Maintenance Yard

Crosby & Overton

Industrial & Environmental Services

March 24, 1993

9423-S

Dave Wells
City & County of San Francisco
Department of Public Health
101 Grove Street Room 207
San Francisco, California 94102

RE: Quarterly Groundwater Monitoring Well Sampling At Sunol Water Department Facility, At 505 Paloma Way, Sunol CA. January 29, 1993 Sampling Event

Dear Mr. Wells,

Crosby & Overton, Inc. (C&O) is pleased to submit this letter report concerning the results of groundwater monitoring well sampling and analyses for three groundwater monitoring wells (MW-1, MW-2, MW-3) on January 29, 1993 at 505 Paloma Way, Sunol, California (see figure 1A).

Background

On May 15 and 16, 1990 three underground storage tanks (UST) used for the maintenance facility vehicles were removed from the Sunol yard by the joint venture of Stacy and Witbeck, and Rogers and Jenner. Soil samples were taken from two feet below the UST at a depth of approximately 10 feet below ground surface. Sampling results indicated that total petroleum hydrocarbons as gasoline (TPH-G) were found at 7.6 parts per million (ppm) and total petroleum hydrocarbons as diesel (TPH-D) were found at 40 ppm. Benzene, toluene, ethyl benzene, and total xylenes (BTEX) were detected in three of the four samples at concentrations up to 1.7 ppm.

In November 1989, American Environmental Management Corporation supervised excavation of oil-contaminated soil for the City and County of San Francisco Department of Public Health (SFDPH). Soil was excavated approximately 100 feet southwest of the former UST locations at the east end of the repair shop area, where San Francisco Water Department personnel disposed of used motor oil and solvents onto the ground. Approximately 225 square feet of soil was excavated. The excavation was extended to 5 to 7.5 feet below ground surface. During excavation, soil samples were collected by the SFDPH at depths where the soil appeared to be the most contaminated. Analysis of these soil samples indicated the presence of total oil and grease (TOG) at 31,000 ppm, and various volatile organic compounds (VOC) at 0.3 to 3.2 ppm. The excavated soil was sent to Laidlaw Environmental in Button Willow, California for disposal.

8430 Amelia Street, Oakland, California 94621
(510) 633-0336 (800) 821-0424 FAX (510) 633-0759

On August 22, 23, and 26, 1991 Harding Lawson Associates drilled three boreholes, converting them to three groundwater monitoring wells. Well MW-1 was installed within 10 feet of the former oil spill area. Well MW-2 was installed within 10 feet of the former UST locations. Well MW-3 was installed in an assumed downgradient location from the two former source areas. At a latter date it was discovered that well MW-1 was in fact in a downgradient location from the former USTs (see figure 2).

On February 6, 1992 C&O was contracted by the SFDPH to begin quarterly sampling and monthly gauging of the three groundwater monitoring wells.

Procedures

Standard operating procedures for groundwater monitoring well sampling is included as an attachment.

After stabilization, the wells were sampled. Samples submitted for chemical analyses were delivered to Curtis & Tompkins, Ltd.. Curtis & Tompkins is certified by the state of California for the analyses requested. Samples were analyzed for extractable petroleum hydrocarbons in aqueous solutions (California DOHS method), total volatile hydrocarbons with BTEX distinction (EPA 5030/8020), total volatile hydrocarbons as gasoline (California DOHS method), total oil and grease (gravimetric, standard methods 5520 B/F), and volatile organics in water (EPA method 8240). The laboratory report and chain of custody are included at the end of this report.

TABLE 1
GROUNDWATER TABLE ELEVATION GAUGING

DATE	MW-1	MW-2	MW-3
8-27-91	218.87	218.30	218.28
10-3-91	218.92	219.10	219.06
2-7-92	218.21	218.30	218.28
2-21-92	219.28	219.42	219.39
4-1-92	218.39	218.62	218.69
4-29-92	218.61	218.70	218.68
5-27-92	218.55	218.64	218.62
6-25-92	218.72	218.90	218.80
8-3-92	218.46	218.55	218.53
9-4-92	218.58	218.68	218.66
10-2-92	218.30	218.40	218.38
11-2-92	218.30	218.39	218.37
11-30-92	218.13	218.22	218.20
12-28-92	218.02	218.09	218.07
1-29-93	219.80	219.97	219.93
3-1-93	220.60	220.74	220.71
TOC	238.79	239.32	238.70

TOC=TOP OF CASING ELEVATION CORRECTED TO USGS BENCHMARK DATUM 143
ALL MEASUREMENTS GIVEN IN FEET AND CORRECTED TO TOC ELEVATION

TABLE 2
ANALYTIC RESULTS OF GROUNDWATER WELL SAMPLING

DATE	SAMPLE	TPH-G	TPH-D	TOG	B	T	E	X	VOC
2-21-92	MW-1	ND	ND	ND	NA	NA	NA	NA	ND
2-21-92	MW-2	ND	ND	ND	ND	ND	ND	ND	NA
2-21-92	MW-3	ND	ND	ND	NA	NA	NA	NA	ND
4-29-92	MW-1	ND	ND	ND	NA	NA	NA	NA	ND
4-29-92	MW-2	ND	ND	ND	ND	ND	ND	ND	NA
4-29-92	MW-3	ND	ND	ND	NA	NA	NA	NA	ND
8-3-92	MW-1	ND	ND	ND	NA	NA	NA	NA	ND
8-3-92	MW-2	ND	ND	ND	ND	ND	ND	ND	NA
8-3-92	MW-3	ND	ND	ND	NA	NA	NA	NA	ND
11-2-92	MW-1	ND	ND	ND	NA	NA	NA	NA	ND
11-2-92	MW-2	ND	ND	ND	ND	ND	ND	ND	NA
11-2-92	MW-3	ND	ND	ND	NA	NA	NA	NA	ND
1-29-93	MW-1	ND	ND	ND	NA	NA	NA	NA	ND
1-29-93	MW-2	ND	ND	ND	ND	ND	ND	ND	NA
1-29-93	MW-3	ND	ND	ND	NA	NA	NA	NA	ND

ND = NOT DETECTED AT OR ABOVE THE REPORTING LIMIT (RL)
NA = NOT ANALYZED
TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (RL = 50 ppb)
TPH-D = TOTAL PETROLEUM HYDROCARBONS AS DIESEL (RL = 50 ppb)
B = BENZENE (RL = 0.5 ppb)
T = TOLUENE (RL = 0.5 ppb)
E = ETHYL BENZENE (RL = 0.5 ppb)
X = TOTAL XYLENES (RL = 0.5 ppb)
VOC = VOLATILE ORGANIC COMPOUNDS (RL ≤ 20 ppb -see lab reports)

Analysis

All three groundwater monitoring wells had below detectable quantities of contamination for the analyte measured (see table 2).

TABLE 3
GROUNDWATER GRADIENT

DATE	GROUNDWATER GRADIENT	GRADIENT DIRECTION
2-7-92	0.0015	SOUTHWEST
2-21-92	0.0022	SOUTHWEST
4-1-92	0.0046	SOUTHWEST
4-29-92	0.0015	SOUTHWEST
5-27-92	0.0014	SOUTHWEST
6-25-92	0.0026	SOUTHWEST
8-3-92	0.0012	SOUTHWEST
9-4-92	0.0013	SOUTHWEST
10-2-92	0.0013	SOUTHWEST
11-2-92	0.0012	SOUTHWEST
11-30-92	0.0012	SOUTHWEST
12-28-92	0.0009	SOUTHWEST
1-29-93	0.0023	SOUTHWEST
3-1-93	0.0018	SOUTHWEST

Conclusions

Groundwater table elevation gaugings have been performed monthly, over a one year period at this site. Analysis of these gauging events have indicated that the groundwater gradient has remained in the same southwestern direction, and that the gradient has varied from 0.0012 to 0.0046 ft/ft.

Five quarterly, groundwater monitoring well sampling events have been performed at this site from February 21, 1992 to January 29, 1993. All analytes measured in these five sampling events have indicated ND results. The requirements recommended by the Tri-Regional Board Staff Recommendations For Preliminary Evaluation And Investigation Of Underground Tank Sites 10 August 1990, to submit for case closure have been met. It is our opinion that you should submit for case closure at this site.

Reportage

A copy of this report should be submitted, along with a cover letter from the SFDPH, to each of the addressees listed below:

Scott Seery
Alameda County Health
Care Services Agency
80 Swan Way, Rm 200
Oakland, CA 94621

Lester Feldman
Water Quality Control Board
2101 Webster Street Suite 500
Oakland, CA 94621

If we may be of further service, or if you should have any questions please do not hesitate to contact us at your convenience (510) 633-0336.

Sincerely,

Darrell Taylor
Staff Geologist

CROSBY & OVERTON, INC.
8430 AMELIA STREET • OAKLAND, CA 94621
(800) 821-0424 • (415) 633-0336
FAX (415) 633-0759

STANDARD OPERATING PROCEDURES

Monitoring Well Sampling

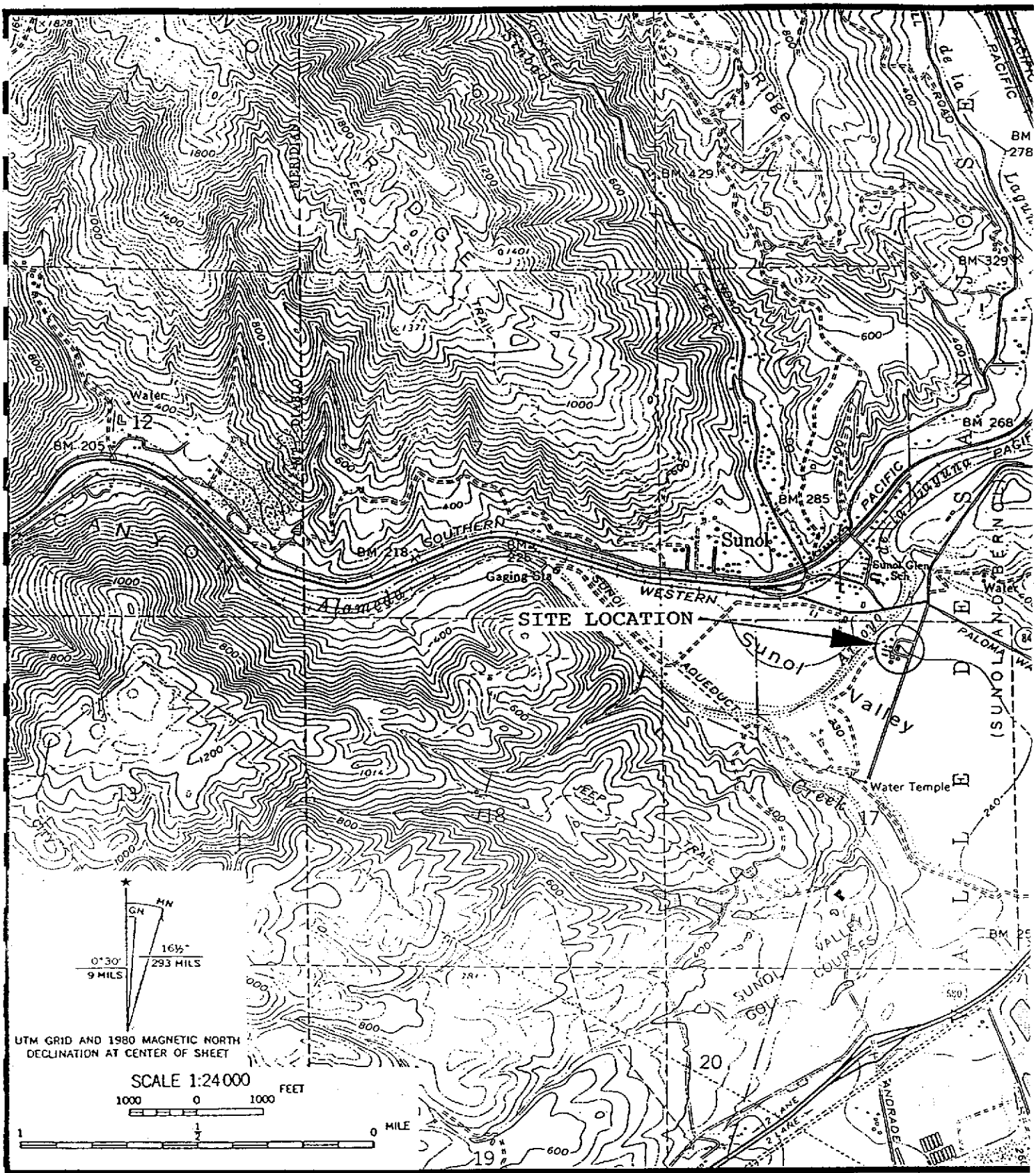
A minimum of three well volumes are pumped from each well, each well is permitted to recharge to ≥80% of original capacity and stabilize. Stabilization is determined by measuring the parameters of pH; temperature; and electrical conductivity. When two subsequent measurements of these three parameters are within 10% of each other, the well is considered stabilized and is sampled.

The samples are collected using a new polyethylene bailer with a bottom siphon and nylon cord. The bailers are disposable, and therefore, never reused. Duplicate water samples for volatile organic compounds are collected from the well and siphoned into three (3) clear 40 ml VOA vials with all headspace removed, and preserved with hydrochloric acid. For all other analyses, samples are collected in 950 ml amber glass bottles. All samples are labeled, chilled to 4°C (utilizing either crushed ice or Blue-Ice®) in an ice chest, and sent to a California State Certified hazardous materials testing laboratory under chain-of-custody documentation.

Groundwater sampling is performed in accordance with the California Regional Water Quality Control Board (RWQCB) procedures described in the *Leaking Underground Fuel Tank (LUFT) Field Manual, the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites,* and local regulatory guidelines.

Standard Environmental Protection Agency (EPA), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), and Department of Health Services (DHS) methodologies are routinely utilized.

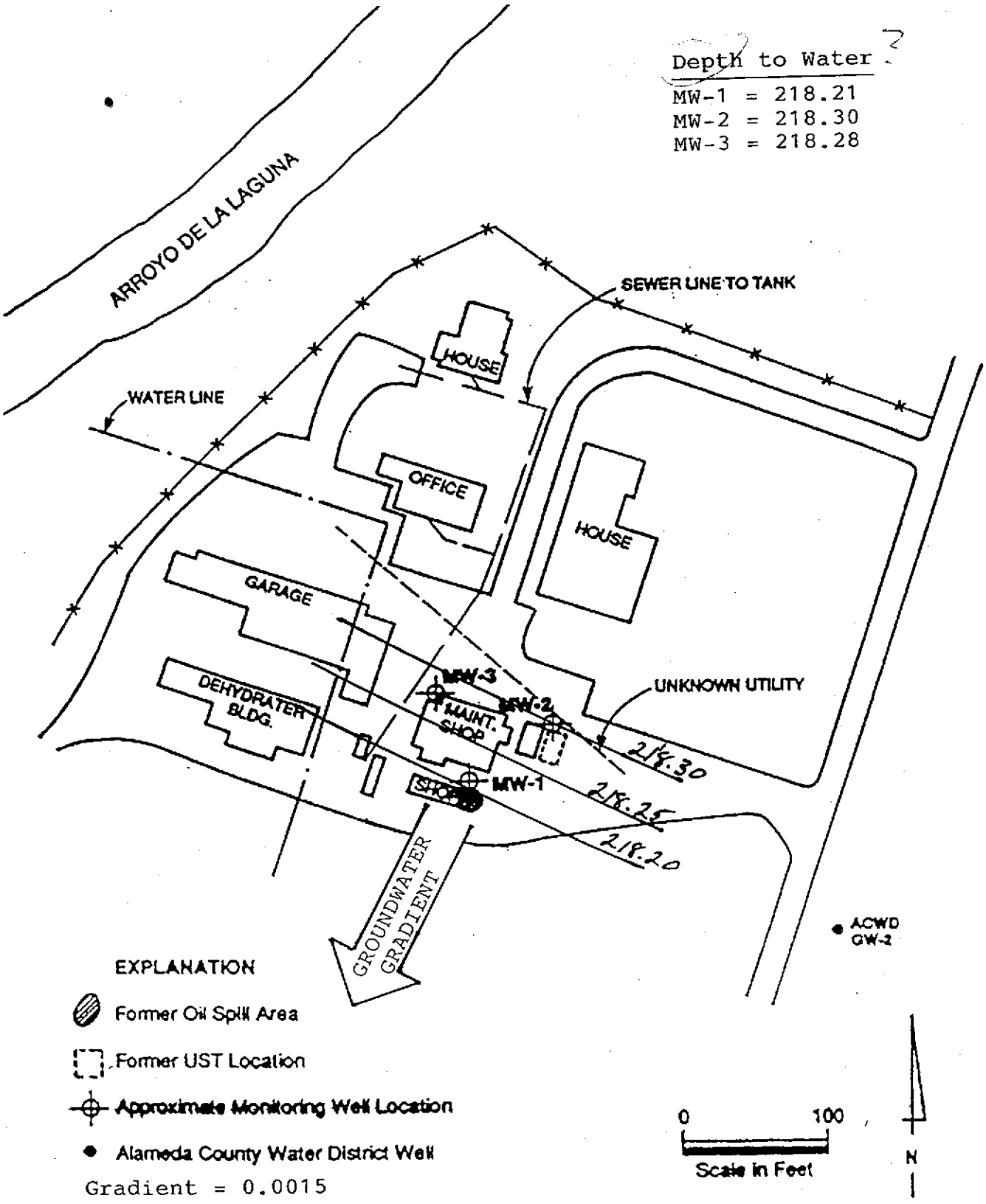
Chain of Custody documentation accompanies all samples to the laboratory. A copy of the Chain of Custody documentation is attached to the Certificate of Analysis.



CROSBY & OVERTON, INC.

FIGURE 1A
SITE LOCATION MAP
AFTER USGS

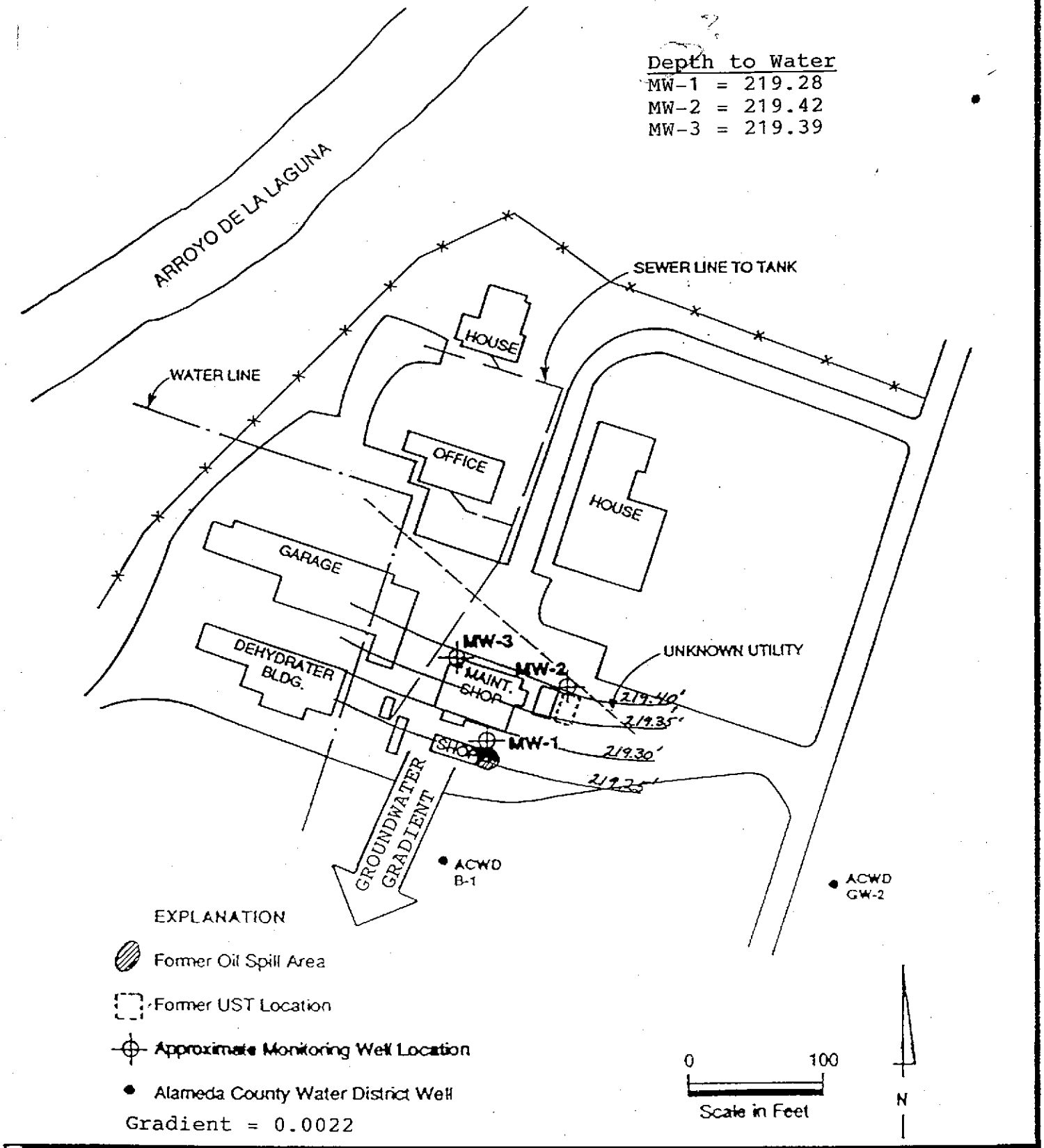
DATE: 3-16-92 JOB NUMBER: 9423-S DRAWN BY: D. Taylor



ROSBY & OVERTON, INC.

FIGURE 1
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

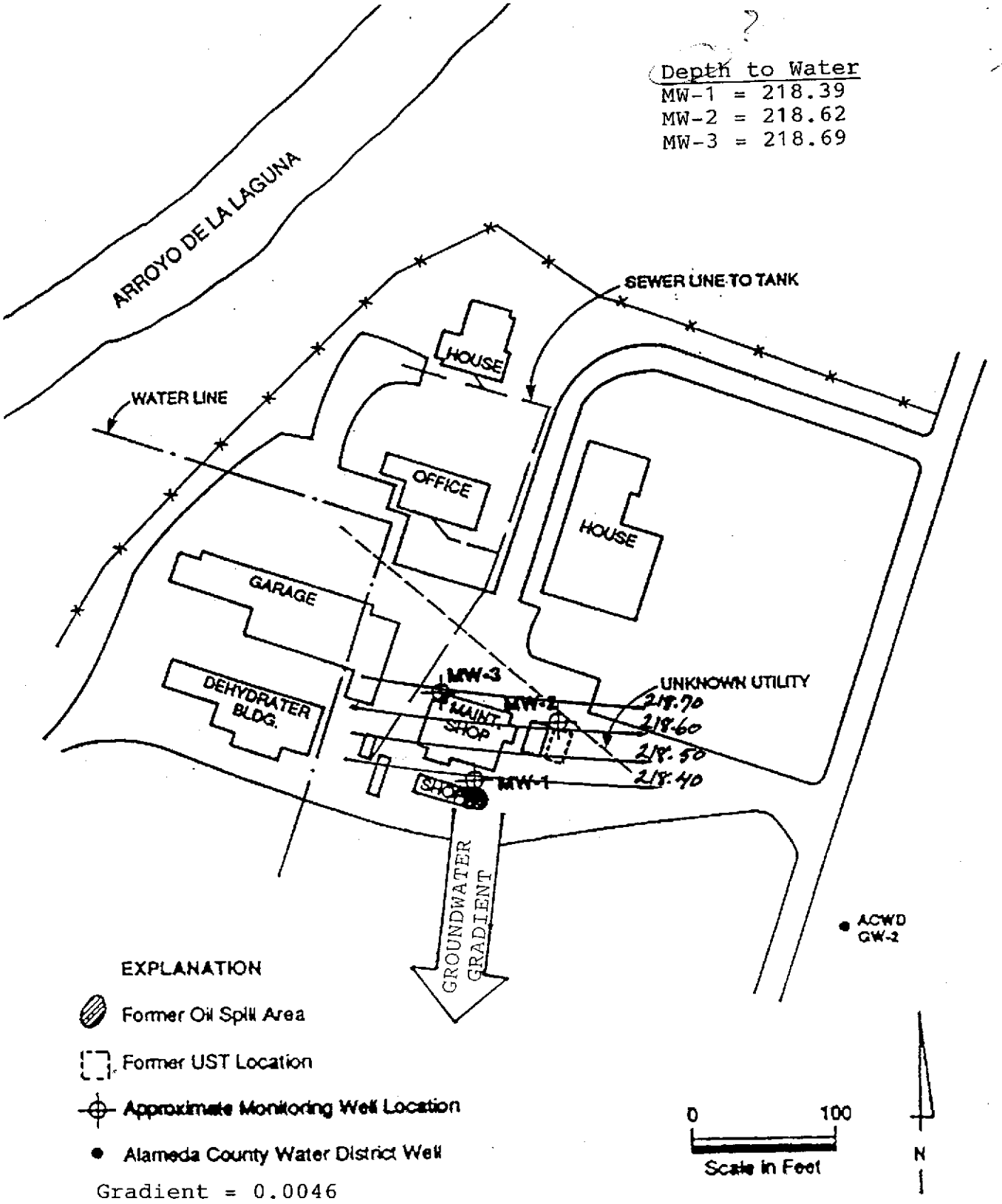
E: 2-7-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 2
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

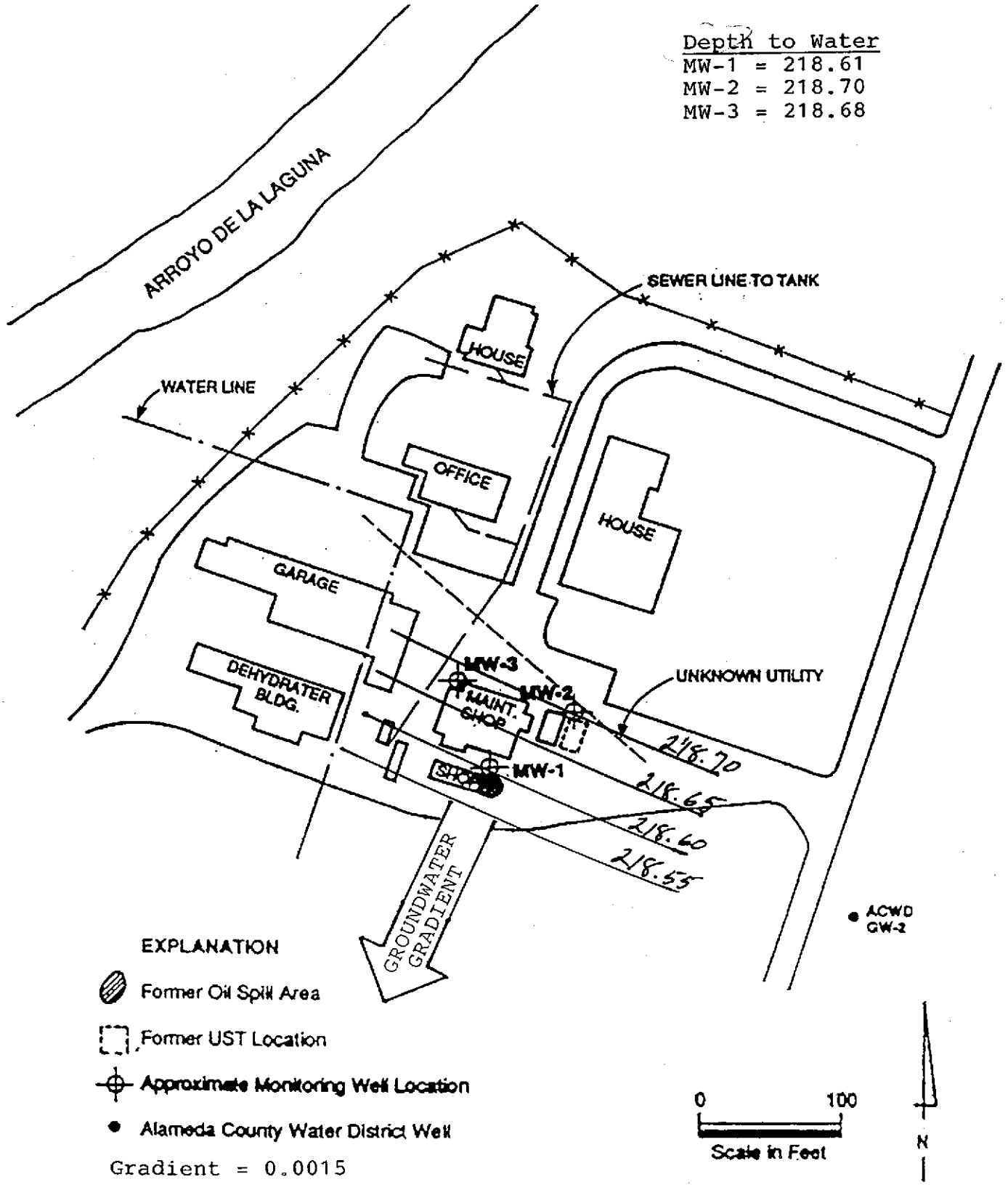
DATE: 2-21-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



ROSBY & OVERTON, INC.

FIGURE 3
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

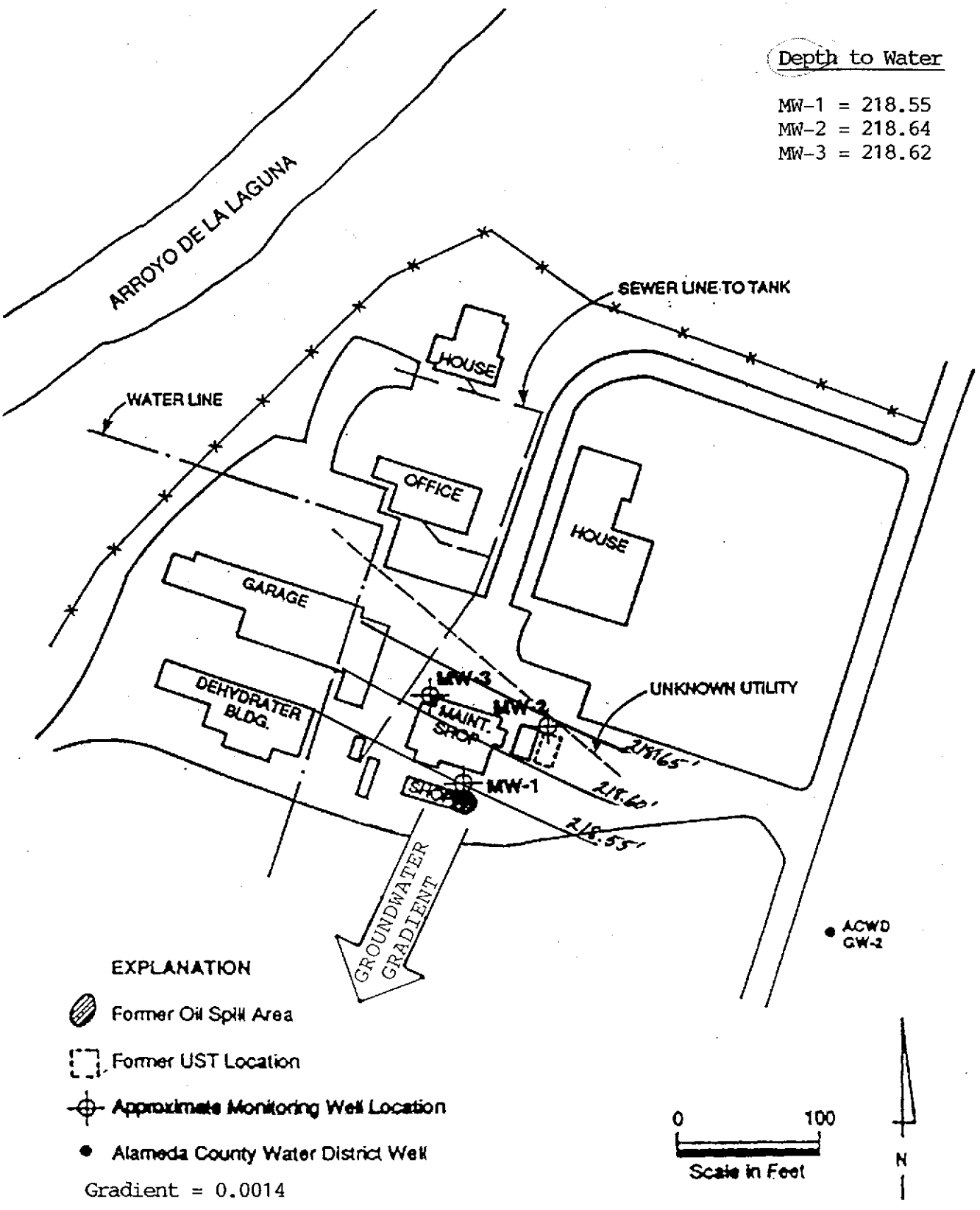
TE: 4-1-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 4
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

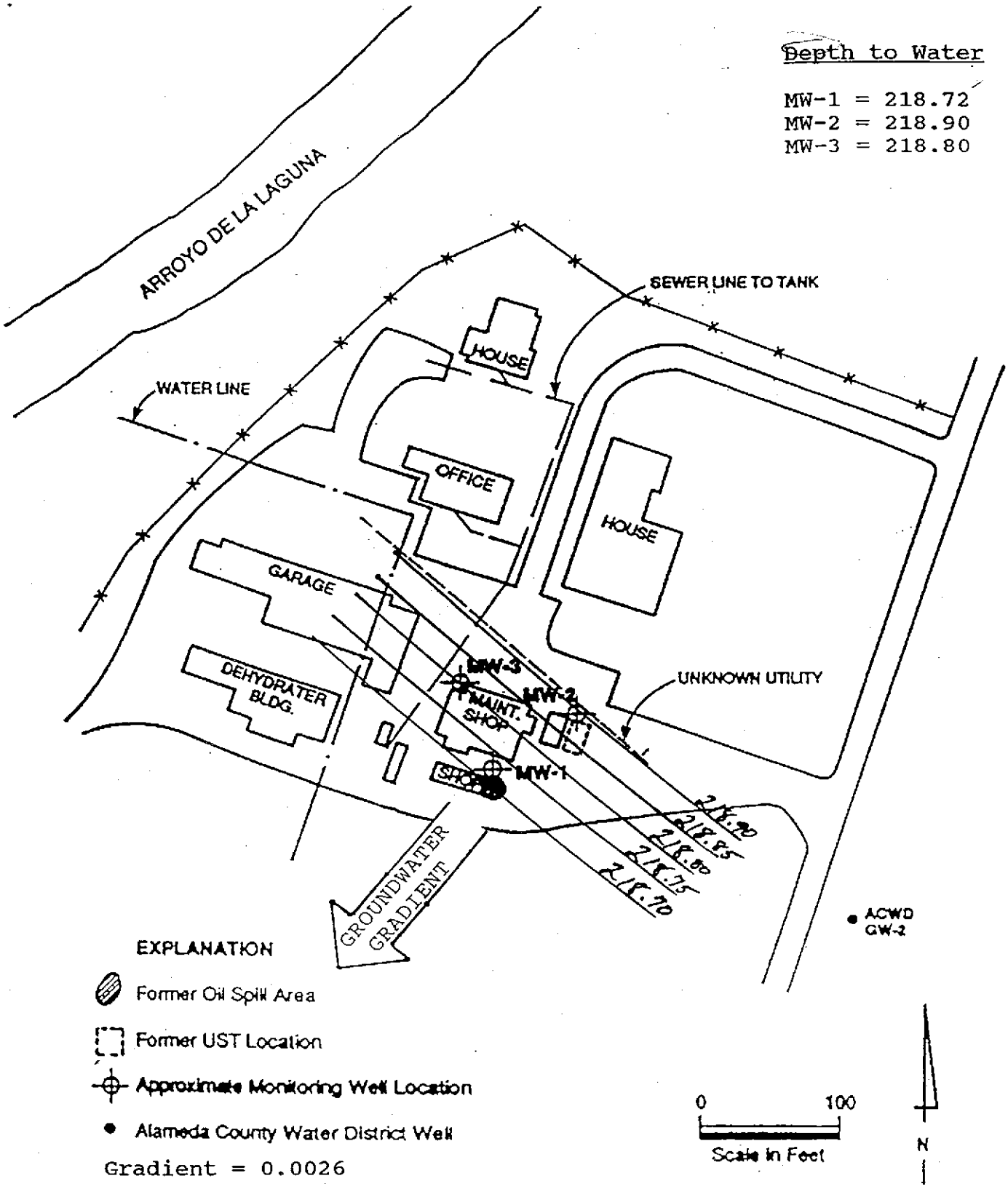
DATE: 4-29-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



ROSBY & OVERTON, INC.

FIGURE 5
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

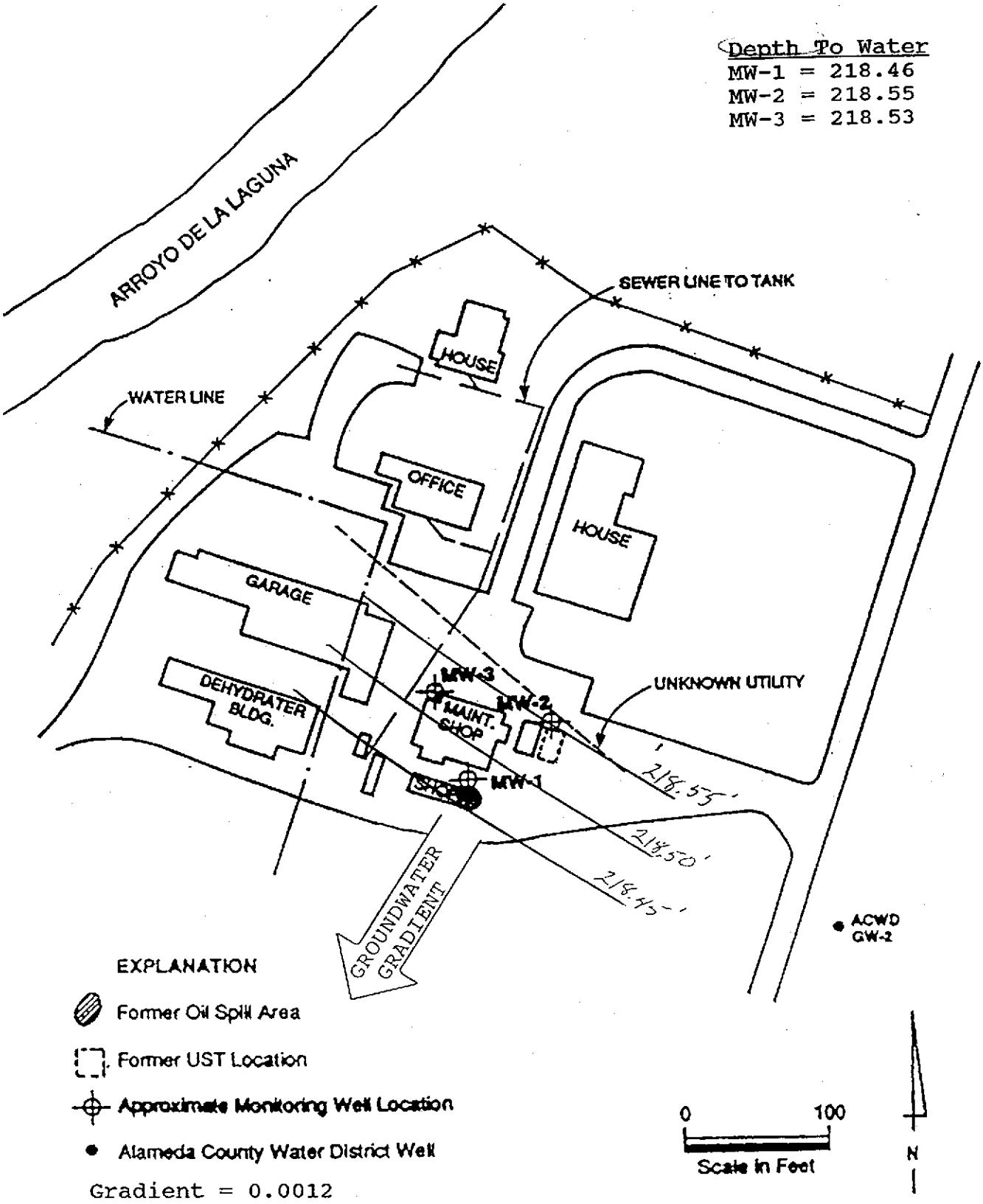
DATE: 5-27-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 6
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

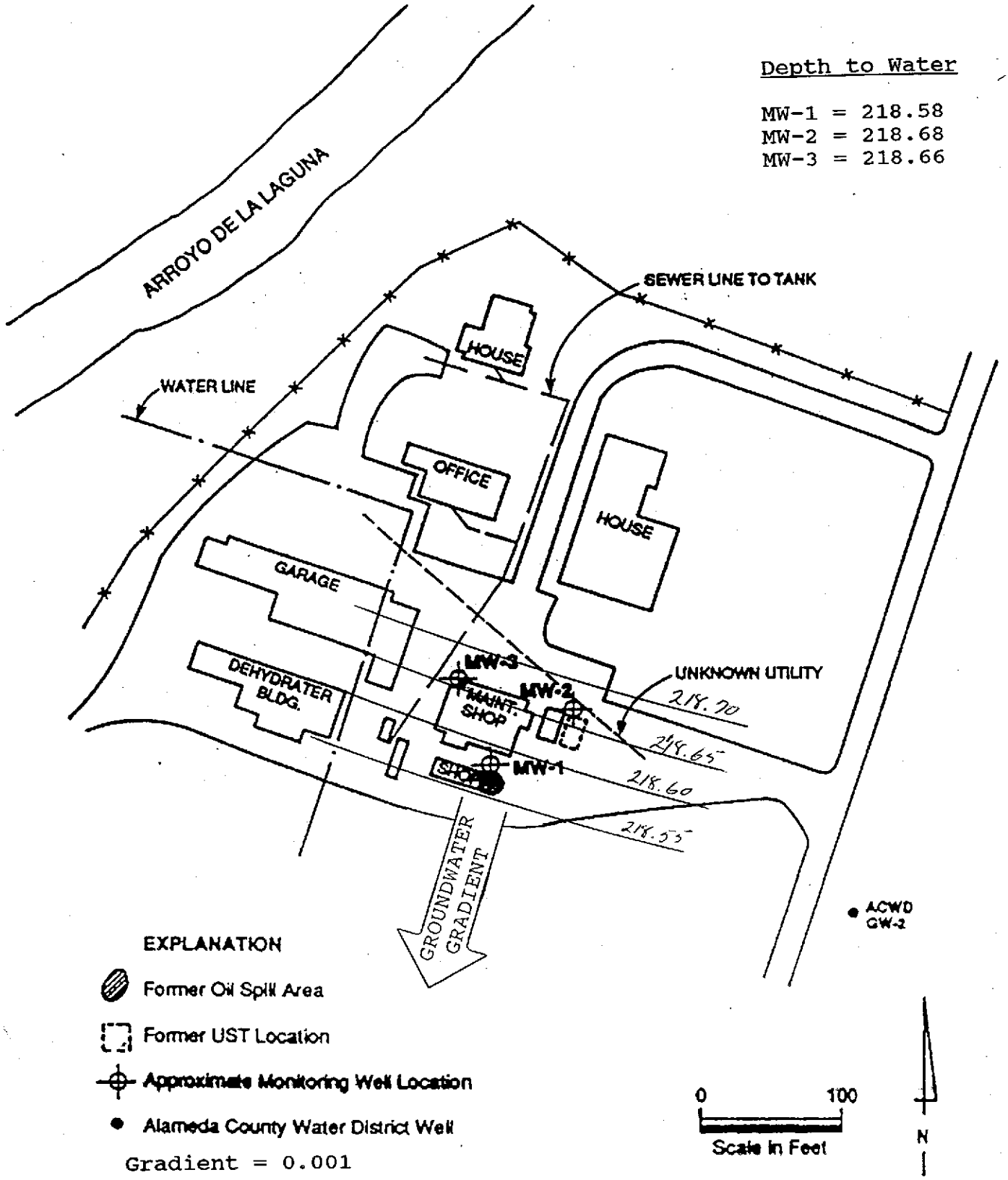
DATE: 6-25-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



ROSBY & OVERTON, INC.

FIGURE 7
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

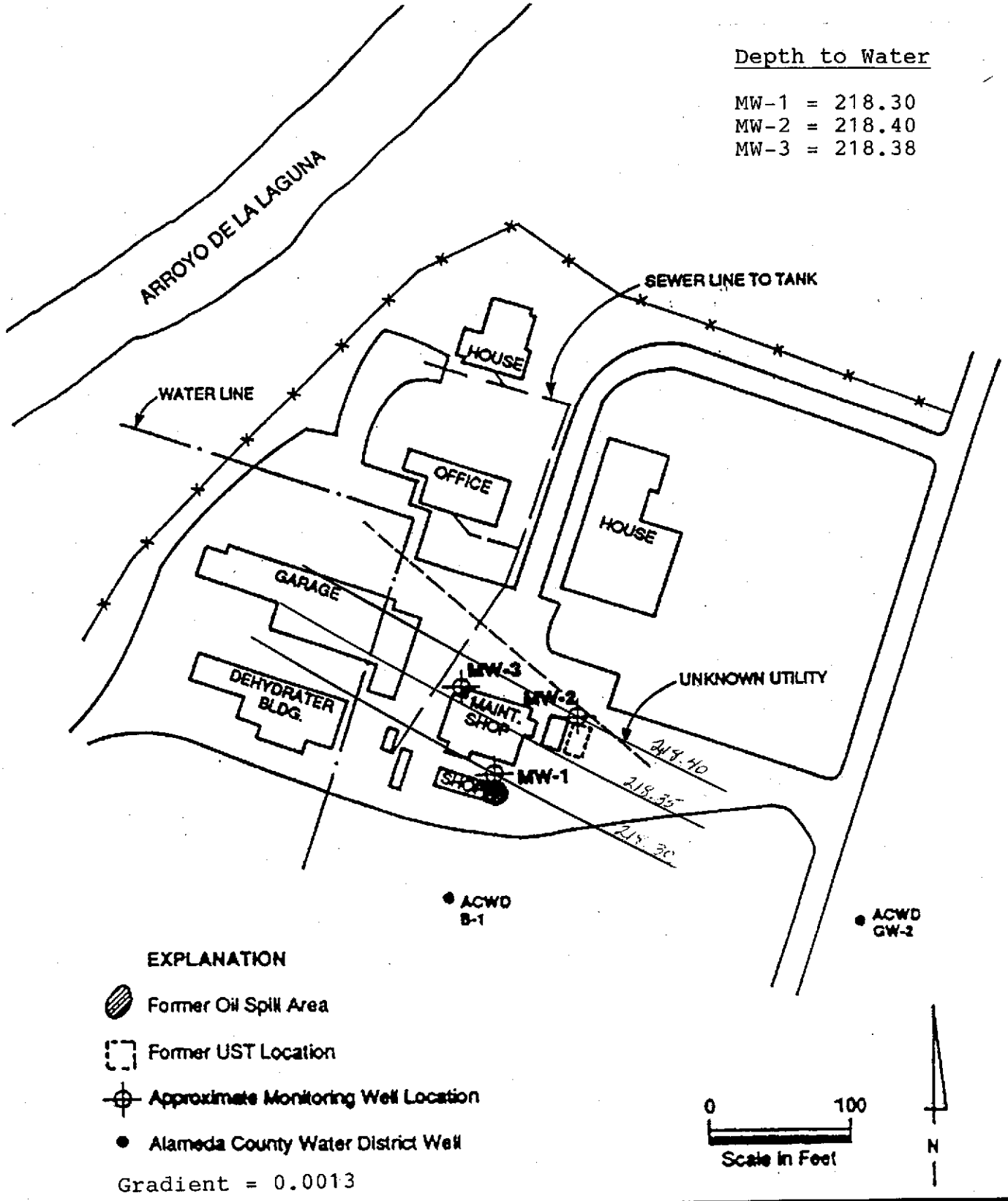
TE: 8-3-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 8
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

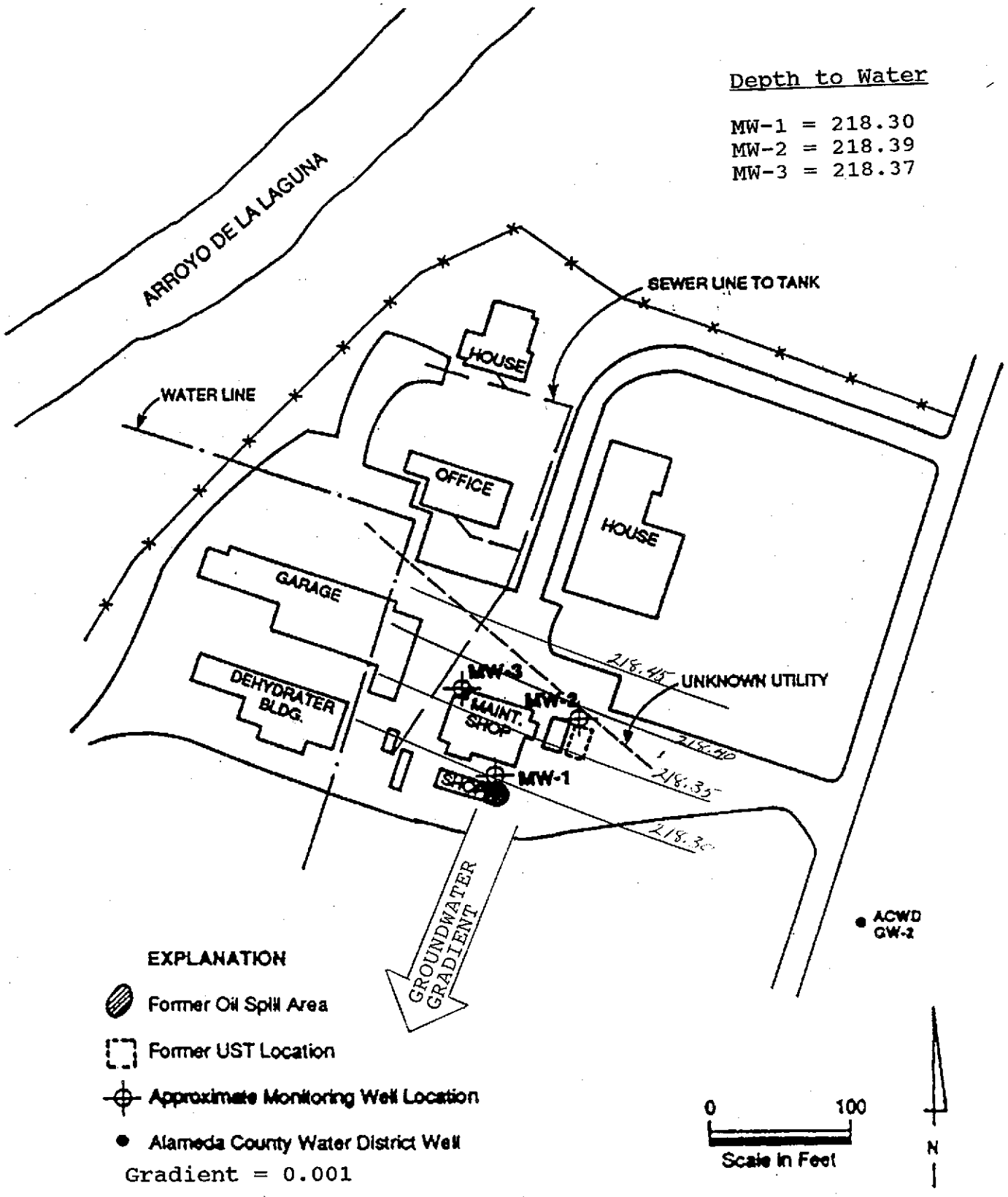
DATE: 9-4-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 9
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

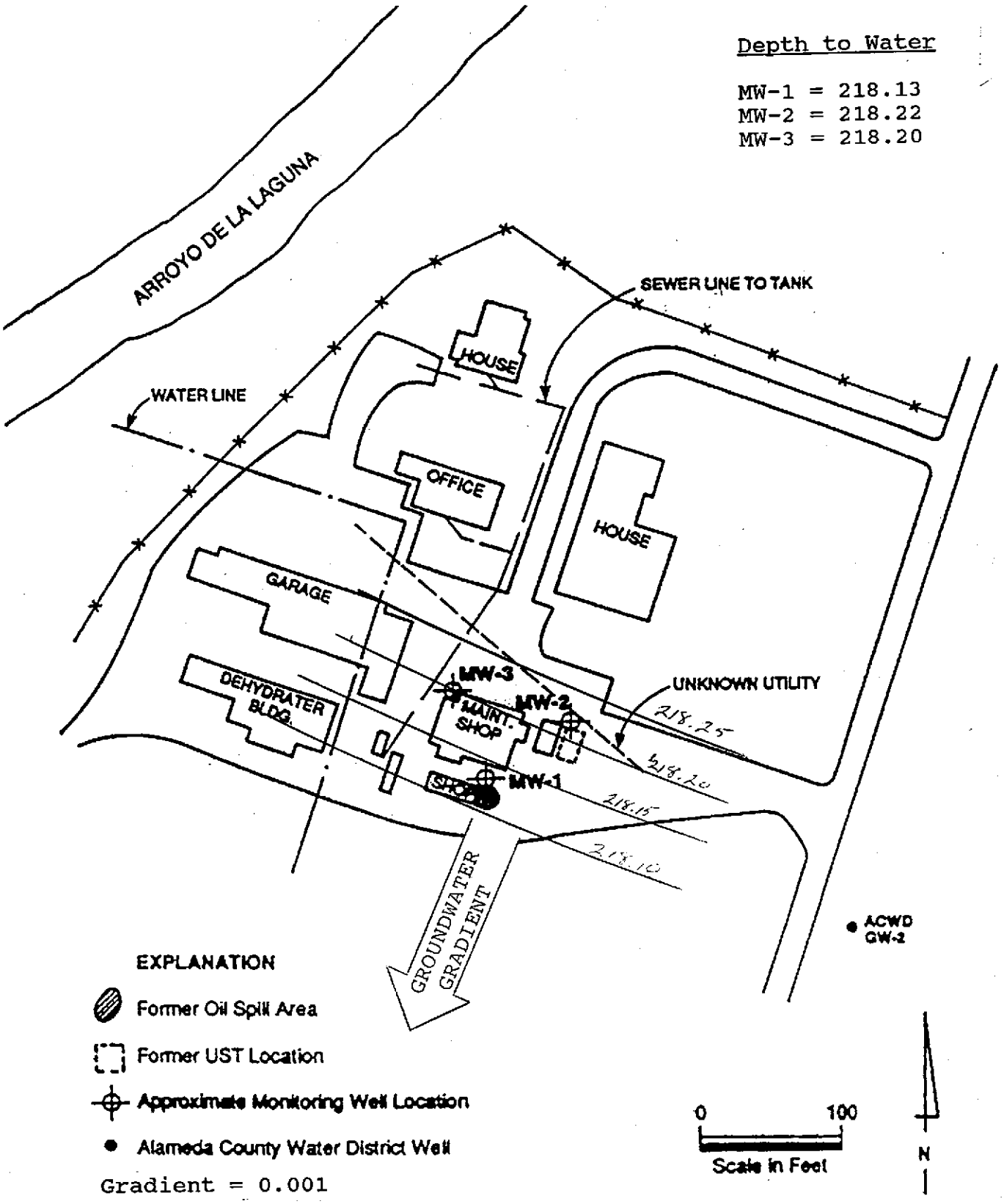
DATE: 10-2-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 10
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

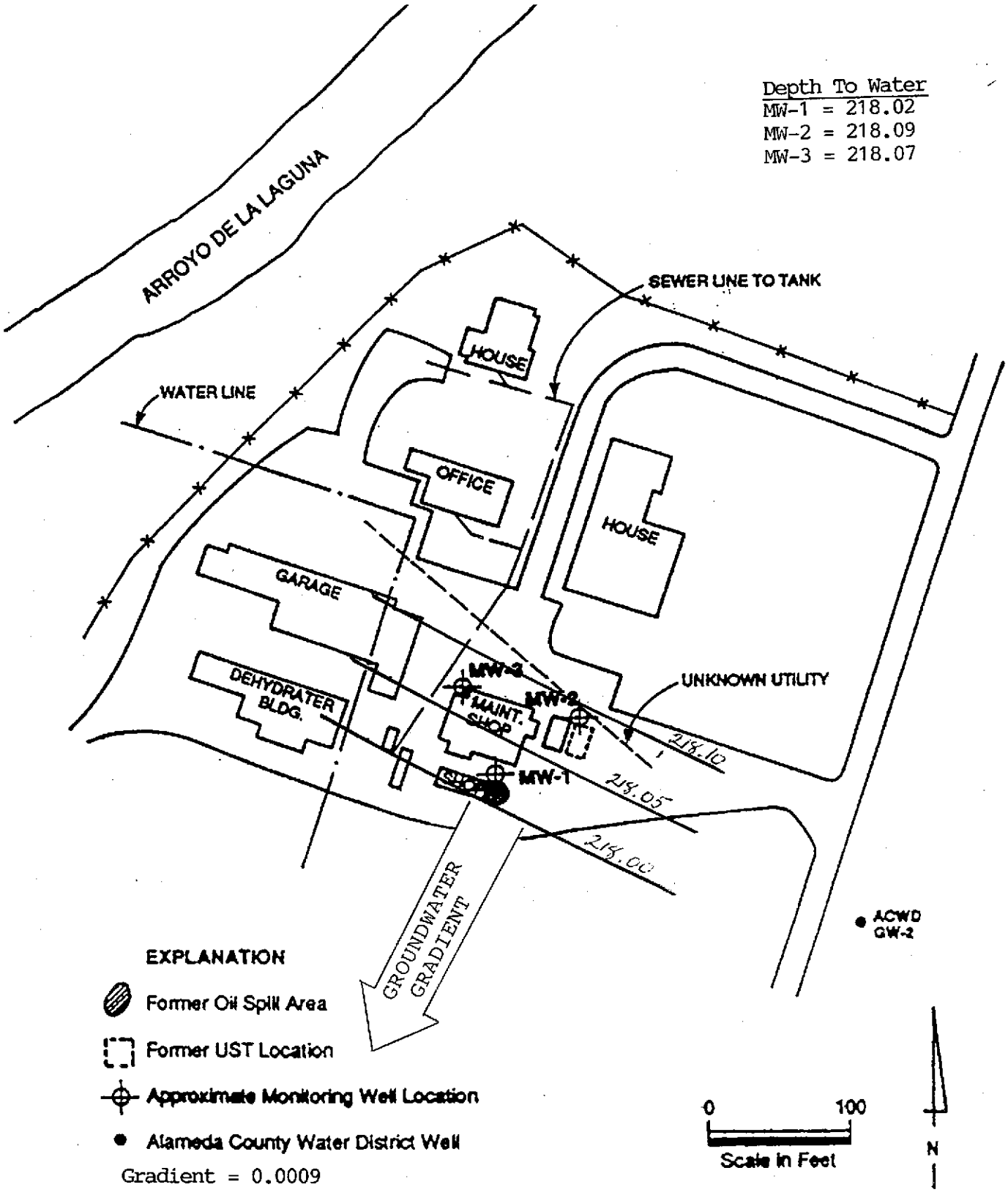
DATE: 11-2-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 11
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

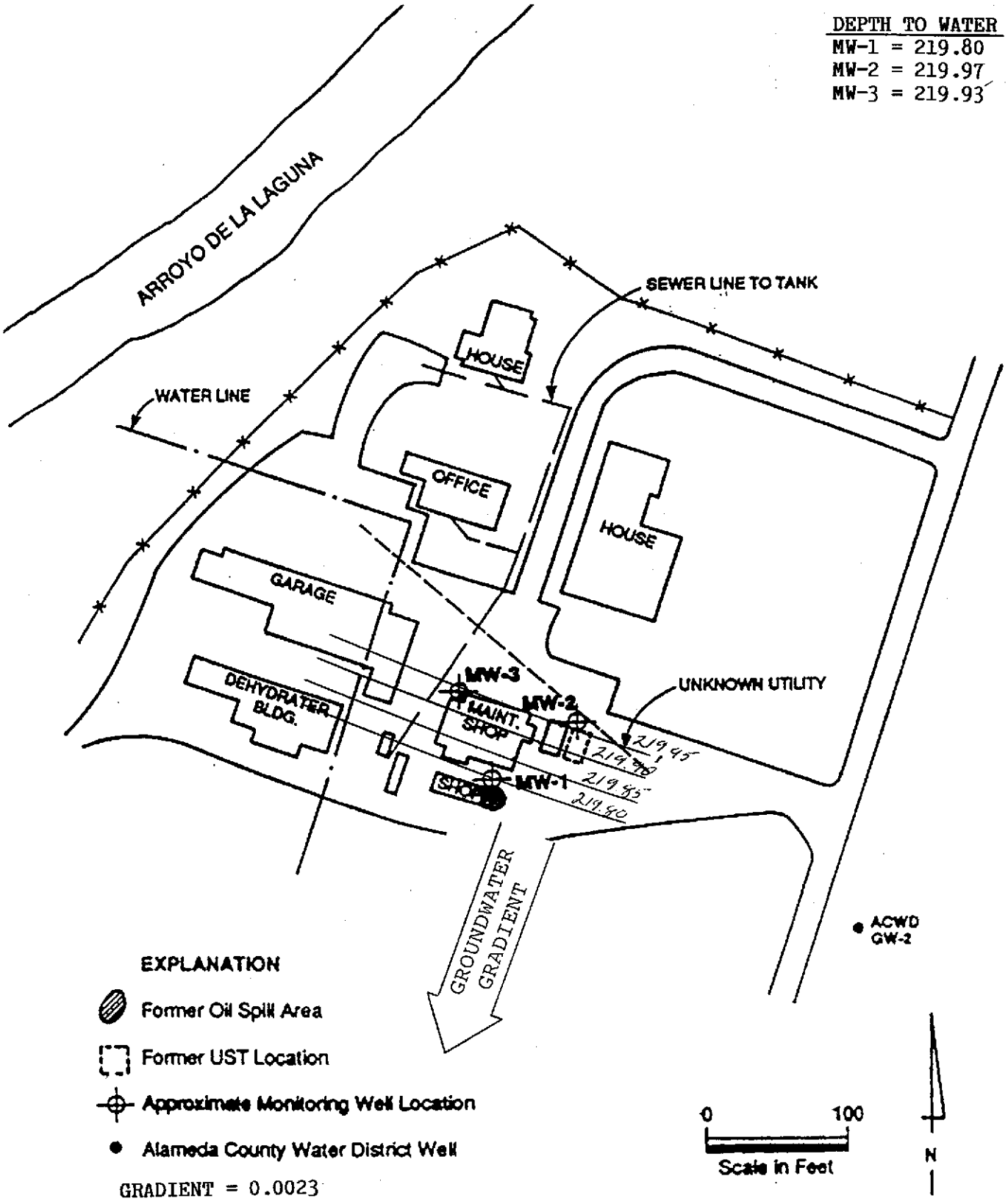
DATE: 11-30-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 12
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

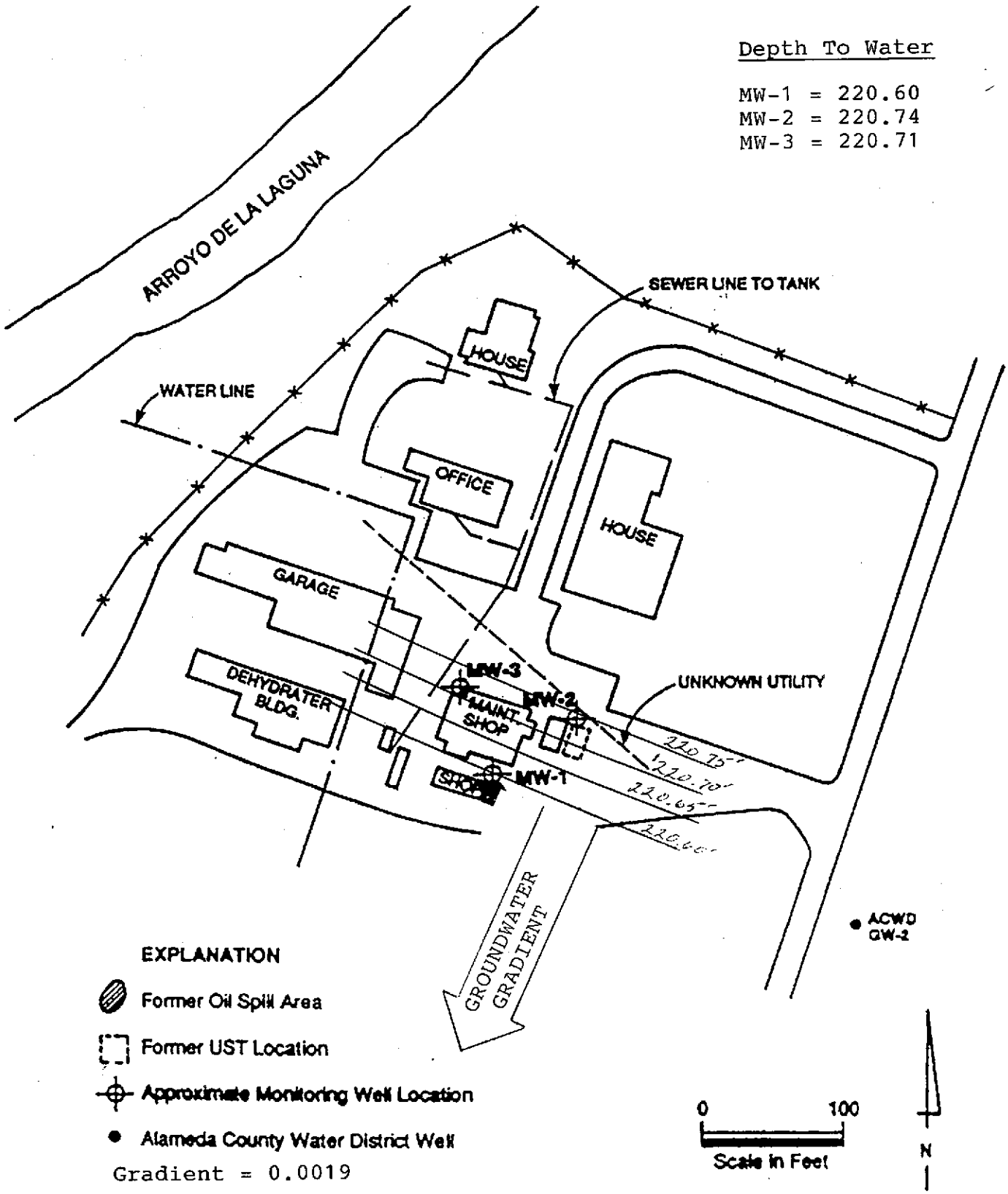
DATE: 12-28-92 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 13
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

DATE: 1-29-93 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90



CROSBY & OVERTON, INC.

FIGURE 14
GROUNDWATER GRADIENT
AND POTENTIOMETRIC SURFACE

DATE: 3-1-93 JOB NUMBER: 9423-S DRAWN BY: after HLA 10/90

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 11/03/92
DATE REPORTED: 11/16/92

LABORATORY NUMBER: 109162

CLIENT: CITY AND COUNTY OF SAN FRANCISCO

PROJECT ID: 9423-S4

LOCATION: SUNOL

RESULTS: SEE ATTACHED

Reviewed by

Reviewed by

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 109162-1
CLIENT: CITY AND COUNTY OF SAN FRANCISCO
PROJECT ID: 9423-S4
LOCATION: SUNOL
SAMPLE ID: MW-1

DATE SAMPLED: 11/02/92
DATE RECEIVED: 11/03/92
DATE ANALYZED: 11/11/92
DATE REPORTED: 11/16/92

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	104 %
Toluene-d8	102 %
Bromofluorobenzene	103 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109162-3
CLIENT: CITY AND COUNTY OF SAN FRANCISCO
PROJECT ID: 9423-S4
LOCATION: SUNOL
SAMPLE ID: MW-3

DATE SAMPLED: 11/02/92
DATE RECEIVED: 11/03/92
DATE ANALYZED: 11/10/92
DATE REPORTED: 11/16/92

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	104 %
Toluene-d8	100 %
Bromofluorobenzene	104 %

Curtis & Tompkins, Lt

LABORATORY NUMBER: 109162-METHOD BLANK DATE ANALYZED: 11/10/92
CLIENT: CITY AND COUNTY OF SAN FRANCISCO DATE REPORTED: 11/16/92
PROJECT ID: 9423-S4
LOCATION: SUNOL

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	103 %
Toluene-d8	102 %
Bromofluorobenzene	102 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109162-METHOD BLANK DATE ANALYZED: 11/11/92
CLIENT: CITY AND COUNTY OF SAN FRANCISCO DATE REPORTED: 11/16/92
PROJECT ID: 9423-S4
LOCATION: SUNOL

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	104 %
Toluene-d8	104 %
Bromofluorobenzene	104 %

Curtis & Tompkins, Ltd

QC SUMMARY SHEET FOR EPA 8240

Laboratory Number: 109162
Client: City and County of SF
Analysis date: 11/11/92
Sample type: Water
Spike file: akb09
Spike dup file: akb10

SPIKE DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	48.21	96 %	OK	61 - 145
Trichloroethene	47.54	95 %	OK	71 - 120
Benzene	49.60	99 %	OK	76 - 127
Toluene	48.92	98 %	OK	76 - 125
Chlorobenzene	49.29	99 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.77	104 %	OK	76 - 114
Toluene-d8	52.41	105 %	OK	88 - 110
Bromofluorobenzene	52.08	104 %	OK	86 - 115

SPIKE DUP DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	49.75	100 %	OK	61 - 145
Trichloroethene	48.42	97 %	OK	71 - 120
Benzene	50.38	101 %	OK	76 - 127
Toluene	49.16	98 %	OK	76 - 125
Chlorobenzene	49.92	100 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	50.74	101 %	OK	76 - 114
Toluene-d8	51.55	103 %	OK	88 - 110
Bromofluorobenzene	51.56	103 %	OK	86 - 115

MATRIX RESULTS	
1,1-Dichloroethene	0
Trichloroethene	0
Benzene	0
Toluene	0
Chlorobenzene	0

RPD DATA

SPIKE COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	48.21	49.75	3 %	OK	< 14
Trichloroethene	47.54	48.42	2 %	OK	< 14
Benzene	49.60	50.38	2 %	OK	< 11
Toluene	48.92	49.16	0 %	OK	< 13
Chlorobenzene	49.29	49.92	1 %	OK	< 13

Curtis & Tompkins, Ltd.

QC SUMMARY SHEET FOR EPA 8240

Laboratory Number: 109162
Client: City and County of SF
Analysis date: 11/11/92
Sample type: Water
Spike file: aka21
Spike dup file: aka22

SPIKE DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	47.90	96 %	OK	61 - 145
Trichloroethene	47.44	95 %	OK	71 - 120
Benzene	48.24	96 %	OK	76 - 127
Toluene	46.63	93 %	OK	76 - 125
Chlorobenzene	47.86	96 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.53	103 %	OK	76 - 114
Toluene-d8	48.96	98 %	OK	88 - 110
Bromofluorobenzene	50.59	101 %	OK	86 - 115

SPIKE DUP DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	45.36	91 %	OK	61 - 145
Trichloroethene	47.43	95 %	OK	71 - 120
Benzene	48.02	96 %	OK	76 - 127
Toluene	45.87	92 %	OK	76 - 125
Chlorobenzene	47.75	96 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.02	102 %	OK	76 - 114
Toluene-d8	47.99	96 %	OK	88 - 110
Bromofluorobenzene	50.87	102 %	OK	86 - 115

MATRIX RESULTS	
1,1-Dichloroethene	0
Trichloroethene	0
Benzene	0
Toluene	0
Chlorobenzene	0

RPD DATA

SPIKE COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	47.90	45.36	5 %	OK	< 14
Trichloroethene	47.44	47.43	0 %	OK	< 14
Benzene	48.24	48.02	0 %	OK	< 11
Toluene	46.63	45.87	2 %	OK	< 13
Chlorobenzene	47.86	47.75	0 %	OK	< 13

Curtis & Tompkins, Lt

LABORATORY NUMBER: 109162
CLIENT: CITY AND COUNTY OF SAN FRANCISCO
PROJECT ID: 9423-S4
LOCATION: SUNOL

DATE SAMPLED: 11/02/92
DATE RECEIVED: 11/03/92
DATE EXTRACTED: 11/09/92
DATE ANALYZED: 11/11/92
DATE REPORTED: 11/16/92

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
109162-1	MW-1	ND	ND	50
109162-2	MW-2	ND	ND	50
109162-3	MW-3	ND	ND	50

ND = Not detected at or above reporting limit.

* Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109162
CLIENT: CITY AND COUNTY OF SAN FRANCISCO
PROJECT ID: 9423-S4
LOCATION: SUNOL

DATE SAMPLED: 11/02/92
DATE RECEIVED: 11/03/92
DATE ANALYZED: 11/06,07/92
DATE REPORTED: 11/16/92

Total Volatile Hydrocarbons as Gasoline in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	REPORTING LIMIT (ug/L)
109162-1	MW-1	ND	50
109162-3	MW-3	ND	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	106

Curtis & Tompkins, Lt

LABORATORY NUMBER: 109162
CLIENT: CITY AND COUNTY OF SAN FRANCISCO
PROJECT ID: 9423-S4
LOCATION: SUNOL

DATE SAMPLED: 11/02/92
DATE RECEIVED: 11/03/92
DATE ANALYZED: 11/07/92
DATE REPORTED: 11/16/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
109162-2	MW-2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	106

Curtis & Tompkins, Ltd.

Client: San Francisco Department of Health

Laboratory Login Number: 109162

Project Name: Sunol
Project Number: 9423-S4

Report Date: 16 November 92

ANALYSIS: Total Oil & Grease (Gravimetric)

METHOD: SMWW 17:5520B

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
109162-001	MW-1	Water	02-NOV-92	03-NOV-92	11-NOV-92	ND	mg/L	5	TR	7385
109162-002	MW-2	Water	02-NOV-92	03-NOV-92	11-NOV-92	ND	mg/L	5	TR	7385
109162-003	MW-3	Water	02-NOV-92	03-NOV-92	11-NOV-92	ND	mg/L	5	TR	7385

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd

Q C B a t c h R e p o r t

Client: San Francisco Department of Health Laboratory Login Number: 109162
Project Name: Sunol Report Date: 16 November 92
Project Number: 9423-S4

ANALYSIS: Total Oil & Grease (Gravimetric) **QC Batch Number: 7385**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520B	11-NOV-92

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	92%	SMWW 17:5520B	11-NOV-92
BSD	98%	SMWW 17:5520B	11-NOV-92

		Control Limits
Average Spike Recovery	95%	80% - 120%
Relative Percent Difference	7.2%	< 20%

Crosby & Overton
Industrial & Environmental Services
8430 Amelia Street, Oakland, California 94621
(510) 633-0336 (800) 821-0424 FAX (510) 633-0759

4423-5 ~~9548-5~~ SUNOL

BILL CHECK DOHM (DAVE WELLS)

SAMPLERS: Signature Darrell Taylor

Send report attention to DARRELL TAYLOR

STA NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	OF CONTAINERS	TPH-G	TPH-GASTEX	TPH-D	8420 VOC	TOG-13				REMARKS
MW-1	1-29-93	2:30		X	WELL #1	4 VOA	X			X					HCL PRESERVATIVE
MW-2	1-29-93	12:30		X	WELL #2	4VOA		X							HCL PRESERVATIVE
MW-3	1-29-93	1:30		X	WELL #3	4VOA	X			X					HCL PRESERVATIVE
MW-1	1-29-93	2:30		X	WELL #1	2-950ml			X		X				
MW-2	1-29-93	12:30		X	WELL #2	2-950ml			X		X				
MW-3	1-29-93	1:30		X	WELL #3	2-950ml			X		X				

Relinquished by:Signature	Date/Time	Received by:Signature	Date/Time
Darrell Taylor	2-1-93 10:50am	Kristi Street	2/1/93 10:50am
Kristi Street	2/1/93 11:35am	Greg Edwards	2-1-93 1135

REMARKS: BILL CITY + COUNTY SF (ATTN DAVE WELLS)

NORMAL TAT

Company Name
Address CURTIS & TOMPKINS
2323 FIFTH ST
BERKELEY, CA
(510) 486-0900