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Alameda County
Environmental Health

ConocoPhillips

76 Broadway
Sacramento, California 95818

March 16, 2009

Barbara Jakub
Alameda County Health Agency
1131 Harbor Bay parkway, Suite250
Alameda, California 94502-577

Re: ***Revised Work Plan—Site Investigation and Injection Well Installation Prior to Property Development***
Former 76 Service Station # 0843 RO # 0450
1629 Webster Street
Alameda, CA

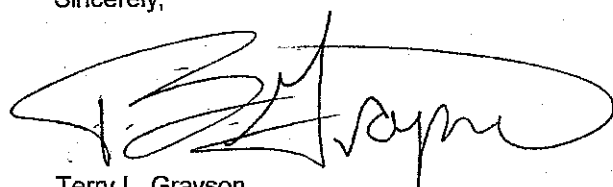
Dear Ms. Jakub:

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

Per the several discussions of the site and the pending development plans your expedited review and approval of this revised plan if possible by or prior to Wednesday April 1st, would be greatly appreciated.

If you have any questions or need additional information, please call me at (916) 558-7666.

Sincerely,



Terry L. Grayson
Site Manager
Risk Management & Remediation

March 16, 2009

Ms. Barbara Jakub
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

**RE: Work Plan – Site Investigation and
Well Installations
Former 76 Station No. 0843
1629 Webster Street
Alameda, California**



Dear Ms. Jakub:

On behalf of Conoco Phillips Company (COP), Delta Consultants (Delta) has prepared this work plan proposing the abandonment of two monitoring wells (MW-1 and MW-2A), installing two replacement monitoring wells (MW-1AR and MW-1BR), and a Cone Penetration Test (CPT) boring confirming the hotspot near the original boring of CPT-01 in order to further determine the petroleum hydrocarbon impact to the groundwater on-site and down-gradient of the site located at 1629 Webster Street in Alameda, California (Figure 1).

The vertical extent of the petroleum hydrocarbon impact to the soil and the groundwater has been defined. Additionally, it appears that the hydrocarbon plume at this site has commingled with the hydrocarbon plume originating from the up-gradient Shell station and has migrated off-site, down-gradient of this site. The proposed locations of the new and replacement monitoring wells MW-1AR and MW-1BR, five (5) monitoring wells (MW-7, MW-8, MW-9, MW-10, and MW-11), one (1) ozone sparge well (TSP-1), and the CPT boring are shown on Figure 2.

SITE DESCRIPTION

The site is located at the southwest corner of the intersection of Webster Street and Pacific Avenue in Alameda California. The site is currently an inactive service station with the fuel dispenser, one underground waste-oil tank, and two underground gasoline storage tanks (UST's) having been previously removed.

PREVIOUS ASSESSMENT

June 1998 - Tosco Marketing Company (Tosco, now ConocoPhillips) removed two 10,000-gallon gasoline underground storage tanks (USTs), one 550-gallon used oil UST, product lines and dispensers. Two holes approximately 3/4-inch in diameter were observed in the used oil tank during removal. Approximately 338 tons of hydrocarbon impacted soil and backfill were removed from beneath the former USTs, dispensers, and product lines during the UST removal activities.

March 1999 - Four soil borings (B1 through B4) were advanced at the site and were subsequently converted into monitoring wells MW-1 through MW-4. Groundwater was encountered from 8 to 15 feet below ground surface (bgs). Static water was observed between 4 and 6 feet bgs subsequent to well installation.

December 1999 - Two offsite soil borings (B5 and B6) were advanced and subsequently converted to monitor wells MW-5 and MW-6. Groundwater was initially present at approximately 10 feet below bgs. Static water was observed at 7 feet bgs subsequent to well installation.

March 2001 - An underground utility survey was conducted to identify and locate underground utilities beneath and in the vicinity of the site that could provide potential preferential pathways for groundwater flow.

May 2001 - Five direct-push soil borings (GP-1 through GP-5) were installed to evaluate whether underground utilities in the vicinity of the site are providing preferential pathways for groundwater flow and the migration of dissolved hydrocarbons. The results of the investigation indicated insufficient evidence that underground utility lines were providing preferential pathways for the off-site migration of dissolved petroleum hydrocarbons.

December 2001 - Twelve direct-push soil borings (GP-6 through GP-17) were completed to further assess the extent of residual hydrocarbons in the vadose zone beneath the site. The results of the investigation indicated that the extent of the residual hydrocarbon impact detected in the previous investigations was limited.

December 2002 - One on-site monitoring well (MW-2) was destroyed during remedial excavation of hydrocarbon-impacted soil. This well was completed in the vicinity of the former eastern dispenser island and was replaced with on-site backfill monitoring well MW-2A. Approximately 292 tons of hydrocarbon-impacted soil was removed from beneath the former eastern dispenser island.

September 2003 - A *Request and Work Plan for Closure* prepared by ERI was submitted to the Alameda County Health Care Services Agency (ACHCSA), dated September 10, 2003. The report summarized why no further action is needed for the site; the report also included plans to destroy the existing wells upon regulatory acceptance for no further action. Closure was not granted.

June 2004 - A work plan was submitted for two monitor wells down-gradient of monitoring well MW-5.

May 2005 - A work plan titled *Work Plan Addendum - Site Assessment Activity* dated May 17, 2005 was prepared by ATC Associates Inc. for the installation of two offsite monitor wells.

September 2005 - A work plan was prepared by ATC Associates Inc., titled *Work Plan Subsurface Investigation*, for the installation of one onsite monitor well.

September 2005 - Site environmental consulting responsibilities were transferred to Delta.

November 2006 - A Sensitive Receptor Survey was performed by Delta to identify wells within the survey area.

January 24, 2007 - A work plan was submitted to the ACHCSA recommending the advancement of one soil boring and the installation of three ozone injection wells at the site.

August 14, 2008 - Gregg Drilling, under supervision of Delta, advanced one cone penetration test (CPT) boring to a depth of 55 feet.

October 29, 2008 - A Site Investigation Report was submitted to ACHCSA detailing the results of the August 14, 2008, CPT borings.

SENSITIVE RECEPTORS

June/July 2002 - A groundwater receptor survey was conducted. Three irrigation wells are located within a one-half mile radius of the site. The wells are located approximately 1,980 feet west and 2,245 feet southwest of the site, cross-gradient and up-gradient of the site.

November 2006 - A survey entailing a visit to the DWR office in Sacramento was conducted to examine well log records and to identify domestic wells within the survey area. The DWR survey provided 15 potential receptors within one mile of the site; one domestic well located 0.5 mile southwest of the site; one domestic/irrigation well located 0.7 mile southeast of the site; 11 irrigation wells with three located 0.1 mile northwest, west, and southeast of the site; and two industrial wells located 0.3 miles southwest and 0.9 mile northeast of the site.

PROPOSED ACTIVITIES

Permitting, Utility Notification and Borehole Clearance

Before commencing field operations Delta will prepare a Health and Safety Plan (HASP) specific to the site and work being performed in accordance with Title 8, Section 5192 of the California Code of Regulations. The HASP will contain a list of emergency contacts, as well as a hospital route map to the nearest emergency facility.

In addition, encroachment and drilling permits will be obtained for the borings from the City of Alameda Public Works Department and Alameda County Public Works Agency (ACPWA). Prior to drilling, Underground Service Alert (USA) will be notified as required and a private utility locator will be contracted to clear the proposed drilling locations for underground utilities.

Monitoring Well Abandonment

Prior to the abandonment of one (1) monitoring well, MW-2A, the total depth of the monitoring well will be measured to determine if any obstruction or sediment is present. Subsequent to measuring the depths of the monitoring well, the well box and the surrounding concrete will be removed using a jackhammer. The space around the monitoring well will be cleared using an air-knife to a depth of five feet bgs unless utilities are encountered or known to be present. The monitoring well will be abandoned by over-drilling to a depth of one foot below their constructed depths using a truck mounted drill-rig equipped with 10-inch outside diameter hollow-stem augers. Subsequent to over-drilling, the borehole will be backfilled with neat cement. If utilities are encountered or known to be present, above or below ground, in the vicinity of the monitoring well that make it unsafe for over-drilling, the monitoring well will be abandoned by pressure grouting using neat cement. Pressure grouting will consist of attaching a hose from the cement mixer directly to the top of the monitoring well and pumping neat cement into the

well, under pressure (a minimum of 25 pounds per square inch (psi)) for five minutes or pumping refusal. In addition, the top of the monitoring well casing will be removed to a depth of five feet bgs if it can be done safely without potentially damaging utilities in the vicinity of the monitoring wells. The space created by removing the well box will be backfilled with concrete or asphalt to match the surrounding conditions.

Monitoring Well Installation

Delta proposes to advance two (2) monitoring wells using a truck mounted drill-rig equipped with 8-inch hollow stem augers adjacent to the former monitoring well MW-1 in the southwest portion of the property (Figure 2). The borings, MW-1AR and MW-1BR, will be advanced to depths of approximately 30 feet bgs and 35 feet bgs, respectfully. In addition, two new monitoring wells are proposed to be in the northeast off-site portion of the property (Figure 2). The borings, MW-7 and MW-8, will be advanced to depths of approximately 25 feet bgs and 30 feet bgs, respectfully. A series of three (3) monitoring wells will also be installed around ozone sparge well TSP-1, at 15 feet to the west, north, and east of the test sparge point to monitor attenuation of the contaminants and radius of influence (ROI). The borings, MW-9, MW-10, and MW-11 will be advanced to depths of 25' bgs, 30' bgs, and 28' bgs, respectively.

Construction diagrams for replacement wells MW-1AR and MW-1BR and new monitoring wells MW-7 and MW-8, are provided as figure(s) 3, 3A, 3B and 3C, respectively. Construction details for ozone injection well TSP-1 are provided as figure 4. Diagrams for new monitoring wells MW-9, MW-10 and MW-11, are provided as respective figure(s) 5, 5A, and 5B.

Soil samples will be logged using the Unified Soil Classification System (USCS) for lithologic interpretation and field screened for the presence of volatile organic compounds by headspace analysis using a pre-calibrated photo-ionization detector (PID). Soil samples will be collected continuously for lithologic interpretation and field screening. The soil sample exhibiting the highest PID reading from the replacement well boring will be submitted for analysis. If PID readings do not indicate the presence of volatile organic compounds, the soil sample collected from above first water and from the bottom of the boring will be submitted for analysis. A chain-of-custody will accompany the samples during transportation to the laboratory. The selected soil sample(s) will be submitted to a California-certified laboratory for analyses of total purgeable petroleum hydrocarbons (TPPH), benzene, toluene, ethyl-benzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), ethanol, and ethylene di-bromide (EDB) - (8 oxygenates) by EPA Method 8260B. Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total manganese (EPA Method 200.8), and total carbon (EPA Method 415.1).

Groundwater samples will be collected at a depth of 25 to 30 feet bgs in MW-1AR, at 30 to 35 feet bgs in MW-1BR, at 20 feet to 25 feet bgs in MW-7, and 25 feet to 30 feet bgs in MW-8. Non-disposable sampling equipment will be decontaminated between samples in a non-phosphate detergent and double rinsed with potable water.

Groundwater samples obtained from both the new and replacement wells will be decanted into properly labeled sample bottles and placed on ice pending transportation to a California-certified laboratory. A chain-of-custody will accompany the samples during transportation to the laboratory. The collected groundwater samples will be analyzed for TPPH, BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, ethanol, and EDB by EPA Method 8260B. Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total and dissolved manganese (EPA Method 200.8), total carbon (EPA Method 415.1), dissolved oxygen (DO), and oxidation reduction potential (ORP).

Once the sampling has been completed both the new and replacement well borings will be completed as MW-1AR, MW-1BR, and MW-7 through MW-11 (Figure 2).

CPT Boring

A CPT boring (CPT-02) will be placed near MW-1 to confirm the presence of the MTBE hotspot found during the August 14, 2008, CPT boring. The soil boring will be advanced to a minimum depth of 45 feet bgs (figure 2).

Soil samples will be logged using the USCS for lithologic interpretation and field screened for the presence of volatile organic compounds by headspace analysis using a pre-calibrated PID. Soil samples will be collected for lithologic interpretation and field screening at changes in lithology and at first encountered groundwater. The soil sample exhibiting the highest PID reading will be submitted for analysis. A chain-of-custody will accompany the samples during transportation to the laboratory. The selected soil sample(s) will be submitted to a California-certified laboratory for analyses of TPPH, BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, ethanol, and EDB by EPA Method 8260B. Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total manganese (EPA Method 200.8), and total carbon (EPA Method 415.1).

Groundwater samples obtained from the CPT boring will be decanted into properly labeled sample bottles and placed on ice as noted above pending transportation to a California-certified laboratory. A chain-of-custody will accompany the samples during transportation to the laboratory. The collected groundwater samples will be analyzed for TPPH, BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, ethanol, and EDB by EPA Method 8260B.

Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total and dissolved manganese (EPA Method 200.8), and total carbon (EPA Method 415.1), dissolved oxygen (DO), and oxidation reduction potential (ORP).

Non-disposable sampling equipment will be decontaminated between samples in a non-phosphate detergent and double rinsed with potable water.

Ozone Well Installation

Delta proposes the installation of one test injection well, TSP-1, at the site. The well will be located between monitoring well MW-1 along the southern boundary of the property, and CPT-01, down-gradient of MW-1, in the source area. The well will be installed at the proposed locations perpendicular to the axis of the TPPH and MTBE plumes present beneath the site. Potential proposed injection well locations are shown on Figure 2.

The injection well will be constructed with ceramic ozone diffusers attached to ¾-inch poly-vinyl chloride (PVC) casing to surface grade. Sand filter packing will extend from total depth to one foot above the top of the screen interval, sealed with 5 feet of bentonite saturated in place, and then capped to the ground surface with cement grout and completed with traffic rated vault boxes. The screened interval depth will be based on the data obtained during the advancement of the previously discussed soil boring and may be modified based on the subsurface lithology encountered during the installation of the borings. A diagram detailing the injection well construction is included as Figure 4.

Delta anticipates that the proposed injection well be installed to a total depth of approximately 30 feet bgs, with the ceramic diffuser placed from 26 – 29 feet bgs. Soil samples for lithologic logging and chemical analysis will be collected at 5-foot intervals of the proposed boring. Selected soil samples will be field screened with a PID for the presence of volatile organic compounds. Delta will collect one soil sample from each boring at the depths that exhibit the highest PID readings. Selected soil samples will be analyzed for TPPH, BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, Ethanol, and EDB - (8 oxygenates) by EPA method 8260B. Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total and dissolved manganese (EPA Method 200.8), and total carbon (EPA Method 415.1).

Groundwater samples will be collected at depths of 25 feet bgs and at 30 feet bgs in TSP-1. Non-disposable sampling equipment will be decontaminated between samples in a non-phosphate detergent and double rinsed with potable water.

Groundwater samples obtained from the sparge well boring will be decanted into properly labeled sample bottles and placed on ice as noted above pending transportation to a California-certified laboratory. A chain-of-custody will accompany the samples during transportation to the laboratory. The collected groundwater samples will be analyzed for TPH, BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, ethanol, and EDB by EPA Method 8260B. Additional analyses will include sulfate (EPA Method 300.0), ferrous iron (EPA Method 3500FE+D), total and dissolved manganese (EPA Method 200.8), and total carbon (EPA Method 415.1), DO, and ORP.

Disposal of Drill Cuttings and Wastewater

Drill cuttings and decontamination water generated during the soil boring advancement and well installation activities will be placed into properly labeled 55-gallon Department of Transportation (DOT) approved steel drums and stored on the property. Samples of the drill cuttings and wastewater will be collected, properly labeled and placed on ice for submittal to a California-certified laboratory and analyzed for TPH, BTEX, and MTBE by EPA Method 8260B and total lead by EPA Method 6010B. A chain-of-custody will accompany the samples during transportation to the laboratory. Subsequent to receiving the laboratory analytical results, the drummed drill cuttings and wastewater will be profiled, transported, and disposed of at a COP approved facility.

Reporting

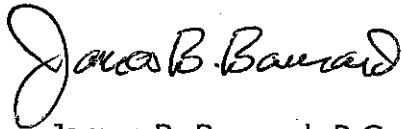
Following completion of the field work and receipt of analytical results, a site investigation report will be prepared and submitted within 60 days. The report will present the details of the boring activities, including copies of boring permits, and details of disposal activities and copies of disposal documents. Required electronic submittals will be uploaded to the State Geotracker database.

REMARKS/SIGNATURES

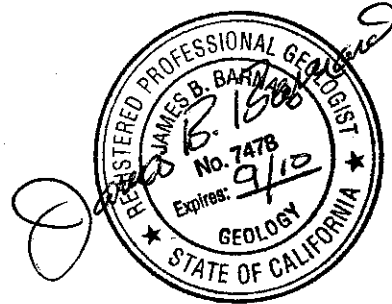
The recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report will be 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) 503-1279 or Mr. Terry Grayson of COP at (916) 558-7666.

Sincerely,
DELTA CONSULTANTS



James B. Barnard, P.G.
Senior Project Manger
California Registered Professional Geologist No. 7478



Figures:

- Figure 1 - Site Location Map
- Figure 2 - Site Plan Monitoring Well Locations
- Figure 3 - Replacement Well MW-1AR Construction Diagram
- Figure 3A - Replacement Well MW-1BR Construction Diagram
- Figure 3B - New Monitoring Well MW-7 Construction Diagram
- Figure 3C - New Monitoring Well MW-8 Construction Diagram
- Figure 4 - Ozone Injection Well TSP-1 Construction Diagram
- Figure 5 - New Monitoring Well MW-9 Construction Diagram
- Figure 5A - New Monitoring Well MW-10 Construction Diagram
- Figure 5B - New Monitoring Well MW-11 Construction Diagram

cc: Mr. Terry Grayson, ConocoPhillips (electronic copy only)

Figures

Figure 1
Site Location Map

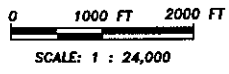
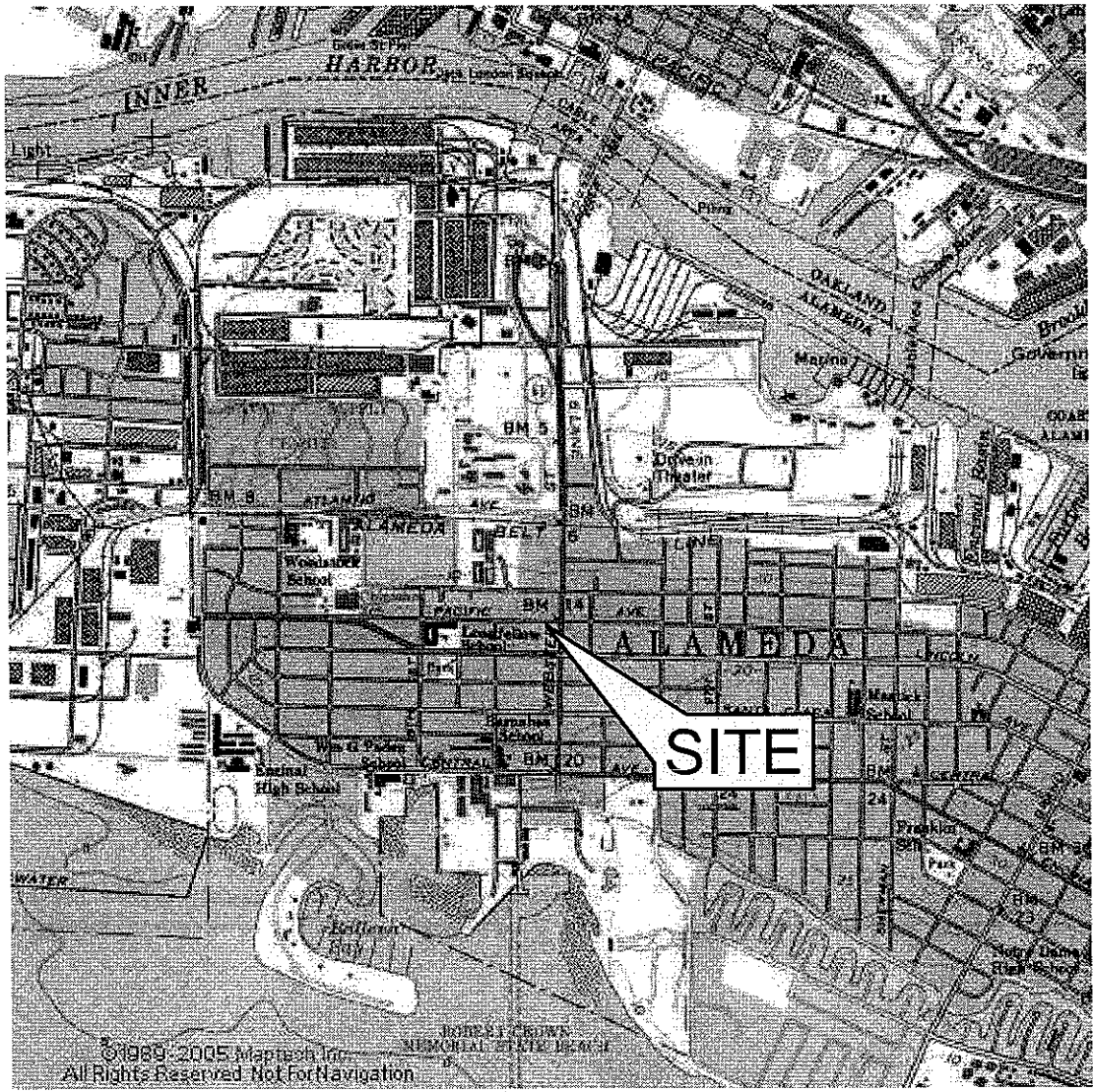


FIGURE 1
SITE LOCATION MAP

76 STATION NO. 0843
1629 WEBSTER STREET
ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 03/18/09
FILE NO. Site Locator 0843	PREPARED BY CM
REVISION NO. 2	REVIEWED BY JM



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, OAKLAND WEST QUADRANGLE, 1996

Figure 2
Site Plan Monitoring Well Locations

Figure 3
Replacement Well MW-1AR Construction Diagram

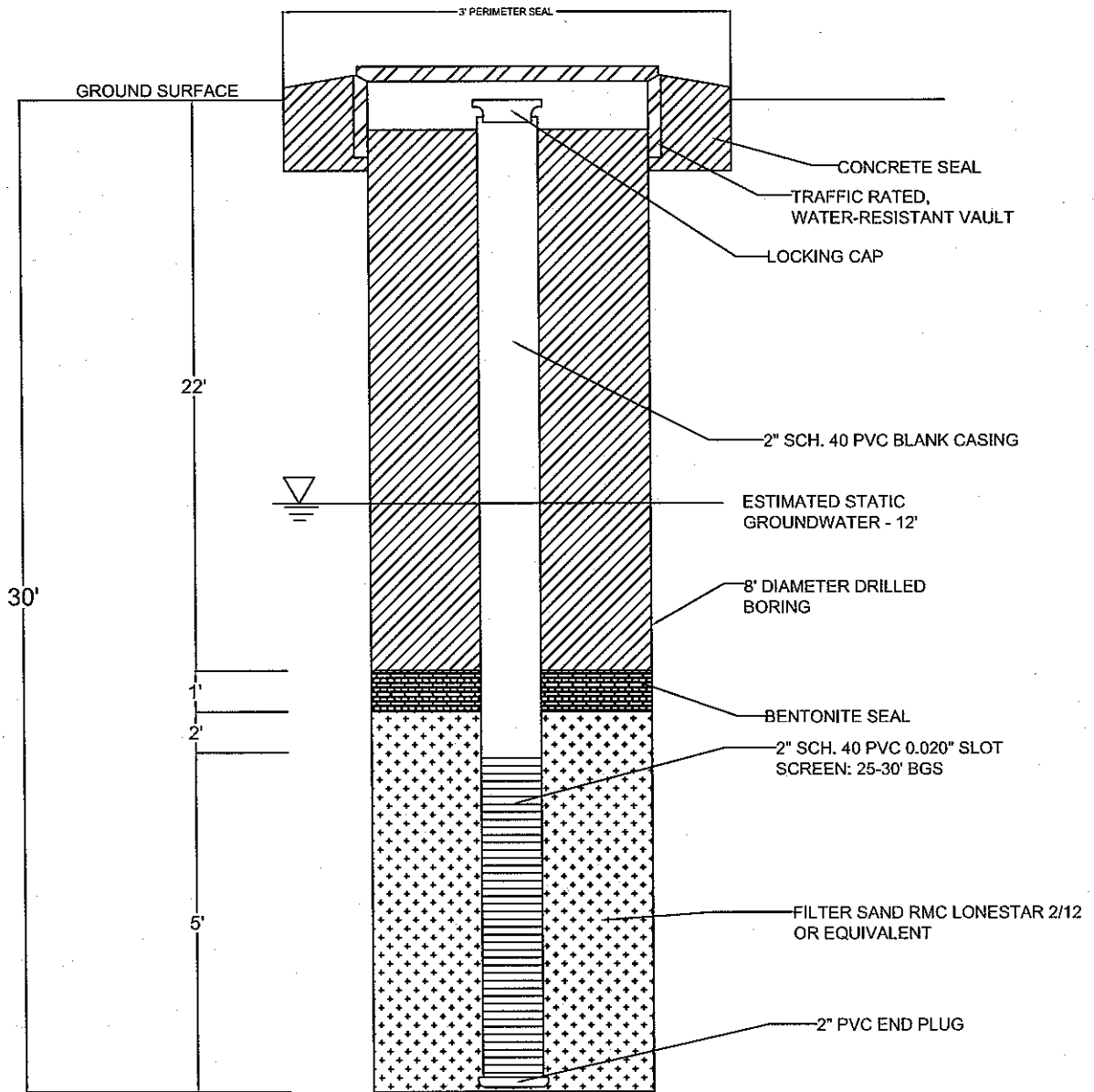


FIGURE 3
 REPLACEMENT GROUNDWATER
 MONITORING WELL 1AR CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 02/13/09
FILE NO. 0843-WELLDDETAIL	PREPARED BY JBB
REVISION NO.	REVIEWED BY



Figure 3A
Replacement Well MW-1BR Construction Diagram

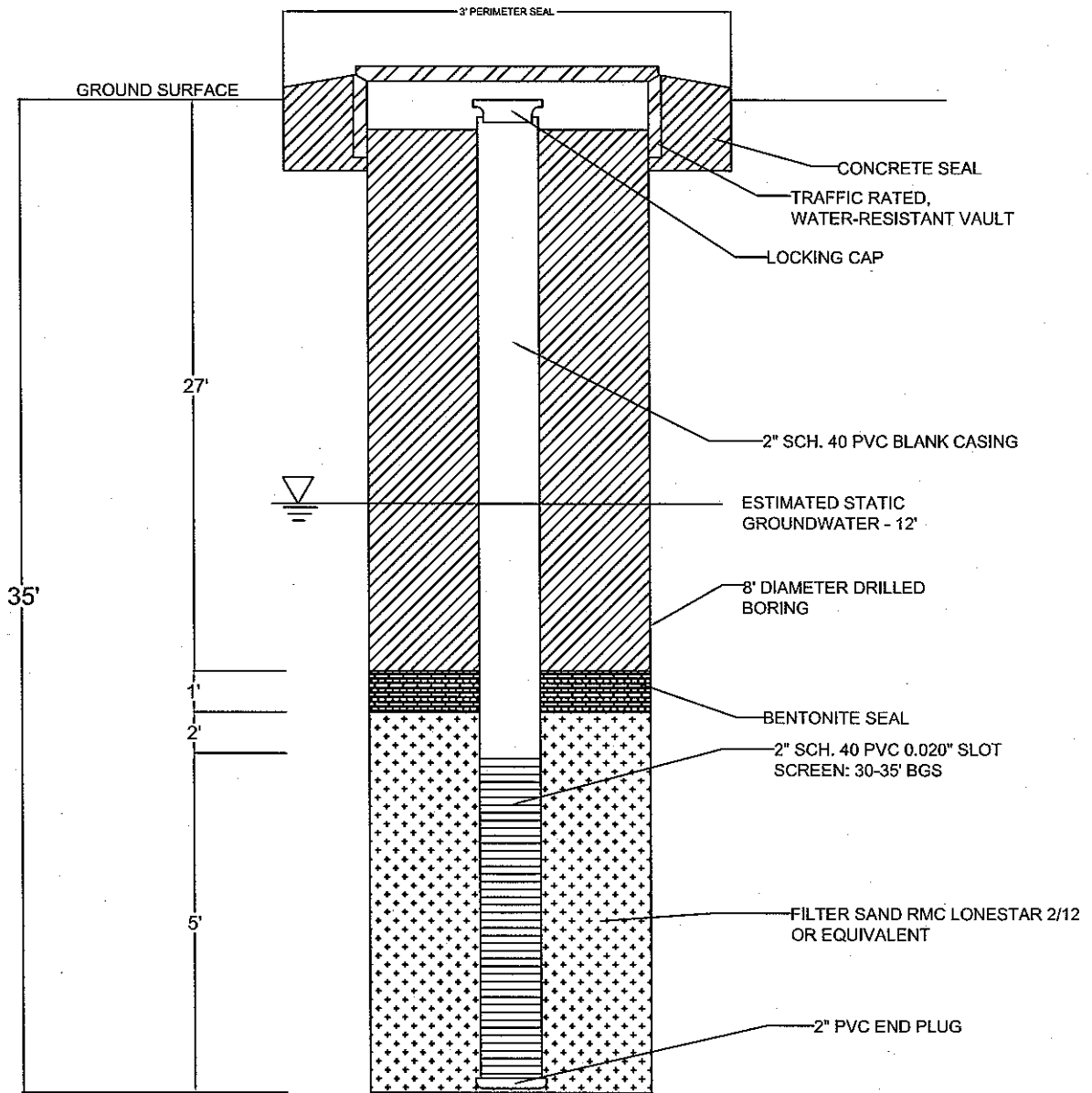


FIGURE 3A
 REPLACEMENT GROUNDWATER
 MONITORING WELL 1BR CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 02/13/09
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REVISION NO.	REVIEWED BY



**Figure 3B
New Monitoring Well MW-7 Construction Diagram**

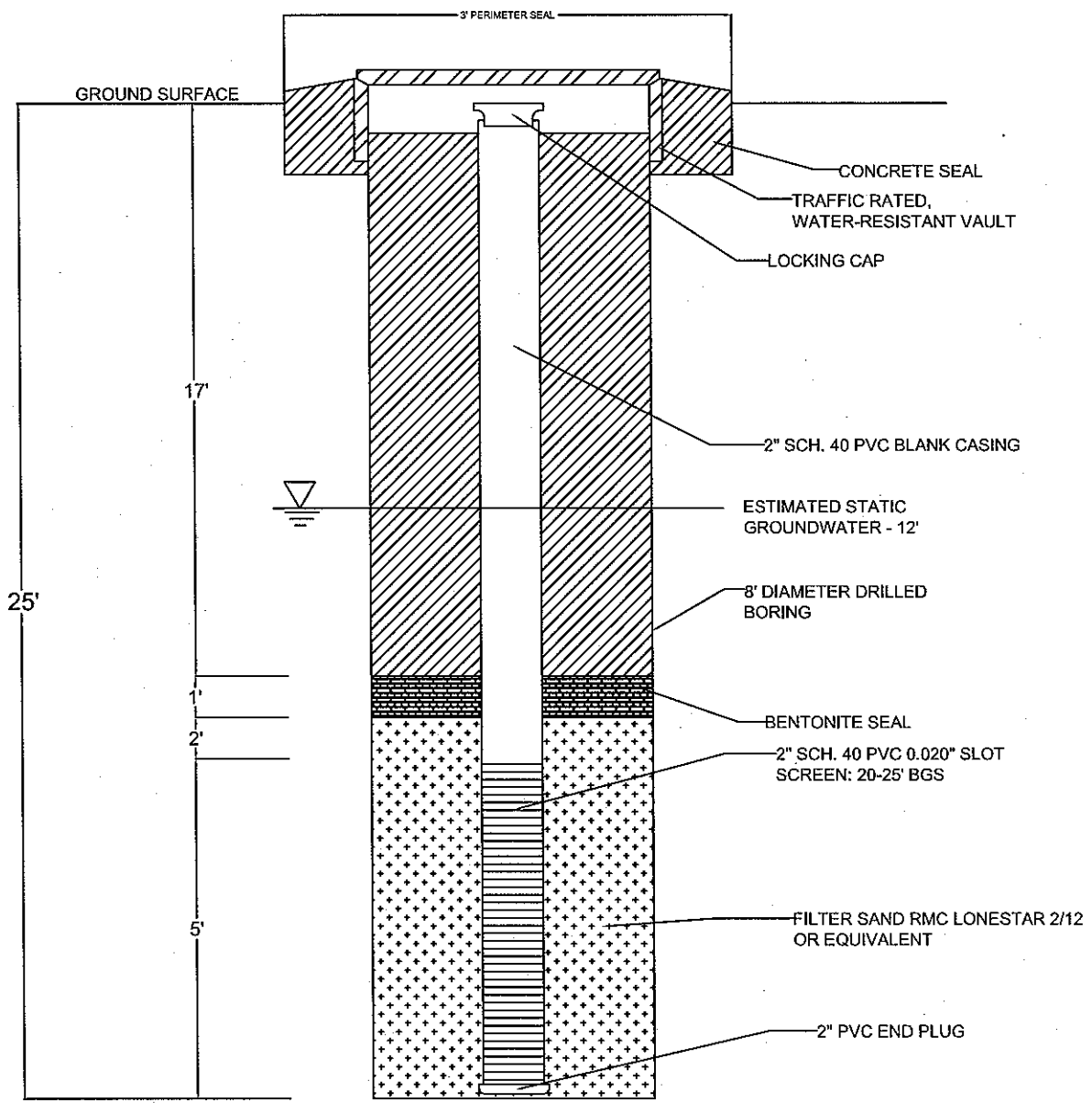


FIGURE 3B
 REPLACEMENT GROUNDWATER
 MONITORING WELL 7 CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 02/13/09
FILE NO. 0843-WELLDDETAIL	PREPARED BY JBB
REVISION NO.	REVIEWED BY



Figure 3C
New Monitoring Well MW-8 Construction Diagram

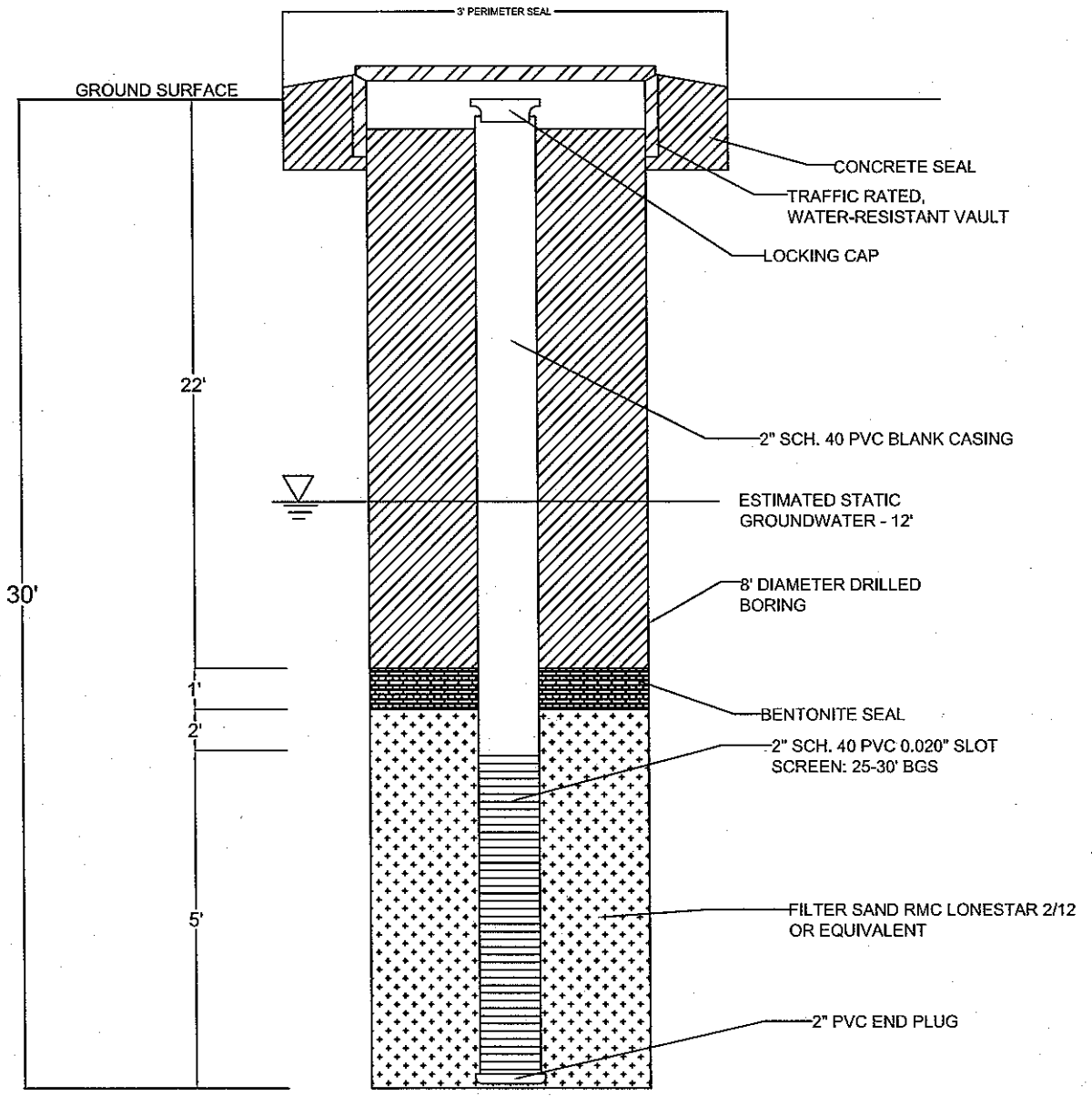
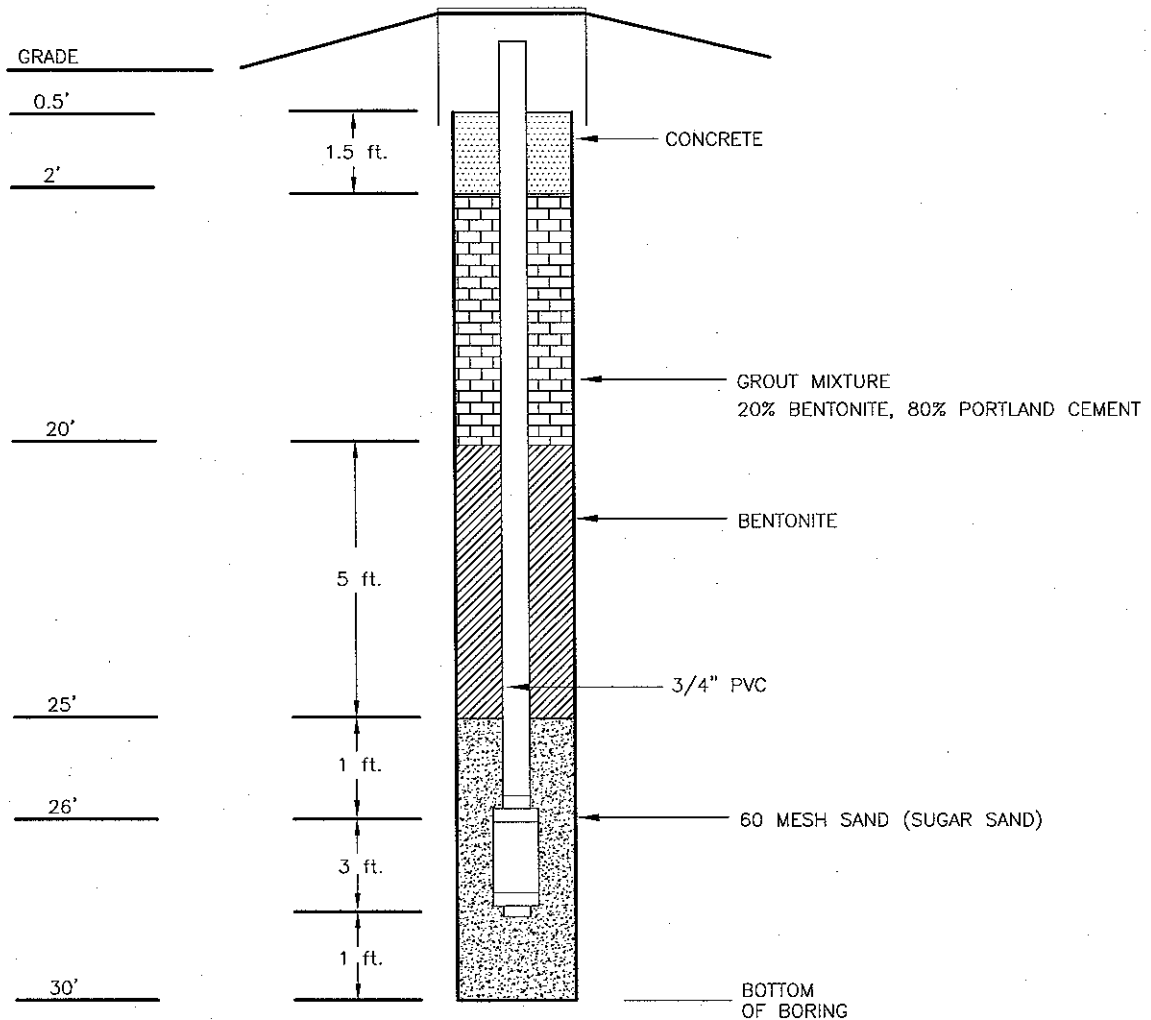


FIGURE 3C
 REPLACEMENT GROUNDWATER
 MONITORING WELL 8 CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 02/13/09
FILE NO. 0843-WELLDDETAIL	PREPARED BY JBB
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Figure 4
Ozone Injection Well TSP-1 Construction Diagram



NOTES:

1. NOT DRAWN TO SCALE
2. DEPTH MEASUREMENTS AND INTERVALS ARE APPROXIMATE. ACTUAL WELL DESIGN WILL BE BASED ON EXPLORATORY BORING AND SITE CONDITIONS

FIGURE 4
TEST SPARGE POINT CONSTRUCTION DETAILS
FORMER 76 STATION 0843
1629 WEBSTER STREET
ALAMEDA, CALIFORNIA


PROJECT NO. C100843	PREPARED BY JBB	DRAWN BY JH	
DATE 02/13/09	REVIEWED BY	FILE NAME 0843-ProSP	

Figure 5
New Monitoring Well MW-9 Construction Diagram

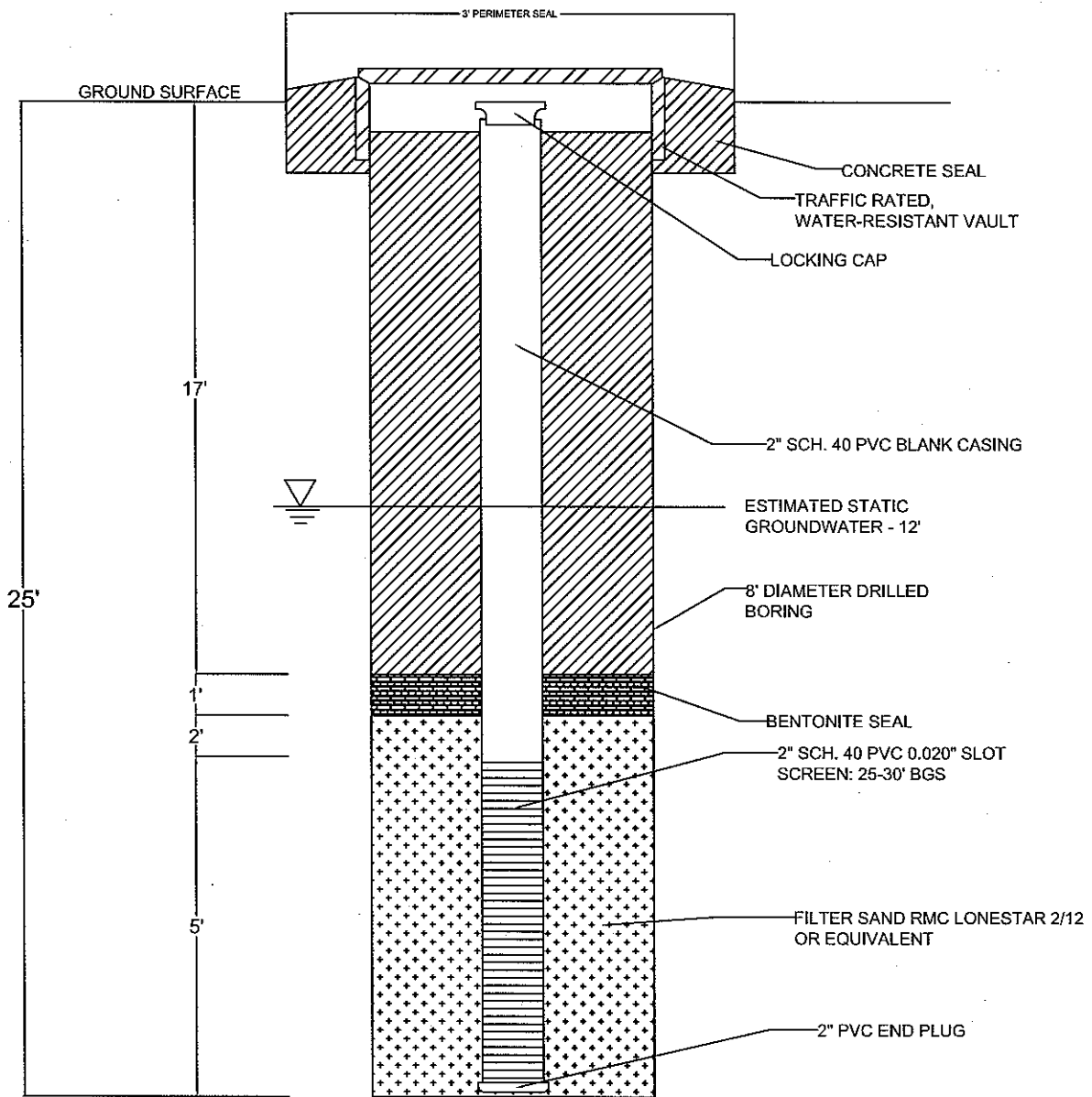


FIGURE 5
 REPLACEMENT GROUNDWATER
 MONITORING WELL 9 CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 03/13/09
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REVISION NO.	REVIEWED BY



Figure 5A
New Monitoring Well MW-10 Construction Diagram

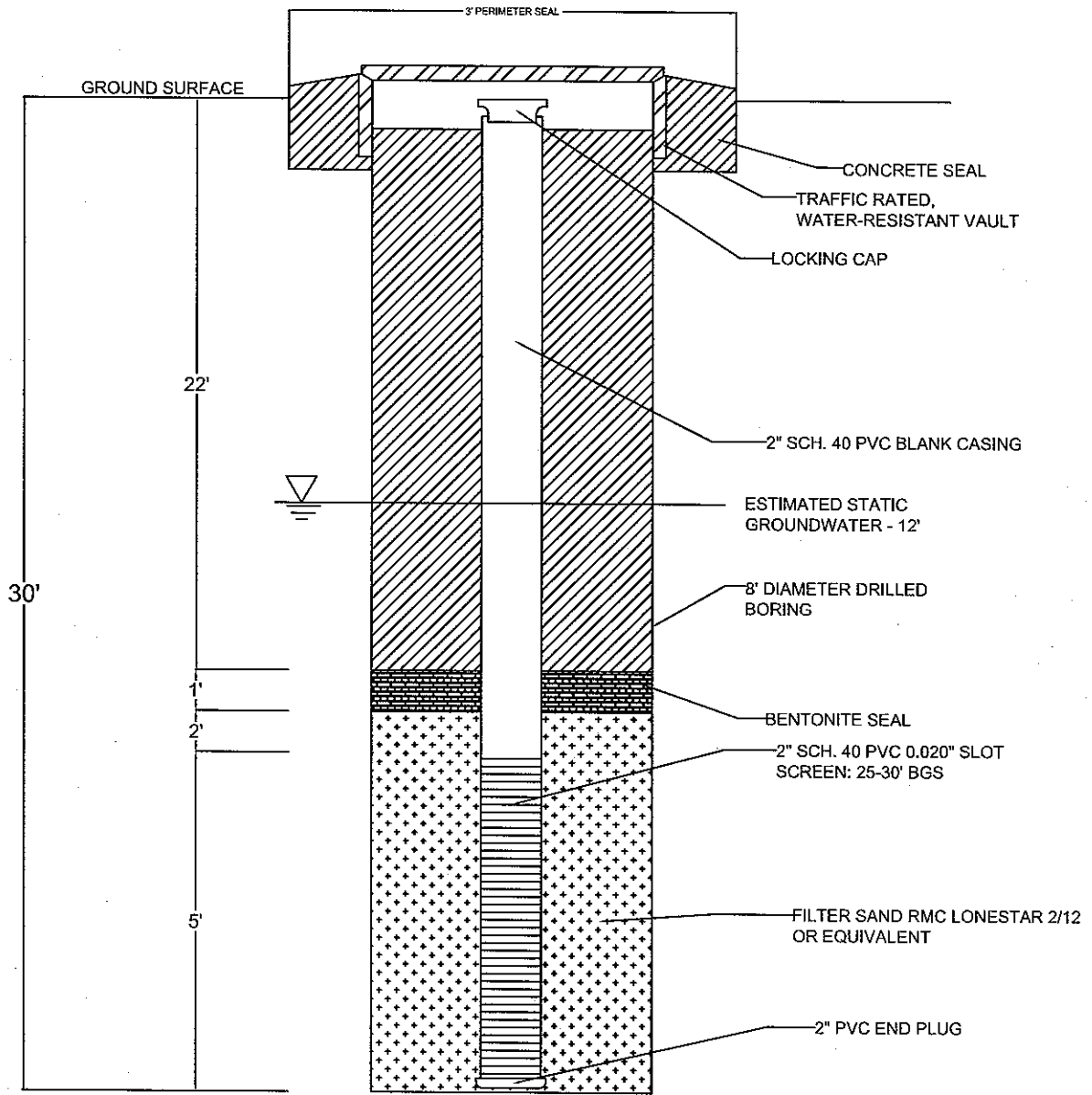


FIGURE 5A
 REPLACEMENT GROUNDWATER
 MONITORING WELL 10 CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

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FILE NO. 0843-WELLDETAIL	PREPARED BY JBB
REVISION NO.	REVIEWED BY



**Figure 5B
New Monitoring Well MW-11 Construction Diagram**

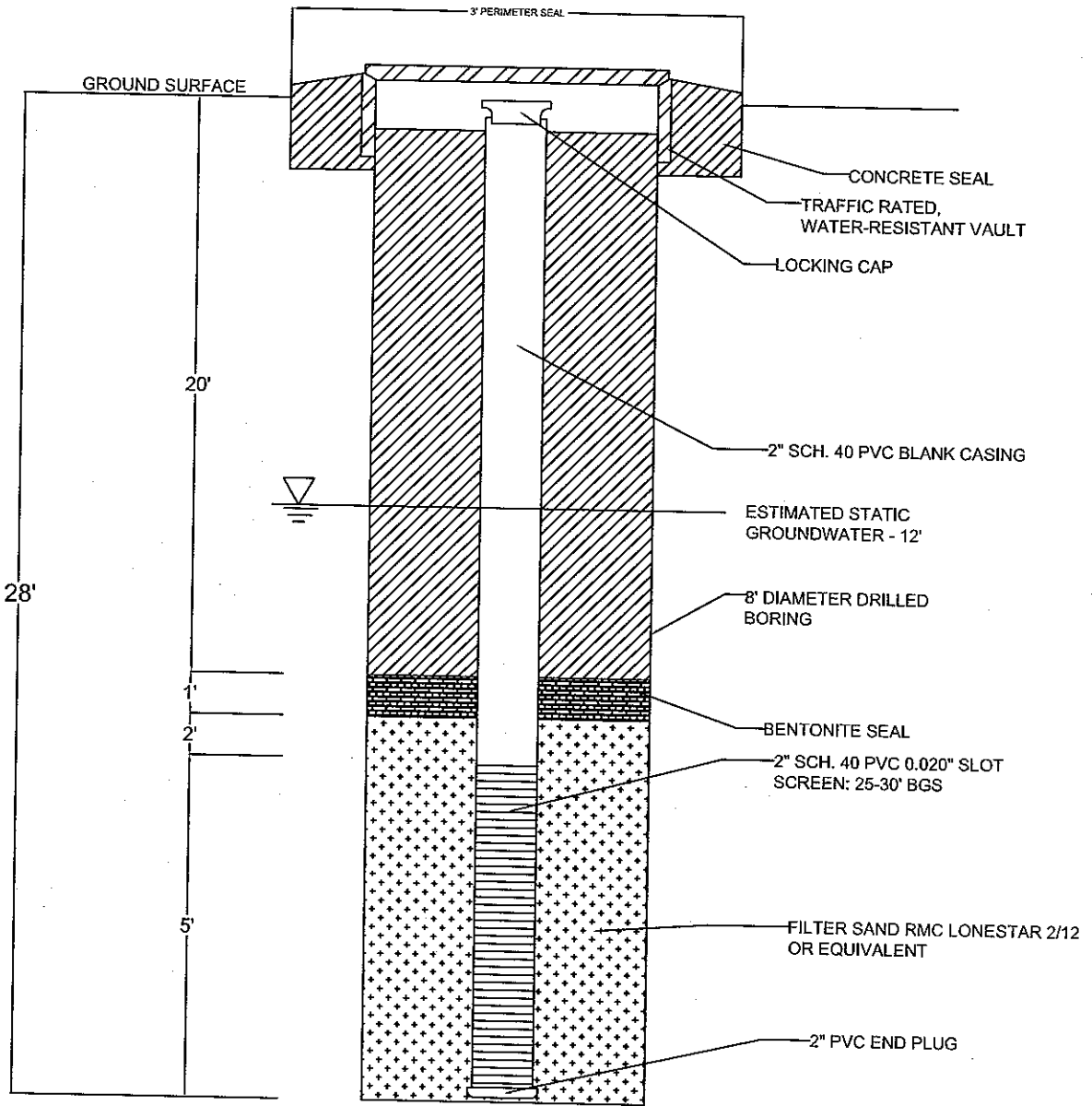


FIGURE 5B
 REPLACEMENT GROUNDWATER
 MONITORING WELL 11 CONSTRUCTION DETAIL
 FORMER 76 STATION NO. 0843
 1629 WEBSTER ROAD
 ALAMEDA, CALIFORNIA

PROJECT NO. C100-843	DRAWN BY JH 03/13/09
FILE NO. 0843-WELLDDETAIL	PREPARED BY JBB
REVISION NO.	REVIEWED BY

