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Solving environment-related business problems worldwide

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March 17, 2006

Amir Gholami
Alameda County
Department of Environmental Health
1131 Harbor Bay Park Way
Alameda, CA 94502

Subject: **Work Plan for the Replacement and Installation of Monitoring Wells**
Case Number # 3580
Former RPMS (E-Z Serve) Location 100877
525 West A Street
Hayward, California
Delta Project RPMS0-877

Dear Mr. Gholami:

Delta Environmental Consultants, Inc, (Delta) has been authorized by Restructure Petroleum Services of California, to provide environmental consulting and remediation services at the subject sites. Delta was informed by the site owner of plans to construct a new gas station on site. The plans include the construction of a building which would destroy monitoring well MW-2. This work plan proposes the proper destruction of MW-2, a location for the replacement of MW-2 (MW-2A), as well as the installation of two new monitoring wells. The location of the Site is shown on Figure 1 and the site features are shown on Figure 2.

Site Background

The site is currently vacant. There are no underground storage tanks (USTs) or dispensers currently on-site; however, the canopy and remnant concrete islands are still present.

In November 1986, Converse Environmental Consultants of California (CECC) conducted an initial phase of assessment as a result of a suspected fuel system leak. The assessment consisted of the installation of three groundwater monitor wells (MW-1 through MW-3), each to total a depth of 30 feet below ground surface (bgs).

In June 1987, CECC conducted another phase of assessment, which included the installation of three additional groundwater monitor wells (MW-4 through MW-6).

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On June 15, 1990, the original USTs were removed. The former UST system consisted of four 10,000-gallon gasoline USTs, and three fuel dispenser islands. The 10,000-gallon USTs were located in the northwestern portion of the property. The fuel dispenser islands were located in the center of the site. The original wells named MW-2 through MW-6 were destroyed during UST removal activities in June 1990. Hereafter, MW-1 is designated as MW-1A. Based on field observations and analytical results, the USTs were suspected to be the source of the release.

In January 1992, Associated Soil Analysis, Inc. (ASA) performed a third site investigation. During this investigation six groundwater monitor wells (MW-1 through MW-6) were installed on-site. All the wells were installed to a total depth of 30 feet bgs, and had a screened interval from approximately 15 to 30 bgs. The soil samples submitted for laboratory analysis indicated low levels or levels below the laboratory reporting limit of fuel hydrocarbons. Details of this assessment were presented in the ASA *Site Assessment Report*, dated May 2, 1992.

In June 1993, ASA installed four groundwater monitor wells (MW-7 through MW-10). The total depth of each well is 30 feet bgs and the wells are screened from 10 to 30 feet bgs. Analytical results of soil samples obtained from well boring MW-7 at an approximate depth of 15 feet bgs, and from well borings MW-9 and MW-10 at approximate depths of 10 and 15 feet bgs indicated the presence of low levels of fuel hydrocarbon constituents. Petroleum hydrocarbon constituents were not detected above laboratory reporting limits in the remaining soil samples submitted for analytical testing. Details of this assessment were presented in the ASA *Site Assessment Study for Petroleum Constituents in Soil and Groundwater*, dated July 20, 1993.

In February 1995, Brown and Caldwell (BC) installed four groundwater monitoring wells (MW-11 through MW-14). Also, prior to well installation activities, seventeen hydro-punch borings were advanced within the rights-of-way of West A Avenue, Victory Drive, Garden Street, and Lupine Street in an effort to locate the best position of wells MW-11 through MW-14. Monitoring well MW-11 was installed to a total depth of 25 feet bgs and was screened from approximately 5 to 25 feet bgs. Monitoring wells MW-12 through MW-14 were each installed to a total depth of approximately 30 feet bgs and screened from approximately 10 to 30 bgs. Low levels of petroleum hydrocarbons were detected in the soil samples obtained during drilling of well borings MW-11 through MW-14. Details of this assessment were presented in the BC *Draft Step 5, Phase II Site Investigation Report*, dated March 1, 1995.

On June 20, 2002, ATC oversaw the installation of three vapor extraction/air sparge remediation wells (VEAS-1 through VEAS-3). The wells were installed to 30 feet bgs and screened from 5 to 15 feet bgs. On June 24, 2002, ATC oversaw the installation of one groundwater extraction well (EX-1) to a depth of 35 feet bgs. The extraction well is screened from 10 to 25 feet bgs. Fifteen of the twenty-four soil samples submitted for laboratory analysis reported concentrations of petroleum hydrocarbon constituents above their respective laboratory equipment practical quantization limits. Details of this assessment were presented in ATC's *Remediation Well Installation Report*, dated August 14, 2002.

Delta has been performing quarterly groundwater monitoring since October 2004.

Site and Area Lithology

The subject site is located within the San Leandro cone, a low gradient alluvial fan, which originates at the mouth of Castro Valley and spreads westward onto the Bay Plain. This cone consists of alluvial sediments, which overlie marine clay, terrigenous sand and silt of inter-tidal provenances. Based on previous investigations, shallow soils consist of silty clay, clay, clayey silt, silty sand, and sand to a total depth of approximately 30 feet bgs (the maximum depth explored).

The Hayward Fault, the San Andreas Fault and the Calaveras Fault are the closest major faults in the vicinity of the site.

Area Hydrology and Hydrogeology

The shallowest regional aquifer in the area is the Newark Aquifer, which consists of permeable water bearing alluvial sand. The Newark Aquifer consists of series of laterally discontinuous saturated lenses of coarse to fine-grained sediments 10 to 100 feet thick at depths less than 200 feet bgs. The regional hydraulic gradient is westward, from the mouth of the Castro Valley towards the San Francisco Bay. The nearest water wells in the area indicate depths to the first water table to be 6 to 21 feet bgs.

An inventory of wells within a ½ mile radius of the site was compiled by ASA. This list was compiled from available well logs and permits at the Alameda County Flood Control and Water Conservation District, Hayward Quadrangle files. Fifteen wells are located within a ½ mile radius of the site, five of which are located within approximately 1,500 feet of the site. Ten of the wells are categorized as shallow (terminating less than 100 feet bgs) with the remaining five having greater depths. Of the ten shallow wells, five are used for water supply, three for groundwater monitoring, and two for unspecified uses.

Based on the groundwater monitoring event conducted by Delta on November 10, 2005, the groundwater flows toward the west to southwest at a gradient of approximately 0.007.

Scope of Work

The site owner has informed Delta of his plans for the construction of a building which would cover monitoring well MW-2. Delta proposes the proper destruction and replacement of this well before construction commences. Figure 2 highlights the outline of the proposed building and the well that would be affected by the construction. Due to the long-term inaccessibility of down-gradient monitoring wells MW-9 and MW-11, Delta proposes installing monitoring wells MW-15 and MW-16 to further delineate petroleum hydrocarbons impacts on groundwater.

Pending approval of this work plan, Delta will obtain all necessary permits from the appropriate parties prior to commencing field work. Once the investigation is done Delta will submit a Well Destruction and Installation Report presenting the results of the activities performed on site.

Destruction of Well

Monitoring well MW-2 will be pressure grouted using a tremie hose or pipe with neat cement grout, mixed per state standards. The top five feet of casing will be over drilled with an 8" truck-mounted, hollow stem auger. The boring will be filled neat portland cement and the surface of the boring will be capped as appropriate to match the surrounding area.

Monitoring Well Construction

Replacement monitoring well MW-2A and new water monitoring wells MW-15 and MW-16 will be constructed of 2-inch diameter, flush-threaded, Schedule 40 PVC casing installed to a total depth of approximately 30 feet bgs. The wells will be screened over the lower most 20 feet with a 0.020-inch slotted casing. The annular space in each well will be filled with No. 3 Lonestar Sand (filter pack) from one foot above the top of the well screen to the maximum depth of the well. A two foot thick bentonite seal will be placed above the filter pack. The annular space above the bentonite seal will be filled with cement grout containing up to 5 percent bentonite. An eight inch diameter traffic rated well box will be installed to protect the wellhead and the surface will be made to match present ground surface. A well construction diagram is included as Figure 3.

Surveying of Wells

The elevation of a reference point on each newly installed monitoring well casing and the ground surface immediately adjacent to the well will be surveyed by a licensed land surveyor. To comply with State of California Assembly Bill AB2886, Delta will request the surveyor to reference the location of the newly installed wells and soil borings to the California State Coordination System using Global Positioning Satellite (GPS) surveying. The top-of-casing (TOC) elevation of the monitoring well and ground surface elevation will be surveyed relative to mean sea-level within 0.01-foot.

Soil Stockpile

Soil generated by drilling activities will be placed in 55 gallon drums and temporarily stored on site. Pending the laboratory analytical results, the soil will be disposed of at an appropriate licensed disposal facility.

Remarks

The recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Delta's Client and anyone else specifically listed on this report. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this report.

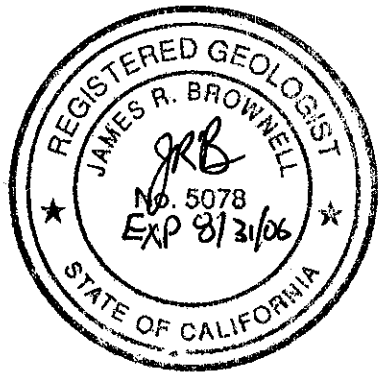
If you have any questions regarding this project, please contact me at (916) 503-1275.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

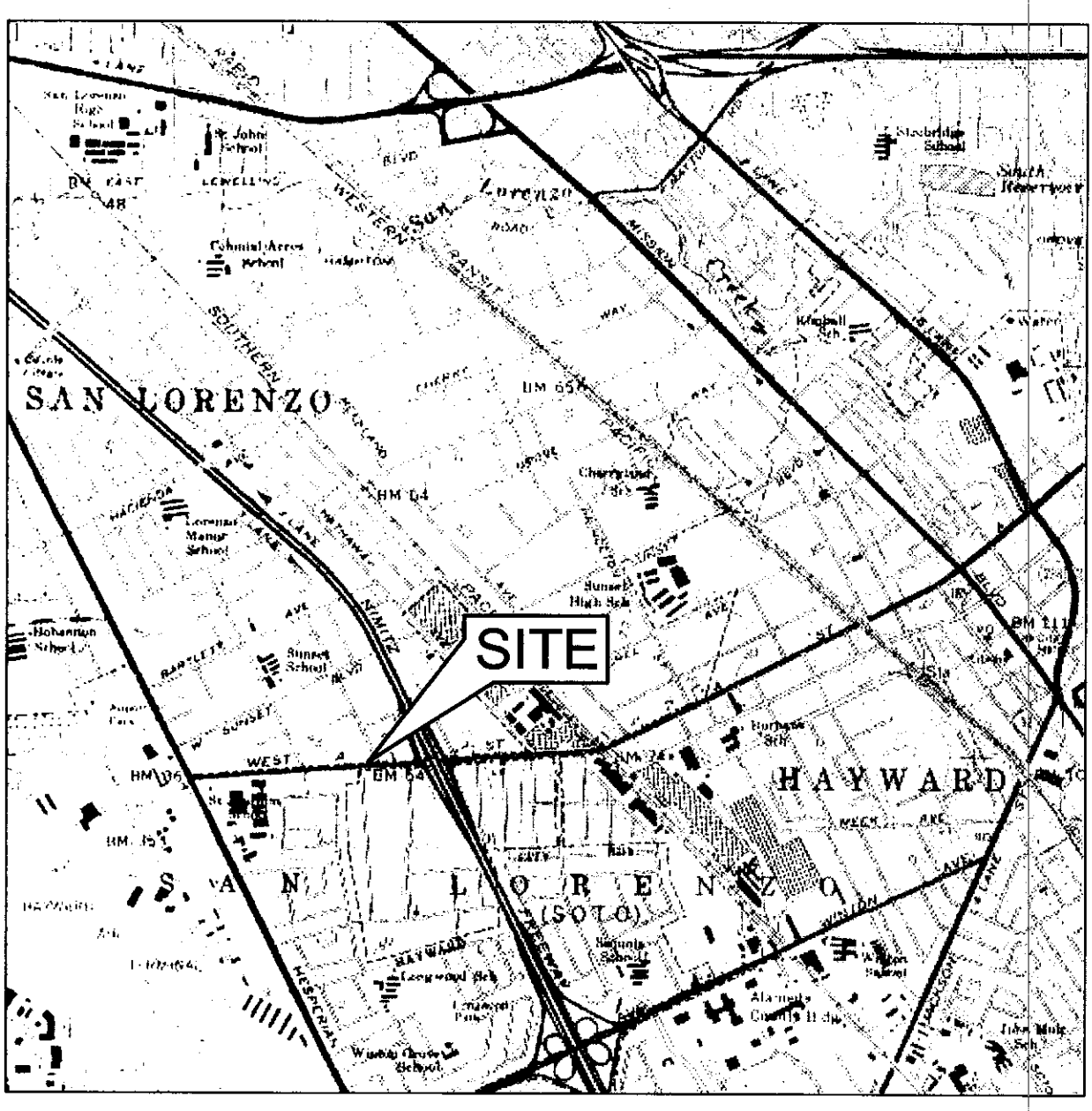
Deborah Shulman
Staff Geologist

Jim Brownell
California Professional Geologist No. 5078



Enclosures
cc: Jack Ceccarelli, RPMS of CA

FIGURES



0 1000 FT 2000 FT

SCALE: 1 : 24,000

North

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, HAYWARD QUADRANGLE, 1962

FIGURE 1

SITE LOCATION MAP

FORMER E-Z SERVE NO. 100877
525 WEST A STREET
HAYWARD, CALIFORNIA

PROJECT NO. RPMS-0877	DRAWN BY MC 11/10/04
FILE NO. EZ-100877-F1	PREPARED BY JS
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

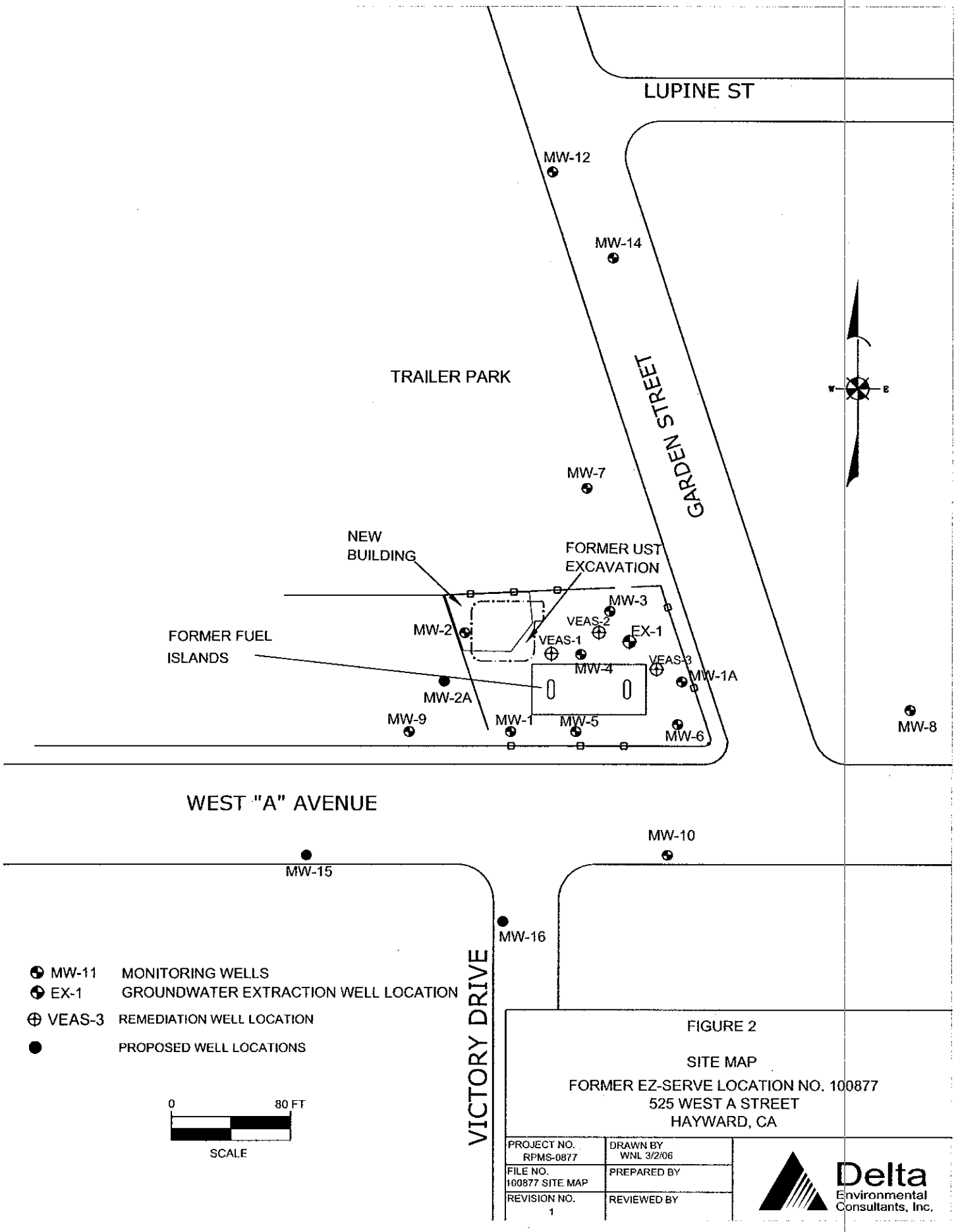


FIGURE 2

SITE MAP

FORMER EZ-SERVE LOCATION NO. 100877
525 WEST A STREET
HAYWARD, CA

PROJECT NO. RPMS-0877	DRAWN BY WNL 3/2/06
FILE NO. 100877 SITE MAP	PREPARED BY
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

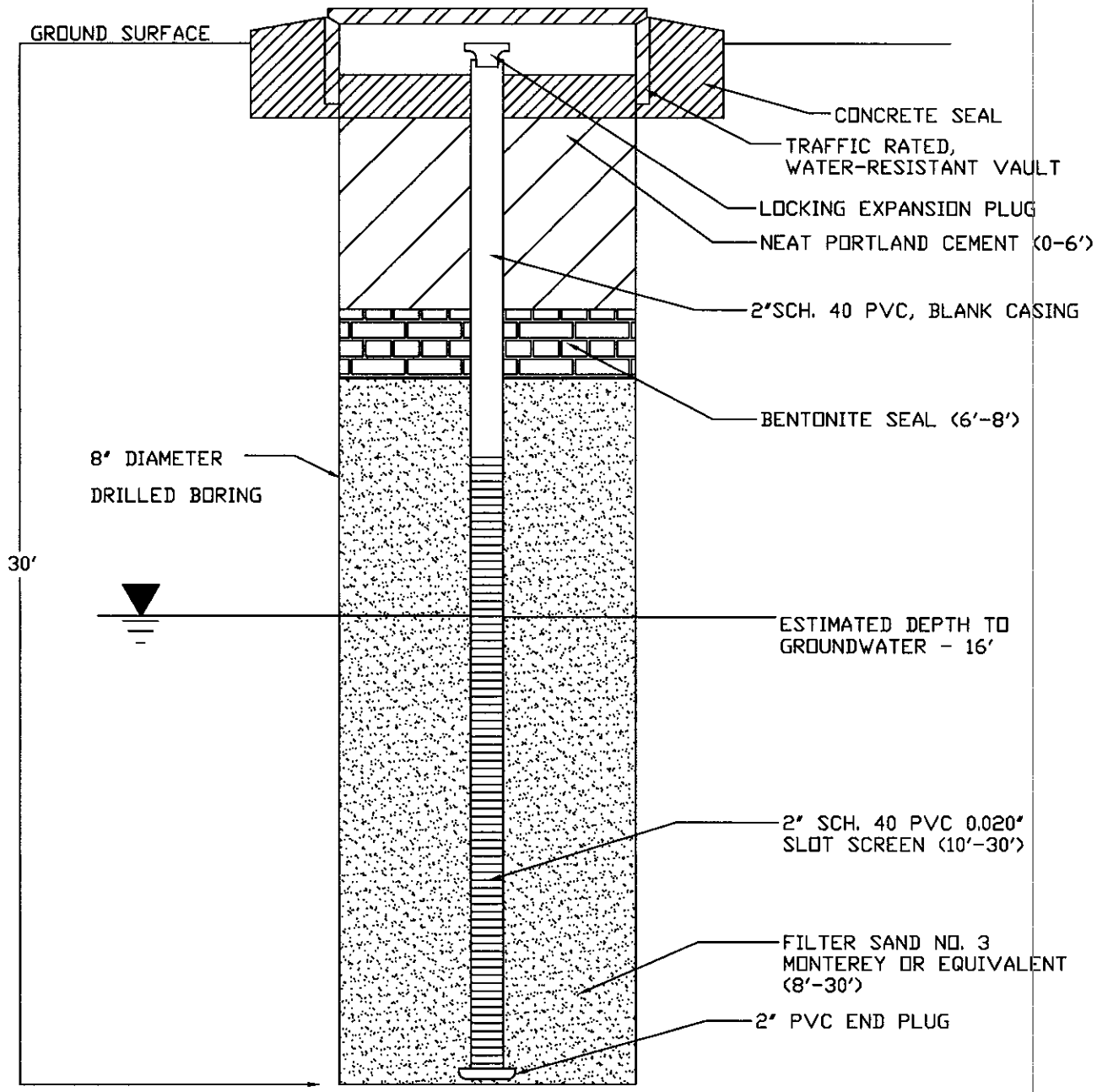


FIGURE 3

PROPOSED MONITORING WELLS (MW-2A, MW-15 & MW-16)
CONSTRUCTION DETAIL

FORMER E-Z SERVE NO. 100877
525 WEST A STREET
HAYWARD, CALIFORNIA

PROJECT NO. RPMS0877	DRAWN BY WNL 3/3/06
FILE NO. PROP-MW	PREPARED BY DS
REVISION NO.	REVIEWED BY

Delta Environmental Consultants, Inc.

ENCLOSURE A

Field Methods and Procedures

Health and Safety Plan

Field work performed by Delta and Delta's subcontractors at the site is conducted according to guidelines established in a Site Health and Safety Plan (SHSP). The SHSP is a document which describes the hazards that may be encountered in the field and specifies protective equipment, work procedures, and emergency information. A copy of the SHSP is at the site and available for reference by appropriate parties during work at the site.

Locating Underground Utilities

Prior to commencement of work on-site, Delta researches the location of all underground utilities with the assistance of Underground Service Alert (USA). USA contacts the owners of the various utilities in the vicinity of the site to have the utility owners mark the locations of their underground utilities. Work associated with the boring and monitoring well installation is preceded by manual hand augering to a minimum depth of 5 feet below surface grade (bsg) to avoid contact with underground utilities.

Soil Sampling and Contamination Reduction

Soil borings and soil sampling are performed under the direction of a Delta geologist. The soil borings are advanced using a truck-mounted drill rig.

To reduce the chances of cross-contamination between boreholes, all downhole drilling equipment are steam-cleaned between each boring. To reduce cross-contamination between samples, the barrel sampler is washed in a soap solution and double-rinsed between each sampling event. Upon recovery, a portion of the soil sample is placed into a plastic bag and sealed for later screening with a photoionization detector (PID). Another portion of the soil sample is used for classification and description. That part of the soil sample collected in the leading brass tube within the California-type sampler is stored at approximately 4°C for transport to the laboratory.

Soil Classification

As the samples are obtained in the field, they are classified by the geologist in accordance with the Unified Soil Classification System, Visual/Manual Method (USCS). Logs of the borings indicating the depth and identification of the various strata, the N value, and pertinent information regarding the method of maintaining and advancing the borehole are made.

Soil Sample Screening/hNu Portable Photoionization Detector Method

After the soil sample in the plastic bags have been brought to ambient temperature, the headspace vapors of the soil sample in the bag are screened with a PID equipped with a 10.2 eV lamp. The sample corner of the bag will be opened and the detector probe immediately placed within the headspace. The highest observed readings are recorded.

Monitoring Well Gravel Pack and Slot Size Selection

The gravel pack is selected such that it will permit the development of a zone of higher hydraulic conductivity adjacent to the well screen but will reduce piping of the finer-grained formation materials into the well. The slot size of the well screen is selected such that it will retain a minimum of 95 percent of the gravel pack material.

Monitoring Well Development

After monitoring wells are installed, each monitoring well is developed with a surge block and bailer (or pump) until the water produced is relatively sediment-free and until the conductivity, pH, and temperature stabilize. If the well is pumped dry during the development process, recharge rates will be recorded. No water or chemicals will be introduced into the monitoring wells during well development. All developed water will be placed in drums on-site for later disposal.

Sample Identification and Chain-of-Custody Procedures

Label information includes a unique sample identification number, job identification number, date, and time. After labeling, samples are placed in a Ziploc® type bag and placed in an ice chest cooled to approximately 4° Celsius. Chemical preservation is controlled by the required analysis and is noted on the chain-of-custody form.

Sample identification and chain-of-custody procedures document sample possession from the time of collection to ultimate disposal. Each sample container submitted for analysis has a label affixed to identify the job number, sampler, date and time of sample collection, and a sample number unique to that sample. This information, in addition to a description of the sample, field measurements made, sampling methodology, names of on-site personnel, and any other pertinent field observations, is recorded in the field records. A California-certified laboratory analyzes samples.

A chain-of-custody form is used to record possession of the sample from time of collection to its arrival at the laboratory. When the samples are shipped, the person in custody of them relinquishes the samples by signing the chain-of-custody form and noting the time. The sample-control officer at the laboratory verifies sample integrity and confirms that the samples are collected in the proper containers, preserved correctly, and contain adequate volumes for analysis.

If these conditions are met, each sample is assigned a unique log number for identification throughout analysis and reporting. The log number is recorded on the chain-of-custody form and in the legally required logbook maintained by the laboratory in the laboratory. The sample description, date received, client's name, and other relevant information is also recorded.