Crown Metal
MANUFACTURING COMPANY INC.
765 SOUTH STATE ROUTE 83 • ELMHURST, ILLINOIS 60126-4709 • PHONE 708/279-9800 • FAX 708/279-9807

91 JUN 17 AM 11:22

June 10, 1991

Alemeda County Health Care Services Agency
Department of Environmental Health
80 Swan Way Room 200
Oakland, CA 94621-1439

Attention: Ms. Pamela Evans

Dear Ms. Evans:

Enclosed please find a copy of our latest report regarding our continuing voluntary clean up of 16525 Worthley Drive.

Should you have any questions on this report please feel free to contact our consultants directly.

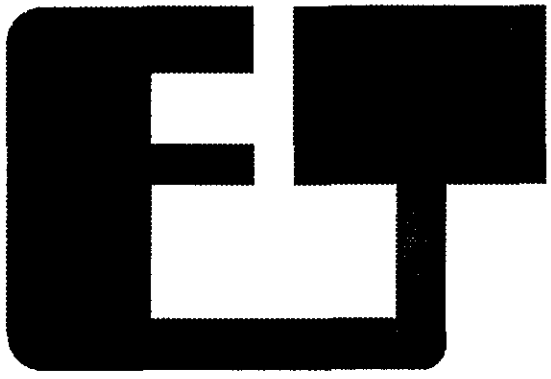
Regards,

Richard C. Ernest
President

RCE/meb
Enc.

cc: Exceltech/Britt Von Thaden

P.S. To All - Please note our new corporate address on the letterhead.



EXCELTECH

# MONITORING WELL MW-8 INSTALLATION AND MAY QUARTERLY GROUNDWATER MONITORING REPORT

FOR

CROWN METAL MANUFACTURING
AT PACIFIC INTERNATIONAL
STEEL FACILITY
16525 WORTHLEY DRIVE
SAN LORENZO, CALIFORNIA

Project No. 1587-2G
May 1991

EXCELTECH A RESNA Company

RESNA
Environmental Solutions
Through Applied Science,
Engineering & Construction

41674 Christy Street
Fremont, CA 94538
Phone: (415) 659-0404
Fax: (415) 651-4677

May 29, 1991

Crown Metal Manufacturing Company
765 S. State Route 83
Elmhurst, IL 60126-4700

Attention: Mr. Richard Ernest

Subject: Monitoring Well MW-8 Installation and May Quarterly Groundwater Monitoring
Pacific International Steel Facility
16525 Worthley Drive, San Lorenzo, California
Exceltech Project No. 1587-2G

Dear Mr. Ernest:

Exceltech, Inc., has completed the installation of groundwater monitoring well MW-8 and the May quarterly groundwater sampling at the subject site in the City of San Lorenzo, Alameda County, California (Figure 1). The well was installed on April 5, 1991 in response to a request by the Alameda County Health Care Services Agency (ACHCSA) to install additional on-site monitoring wells immediately downgradient from the zone of groundwater contamination (letter dated January 17, 1991).

Quarterly groundwater sampling was conducted on May 1, 1991 and included collecting samples from wells MW-2 and MW-8 as well as the remediation system influent from well RW-1. Sample collection was suspended from wells MW-1, MW-4, MW-5, MW-6, and MW-7 as approved by ACHCSA in a letter dated March 25, 1991. Water level measurements were collected from all on-site wells except RW-1 on the day of sampling for the construction of a groundwater surface contour map (Figure 2). A water level was not obtained nor was a sample collected directly from well RW-1 because the pump for the remediation system is in place and limits access to the well.

**Exploratory Drilling, Soil Sampling**

Exceltech drilled one exploratory boring on-site on April 5, 1991 using an Exceltech Mobile B-53 truck-mounted drill rig. The boring (MW-8) was drilled for the purpose of installing a groundwater monitoring well.

Soil samples were collected in the boring at approximately 5-foot depth intervals by driving a pre-cleaned modified California split-spoon sampler with a 140-pound hammer into the relatively undisturbed soils ahead of the augers. The sampler, containing three brass liners, was driven 18 inches, then retrieved and disassembled. The lowermost liner containing the soil sample from each interval was preserved for laboratory analysis. The liners were sealed at both ends with foil and plastic caps, labeled with a unique sample number, placed in a Ziploc storage bag, and packed on ice for transport to the laboratory. A total

of three samples was collected and chain-of-custody documentation accompanied all of the samples to the laboratory. The remaining samples were visually characterized and checked for the presence of petroleum hydrocarbons using a photoionization detector (PID). Details of the subsurface materials encountered as well as PID readings are presented in the attached exploratory boring log in Appendix A.

## Monitoring Well Installation

The exploratory borehole was converted to a groundwater monitoring well and designated MW-8. Two-inch-diameter, Schedule 40 polyvinyl chloride (PVC) blank and factory-slotted (0.010) casing with flush-threaded couplings was set through the 8-inch-outside-diameter augers. No solvents or cements were used in the well construction. The placement of the screened interval was determined in the field by the Exceltech geologist. The well was installed to monitor the uppermost water-bearing zone.

After the PVC well casing was installed, No. 2/12 sand was slowly poured down the annular space between the augers and the well casing to make the desired sand pack. The augers were pulled out of the ground a few feet at a time during sanding. The annular space was sanded to approximately 1 foot above the top of the screened interval. One foot of bentonite pellets was then placed upon the top of the sand and hydrated. The remaining portion of the annular space was sealed with cement grout. The top of the well was set in concrete in a water-tight, traffic-rated vault box at grade. A PVC locking expansion plug was used to seal the wellhead and provide security. Construction details for the well are contained in Appendix A.

## Wellhead Survey

Ron Archer Civil Engineer, Inc., surveyed the elevation of the top of the PVC casing of well MW-8 to the nearest 0.01 foot. The elevation was taken from a benchmark found in the northwest corner of the northerly concrete abutment, field control line "N," Zone 2, south of the corner of a chain link fence and east of the centerline of the Southern Pacific Railroad tracks. The survey elevation used in this report was transcribed from the final survey report attached in Appendix B.

## Well Development

Following construction, the well was developed on April 23, 1991 by overpumping to remove the fine sand and silt from around the screened interval. Approximately 25 well casing volumes of water were removed during development.

## Groundwater Sampling

Before sampling, Exceltech measured the depth to groundwater in each well with an electric sounding tape and checked for the presence of free-phase hydrocarbons using a clear acrylic bailer. No free-phase hydrocarbons were detected. Groundwater samples were collected from wells MW-2 and MW-8 and the remediation system influent in accordance with Exceltech's groundwater sampling protocol (Appendix C). An equipment rinse water sample (bailer blank) was also collected for quality control. Equipment rinse water and groundwater removed from the wells were placed in drums approved by the Department of Transportation and left at the site pending receipt of the analytical results.

## Hydrogeology

The groundwater surface contour map (Figure 2) reveals a variable, shallow groundwater gradient in the area of investigation for May 1, 1991. Apparent groundwater flow directions range from the southwest to the southeast.

## Laboratory Analyses and Results

The soil, groundwater, and bailer blank samples were analyzed by Sequoia Analytical, a state-certified laboratory, located in Redwood City, California. Seqouia analyzed the samples for the presence of total petroleum hydrocarbons as gasoline (TPHG), as well as benzene, toluene, ethyl benzene, and total xylenes (BTEX) using Environmental Protection Agency Methods 5030/8015/8020.

The three soil samples were composited and analyzed by Sequoia to determine an appropriate disposal method for the drill cuttings. No petroleum hydrocarbons were detected in the composite sample. Sequoia reported that petroleum hydrocarbons were detected in the groundwater samples from well MW-2 and the remediation system influent. The concentrations, reported in micrograms per liter (parts per billion), are as follows:

| Well | TPHG | Benzene | Toluene | Ethyl benzene | Total Xylenes |
|---|---|---|---|---|---|
| MW-2 | 220 | 1.5 | 0.42 | 0.53 | 0.54 |
| Remediation System Influent | 160 | 40 | 0.79 | 14 | 6.1 |

TPHG Total petroleum hydrocarbons as gasoline

Neither MW-8 nor the bailer blank samples were reported as containing petroleum hydrocarbons. A summary of past and present analytical results is presented in Table 1. Copies of the analytical reports and chain-of-custody documents are attached in Appendix D.

## Reporting Requirements

A copy of this report should be forwarded by Crown Metal Manufacturing to the following agencies in a timely manner:

California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94612-3429
Attention: Mr. Richard Hiett

Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621-1439
Attention: Ms. Pamela Evans

**Limitations**

The discussion presented in this report are based on the following:

1. Observations by field personnel.
2. Exploratory test boring drilled at the site.
3. Results of laboratory analyses performed by a state-certified laboratory.
4. Our understanding of the regulations of the State of California and Alameda County and/or the City of San Lorenzo.

It is possible that variations in the soil and groundwater conditions could exist beyond the points explored in this investigation. Also, changes in the groundwater conditions could occur at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Exceltech has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the San Lorenzo area. Please note that contamination of soil and groundwater must be reported to the appropriate agencies in a timely manner. No other warranty, expressed or implied, is made.

Exceltech includes in this report chemical analytical data from a state-certified laboratory. The analytical tests are performed according to procedures suggested by the U.S. EPA and State of California. Exceltech is not responsible for laboratory errors in procedure or result reporting.

The next quarterly sampling is scheduled for August 1991. If you have any questions, please call.

Sincerely,
Exceltech, Inc.

Britt Von Thaden
Project Geologist

Lawrence D. Pavlak, C.E.G. 1187
Senior Program Geologist

BVT/LDP/sr
Attachment

cc: Mr. James Lewis, Pacific International Steel

Exceltech, Inc.
Project No. 1587-2G
May 29,1991

Crown Metal Manufacturing
Pacific International Steel Facility
San Lorenzo, CA

## TABLE 1

## SUMMARY OF GROUNDWATER ANALYSES DATA

| Well | Date Sampled | TPHG (µg/l) | Benzene (µg/l) | Toluene (µg/l) | Ethyl Benzene (µg/l) | Total Xylenes (µg/l) | Well Elevation (ft) | Depth to Water (ft) | Floating Product (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 7/14/87 | BDL | BDL | BDL | — | BDL | 8.86 | 7.56 | — |
| | 11/24/87 | BDL | BDL | BDL | — | 9.0 | | 7.51 | — |
| | 2/29/88 | BDL | BDL | BDL | — | BDL | | 7.18 | — |
| | 5/25/88 | BDL | BDL | BDL | — | BDL | | 7.40 | — |
| | 8/10/88 | N D | N D | N D | N D | N D | | 7.85 | — |
| | 11/29/88 | N D | N D | N D | N D | N D | | 7.86 | — |
| | 2/7/89 | N D | N D | N D | N D | N D | | 7.43 | — |
| | 5/12/89 | N D | 1.4 | N D | N D | N D | | 7.23 | — |
| | 8/4/89 | N D | N D | N D | N D | N D | | 8.17 | — |
| | 11/14/89 | N D | N D | N D | — | — | | 7.93 | — |
| | 1/3/90 | — | — | — | — | — | | 7.77 | — |
| | 2/22/90 | N D | N D | N D | N D | N D | | 7.28 | — |
| | 5/17/90 | — | — | — | — | — | | 7.62 | — |
| | 8/17/90 | — | — | — | — | — | | 7.91 | — |
| | 11/6/90 | — | — | — | — | — | | 8.01 | — |
| | 2/1/91 | N D | N D | N D | N D | N D | | 8.00 | — |
| | 5/1/91 | — | — | — | — | — | | 7.36 | — |
| MW-2 | 7/14/87 | 110 | 1.2 | 1.9 | — | 2.0 | 9.17 | 7.79 | — |
| | 11/24/87 | 3,600 | 82 | 47 | — | 13 | | 7.73 | — |
| | 2/29/88 | 800 | BDL | BDL | — | BDL | | 7.26 | — |
| | 5/25/88 | 250 | N D | N D | — | N D | | 7.45 | — |
| | 8/10/88 | 260 | N D | N D | N D | N D | | 7.90 | — |
| | 11/29/88 | 870 | 9.0 | N D | 1.0 | 1.0 | | 8.20 | — |
| | 2/7/89 | 710 | 16 | N D | N D | N D | | 7.47 | — |
| | 5/12/89 | 260 | 2.8 | 0.76 | 1.3 | 3.0 | | 7.27 | — |
| | 8/4/89 | 360 | N D | N D | N D | 0.48 | | 8.23 | — |

**TABLE 1**

**SUMMARY OF GROUNDWATER ANALYSES DATA**

| Well | Date Sampled | TPHG (µg/l) | Benzene (µg/l) | Toluene (µg/l) | Ethyl Benzene (µg/l) | Total Xylenes (µg/l) | Well Elevation (ft) | Depth to Water (ft) | Floating Product (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-2 | 11/14/89 | 85 | N D | 3.5 | 0.36 | 2.5 | | 8.08 | — |
| Con't | 1/3/90 | — | — | — | — | — | | 7.95 | — |
| | 2/22/90 | 120 | N D | N D | 1.5 | 0.55 | | 7.47 | — |
| | 5/17/90 | 240 | N D | N D | N D | N D | | 7.70 | — |
| | 8/17/90 | 130 | N D | 2.9 | 1.2 | 0.68 | | 8.00 | — |
| | 11/6/90 | 170 | 0.37 | 1.2 | 2.0 | 1.5 | | 8.30 | — |
| | 2/1/91 | 57 | N D | N D | N D | 0.73 | | 8.15 | — |
| | 5/1/91 | 220 | 1.5 | 0.42 | 0.53 | 0.54 | | 7.56 | — |
| MW-3 | 7/14/87 | 260 | BDL | 1.0 | — | 2.0 | 8.54 | 7.09 | — |
| | 11/24/87 | 8,900 | 1,700 | 3.0 | — | 12 | | 7.11 | — |
| | 2/29/88 | 9,300 | 1,600 | 93 | — | 99 | | 6.57 | — |
| | 5/25/88 | 11,000 | 140 | 16 | — | 34 | | 6.80 | — |
| | 8/10/88 | 4,600 | 23 | 4.8 | 140 | 3.0 | | 7.20 | — |
| | 11/29/88 | 16,000 | 3,900 | 11 | 600 | 40 | | 7.41 | — |
| | 2/7/89 | — | — | — | — | — | | N A | — |
| | 5/12/89 | 2,500 | N D | 5.6 | N D | 2.7 | | 6.64 | — |
| | 8/4/89 | 2,900 | 800 | 7.5 | 96 | N D | | 7.38 | — |
| | 11/14/89 | Destroyed in August 1989 | | | | | | | |
| MW-4 | 7/14/87 | BDL | BDL | BDL | — | BDL | 8.48 | 7.25 | — |
| | 11/24/87 | 60 | BDL | 0.65 | — | 7.6 | | 6.97 | — |
| | 2/29/88 | BDL | BDL | BDL | — | BDL | | 6.54 | — |
| | 5/25/88 | BDL | BDL | BDL | — | BDL | | 6.36 | — |
| | 8/10/88 | — | — | — | — | — | | N A | — |
| | 11/29/88 | N D | 0.87 | N D | N D | N D | | 6.85 | — |
| | 2/7/89 | N D | N D | N D | N D | N D | | 6.26 | — |
| | 5/12/89 | N D | N D | N D | N D | 0.76 | | 6.55 | — |

**TABLE 1**

**SUMMARY OF GROUNDWATER ANALYSES DATA**

| Well | Date Sampled | TPHG (µg/l) | Benzene (µg/l) | Toluene (µg/l) | Ethyl Benzene (µg/l) | Total Xylenes (µg/l) | Well Elevation (ft) | Depth to Water (ft) | Floating Product (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-4 | 8/4/89 | — | — | — | — | — | | N A | — |
| Con't | 11/14/89 | — | — | — | — | — | | — | — |
| | 2/22/90 | — | N D | N D | N D | N D | | 6.67 | — |
| | 5/17/90 | N D | — | — | — | — | | — | — |
| | 8/17/90 | — | — | — | — | — | | 7.30 | — |
| | 11/6/90 | — | — | — | — | — | | 7.15 | — |
| | 2/1/91 | N D | N D | N D | N D | N D | | 6.85 | — |
| | 5/1/91 | — | — | — | — | — | | 6.73 | — |
| MW-5 | 7/14/87 | | BDL | BDL | — | BDL | 9.11 | 7.06 | — |
| | 11/24/87 | BDL | BDL | BDL | — | 7.2 | | 7.24 | — |
| | 2/29/88 | BDL | BDL | BDL | — | BDL | | 6.75 | — |
| | 5/25/88 | BDL | — | — | — | — | | — | — |
| | 8/10/88 | — | N D | N D | N D | N D | | 7.35 | — |
| | 11/29/88 | N D | N D | N D | N D | N D | | — | — |
| | 2/7/89 | N D | N D | N D | N D | N D | | 7.02 | — |
| | 5/12/89 | N D | N D | N D | N D | 0.84 | | 6.69 | — |
| | 8/4/89 | N D | N D | N D | N D | N D | | 7.52 | — |
| | 11/14/89 | N D | N D | N D | N D | N D | | 7.51 | — |
| | 1/3/90 | N D | — | — | — | — | | 7.42 | — |
| | 2/21/90 | — | N D | N D | N D | N D | | 6.85 | — |
| | 5/17/90 | N D | — | — | — | — | | 7.09 | — |
| | 8/17/90 | — | — | — | — | — | | 7.36 | — |
| | 11/6/90 | — | — | — | — | — | | 7.65 | — |
| | 2/1/91 | N D | N D | N D | N D | N D | | 7.63 | — |
| | 5/1/91 | — | — | — | — | — | | 6.68 | — |

## TABLE 1

## SUMMARY OF GROUNDWATER ANALYSES DATA

| Well | Date Sampled | TPHG (µg/l) | Benzene (µg/l) | Toluene (µg/l) | Ethyl Benzene (µg/l) | Total Xylenes (µg/l) | Well Elevation (ft) | Depth to Water (ft) | Floating Product (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-6 | 7/14/87 | BDL | BDL | BDL | — | BDL | 9.19 | — | — |
| | 11/24/87 | — | — | — | — | — | | — | — |
| | 1/5/88 | BDL | BDL | BDL | — | BDL | | — | — |
| | 2/29/88 | BDL | BDL | BDL | — | BDL | | 7.19 | — |
| | 5/25/88 | BDL | BDL | BDL | N D | BDL | | 7.33 | — |
| | 8/10/88 | BDL | N D | N D | N D | N D | | 7.50 | — |
| | 11/29/88 | N D | N D | N D | N D | N D | | 7.93 | — |
| | 2/7/89 | N D | N D | N D | N D | N D | | 7.56 | — |
| | 5/12/89 | N D | N D | N D | N D | N D | | 7.16 | — |
| | 8/4/89 | N D | N D | N D | N D | N D | | 7.94 | — |
| | 11/14/89 | N D | N D | N D | N D | N D | | 8.92 | — |
| | 1/3/90 | N D | — | — | — | — | | 7.89 | — |
| | 2/21/90 | — | N D | N D | N D | N D | | 7.28 | — |
| | 5/17/90 | N D | — | — | — | — | | 8.62 | — |
| | 8/17/90 | — | — | — | — | — | | 7.68 | — |
| | 11/6/90 | — | — | — | — | — | | 8.05 | — |
| | 2/1/91 | N D | N D | N D | N D | N D | | 7.87 | — |
| | 5/1/91 | — | — | — | — | — | | 6.95 | — |
| MW-7 | 1/3/90 | — | — | — | — | — | 8.41 | 8.06 | — |
| | 1/9/90 | N D | N D | N D | N D | N D | | 8.42 | — |
| | 2/21/90 | N D | N D | N D | N D | N D | | 6.63 | — |
| | 5/17/90 | N D | N D | N D | N D | N D | | 6.81 | — |
| | 8/17/90 | 48 | N D | N D | N D | N D | | 7.13 | — |
| | 11/6/90 | N D | N D | 0.55 | N D | 0.32 | | 7.29 | — |
| | 2/1/91 | N D | N D | N D | N D | N D | | 7.20 | — |
| | 5/1/91 | — | — | — | — | — | | 6.80 | — |

## TABLE 1

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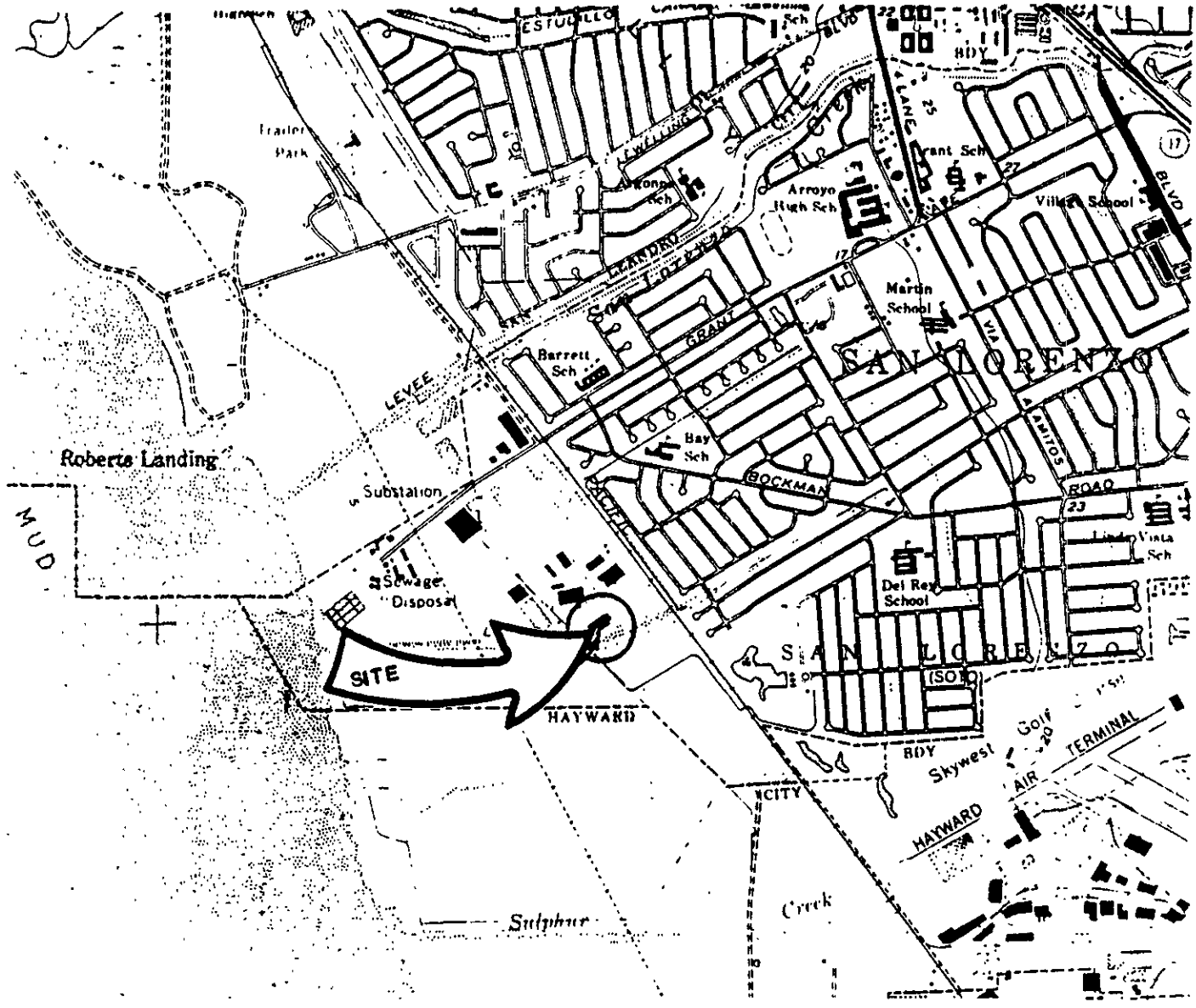
| Well | Date Sampled | TPHG (µg/l) | Benzene (µg/l) | Toluene (µg/l) | Ethyl Benzene (µg/l) | Total Xylenes (µg/l) | Well Elevation (ft) | Depth to Water (ft) | Floating Product (ft) |
|---|---|---|---|---|---|---|---|---|---|
| MW-8 | 5/1/91 | N D | N D | N D | N D | N D | 8.52 | 7.67 | — |
| RW-1 | 1/3/90 | — | — | — | — | — | 11.02 | 9.81 | — |
| | 1/9/90 | 1,300 | 150 | 15 | 100 | 170 | | 9.75 | — |
| | 3/1/90 | 440 | 9.4 | 1.3 | 16 | 25 | | 9.34 | — |
| | 5/17/90 | 1,400 | 52 | 1.0 | 20 | 12 | | 9.55 | — |
| | 8/17/90 | 1,800 | 410 | 7.8 | 160 | 65 | | 9.84 | — |
| | 11/6/90 | — | — | — | — | — | | 10.15 | — |
| RW-1 System Influent | 1/16/91 | 78 | 17 | 2.7 | 7.7 | 1.3 | — | — | — |
| | 5/1/91 | 160 | 40 | 0.79 | 14 | 6.1 | — | — | — |
| BB-1 | 1/9/90 | N D | N D | N D | N D | N D | — | — | — |
| | 5/17/90 | N D | N D | N D | N D | N D | — | — | — |
| | 11/6/90 | N D | N D | N D | N D | N D | | | |
| | 2/1/91 | N D | N D | N D | N D | N D | — | — | — |
| | 5/1/91 | N D | N D | N D | N D | N D | — | — | — |

TPHG Total petroleum hydrocarbons as gasoline
N D Not detected at or above the method detection limit
— No data obtained
µg/l Micrograms per liter (parts-per-billion)
BB-1 Bailer blank




**LEGEND**

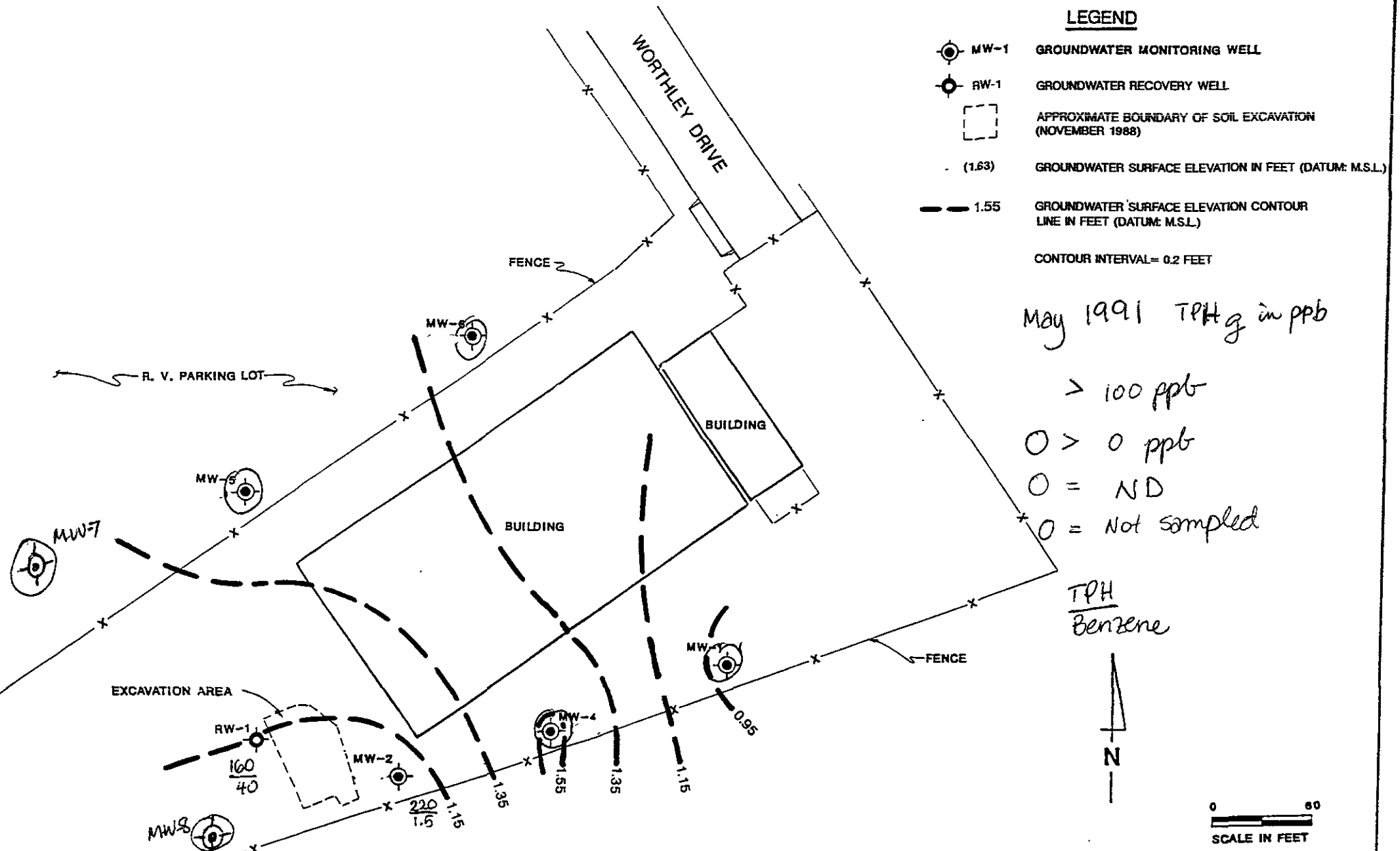
SITE LOCATION

USGS 7.5 MINUTE SAN LEANDRO QUADRANGLE 1980

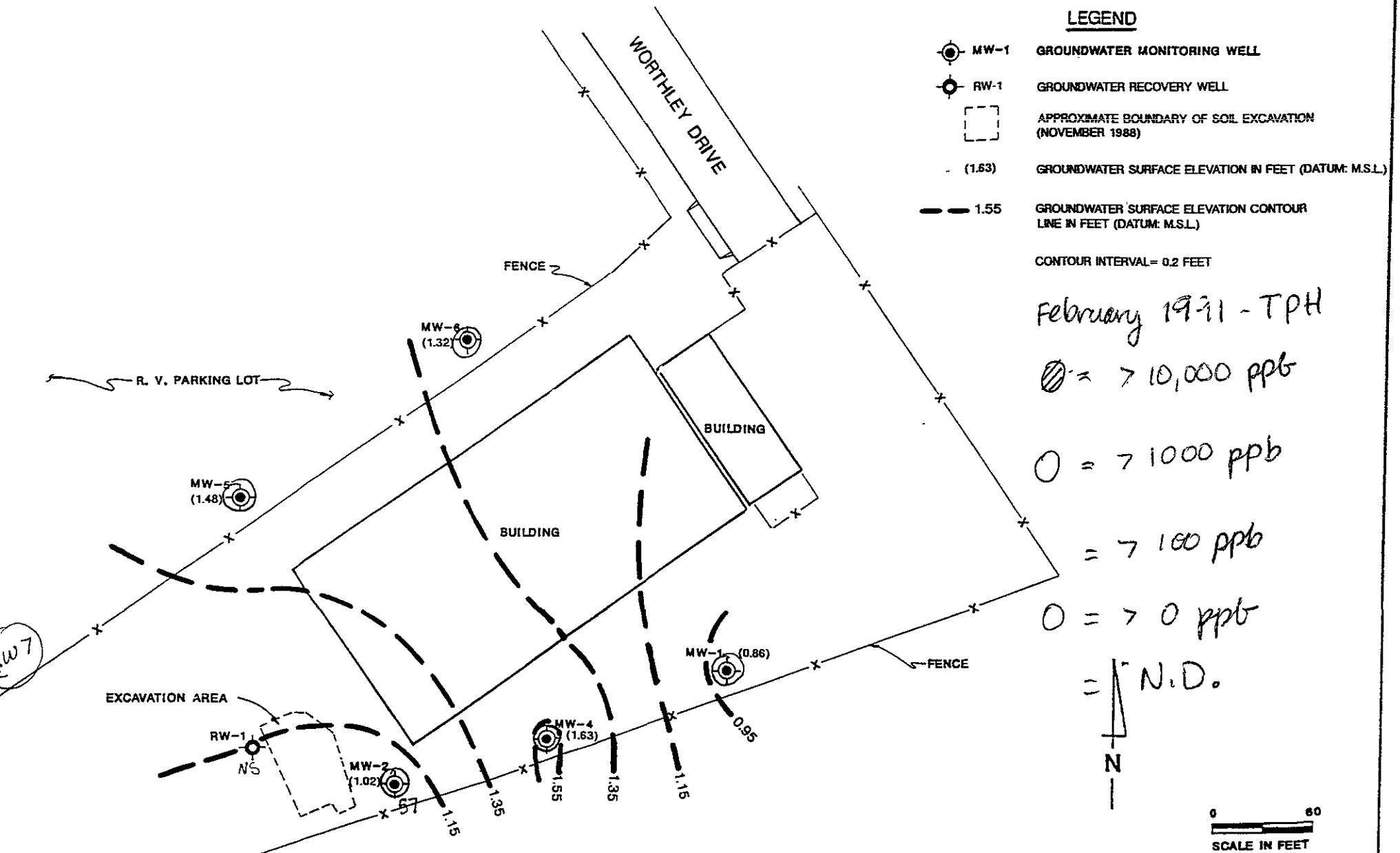
EXCELTECH

# SITE LOCATION MAP

| | | |
|---|---|---|
| CROWN METAL MFG-PACIFIC INT'L STEEL | JOB #: 1587-2G | |
| 16525 WORTHLEY DRIVE | SCALE: 1:24000 | DRAWN BY: |
| SAN LORENZO, CALIFORNIA | DATE: 5/29/91 | DRAWING #: FIG. 1 |




| | | | |
|---|---|---|---|
| EXCELTECH | GROUNDWATER SURFACE CONTOUR MAP (2/1/91) | REVIEWED BY: BVT | APPROVED BY: |
| | CROWN METAL MFG – PACIFIC INTL' STEEL | DESIGNED BY: | DATE: |
| | 16525 WORTHLEY DRIVE | JOB #: 1587G | DRAWN BY: SLS |
| | SAN LORENZO, CALIFORNIA | DATE: 4/18/91 | DRAWING #: FIG. 2 |




## LEGEND

- MW-1 — GROUNDWATER MONITORING WELL
- RW-1 — GROUNDWATER RECOVERY WELL
- APPROXIMATE BOUNDARY OF SOIL EXCAVATION (NOVEMBER 1988)
- (1.63) — GROUNDWATER SURFACE ELEVATION IN FEET (DATUM: M.S.L.)
- 1.55 — GROUNDWATER SURFACE ELEVATION CONTOUR LINE IN FEET (DATUM: M.S.L.)

CONTOUR INTERVAL= 0.2 FEET

February 1991 - TPH

▨ = > 10,000 ppb

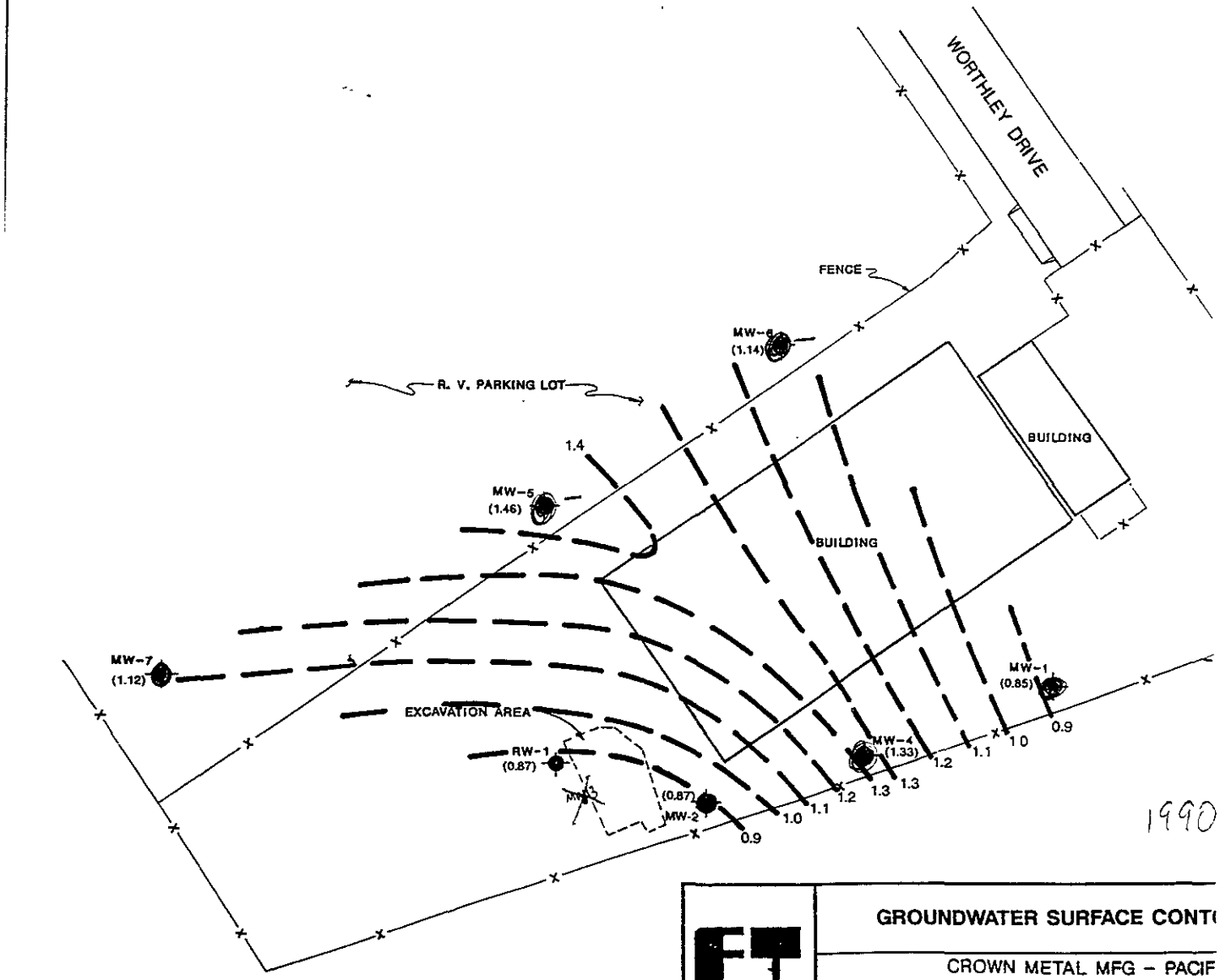
O = > 1000 ppb

= > 100 ppb

O = > 0 ppb

= N.D.

| | | | |
|---|---|---|---|
| EXCELTECH | GROUNDWATER SURFACE CONTOUR MAP (2/1/91) | REVIEWED BY: BVT | APPROVED BY: |
| | CROWN METAL MFG - PACIFIC INTL' STEEL | DESIGNED BY: | DATE: |
| | 16525 WORTHLEY DRIVE | JOB #: 1587G | DRAWN BY: SLS |
| | SAN LORENZO, CALIFORNIA | DATE: 4/18/91 | DRAWING #: FIG. 2 |




1990

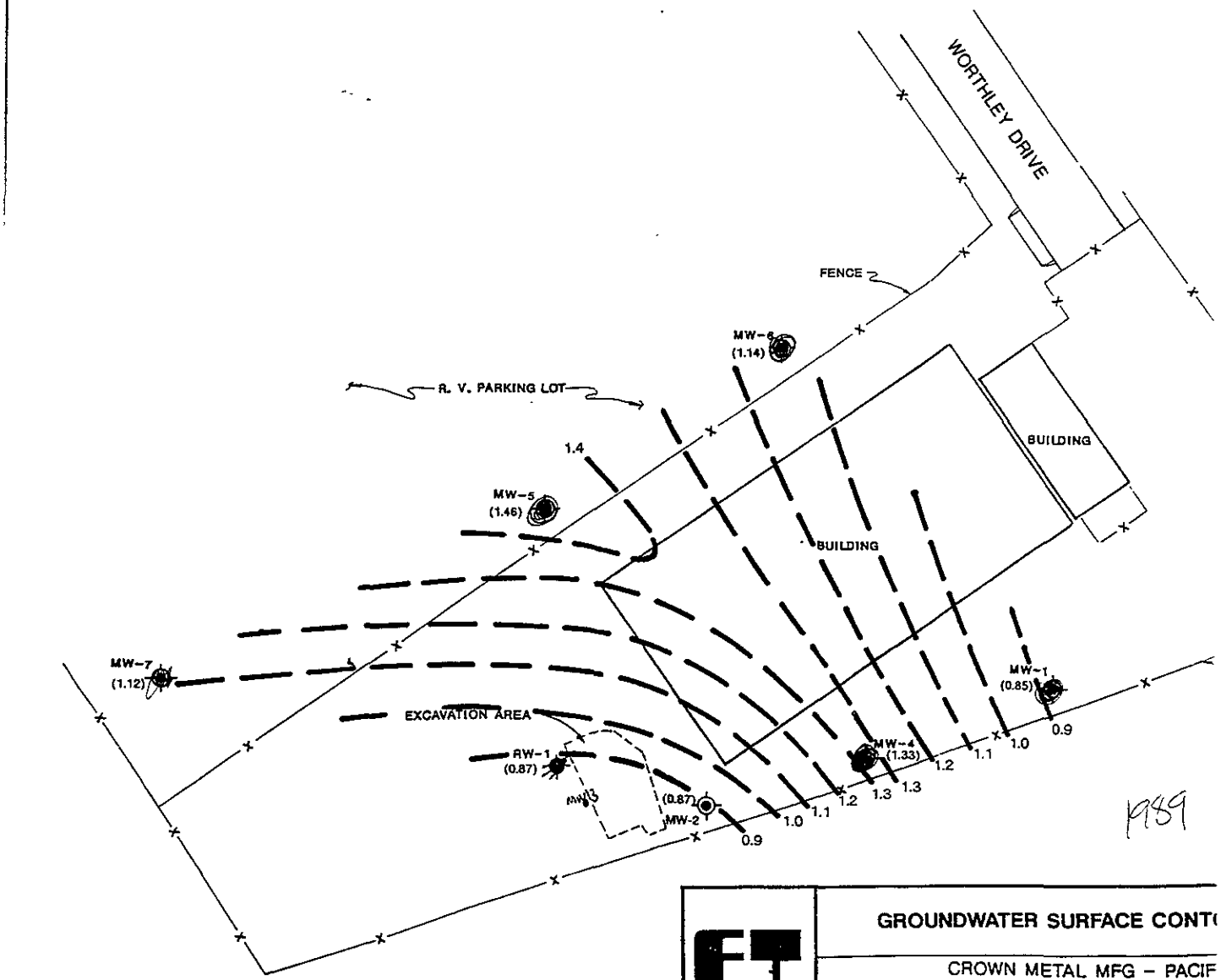
EXCELTECH

GROUNDWATER SURFACE CONT

CROWN METAL MFG – PACIF

16525 WORTHLEY DR

SAN LORENZO, CALIFO



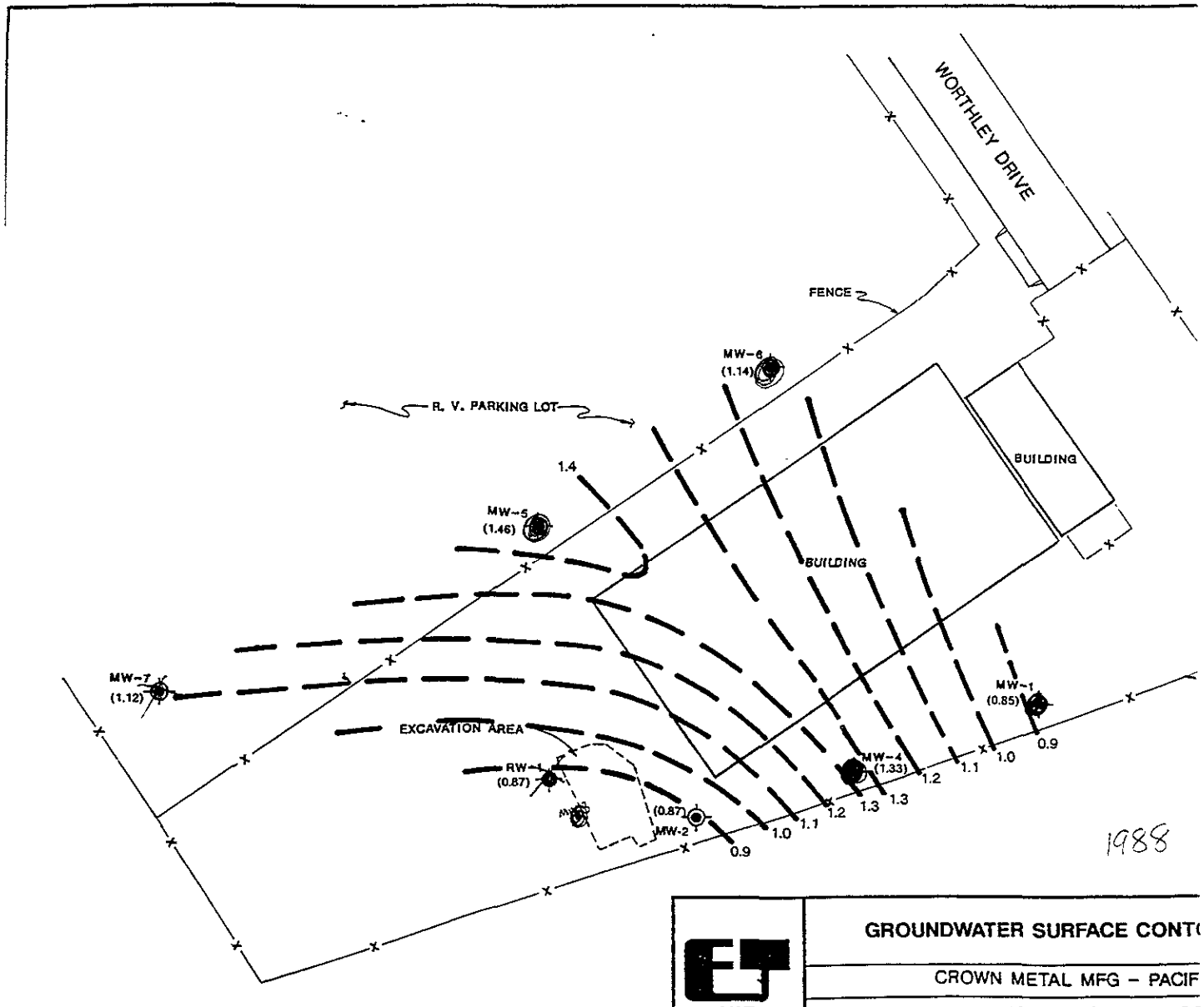

EXCELTECH

GROUNDWATER SURFACE CONT(

CROWN METAL MFG – PACIF

16525 WORTHLEY DF

SAN LORENZO, CALIFO



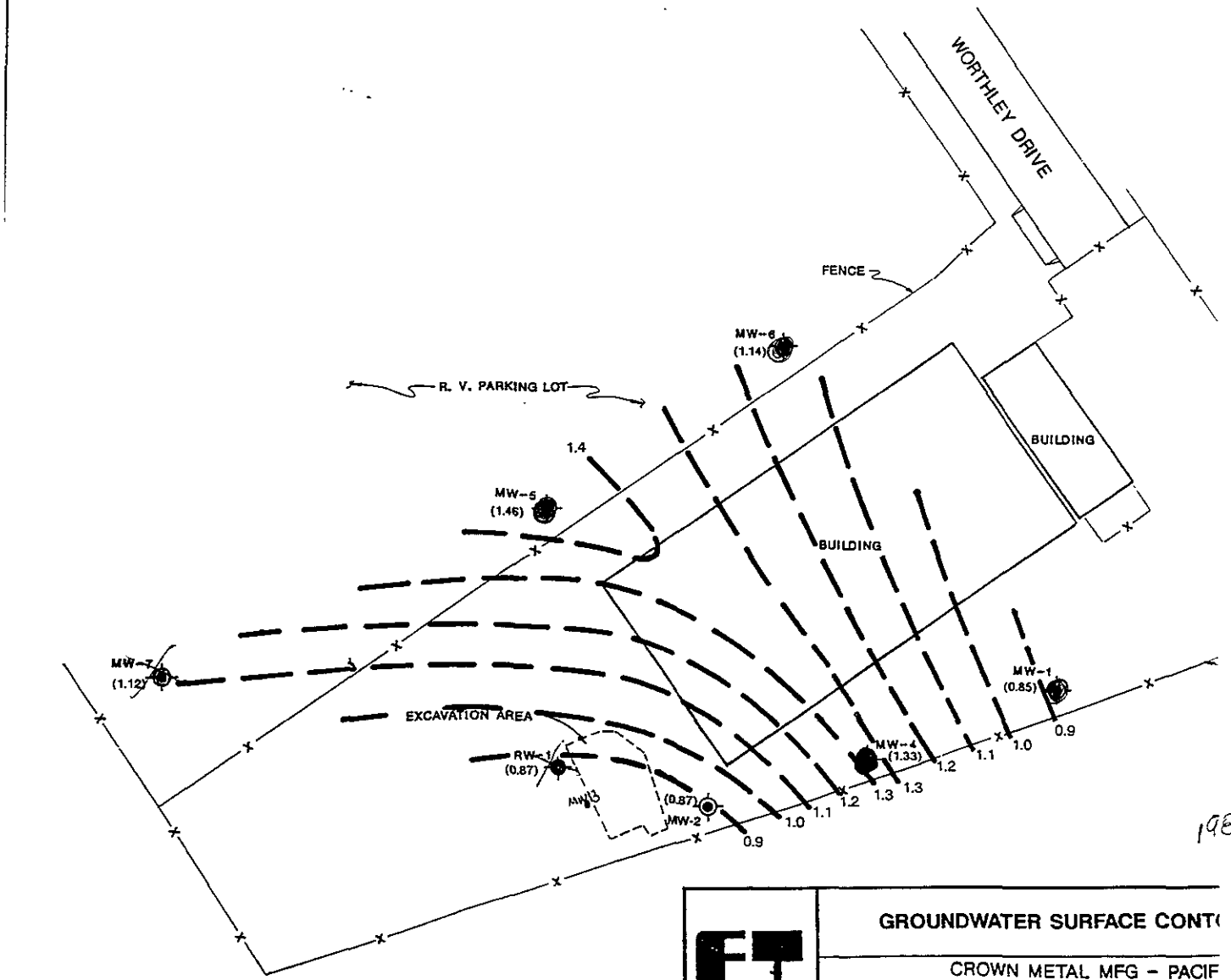

EXCELTECH

GROUNDWATER SURFACE CONT(

CROWN METAL MFG – PACIF

16525 WORTHLEY DF

SAN LORENZO, CALIFO




1987

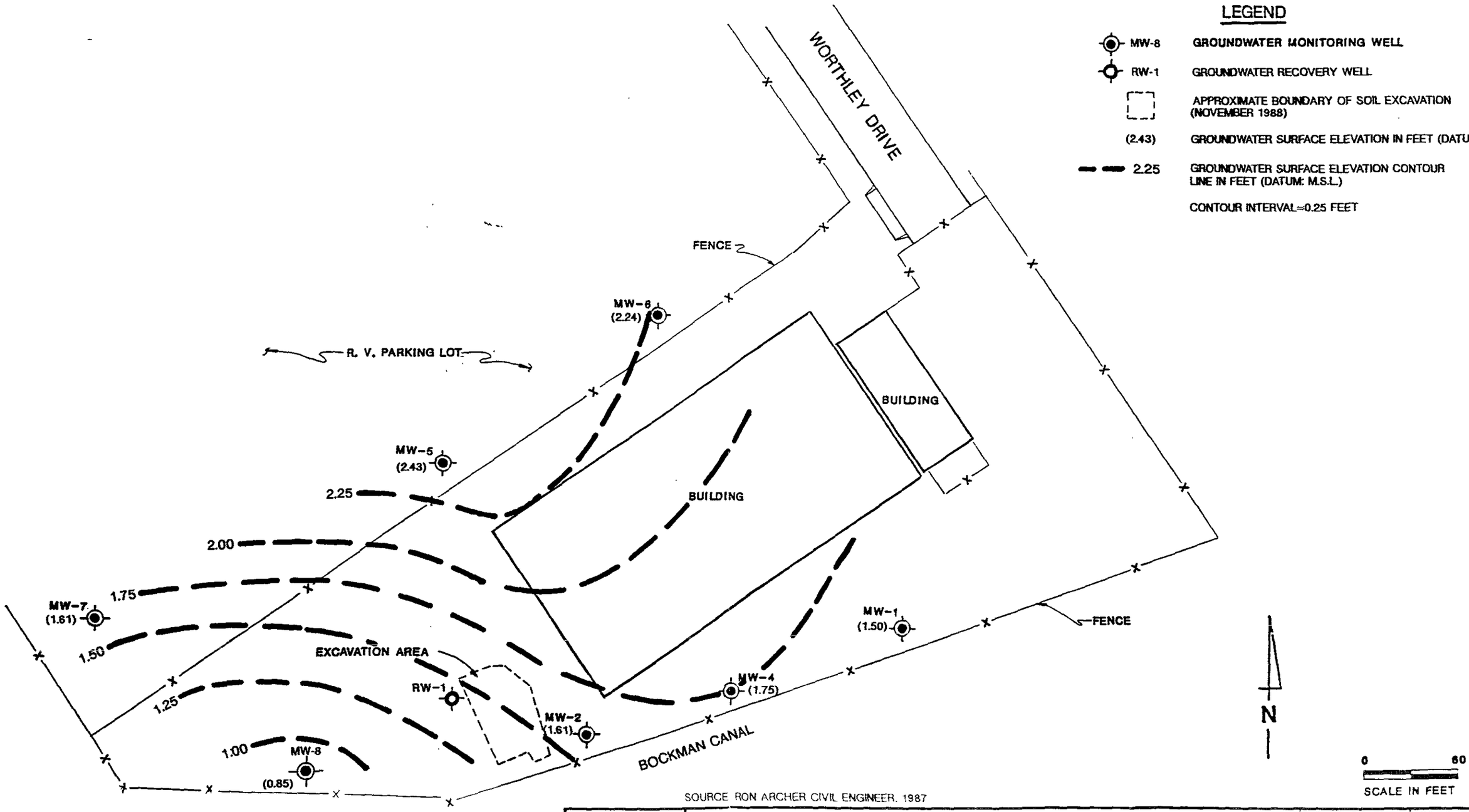
EXCELTECH

GROUNDWATER SURFACE CONT(

CROWN METAL MFG - PACIF

16525 WORTHLEY DF

SAN LORENZO, CALIFO




SOURCE RON ARCHER CIVIL ENGINEER, 1987

EXCELTECH

| | | |
|---|---|---|
| **GROUNDWATER SURFACE CONTOUR MAP (5/1/91)** | REVIEWED BY: BVT | APPROVED BY: |
| CROWN METAL MFG - PACIFIC INTL' STEEL | DESIGNED BY: | DATE: |
| 16525 WORTHLEY DRIVE | JOB #: 1587G | DRAWN BY: SLS |
| SAN LORENZO, CALIFORNIA | DATE: 5/29/91 | DRAWING #: FIG. 2 |

# APPENDIX A

# EXPLORATORY BORING LOG AND MONITORING WELL DETAILS

EXCELTECH

# STANDARD SYMBOLS

## Legend

- Soil sample location
- Soil sample collected for laboratory analysis
- No soil recovery
- First encountered groundwater level
- Potentiometric groundwater level
- Disturbed or bag soil sample

2.5 YR 6/2 Soil color according to Munsell Soil Color Charts (1975 Edition)

## Penetration

Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

## Well Construction

- Annular seal
- Bentonite seal
- Sand pack
- Well riser section
- Well screen section

## UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | | | GROUP SYMBOLS | TYPICAL NAMES |
|---|---|---|---|---|
| COARSE-GRAINED SOILS More than half of material is larger than No. 200 sieve size | GRAVELS More than half of coarse fraction is larger than No. 4 sieve size | Clean Gravels | GW | Well-graded gravels, gravel-sand mixtures, little or no fines |
| | | | GP | Poorly graded gravels, gravel-sand mixture, little or no fines |
| | | Gravels with Fines | GM | Silty gravels, gravel-sand-silt mixtures |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures |
| | SANDS More than half of coarse fraction is smaller than No. 4 sieve size | Clean Sands | SW | Well-graded sands, gravelly sand, little or no fines |
| | | | SP | Poorly graded sands, gravelly sands, little or no fines |
| | | Sands with Fines | SM | Silty sands, sand-silt mixtures |
| | | | SC | Clayey sands, sand-clay mixtures |
| FINE-GRAINED SOILS More than half of material is smaller than No. 200 sieve size | SILTS AND CLAYS | Low Liquid Limit | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity |
| | | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | | | OL | Organic silts and organic silty clays of low plasticity |
| | | High Liquid Limit | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | | CH | Inorganic clays of high plasticity, fat clays |
| | | | OH | Organic clays of medium to high plasticity, organic silts |
| | | | Pt | Peat and other highly organic soils |

## NOTES:

1. Boundary Classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.
2. All sieve sizes on this chart are U.S. standard.
3. The terms "silt" and "clay" are used respectively to distinguish materials exhibiting lower plasticity from those with higher plasticity.
4. For a complete description of the Unified Soil Classification System, see "Technical Memorandum No. 3-357," prepared for Office, Chief of Engineers, by Waterways Equipment Station, Vicksburg, Mississippi, March 1953.

# EXPLORATORY BORING LOG

EXCELTECH

**Project Name:** Crown Metal Manufacturing
San Lorenzo, California

**Boring No.** MW-8

**Date Drilled:** 4/5/91

**Project Number:** 1587-2G

**Logged By:** BVT

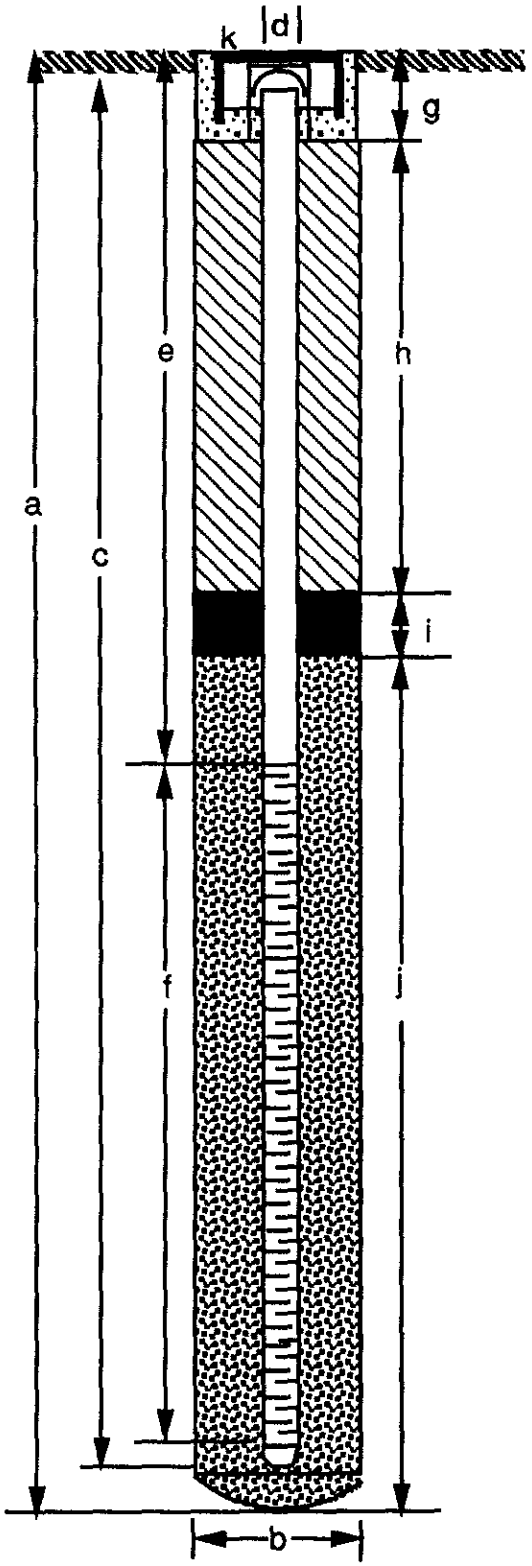
| Depth (ft.) | Sample No. | Blows/Foot | Unified Soil Classification | SOIL DESCRIPTION | Water Level | PID Reading (ppm) | Well Construction Detail |
|---|---|---|---|---|---|---|---|
| | | | | FILL - SANDY GRAVEL: 7 inches | | | |
| 1-5 | | | CL | SILTY CLAY, mottled dark greenish gray (5G 4/1) with black (7.5YR N2/) 35 - 45% silt, trace very fine sand, 5 - 15% roots and plant matter, very stiff, moist | | | |
| 6 | 8-1 | 18 | | Color grades to primarily dark greenish gray, decrease in organic matter (5 - 7%) | | 0 | |
| 7-9 | | | SM | SILTY SAND, light yellowish brown (2.5Y 6/4), 55 - 65% fine-medium sand, 30 - 40% silt, minor clay, loose, very moist to wet | ▽ | | |
| 10-11 | 8-2 | 3 | CL | SILTY CLAY, dark gray (2.5 Y N4/), 15 - 25% silt, very soft, wet. At 11 feet, localized increase in sand content; 20 - 30% | | 0 | |
| 12-15 | | | ML | CLAYEY SILT, mottled dark grayish brown (2.5Y 4/2), dark yellowish brown (10YR 4/4) and light brownish gray (2.5Y 6/2), 20-30% clay, trace fine sand, 1 - 3% roots and rootholes, very stiff, moist | | | |
| 16 | 8-3 | 20 | | | | 0 | |
| 17-21 | | | | Bottom of boring = 16.5 feet | | | |

REVIEWED BY R.G./C.E.G.

EXCELTECH

# MONITORING WELL DETAIL

| | | | |
|---|---|---|---|
| **Project Number** | 1587-2G | **Boring/Well No.** | MW-8 |
| **Project Name** | Crown Metal Manufacturing | **Top of Casing Elev.** | 8.52 |
| **County** | Alameda | **Ground Surface Elev.** | 8.86 |
| **Well Permit No.** | 91169 | **Datum** | Mean Sea Level |




## EXPLORATORY BORING

**a.** **Total depth** 16.5 ft.

**b.** **Diameter** 8 in.

**Drilling method** Hollow Stem Auger

## WELL CONSTRUCTION

**c.** **Casing length** 16.5 ft.

**Material** Schedule 40 PVC

**d.** **Diameter** 2 in.

**e.** **Depth to top perforations** 6.5 ft.

**f.** **Perforated length** 10 ft.

**Perforated interval from** 16.5 **to** 6.5 ft.

**Perforation type** Machine Slot

**Perforation size** 0.01 in.

**g.** **Surface seal** 1 ft.

**Seal material** Concrete

**h.** **Backfill** 3.5 ft.

**Backfill material** Cement Grout

**i.** **Seal** 1 ft.

**Seal material** Bentonite

**j.** **Gravel pack** 11 ft.

**Pack material** 2/12 Monterey Type Sand

**k.** Traffic rated water tight vault box with locking PVC expansion cap

# APPENDIX B

# WELLHEAD SURVEY DATA

# RON ARCHER
CIVIL ENGINEER, INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(415) 462-9372


REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23721
EXP. 12/31/93
CIVIL
STATE OF CALIFORNIA

JULY 22, 1987
REVISED DECEMBER 20, 1989
*REVISED MAY 6, 1991

JOB NO. 1366

ELEVATIONS OF EXISTING MONITOR WELLS AT CROWN METAL MFG.-PACIFIC INTERNATIONAL STEEL CORPORATION, LOCATED AT 16525 WORTHLEY DRIVE, CITY OF SAN LORENZO, ALAMEDA COUNTY, CALIFORNIA.

FOR: EXCELTECH
PROJECT NO. 1587G

BENCHMARK:
A FOUND CHISLED "T" IN THE NORTHWEST CORNER OF THE NORTHERLY CONCRETE ABUTMENT. FIELD CONTROL LINE "N", ZONE 2, 14.3 FEET SOUTH OF THE CORNER OF A CHAIN LINK FENCE AND 75 FEET EAST OF THE CENTERLINE OF S.P.R.R. TRACKS. ELEVATION TAKEN AS 9.00 N.G.S. DATUM.

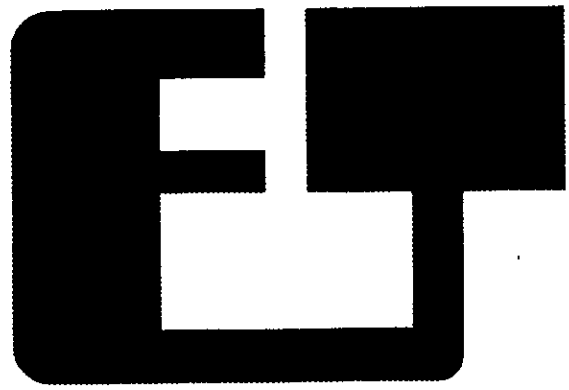
MONITOR WELL DATA TABLE

| WELL DESIGNATION | ELEVATION | DESCRIPTION |
|---|---|---|
| MW1 | 8.86 | TOP OF PVC CASING |
| | 9.40 | TOP OF BOX |
| MW2 | 9.17 | TOP OF PVC CASING |
| | 9.59 | TOP OF BOX |
| MW3 | 8.54 | TOP OF PVC CASING |
| | 9.05 | TOP OF BOX |
| MW4 | 8.48 | TOP OF PVC CASING |
| | 8.92 | TOP OF BOX |
| MW5 | ----- | TOP OF PVC CASING |
| | 9.6 | GROUND |
| MW6 | ----- | TOP OF PVC CASING |
| | 9.7 | GROUND |
| MW7 | 8.41 | TOP OF PVC CASING |
| | 8.90 | TOP OF BOX |
| * MW8 | 8.52 | TOP OF PVC CASING |
| | 8.86 | TOP OF BOX |
| RW-1 | 11.02 | TOP OF PVC CASING |

NOTE: UNABLE TO ACHIEVE EXACT ELEVATIONS ON MONITOR WELLS 5 AND 6. ELEVATIONS WERE TAKEN AT GROUND NEAR MONITOR WELLS.

# APPENDIX C

# GROUNDWATER SAMPLING PROTOCOL




# Groundwater Sampling Protocol

# GROUNDWATER SAMPLING PROTOCOL

Sampling of groundwater is performed by Exceltech, Inc. sampling technicians. Summarized field sampling procedures are as follows:

1. Proceed to first well with clean and decontaminated equipment.

2. Measurements of liquid surface(s) in the well, and total depth of monitoring well. Note presence of silt accumulation.

3. Field check for presence of floating product; measure apparent thickness.

4. Purge well prior to collecting samples; purge volume (casing volumes) calculated prior to removal.

5. Monitor groundwater for temperature, pH, and specific conductance during purging.

6. Collect samples using Environmental Protection Agency (EPA) approved sample collection devices, i.e., teflon or stainless steel bailers or pumps.

7. Transfer samples into laboratory-supplied EPA-approved containers.

8. Label samples and log onto chain-of-custody form.

9. Store samples in a chilled ice chest for shipment to a state-certified analytical laboratory.

10. Decontaminate equipment prior to sampling next well.

## Equipment Cleaning and Decontamination

All water samples are placed in precleaned laboratory-supplied bottles. Sample bottles and caps remain sealed until actual usage at the site. All equipment which comes in contact with the well or groundwater is thoroughly cleaned with a trisodium phosphate (TSP) solution and rinsed with deionized or distilled water before use at the site. This cleaning procedure is followed between each well sampled. Wells are sampled in approximate order of increasing contamination. If a teflon cord is used, the cord is cleaned. If a nylon or cotton cord is used, a new cord is used in each well. All equipment blanks are collected prior to sampling. The blanks are analyzed periodically to ensure proper cleaning procedures are used.

## Water Level Measurements

Depth to groundwater is measured in each well using a sealed sampling tape or scaled electric sounder prior to purging or sampling. If the well is known or suspected of containing free-phase petroleum hydrocarbons, an optical interface probe is used to measure the hydrocarbon thickness and groundwater level. Measurements are collected and recorded to the nearest 0.01 foot. Each monitoring well's total depth will be measured; this will allow a judgement of well siltation to be made.

## Bailer Sheen Check

If no measurable free-phase petroleum hydrocarbons are detected, a clear acrylic bailer is used to determine the presence of a sheen. Any observed film as well as odor and color of the water is recorded.

## Groundwater Sampling

Prior to groundwater sampling, each well is purged of "standing" groundwater. Either a bailer, hand pump, or submersible pump is used to purge the well. The amount of purging is dependent on the well yield. In a high yield formation, samples will be collected when normal field measurement, including temperature, pH, and specific conductance stabilize, provided a minimum of three well-casing volumes of water have been removed. Field measurements will be taken after purging each well volume. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ±10

umhos/cm and are calibrated daily. pH meters are read to the nearest ±0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 °F. Calibration of physical parameter meters will follow manufacturer's specifications. Collected field data during purging activities will be entered on the Well Sampling Field Data Sheet.

In low yield formations, the well is purged such that the "standing" water is removed and the well is allowed to recharge. (Normal field measurements will be periodically recorded during the purging process.) In situations where recovery to 80% of static water level is estimated, or observed to exceed a two hour duration, a sample will be collected when sufficient volume is available for a sample for each parameter. Attempts will be made so the well is not purged dry such that the recharge rate causes the formation water to cascade into the well.

In wells where free-phase hydrocarbons are detected, the free-phase portion will be bailed from the well and the estimated volume removed recorded. A groundwater sample will be collected if bailing reduces the amount of free-phase hydrocarbons to the point where they are not present in the well. Well sampling will be conducted using one of the aforementioned methods depending on the formation yield. However, if free-phase hydrocarbons persist throughout bailing, then a groundwater sample will not be collected.

Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

## Chain-of-Custody

Groundwater sample containers are labeled with a unique sample number, location, and date of collection. All samples are logged into a chain-of-custody form and placed in a chilled ice chest for shipment to a laboratory certified by the State of California Department of Health Services.

## Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by Exceltech for groundwater sampling and monitoring follow quality assurance/quality control (QA/QC) guidelines.

Quality assurance objectives have been established to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner. In this way, sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality control (QC) is maintained by site-specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. The goal is to provide data that are accurate, precise, complete, comparable, and representative. The definitions as developed by overseeing federal, state, and local agency guidance documents for accuracy, precision, completeness, comparability, and representativeness are:

- **Accuracy** — the degree of agreement of a measurement with an accepted reference or true value.

- **Precision** — a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

- **Completeness** — the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

- **Comparability** — express the confidence with which one data set can be compared to another.

- **Representativeness** — a sample or group of samples that reflect the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

- **Trip Blanks:** Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are **not** opened, and are returned from a project site with the project site samples for analysis.

- **Field Blank:** Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

- **Duplicates:** Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

- **Equipment Blank:** Periodic QC samples collected from field equipment rinseate to verify decontamination procedures.

The number and types of QC samples are determined and analyzed on a project-specific basis.

## Shallow Groundwater Survey

A shallow groundwater survey employs reconnaissance field sampling and chemical analysis for rapid plume mapping. Occasionally, a state-certified laboratory subcontractor may be used. The subcontractor would sample for analysis at locations marked by the Exceltech field geologist. The thin-diameter probes from which groundwater is collected are advanced to the water bearing stratum, sample is withdrawn to the surface, and analyzed immediately thereafter. Probe holes are backfilled with a grout slurry or as the local permitting agency requires. The vapor survey contractor will supply sampling, purging, and field chemical analysis to Exceltech in their report. Exceltech considers the vapor probe mapping (together with shallow groundwater sampling) to be a reconnaissance technique only.

# APPENDIX D

# LABORATORY RESULTS AND CHAIN-OF-CUSTODY DOCUMENTS

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | |
|---|---|---|---|
| Exceltech | Client Project ID: | #1587-2G, Crown Metal,PO#22829 | Sampled: Apr 5, 1991 |
| 41674 Christy Street | Sample Descript.: | Soil, composite, 8-1, 8-2, 8-3 | Received: Apr 5, 1991 |
| Fremont, CA 94538 | Analysis Method: | EPA 5030/8015/8020 | Analyzed: Apr 12, 1991 |
| Attention: Britt Von Thaden | Lab Number: | 104-0913 A-C | Reported: Apr 23, 1991 |

## TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION (EPA 8015/8020)

| Analyte | Detection Limit mg/kg (ppm) | Sample Results mg/kg (ppm) |
|---|---|---|
| Low to Medium Boiling Point Hydrocarbons | 1.0 | N.D. |
| Benzene | 0.0050 | N.D. |
| Toluene | 0.0050 | N.D. |
| Ethyl Benzene | 0.0050 | N.D. |
| Xylenes | 0.0050 | N.D. |

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


Exceltech
41674 Christy Street
Fremont, CA 94538
Attention: Britt Von Thaden

Client Project ID: #1587-2G, Crown Metal,PO#22829

Q C Sample Group: 104-0913

Reported: Apr 23, 1991

## QUALITY CONTROL DATA REPORT

| ANALYTE | Benzene | Toluene | Ethyl Benzene | Xylenes |
|---|---|---|---|---|
| Method: | EPA 8020 | EPA 8020 | EPA 8020 | EPA 8020 |
| Analyst: | L. Gonzales | L. Gonzales | L. Gonzales | L. Gonzales |
| Reporting Units: | ng | ng | ng | ng |
| Date Analyzed: | Apr 12, 1991 | Apr 12, 1991 | Apr 12, 1991 | Apr 12, 1991 |
| QC Sample #: | GBLK041291 | GBLK041291 | GBLK041291 | GBLK041291 |
| **Sample Conc.:** | N.D. | N.D. | N.D. | N.D. |
| **Spike Conc. Added:** | 100 | 100 | 100 | 300 |
| **Conc. Matrix Spike:** | 110 | 110 | 110 | 340 |
| **Matrix Spike % Recovery:** | 110 | 110 | 110 | 113 |
| **Conc. Matrix Spike Dup.:** | 100 | 100 | 100 | 300 |
| **Matrix Spike Duplicate % Recovery:** | 100 | 100 | 100 | 100 |
| **Relative % Difference:** | 9.5 | 9.5 | 9.5 | 13 |

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

| | | |
|---|---|---|
| % Recovery: | Conc. of M.S. - Conc. of Sample / Spike Conc. Added | x 100 |
| Relative % Difference: | Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2 | x 100 |

# CHAIN OF CUSTODY RECORD

10 DAY RUSH

| PROJECT NO. | PROJECT NAME |
|---|---|
| 1587-26 | CROWN METAL |

SAMPLERS (Signature) Britt Von Thaden

| NO. | DATE | TIME | SAMPLE DESCRIPTION | TPH6/BTEX |
|---|---|---|---|---|
| 8-1 | 4/5/91 | 8:32A | SOIL IN BRASS LINER | X |
| 8-2 | " | 8:42A | " " | X |
| 8-3 | ↓ | 8:55A | " " | X |

TEST REQUESTED

P.O. # 22829

LAB SEQUOIA

TURN AROUND TIME NORMAL

REMARKS

1040913

COMPOSITE 8-1 THROUGH 8-3

SEQUOIA

| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
|---|---|---|---|
| Britt Von Thaden ET | 4/5/91 | 1605 | |
| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
| | | | |

| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
|---|---|---|---|
| | | | |
| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
| | | | |

REMARKS:

REPORT TO: BRITT VON THADEN

EXCELTECH
41674 Christy Street
Fremont, C.A. 94538-3114
(415) 659-0404
Fax (415) 651-4677
Contr. Lic. No. 550205

FORM DATED 3-27-90

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | | |
|---|---|---|---|---|---|
| Exceltech | Client Project ID: | #1587-2G, Crown Metals, PO#23074 | Sampled: | May 1, 1991 |
| 41674 Christy Street | Matrix Descript: | Water | Received: | May 2, 1991 |
| Fremont, CA 94538 | Analysis Method: | EPA 5030/8015/8020 | Analyzed: | May 2, 1991 |
| Attention: Britt Von Thaden | First Sample #: | 105-0209 A-C | Reported: | May 8, 1991 |

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

| Sample Number | Sample Description | Low/Medium B.P. Hydrocarbons µg/L (ppb) | Benzene µg/L (ppb) | Toluene µg/L (ppb) | Ethyl Benzene µg/L (ppb) | Xylenes µg/L (ppb) |
|---|---|---|---|---|---|---|
| 1050209 A-C | RW1 - Influent | 160 | 40 | 0.79 | 14 | 6.1 |
| 1050210 A-C | BB1 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 1050211 A-C | MW8 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 1050212 A-C | MW2 | 220 | 1.5 | 0.42 | 0.53 | 0.54 |
| **Detection Limits:** | | **30** | **0.30** | **0.30** | **0.30** | **0.30** |

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


Exceltech
41674 Christy Street
Fremont, CA 94538
Attention: Britt Von Thaden

Client Project ID: #1587-2G, Crown Metals, PO#23074

Q C Sample Group: 1050209-12

Reported: May 8, 1991

## QUALITY CONTROL DATA REPORT

| ANALYTE | Benzene | Toluene | Ethyl Benzene | Xylenes |
|---|---|---|---|---|
| Method: | EPA 8020 | EPA 8020 | EPA 8020 | EPA 8020 |
| Analyst: | M. Nguyen | M. Nguyen | M. Nguyen | M. Nguyen |
| Reporting Units: | ng | ng | ng | ng |
| Date Analyzed: | May 2, 1991 | May 2, 1991 | May 2, 1991 | May 2, 1991 |
| QC Sample #: | GBLK050291 | GBLK050291 | GBLK050291 | GBLK050291 |
| **Sample Conc.:** | N.D. | N.D. | N.D. | N.D. |
| **Spike Conc. Added:** | 100 | 100 | 100 | 300 |
| **Conc. Matrix Spike:** | 101 | 102 | 102 | 306 |
| **Matrix Spike % Recovery:** | 101 | 102 | 102 | 102 |
| **Conc. Matrix Spike Dup.:** | 99 | 101 | 100 | 300 |
| **Matrix Spike Duplicate % Recovery:** | 99 | 101 | 100 | 100 |
| **Relative % Difference:** | 2.0 | 0.99 | 2.0 | 2.0 |

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

| | | |
|---|---|---|
| % Recovery: | Conc. of M.S. - Conc. of Sample / Spike Conc. Added | x 100 |
| Relative % Difference: | Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2 | x 100 |

# CHAIN OF CUSTODY RECORD

| PROJECT NO. | PROJECT NAME |
|---|---|
| 1587-26 | CROWN METALS |

SAMPLERS (Signature) Dennis Mentus

| NO. | DATE | TIME | SAMPLE DESCRIPTION | Total | TPHG BTEX |
|---|---|---|---|---|---|
| RW1 Effluent | 5-1-91 | 11:45 | Preg VOAs | (3) | X |
| BB1 | " | ~~11:35~~ 12:00 | Preg VOAs | (3) | X |
| MW8 | " | 12:30 | Preg VOAs | (3) | X |
| MW2 | " | 1:25 | Preg VOAs | (3) | X |

RW1 influent per B. von Thaden 5-2-91

TEST REQUESTED

P.O. # 23074

LAB Sequoia

TURN AROUND TIME Normal

REMARKS

1050209 A/C

10

11

12

| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
|---|---|---|---|
| Dennis Mentus | 5/1/91 | 2:37PM | Mark Edwards |
| Craig Lee | 5/2/91 | 944AM | |

| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
|---|---|---|---|
| Mark Edwards | 5/2/91 | 9:10AM | Craig Lee 5/2/91 910A |
| | | | |

REMARKS:

REPORT TO: BRITT VON THADEN

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