RO-346

ENVIRONMENTAL ENGINEERING, INC.
2680 Bishop Drive, Suite 203, San Ramon, CA 94583
TEL (925) 244-6600 * FAX (925) 244-6601

# MONITORING WELL INSTALLATION REPORT

## CHEVRON GASOLINE SERVICE STATION
## 3519 Castro Valley Boulevard
## Castro Valley, California

July 7, 2004

Project 2762

Prepared for

**Mr. Mirazim Shakoori**
**3519 Castro Valley Boulevard**
**Castro Valley, California**

Prepared by

**SOMA Environmental Engineering, Inc.**
**2680 Bishop Drive, Suite 203**
**San Ramon, California**

RO-346

ENVIRONMENTAL ENGINEERING, INC
2680 Bishop Drive • Suite 203 • San Ramon, CA 94583
TEL (925) 244-6600 • FAX (925) 244-6601

July 7, 2004

Mr. Robert Schultz
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: **#RO0000346**
Site Address: 3519 Castro Valley Boulevard, Castro Valley, CA
Castro Valley Gasoline Service Station

Dear Mr. Schultz:

Enclosed for your review is SOMA's "Monitoring Well Installation Report" for the subject site.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

Mansour Sepehr, Ph.D., PE
Principal Hydrogeologist


Enclosure

cc: Mr. Azim Shakoori w/enclosure
Mr. Michael D. Ahern w/enclosure
Forrest & Louise Riley w/enclosure

## CERTIFICATION

This report has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mirazim Shakoori, the property owner of 3519 Castro Valley Boulevard, Castro Valley, California. This report includes details of the monitoring well installation as described in SOMA's workplan entitled, "Workplan for Monitoring Well Installation," dated March 8, 2004, and approved by the Alameda County Health Care Services in their letter, "Workplan Approval at 3519 Castro Valley Boulevard, Castro Valley, California," dated March 22, 2004.

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

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## 1.0 INTRODUCTION

This report has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mirazim Shakoori, the property owner of 3519 Castro Valley Boulevard, Castro Valley, California (the "Site"). Field activities were performed in accordance with SOMA's workplan dated March 8, 2004. This report has been prepared to comply with the Alameda County Health Care Services' (ACHCS's) directive as described in their workplan approval letter dated March 22, 2004.

The previous consultant, URS Corporation (URS), provided relevant project documents with a Site Background and Document Transfer letter, dated July 14, 2003. The following background and previous activities sections are based on the information provided by URS.

## 2.0 BACKGROUND

Prior to 1989, the Site was a Mobil service station. In 1984, three single-walled fiberglass gasoline underground storage tanks (USTs) with capacities of 6,000, 8,000, and 10,000 gallons were installed in the southeast portion of the Site. In 1988, a 1,000-gallon double-walled waste oil tank (WOT) was also installed to replace a 380-gallon single-walled steel WOT.

In 1989, the subject property was transferred from Mobil to British Petroleum (BP). In March 1994, the subject property was transferred to Mr. Mirazim Shakoori who operated the Site as a Chevron station.

In September 2003, the three single-walled fiberglass USTs with volumes of 6,000, 8,000, and 10,000 gallons and the WOT with a volume of 1,000 gallons were removed from the southeast portion of the Site. The USTs were replaced

with one 12,000-gallon UST and one 20,000-gallon UST in the northwest portion of the Site.

As shown in Figure 1, the Site is an active Chevron station located within in a mixed commercial/residential area of Castro Valley, on the southeast corner of Castro Valley Boulevard and Redwood Road.

### 2.1 Previous Activities

In September 1988, Kaprealian Engineering, Inc. (KEI) removed the original 380-gallon WOT and observed holes in this UST. Confirmation soil samples from the bottom of the excavation pit, at 8.5 feet below ground surface (bgs), contained benzene at 6.8 micrograms per kilogram (µg/Kg or parts per billion) and toluene at 9.5 µg/Kg. The laboratory analysis did not detect total petroleum hydrocarbons (TPH) or total oil and grease (TOG). In March 1989, an Unauthorized Release Report (URR) was submitted to the ACHCS.

In September and October 1992, Environmental Science & Engineering, Inc. (ESE) drilled five soil boreholes and converted the boreholes into monitoring wells (ESE-1 through ESE-5) that ranged in depth from approximately 23 to 30 feet bgs. The maximum level of soil contamination was detected in monitoring well borehole ESE-5 at a depth of 10.5 feet bgs with 220,000 µg/Kg total petroleum hydrocarbons as gasoline (TPH-g), 1,400 µg/Kg benzene, 8,200 µg/Kg toluene, 3,300 µg/Kg ethylbenzene, and 18,000 µg/Kg xylenes. ESE encountered petroleum hydrocarbon contaminants in all the monitoring wells with maximum levels detected in ESE-1, which is located west of, and adjacent to the three USTs. This well contained TPH-g at 2,300 µg/L, benzene at 370 µg/L, toluene at 160 µg/L, ethylbenzene at 17 µg/L, and xylenes at 110 µg/L. A URR for this documented release was submitted to the ACHCS in March 1993.

In December 1994, ACC Environmental Consultants, Inc. (ACC) conducted an investigation along the western edge of the property for the Redwood Boulevard

road-widening project. ACC drilled five boreholes to a maximum depth of 10 feet bgs. The maximum level of petroleum hydrocarbon contaminants detected in the road-widening boreholes was 59,000 µg/Kg TPH-g, 5,890 µg/Kg benzene, 220,000 µg/Kg ethylbenzene, and 540,000 µg/Kg xylenes.

In July 1995, Alisto Engineering (AE) installed three additional monitoring wells. AE installed two of the wells, MW-6 and MW-8, on-site, and the third well, MW-7, on the adjacent property southeast of the Site. In February and March 1996, AE also advanced several hand-augered boreholes in the vicinity of the former western pump island and product lines. The boreholes were hand-augered to a maximum depth of 8.5 feet bgs. AE reported that petroleum hydrocarbon contamination increased with depth and the highest concentration was encountered at the capillary fringe. Subsequently, in April 1996, AE decommissioned well MW-8 on the western margin of the Site to accommodate the road-widening project along Redwood Boulevard.

Since 1992, quarterly monitoring has been conducted at the Site. In 1999, the sampling schedule was modified to include semi-annual sampling of ESE-5 and ESE-7. Prior to SOMA, URS Corporation, Cambria Environmental Technology, Inc., Blaine Technical Services, AE, and ESE conducted these monitoring and sampling events.

Based on joint monitoring events with the adjacent former Shell station to the west, the groundwater flow direction varied from north/northwest to south/southeast and primarily to the northeast. Based on the monitoring events since the cessation of the joint monitoring, the groundwater flow direction has usually been to the south and east. For the last four years, Methyl tertiary Butyl Ether (MtBE) has been detected in off-site well MW-7 at concentrations from 95 to 4,400 µg/L, however most of these detections were above 1,000 µg/L. Consistent with the on-site groundwater flow direction toward the southeast/south,

contaminated groundwater has been migrating off-site towards the adjacent commercial property, which is located south of the Site.

In December 2003, five temporary well boreholes were installed by SOMA to delineate the off-site groundwater plume extending from the Site. The results of SOMA's soil and groundwater investigation confirmed the existence of an off-site petroleum hydrocarbon plume. Based on the results of the investigation, groundwater contaminants appeared to have migrated off-site at least 150 feet to the south of the Site. SOMA recommended installing one on-site and three off-site monitoring wells to evaluate the off-site petroleum hydrocarbon plume migrating from the Site.

In a letter dated January 23, 2004, the ACHCS requested a workplan for installing off-site monitoring wells. The letter mentioned that the anomalously high contaminant levels in off-site borehole TWB-5 may have originated from a neighboring gas station, which is located at 3495 Castro Valley Boulevard. Due to the apparently complex hydrogeology, with possible perched groundwater, the ACHCS also strongly recommended a thorough file review of site investigation reports for adjacent sites. Based on SOMA's file review, the nearby Xtra Oil (Former Shell) gas station, located at 3495 Castro Valley Boulevard, is the nearest active gasoline station within the Site's vicinity. SOMA concluded that the anomalously high contaminant levels in TWB-5 originated from the Xtra Oil site. The letter also suggested that replacement wells for ESE-3 and ESE-4 might not be needed.

## 2.2 Regional Geology

The U.S. Geologic Survey (USGS) mapped the Site as weakly consolidated, slightly weathered, poorly sorted, irregular interbedded clay, silt, sand, and gravel. Based on the temporary well and monitoring well borehole logs, underlying sediments generally consists of soft to very stiff silty clay and clayey silt with intervening layers of medium dense silty sand and sandy silt.

In developed urban areas, such as the Bay Area, earthwork construction often involves the emplacement of artificial fill derived from nearby cuts or quarries. Artificial fill is emplaced over native earth materials to provide level building pads and base rock for roadways.

## 3.0 SCOPE OF WORK

In response to the ACHCS's request letter, dated January 23, 2004, and based on the ACHCS workplan approval letter, SOMA organized the scope of the proposed investigation into the following tasks:

**Task 1:** **Field Preparation: Permit Acquisition, Off-Site Access Arrangement, Preparation of a Health and Safety Plan and Subsurface Utility Clearance**

**Task 2:** **Monitoring Well Installation**

**Task 3:** **Monitoring Well Development**

**Task 4:** **Monitoring Well Survey**

## 4.0 INVESTIGATIVE ACTIVITIES

The following are descriptions of the above tasks.

### 4.1 Field Preparation

Prior to commencing field activities, SOMA obtained the necessary drilling permits from the ACHCS and arranged for off-site access. SOMA obtained an access agreement from each of the off-site property owners before fieldwork began. The permits issued by the ACHCS are attached as Appendix A.

A site-specific health and safety plan (HASP) was prepared by SOMA to address safety provisions during field activities. The HASP provided procedures to protect the field crew from physical and chemical hazards resulting from drilling. The

HASP established personnel responsibilities, general safe work practices, personal protective equipment standards, decontamination procedures, and emergency action plans.

SOMA contacted Underground Service Alert (USA) to clear the drilling areas of underground utilities. Following the USA clearance, a private utility locator surveyed the drilling areas and located additional subsurface conduits.

### 4.2 Monitoring Well Installation

To delineate the extent of the groundwater plume, SOMA oversaw the installation of four monitoring well boreholes: SOMA-1, SOMA-2, SOMA-3 and SOMA-4, as shown in Figure 2. On June 10, 2004, Gregg Drilling & Testing (Gregg) used a hollow stem auger drilling rig to drill four monitoring well boreholes 15 to 30 feet bgs. In order to clear the monitoring well boreholes of utilities, each borehole was hand-augered to a depth of approximately 5 feet bgs.

Under the direction of SOMA's field geologist, the monitoring wells were screened to span only the saturated zone observed in the soil cores to minimize screen lengths. Using factory-slotted schedule 40 PVC screen with 0.01" slots, the drilling crew screened SOMA-1 from 22 to 30 feet bgs, SOMA-2 from 10 to 15 feet bgs, SOMA-3 from 10 to 15 feet bgs and SOMA-4 from 16 to 23 feet bgs. The monitoring well boreholes were cased with threaded, blank and slotted schedule 40 PVC pipe. The drilling crew fitted a PVC cap on the bottom of the casing without adhesives or tape, and the top of the casing was fitted with a locking well plug.

After the casing was set into the borehole, the monitoring well filter pack was emplaced outside the casing by slowly pouring 2/12 kiln-dried sand material into the annular space from the bottom of the borehole to approximately 1 to 2 feet above the screened interval. To prevent grout from infiltrating down into the filter material, a one- or two-foot thick bentonite plug was placed above this filter

material. Approximately one to two gallons of distilled water was then added to hydrate the bentonite pellets. After thoroughly hydrating the bentonite seal, the well was sealed from the top of the bentonite layer to about one-foot bgs with neat cement containing approximately 5% bentonite. The well was completed by installing a traffic-rated well vault into concrete. Monitoring well construction details are attached as Appendix B.

### 4.3 Monitoring Well Development

On June 17, 2004, Gregg developed the monitoring wells. The field crew used a bailer to remove sediment-laden water from the wells until the turbidity had substantially decreased. The wells were then purged by pumping until the purgewater was moderately clear and groundwater quality parameters stabilized. Approximately 7 to 30 casing volumes were removed from the wells. Appendix C presents the well development logs.

In the third quarter of 2004, SOMA field personnel will sample the newly installed monitoring wells along with the pre-existing monitoring wells. The results of the groundwater sampling event will be presented in SOMA's Third Quarter 2004 Groundwater Monitoring Report.

### 4.4 Monitoring Well Surveying

On June 21, 2004, licensed surveyors from Kier & Wright surveyed the casing elevations of the monitoring wells. Kier & Wright performed a horizontal and vertical survey on the wells in accordance with the requirements set forth by the State for the GeoTracker database. Using NAD 83, all well casing elevations were surveyed to mean sea level with latitude and longitude to sub-meter accuracy. With the survey data, depths to groundwater will be converted into groundwater surface elevations to determine the groundwater flow direction beneath the Site. Monitoring well survey data is attached as Appendix D.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of SOMA's previous soil and groundwater investigation confirm the existence of an off-site petroleum hydrocarbon plume migrating from the Site. Based on this and SOMA's previous investigations, the plume exists along the south and southeastern half of the Site, and it appears that the groundwater contaminants have migrated off-site at least 150 feet. However, the full downgradient extent of the groundwater chemical plume has not yet been defined.

This investigation was performed to assess the downgradient extent of the gasoline contamination and to assess the need for remedial actions at the Site. Four groundwater monitoring wells were installed at the subject property, three off-site and one on-site. The wells were installed to verify the groundwater flow direction and to monitor the groundwater quality for an accurate assessment of the hydrogeologic conditions, and to verify the stability of the chemical plume and other attenuation parameters.

## 6.0 REFERENCES

Alameda County Health Care Services, October 3, 2003. A Letter in Connection with Request for Conducting Subsurface Investigation entitled, "Amended Workplan for BP Station #11105 at 3519 Castro Valley Blvd., Castro Valley, CA."

Alameda County Health Care Services, October 22, 2003. A Letter in Connection with Request for Conducting Subsurface Investigation entitled, "Workplan for BP Station #11105 at 3519 Castro Valley Blvd., Castro Valley, CA."

Alameda County Health Care Services, March 22, 2004. A Letter in Connection with Request for Conducting Subsurface Investigation entitled, "Workplan Approval for BP Station #11105 at 3519 Castro Valley Blvd., Castro Valley, CA."

Helley, E. J. and LaJoie, K. R., 1979. "Flatland Deposits of the San Francisco Bay Region, California". Geologic Survey Professional Paper 943.

SOMA Environmental Engineering, Inc., September 25, 2003. "Workplan to Conduct Off-Site Soil and Groundwater Investigation at Chevron Gasoline Service Station, 3519 Castro Valley Boulevard, Castro Valley, California."

SOMA Environmental Engineering, Inc., October 8, 2003. "Revised Workplan to Conduct Off-Site Soil and Groundwater Investigation at Chevron Gasoline Service Station, 3519 Castro Valley Boulevard, Castro Valley, California."

SOMA Environmental Engineering, Inc., March 8, 2004. "Workplan for Monitoring Well Installation at Chevron Gasoline Service Station, 3519 Castro Valley Boulevard, Castro Valley, California."

# Figures


Figure 1: Site vicinity map.

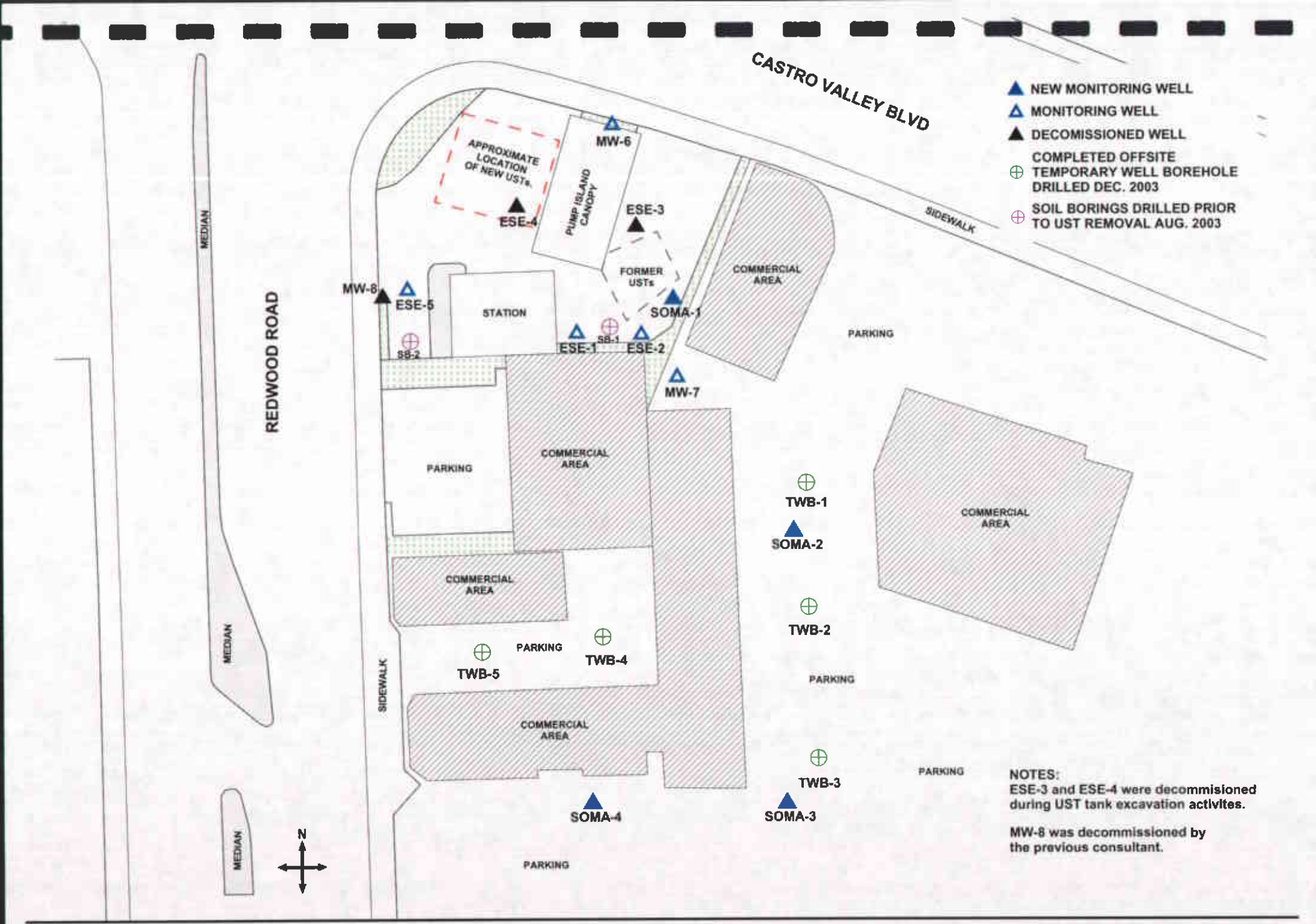



Figure 2: Site Map Showing the Locations of Temporary Well Boreholes and Monitoring Wells

SOMA ENVIRONMENTAL ENGINEERING, INC.

# Appendix A

Drilling Permits

# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510) 782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

## DRILLING PERMIT APPLICATION

**FOR APPLICANT TO COMPLETE**

LOCATION OF PROJECT 3519 Castro Valley Blvd
Castro Valley

CLIENT
Name Azim Shakoori
Address 3519 Castro Valley Blvd (510) 889-0579
City Castro Valley Zip 94930

APPLICANT
Name SOMA Environmental Engineering
Fax (925) 244-6601
Address 2680 Bishop Dr Phone (925) 244-6600
City San Ramon Zip 94583

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ☐ | General | ☐ |
| Water Supply | ☐ | Contamination | ☐ |
| Monitoring | ☒ | Well Destruction | ☐ |

PROPOSED WATER SUPPLY WELL USE

| | | | |
|---|---|---|---|
| New Domestic | ☐ | Replacement Domestic | ☐ |
| Municipal | ☐ | Irrigation | ☐ |
| Industrial | ☐ | Other | ☐ |

DRILLING METHOD:
Mud Rotary ☐ Air Rotary ☐ Auger ☒
Cable ☐ Other ☐

DRILLER'S NAME Gregg Drilling & Testing

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 6 in. Maximum
Casing Diameter ____ in. Depth 30 ft.
Surface Seal Depth 6 ft. Owner's Well Number SOMA-1

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum
Hole Diameter ____ in. Depth ____ ft.

STARTING DATE May 18, 2004

COMPLETION DATE May 19, 2004

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73 68.

APPLICANT'S SIGNATURE [signature] DATE 4/30/04

PLEASE PRINT NAME Eric Jennings

Rev.9-18-02

**FOR OFFICE USE**

PERMIT NUMBER W04-0489
WELL NUMBER
APN

**PERMIT CONDITIONS**
Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
(2.) Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

(G.) SPECIAL CONDITIONS — Traffic

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 4/30-02

# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510) 782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

## DRILLING PERMIT APPLICATION

**FOR APPLICANT TO COMPLETE**

LOCATION OF PROJECT 3519 Castro Valley Blvd
Castro Valley

CLIENT
Name Azim Shakonri
Address 3519 Castro Valley Blvd (510) 889-0579
City Castro Valley Zip 94930

APPLICANT
Name SOMA Environmental Engineering
Fax (925) 244-6601
Address 2680 Bishop Dr Phone (925) 244-6600
City San Ramon Zip 94583

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ☐ | General | ☐ |
| Water Supply | ☐ | Contamination | ☐ |
| Monitoring | ☒ | Well Destruction | ☐ |

PROPOSED WATER SUPPLY WELL USE

| | | | |
|---|---|---|---|
| New Domestic | ☐ | Replacement Domestic | ☐ |
| Municipal | ☐ | Irrigation | ☐ |
| Industrial | ☐ | Other | ☐ |

DRILLING METHOD:

| | | | | | |
|---|---|---|---|---|---|
| Mud Rotary | ☐ | Air Rotary | ☐ | Auger | ☒ |
| Cable | ☐ | Other | ☐ | | |

DRILLER'S NAME Gregg Drilling & Testing

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 6 in. Maximum
Casing Diameter ____ in. Depth 30 ft.
Surface Seal Depth ____ ft. Owner's Well Number SOMA-2

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum
Hole Diameter ____ in. Depth ____ ft.

STARTING DATE May 18, 2004

COMPLETION DATE May 19, 2004

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE April 2004

PLEASE PRINT NAME ERIC KENNINGS

Rev.9-18-02

**FOR OFFICE USE**

PERMIT NUMBER W04-0490
WELL NUMBER ____
APN ____

**PERMIT CONDITIONS**
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS — HWH-1

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 4-30-04

# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yuo
FAX (510) 782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

## DRILLING PERMIT APPLICATION

**FOR APPLICANT TO COMPLETE**

LOCATION OF PROJECT 3519 Castro Valley Blvd
Castro Valley

CLIENT
Name Azim Shakoori
Address 3519 Castro Valley Blvd Phone (510) 889-0579
City Castro Valley Zip 94930

APPLICANT
Name SOMA Environmental Engineering Fax (925) 244-6601
Address 2680 Bishop Dr. Phone (925) 244-6600
City San Ramon Zip 94583

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ☐ | General | ☐ |
| Water Supply | ☐ | Contamination | ☐ |
| Monitoring | ☒ | Well Destruction | ☐ |

PROPOSED WATER SUPPLY WELL USE

| | | | |
|---|---|---|---|
| New Domestic | ☐ | Replacement Domestic | ☐ |
| Municipal | ☐ | Irrigation | ☐ |
| Industrial | ☐ | Other | ☐ |

DRILLING METHOD:

| | | | | | |
|---|---|---|---|---|---|
| Mud Rotary | ☐ | Air Rotary | ☐ | Auger | ☒ |
| Cable | ☐ | Other | ☐ | | |

DRILLER'S NAME Gregg Drilling & Testing

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 6 in. Maximum
Casing Diameter ____ in. Depth 30 ft.
Surface Seal Depth ____ ft. Owner's Well Number SOMA-3

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum
Hole Diameter ____ in. Depth ____ ft.

STARTING DATE May 18, 2004

COMPLETION DATE May 19, 2004

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 14 APRIL 2004

PLEASE PRINT NAME ERIC JENNINGS

Rev.9-18-02

**FOR OFFICE USE**

PERMIT NUMBER W04-0491
WELL NUMBER
APN

**PERMIT CONDITIONS**
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS — MW#1

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 4-30-04

# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-6633 James Yoo
FAX (510) 782-1939
APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

## DRILLING PERMIT APPLICATION

**FOR APPLICANT TO COMPLETE**

LOCATION OF PROJECT 3519 Castro Valley Blvd
Castro Valley

CLIENT
Name Azim Shakoori
Address 3519 Castro Valley Blvd (510) 889-0579
City Castro Valley Zip 94930

APPLICANT
Name SOMA Environmental Engineering Fax (925) 244-6601
Address 2680 Bishop Dr Phone (925) 244-6600
City San Ramon Zip 94583

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ☐ | General | ☐ |
| Water Supply | ☐ | Contamination | ☐ |
| Monitoring | ☒ | Well Destruction | ☐ |

PROPOSED WATER SUPPLY WELL USE

| | | | |
|---|---|---|---|
| New Domestic | ☐ | Replacement Domestic | ☐ |
| Municipal | ☐ | Irrigation | ☐ |
| Industrial | ☐ | Other | ☐ |

DRILLING METHOD:

| | | | | | |
|---|---|---|---|---|---|
| Mud Rotary | ☐ | Air Rotary | ☐ | Auger | ☒ |
| Cable | ☐ | Other | ☐ | | |

DRILLER'S NAME Gregg Drilling & Testing

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 6 in. Maximum Depth 30 ft.
Casing Diameter ____ in. Owner's Well Number SOMA-4
Surface Seal Depth ____ ft.

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum
Hole Diameter ____ in. Depth ____ ft.

STARTING DATE May 18, 2004

COMPLETION DATE May 19, 2004

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] DATE 19 APRIL 2004

PLEASE PRINT NAME ERIC JENNINGS Rev.9-18-02

**FOR OFFICE USE**

PERMIT NUMBER W04-0492
WELL NUMBER
APN

**PERMIT CONDITIONS**
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS —1 well #1

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 4-30-04

**ALAMEDA COUNTY PUBLIC WORKS AGENCY**
**WATER RESOURCES SECTION**
**399 ELMHURST ST. HAYWARD, CA. 94544-1395**
**PHONE (510) 670-6633 James Yoo FAX (510) 782-1939**

# PERMIT NO. W04-0489-0492

WATER RESOURCES SECTION
GROUNDWATER PROTECTION ORDINANCE
**MW#1-GENERAL CONDITIONS: MONITIORING WELL**

1. Prior to installation of any monitoring wells into any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

2. The minimum surface seal thickness two inches of cement grout placed by tremie.

3. All monitoring wells shall have a minimum surface cement seal depth of five (5) feet or the maximum depth practicable or twenty (20) feet.

4. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

5. Permitte, permittee's, contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statues regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on-or off site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

6. No changes in construction procedures or well type shall change, as described on this permit application. This permit may be voided if it contains incorrect information.

7. Drilling Permit(s) can be voided/ canceled only in writing. It is the applicants responsibilities to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. **Permit is valid from May 18 to May 19, 2004**. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

8. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate State reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). **Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days. Including: permit number and site map.**

9. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

# Appendix B

Monitoring Well Borehole Logs

SOMA ENVIRONMENTAL ENGINEERING, INC.

# GEOLOGIC LOG OF BOREHOLE SOMA-1



BORING LOCATION

SEE SITE MAP

PROJECT: 2762

SITE LOCATION: 3519 Castro Valley Blvd
Castro Valley, CA

DRILLING METHOD: Hollow Stem Auger.

DRILLER: Gregg Drilling & Testing

LOGGED BY: E Jennings

DATE DRILLED: June 10, 2004

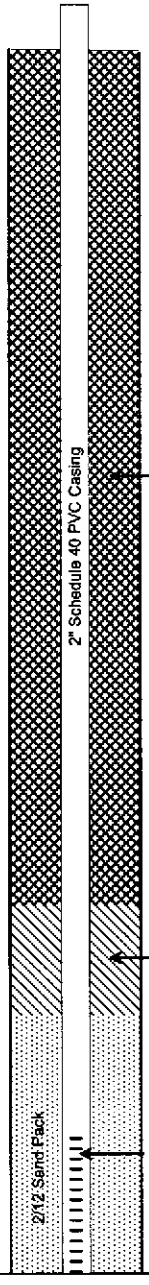
CASING ELEVATION:

DEPTH TO 1ST GW: 22'

APPROVED BY: M Sepehr

| PID ppm | DEPTH | GRAPHIC LOG | SOIL CLASS. | GEOLOGIC DESCRIPTION | SAMPLED (split spoon / core) | GW LEVEL | BLOWCOUNTS |
|---|---|---|---|---|---|---|---|
| | | | | 4" concrete over 4-6" base rock | HAND AUGERED TO 5' | | |
| | 5 | | CL | SILTY CLAY: dark brown, very soft, moist to very moist, high plasticity; Medium to high estimated permeability (MEK-HEK). No petroleum hydrocarbon (PHC) odor. | | | 3<br>7<br>9 |
| | 10 | | CL/ML | SILTY CLAY/ CLAYEY SILT: gray mottled orange brown, med. stiff to stiff, damp, slight plasticity; Low estimated permeability (LEK). No PHC odor. | | | 7<br>11<br>13 |
| | 15 | | CL/ML | As above. Becomes gray and slight bluish gray. Moderate to strong PHC odor. | | | 13<br>18<br>20 |
| | 20 | | ML/SM | SANDY SILT/SILTY SAND with some Clay: gray brown and slight orange brown, med. dense and med. stiff, moist; 40-60% fine to med. sand; LEK-MEK. No PHC odor. | | ▽ | 6<br>11<br>16<br>8<br>10<br>10 |
| | 25 | | | | | | 5<br>6<br>10 |

WELL DIAGRAM



ENVIRONMENTAL ENGINEERING, INC.

# GEOLOGIC LOG OF BOREHOLE SOMA-1



BORING LOCATION

SEE SITE MAP

PROJECT: 2762

SITE LOCATION: 3519 Castro Valley Blvd
Castro Valley, CA

DRILLING METHOD: Hollow Stem Auger.

DRILLER: Gregg Drilling & Testing

LOGGED BY: E Jennings

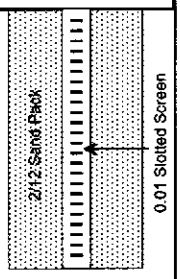
DATE DRILLED: June 10, 2004

CASING ELEVATION:

DEPTH TO 1ST GW: 22'

APPROVED BY: M Sepehr

| PID ppm | DEPTH | GRAPHIC LOG | SOIL CLASS. | GEOLOGIC DESCRIPTION | SAMPLED (split spoon / core) | GW LEVEL | BLOWCOUNTS | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| | | | SP/SM | SAND and SILTY SAND: gray brown and light orange brown, med. dense, saturated; 40-70% fine to med. sand; HEK. No PHC odor. | | | | |
| | | | ML/CL | CLAYEY SILT/ SILTY CLAY: dark brown, wet to saturated; HEK. No PHC odor. | | | | |
| | | | | SILTY CLAY: gray brown slightly mottled orange brown, med stiff, moist to very moist; LEK-MEK. No PHC odor. | | | | |
| | 30 | | | TOTAL DEPTH 30' | | | | |
| | | | | Groundwater first encountered at 22' and stabilized at 11.56' | | | | |
| | 35 | | | | | | | |
| | 40 | | | | | | | |
| | 50 | | | | | | | |
| | 55 | | | | | | | |



ENVIRONMENTAL ENGINEERING, INC.

# GEOLOGIC LOG OF BOREHOLE SOMA-2



BORING LOCATION

SEE SITE MAP

PROJECT: 2762

SITE LOCATION: 3519 Castro Valley Blvd
Castro Valley, CA

DRILLING METHOD: Hollow Stem Auger.

DRILLER: Gregg Drilling & Testing

LOGGED BY: E Jennings

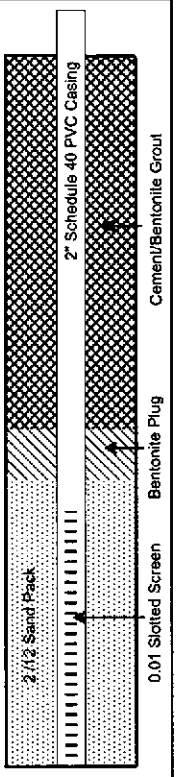
DATE DRILLED: June 10, 2004

CASING ELEVATION:

DEPTH TO 1ST GW: Approx 12'

APPROVED BY: M Sepehr

| PID ppm | DEPTH | GRAPHIC LOG | SOIL CLASS. | GEOLOGIC DESCRIPTION | SAMPLED (split spoon / core) | GW LEVEL | BLOWCOUNTS | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| | | | CL | 4" concrete over 4-6" base rock | HAND AUGERED TO 5' | | | |
| | 5 | | CL | SILTY CLAY with some FINE SAND: dark brown and gray brown slightly mottled orange brown, soft and med. stiff, moist, med. to high plasticity; <30% fine sand; Low to medium estimated permeability (LEK-MEK). No petroleum hydrocarbon (PHC) odor. | | | 2<br>7<br>8 | |
| | 10 | | | As above. Light gray and light gray brown and reddish orange brown with depth. | | ▽ | 10<br>13<br>26 | |
| | | | SM | FINE SILTY SAND: reddish brown and light gray brown, med. dense, very moist; 40-60% fine sand; MEK to high estimated permeability (HEK). No PHC odor. | | | 7<br>6<br>7 | |
| | 15 | | | TOTAL DEPTH 15' | | | | |
| | | | | Groundwater first encountered at 12' and stabilized at 10.60' | | | | |
| | 20 | | | | | | | |
| | 25 | | | | | | | |



ENVIRONMENTAL ENGINEERING, INC.

# GEOLOGIC LOG OF BOREHOLE SOMA-3



BORING LOCATION

SEE SITE MAP

PROJECT: 2762

SITE LOCATION: 3519 Castro Valley Blvd
Castro Valley, CA

DRILLING METHOD: Hollow Stem Auger.

DRILLER: Gregg Drilling & Testing

LOGGED BY: E Jennings

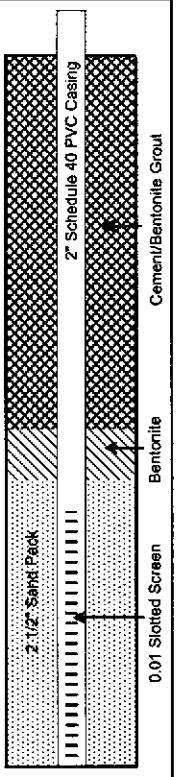
DATE DRILLED: June 10, 2004

CASING ELEVATION:

DEPTH TO 1ST GW: Approx 12'

APPROVED BY: M Sepehr

| PID ppm | DEPTH | GRAPHIC LOG | SOIL CLASS. | GEOLOGIC DESCRIPTION | SAMPLED (split spoon / core) | GW LEVEL | BLOWCOUNTS | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| | | | CL | 4" concrete over 4-6" base rock | HAND AUGERED TO 5' | | | |
| | 5 | | CL | SILTY CLAY with some FINE SAND: gray brown mottled orange brown, med. stiff dense, moist slightly plastic; <30% fine sand; Low estimated permeability (LEK). No petroleum hydrocarbon (PHC) odor. | | | 7 7 8 | |
| | 10 | | | As above. Reddish brown and moist with depth. | | ▽ | 9 8 9 | |
| | | | SM | FINE SILTY SAND: reddish brown slightly mottled gray, med. dense, very moist to wet; 40-60% wery fine to fine sand; High estimated permeability (HEK). No PHC odor. | | | 5 5 6 | |
| | 15 | | | TOTAL DEPTH 15' | | | | |
| | | | | Groundwater first encountered at 12' and stabilized at 9.90' | | | | |
| | 20 | | | | | | | |
| | 25 | | | | | | | |



ENVIRONMENTAL ENGINEERING, INC.

# GEOLOGIC LOG OF BOREHOLE SOMA-4



BORING LOCATION

SEE SITE MAP

PROJECT: 2762

SITE LOCATION: 3519 Castro Valley Blvd
Castro Valley, CA

DRILLING METHOD: Hollow Stem Auger.

DRILLER: Gregg Drilling & Testing

LOGGED BY: E Jennings

DATE DRILLED: June 10, 2004

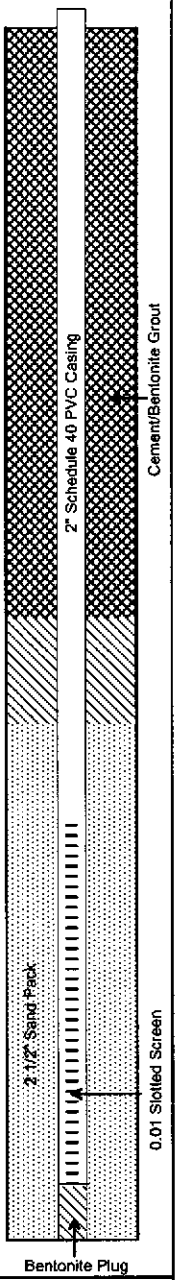
CASING ELEVATION:

DEPTH TO 1ST GW: Approx 16'-17'

APPROVED BY: M Sepehr

| PID ppm | DEPTH | GRAPHIC LOG | SOIL CLASS. | GEOLOGIC DESCRIPTION | SAMPLED (split spoon / core) | GW LEVEL | BLOWCOUNTS |
|---|---|---|---|---|---|---|---|
| | | | | 4" concrete over 4-6" base rock | HAND AUGERED TO 5' | | |
| | 5 | | SM | FINE SILTY SAND with some CLAY: gray to grayish brown mottled orange brown, med. dense, damp to moist; 40-60% fine sand; Low to med. estimated permeability (LEK). No petroleum hydrocarbon (PHC) odor. | | | 26<br>50 |
| | 10 | | SM/CL | SILTY SAND/ SILTY CLAY: reddish brown, dense and med. stiff, damp; LEK. Slight PHC odor. | | | 11<br>14<br>23 |
| | 15 | | CL | SILTY CLAY: brown, med. stiff to stiff, damp to moist, slightly plastic; LEK. No PHC odor. | | | 9<br>9<br>9 |
| | | | SM | SILTY SAND with some CLAY: gray and slight yellow brown, med. dense, very moist to wet; <60% fine sand; MEK to high estimated permeability (HEK). No PHC odor. | | ▽ | |
| | 20 | | SM/ML | SILTY SAND/ SANDY SILT: gray brown slightly mottled orange, med. dense, wet to saturated; 40-60% fine sand; MEK-HEK. No PHC odor. | | | 7<br>11<br>6<br>8<br>8 |
| | | | CL | SILTY CLAY with some SAND: gray brown slightly mottled orange brown, med. stiff; moist; LEK-MEK. No PHC odor. | | | |
| | 25 | | | TOTAL DEPTH 24.5' | | | |

WELL DIAGRAM




Groundwater first encountered at 16-17' and stabilized at 9.32'

# Appendix C

## Monitoring Well Development Logs

GREGG

# MONITORING WELL DEVELOPMENT LOG

Page _____ of _____

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level

Sample ID _____

Well Number SOMA 1
Date 6-17-04
Time Start: 7:30 End: _____
Client SOMA
Project _____
Job Number _____
Installation Date _____
Well Diameter 2"

Borehole Diameter 8"
Screen Length 8'
Measured Depth (pre-development) 29.47
Measured Depth (post-development) _____
Static Water Level (ft.) 11.56
Standing Water Column (ft.) 17.91
One Well Volume (gal.) 3.04
One Annulus Vol. (gal.) _____

Qty. of Drilling Fluid Lost _____
Minimum Gal. to be Purged 31
Development Method BAIL - SURGE - PUMP
_____
Purging Equipment SS BAILER, 2" PUMP
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter HORIBA U-10
Other _____

| Time | Amount Purged (gal.) | Field Parameters Measured | | | | | | | Comments | Field Tech. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | pH | EC | Turbidity | D.O. | ~~BIO~~ Temp. | SAL. | GPM / ~~WL~~ | | |
| 8:22 | 10 | 6.67 | 0.91 | >999 | — | 18.8 | 0.04 | 1.25 | CALIBRATE HORIBA pH 3.94 | |
| 8:26 | 15 | 6.78 | 0.93 | >999 | — | 19.8 | 0.04 | 1.25 | COND 4.52 TURB 0 TEMP 19.1 | |
| 8:30 | 20 | 6.86 | 0.89 | >999 | — | 19.5 | 0.03 | 1.25 | BAILED 3 GAL. - START SURGE | 7:45 |
| 8:35 | 25 | 6.94 | 0.88 | >999 | — | 19.6 | 0.03 | 1.25 | STOP 8:05 - BAIL 3 GAL - 6.2 | ~13.5 |
| 8:40 | 30 | 6.93 | 0.87 | >999 | — | 19.6 | 0.03 | 1.25 | | |
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**FINAL FIELD PARAMETER MEASUREMENTS**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

GREGG

# MONITORING WELL DEVELOPMENT LOG

Page _____ of _____

All measurements taken from: [X] Top of Casing [ ] Protective Casing [ ] Ground Level

Well Number SOMA 2
Date 6-17-04
Time Start: 9:00 End: 10:00
Client SOMA
Project
Job Number
Installation Date
Well Diameter 2"

Borehole Diameter 8"
Screen Length 5'
Measured Depth (pre-development) 14.75
Measured Depth (post-development)
Static Water Level (ft.) 10.60
Standing Water Column (ft.) 4.15
One Well Volume (gal.) 0.71
One Annulus Vol. (gal.)

Sample ID
Qty. of Drilling Fluid Lost
Minimum Gal. to be Purged 7
Development Method SURGE - BAIL
Purging Equipment SS BAILER
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter HORIBA U-10
Other

| Time | Amount Purged (gal.) | Field Parameters Measured: pH | EC | Turbidity | D.O. | ~~D.O.~~ Temp. | SAL. | GPM / W.L. | Comments | Field Tech. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9:25 | 2 | 8.05 | 1.87 | >999 | — | 19.3 | 0.08 | | NO SEDIMENT ON BOTTOM | |
| 9:29 | 4 | 7.92 | 1.80 | >999 | — | 19.1 | 0.08 | | SURGED 15 MIN | |
| 9:34 | 6 | 7.99 | 1.65 | >999 | — | 19.0 | 0.07 | W.L. 14.0 | -LET RECHARGE 10 MIN | |
| 9:47 | 7 | 7.82 | 1.56 | >999 | — | 18.9 | 0.07 | | | |
| | | | | | | | | | | |
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**FINAL FIELD PARAMETER MEASUREMENTS**

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|---|---|---|---|---|---|---|---|---|---|---|
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GREGG

# MONITORING WELL DEVELOPMENT LOG

Page _____ of _____

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level

Well Number SOMA 3
Date 6-17-04
Time Start: 10:05 End: 10:55
Client SOMA
Project
Job Number
Installation Date
Well Diameter 2"

Borehole Diameter 8"
Screen Length 5'
Measured Depth (pre-development) 14.82
Measured Depth (post-development)
Static Water Level (ft.) 9.90
Standing Water Column (ft.) 4.92
One Well Volume (gal.) 0.84
One Annulus Vol. (gal.)

Sample ID
Qty. of Drilling Fluid Lost
Minimum Gal. to be Purged 9
Development Method SURGE - BAIL
Purging Equipment SS BAILER
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter HORIBA U-10
Other

| Time | Amount Purged (gal.) | Field Parameters Measured | | | | | | | Comments | Field Tech. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | pH | EC | Turbidity | D.O. | ~~DO~~ Temp. | SAL. | ~~GPM~~ / W.L. | | |
| 10:29 | 2 | 7.85 | 1.57 | >999 | — | 20.6 | 0.07 | 11.40 | NO SEDIMENT - SURGED 15 MIN | |
| 10:33 | 4 | 7.40 | 1.24 | >999 | — | 20.2 | 0.05 | 11.60 | | |
| 10:37 | 6 | 7.29 | 1.09 | >999 | — | 20.0 | 0.04 | 11.76 | | |
| 10:41 | 8 | 7.26 | 1.01 | >999 | — | 19.8 | 0.04 | 11.80 | | |
| 10:45 | 10 | 7.27 | 1.00 | >999 | — | 19.8 | 0.04 | 11.80 | | |
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**FINAL FIELD PARAMETER MEASUREMENTS**

GREGG

# MONITORING WELL DEVELOPMENT LOG

Page _____ of _____

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level

Sample ID _____

Well Number SOMA 4
Date 6-17-04
Time Start: 11:00 End: _____
Client SOMA
Project _____
Job Number _____
Installation Date _____
Well Diameter 2"

Borehole Diameter 8"
Screen Length 8'
Measured Depth (pre-development) 22.72
Measured Depth (post-development) 22.72
Static Water Level (ft.) 9.32
Standing Water Column (ft.) 13.40
One Well Volume (gal.) 2.28
One Annulus Vol. (gal.) _____

Qty. of Drilling Fluid Lost _____
Minimum Gal. to be Purged 23
Development Method BAIL-SURGE-PUMP
_____
Purging Equipment SS BAILER, 2" PUMP
Water Level Equipment SOLINST
pH/EC Meter HORIBA U-10
Turbidity Meter HORIBA U-10
Other _____

| Time | Amount Purged (gal.) | Field Parameters Measured | | | | | | | Comments | Field Tech. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | pH | EC | Turbidity | D.O. | ~~D.O.~~ Temp. | SAL. | GPM / W.L. | | |
| 11:43 | 8 | 7.30 | 1.29 | >999 | — | 22.7 | 0.05 | 1.0 | BAILED 3GAL. - STARTED SURGE 11:10 | |
| 11:47 | 12 | 7.06 | 1.17 | >999 | — | 22.5 | 0.05 | 1.0 | STOPPED - 11:25 / BAILED 3 GAL | |
| 11:51 | 16 | 7.03 | 1.14 | >999 | — | 21.8 | 0.05 | 1.0 | | |
| 11:56 | 20 | 7.18 | 1.08 | >999 | — | 22.3 | 0.04 | 1.0 | | |
| 12:00 | 24 | 7.20 | 1.12 | >999 | — | 22.5 | 0.05 | 1.0 | | |
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**FINAL FIELD PARAMETER MEASUREMENTS**

# Appendix D

## Monitoring Well Survey Data

DATE: 6/21/04
JOB# A0459

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL
3519 CASTRO VALLEY BLVD., CASTRO VALLEY

| WELL ID # | NORTHING (FT.) / LATITUDE (D.M.S.) | EASTING (FT.) / LONGITUDE (D.M.S.) | ELEVATION (FT.) | DESCRIPTION |
|---|---|---|---|---|
| ESE-1 | 2079361.15 | 6106465.13 | 180.24 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 42.07112" | W 122° 04' 24.07899" | 180.71 | SET PUNCH NORTH SIDE RIM |
| | | | 180.69 | PAVEMENT NORTH SIDE |
| | | | | |
| ESE-2 | 2079361.30 | 6106501.97 | 180.79 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 42.07873" | W 122° 04' 23.62071" | 181.16 | SET PUNCH NORTH SIDE RIM |
| | | | 181.14 | CONC. NORTH SIDE |
| | | | | |
| ESE-5 | 2079381.46 | 6106387.63 | 178.80 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 42.25902" | W 122° 04' 25.04739" | 179.07 | FELT X ON NORTH SIDE RIM |
| | | | 179.10 | CONC. NORTH SIDE |
| | | | | |
| MW-6 | 2079451.94 | 6106492.77 | 181.80 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 42.97323" | W 122° 04' 23.75412" | 181.97 | SET PUNCH NORTH SIDE RIM |
| | | | 181.88 | GROUND NORTH SIDE |
| | | | | |
| MW-7 | 2079337.18 | 6106516.12 | 179.11 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 41.84264" | W 122° 04' 23.43963" | 179.55 | SET PUNCH NORTH SIDE RIM |
| | | | 179.49 | CONC. NORTH SIDE |
| | | | | |
| SOMA-1 | 2079370.39 | 6106506.79 | 180.95 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 42.16939" | W 122° 04' 23.56265" | 181.25 | SET PUNCH NORTH SIDE RIM |
| | | | 181.22 | CONC. NORTH SIDE |
| | | | | |
| SOMA-2 | 2079297.44 | 6106567.02 | 178.99 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 41.45825" | W 122° 04' 22.79809" | 179.29 | SET PUNCH NORTH SIDE RIM |
| | | | 179.28 | CONC. NORTH SIDE |
| | | | | |
| SOMA-3 | 2079130.83 | 6106567.48 | 176.81 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 39.81129" | W 122° 04' 22.75752" | 177.18 | SET PUNCH NORTH SIDE RIM |
| | | | 177.12 | PAVEMENT NORTH SIDE |
| | | | | |
| SOMA-4 | 2079141.57 | 6106464.22 | 176.94 | 2" PVC, NOTVH N. SIDE |
| | N 37° 41' 39.9003" | W 122° 04' 24.04438" | 177.43 | SET PUNCH NORTH SIDE RIM |
| | | | 177.44 | PAVEMENT NORTH SIDE |
| | | | | |
| | | | | |

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DATE: 6/21/04
JOB# A0459

# TABLE OF ELEVATIONS & COORDINATES ON MONITORING WELLS

SOMA ENVIRONMENTAL
3519 CASTRO VALLEY BLVD., CASTRO VALLEY

## ADDITIONAL POINTS

| PT# | NORTHING (FT.) | EASTING (FT.) | ELEVATION (FT.) | DESCRIPTION |
|---|---|---|---|---|
| 320 | 2079386.87 | 6106408.85 | N/A | BL. INTX |
| 321 | 2079387.18 | 6106455.22 | N/A | BL. INTX |
| 331 | 2079351.06 | 6106409.27 | N/A | BL< |
| 318 | 2079384.55 | 6106369.10 | N/A | DWY |
| 329 | 2079106.74 | 6106368.58 | N/A | DWY |
| 330 | 2079148.74 | 6106368.66 | N/A | DWY |
| 317 | 2079424.72 | 6106369.39 | N/A | DWY E-C |
| 315 | 2079481.34 | 6106432.38 | N/A | DWY PCC |
| 310 | 2079415.57 | 6106624.48 | N/A | DWY POC |
| 311 | 2079423.23 | 6106606.56 | N/A | DWY POC |
| 312 | 2079447.91 | 6106542.76 | N/A | DWY POC |
| 313 | 2079461.36 | 6106504.01 | N/A | DWY POC |
| 314 | 2079472.67 | 6106468.07 | N/A | DWY POC |
| 316 | 2079466.76 | 6106389.18 | N/A | HCRMP POC |
| 319 | 2079237.38 | 6106368.78 | N/A | TC |

**BENCH MARK:** NGS Bench mark No.PID# HT0223

THE STATION IS LOCATED IN THE CITY OF HAYWARD AT THE RAILROAD CROSSING OF THE SOUTHERN PACIFIC RAIL-ROAD AND BLOSSOM WAY, IN THE TOP OF THE NORTHWEST CURB OF BLOSSOM WAY.

TO REACH THE STATION FROM THE JUNCTION OF U S HIGHWAY 880 ON WEST A STREET, GO SOUTHEAST ON WEST A STREET FOR 0.2 MILES TO A CROSSROAD, HATHAWAY AVE ON THE LEFT, SANTA CLARA STREET ON THE RIGHT. TURN LEFT, NORTH, ON HATHAWAY AVENUE AND CONTINUE FOR 0.7 MILES TO WEST BLOSSOM WAY. TURN RIGHT, NORTH, ON WEST BLOSSSOM WAY AND CONTINUE FOR 0.25 MILES TO THE STATION ON THE LEFT, JUST PAST THE RAIL-ROAD TRACKS.

THE STATION IS 48.95 M (160.6 FT) NORTHEAST OF THE NORTHEAST RAIL, 7.01 M NORTHWEST OF THE CENTER OF BLOSSOM WAY, 0.24 M (0.8 FT) NORTH OF THE NORTH CORNER OF A STEEL GRATE IN THE STREET, 5.6 M (18.5 FT) SOUTHWEST OF A POWER POLE AND 0.12 M (0.4 FT) HIGHER THAN THE STREET.

Elevation =56.33 FEET NAVD88 Datum ADJUSTED

**HORIZONTAL CONTROL:**

**PID - HT0223**
NORTHING =2,072,670.26 , EASTING = 6,095,650.79 FEET; EPOCH DATE = 1998.50

**PID - HT 2583**
NORTHING =2,082,510.30 , EASTING = 6,116,892.13 FEET; EPOCH DATE = 1991.35

Coordinate values are based on the California Coordinate System, Zone III NAD 83 Datum.



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