. 12
HOR SCALE: 1"= 2'-0"
VERT SCALE: 1"= 2'-0"
NOTE: FOR SITE PLAN SEE DWG. C-6

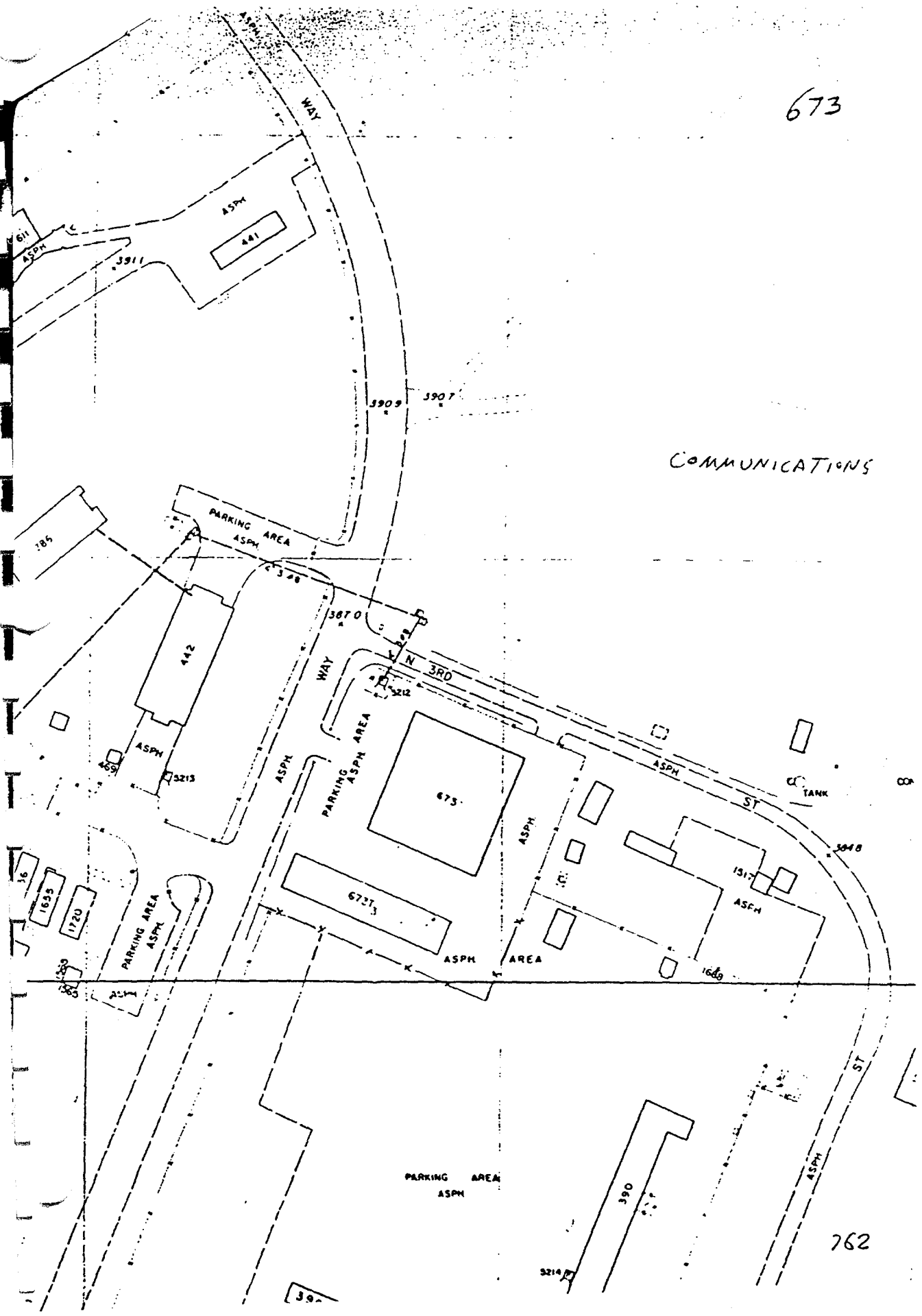
673

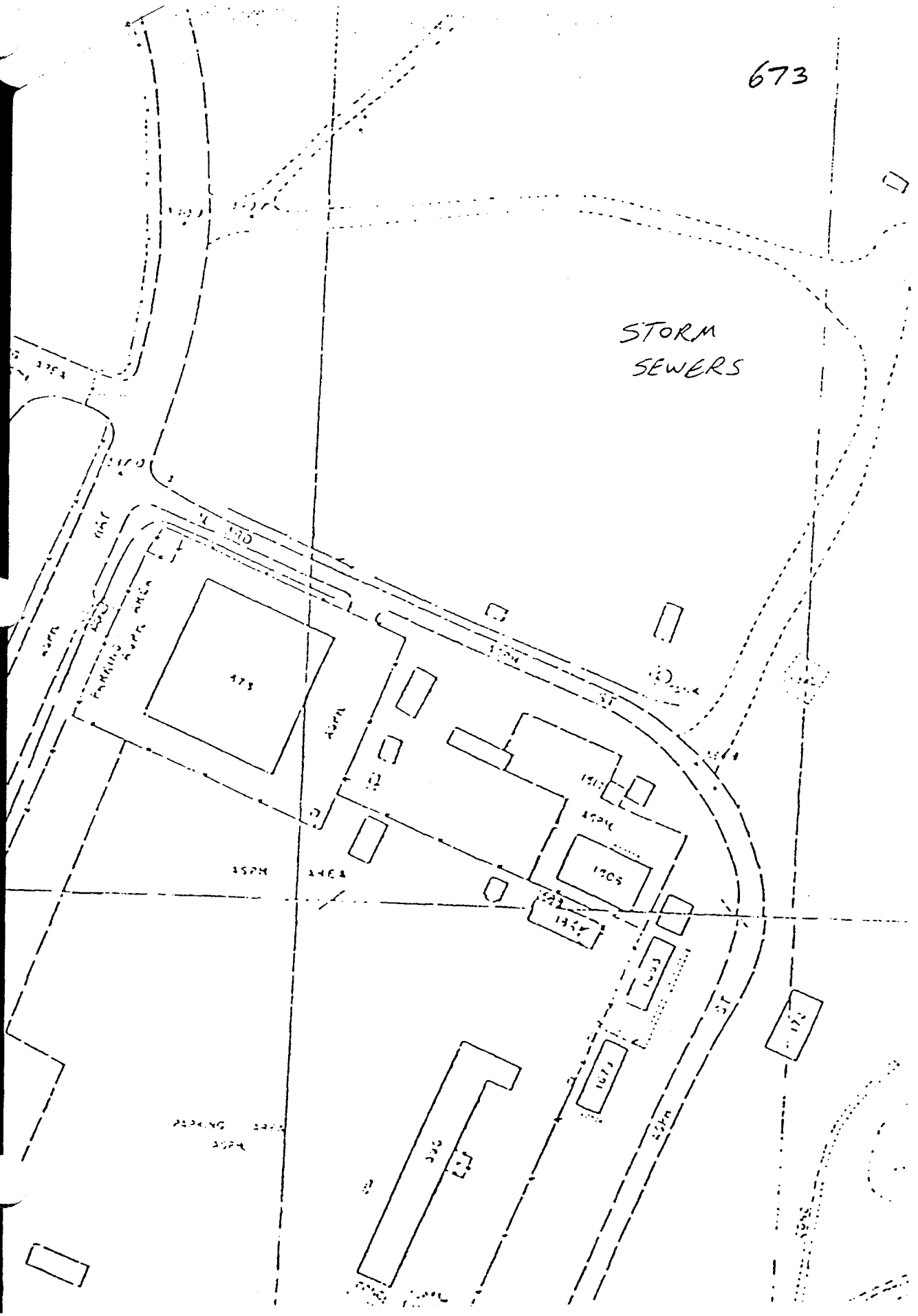
ELECTRICAL

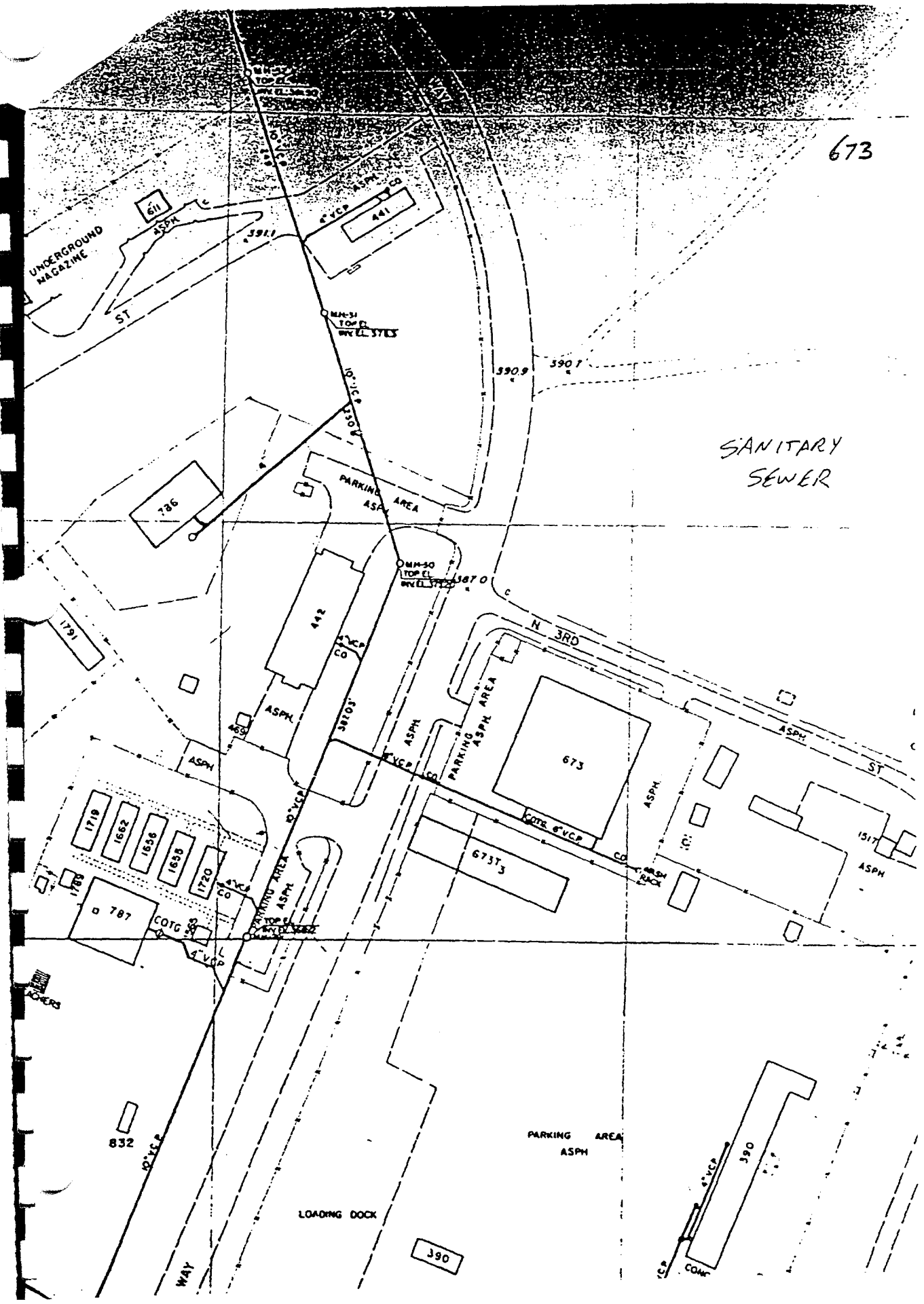



673
WATER
441
442
673
673T
389
390
PARKING AREA
ASPH
LOADING DOCK
N 3RD
WAY
ST
ASPH
CONC
1666
3911
3904
3901
3870
3848


673
WAY
ASPH
441
3911
3909
3907
NATURAL
GAS
PARKING AREA
ASPH
786
3870
442
N 3RD
ASPH
469
ASPH
PARKING AREA
ASPH
673
ASPH
ASPH
ST
TANK
CON
3848
1635
1720
573T3
1517
ASPH
PARKING AREA
ASPH
ITR
1½
ST
ASPH
PARKING AREA
ASPH
390
LOADING DOCK
390


673
COMMUNICATIONS
ASPH
WAY
441
611
3911
3909
3907
PARKING AREA
ASPH
785
442
3870
N 3RD
3212
ASPH
3213
465
PARKING AREA
ASPH
673
ASPH
ST
TANK
3848
1317
ASPH
673T3
ASPH
AREA
1668
16
1635
1720
PARKING AREA
ASPH
1665
PARKING AREA
ASPH
390
3214
ST
ASPH
762


673
STORM
SEWERS
PARKING AREA
473
1305
PARKING AREA


673
SANITARY SEWER
UNDERGROUND MAGAZINE
611
441
442
786
787
673
390
832
1791
1719
1662
1656
1658
1720
1517
N 3RD ST
PARKING AREA ASPH
LOADING DOCK
WAY
10" VCP
4" VCP
COTG 6" VCP
MH-50
MH-51
MH-52
391.1
390.9
390.7
387.0
381.0'S

SOUTHWESTNAVFACENGCOM
CODE 05BME.LMH
SAN DIEGO, CA 92101

Tank Abandonment Information

EXTRACTS

SUMMARY REPORT

Closure In-Place of OWS 673A and Washrack Repairs at Buildings 386 and 761 Marine Corps Air Station (MCAS) El Toro, California

Contract No. N68711-97-D-8702
Delivery Order No. 0019

Prepared for:

Department of the Navy,
Southwest Division
Naval Facilities Engineering Command
BRAC Operations Office
1420 Kettner Boulevard, Suite 507
San Diego, California 92101-2404

Prepared by:

GEOFON, INC.
1081 Camino Del Rio South, Suite 204
San Diego, California 92108

GEOFON Project No. 97-404.190 February 10, 1999

CERTIFICATION

To the best of our knowledge, all statements and information provided in this report are true and correct.

Asrar Faheem
Registered Environmental Assessor

Charles K. Duckworth, P.E.
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
CHARLES K. DUCKWORTH
No. C 34575
Exp. 9-30-99
CIVIL
STATE OF CALIFORNIA

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

2.0 SUMMARY OF WORK AT OWS 673A 2-1

2.1 Waste Management of Rinsate 2-1

2.2 Conclusions 2-1

3.0 WASHRACK REPAIRS AT BUILDINGS 386 3-1

3.1 Conclusions 3-1

4.0 WASHRACK REPAIRS AT BUILDINGS 761 4-1

4.1 Conclusions 4-1

5.0 LIMITATIONS 5-1

LIST OF FIGURES

Figure 1	Project Vicinity Map
Figure 2	Site Location Map, OWS 673A
Figure 3	Site Location Map, Washrack at Building 386
Figure 4	Site Location Map, Washrack at Building 761

LIST OF APPENDICES

Appendix A	Progress Photographs
Appendix B	Material Submittals
Appendix C	Waste Manifest

1.0 INTRODUCTION

GEOFON, Inc. has been retained by the Department of the Navy, Southwest Division (SWDIV), under Contract No. N68711-97-D-8702, Delivery Order No. 0019 to remove and dispose of inactive underground storage tanks (USTs) and oil-water separators (OWS) and conduct washrack repairs at the Marine Corps Air Station (MCAS), El Toro, California (Figure 1). The work involved the removal and disposal of four (4) USTs and two (2) OWS and closure in-place of one (1) OWS at Buildings 797, 765, 766, 655 and 673 and washrack repairs at Building 386 and 761.

This report documents and summarizes the closure in-place of OWS 673A and the washrack repairs at Buildings 386 and 761. Progress photographs are presented in Appendix A. The Material Submittals are included in Appendix B. The Waste Manifest is included in Appendix C.

2.0 SUMMARY OF WORK AT OWS 673A

One (1) 895-gallon concrete OWS, identified as OWS 673A was closed in-place on December 22, 1998, in accordance with the details outlined in the Work Plan dated November 6, 1998 and under the direct supervision of the Assistant Resident Officer in Charge of Construction (AROICC). All materials were pre-approved by the AROICC prior to initiation of field activities.

OWS 673A was located southeast of Building 673 on the southeast side of MCAS El Toro and measured approximately 4 feet wide, 10 feet long and 6 feet deep (Figure 2). The OWS was tripled-rinsed and then slurry filled with 8 cubic yards of 2-sack slurry. Progress photographs are presented in Appendix A (Figure A-1 and Figure A-2).

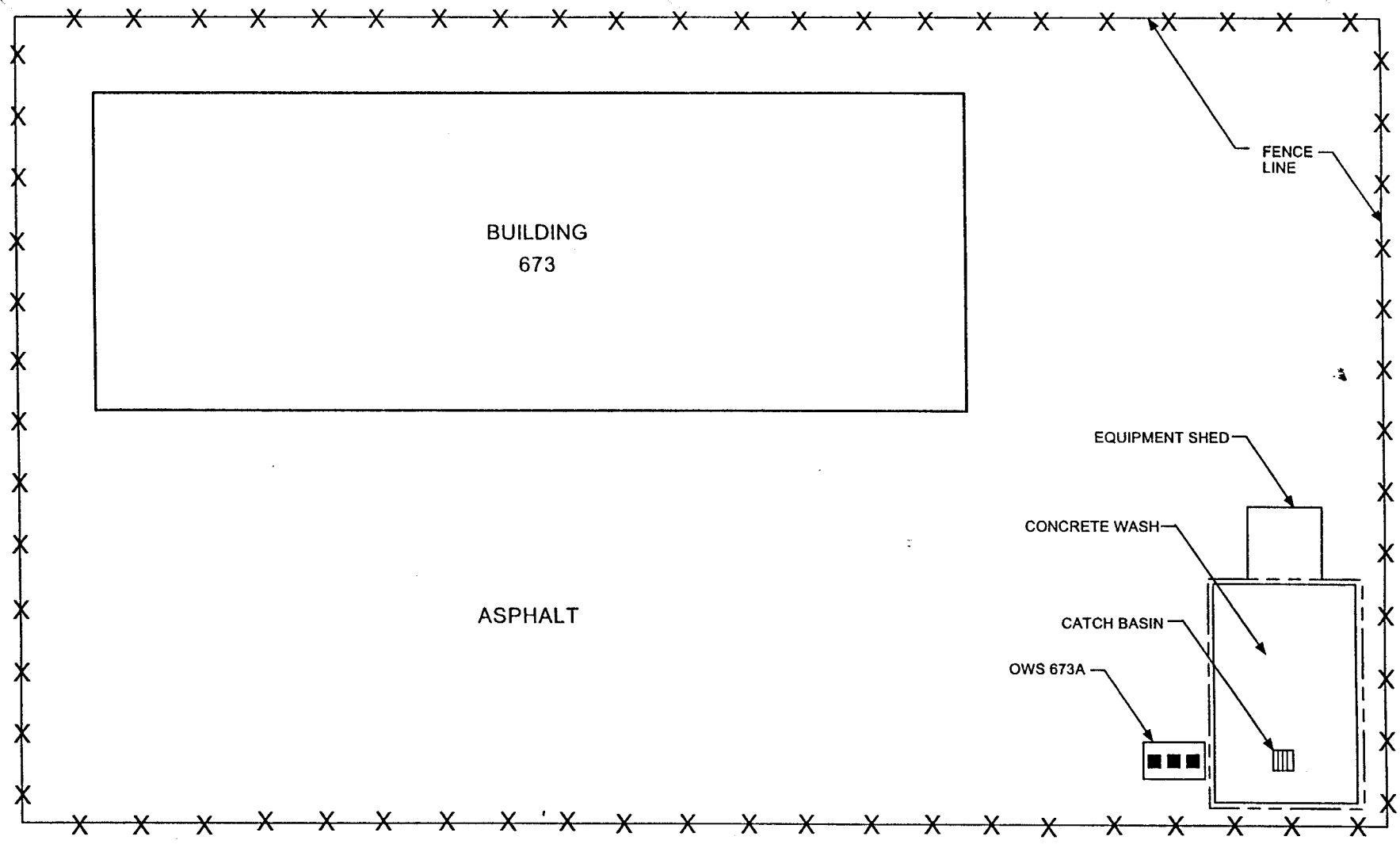
2.1 Waste Management of Rinsate

Approximately 1,600 gallons of rinsate from OWS 673A was transported on December 14, 1998 by EFR Environmental Services (EFR), a state-certified waste hauler, to Demenno/Kerdoon, a recycling facility.

2.2 Conclusions

Based on our observations, we conclude that:

- One (1) OWS was closed in-place in accordance with the approved Work Plan dated November 6, 1998 and under the direct supervision of the AROICC.



Not To Scale

N

GEOFON INCORPORATED

PROJECT NO.:
97-404.190

SITE LOCATION MAP
OWS 673A

2/99

Figure 2

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. Form designed for use on elite (12) typewriter.

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CA6170023208 Manifest Document No. 1559
2. Page 1 of 1
Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address
COMMANDING GENERAL
MCAS EL TORO SANTA ANA, CA. 92518-5001

4. Generator's Phone (949) 726-2772

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES
6. US EPA ID Number: CAR000011205

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

9. Designated Facility Name and Site Address
DEMENNO/KERDOON
2000 N. ALAMEDA ST.
COMPTON, CA 90222
10. US EPA ID Number: CAT080013352

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-RCRA HAZARDOUS WASTE LIQUID (OILY WATER)	001	TT	02200	G
b.				
c.				
d.				

J. Additional Descriptions for Materials Listed Above
[illegible] CONTAINERS [illegible] R-01

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS!
24 HOUR EMERGENCY NUMBER 800-424-8802 (CHEM TEC)

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

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

Printed/Typed Name: EDISON ARDENAS
Signature: [signature]
Month 12 Day 03 Year 91

17 Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: [illegible]
Signature: [signature]
Month [illegible] Day [illegible] Year [illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: JOHN DRISDOM
Signature: John Drisdom
Month 12 Day 12 Year 91

DO NOT WRITE BELOW THIS LINE.

GENERATOR
TRANSPORTER
FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL R[illegible] CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

Appendix B

Historical Records from Previous Investigations

- Resource Conservation and Recovery Act Facility Assessment (RFA) Extracts
- Oil/Water Separator Survey Extracts
- Other Survey Data
- Construction Drawing of OWS 673A
- Ground Water Information

M60050.000721
MCAS EL TORO
SSIC # 5090.3

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY ASSESSMENT (RFA) EXTRACTS

SITE ASSESSMENT REPORT OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

MARINE CORPS AIR STATION EL TORO
EL TORO, CALIFORNIA
INSTALLATION RESTORATION PROGRAM
FINAL RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY ASSESSMENT REPORT

VOLUME I

16 July 1993

EXTRACTS

PREPARED BY:
Southwest Division, Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

THROUGH:
CONTRACT #N68711-89-D-9296
CTO #193
DOCUMENT CONTROL NO:
CLE-C01-01F193-S2-0001

WITH:
Jacobs Engineering Group Inc.
3655 Nobel Drive, Suite 200
San Diego, California 92122

In association with:
International Technology Corporation
CH2M HILL

Evaluation Form
SWMU/Area of Concern
Number 179

Name: Oil/Water Separator 673-A

Location: South of Building 673

Size: 100 gallons

Date of Site Visit: 02 May 1991

Period of Operation

Installed in 1982
Currently active

Evaluation Form
SWMU/Area of Concern
Number 179

Unit Characteristics

An oil/water separator is located adjacent to the washrack at Building 673 (SWMU/AOC Number 178). The oil/water separator is located at the northern side of the northwestern corner of the washrack. The ground surface above the oil/water separator consists of a 5-ft x 8-ft concrete pad with three 2-ft x 2-ft steel covers. The edge of the concrete pad is located approximately 1 ft from the washrack berm. The oil/water separator appears to be a 3-stage separator. The surface bordering the concrete pad consists of asphalt pavement. Some dark areas are present on the surrounding asphalt pavement.

Waste Characteristics

Oily water

Possible Migration Pathways

Subsurface soil

Evidence of Release

Stains on nearby asphalt pavement

Exposure Potential

Authorized on-Station personnel

Recommendations

This UST has not been tank tested. Although no evidence of a release was indicated from the records review or the VSI, it is difficult to assess the potential for release from this underground SWMU/AOC. Stains on the nearby asphalt pavement indicate some spillage in the area although it does not appear that the underlying soil was impacted. A sampling visit is suggested for this UST to verify whether the UST and/or the spills have resulted in a release to soil.

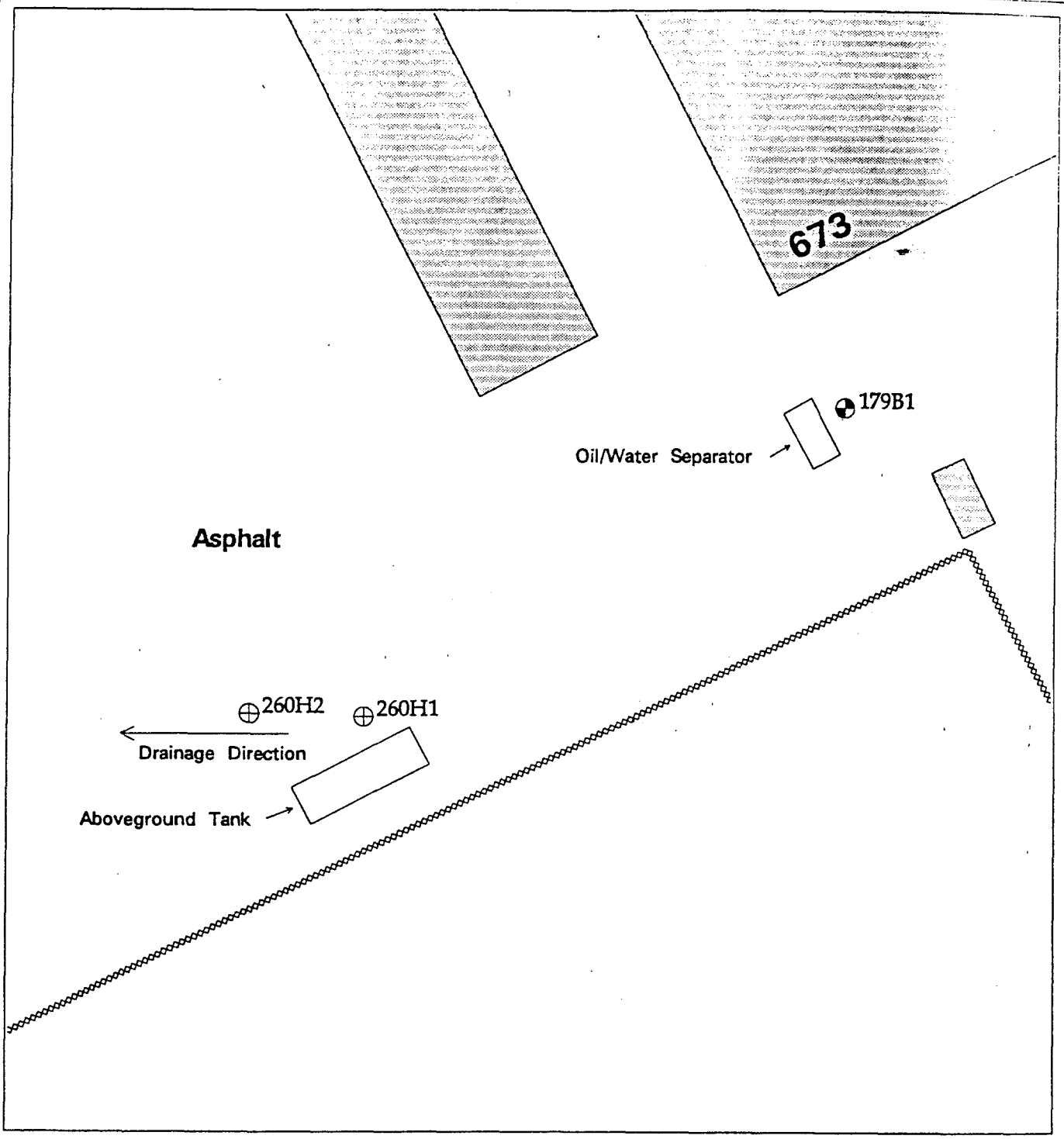


Figure 55 Sample Location Map

Boring Location and Number:

- 123H4 5′ Deep Boring
- 123B4 25′ Deep Boring
- 123A4 60′ Long, Angle Boring

Features:

- Building
- Concrete
- Fence
- Railroad

Scale

0 20 40 80 Feet

SWMU/AOC Number and Type:

179 - Oil/Water Separator

260 - Aboveground Storage Tank

MCAS El Toro
RCRA Facility Assessment

MCAS EL TORO RCRA FACILITY ASSESSMENT -- SAMPLING VISIT RESULTS

SWMU/AOC NUMBER	SWMU/AOC TYPE (FIGURE)	BORING NUMBER	SAMPLE DEPTH (FEET)	ANALYTICAL TEST RESULTS							RECOMMENDATIONS	
				TPH (mg/kg)	TFH (mg/kg)		VOCs (ug/kg)	SVOCs (ug/kg)	PESTICIDES/PCBs (ug/kg)	METALS (mg/kg)	Action	Rationale
					Gasoline	Diesel						
179	Oil/Water Separator (55)	B1	5	ND	NA	NA	Methylene Chloride-7 BJ * Acetone-31 *	NA	NA	NA	NFA	TPH/TFH < 100 ppm VOCs < CRDL
			10	ND	NA	NA	Methylene Chloride-11 BJ * Acetone-34 *	NA	NA	NA		
			15	ND	NA	NA	Methylene Chloride-12 B * Acetone-25 * Toluene-6 J Carbon Tetrachloride-2J	NA	NA	NA		
			20	ND	NA	NA	Methylene Chloride-18 B * Acetone-24 *	NA	NA	NA		
			25	ND	NA	NA	Methylene Chloride-12 B * Acetone-21 *	NA	NA	NA		

CRDL - Contract Required Detection Limit

M60050.000721
MCAS EL TORO
SSIC # 5090.3

OIL/WATER SEPARATOR SURVEY EXTRACTS

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

EXTRACTS

USMC MCAS El Toro Underground Storage Tank Survey Report

November 1990

Prepared by
Idaho National Engineering Laboratory
U.S. Department of Energy
Idaho Operations Office
EG&G Idaho, Inc.
as part of
Work For Others Project #89754
Under DOE Contract # DE-AC07-76ID01570

Prepared for
Headquarters, United States Marine Corps
Washington, D.C.

Table 2-1. ster UST inventory

Tank #	EPA Registered	1987 Survey	Suspect Location	Drawing	USMC List	Comments
658A	Y	N		Y	Y	Active
658B	Y	N		Y	Y	Active
658C	N	N		Y	N	Active
672	Y	N		N	Y	Active - Waste storage
672A	Y	Y		Y	Y	Active - O/W Sep.
672B	Y	Y		Y	Y	Active - Waste storage
→ 673A	Y	Y		Y	Y	Active - O/W Sep.←
673B	Y	N		N	Y	Active - Waste storage — phantom
674	Y	Y		N	Y	Active - Waste storage
675	Y	Y		N	Y	Active - Waste storage
693A	Y	Y	NW CORNER OF BLD.	Y	Y	1987 Survey Form-Converted facility to natural gas
693B	N	Y	SW CORNER OF BLD.	Y	N	1987 Survey Form-Converted facility to natural gas
706	Y	N	NOT AVAILABLE	N	Y	Demolished facility-87, 84-C-4327
716A	Y	N		N	Y	Active- Waste storage
716B	Y	N		N	Y	Active - O/W Sep.
718	Y	Y	E SIDE OF BLD.	Y	Y	1987 Survey Form-Converted facility to natural gas
730	N	N		Y	N	Active, Em. Generator
733A	Y	Y	N SIDE OF BLD.	Y	Y	1987 Survey Form-Converted facility to natural gas
733B	N	Y	N SIDE OF BLD.	Y	N	1987 Survey Form-Converted facility to natural gas
733C	N	Y	N SIDE OF BLD.	Y	N	1987 Survey Form-Converted facility to natural gas
758A	Y	N		N	Y	Active O/W Sep.
758B	Y	Y		Y	Y	Active - Waste storage
759A	Y	N		N	Y	Active - O/W Sep.
759B	Y	Y		Y	Y	Active - Waste storage

M60050.000721
MCAS EL TORO
SSIC # 5090.3

OTHER SURVEY DATA

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

EL TORO OIL/ : SEPARATORS

Oil Water Separator ID	Location	Material	Type	Interior Dimensions LxWxD Inches & Feet	Estimated Flow or Capacity	Monitoring/Leak Detection Devices	Rain diversion Valves & Controls
626(1)#**	626 driveway	Precast Concrete	3-Stage Gravity	9' x 5' x 3'	600 gal Capacity	None	No
626(2)	626(2)	Precast Concrete	2-Stage Gravity	5'6" x 4'4" x 3'2"	560 gal Capacity	High Level Alarm	No
651/ 652	W B-652	Precast Concrete	2-Stage Gravity	5'5" x 2' x 3'6"	280 gal Capacity	None	No
658(1)	N B-658	Concrete	Single Stage Gravity	6' x 4'2" x 2'4"	400 gal Capacity	None	No
658(2)#	N B-658	Aboveground Steel	Great Lakes	8' x 8' x 10'	200 gpm	Level Alarm	Progressive Cavity Pump
672#	SW B-672	Metal/ Concrete	Unknown	24" x 41" x 8'1"	400 gal Capacity	Level Alarm	Yes - Butterfly
673	WS B-673	Concrete	3-Stage Gravity	95" x 52" x 48"	895 gal Capacity	Level Alarm	No
674(1)#	Bee Canyon Wash	Steel	Single Stage Gravity	4' x 4' x 12'	1400 gal, skim at 50 gpm	None	Low Flow Diverter
674(2)	Bee Canyon Wash	Aboveground Steel	Facet	4' x 3' x 3'	5 gpm	Level Alarm	No
675(1)#	Aqua Chinon Wash	Steel	Gravity	4' x 4' x 12'	1400 gal, skim at 50 gpm	None	Fixed Low Flow Diverter
675(2)#	Aqua Chinon Wash	Aboveground Steel	Facet	4' x 3' x 3'	5 gpm	Level Alarm	No

Oil/Water Separators with associated waste oil tanks

ATTACHMENT H

Source: MCAS El Toro OWS Maintenance Service Contract records

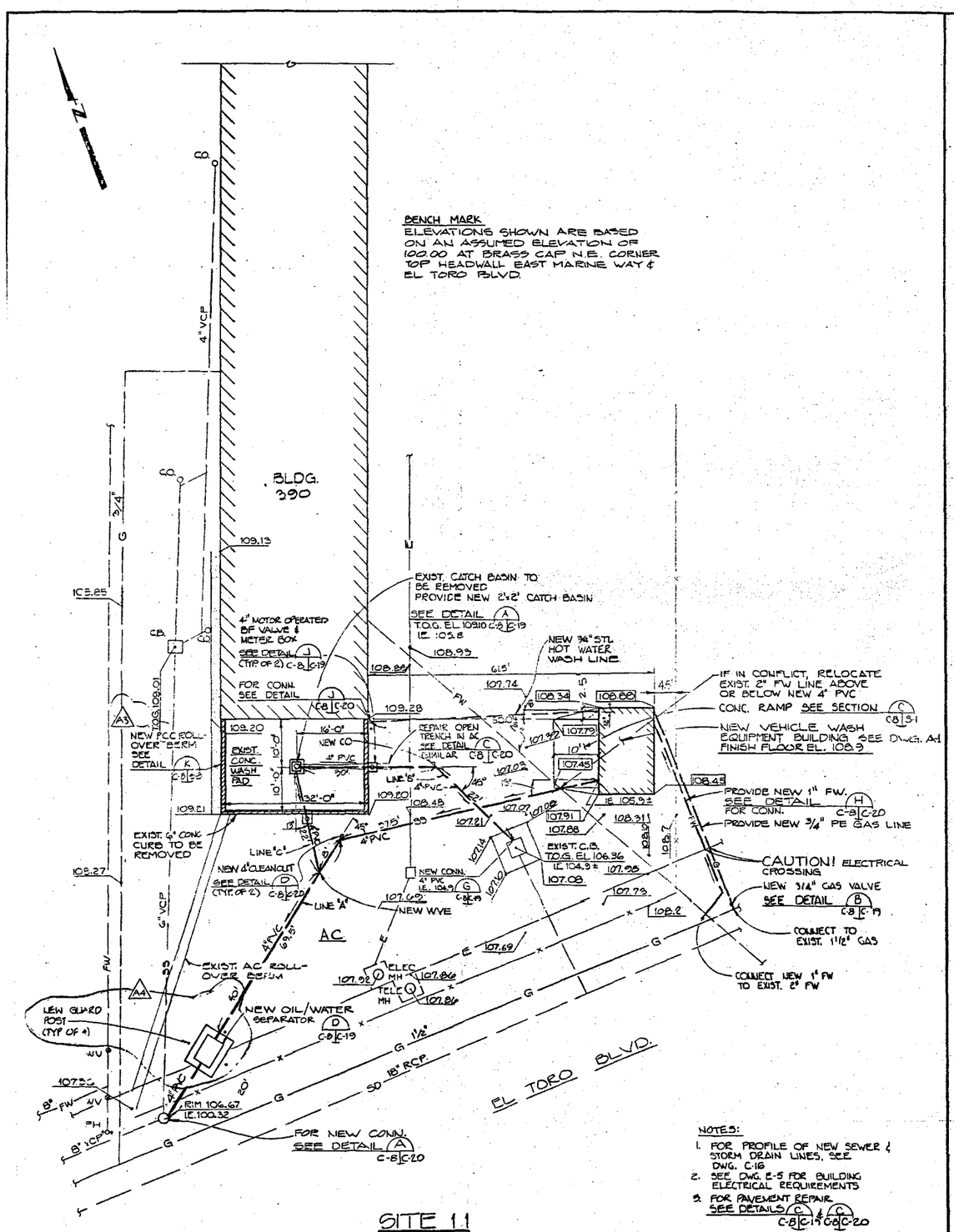
M60050.000721
MCAS EL TORO
SSIC # 5090.3

CONSTRUCTION DRAWING OF OWS 673A

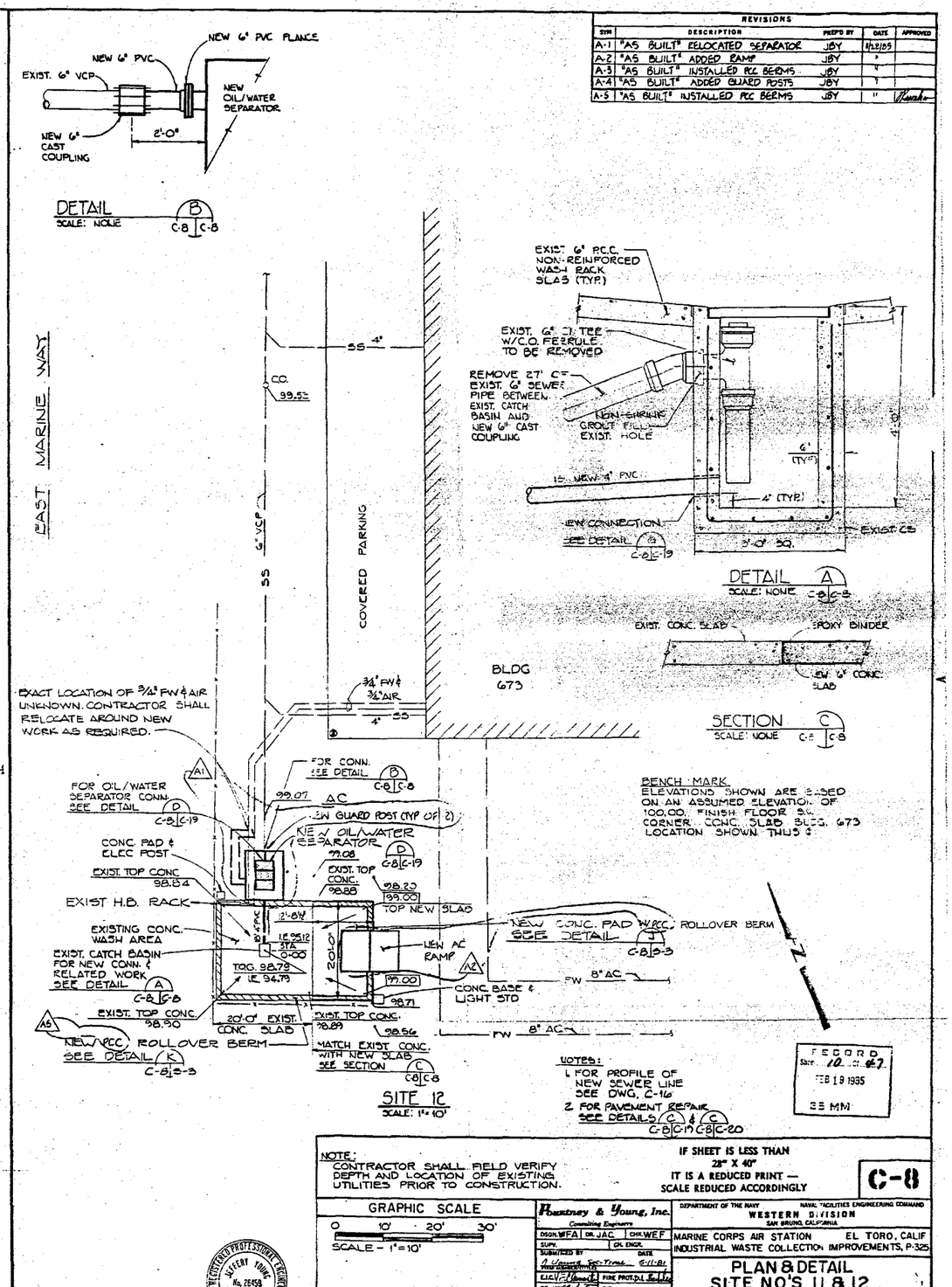
SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

REVISIONS				
SYM	DESCRIPTION	PREP'D BY	DATE	APPROVED
A-1	"AS BUILT" RELOCATED SEPARATOR	JBY	8/28/85	
A-2	"AS BUILT" ADDED RAMP	JBY	"	
A-3	"AS BUILT" INSTALLED PCC BERMS	JBY	"	
A-4	"AS BUILT" ADDED GUARD POSTS	JBY	"	
A-5	"AS BUILT" INSTALLED PCC BERMS	JBY	"	



NOTES:
1. FOR PROFILE OF NEW SEWER & STORM DRAIN LINES, SEE DWG. C-16
2. SEE DWG. E-5 FOR BUILDING ELECTRICAL REQUIREMENTS
3. FOR PAVEMENT REPAIR SEE DETAILS C & C C-8|C-19 C-8|C-20



NOTES:
1. FOR PROFILE OF NEW SEWER LINE SEE DWG. C-16
2. FOR PAVEMENT REPAIR SEE DETAILS C & C C-8|C-19 C-8|C-20

RECORD
Date 10 of 87
FEB 19 1985
EE MM

NOTE:
CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

IF SHEET IS LESS THAN 28" X 40" IT IS A REDUCED PRINT — SCALE REDUCED ACCORDINGLY

C-8

GRAPHIC SCALE
0 10' 20' 30'
SCALE - 1"=10'

REGISTERED PROFESSIONAL ENGINEER JEFFERY YOUNG No. 26458 CIVIL STATE OF CALIFORNIA

Pinkney & Young, Inc.
Consulting Engineers

DSGN. WFA DR. JAC CHK. WEF
SUPV. CH. ENGR.
SUBMITTED BY DATE
EIC/ FIRE PROT. ENG.
BR. HD. DIR.
SATISFACTORY TO DATE
TITLE
APPROVED DATE
EFD FOR "AS BUILT" NOTES

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
WESTERN DIVISION
SAN BRUNO, CALIFORNIA

MARINE CORPS AIR STATION EL TORO, CALIF
INDUSTRIAL WASTE COLLECTION IMPROVEMENTS, P-325

PLAN & DETAIL SITE NO'S 11 & 12

SIZE	CODE IDENT. NO.	NAVFAC DRAWING NO.
F	80091	6147727

CONST. CONTR. NO. N62474— 80 —C— 9175
SCALE SHOWN
SPEC. 12 80 5 75
SHEET 10 OF 1

M60050.000721
MCAS EL TORO
SSIC # 5090.3

GROUND WATER INFORMATION

SITE ASSESSMENT REPORT
OIL/WATER SEPARATOR SITE 673A

DATED 12 APRIL 1999

EXTRACTS

FINAL

GROUNDWATER MONITORING REPORT
OCTOBER 1997 SAMPLING ROUND

GROUNDWATER MONITORING PROGRAM
FOR
MARINE CORPS AIR STATION EL TORO
EL TORO, CALIFORNIA

Contract No. N68711-96-D-2029
Delivery Order 005

Prepared for:

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 Pacific Highway
San Diego, California 92132

Prepared by:

CDM FEDERAL PROGRAMS CORPORATION
3760 Convoy Street, Suite 210
San Diego, California 92111

March 1998

Table 4-1: SUMMARY OF DETECTED VOLATILE ORGANIC COMPOUNDS
MCAS El Toro Groundwater Monitoring Program

Station ID	Base Screen Depth (Ft BGS)	Sample Date	PRIMARY VOCs DETECTED AND REGULATORY STANDARDS – All Results in Micrograms per Liter (ug/L)												OTHER VOCs DETECTED	
			TCE	PCE	CCl_4	1,1-DCE	1,2-DCE (total)	Chloroform	Chloro-methane	Benzene	Toluene	Ethyl-benzene	Xylenes (total)	Freon-113	Compound	Concent.
			5.0	5.0	0.5	6.0		100.0		1.0	100.0	680.0	1750.0			
18_BGMW02D	314	17-Jun-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		BROMODICHLOROMETHANE	0.7 J
								1.0 U			2.0		1.0 U		CHLORODIBROMOMETHANE	0.6 J
		18-Dec-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	4.0	1.0 U	1.0 U		CARBON DISULFIDE	1.0
		15-Jun-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0	2.0 U	1.0 U	1.0 U	1.0 U				
		17-Jan-96	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		17-Jan-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		6-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		13-Mar-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
18_BGMW02E	233	6-May-92	1.0 U	0.8 J	1.0 U	1.0 U	1.0 U	0.7 J	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		21-Sep-92	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		METHYLENE CHLORIDE	0.5 J
		15-Jun-93	3.0 JN	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		1-Feb-96	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		1-Nov-96	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		27-Mar-97	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
18_BGMW03A	390	25-Jun-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		BROMODICHLOROMETHANE	0.5 J
															CHLORODIBROMOMETHANE	0.6 J
		29-Oct-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		14-Jul-93	0.8 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		29-Jan-96	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	3.0	1.0 U	1.0 U	10.0 U		
		29-Jan-96	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	3.0	1.0 U	1.0 U	10.0 U		
		7-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		21-Mar-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
18_BGMW03B	300	28-Oct-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		28-Nov-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.8 J	1.0 U	1.0 U	1.0 U	1.0 U			
		14-Jul-93	0.8 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		29-Jan-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		7-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		21-Mar-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
18_BGMW03C	242	23-Jul-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		METHYLENE CHLORIDE	1.0 B
		17-Dec-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	0.8 J	1.0 U	1.0 U			
		15-Jul-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		12-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	10.0	1.0 U	1.0 U	10.0 U		
		7-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		21-Mar-97	0.5 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		8-Jul-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		17-Oct-97	0.5 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		

Table 4-1: SUMMARY OF DETECTED VOLATILE ORGANIC COMPOUNDS
MCAS El Toro Groundwater Monitoring Program

Station ID	Base Screen Depth (Ft BGS)	Sample Date	PRIMARY VOCs DETECTED AND REGULATORY STANDARDS – All Results in Micrograms per Liter (ug/L)												OTHER VOCs DETECTED	
			TCE 5.0	PCE 5.0	CCl_4 0.5	1,1-DCE 6.0	1,2-DCE (total)	Chloroform 100.0	Chloro-methane	Benzene 1.0	Toluene 100.0	Ethyl-benzene 680.0	Xylenes (total) 1750.0	Freon-113	Compound	Concent
19_DGMW86	198	17-Dec-92	0.8 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		6-Nov-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		27-Feb-96	3.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		27-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		3-Dec-96	**10.0**	**5.0**	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		3-Dec-96	**11.0**	**10.0**	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		11-Mar-97	0.9 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
19_UGMW35	185	12-Aug-92	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		15-Jul-93	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		8-Feb-96	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		8-Feb-96	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		21-Nov-96 *	3.0	2.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 J		
		18-Mar-97 *	1.0 U	1.0 J	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		18-Mar-97 *	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
20_DBMW55	227	12-Sep-92	0.5 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		17-Jun-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		27-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		14-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		25-Mar-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
20_DGMW88	225	11-Apr-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.5 J	1.0 U	1.0 U	1.0 U	1.0 U			
		17-Jun-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		1-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		1-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		25-Nov-96 *	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		25-Nov-96 *	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	METHYLENE CHLORIDE	1.0
		20-Mar-97 *	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
20_UGMW36	223	28-Oct-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.9 J	1.0 U	1.0 U	1.0 U	1.0 U			
		18-Jun-93	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		METHYLENE CHLORIDE	0.6 J
		5-Feb-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		14-Nov-96	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		27-Mar-97	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	METHYLENE CHLORIDE	1.0
21_DBMW56	132	18-Nov-92	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0	1.0 U	1.0 U	1.0 U	1.0 U			
		24-Jun-93	0.7 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0					3.0 JN		
		15-Feb-96	**47.0**	1.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	7.0	1.0 U	1.0 U	10.0 U		
		13-Nov-96	**7.0**	4.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		25-Mar-97	**8.0**	4.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
21_DGMW90	135	18-Dec-92	1.0	0.8 J	1.0 U	1.0 U	1.0 U	0.6 J	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U		METHYLENE CHLORIDE	0.6 J
		6-Oct-93	3.0	1.0	1.0 U	1.0 U	1.0 U	3.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
		2-Feb-96	3.0	2.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
		26-Nov-96 *	3.0	2.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 J	METHYLENE CHLORIDE	1.0
		20-Mar-97 *	4.0	3.0	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		

Table B-1: WATER LEVEL MEASUREMENTS AND GROUNDWATER ELEVATIONS
MCAS El Toro Groundwater Monitoring Program

STATION ID	WELL TYPE	SCREEN INTERVAL (feet BGS)	TOP OF CASING ELEVATION (feet MSL)	MEASUREMENT DATE	DEPTH TO WATER (feet TOC)	WATER LEVEL ELEVATION (feet MSL)	CHANGE FROM PRIOR ELEVATION (+ or - feet)
18_BGMW02A	CL	462 - 482	391.81	12-Jan-96	164.41	227.40	
			391.81	18-Jan-96	164.04	227.77	0.37
			391.81	27-Feb-96	163.38	228.43	0.66
			391.81	27-Mar-96	163.30	228.51	0.08
			391.81	31-Oct-96	161.69	230.12	1.61
			391.81	26-Nov-96	163.60	228.21	-1.91
			391.81	26-Dec-96	160.86	230.95	2.74
			391.81	24-Jan-97	160.66	231.15	0.20
			391.81	27-Feb-97	159.90	231.91	0.76
			391.81	27-Mar-97	161.08	230.73	-1.18
			391.81	26-Jun-97	158.90	232.91	2.18
			391.81	11-Aug-97	159.90	231.91	-1.00
			391.81	25-Sep-97	158.83	232.98	1.07
			391.81	6-Nov-97	158.90	232.91	-0.07
18_BGMW02C	CL	358 - 378	391.75	12-Jan-96	165.06	226.69	
			391.75	18-Jan-96	164.62	227.13	0.44
			391.75	27-Feb-96	164.30	227.45	0.32
			391.75	27-Mar-96	163.94	227.81	0.36
			391.75	31-Oct-96	162.45	229.30	1.49
			391.75	26-Nov-96	162.00	229.75	0.45
			391.75	26-Dec-96	161.48	230.27	0.52
			391.75	24-Jan-97	161.62	230.13	-0.14
			391.75	27-Feb-97	160.59	231.16	1.03
			391.75	27-Mar-97	161.06	230.69	-0.47
			391.75	26-Jun-97	160.25	231.50	0.81
			391.75	11-Aug-97	160.40	231.35	-0.15
			391.75	25-Sep-97	159.72	232.03	0.68
			391.75	6-Nov-97	159.72	232.03	0.00
18_BGMW02D	CL	294 - 314	391.45	12-Jan-96	166.42	225.03	
			391.45	17-Jan-96	166.10	225.35	0.32
			391.45	27-Feb-96	165.78	225.67	0.32
			391.45	27-Mar-96	165.48	225.97	0.30
			391.45	31-Oct-96	164.06	227.39	1.42
			391.45	26-Nov-96	163.30	228.15	0.76
			391.45	26-Dec-96	163.00	228.45	0.30
			391.45	24-Jan-97	162.88	228.57	0.12
			391.45	27-Feb-97	161.92	229.53	0.96
			391.45	27-Mar-97	162.34	229.11	-0.42
			391.45	26-Jun-97	161.45	230.00	0.89
			391.45	11-Aug-97	161.90	229.55	-0.45
			391.45	25-Sep-97	160.98	230.47	0.92
			391.45	6-Nov-97	160.95	230.50	0.03
18_BGMW02E	CL - WT	198 - 233	391.72	12-Jan-96	169.88	221.84	
			391.72	1-Feb-96	169.10	222.62	0.78
			391.72	27-Feb-96	169.05	222.67	0.05
			391.72	27-Mar-96	168.56	223.16	0.49
			391.72	31-Oct-96	166.22	225.50	2.34
			391.72	27-Nov-96	165.50	226.22	0.72
			391.72	26-Dec-96	165.18	226.54	0.32
			391.72	24-Jan-97	164.92	226.80	0.26
			391.72	27-Feb-97	163.86	227.86	1.06
			391.72	27-Mar-97	164.38	227.34	-0.52
			391.72	26-Jun-97	163.05	228.67	1.33
			391.72	11-Aug-97	163.64	228.08	-0.59
			391.72	25-Sep-97	162.60	229.12	1.04
			391.72	6-Nov-97	162.48	229.24	0.12

Table B-1: WATER LEVEL MEASUREMENTS AND GROUNDWATER ELEVATIONS
MCAS El Toro Groundwater Monitoring Program

STATION ID	WELL TYPE	SCREEN INTERVAL (feet BGS)	TOP OF CASING ELEVATION (feet MSL)	MEASUREMENT DATE	DEPTH TO WATER (feet TOC)	WATER LEVEL ELEVATION (feet MSL)	CHANGE FROM PRIOR ELEVATION (+ or - feet)
19_DGMW86	WT	158 - 198	332.87	12-Jan-96	150.34	182.53	
			332.87	12-Feb-96	149.94	182.93	0.40
			332.87	27-Mar-96	149.47	183.40	0.47
			332.87	31-Oct-96	149.46	183.41	0.01
			332.87	26-Nov-96	148.88	183.99	0.58
			332.87	27-Dec-96	149.15	183.72	-0.27
			332.87	24-Jan-97	148.12	184.75	1.03
			332.87	27-Feb-97	147.31	185.56	0.81
			332.87	27-Mar-97	148.15	184.72	-0.84
			332.87	26-Jun-97	147.94	184.93	0.21
			332.87	12-Aug-97	147.76	185.11	0.18
			332.87	25-Sep-97	147.42	185.45	0.34
			332.87	6-Nov-97	147.10	185.77	0.32
19_UGMW35	WT	148 - 185	343.66	12-Jan-96	150.62	193.04	
			343.66	8-Feb-96	150.29	193.37	0.33
			343.66	27-Feb-96	149.97	193.69	0.32
			343.66	27-Mar-96	149.65	194.01	0.32
			343.66	31-Oct-96	149.26	194.40	0.39
			343.66	26-Nov-96	148.94	194.72	0.32
			343.66	27-Dec-96	149.50	194.16	-0.56
			343.66	24-Jan-97	147.84	195.82	1.66
			343.66	27-Feb-97	147.29	196.37	0.55
			343.66	27-Mar-97	148.20	195.46	-0.91
			343.66	26-Jun-97	147.69	195.97	0.51
			343.66	11-Aug-97	142.42	201.24	5.27
			343.66	7-Nov-97	146.62	197.04	-4.20
20_DBMW55	WT	187 - 227	331.56	11-Jan-96	180.53	151.03	
			331.56	27-Feb-96	179.62	151.94	0.91
			331.56	28-Feb-96	179.92	151.64	-0.30
			331.56	27-Mar-96	179.34	152.22	0.58
			331.56	31-Oct-96	179.30	152.26	0.04
			331.56	26-Nov-96	179.14	152.42	0.16
			331.56	26-Dec-96	178.58	152.98	0.56
			331.56	24-Jan-97	178.42	153.14	0.16
			331.56	27-Feb-97	178.40	153.16	0.02
			331.56	27-Mar-97	177.60	153.96	0.80
			331.56	26-Jun-97	178.23	153.33	-0.63
			331.56	11-Aug-97	178.47	153.09	-0.24
			331.56	25-Sep-97	178.12	153.44	0.35
			331.56	5-Nov-97	178.03	153.53	0.09
20_DGMW88	WT	185 - 225	331.65	11-Jan-96	181.59	150.06	
			331.65	1-Feb-96	181.38	150.27	0.21
			331.65	28-Feb-96	181.10	150.55	0.28
			331.65	27-Mar-96	180.55	151.10	0.55
			331.65	31-Oct-96	180.54	151.11	0.01
			331.65	26-Nov-96	180.26	151.39	0.28
			331.65	26-Dec-96	179.82	151.83	0.44
			331.65	24-Jan-97	179.32	152.33	0.50
			331.65	28-Feb-97	178.88	152.77	0.44
			331.65	27-Mar-97	179.12	152.53	-0.24
			331.65	26-Jun-97	179.58	152.07	-0.46
			331.65	11-Aug-97	179.68	151.97	-0.10
			331.65	25-Sep-97	179.23	152.42	0.45
			331.65	5-Nov-97	179.24	152.41	-0.01

EXTRACTS

Technical Memorandum

Groundwater Monitoring Report
Petroleum Storage Facilities at Various Locations
Marine Corps Air Station
El Toro, California

SWDIV Contract No. N68711-93-D-1459, Delivery Order No. 0050
OHM Project No. 18292
Document Control No. SW4356
Revision 0
November 5, 1997

OHM Remediation Services Corp.

1202 Kettner Boulevard
San Diego, California 92101

Prepared by:

Julie Diebenow
Senior Hydrogeologist

Approved by:

William Sedlak
Senior Project Manager

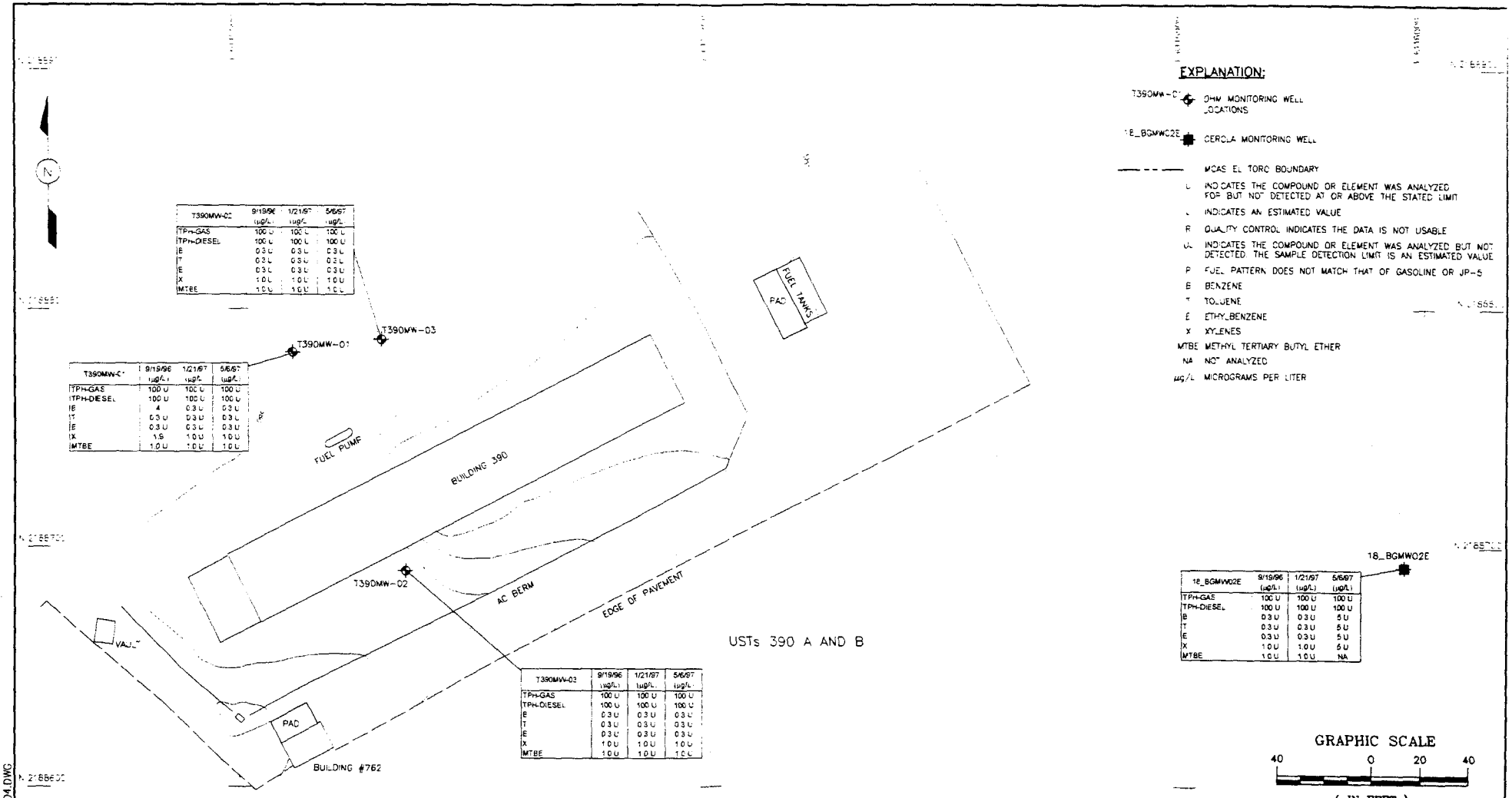
\prod\reports\do50\18292\TM_97d.doc

Table 2-2
Water Level Measurements and Groundwater Elevations
MCAS El Toro, Santa Ana, California

Well Number	Date Measured	Screen Interval (feet bgs)	Depth to Water (feet bgs)	TOC Elevation (feet msl)	Ground Surface Elevation (feet msl)	Water Elevation (feet msl)
17_DGMW82	23-Sep-96	235-255	183.10	442.50	441.69	**259.40**
	13-Dec-96		185.67	442.50	441.69	**256.83**
	30-Jan-97		182.25	442.50	441.69	**260.25**
	31-Mar-97		184.84	442.50	441.69	**257.66**
	14-May-97		184.62	442.50	441.69	**257.88**
T390MW-01	5-Aug-96	158-198	160.28	379.80	380.20	**219.52**
	19-Sep-96		159.90	379.80	380.20	**219.90**
	26-Sep-96		159.70	379.80	380.20	**220.10**
	27-Sep-96		159.79	379.80	380.20	**220.01**
	13-Dec-96		159.06	379.80	380.20	**220.74**
	21-Jan-97		159.54	379.80	380.20	**220.26**
	28-Mar-97		158.18	379.80	380.20	**221.62**
	20-May-97		157.82	379.80	380.20	**221.98**
T390MW-02	16-Sep-96	151.5-191.5	160.00	380.41	380.87	**220.41**
	19-Sep-96		159.73	380.41	380.87	**220.68**
	26-Sep-96		159.54	380.41	380.87	**220.87**
	27-Sep-96		159.61	380.41	380.87	**220.80**
	13-Dec-96		158.85	380.41	380.87	**221.56**
	28-Mar-97		158.00	380.41	380.87	**222.41**
	20-May-97		157.42	380.41	380.87	**222.99**
T390MW-03	18-Sep-96	149-189	161.40	380.85	381.21	**219.45**
	19-Sep-96		160.70	380.85	381.21	**220.15**
	26-Sep-96		160.40	380.85	381.21	**220.45**
	27-Sep-96		160.46	380.85	381.21	**220.39**
	13-Dec-96		159.75	380.85	381.21	**221.10**
	28-Mar-97		158.80	380.85	381.21	**222.05**
	20-May-97		158.53	380.85	381.21	**222.32**
18_BGMW02E	19-Sep-96	198-223	165.61	391.72	390.97	**226.11**
	27-Sep-96		166.19	391.72	390.97	**225.53**
	13-Dec-96		165.36	391.72	390.97	**226.36**
	21-Jan-97		159.80	391.72	390.97	**231.92**
	28-Mar-96		164.24	391.72	390.97	**227.48**
	20-May-96		163.87	391.72	390.97	**227.85**

Explanation

MSL - mean sea level
NA - not available
TOC - top of casing
GS - ground surface
RP - recording point (Unless otherwise indicated, the wells were measured from the TOC. If measurements were collected from the GS, the well number column was noted with a "GS".)



T390MW-02	9/19/96 (µg/L)	1/21/97 (µg/L)	5/6/97 (µg/L)
TPH-GAS	100 U	100 U	100 U
TPH-DIESEL	100 U	100 U	100 U
B	0.3 U	0.3 U	0.3 U
T	0.3 U	0.3 U	0.3 U
E	0.3 U	0.3 U	0.3 U
X	1.0 U	1.0 U	1.0 U
MTBE	1.0 U	1.0 U	1.0 U

T390MW-01	9/19/96 (µg/L)	1/21/97 (µg/L)	5/6/97 (µg/L)
TPH-GAS	100 U	100 U	100 U
TPH-DIESEL	100 U	100 U	100 U
B	4	0.3 U	0.3 U
T	0.3 U	0.3 U	0.3 U
E	0.3 U	0.3 U	0.3 U
X	1.5	1.0 U	1.0 U
MTBE	1.0 U	1.0 U	1.0 U

T390MW-03	9/19/96 (µg/L)	1/21/97 (µg/L)	5/6/97 (µg/L)
TPH-GAS	100 U	100 U	100 U
TPH-DIESEL	100 U	100 U	100 U
B	0.3 U	0.3 U	0.3 U
T	0.3 U	0.3 U	0.3 U
E	0.3 U	0.3 U	0.3 U
X	1.0 U	1.0 U	1.0 U
MTBE	1.0 U	1.0 U	1.0 U

18_BGMW02E	9/19/96 (µg/L)	1/21/97 (µg/L)	5/6/97 (µg/L)
TPH-GAS	100 U	100 U	100 U
TPH-DIESEL	100 U	100 U	100 U
B	0.3 U	0.3 U	5 U
T	0.3 U	0.3 U	5 U
E	0.3 U	0.3 U	5 U
X	1.0 U	1.0 U	5 U
MTBE	1.0 U	1.0 U	NA

REVISIONS			
REV. No.	DESCRIPTION	DATE	APPROVED

PROJECT: SWDIV

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation
IRVINE, CA

DRAWN BY: B. COHEN — DATE: 03/10/97
CHECKED BY — DATE
APPROVED BY — DATE
PROJECT MANAGER — DATE
AUTOCAD FILE No.: 18292S21.DWG

USTs 390 A AND B
TPH AND BTEX CONCENTRATION MAP

MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

SCALE	SHEET	OF	DOCUMENT CONTROL No.	OHM PROJECT No.	DRAWING No.	REVISION
1"=40'	1	1	SW4356	18292	FIG 8-3	0

C:\CAD-DGNS\OHM\18292\18292S04.DWG