

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



R01052

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

StID 3604

December 21, 1998

Mr. Anthony Varni
Cosmas, Ltd., A California Corp.
14 Mirada Rd.
Half Moon Bay CA 94019

**Re: Fuel Leak Site Case Closure for Crown Metal Manufacturing and Pacific
International Steel at 16525 Worthley Dr., San Lorenzo CA 94580**

Dear Mr. Varni:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with Chapter 6.75 (Article 4, Section 25299.37[h]). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Alameda County Environmental Protection Division is required to use this case closure letter for all UST leak sites. We are also transmitting to you the enclosed case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site. The subject fuel leak case is closed.

SITE INVESTIGATION AND CLEANUP SUMMARY

Please be advised that the following conditions exist at the site:

- up to 900ppm TPH as gasoline and 1.0ppm benzene exists in soil beneath the site;
- up to 4.2ppb benzene exists in groundwater beneath the site; and,
- a site safety plan must be prepared for construction workers in the event of excavation/trenching is proposed in the vicinity of residual soil and groundwater contamination.

If you have any questions, please contact me at (510) 567-6876.

Amir K. Gholami, REHS
Hazardous Materials Specialist

enclosures: 1. Case Closure Letter 2. Case Closure Summary

c: Richard Panteges, chief of Division of Environmental Protection
Richard Earnest Crown Metal Manufacturing Co., 765 South Routh 83, Elmhurst IL
60126-4700
Files-AG

ALAMEDA COUNTY
HEALTH CARE SERVICES



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(510) 567-6700
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REMEDIAL ACTION COMPLETION CERTIFICATION

StID 3604 - 16525 Worthley Dr., San ^{Lorenzo} ~~Leandro~~ CA94580
(1-10K and 2-1K gallons tanks removed on 2/87?)

December 21, 1998

Mr. Anthony Varni
Cosmas, Ltd., A California Corp.
14 Mirada Rd.
Half Moon Bay CA 94019

Dear Mr. Varni:

This letter confirms the completion of site investigation and remedial action for the underground storage tank formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required.

This notice is issued pursuant to a regulation contained in Title 23, Section 2721(e) of the California Code of Regulations.

Please contact our office if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung, Director

cc: Richard Pantages, Chief of Division of Environmental Protection
Chuck Headlee, RWQCB
Dave Deaner, SWRCB
Richard Earnest Crown Metal Manufacturing Co., 765 South State Routh83, Elmhurst IL
60126-4700
Files-AG

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program
Page 1 of 5

01-0465

I. AGENCY INFORMATION

Agency name: **Alameda County-HazMat**
Date:City/State/Zip: **Alameda, CA 94502**
Responsible staff person: **Amy Leech**

Date: **December 9, 1996**
Address: **1131 Harbor Bay Pkwy**
Phone: **(510) 567-6700**
Title: **Hazardous Materials Spec.**

II. CASE INFORMATION

Site facility name: **Crown Metal Manufacturing and Pacific International Steel**
Site facility address: **16525 Worthley Dr., San Lorenzo CA 94580**
RB LUSTIS Case No: **N/A** Local Case No./LOP Case No.: **3604**
URF filing date: **09/11/87** SWEEPS No: **N/A**

Responsible Parties:

Attn: **Anthony Varni**
Cosmas, Ltd., A California Corp.

Address:

14 Mirada Rd.
Half Moon Bay CA 94019

Phone Numbers:

Attn: **Richard Ernest**
Crown Metal Manuf. Co., Inc.

765 South State Route 83
Elmhurst IL 60126-4700

(603)279-9800

Elise Varon

765 S Route 83
Elmhurst IL 60126

<u>Tank No:</u>	<u>Size in gal.:</u>	<u>Contents:</u>	<u>Closed in-place or removed?:</u>	<u>Date:</u>
1	10,000	gasoline	removed w/o permit	2/87 (?)
2	1,000	aviation fuel	"	"

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: **unknown**

Site characterization complete? **Yes**

Monitoring Wells installed? **Yes** Number: **9**

Proper screened interval? **Based on a review of the boring logs for wells MW1 - MW6, groundwater appears to be semi-confined at this site. Groundwater was first encountered ~14 feet bgs for MW1 - MW6. These wells were screened at or below 9.5 ft. bgs, and groundwater subsequently stabilized to ~7 to 8 ft. bgs.**

Highest GW depth below ground surface: **5.75 ft** Lowest depth: **8.95 ft (MW-2)**

Flow direction: **Predominately southerly, ranged from southwest, south and southeast.**

Most sensitive current use: **Commercial**

Are drinking water wells affected? **No** Aquifer name: **N/A**

Is surface water affected? **No** Nearest affected SW name: **N/A**

Off-site beneficial use impacts (addresses/locations): **none**

Report(s) on file? **YES** Where is report(s) filed?
Alameda County, 1131 Harbor Bay Pkwy, Alameda, CA 94502

ENVIRONMENTAL PROTECTION
97MAR-7 PM 3:48

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program
Page 2 of 5

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Treatment and Disposal of Affected Material:

<u>Material</u>	<u>Amount</u> (include units)	<u>Action (Treatment or Disposal w/destination)</u>	<u>Date</u>
Soil	42.9 tons	Altamont Landfill, Livermore CA	08/2/96

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	Before ¹	After ²	Before ³	After ⁴
TPH (Gasoline)	13	900	16,000	ND
Benzene	0.14	1.0	3,900	4.2
Toluene	0.17	1.5	11	ND
Ethylbenzene	NT	17	600	0.73
Xylene	1.4	33	40	ND
MTBE	NT	NT	NT	ND
1,2-DCA	ND	NT	36	NT
Heavy metals (Ar, Cd, Cr, Pb)	see below	NT	see below	NT

ND=non-detect

NT=not tested

- 1 "Before" soil sample collected from boring E-3 (MW-3) @ 10 ft. bgs. Background levels of metals identified in all samples.
- 2 "After" soil samples collected from confirmatory samples (S-1 or S-2A) after overexcavation of the tank pit in 7/96.
- 3 "Before" water sample represents max. conc. detected in monitoring well MW-3 between July 1987 and Nov. 1989 (prior to overex. and gw extraction activities). ≤ 0.15 ppm Cd detected in all wells and 0.036 ppm Cr detected in MW-6.
- 4 "After" water sample collected from monitoring well RW-1 in April 1996.

Comments (Depth of Remediation, etc.): See "Additional Comments" section.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan?

Undetermined

Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan?

Undetermined

Does corrective action protect public health for current land use? **Yes**

Site management requirements: **If a change in land use is proposed or excavation of soils is planned at this site, then an evaluation of risk from exposure to contaminated soil and groundwater must be made.**

Should corrective action be reviewed if land use changes? **YES**

Monitoring wells Decommissioned: **Pending case closure approval.**

Number Decommissioned: **1 (MW-3)** Number Retained: **8 (MW1, MW2, MW4, MW5-MW8, RW1)**


List enforcement actions taken: **n/a**

List enforcement actions rescinded: **n/a**

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program
Page 3 of 5

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Amy Leech

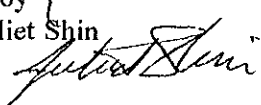
Signature: 

Title: Hazardous Materials Specialist

Date: 2/18/97

Reviewed by


Name: Juliet Shin

Signature: 

Title: Sr., Hazardous Materials Specialist

Date: 1/8/97

Name: Thomas Peacock

Signature: 

Title: Supervising, Hazardous Materials Spec.

Date: 2-14-97


VI. RWQCB NOTIFICATION

Date Submitted to RB: 02/18/97

RWQCB Staff Name: Kevin Graves, P.E.

Title: Assoc. Water Resources Control Engineer

RB Response: 

Signature: 

Date: 3-3-97

VII. ADDITIONAL COMMENTS

An aircraft engine maintenance facility which overhauled DC-3 engines reportedly operated at 16525 Worthley Drive in San Lorenzo, CA sometime prior to August 1987. (See attachment 1 for site location.) There are no records on file with Alameda County regarding the permitting or removal of underground storage tanks (USTs) at this site. However, an August 12, 1987 phase II environmental investigation report indicates that a subsurface motor fuel (unleaded) gasoline storage tank had leaked near the southern corner of the property. In addition, a correspondence from Exceltech, the consultant representing Mr. Richard Ernest, indicated that two USTs, one 10,000-gallon gasoline UST and one 1,000-gallon aviation fuel UST, were removed from the property in February 1987; the exact date the USTs were removed is not known; sampling was not performed at the time of removal; and the tanks were removed without manifests. The USTs were reportedly located approximately 180 feet directly west of a concrete slab which is the remains of a building used as the engine run-up area. (See attachment 2 for site layout.)

On June 24, 1987, six exploratory borings (E-1 through E-6) were installed at the site to assess the extent of soil and groundwater contamination at this site. These borings were converted into groundwater monitoring wells. Contrary to entries made in the boring logs for E-1 through E-6, groundwater was reportedly first encountered during drilling operations between 8- and 13-feet below ground surface (bgs). Site hydrogeology reportedly indicates an unconfined aquifer consisting of primarily clay with minor inter-bedding of sand and silt. Motor fuel contamination was identified from soil and groundwater samples collected from monitoring wells MW-2 and MW-3, the wells closest to the former UST pit; 36 ppb 1,2-DCA was detected in the groundwater sample collected from MW-3. (See attachment 3 for soil results and attachment 4 for boring logs.)

A soil gas survey was reportedly completed in April 1988 to further delineate the extent of soil contamination at the site which was followed by a soil sampling investigation to confirm the results of the previous investigation. In November 1988, overexcavation of contaminated soil was reportedly completed adjacent to monitoring well MW-3. The final dimensions of the excavated pit were reported to be 40 by 60 by 10 feet, and was subsequently back-filled with excavated soil after soil had aerated and analytical results indicated petroleum hydrocarbons were at non-detectable levels. It appears that no confirmatory soil samples were collected at the perimeter of the excavated pit to define the extent of contamination. MW-3 was apparently damaged and subsequently abandoned during this investigation. In September 1989, a shallow groundwater investigation was completed in the west side of the site to further assess the lateral extent of petroleum hydrocarbons. (See attachment 5 for sample locations and results.) Up to 1,600 ppb TPH-G and 56 ppb benzene were identified in boring WS-2, located at the northwest corner of the site. No records of the above-mentioned investigations, except for a map with sample results, are on file with Alameda County.

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program
Page 4 of 5

VII. ADDITIONAL COMMENTS (cont'd)

On November 28, 1989, monitoring well MW-7 and recovery well RW-1 were installed at the site. Well RW-1 was installed within the vicinity of the former tank pit. A soil sample was collected at approximately 5 feet bgs; 3.2 ppm TPH-G and non-detect BTEX levels were identified in the soil sample and 1,300 ppb and 150 ppb benzene were identified in groundwater collected from RW-1. Analytical results indicated no detectable levels of TPH-G and BTEX in soil or groundwater in samples collected from monitoring well MW-7. (See attachment 4 for boring logs.)

In January 1991, a groundwater extraction and treatment system was put into operation at recovery well RW-1. In September 1992, pump tests were conducted on recovery well RW-1. The capture zone downgradient of well RW-1 was determined to be 22 feet and the width of the steady state capture zone was measured to be 70 feet. The groundwater extraction and treatment system was reportedly shut-down at the end of 1993 due to low yield (0.1 gpm) and a limited radius of influence.

On April 5, 1991, monitoring well MW-8 was installed downgradient from MW-2. Three soil samples were collected from boring MW-8 and composited prior to laboratory analyses; TPH-G and BTEX were not detected in this sample. The initial groundwater sample collected from monitoring well MW-8 was non-detect for TPH-G and BTEX. (See attachment 4 for boring logs.)

In September 1992, "grab" water samples were collected from Bockman Canal which is located approximately 32 feet downgradient from the southern edge of the property line. Both the downstream and upstream water samples collected from Bockman Canal were non-detect for TPH-G and BTEX.

Groundwater was sampled and analyzed from some or all of the eight monitoring wells (MW-1 through MW-8) and one recovery well (RW-1) at this site from July 1987 through April 1996. TPH-G and BTEX were consistently detected in MW-2, MW-3, and RW-1; low levels of BTEX constituents were detected from samples collected from MW-8 during the last sampling event in April 1996. The highest concentrations of TPH-G and BTEX (up to 16,000 ppb TPH-G and 3,900 ppb benzene) in groundwater were historically detected in monitoring well MW-3 up until this well was destroyed during overexcavation of impacted soil in this area. TPH-G and benzene concentrations identified in groundwater samples collected from MW-2 and RW-1 have historically fluctuated and have not exceeded 130 ppb and 25 ppb, respectively, during the past three years. (See attachment 6 for historical groundwater results.)

In order to verify the extent of soil contamination left in place in the vicinity of the former UST pit and the extent of groundwater impact downgradient of the former tank pit and monitoring well MW-2, two borings (HP-1 and HP-2) were installed downgradient from MW-2 and north of the Bockman Canal. Soil samples were collected at 5 and 7.5 feet depths (just above groundwater). Up to 990 ppm TPH-G and 2.8 ppm benzene were detected in the 7.5 ft. soil sample collected from boring HP-1; 67 ppb TPH-G and 2.3 ppb benzene were detected in groundwater collected from boring HP-1. TPH-G and BTEX were not detected in soil or groundwater samples collected from boring HP-2. (See attachment 7 for boring locations and results.)

In July 1996, contaminated soil was excavated and removed in two stages in the vicinity of boring HP-1. Up to 880 ppm TPH-G and 1.0/1.5/17/33 ppm BTEX, respectively, were detected (sample SP-1 @ 8ft. bgs) in the confirmatory soil samples collected at the limits of the excavation. (See attachment 8 for excavation limits, sample locations and results.)

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program
Page 5 of 5

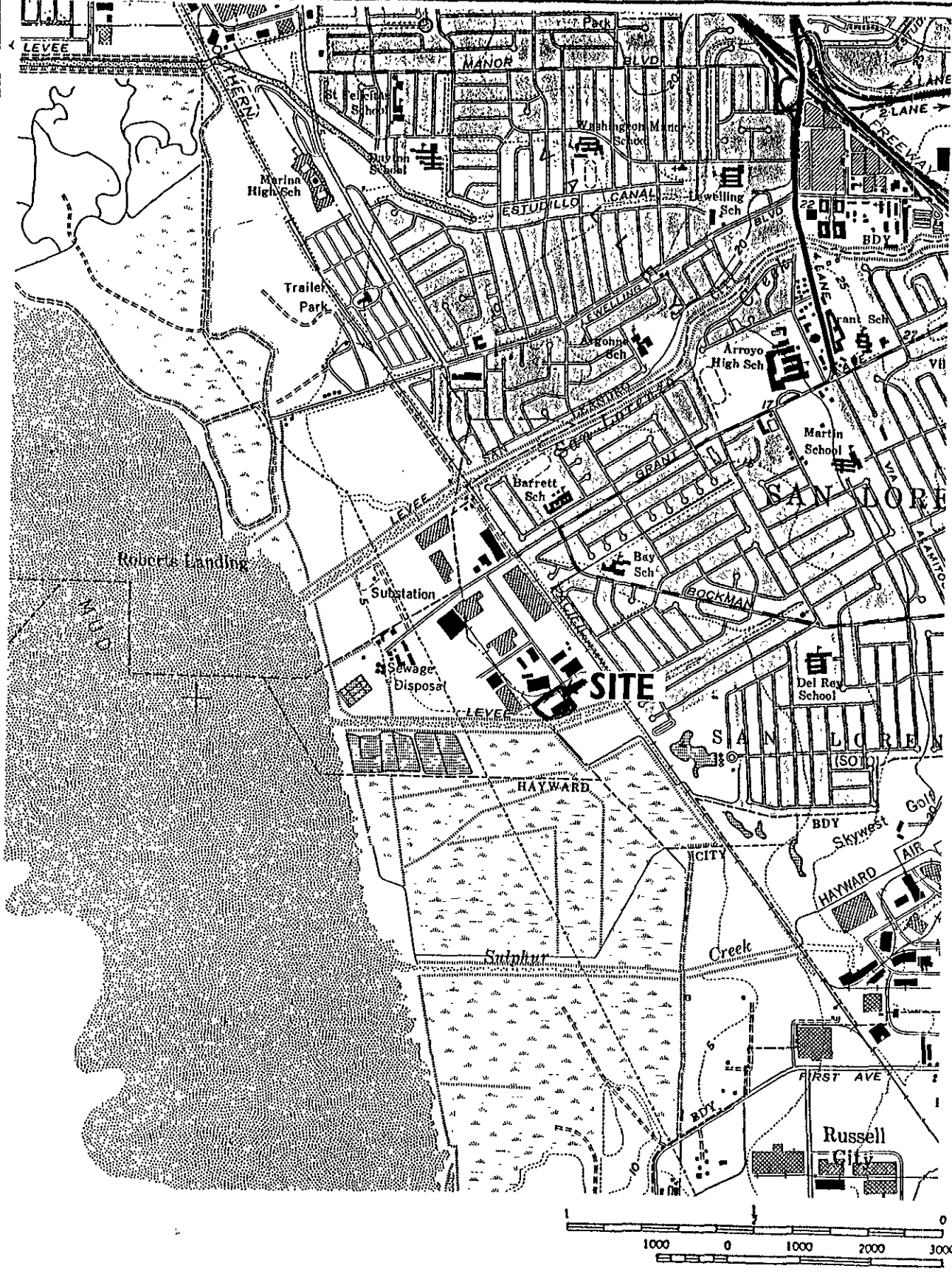
VII. ADDITIONAL COMMENTS (cont'd)

No further investigations are recommended since this site appears to meet the San Francisco RWQCB's definition of a low risk groundwater case:

1. The source of contamination was abated by removal of the UST and overexcavation of contaminated soil in the vicinity of the abandoned UST pit.
2. The extent of impact to soil and groundwater has been evaluated at this site by analysis of multiple soil and groundwater samples collected within and in the vicinity of the UST pit.
3. Analytical groundwater data collected over 9 years has shown that the dissolved hydrocarbon plume is not significantly migrating.
4. The residual contamination left in soil and groundwater at this site is not expected to significantly impact water wells, deeper drinking water aquifers, surface water, or other sensitive receptors. Shallow groundwater at this site is not used for municipal or domestic purposes. Total dissolved solids were measured at $\geq 14,000$ ppm in groundwater samples collected from wells RW-1, MW-2 and MW-8. A well survey completed in 1987 reported there were no drinking water wells within a 1/2 mile radius of the site. Bockman Canal is located approximately 30 feet downgradient from the vicinity of the abandoned tank pit; however, TPH-G and BTEX have not been identified in "grab" samples collected from the canal and boring HP-2 (located approximately 15 feet north/upgradient of the canal).
5. No significant risk to human health was found for outdoor inhalation for commercial exposure scenarios to benzene from soil or groundwater contamination using the ASTM E1739-95 Tier 1 RBSL Look-up Table for a 1×10^{-5} excess cancer risk. There are currently no buildings or structures over the soil and groundwater contaminant plume; the closest buildings are located approximately 30 feet east from the abandoned UST pit.
6. Based on analytical results discussed in item number four above, it does not appear that sensitive ecological receptors are currently impacted by the petroleum hydrocarbon release from this site; therefore, an environmental risk analysis was not performed.

A risk management strategy should be developed to:

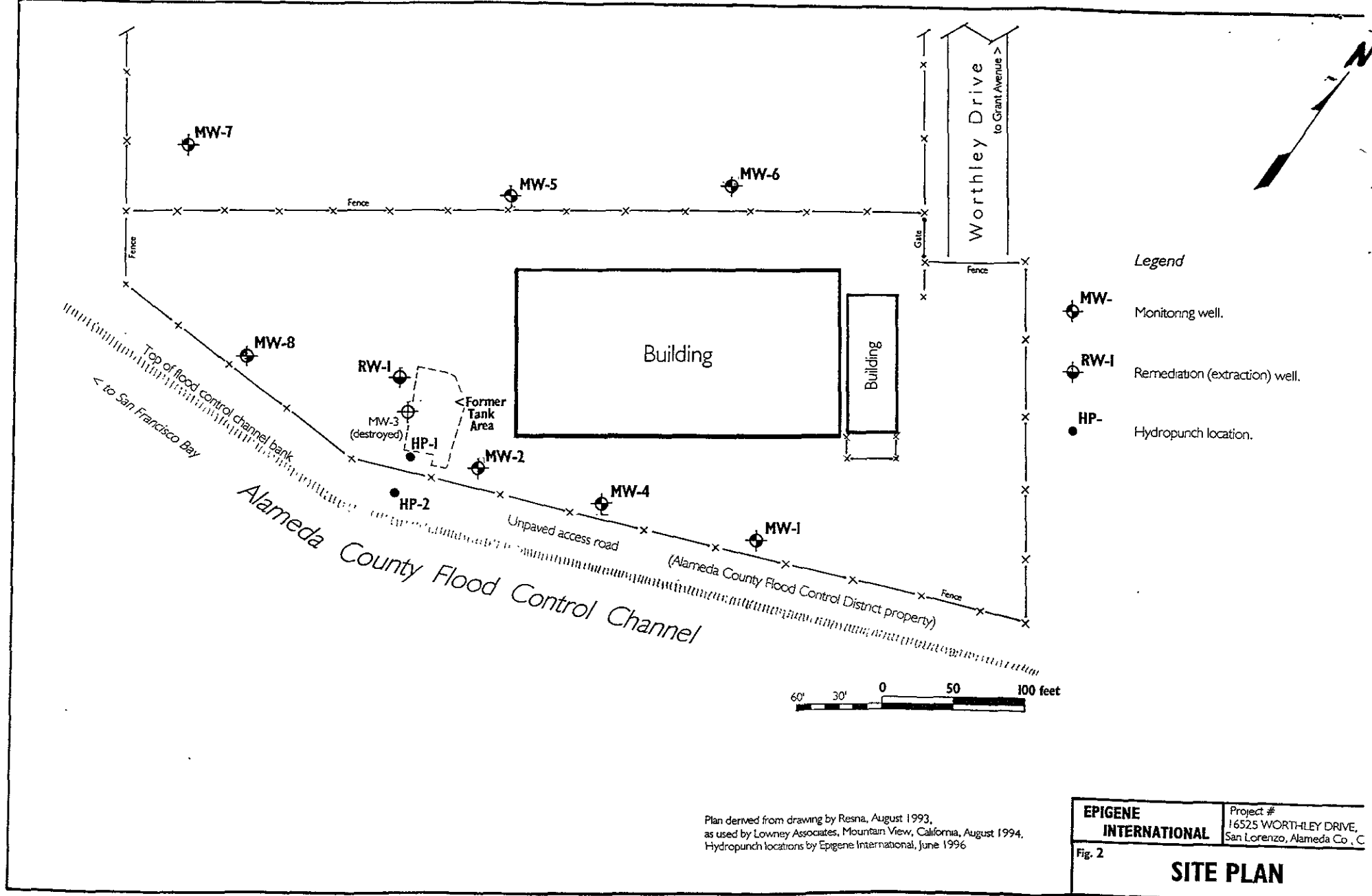
- If appropriate, mitigate any potential negative impacts posed by the residual contamination remaining on site (e.g., install vapor barriers beneath new building construction).
- Develop a strategy to address any risk posed to the construction or utility worker exposure during earth moving activities in the vicinity of the former tank pit.
- Take precautions to avoid making vertical or lateral conduits that may cause cross contamination between the shallow and deeper aquifers.



Base map from USGS 7 1/2 minute series
San Leandro quadrangle, 1980.

EPIGENE INTERNATIONAL Project #96-150
16525 WORTHLEY DRIVE,
San Lorenzo, Alameda Co., CA.

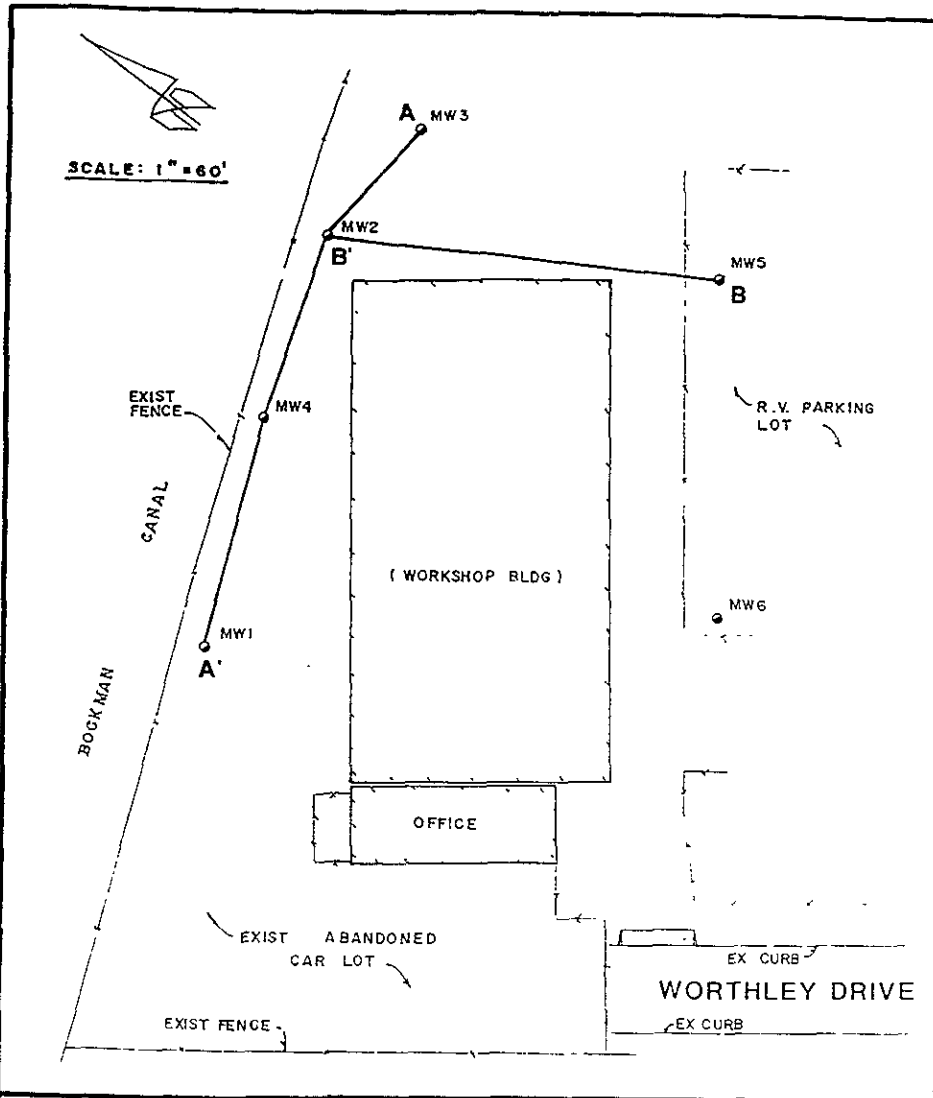
Fig. 1
SITE LOCATION MAP



Plan derived from drawing by Resna, August 1993,
 as used by Lowney Associates, Mountain View, California, August 1994.
 Hydropunch locations by Epigene International, June 1996

EPIGENE INTERNATIONAL	Project #
	16525 WORTHLEY DRIVE, San Lorenzo, Alameda Co., C
Fig. 2	SITE PLAN

2



SOIL ANALYSIS RESULTS

Sample	Depth (ft)	TVH* (ppb)	Benzene (ppb)	Toluene (ppb)	Xylene (ppb)
E-1	10	7500	ND	ND	1300
	15	28000	ND	ND	3600
E-2	10	8400	ND	ND	2200
	15	10000	340	470	1500
E-3	10	13000	140	170	1400
	15	4100	150	170	310
E-4	10	6600	ND	ND	230
	15	ND	ND	ND	ND
E-5	10	1300	ND	ND	ND
	15	2400	ND	ND	240
E-6	10	4900	ND	ND	560
	15	ND	ND	ND	ND

ND - NONE DETECTED
*TVH = TOTAL VOLATILE HYDROCARBONS

Water samples collected from all the monitoring wells were analyzed for dissolved concentrations of volatile hydrocarbons, BTX compounds, following modifications of EPA Methods 8015 and 8020. The results of the laboratory analyses are presented in the table below in the microgram per liter (ug/l) or parts per billion range.



CROSS SECTION POSITION MAP

CROWN METAL MFG-PACIFIC INTL' STEEL

JOB # 1587

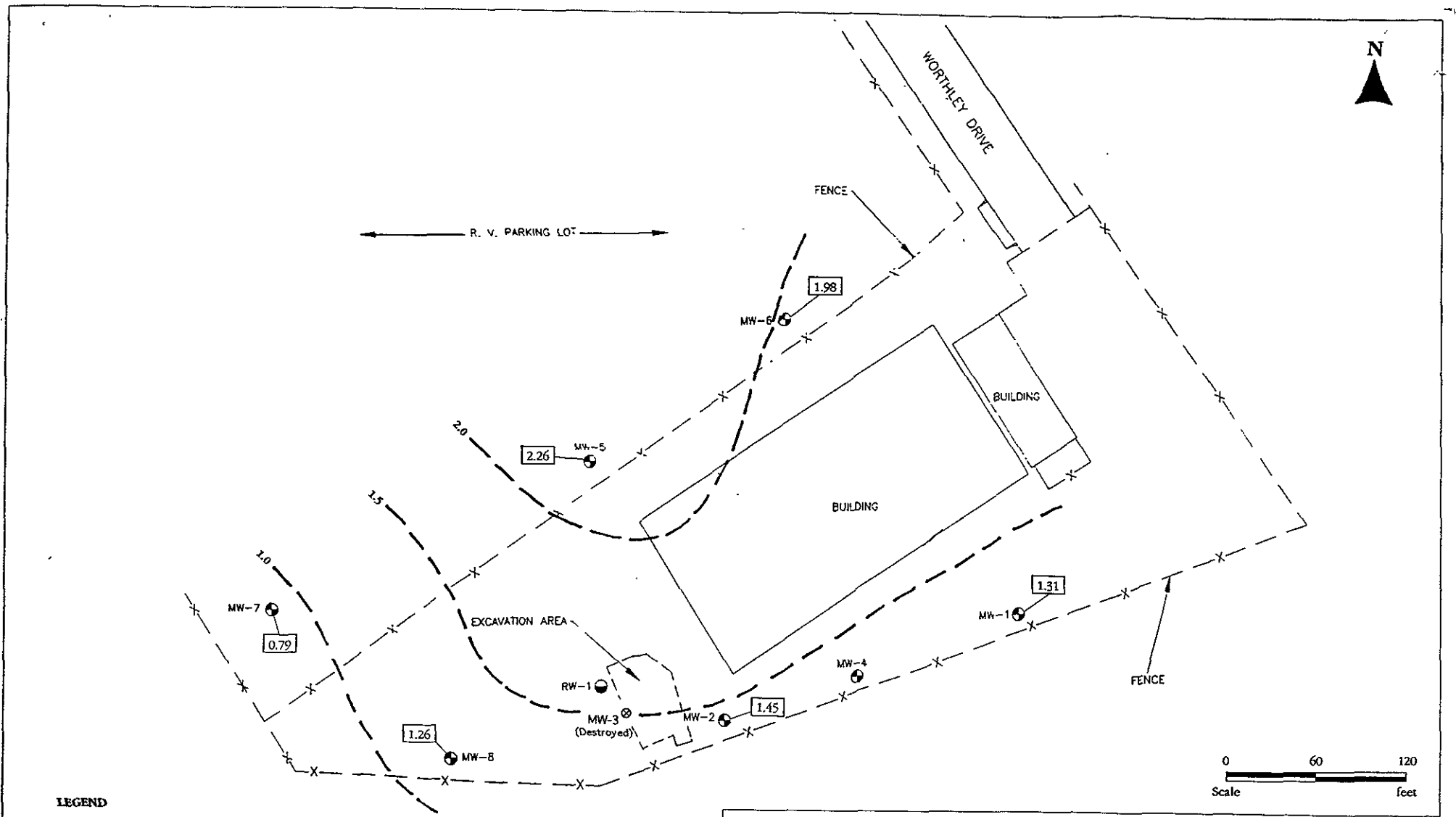
16525 WORTHLEY DRIVE

SCALE 1"=60' DRAWN BY RA/MH

SAN LORENZO, CALIFORNIA

DATE 3/3/87 DRAWING # 1

3



LEGEND

- ⊕ - Approximate location of ground water monitoring well by Resna (1993)
- ⊙ - Approximate location of ground water recovery well by Resna (1993)
- 2.26 - Ground water elevations
- - - Ground water contour

Base by Resna, dated 8/93.

SITE PLAN/GROUND WATER ELEVATIONS

WORTHLEY DRIVE PARCEL
San Lorenzo, California

LOWNEY ASSOCIATES
Environmental / Geotechnical / Engineering Services

FIGURE 2
719-3A

4

EXPLORATORY BORING LOG

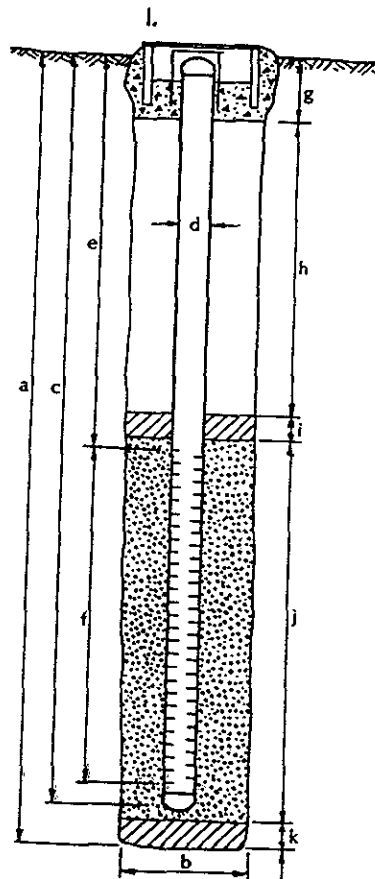
LOGGED BY: MDH

DEPTH (ft.)	SAMPLE NO.	BLOWS/FOOT 360 ft-lb.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	OVA READING ppm
1					Hard packed road surface		
2							
3							
4							
5	1-01			ML	SILT, medium plasticity, low dry strength, slow dilatancy, low toughness, dark brown, no product odor, moist		
6							
7							
8							
9							
10	1-02			CL	CLAY, medium plasticity, low dry strength, slow dilatancy, medium toughness, tannish grey, no product odor, moist		
11							
12							
13							
14	1-03			CL	CLAY, w/15% fine subrounded sand, low plasticity, low dry strength, slow dilatancy, medium toughness, tannish brown, no product odor, wet		
15							
16							
17							
18							
19							
20	1-04			CL	CLAY, w/15% fine subangular sand, low plasticity, medium dry strength, slow dilatancy, medium toughness, brown, no product odor, wet		
21							
22							
23							
24							
25	1-05			ML	SILT, low plasticity, low dry strength, no dilatancy, low toughness, tannish brown, no product odor, moist		
26							
					TD 26.5'		

Monitoring Well Detail

6/24/87

PROJECT NUMBER 1587
 PROJECT NAME Crown Metal Mfg.
 COUNTY Alameda
 WELL PERMIT NO. 87150
 BORING / WELL NO. MW-1
 TOP OF CASING ELEV. 8.86
 GROUND SURFACE ELEV. 9.40
 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 26.5 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 15 ft.
 f. Perforated length 10 ft.
 Perforated interval from 15 to 25 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 11 ft.
 Backfill material Cement/Bentonite Slurry
 i. Seal 1 ft.
 Seal material Valclay 1/2" pellets
 j. Gravel pack 12 ft.
 Pack material #2 Sand
 k. Bottom seal ft.
 Seal material None
 l. ft.



PROJECT NAME: Crown Metal Mfg.

BORING #: 2

PROJECT #: 1587G

DATE DRILLED: 6/24/87

EXCELTECH

EXPLORATORY BORING LOG

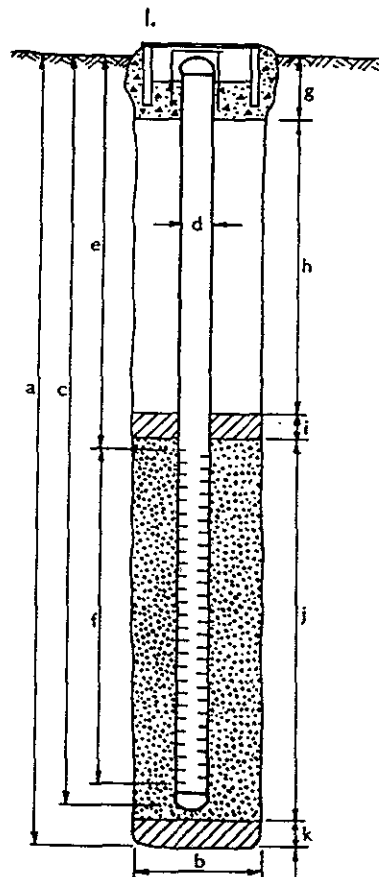
LOGGED BY: MDH

DEPTH (ft.)	SAMPLE NO.	BLOWS/FOOT 360 ft-lbs.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	OVA READING ppm
1					Hard-packed road surface, product odor		
2							
3							
4							
5	2-01	3		CL	CLAY, medium plasticity, high dry strength, no dilatancy, medium toughness, dark grey, no product odor, moist, fill material		
6							
7							
8							
9							
10	2-02	4		CL	CLAY, medium plasticity, high dry strength, no dilatancy, medium toughness, light grey with brown streaks, no product odor, moist		
11							
12							
13							
14							
15	2-03	12	▽	CL	CLAY w/10% fine to coarse subrounded sand, medium plasticity, high dry strength, no dilatancy, medium toughness, brownish dark grey, no product odor, wet		
16							
17							
18							
19							
20	2-04	4		ML	SILT, medium plasticity, medium dry strength, slow dilatancy, low toughness, brown, no product odor, moist		
21							
22							
23							
24							
25	2-05	7					
26							
					TD 26.5'		

Monitoring Well Detail

6/24/87

PROJECT NUMBER 1587 BORING / WELL NO. MW-2
 PROJECT NAME Crown Metal Mfg. TOP OF CASING ELEV. 9.17
 COUNTY Alameda GROUND SURFACE ELEV. 9.59
 WELL PERMIT NO. 87150 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 27 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25.5 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 9.5 ft.
 f. Perforated length 16 ft.
 Perforated interval from 9.5 to 25.5 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 4 ft.
 Backfill material Bentonite Slurry
 i. Seal 2 ft.
 Seal material Voiclay Pellets 1/2"
 j. Gravel pack 17.5 ft.
 Pack material #2 Sand
 k. Bottom seal ft.
 Seal material
 l.

EXCELTECH



PROJECT NAME: Crown Metal Mfg.

PROJECT #: 1587G

BORING #: 5

DATE DRILLED: 6/25/87

LOGGED BY: MDH

EXPLORATORY BORING LOG

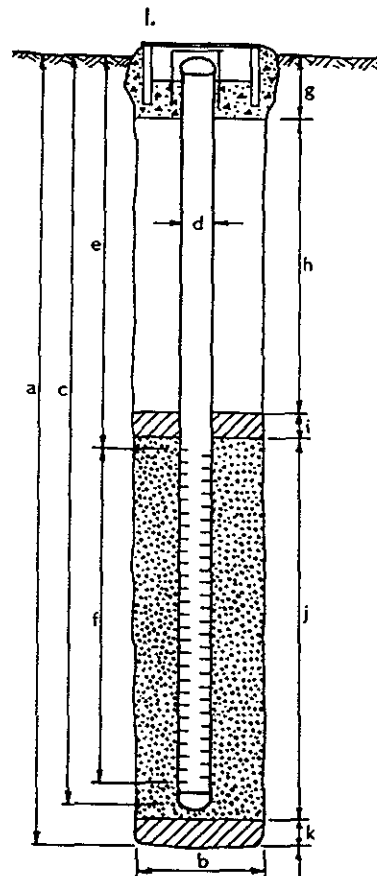
DEPTH (ft.)	SAMPLE No.	BLOWS/FOOT 350 lb.-lb.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	NOVA PERFORATIONS PPH
1					Surfaced discolored, steam cleaning area		
2							
3							
4							
5	3-01	3		CL	CLAY w/15% fine to coarse subrounded sand, medium plasticity, medium dry strength, no dilatancy, medium toughness, tannish grey, no product odor, moist		
6							
7							
8							
9							
10	3-02	8		CL	CLAY, medium plasticity, medium dry strength, no dilatancy, medium toughness, tannish grey, no product odor, moist		
11							
12							
13							
14							
15	3-03	15		SC	CLAYEY SAND, 50% fine to coarse, subrounded sand, 30% fine subrounded sand, medium plasticity, medium dry strength, slow dilatancy, low toughness, brownish grey, no product odor, wet		
16							
17							
18							
19							
20	3-04	4		ML	SILT, medium plasticity, medium dry strength, no dilatancy, medium toughness, brown, no product odor, moist		
21							
22							
23							
24							
25	3-05	11					
26							
					TD 26.5'		

Monitoring Well Detail

6/25/87

PROJECT NUMBER 1587
 PROJECT NAME Crown Metal Mfg.
 COUNTY Alameda
 WELL PERMIT NO. 87150

BORING / WELL NO. MW-3
 TOP OF CASING ELEV. 8.54
 GROUND SURFACE ELEV. 9.05
 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 26.5 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 15 ft.
 f. Perforated length 10 ft.
 Perforated interval from 10 to 25 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 4 ft.
 Backfill material Bentonite Slurry
 i. Seal 2 ft.
 Seal material Volclay pellet 1/2"
 j. Gravel pack 17 ft.
 Pack material #2 Sand
 k. Bottom seal ft.
 Seal material
 l.

EXCELTECH



PROJECT NAME: Crown Metal Mfg.

BORING #: 4

PROJECT #: 1587G

DATE DRILLED: 6/25/87

EXPLORATORY BORING LOG

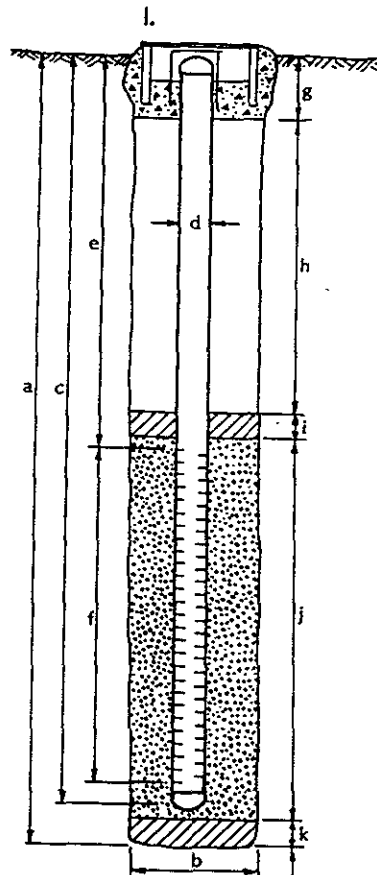
LOGGED BY: MDH

DEPTH (ft.)	SAMPLE NO.	BLOWS/FOOT 350 ft.-lbs.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	OVA READING ppm
1					Hard packed road surface		
2							
3							
4	4-01	3		CL	CLAY, medium plasticity, high dry strength, no dilatancy, medium toughness, dark grey, no product odor, moist		
5							
6							
7							
8							
9							
10	4-02	5		CL	CLAY, medium plasticity, high dry strength, no dilatancy, medium toughness, medium grey, no product odor, moist		
11							
12							
13							
14							
15	4-03	10		CL	CLAY w/10% fine to coarse subrounded sand, medium plasticity, high dry strength, no dilatancy, medium toughness, tannish brown, no product odor, wet		
16							
17							
18							
19							
20	4-04	9		CL	CLAY w/5% medium subrounded sand, medium plasticity, high dry strength, no dilatancy, medium toughness, medium grey, no product odor, moist		
21							
22							
23							
24	4-05	9		ML	SILT, medium plasticity, medium dry strength, slow dilatancy, low toughness, grey no product odor, moist		
25							
26							
					TD 26.5'		

Monitoring Well Detail

6/25/87

PROJECT NUMBER 1587 BORING / WELL NO. MW-4
 PROJECT NAME Crown Metal Mfg. TOP OF CASING ELEV. 8.48
 COUNTY Alameda GROUND SURFACE ELEV. 8.92
 WELL PERMIT NO. 87150 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 26.5 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 15 ft.
 f. Perforated length 10 ft.
 Perforated interval from 15 to 25 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 6.5 ft.
 Backfill material Bentonite slurry
 i. Seal 4 ft.
 Seal material Volclay pellets 1/2"
 j. Gravel pack 12.5 ft.
 Pack material #2 Sand
 k. Bottom seal ft.
 Seal material
 l.

EXCELTECH



PROJECT NAME: Crown Metal Mfg.

BORING #: 5

PROJECT #: 1587

DATE DRILLED: 6/24/87

EXCELTECH

EXPLORATORY BORING LOG

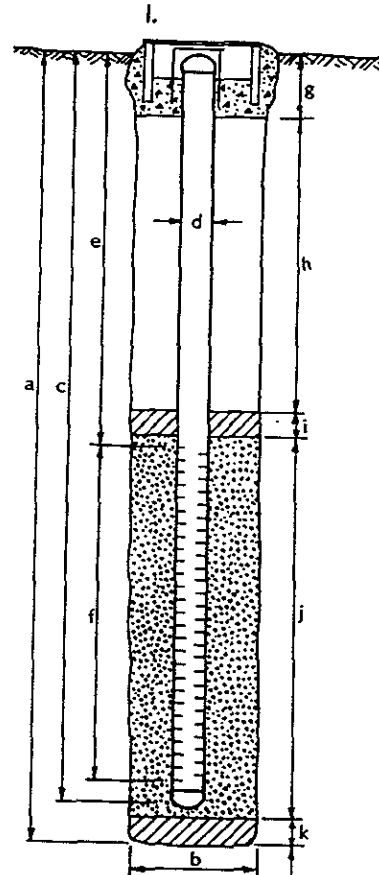
LOGGED BY: MDH

DEPTH (ft.)	SAMPLE NO.	BLOWS/FOOT 350 lb.-lbs.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	TOVA READING ppm
1					Hard packed road surface		
2							
3							
4							
5	5-01	3		CL	CLAY, medium plasticity, low dry strength, no dilatancy, low toughness, brown, no product odor, dry		
6							
7							
8							
9							
10	5-02	8		CL	CLAY w/10% fine to coarse subrounded sand, medium plasticity, low dry strength, low dilatancy, medium toughness, tannish brown, no product odor, moist		
11							
12							
13							
14							
15	5-03	12		CL	CLAY w/20% medium to coarse subrounded sand, medium plasticity, low dry strength, low dilatancy, medium toughness, tan brown, no product odor, moist		
16							
17							
18							
19							
20	5-04	6		SP	POOR GRADED SAND, medium subangular sand, low plasticity, low dry strength, high dilatancy, low toughness, light brown, no product odor, wet		
21							
22							
23							
24							
25	5-05	15		CL	LEAN CLAY w/5% medium subrounded sand, medium plasticity, high dry strength, no dilatancy, medium toughness, grey, no product odor, moist		
26							
					TD 26.5'		

Monitoring Well Detail

6/24/87

PROJECT NUMBER 1587 BORING / WELL NO. MW-5
 PROJECT NAME Crown Metal Mfg. TOP OF CASING ELEV. 9.11
 COUNTY Alameda GROUND SURFACE ELEV. 9.6
 WELL PERMIT NO. 87150 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 26.5 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 10 ft.
 f. Perforated length 15 ft.
 Perforated interval from 10 to 25 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 5 ft.
 Backfill material Bentonite slurry
 i. Seal 1 ft.
 Seal material Volclay pellets 1/2"
 j. Gravel pack 17.5 ft.
 Pack material #2 Sand
 k. Bottom seal ft.
 Seal material

EXCELTECH

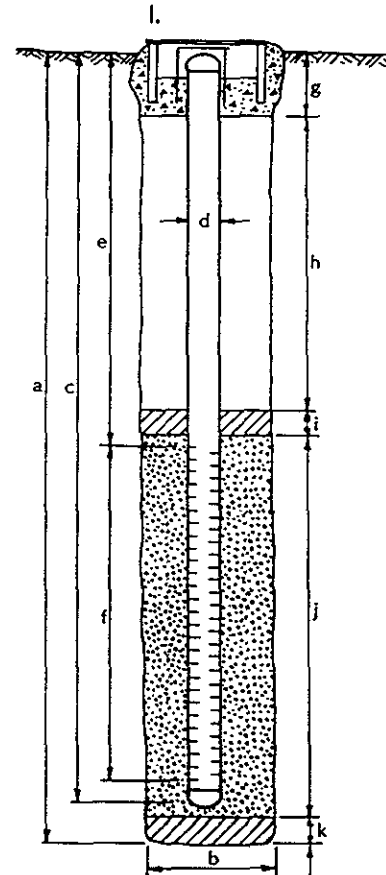
EXPLORATORY BORING LOG

DEPTH (ft.)	SAMPLE No. & BLOWS/FOOT 350 lb-ft.	WATER LEVEL	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	PRODUCT ODOR	LOA READING ppm
1-5				Hard packed road surface		
5-9	6-01 3		CL	CLAY w/15% fine to coarse sand, medium plasticity, medium dry strength, no dilatancy, medium toughness tannish grey, no product odor, moist		
9-14	6-02 4					
14-18	6-03 14		CL	LEAN CLAY, medium plasticity, medium dry strength, no dilatancy, medium toughness, tannish grey, no product odor, moist		
18-25	6-04 9		SC	CLAYEY SAND, 40% fine to coarse subrounded sand, 40% fine subrounded sand, medium plasticity, medium dry strength, slow dilatancy, low toughness, brownish grey, no product odor, wet		
25-26	6-05 17		CL	LEAN CLAY w/5% medium subrounded sand, medium plasticity, high dry strength, no dilatancy, medium toughness, grey, no product odor, moist		
				TD 26.5'		

Monitoring Well Detail

6/26/87

PROJECT NUMBER 1587 BORING / WELL NO. MW-6
 PROJECT NAME Crown Metal Mfg. TOP OF CASING ELEV. 9.19
 COUNTY Alameda GROUND SURFACE ELEV. 9.70
 WELL PERMIT NO. 87150 DATUM N.G.S.



EXPLORATORY BORING

a. Total depth 26.5 ft.
 b. Diameter 8 in.
 Drilling method Auger

WELL CONSTRUCTION

c. Casing length 25 ft.
 Material PVC Sch 40
 d. Diameter 2 in.
 e. Depth to top perforations 10 ft.
 f. Perforated length 15 ft.
 Perforated interval from 15 to 25 ft.
 Perforation type Slotted
 Perforation size .01
 g. Surface seal 2 ft.
 Seal material Neat Cement
 h. Backfill 10.5 ft.
 Backfill material Bentonite slurry
 i. Seal 2 ft.
 Seal material Volclay pellets 1/2"
 j. Gravel pack 12 ft.
 Pack material #2 Sand
 k. Bottom seal _____ ft.
 Seal material _____
 l. _____



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services, inc.

EXPLORATORY BORING LOG

PROJECT NAME: Crown Metal Manufacturing
(Pacific International Steel)
San Lorenzo, California

BORING NO. RW-1

DATE DRILLED: 11/28/89

LOGGED BY: J.K.R.

PROJECT NUMBER: 1587-2G

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL
1				FILL: reddish brown sandy gravel	
2			ML	CLAYEY SILT, very dark gray (10YR 3/1), 30-40% clay, roots, stiff, moderate plasticity, moist	
3					
4					
5	RW-1-1	11			
6					
7					
8					
9			CH	CLAY, greenish gray (5G 5/1), roots, soft, high plasticity, moist	
10		3			
11					
12					
13			CL	SILTY CLAY, greenish gray (5GY 5/1), trace very fine sand, roots and rootholes, stiff, high plasticity, moist	
14					
15					
16					
17					
18			ML	SANDY SILT, yellowish brown (10YR 5/4), 40-50% very fine sand, stiff, wet	
19					
20		8			
21					
Bottom of Boring = 20 feet					

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

Monitoring Well Detail

PROJECT NUMBER 1587-2G
PROJECT NAME Crown Metals - San Lorenzo
COUNTY Alameda

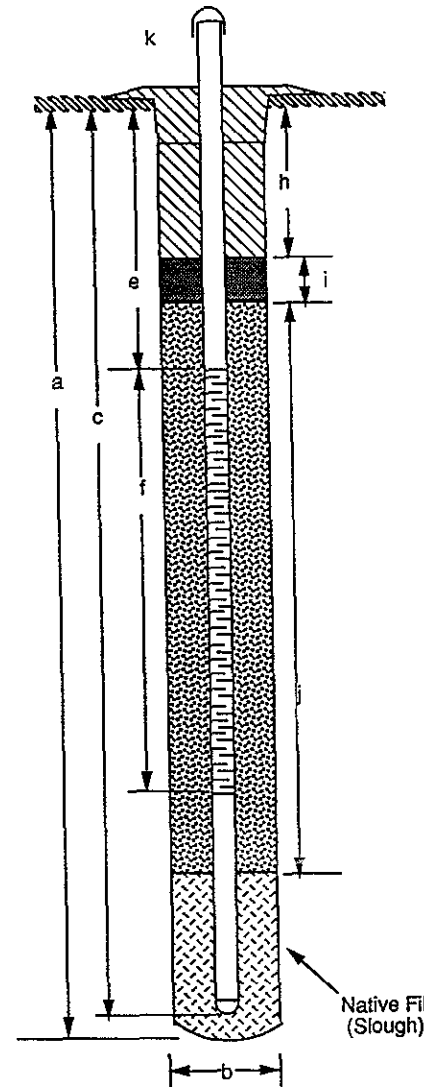
BORING / WELL NO. RW-1
TOP OF CASING ELEV. 11.02
GROUND SURFACE ELEV. ---
DATUM Mean Sea Level

EXPLORATORY BORING

a. Total Depth 20
b. Diameter 11
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Casing length 18 ft.
Material Schedule 40 PVC
d. Diameter 6 in.
e. Depth to top perforations 3 ft.
f. Perforated length 10 ft.
Perforated interval from 3 to 13 ft.
Perforation type Stainless Steel Wire Wrap
Perforation size 0.015 in.
g. Surface seal 0 ft.
Seal Material None
h. Backfill 1.5 ft.
Backfill material Neat Cement Grout
i. Seal .5 ft.
Seal Material Bentonite Pellets
j. Gravel pack 13 ft.
Pack material #2/12 Silica Sand
k. Well Head Completion 2 ft of PVC Stock Up



ensco
environmental
services, inc.



EXPLORATORY BORING LOG

PROJECT NAME: Crown Metal Manufacturing
(Pacific International Steel)
San Lorenzo, California

BORING NO. MW-7

DATE DRILLED: 11/28/89

PROJECT NUMBER: 1587-2G

LOGGED BY: J.K.R.

DEPTH (ft.)	SAMPLE NO	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL
1			CL	SILTY CLAY, greenish gray (5G 5/1) mottled with dark gray (N4), 10-15% very fine sand, medium stiff, moderate plasticity, moist	
2					
3					
4					
5	MW-7-1	11			
6					
7					
8					
9			CH	CLAY, dark gray (N4), roots, stiff, high plasticity, moist	
10	MW-7-2	5			
11					
12					
13			CL	SILTY CLAY, greenish gray (5GY 5/1), trace very fine sand, roots and rootholes, stiff, moderate plasticity, moist	
14					
15	MW-7-3	18			
16				Bottom of Boring = 16 feet	
17					
18					
19					
20					
21					

REVIEWED BY R.G./E.G.

Monitoring Well Detail

PROJECT NUMBER 1587-2G
PROJECT NAME Crown Metals - San Lorenzo
COUNTY Alameda

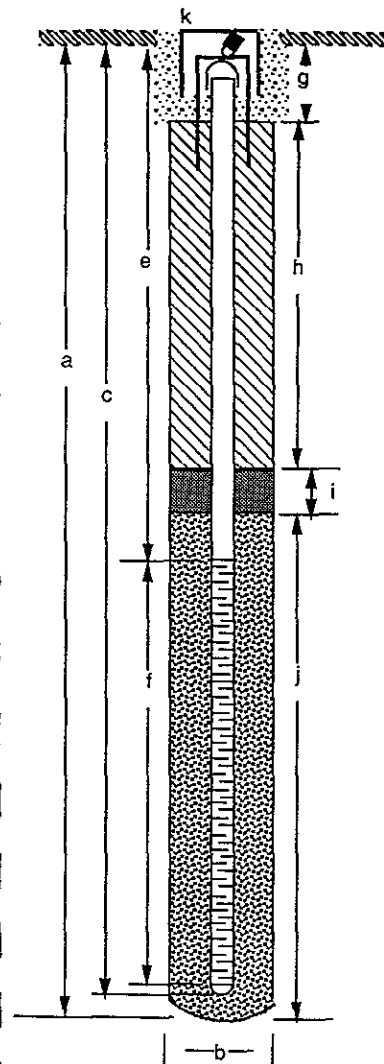
BORING / WELL NO. MW-7
TOP OF CASING ELEV. 8.41
GROUND SURFACE ELEV. 8.90
DATUM Mean Sea Level

EXPLORATORY BORING

- a. Total Depth 16 ft.
- b. Diameter 8 in.
- Drilling method Hollow Stem Auger

WELL CONSTRUCTION

- c. Casing length 16 ft.
Material Schedule 40 PVC
- d. Diameter 2 in.
- e. Depth to top perforations 6 ft.
- f. Perforated length 10 ft.
Perforated interval from 6 to 16 ft.
Perforation type machine slot
Perforation size 0.01 in.
- g. Surface seal 1 ft.
Seal Material Concrete
- h. Backfill 3 ft.
Backfill material Neat Cement Grout
- i. Seal 1 ft.
Seal Material Bentonite Pellets
- j. Gravel pack 11 ft.
Pack material #2/12 Silica Sand
- k. Well Head Completion Traffic rated vault
box and locking steel protective cover.



9/8/89
M.W.
Log



EXPLORATORY BORING LOG

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	Water Level PID Reading (ppm)	Well Construction Detail
1				FILL - SANDY GRAVEL: 7 inches			
2			CL	SILTY CLAY, mottled dark greenish gray (5G 4/1) with black (7.5YR N2/)			
3				35 - 45% silt, trace very fine sand, 5 - 15% roots and plant matter, very stiff, moist			
4							
5							
6	8-1	18		Color grades to primarily dark greenish gray, decrease in organic matter (5 - 7%)	0		
7							
8							
9							
10			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			
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							
13			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			
14							
15							
16	8-3	20			0		
17				Bottom of boring = 16.5 feet			
18							
19							
20							
21							

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

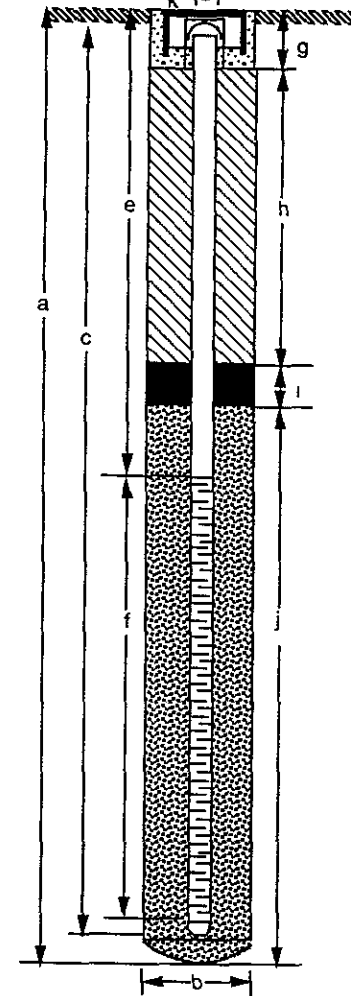
Page 1 of 1



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

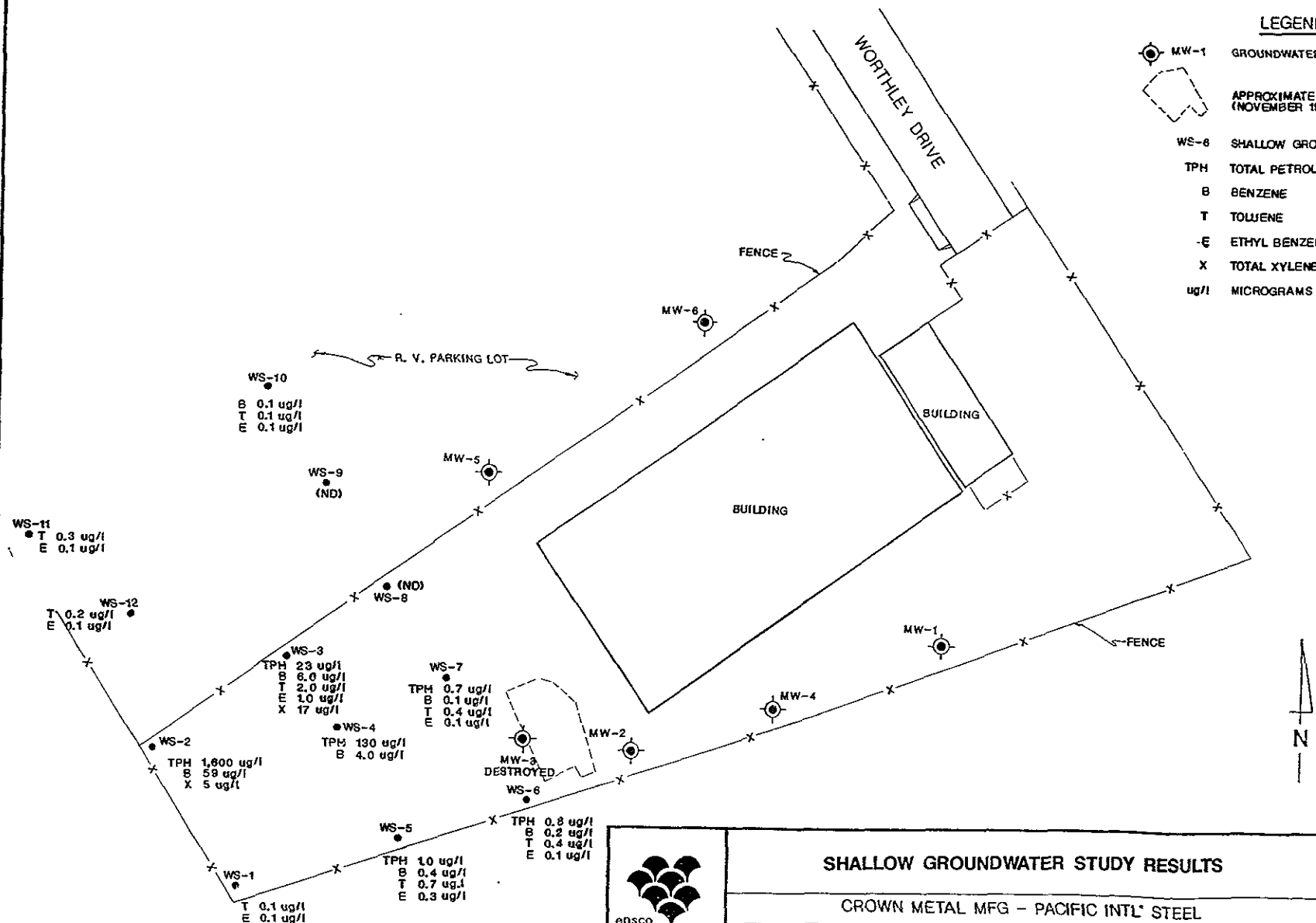
- a. Total depth 16.5 ft.
 b. Diameter 8 in.
 Drilling method Hollow Stem Auger

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

LEGEND

-  MW-1 GROUNDWATER MONITORING WELL
-  APPROXIMATE BOUNDARY OF SOIL EXCAVATION (NOVEMBER 1988)
- WS-8 SHALLOW GROUNDWATER SAMPLE LOCATION
- TPH TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B BENZENE
- T TOLUENE
- E ETHYL BENZENE
- X TOTAL XYLENES
- ug/l MICROGRAMS PER LITER



WS-11
 T 0.3 ug/l
 E 0.1 ug/l

WS-12
 T 0.2 ug/l
 E 0.1 ug/l

WS-2
 TPH 1,600 ug/l
 B 59 ug/l
 X 5 ug/l

WS-1
 T 0.1 ug/l
 E 0.1 ug/l

WS-3
 TPH 23 ug/l
 B 6.0 ug/l
 T 2.0 ug/l
 E 1.0 ug/l
 X 17 ug/l

WS-4
 TPH 130 ug/l
 B 4.0 ug/l

WS-5
 TPH 1.0 ug/l
 B 0.4 ug/l
 T 0.7 ug/l
 E 0.3 ug/l

WS-7
 TPH 0.7 ug/l
 B 0.1 ug/l
 T 0.4 ug/l
 E 0.1 ug/l

WS-6
 TPH 0.8 ug/l
 B 0.2 ug/l
 T 0.4 ug/l
 E 0.1 ug/l

WS-10
 B 0.1 ug/l
 T 0.1 ug/l
 E 0.1 ug/l

WS-9
 (ND)

WS-8
 (ND)

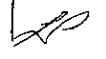


SHALLOW GROUNDWATER STUDY RESULTS

CROWN METAL MFG - PACIFIC INTL' STEEL

16525 WORTHLEY DRIVE

SAN LORENZO, CALIFORNIA

REVIEWED BY: RVT	APPROVED BY: 
DATE:	
DRAWN BY: SLS	
DRAWING #: FIG. 2	

Log 54
 MW-1

9/89
 GDD

5

TABLE I
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)
MW-1	07/14/87	ND	ND	ND	---	ND	8.86	7.56	
	11/24/87	ND	ND	ND	---	9.0		7.51	
	02/29/88	ND	ND	ND	---	ND		7.18	
	05/25/88	ND	ND	ND	---	ND		7.40	
	08/10/88	ND	ND	ND	ND	ND		7.85	
	11/29/88	ND	ND	ND	ND	ND		7.86	
	02/07/89	ND	ND	ND	ND	ND		7.43	
	05/12/89	ND	1.4	ND	ND	ND		7.23	
	08/04/89	ND	ND	ND	ND	ND		8.17	
	11/14/89	ND	ND	ND	---	---		7.93	
	01/03/90	---	---	---	---	---		7.77	
	02/22/90	ND	ND	ND	ND	ND		7.28	
	05/17/90	---	---	---	---	---		7.62	
	08/17/90	---	---	---	---	---		7.91	
	11/06/90	---	---	---	---	---		8.01	
	02/01/91	ND	ND	ND	ND	ND		8.00	
	05/01/91	---	---	---	---	---		7.36	
	08/08/91	---	---	---	---	---		8.17	
	11/15/91	---	---	---	---	---		8.17	
	02/12/92	---	---	---	---	---		6.75	
	05/21/92	---	---	---	---	---		---	
	11/13/92	---	---	---	---	---		8.00	
	02/24/93	---	---	---	---	---		5.74	
05/28/93	---	---	---	---	---	7.36			
08/20/93	---	---	---	---	---	7.85	1.01		

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TABLE I
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)	
MW-2	07/14/87	110	1.2	1.9	---	2.0	9.17	7.79		
	11/24/87	3,600	82	47	---	13		7.73		
	02/29/88	800	ND	ND	---	ND		7.26		
	05/25/88	250	ND	ND	---	ND		7.45		
	08/10/88	260	ND	ND	ND	ND		7.90		
	11/29/88	870	9.0	ND	1.0	1.0		8.20		
	02/07/89	710	16	ND	ND	ND		7.47		
	05/12/89	260	2.8	0.76	1.3	3.0		7.27		
	08/04/89	360	ND	ND	ND	0.48		8.23		
	11/14/89	85	ND	3.5	0.36	2.5		8.08		
	01/03/90	---	---	---	---	---		7.95		
	02/22/90	120	ND	ND	1.5	0.55		7.47		
	05/17/90	240	ND	ND	ND	ND		7.70		
	08/17/90	130	ND	2.9	1.2	0.68		8.00		
	11/06/90	170	0.37	1.2	2.0	1.5		8.30		
	02/01/91	57	ND	ND	ND	0.73		8.15		
	05/01/91	220	1.5	0.42	0.53	0.54		7.56		
	08/08/91	710	4.1	0.84	ND	0.71		8.95		
	11/15/91	630	2.3	ND	3.1	0.86		8.26		
	02/12/92	580	5.9	1.2	0.52	ND		7.02		
	05/21/92	790	26	5.4	ND	ND		7.89		
	11/13/92	230	ND	ND	ND	ND		8.29		
	02/24/93	400	17	ND	ND	ND		5.75		
	05/28/93	110	<0.50	<0.50	<0.50	<0.50		7.56		
	08/20/93	1,000	<0.50	0.75	1.1	5.4		8.01	1.16	
		11/30/93	590	<0.50	<0.50	3.8		2.3	8.20	
		04/08/94	480	5.2	<0.50	<0.50		<0.50	7.26	
		08/08/94	330	<0.50	<0.50	2 of 9 <0.50		<0.50	7.53	
	08/23/95	160	<0.50	0.68	<0.50	0.98	7.72			
	04/17/96	56	0.84	3.0	0.61	2.9	6.66			

TABLE I
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)
MW-3	07/14/87	260	ND	1.0	---	2.0	8.54	7.09	
	11/24/87	8,900	1,700	3.0	---	12		7.11	
	02/29/88	9,300	1,600	93	---	99		6.57	
	05/25/88	11,000	140	16	---	34		6.80	
	08/10/88	4,600	23	4.8	140	3.0		7.20	
	11/29/88	16,000	3,900	11	600	40		7.41	
	02/07/89	---	---	---	---	---		NA	
	05/12/89	2,500	ND	5.6	ND	2.7		6.64	
	08/04/89	2,900	800	7.5	96	ND		7.38	
	11/14/89								
	Well Destroyed in August 1989								
MW-4	07/14/87	ND	ND	ND	---	ND	8.48	7.25	
	11/24/87	60	ND	0.65	---	7.6		6.97	
	02/29/88	ND	ND	ND	---	ND		6.54	
	05/25/88	ND	ND	ND	---	ND		6.36	
	08/10/88	---	---	---	---	---		NA	
	11/29/88	ND	0.87	ND	ND	ND		6.85	
	02/07/89	ND	ND	ND	ND	ND		6.26	
	05/12/89	ND	ND	ND	ND	0.76		6.55	
	08/04/89	---	---	---	---	---		NA	
	11/14/89	---	---	---	---	---		---	
	02/22/90	ND	ND	ND	ND	ND		6.67	
	05/17/90	---	---	---	---	---		---	
	08/17/90	---	---	---	---	---		7.30	
11/06/90	---	---	---	---	---	7.15			

TABLE I
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft aboveMSL)	Depth to Water (feet)	Groundwater Elevation (ft aboveMSL)
MW-4 (con't)	02/01/91	ND	ND	ND	ND	ND	8.48	6.85	
	05/01/91	---	---	---	---	---		6.73	
	08/08/91	---	---	---	---	---		---	
	11/15/91	---	---	---	---	---		7.45	
	02/12/92	---	---	---	---	---		6.55	
	05/21/92	---	---	---	---	---		6.62	
	11/13/92	---	---	---	---	---		7.45	
	02/24/93	---	---	---	---	---		4.28	
	05/28/93	---	---	---	---	---		---	
	08/20/93	---	---	---	---	---		7.34	1.14
MW-5	07/14/87	ND	ND	ND	---	ND	9.11	7.06	
	11/24/87	ND	ND	ND	---	7.2		7.24	
	02/29/88	ND	ND	ND	---	ND		6.75	
	05/25/88	ND	---	---	---	---		---	
	08/10/88	---	ND	ND	ND	ND		7.35	
	11/29/88	ND	ND	ND	ND	ND		---	
	02/07/89	ND	ND	ND	ND	ND		7.02	
	05/12/89	ND	ND	ND	ND	0.84		6.69	
	08/04/89	ND	ND	ND	ND	ND		7.52	
	11/14/89	ND	ND	ND	ND	ND		7.51	
	01/03/90	ND	---	---	---	---		7.42	
	02/21/90	ND	ND	ND	ND	ND		6.85	
	05/17/90	---	---	---	---	---		7.09	
08/17/90	---	---	---	---	---	7.36			

TABLE 1
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)
MW-5 (con't)	11/06/90	---	---	---	---	---	9.11	7.65	
	02/01/91	ND	ND	ND	ND	ND		7.63	
	05/10/91	---	---	---	---	---		6.68	
	08/08/91	---	---	---	---	---		7.65	
	11/15/91	---	---	---	---	---		7.52	
	02/12/92	---	---	---	---	---		6.43	
	05/21/92	---	---	---	---	---		6.92	
	11/13/92	---	---	---	---	---		7.63	
	02/24/93	---	---	---	---	---		5.15	
	05/28/93	---	---	---	---	---		6.53	
	08/20/93	---	---	---	---	---		7.17	1.94
MW-6	07/14/87	ND	ND	ND	---	ND	9.19	---	
	11/24/87	---	---	---	---	---		---	
	01/05/88	ND	ND	ND	---	ND		---	
	02/29/88	ND	ND	ND	---	ND		7.19	
	05/25/88	ND	ND	ND	ND	ND		7.33	
	08/10/88	ND	ND	ND	ND	ND		7.50	
	11/29/88	ND	ND	ND	ND	ND		7.93	
	02/07/89	ND	ND	ND	ND	ND		7.56	
	05/12/89	ND	ND	ND	ND	ND		7.16	
	08/04/89	ND	ND	ND	ND	ND		7.94	
	11/14/89	ND	ND	ND	ND	ND		8.92	
	01/03/90	ND	---	---	---	---		7.89	
	02/21/90	---	ND	ND	ND	ND		7.28	

TABLE 1
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft aboveMSL)	Depth to Water (feet)	Groundwater Elevation (ft aboveMSL)
MW-6 (con't)	05/17/90	ND	---	---	---	---	9.19	7.89	
	08/17/90	---	---	---	---	---		7.68	
	11/06/90	---	---	---	---	---		8.05	
	02/01/90	ND	ND	ND	ND	ND		7.87	
	05/01/90	---	---	---	---	---		6.95	
	08/08/91	---	---	---	---	---		7.97	
	11/15/91	---	---	---	---	---		7.92	
	02/12/92	---	---	---	---	---		6.92	
	05/21/92	---	---	---	---	---		7.11	
	11/13/92	---	---	---	---	---		7.98	
	02/24/93	---	---	---	---	---		5.61	
	05/28/93	---	---	---	---	---		6.78	
	08/20/93	---	---	---	---	---		7.60	1.59
MW-7	01/03/90	---	---	---	---	---	8.41	8.06	
	01/09/90	ND	ND	ND	ND	ND		8.42	
	02/21/90	ND	ND	ND	ND	ND		6.63	
	05/17/90	ND	ND	ND	ND	ND		6.81	
	08/17/90	48	ND	ND	ND	0.32		7.13	
	11/06/90	ND	ND	ND	ND	ND		7.29	
	02/01/91	ND	ND	ND	ND	ND		7.20	
	05/01/91	---	---	---	---	---		6.80	
	08/08/91	---	---	---	---	---		7.15	
	11/15/91	---	---	---	---	---		7.20	
	02/12/92	---	---	---	---	---		6.73	

TABLE I
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)
MW-7 (con't)	05/21/92	---	---	---	---	---	8.41	6.67	1.83
	11/13/92	---	---	---	---	---		7.03	
	02/24/93	---	---	---	---	---		5.26	
	05/28/93	---	---	---	---	---		6.15	
	08/20/93	---	---	---	---	---		6.58	
MW-8	05/01/91	ND	ND	ND	ND	ND	8.52	7.67	1.06
	08/08/91	ND	ND	ND	ND	ND		8.15	
	11/15/91	ND	ND	ND	ND	ND		7.94	
	02/12/92	ND	ND	ND	ND	ND		7.29	
	05/21/92	---	---	---	---	---		---	
	11/13/92	---	---	---	---	---		8.02	
	02/24/93	ND	ND	ND	ND	ND		5.47	
	05/28/93	---	---	---	---	---		6.85	
	08/20/93	---	---	---	---	---		7.46	
	08/23/95	ND	ND	ND	ND	ND		5.99	
RW-1	01/03/90	---	---	---	---	---	11.02	9.81	
	01/09/90	1,300	150	15	100	170		9.75	
	03/01/90	440	9.4	1.3	16	25		9.34	
	05/17/90	1,400	52	1.0	20	12		9.55	
	08/17/90	1,800	410	7.8	160	65		9.84	
	11/06/90	---	---	---	---	---		10.15	
	10/25/91	420	79	1.8	2.5	14		10.20	

TABLE 2. Laboratory Analysis of Ground Water Samples
 (concentrations in ppb)
 (continued)

Well Number	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
RW-1	11/28/89	3,200	<50	<100	<100	<100
	01/09/90	1,300	150	15	100	170
	01/16/91	78	17.0	2.7	7.7	1.3
	04/20/91	<30	<0.30	<0.30	<0.30	<0.30
	05/01/91	160	40	0.79	14	6.1
	05/24/91	<30	<0.30	<0.30	<0.30	<0.30
	06/14/91	57	12	<0.30	4.3	0.84
	07/03/91	<30	<0.30	<0.30	<0.30	<0.30
	07/22/91	18	<0.30	2.7	0.4	<0.30
	08/08/91	89	41	0.31	4.6	0.73
	11/15/91	140	41	<0.30	1.3	0.44
	12/18/91	<50	12	<0.50	0.78	<0.50
	02/12/92	260	78	.073	6.6	8.2
	03/06/92	480	81	1.2	21	21
	04/02/92	300	52	1.2	13	15
	05/21/92	57	20	ND	1.7	0.85
	06/30/92	<50	7.7	<0.50	<0.50	<0.50
	07/17/92	79	7.4	<0.50	1.2	1.4
	09/01/92	<50	4.2	<0.50	<0.50	<0.50
	11/13/92	ND	ND	ND	ND	ND
	01/08/93	ND	8	ND	0.78	0.59
	01/29/93	64	22	ND	4.8	3.7
	03/18/93	2,400	330	3.3	51	17
	04/22/93	<50	13	<0.50	1.5	<0.50
	05/28/93	<50	0.76	<0.50	<0.50	<0.50
	08/20/93	57	16	<0.50	0.70	1.92
	09/15/93	<50	1.5	<0.50	<0.50	<0.50
	10/08/93	<50	<0.50	<0.50	0.50	<0.50
	10/26/93	<50	<0.50	<0.50	0.50	<0.50
	12/16/93	<50	0.73	2.6	1.1	<0.50
	04/08/94	130	15	1.4	1.9	1.9
	08/08/94	110	25	<0.50	0.86	3.2
	08/23/95	75	12	<0.50	1.8	3.5
	04/17/96	ND	4.2	ND	0.73	ND

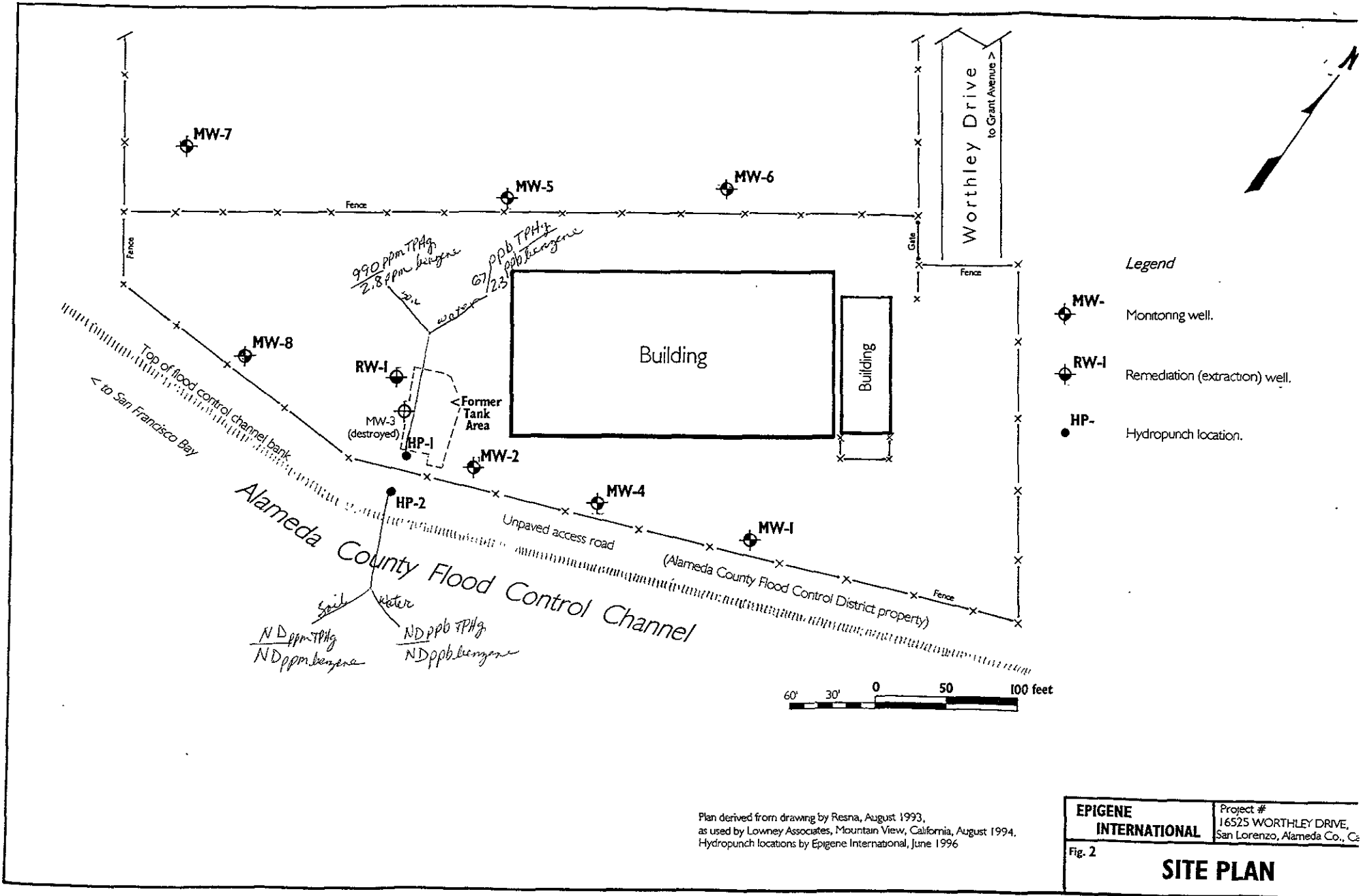
- no data obtained
 ND not detected

TABLE 1
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft above MSL)	Depth to Water (feet)	Groundwater Elevation (ft above MSL)
RW-1 System Influent	01/16/91	78	17	2.7	7.7	1.3	11.02	---	
	05/01/91	160	40	0.79	14	6.1		---	
	08/08/91	89	41	0.31	4.6	0.73		---	
	11/15/91	140	41	ND	1.3	0.44		---	
	02/12/92	260	78	0.73	6.6	8.2		---	
	05/21/92	57	20	ND	1.7	0.85		---	
	11/13/92	ND	ND	ND	ND	ND		---	
	01/08/93	ND	8	ND	0.78	0.59		---	
	01/29/93	64	22	ND	4.8	3.7		---	
	03/18/93	2,400	330	3.3	51	17		---	
	04/22/93	<50	13	<0.50	1.5	<0.50		---	
	05/28/93	<50	0.76	<0.50	<0.50	<0.50		---	
	08/20/93	57	16	<0.50	0.70	1.9		9.80	1.22
	BB-1	01/09/90	ND	ND	ND	ND	ND		
05/17/90		ND	ND	ND	ND	ND			
11/06/90		ND	ND	ND	ND	ND			
02/01/91		ND	ND	ND	ND	ND			
05/01/90		ND	ND	ND	ND	ND			
08/08/91		ND	ND	ND	ND	ND			

TABLE 1
 CUMULATIVE RESULTS OF GROUNDWATER SAMPLING AND ANALYSES

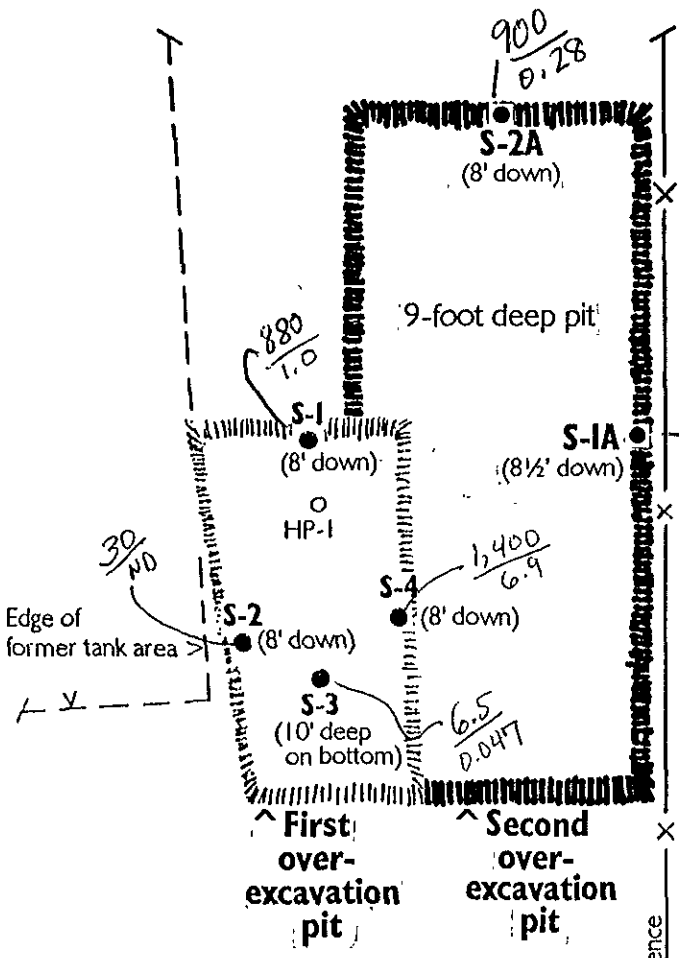
Well	Date Sampled	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Well Elevation (ft aboveMSL)	Depth to Water (feet)	Groundwater Elevation (ft aboveMSL)
BB-1 (con't)	11/15/91	ND	ND	ND	ND	ND			
	02/12/92	---	---	---	---	---			
	05/21/92	---	---	---	---	---			
	11/13/92	---	---	---	---	---			
	02/24/93	ND	ND	ND	ND	ND			
	05/28/93	---	---	---	---	---			
	08/20/93	<50	<0.50	<0.50	<0.50	<0.50			
Notes:									
TPHG	Total petroleum hydrocarbons as gasoline					ppb	Parts per billion ($\mu\text{g/l}$)		
ND	Not detected at or above the method detection limit (see laboratory reports for detection limits)					BB-1	Bailer Bank		
						ft	feet		
---	No data obtained					MSL	Mean sea level		



Plan derived from drawing by Resna, August 1993,
as used by Lowney Associates, Mountain View, California, August 1994.
Hydropunch locations by Epigene International, June 1996

7

TPH-G (ppm)
benzene

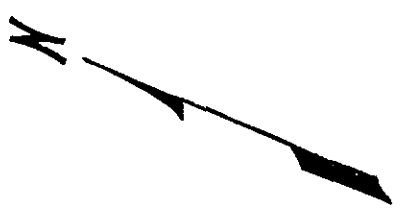


< Fence to channel bank ~32 feet >

HP-2

Unpaved access road
(Alameda County Flood Control District property)

to entrance on Worthley Drive:



- S- ● Soil sample location (samples taken July 10, 1996).
- Former hydropunch location.
- Soil samples taken July 24, 1996.

S-1A S-2A:

Property Line

EPIGENE INTERNATIONAL	Project #96-150 16525 WORTHLEY DRIVE, San Lorenzo, Alameda Co., CA
	SOIL SAMPLE LOCATIONS