Alameda County
OCT 14 2004
Environmental Health

ADDITIONAL
SITE CHRACTERIZATION
WORK PLAN ADDENDUM

Sheaff's Garage
5930 College Avenue
Oakland, California

ACHCSA Fuel Leak Case No. RO0000377

Prepared For:

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September 30, 2004

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INTRODUCTION

Purpose

On behalf of Brian Sheaff, Golden Gate Tank Removal, Inc. (GGTR) is pleased to submit this work plan addendum, which was prepared in response to a June 3, 2004 directive letter issued by the Alameda County Health Care Services Agency (ACHCSA) - Environmental Protection Division, requesting additional information to clarify and/or change the scope of work previously proposed in our December 29, 2003 *Work Plan for Additional Site Characterization* activities at Sheaff's Garage located at 5930 College Avenue in Oakland, California. A copy of the June 3, 2004 ACHCSA directive letter is attached.

In general accordance with the technical comments presented in the aforementioned directive letter, the purpose of this work plan addendum is to describe the procedures and methods used to conduct the following modified additional site characterization activities: 1) further define the lateral and vertical extent of the hydrocarbon-effected groundwater plume in the direct vicinity of the site by installing temporary soil borings only, and collecting soil and/or depth discrete grab groundwater samples from each boring, and 2) further define the lateral and vertical extent of residual soil contamination in the direct vicinity of both the former underground fuel storage tanks (USTs) and former location of the above-grade fuel dispenser island (source areas) by advancing designated borings further past the first encountered groundwater to account for potentially entrapped petroleum hydrocarbon product below the groundwater table. The work will be conducted in general accordance with the State Water Resources Control Board's Leaking Underground Fuel Tank (LUFT) manual and the TRI-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites.

Scope

The general scope of work contained in this work plan addendum includes the following:

- Pre-field work activities and permitting
- Modified percussion soil boring and sampling activities
- Interim remedial excavation activities [general source area(s)]
- Backfilling activities
- Additional monitor well installation (if warranted)
- Sample analysis
- Waste management
- GeoTracker AB2886 Analytical Uploading
- Data interpretation and report preparation and submittal.

Site Location and Description

The subject property is located at 5930 College Avenue, along the east side of College Avenue between Harwood Street and Chabot Road in Oakland, California. The site lies approximately 0.2 mile (1,000 feet) north of Highway 24 and approximately 2.5 miles east of Interstate 80 and the San Francisco Bay. The general location of the site is shown on the attached Figure 1, *Site Location Map*.

The commercial property is currently occupied by Sheaff's Garage for the service and repair of automobiles, with no active fuel storage or distribution systems. The site is approximately 5,500 square feet in area with about 75% utilized by a covered warehouse/garage and 25% used as an exterior (uncovered) storage yard. The ground surface of the entire property is paved with concrete and the elevation of the site is approximately 195 feet above Mean Sea Level (Figure 1). The site, adjacent properties, and pertinent site structures are shown on the attached Figure 2, *Site Plan*.

The property is relatively flat lying with the topographic relief in the immediate vicinity of the site generally directed toward the southwest (Figure 1). Regional topographic relief appears to be directed toward the west-southwest in the general direction of the San Francisco Bay. One 675-gallon gasoline UST and one 340-gallon waste oil UST was located beneath the sidewalk at the southwest corner of the site (Figure 2). The tanks were removed by GGTR in August 1996. A brief discussion of the tank removal activities is presented herein.

Site Geology and Hydrogeology

According to a Geologic Map of the San Francisco-San Jose Quadrangle published by the California Department of Conservation, the site is underlain by up to 500 feet of dissected Quaternary alluvium deposited on marine sandstone, shale and conglomerate of the Mesozoic Franciscan Complex and possibly Mesozoic, cretaceous marine sedimentary rocks of the Great Valley Sequence (thicknesses not established). Native subsurface soil encountered at the site during the additional soil and groundwater investigation activities (August and October 2002) was predominantly a moist, dark yellowish brown, clayey silt up to approximately 7 fbg, overlying a dark yellowish brown and dark greenish gray, silty clay up to approximately 15 fbg. Moist to wet, clayey silt/sand and silty clay lenses extend up to a total explored sample depth of 20 fbg. Soil observed throughout B10 and B11 was predominantly a clayey, sandy silt.

Depth to groundwater as measured on a quarterly basis in the three onsite monitoring wells (October 1999 through October 2002) ranged between approximately 5.5 and 13 fbg. The associated groundwater gradient across the site ranged between 0.005 (July 2001) and 0.032 (October 2002) foot per foot and the flow direction has fluctuated between 11° west of south (October 1999) to 71° east of north (October 2002). The regional groundwater flow in the vicinity of the site is assumed to be towards the west-southwest, in the direction of the San Francisco Bay, and generally following the natural topographic relief of the area.

The nearest surface water body is Claremont Creek, flowing southwest, with surface water flow ending approximately 0.9 mile northeast of the site. Creek flow then appears to continue southwest via an intermittent underground culvert and an open surface channel, and generally parallels Claremont Avenue towards its intersection with College Avenue, located approximately 0.1 mile (525 feet) north of the site (Figure 1). Lake Temescal, situated at an elevation approximately 200 feet higher than the site, is located approximately 1.1 miles east of the subject property, with effluent flow directed generally southeast.

Environmental Site History & Chronology

In August 1996, GGTR removed two USTs and associated fuel dispenser from the site at the locations shown in Figure 2. The following table presents a summary of the tank designations, size, type of construction and contents:

Designation	Construction	Diameter (Feet)	Length (Feet)	Volume (Gallons)	Contents
TANK 1	Steel	4	7	675	Gasoline
TANK 2	Steel	4	3.5	340	Waste Oil

GGTR removed the residual fuel from the subsurface product piping (left in place), thoroughly flushed and drained the piping, and capped both ends. GGTR over-excavated the gasoline-contaminated soil surrounding the former UST location to the extent feasible. Analytical results of soil samples collected during the UST removal and over-excavation activities at the site are summarized in the attached Table 1. The tank removal and over-excavation activities are documented in GGTR's *Tank Removal Report*, dated October 11, 1996.

Between May 1998 and October 1999, as requested by the ACHCSA, GGTR performed a preliminary subsurface soil boring investigation at the subject property and subsequently installed three groundwater monitor wells in the vicinity of the former UST cavity. Soil borings B1 through B3 were advanced immediately south, east, and west, respectively, of the former UST cavity at the locations shown in Figures 2 & 3. Following review and interpretation of all field and soil sample analytical data collected during these activities, additional soil borings (B4 through B6) were then advanced at the site to further assess the extent of contamination in soil and the potential impact to groundwater. These borings were converted to 2-inch-diameter groundwater monitoring wells, MW1 through MW3. The locations of the soil borings/monitor wells are shown in Figure 2. Table 2, attached, summarizes the laboratory analytical results of soil samples collected from B1 through B6.

In collaboration with Gettler-Ryan, Inc. of Dublin, California, which is conducting a separate groundwater investigation adjacent to the subject property (5940 College Avenue; Former Chevron Station), GGTR has jointly monitored and sampled each well on a quarterly basis between January 2000 and October 2002. The locations of the

subject monitor wells as well as Gettler-Ryan's monitoring wells are shown on Figure 2. The attached Table 3 presents the historical boring/monitor well fluid-level data and groundwater analytical results for samples collected from B1 through B3 and B4/MW1 through B6/MW3. Table 4 presents the groundwater elevation, flow direction, and gradient data for MW1 through MW3 since October 1999.

Based on the residual elevated concentrations of gasoline-range hydrocarbons measured in the groundwater samples collected during the April 2001 quarterly monitoring activities, the ACHCSA, in a letter dated July 9, 2001, requested a work plan to assess whether any additional contaminant sources may potentially exist onsite that may be contributing to the elevated hydrocarbon concentration in groundwater. GGTR submitted the work plan on December 19, 2001, which was subsequently approved by the ACHCSA in a letter dated January 3, 2002.

In August 2002, GGTR removed the entire length of UST product piping extending between the former UST cavity and fuel dispenser (Figure 2). Confirmation soil samples collected beneath the piping between approximately 2.5 and 3.5 fbg contained non-detectable or insignificant concentrations of total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl tertiary-butyl ether (MTBE), and total lead.

In November 2002, GGTR returned to the site to conduct the additionally proposed soil boring activities. GGTR percussion drilled five additional soil borings (B7 through B11) up to approximately 20 fbg at the locations shown in Figure 2. Soil samples collected in B7 through B9 and B11 between 8 and 20 fbg contained non-detectable or insignificant concentrations of TPH-G, BTEX, and MTBE. The soil samples collected in B10 between 11 and 17 fbg contained ≤479 milligrams per kilogram (mg/kg; parts per million) TPH-G and non-detectable or insignificant concentrations of BTEX, MTBE, and volatile organic compounds (VOCs). Grab groundwater samples collected in B7 through B9 contained up to 296,000 micrograms per liter (ug/l; parts per billion) TPH-G, 18,400 ug/l benzene, and 2,680 ug/l (EPA 8260) MTBE. Soil sample and grab groundwater analytical results of the additional soil boring activities are included in Tables 2 and 3, respectively. Details of the August and November 2002 site activities are presented in GGTR's June 10, 2003 *Report of Additional Soil & Groundwater Investigation.*

Based on review of GGTR's June 2003 report, the ACHCSA, in their letter dated September 8, 2003 requested a work plan addressing additional source and site characterization of contaminants in soil and groundwater at the subject property. GGTR submitted their Work Plan for Additional Site Characterization on December 29, 2004, which was conditionally approved by the ACHCSA in their most recent letter dated June 3, 2004. Between October 15, 2003 and April 23, 2004 GGTR conducted quarterly groundwater monitoring and sampling activities at the site and submitted their associated Groundwater Monitoring Reports to the ACHCSA on October 31, 2003, March 29, 2004, and August 19, 2004. GGTR conducted 3rd Quarter 2004 monitoring activities at the site on July 19, 2004, a report of which will be submitted to the ACHCSA by October 31,

2004. Tables 3B and 4 include the respective groundwater sample analytical results and fluid-level monitoring data as well as the groundwater elevation and gradient data for these events.

The following chronological list of activities shows the significant UST removal and investigative activities performed at the site to date:

08/06/96	Underground storage tanks 1 and 2 were removed and samples recovered
08/15/96	A work plan was submitted by GGTR for over excavation and disposal of gasoline-contaminated soil surrounding the UST
09/30/96	Over-excavation of gasoline-contaminated soil performed
10/01/96	Last of additional excavation soil disposed of at a Class II facility
10/11/96	TANK REMOVAL REPORT published by GGTR
12/30/96	ACHSA submitted letter requiring soil and groundwater investigation
03/10/97	GGTR authorized to prepare a work plan for additional investigation
04/01/97	GGTR submitted work plan for a Soil and Groundwater Investigation
04/21/97	ACHSA submitted letter authorizing work plan
05/06/98	GGTR drills borings B1 through B3
05/20/98	GGTR drills borings B4 (Monitoring Well MW1)
05/27/98	GGTR develops monitoring well MW1
06/01/98	GGTR measures, purges and samples monitoring well MW1
06/17/98	GGTR submitted Soil and Groundwater Investigation Report
07/21/98	GGTR submitted Work Plan Addendum for installation of two additional groundwater monitoring wells
09/10/98	GGTR measures, purges and samples monitoring well MW1 then submits a groundwater monitoring report
10/02/99	GGTR drills two borings (B5 and B6) and converts them to groundwater monitoring Wells (MW2 and MW3)
10/04/99	GGTR develops monitoring wells MW2 and MW3
10/07/99	GGTR surveys monitoring wells MW2 / MW3; measures, purges and samples monitoring wells MW1, MW2 and MW3 then submits a groundwater monitoring report
10/22/99	GGTR submitted Summary Report
11/24/99	HCS submitted letter requiring quarterly monitoring and setting parameters for January 2000 analyses
01/26/00	GGTR measures, purges and samples monitoring wells MW1, MW2 and MW3 then submits a groundwater monitoring report
10/25/00	GGTR and Gettler-Ryan, Inc. perform joint groundwater monitoring activities; GGTR measures, purges and samples monitoring wells MW1, MW2 and MW3 then submits a groundwater monitoring report
04/25/01	GGTR and Gettler-Ryan, Inc. perform joint groundwater monitoring activities; GGTR surveys, measures and samples monitoring wells MW1, MW2 and MW3 then submits a groundwater monitoring report

07/10/01	GGTR and Gettler-Ryan, Inc. perform joint groundwater monitoring activities; GGTR measures and samples monitoring wells MW1, MW2 and MW3 then submits a groundwater monitoring report
10/08/01	GGTR and Gettler-Ryan, Inc. perform joint groundwater monitoring activities; GGTR monitors and samples MW1, MW2 and MW3.
11/28/01	GGTR submits October 2001 Groundwater Monitoring Report to the ACHCSA
12/19/01	GGTR submits Work Plan for Additional Soil & Groundwater Investigation to the ACHCSA
01/03/02	ACHCSA submits work plan implementation request letter.
01/07/02	GGTR monitors and samples MW1, MW2 and MW3.
01/13/02	Gettler-Ryan, Inc. monitors and samples GR-MW1 &GR-MW2.
02/11/02	GGTR submits January 7, 2001 Groundwater Monitoring Report to the ACHCSA
04/08/02	GGTR monitors and samples MW1, MW2 and MW3.
04/08/02	Gettler-Ryan, Inc. monitors and samples GR-MW1 &GR-MW2.
05/15/02	GGTR submits April 8, 2002 Groundwater Monitoring Report to the ACHCSA
07/09/02	GGTR monitors and samples MW1, MW2 and MW3; Gettler-Ryan, Inc. currently on bi-annual sampling basis
08/19/02	GGTR submits July 9, 2002 Groundwater Monitoring Report to the ACHCSA
08/24/02-08/30/02	GGTR conducts December 2001 work plan subsurface fuel piping removal and site restoration activities.
10/15/02	Gettler-Ryan, Inc. monitors and samples GR-MW1 & GR-MW2.
10/23/02	GGTR monitors and samples MW1, MW2 and MW3.
10/30/02 & 11/01/02	GGTR conducts December 2001 work plan additional soil boring activities
12/30/02	GGTR submits October 23, 2002 Groundwater Monitoring Report to the ACHCSA
06/10/03	GGTR submits Report of Additional Soil and Groundwater Investigation to the ACHCSA
09/08/03	ACHCSA submits Report Review Letter
10/15/03	GGTR conducts 3rd Quarter 2003 Monitoring & Sampling (MW1-MW3)
10/31/03	GGTR submits October 15, 2003 Groundwater Monitoring Report to the ACHCSA
12/29/03	GGTR submits Work Plan for Additional Site Characterization
02/02/04	GGTR conducts 1st Quarter 2004 Monitoring & Sampling (MW1-MW3)
03/29/04	GGTR submits February 2, 2004 Groundwater Monitoring Report to the ACHCSA
04/23/04	GGTR conducts 2nd Quarter 2004 Monitoring & Sampling (MW1-MW3)
06/03/04	ACHCSA submits conditional work plan approval letter
07/19/04	GGTR conducts 3rd Quarter 2004 Monitoring & Sampling (MW1-MW3)

08/19/04 GGTR submits April 23, 2004 Groundwater Monitoring Report to the ACHCSA

09/30/04 GGTR submits Work Plan Addendum for Additional Site Characterization to the ACHCSA

PLANNED WORK

Sequence

The following is the planned sequence of activities at the site:

- Notify all representative parties of scheduled field activities
- Obtain site Excavation Permit from City of Oakland Department of Public Works
- Obtain Drilling Permit from Alameda County Public Works Agency
- Conduct site markout and notify Underground Service Alert for utility clearance
- Conduct additional soil boring and sampling activities to delineate lateral and vertical extent of 1) impacted source soil in direct vicinity of former UST cavity, and 2) contaminant groundwater plume in the vicinity of the site
- Perform soil and/or grab groundwater sampling activities in each boring
- Backfill soil borings with neat Portland cement and surface concrete
- Excavate and remove all hydrocarbon-effected source soil in the vicinity of the former UST and fuel dispenser; limits of excavation based upon soil sample analyses
- Collect confirmation soil samples at excavation limits
- Backfill trench excavation with clean overburden soil and/or clean import soil and compact; restore original site conditions
- If warranted, install additional groundwater wells to further monitor plume stability
- Submit all samples to State-licensed environmental laboratory for analysis
- Profile, transport, and dispose of all impacted solid/liquid waste
- Interpret all field and analytical data and prepare summary report
- If warranted, incorporate newly-installed groundwater wells into current quarterly monitoring and sampling schedule

Preferential Migration Pathway Survey

Subsurface Utility Corridor Survey

The ACHCSA, in their September 8, 2003 letter, requested a subsurface utility survey in the general vicinity of the site to evaluate whether any underground utility corridors may potentially act as preferential pathways for on- and/or off-site migration of dissolved-phase contaminant hydrocarbons. The approximate locations of the pertinent subsurface site vicinity utilities are shown in Figure 3. Associated *Cross Sections C-C' & D-D'* (locations referenced in Figure 3) showing the approximate locations and depths of the utilities and trenches within and in the direct vicinity of the known contaminant plume area are presented in Figures 4 and 5, respectively. Cross Sections A-A' and B-B' were

presented previously in GGTR's June 2003 Report of Additional Soil and Groundwater Investigation.

On November 13, 2003, GGTR visited the City of Oakland Department of Engineering to obtain a copy of their subsurface utility map associated with the sanitary and storm sewer lines located in the direct vicinity of the site along College Avenue. GGTR also contacted the East Bay Municipal Utilities District (EBMUD), Engineering/Mapping Division to obtain utility map(s) associated with the municipal supply water mains/laterals in the vicinity of the site. Information obtained from each agency included utility line dimensions (diameter), invert depths, and flow directions. GGTR subsequently conducted a site reconnaissance to confirm general locations of each public utility corridor. GGTR also obtained information from the Pacific Bell Engineering Division and Pacific Gas & Electric (PG&E) for the associated utility corridors, which were located beneath the sidewalk and parking lane locations only. Utility corridor designation, approximate location, and associated line diameters, depths, and flow line directions are included in Figure 3. Data for PG&E and Pacific Bell utilities was verbally provided and are only approximate due to the absence of "as-built" plans.

The City of Oakland map confirms that the following subsurface utility corridors exist along College Avenue, flowing southward and extending between and beyond Harwood and Chabot Avenues, in Oakland California: 1) an 18-inch-diameter, utility storm water line with invert flow depth of approximately 12 fbg, located 12 to 14 feet west of the former UST cavity; 2) an 8- to 12-inch-diameter, sanitary sewer line with invert flow depth of approximately 12 fbg located 15 feet west of the former UST cavity; 3) a 90-inch-diameter storm water line (Alameda County Flood Control) with invert depth of approximately 12 fbg located approximately 22 to 23 feet west of the former UST cavity, and 4) an 8-inch-diameter sanitary sewer line with invert depth approximately 10 fbg and located approximately 38 to 40 feet west of the former UST cavity and MW1. Although not shown on the City map, a sanitary sewer lateral, located at the southwest corner of the property, flows west and connects to the associated sanitary main closest to the site.

The EBMUD map confirms that the following subsurface water utility corridors exist along College Avenue, flowing southward and extending between and beyond Harwood and Chabot Avenues, in Oakland California: 1) a 16-inch-diameter, steel and mortar water utility main located approximately 5 feet west of the former UST cavity and 2) a 16.5-inch-diameter, steel and mortar water utility main located approximately 35 feet west of the former UST cavity. The invert depth for both utility mains were not provided but are approximated to be between 4 and 6 fbg. The map also indicates that a lateral utility pipeline extends westward from the southwest corner of the property (restroom location) to the closest utility main. The diameter, invert depth, and construction material of the lateral pipeline are not provided on the map; however, the invert depth at both ends are most likely between 1.5 and 5 fbg The pipe does appear to extend adjacent to the southern portion of the former UST cavity.

Information provided by the Sanborn Insurance Maps for the subject and vicinity properties, suggests that historical public utility mains (16-inch diameter) have been located beneath the College Avenue frontage of the property since at least 1911. The more recent available maps dated between 1950 and 1967 show that these utility mains are most likely those that are existing today, although upgrading or replacement of the utility lines may have occurred since. Invert depths of these historical utility lines were not reported. Utility corridor gradient and fluid flow is presumed to be towards the south-southwest. Both the Sanborn maps and aerial photographs provided for the years between 1911 and 1933, show that the subject facility has occupied the site since approximately 1952 and the fuel distribution/service stations occupied both corner properties to the north and south of the site since at least 1939 (See aerial photograph).

Based on the information provided by the subsurface utility corridor survey and on the historical fluctuation of the groundwater depth reported at the site (4.5 to 14 fbg), it appears that each sanitary, storm water, and water utility main west of the subject property line along College Avenue, are possibly located between the upper and lower vertical limits of the historical water table fluctuation and potentially act as a pathway for on- and/or off-site migration of contaminant hydrocarbons. Invert gradient and flow for each utility are generally southward, along College Avenue. On-site contaminant migration from an off-site source may potentially occur or have occurred via these utility corridors in the presumed down gradient directions reported during quarterly events conducted in October 2000 (northeast), July and October 2001 (northeast), April (southeast) and October (northeast) 2002, and October 2003 (northeast). Figure 6 presents a *Rose Diagram* showing the historical groundwater gradient and flow directions reported during these and other quarterly monitoring events.

Site Vicinity Receptor Well Survey

As part of the preferential migration pathway survey, the ACHCSA also requested that a site vicinity well survey be conducted within a 0.25-mile radius of the former subject property. The purpose of the survey was to determine whether any domestic and/or irrigation water-producing wells and monitor wells exist within this area that may both potentially act as receptors for offsite migration of the hydrocarbon-affected groundwater and potentially act as conduits for continued vertical migration.

On November 4, 2003, GGTR submitted a Well Completion Report Release Agreement to the Department of Water Resources (DWR), Central District for all domestic/irrigation and monitoring wells installed within a 0.25-mile radius of the subject property. A copy of the DWR Well Report Release Agreement is in attached.

On November 12, 2003, GGTR visited the DWR Central District office in Sacramento to access their database for the associated well search. Well Completion Reports were provided within a 2-mile radius of the subject property. Only two irrigation wells and three monitoring wells were located as result of the search. The two irrigation wells exist at the Claremont Resort and Tennis Club located approximately 0.75 mile northeast of the subject property, at the intersection of Claremont and Ashby Avenues in Oakland,

California. The two irrigation wells are logged as DWR Well Driller Report Nos. 071743 and 340582. One of the three monitoring wells exist at the Chevron Service Station at 3048 Ashby Avenue (southwest corner of intersection of Ashby & Domingo Avenues), approximately 0.75 mile northeast of the site. The monitor well is logged as DWR Well Driller Report Nos. 403112. It appears that three additional monitor wells currently exist on this property, although no well driller reports were provided. The two other monitor wells exist at the Arco Service Station at 6407 Telegraph Avenue, located approximately 0.5 mile west-northwest of the site, at the intersection of Alcatraz and Telegraph Avenues. These two monitor wells are logged as DWR Well Driller Report Nos. 421623 and 421624. DWR Well Completion Reports were not provided for either of the wells located at the subject and adjacent properties. The results of the receptor well survey are presented in the table below. A copy of each associated DWR Well Completion Report is attached.

DWR Report No.	Distance from Site (Miles)	Well Diameter (Inches)	Total Well Depth (Feet)	Well Construction Material	Screened Interval (Feet)	Well Usage (D,I,G)	Well Installation Date
071743	0.75	8	200	Steel	50-200	I	<1991
340582	0.75	8	190	Plastic	70-90, 150-180	I	1991
403112	0.75	4	34	PVC Plastic	14-34	GM	1992
421623	0.5	4	23	PVC Plastic	10-23	GM	1992
421624	0.5	4	15	PVC Plastic	5-15	GM	1992

Notes: D = Domestic/Household I = Irrigation/Landscaping GM = Groundwater Monitoring

Based on results of the receptor well survey, no known active domestic and/or irrigation wells exist within the 0.25-mile survey radius of the subject property. Only two irrigation wells reportedly exist approximately 0.75 mile from the site and are located regionally up-gradient of the property. At least three groundwater monitoring wells, in addition to the site and adjacent property wells, exist within 0.75 mile of the subject property. The three above reported monitor wells are located regionally up- and lateral gradient of the site. Because of their distance and up-/lateral-gradient locations from the subject property impacted groundwater, it appears unlikely that such irrigation and monitor wells will act as potential receptors or vertical conduits for continued contaminant migration. The approximate location of each associated well is shown in Figure 1 (DWR Report No.).

Pre-Field Activities

GGTR will obtain a drilling permit from of the County of Alameda Public Works Agency, an excavation permit from the City of Oakland Office of Planning & Building, and if warranted, a parking permit from the Oakland Traffic Control Department. GGTR will notify all property owners and tenants as well as the ACHCSA of all scheduled work activities. At least 72 hours before commencing field activities, GGTR will visit the site and outline the proposed work areas in white surface paint and subsequently notify Underground Service Alert (USA) to locate and mark any subsurface utilities extending through the designated work areas. Also, GGTR will prepare a traffic control plan should

partial or complete closure of the parking lane and/or sidewalk along the College Avenue frontages be warranted.

Modification of Additionally Proposed Site Characterization Activities

To address the associated technical comments presented in the ACHCSA's June 3, 2004 directive letter, GGTR recommends the following modifications to their previously proposed soil boring activities for further delineating both the site and contaminant source areas of the subject property. Revised soil boring locations are shown in Figure 7.

Site Characterization Soil Boring Locations

As discussed in our December 29, 2003 *Work Plan for Additional Site Characterization*, additional monitor well installation, specifically MW4, was proposed to better contour the existing gradient and to minimize the potential discrepancies in the historically fluctuating groundwater flow direction. GGTR had proposed to install this well following review of all percussion soil boring sample data (B15, B17, and B18) and only if this well was necessary at this time for collection of data in the presumed upgradient direction of MW2, pertaining to regional groundwater flow in the west-southwest direction. At a minimum, we feel that it is necessary to install a small diameter piezometer well, possibly using pre-pack filter sand, to establish groundwater elevation data on a monthly or quarterly basis as well as data on groundwater quality at this general location. If MW4 is not warranted at this time, we recommend relocating HB-2 further southwest toward the east wall of the garage and installing a small diameter piezometer well at this location. The revised location of HB-2 is shown in Figure 7.

In accordance with the ACHCSA's recommendation, the proposed Monitor Well MW5 will not be installed at this time. GGTR suggests relocating HB-3 approximately 15 feet south and utilizing this boring to acquire groundwater data only. Soil borings B19 & B20 (former monitor well location borings) will be relocated to the east and west sides, respectively, of the former fuel dispenser location to further assess potential source characterization, as discussed below.

Also, the ACHCSA requested that **depth discrete** grab groundwater samples be collected from Soil Borings B12 through B18. Based on review of historical grab and representative well groundwater data presented in Tables 3A & 3B, respectively, it appears that the highest reported gasoline-range hydrocarbon concentrations in groundwater *away* from the source areas were present in the direct vicinity of B3 and MW2 at depths ranging between 4.9 and 8.5 feet below the top of well casing (@ 5.4-9 fbg). Such water table levels were recorded during the months of January (MW2), April (MW2), and May (B3), with associated TPH-G concentrations ranging between 42,000 and 1,000,000 ug/l. Therefore, GGTR recommends that all interior soil boring grab groundwater samples (including HB-1) be collected within this depth interval, with screened well casing extending between approximately 4.5 and 9.5 fbg. Based on the tabulated historical fluid-level data for MW2, GGTR suggests conducting the grab

groundwater sampling between the months of January and April, when the water table is most likely within this specified interval.

As recommended by the ACHCSA, GGTR, in their December 2003 Work Plan proposed drilling GeoProbe® hydropunch borings both onsite and in the regional down- and lateral-gradient directions of the former UST cavity to further delineate the lateral extent of the contaminate groundwater plume at the subject property. To reiterate, Hydropunch Boring HB-1, located in the direct vicinity of B11 (October 2002), will be drilled and sampled to assess groundwater contamination only. Groundwater was not encountered in B11 during the previous investigation activities. As discussed above, GGTR recommends that HB-2 be relocated approximately 25 to 30 feet southwest of the originally proposed location, and that this boring be converted to a small diameter piezometer well (using pre-pack filter sand). Data from this well will be used to establish groundwater elevation data on a monthly or quarterly basis as well as data on groundwater quality in the presumed upgradient direction of regional groundwater flow. Also as mentioned above, HB-3, located in the east parking lane of College Avenue, should be relocated approximately 15 feet southward and used to acquire groundwater data only, in lieu of installation of MW5 (Figure 7).

As proposed previously, hydropunch borings HB-3 through HB-8 will be drilled in the west and east parking lanes along College Avenue to assess the lateral extent of groundwater contamination in the presumed regional down-gradient direction of the site. Hydropunch boring depth were proposed to approximately 15 fbg. Based on reported invert depths and on the general southward gradient flow direction of specific utilities along College Avenue (*Subsurface Utility Corridor Survey, Above Section*), we have previously concluded that such utilities may potentially act as preferential pathways for on- and/or off-site migration of contaminant hydrocarbons. GGTR proposes to assess such subsurface utility migration potential utilizing the hydropunch borings. **HB-3** will be positioned adjacent to the east side of the Municipal Water Supply Utility Main that is closest to the west side of the site structure (Figure 3) and will assess whether any contaminants may be entering the utility corridor from an upgradient source. With this utility invert reportedly lying approximately 4 to 6 fbg, GGTR proposes collecting a depth discrete grab groundwater sample at approximately 6 fbg, should groundwater be present at this depth. The depth to groundwater in GR-MW2 and MW1, located approximately 30 feet north-northeast and 50 feet south-southeast, respectively, of this proposed hydropunch boring, ranged between 4.5 and 8.5 fbg during the months of January and April. Based on this, GGTR will collect the grab groundwater sample at this location using a screened interval casing extending between 4 and 9 fbg only. **HB-8** will be relocated approximately 5 feet west of its original location, to the west side of the Municipal Water Supply Utility Main, and utilized to assess potential contaminant migration to the south of the site via the same water supply utility corridor; however, the depth and screened casing interval will be based upon the more shallow depth to water in MW3, located approximately 35 feet north of the hydropunch boring. The depth to water in MW3 during January and April ranged between 4.5 and 6.5 fbg.

HB-4 through HB-7 will straddle the east and west sides of the Sanitary Sewer (City of Oakland) and Municipal Water Supply Utility Mains located beneath the west parking lane of College Avenue. We recommend that the locations of **HB-4** and **HB-6** remain the same and used to both assess the lateral extent of hydrocarbon-effected groundwater from the subject site and whether contaminant migration maybe occurring from an offsite source during the general easterly groundwater flow direction historically reported during the months of October 2000 – 2003. Depth to groundwater in MW1 during these months ranged between approximately 10.25 to 11.25 fbg. The associated invert depths for these utility mains reportedly ranged between 4-6 fbg (Storm Water) and 10 fbg (Sanitary Sewer). Hydropunch Borings **HB-5** and **HB-7** will be relocated approximately 10 feet east of the originally proposed locations, adjacent to the east side of the Municipal Water Supply Line. These borings will be used to 1) evaluate the lateral extent of the subject site contamination in groundwater, and 2) evaluate whether contaminant migration from the subject property or an offsite source from the north maybe flowing westward past the 90-inch-diameter Alameda Flood Control Pipeline and other Sanitary and Storm Water Utility Mains located along the centerline of College Avenue. The maximum reported invert depth for these utility mains is approximately 12 fbg. The 90-inch-diameter Alameda Flood Control Pipeline extends between approximately 4.5 and 12 fbg. Temporary lane closure may be necessary for installation of these borings. Groundwater samples will be collected in each of the four hydropunch borings within the capillary fringe zone and, if present, within the estimated depth range of the associated utility corridors. Figure 7 shows the approximate revised locations of each hydropunch boring.

Source Characterization Soil Boring Locations

The ACHCSA, in their June 2003 Directive Letter, recommended that the hydrocarbon-affected soil and groundwater in the direct vicinity of the former fuel dispenser be delineated. As mentioned above, GGTR recommends relocating B19 and B20 to the general east and west sides, respectively, of the former fuel dispenser, located at the northwest corner of the subject property. An additional soil boring, B24, will be placed to the south of the former fuel dispenser. GGTR recommends placing each respective soil boring 10 to 15 feet from the dispenser island. Based on the maximum soil (61.8 mg/kg @ 16.5 fbg) and grab groundwater (296,000 ug/l @ 16.4 fbg) sample concentrations measured in soil boring B7 (October 2002), GGTR recommends advancing each boring in this source area to approximately 25 fbg or at least 10 feet past this established contaminate zone, to adequately assess the vertical extent of soil contamination and account for entrapped petroleum product below the water table. Figure 7 shows the approximate revised locations of each source characterization soil boring.

Soil boring locations in the vicinity of the former UST excavation (B21 through B22) will remain similar to those proposed in our December 2003 Work Plan. However, to further vertically assess the extent of soil contamination in this source area, as recommended by the ACHCSA, GGTR, again recommends advancing each boring at this source area to approximately 25 fbg or at least 10 feet past the established contaminate zone as previously characterized by elevated soil and grab groundwater sample results from B9 and B10 (@ 15 to 17 fbg) in November 2002 (See Tables 2 and 3A).

Again, based on field screening of soil samples collected at this time, additional soil borings may be warranted to further delineate the extent of source contamination. The additionally proposed boring locations will be reviewed and authorized by both the ACHCSA and responsible party prior to drilling.

Drilling and Soil Sampling Activities

GGTR will direct the subcontracted driller to initially hand auger each proposed soil boring location up to approximately 4 fbg to confirm clearance of any unmarked subsurface utilities. GGTR will drill each boring using a Geoprobe® direct push technology rig equipped with 2.25-inch-diameter drill rods/sampler. As approved by the ACHCSA, *site characterization* soil borings will be drilled to a depth of approximately 13 fbg or 2 to 3 feet past the first encountered groundwater. As discussed above, each *source characterization* boring will be drilled to approximately 25 feet below grade, to account for potentially trapped petroleum product below the water table.

Prior to drilling, the depth to groundwater (relative to grade surface) will initially be measured in MW1 through MW3 to determine the approximate location of the capillary fringe zone and to calculate a current gradient and flow direction. Soil samples will be collected continuously in each boring using a butyrate plastic tube-lined remote sampler (3 to 4 feet in length) beginning at approximately 4 fbg and continuing to the designated depths as proposed above. Again, soil samples will be collected continuously, specifically at changes of lithology, at the soil/groundwater interface, and at areas showing obvious contamination. All soil samples will be sealed with Teflon and plastic end caps, appropriately labeled, and transferred to cooler chilled to approximately 4° Centigrade. Soil boring samples will also be screened using a Thermo® 580B Organic Vapor Analyzer (OVA) and described using the Unified Soil Classification System and Munsell Rock Color Chart.

Geoprobe® drilling will be conducted by a California-licensed Water Well Drilling Contractor (C57). Boreholes will be logged under the supervision of a Registered Civil Engineer/Geologist. Hand auger soil cuttings generated during drilling activities will be transferred to a 55-gallon, D.O.T.-approved steel drum. GGTR will collect a four point composite soil sample from the drummed soil cuttings for analysis and waste disposal characterization. All down hole drilling and sampling equipment will be decontaminated between each boring location using an Alconox® solution and double rinsed with potable water. Equipment wash and rinse water will be transferred directly to a separate 55-gallon drum. All drilling and sampling activities will be conducted under the direct supervision of a representative of the ACHCSA.

Grab Groundwater Sampling Activities

Immediately following soil sampling activities in B12, B13, B16, and B19 through B24, GGTR will place 0.75-inch-diameter, factory-sealed, PVC screened casing to the approximate total depth of each borehole and allow a sufficient volume of water to enter each boring. Screened casing will be placed in B12 through B18 at proposed interval

depths only, as discussed above *(Site Characterization Borings)*. GGTR will then periodically monitor and record the depth to water in each temporary well casing and then collect a grab groundwater sample in each soil boring using either a disposable, factory-sealed polyethylene or stainless steel bailer. GGTR will carefully drain the volatile groundwater sample from the bottom of the bailer directly into laboratory-cleaned, 40-milliliter volatile organic analysis (VOA) vials. A specialized drainage tip will be used to prevent loss of any volatile constituents during sample transfer. GGTR will seal each sample container with a threaded cap and invert the VOA vials to insure no headspace or entrapped air bubbles are present. Groundwater samples analyzed for TPH-D analysis will be transferred to laboratory-supplied, 1 liter amber bottles.

As previously proposed, Hydropunch Borings HB-1 through HB-8 will be drilled to assess potential groundwater contamination only. Again, GGTR recommends relocating and converting HB-2 to a temporary pre-pack piezometer well to both assess groundwater quality east of site and to establish groundwater elevation data on a monthly or quarterly basis. GGTR will direct the subcontracted driller to initially hand auger each proposed hydropunch soil boring location up to approximately 4 fbg to confirm clearance of any unmarked subsurface utilities. Using Geoprobe® direct push technology, GGTR will hydraulically push the steel drill tubes to the desired depth of each boring. Factory-sealed, polyethylene sample tubing will be advanced through the center of the drill tubes to depth and connected to a screened sample point. GGTR will then extract the tubes approximately 6 to 8 inches, exposing the screened section of the sample point to the surrounding stratum and groundwater. If a sufficient volume of groundwater is present, GGTR will initially purge approximately 0.5 gallon using a low flow purge pump. GGTR will then collect a grab groundwater sample directly from the effluent end of the polyethylene tubing into laboratory-supplied sample containers. All grab groundwater samples will be appropriately labeled and transferred to a cooler chilled to approximately 4° Centigrade.

Backfilling Activities

Immediately following grab groundwater sampling activities in all additional soil and hydropunch borings (except HB-2), GGTR will direct the subcontracted driller to extract all temporary well casing and drill tubes from each borehole and backfill with neat Portland cement up to approximately 0.5 fbg. The balance of each borehole will be backfilled with appropriate surface material (i.e., concrete, asphalt, etc.) to restore original site conditions.

Interim Remedial Excavation Activities (Source Areas)

Source Excavation Activities

Following review of analytical results of the soil and grab groundwater samples collected in B19 through B24, GGTR will determine the approximate vertical and lateral limits of the additional source excavation areas (former UST cavity and dispenser locations). The actual limits of excavation will be proposed so as not damage existing vicinity subsurface utilities or building foundation and/or retaining walls. Prior to commencement, a *to-scale* plan showing the proposed excavation limits will be submitted to the ACHCSA for review and approval. GGTR will prepare a traffic control plan for temporary sidewalk closure and foot traffic diversion around the proposed work area in the public right of way.

GGTR will mobilize all excavation and support equipment to the site and initially saw cut through the concrete pavement (interior) and sidewalk and/or parking lane above the proposed excavation areas. GGTR will remove all concrete/asphalt using a backhoe excavator and transfer the debris to a flatbed truck for transport and disposal to a designated recycling facility.

Under direct supervision by a representative of the ACHCSA, GGTR will initially excavate and remove all clean overburden soil and temporarily stockpile the soil on plastic sheeting adjacent to the excavation areas. GGTR will then excavate all impacted soil generally within the proposed limits of excavation and transfer the soil directly to a roll-off bin lined with plastic sheeting. A four-point composite soil sample previously collected from B19 through B24, will be utilized for waste characterization and pre-approval of the impacted excavation soil waste to a State-licensed landfill facility. If warranted, the excavations will be shored to alleviate any undermining and/or allow for soil excavation below the water table. For safety purposes, GGTR will continually monitor the air quality within the general work area and excavation using an OVA.

Source Excavation Sampling Activities

At the direction of the ACHCSA, GGTR will collect confirmation soil samples from either the bottom or sidewalls of the excavation areas and/or at pertinent locations chosen during field activities. Samples will be collected using a brass tube-lined, 2-inch-diameter remote sampler (3- to 6- inch length) driven by a 15 pound slide hammer into relatively undisturbed soil, then sealed with Teflon® sheeting and plastic end caps, labeled, and transferred to a cooler chilled to approximately 4°C. Soil extracted from the shoe of the core sampler will be screened for soil vapor concentration (parts per million) using an OVA. GGTR will record the exact location, depth, and collection time of each sample. All sampling equipment will be washed with a non-phosphate Alconox® solution and double rinsed with potable water prior to each sample location.

Source Excavation Backfill Activities

Immediately following excavation sampling activities, GGTR will backfill the excavation cavities with the overburden soil and clean import Class 2 baserock up to approximately 0.5 fbg and compact the backfill soil in 2- to 3-feet lifts. GGTR will then resurface the balance of the excavation with concrete/asphalt to restore original site conditions.

If remedial excavation activities were performed to the extent feasible, and obvious soil contamination remains present in the saturated zone soil, GGTR recommends mixing Oxygen Release Compound (ORC) within the top three feet of the saturated zone soil to accelerate potential natural bioremediation of residual hydrocarbons within the saturated zone of the contaminant plume. ORC is a proprietary formulation of magnesium peroxide powder that is designed to provide increased oxygen to the saturated zone groundwater on a timed release basis. It is used to provide terminal electron acceptors to support the oxidative biodegradation of petroleum-based hydrocarbons, such as gasoline and PAHs. ORC can be applied by 1) mixing with excavation backfill material, 2) mixing with water for slurry injection into the saturated zone utilizing Geoprobe® drilling technology, and 3) placement into groundwater monitor wells in specially designed socks. ORC is manufactured by Regenesis of San Clemente, California.

In this case, ORC will only be used if site-specific groundwater parameters warrant it's use. For example, the grab groundwater samples collected from the initial soil borings (B19 through B24) and representative samples collected from MW1 through MW3 should initially be analyzed for dissolved Iron and Manganese to help verify whether potential oxygen sinks are present within the source area of the contaminant plume. Dissolved oxygen and oxidation-reduction potential parameters historically measured in each monitor well will also be used to evaluate the biodegradation potential within the saturated zone soil and groundwater. Prior to any ORC application, a project evaluation form summarizing all site specific soil/groundwater information should be submitted to Regenesis for review and subsequent design application.

Soil & Groundwater Sample Analysis

A Chain-of-Custody form will be initiated by GGTR personnel at the time of sampling and will accompany the soil and groundwater samples to a State-certified environmental laboratory using California Department of Health Services approved analytical methods.

All soil and grab groundwater samples will be analyzed for:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G; EPA 8015M/8021B)
- Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX; EPA 8015M/8021B)
- Methyl Tertiary-Butyl Ether (MTBE; EPA 8015M/8021B)
- Ethylene Dibromide and Ethylene Dichloride (EDB & EDC; EPA 8260)

All grab groundwater samples will additionally be analyzed for Fuel Oxygenates (EPA Method 8260), including Ethanol, Tertiary Amyl Methyl Ether (TAME), Ethyl Tertiary Butyl Ether (ETBE), Di-Isopropyl Ether (DIPE), and Tertiary Butyl Alcohol (TBA)

Selected soil samples and all groundwater samples collected from B12 and B21-B23 (former UST source area) and from the remedial source excavation samples will be additionally analyzed for:

- Total Oil & Grease (TOG; Standard Method 5520 E&F)
- Cadmium, Chromium, Lead, Nickel, and Zinc (LUFT Metals; EPA 3000/7000)
- VOCs (EPA Method 8260)

The stockpile composite soil sample(s) will be analyzed for:

- TPH-G
- BTEX & MTBE
- Total Lead (EPA Method 6010B/ICAP)

Monitoring Well Construction

Following receipt of all chemical and physical testing conducted on the soil and grab groundwater samples collected in the proposed soil (B12, B13, B16, and B19 through B24) and hydropunch borings (HB-1 through HB-8), GGTR will evaluate the necessity for and determine the most appropriate locations of additional monitor well(s) proposed at the site. GGTR will discuss all preliminary data with the ACHCSA and determine whether the additional wells are required, and if so, their most appropriate location. If warranted, GGTR will then return to the site and rotary auger drill additional, hollow stem auger soil boring(s), and place each additional boring according to field data/observations from the percussion borings. Each additional boring will be converted to a 2-inch-diameter, groundwater monitoring well. The proposed total well depth will be approximately 20 fbg. Figure 8 is a Well Construction Diagram showing the anticipated construction details of the additionally proposed groundwater monitoring wells in the vicinity of the subject property.

The monitoring wells will be constructed of standard 2-inch diameter, flush-threaded, Schedule 40 Polyvinyl Chloride (PVC) factory slotted well screen and blank riser casing. Well construction specifications will be generally consistent with that for MW1 through MW3. GGTR proposes using 0.010-inch slotted well screen sections for construction of the MW4 and MW5 due to the appreciable amount of fines observed in the soil samples collected during the November 2002 soil boring activities. The screened casing interval will extend from approximately 4 to 20 fbg. Blank riser casing will extend from approximately 0.5 to 4 fbg. A locking compression plug and threaded PVC bottom cap will be installed at the top and bottom of each well, respectively. Filter pack, consisting of No. 2/12 silica sand, will be placed within the annular space between the PVC casing and borehole as the auger sections are withdrawn from the borehole. Filter sand will extend approximately 1 foot above the upper limit of the screened well section to the total depth of each well.

Prior to setting the annular well seal, if a sufficient volume of water is present within each borehole, GGTR will surge each well using a 2-inch-diameter surge block to remove any native annular fines and settle the sand filter pack (the addition of potable water may be necessary for this application). If required, GGTR will place additional sand within the borehole/well annulus to maintain the proper amount above the well screen. GGTR will than place hydrated bentonite chips above the annular filter pack up to approximately 2 fbg. The remainder of the annular space will be filled with neat Portland cement grout and a traffic-rated monitoring well box will be placed directly over each monitor well casing and secured in place with concrete, flush to surface grade. If actual site conditions vary significantly from that anticipated, GGTR personnel may vary the well construction specifications accordingly.

Monitoring Well Development & Elevation/Coordinate Survey

At least 48 hours following completion of the additional well installation activities, GGTR will develop each well to improve the groundwater hydraulic conductivity between the newly introduced sand filter pack and the native soil surrounding each well casing. GGTR will initially monitor and record the depth to water in each well and subsequently surge each well along the entire water column interval for approximately 10 minutes, using a 2-inch-diameter surge block. Well development will continue by purging up to approximately 10 casing volumes of groundwater from each well using a diaphragm pump and polyethylene tubing, and continuing until the well water is relatively free of turbidity and suspended fines (generally only until slightly cloudy). GGTR will transfer the well purge water to 55-gallon, DOT-approved, steel drums and temporarily store them onsite pending transport and disposal to a licensed facility.

A Civil Engineer or Land Surveyor licensed in the State of California will survey the grade elevation and the elevation of the top of casing (TOC; north side) of each newly-installed monitor well relative to Mean Sea Level (NGVD 29). In addition, the latitude, longitude, and coordinates of each well location will be surveyed relative to the California Coordinate System, Zone III (NAD83). GGTR will subsequently upload all survey data to the State Water Resources Control Board's GeoTracker Database System.

Groundwater Sampling Activities: Monitor Wells

Approximately 48 hours following development activities in each newly-installed well, GGTR will measure and record the depth to water and presence of sheen or free product in each existing and newly-installed well using a Keck® oil/water interface probe. GGTR will obtain all measurements relative to the approximate north side of the TOC, with an accuracy of 0.01 foot. GGTR will also measure the dissolved oxygen concentration in each well (insitu) using a YSI®55 Dissolved Oxygen Meter and measure the oxidation-reduction potential.

GGTR will purge approximately three to four casing volumes of groundwater from each well and simultaneously monitor the pH, temperature and conductivity of the purge water to evaluate groundwater stabilization. GGTR will purge each well using a diaphragm

pump and transfer the purge water to a 55-gallon storage drum. If floating product is present in any well, GTTR will remove the product using a disposable bailer and reduce it to a sheen prior to purging and sampling.

GGTR will then collect a groundwater sample in each well using a factory-sealed, disposable, clear acrylic bailer. The volatile water samples will be poured directly into laboratory cleaned 40-milliliter volatile organic analysis (VOA) vials to prevent loss of any volatile constituents. The vials will be filled slowly and in such a manner that the meniscus extends above the top of the VOA vial. After the vials are filled and capped, they will be inverted to insure there is no headspace or entrapped air bubbles. Groundwater samples analyzed for diesel/stoddard-range organics will be carefully poured into laboratory cleaned 1-liter amber bottles. All groundwater samples will be labeled and placed in a cooler chilled to approximately 4°C. GGTR will submit the samples under chain of custody command to NSL in South San Francisco, California for chemical analysis. Equipment wash and rinse water will be transferred to a 55-gallon storage drum. Each drum will be sealed with a steel lid and appropriately labeled as non-hazardous waste.

Monitor Well Groundwater Sample Analysis

All groundwater samples obtained from each newly installed (and existing) well will be analyzed for the following California Department of Health Services approved methods.

- TPH-G (EPA 8015M/8021B)
- TPH-D (EPA Methods 3510/8015M)
- BTEX (EPA 8015M/8021B)
- MTBE (EPA 8015M/8021B; Confirmation by EPA 8260)
- VOCs (EPA 8260), including Fuel Oxygenates and EDB & EDC

One groundwater sample will additionally be analyzed for total dissolved solids (EPA Method 160.1) to further assess groundwater quality at the site. A sample trip blank will accompany all groundwater samples to the laboratory and be analyzed for BTEX only. GGTR will request that all associated laboratory analytical reports be reported in Electronic Deliverable Format (State Assembly Bill 2886, Fall 2000) in general accordance with the State Water Resources Control Board's GeoTracker Database System.

Waste Management

Hydrocarbon-effected soil generated during the remedial source excavation and additional soil boring/well installation activities will be either drummed and/or stockpiled and covered with plastic sheeting and then temporarily stored onsite in a secure area. Pending receipt of the composite stockpile soil sample analysis, GGTR will subsequently profile and transport the waste to an appropriate licensed disposal facility under uniform waste manifest.

Equipment wash and rinse water generated from the decontamination of soil boring equipment will be transferred to a 55-gallon, D.O.T.-approved steel drum, labeled, and stored onsite. The liquid waste will be profiled for disposal/recycling under uniform waste manifest following receipt of the laboratory results of soil boring grab groundwater sample analysis.

Data Interpretation and Report Preparation

Following the completion of all field work, GGTR will review all field and analytical data and prepare a technical report, discussing the activities and findings of the investigation and present conclusions and recommendations. The report will be submitted to the ACHCSA for regulatory review.

Schedule

GGTR anticipates beginning the additional field activities within two to three weeks of receiving client authorization to proceed. Pursuant to the ACHCSA's Technical Report Request guideline (June 3, 2004), the aforementioned report will be submitted to the ACHCSA within 60 days following work plan approval.

During this phase of work or shortly thereafter, GGTR recommends conducting a professional re-survey of the site monitor wells to acquire GPS x,y-coordinate survey data for electronic submission to the GeoTracker (Assembly Bill 2886, Fall 2000).

Report Distribution

All reports that are prepared during the continuing work on this project will be sent to:

Alameda County Health Care Services
Environmental Health Services
Environmental Protection (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
Attention: Mr. Don Hwang *(1 Copy, Unbound)*

William G Sheaff Trust
c/o Dr. Brian Sheaff
1945 Parkside Drive
Concord, California 94519 *(1 Copy, Bound; 1 Copy, Unbound)*

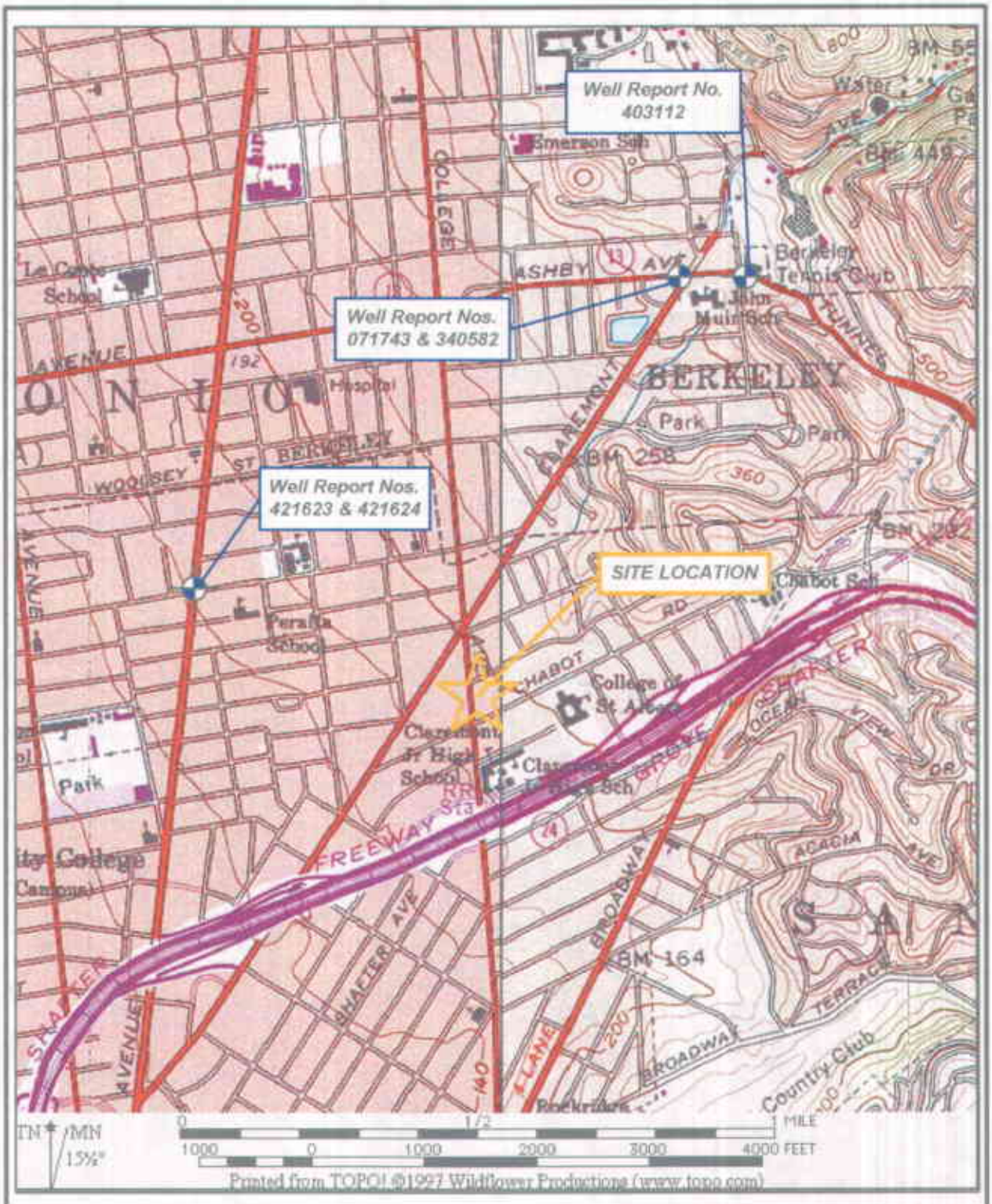
ATTACHMENTS

FIGURES
TABLES
REGULATORY CORRESPONDENCE

ADDITIONAL
SITE CHARACTERIZATION
WORK PLAN ADDENDUM

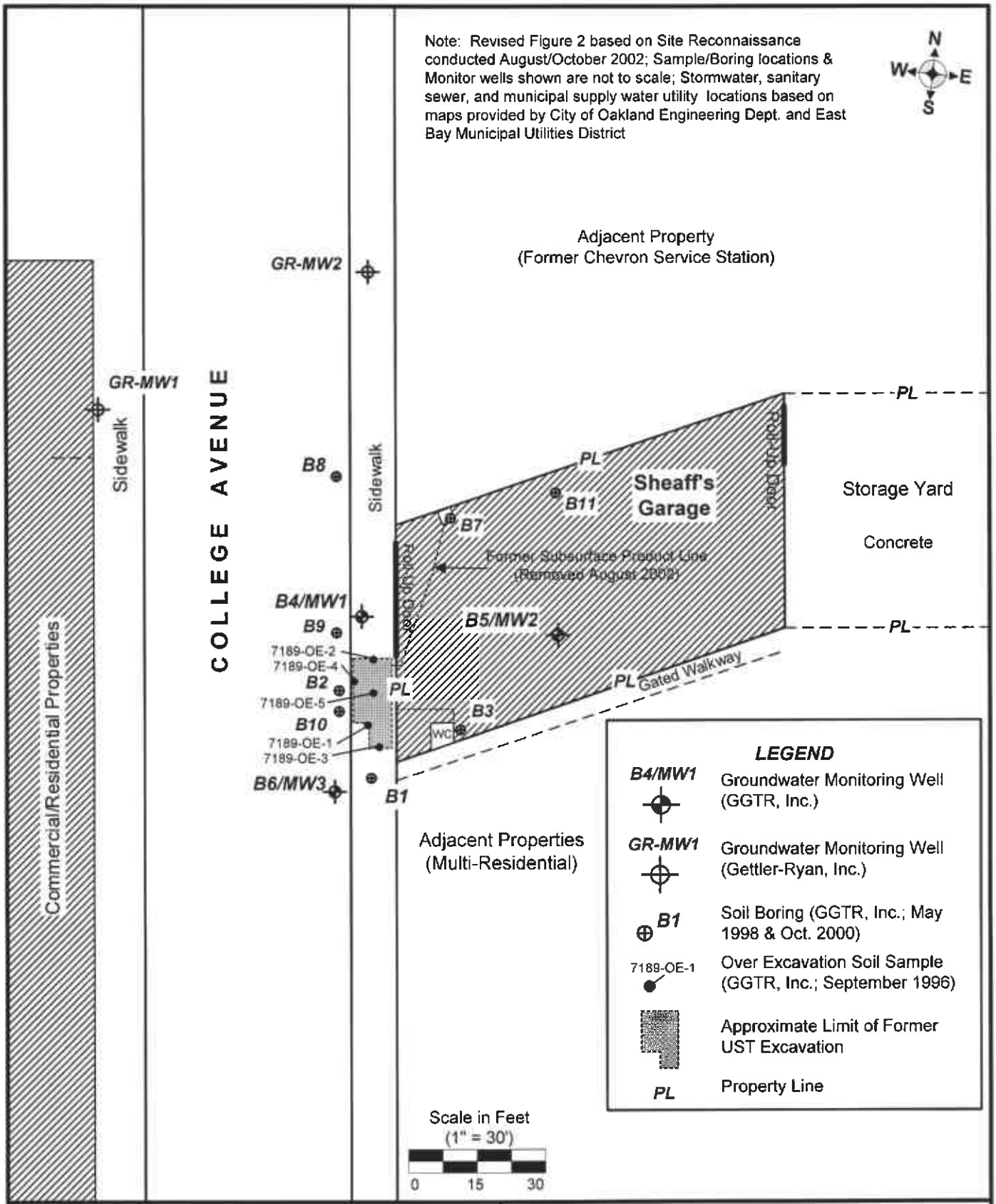
Sheaff's Garage
5930 College Avenue
Oakland, California

GGTR Project No. 7335
September 30, 2004



GOLDEN GATE TANK REMOVAL, INC. 255 Shipley Street San Francisco, California 94107 Ph (415) 512-1555 Fx (415) 512-0964	SITE LOCATION MAP Sheaff's Garage 5930 College Avenue Oakland, California

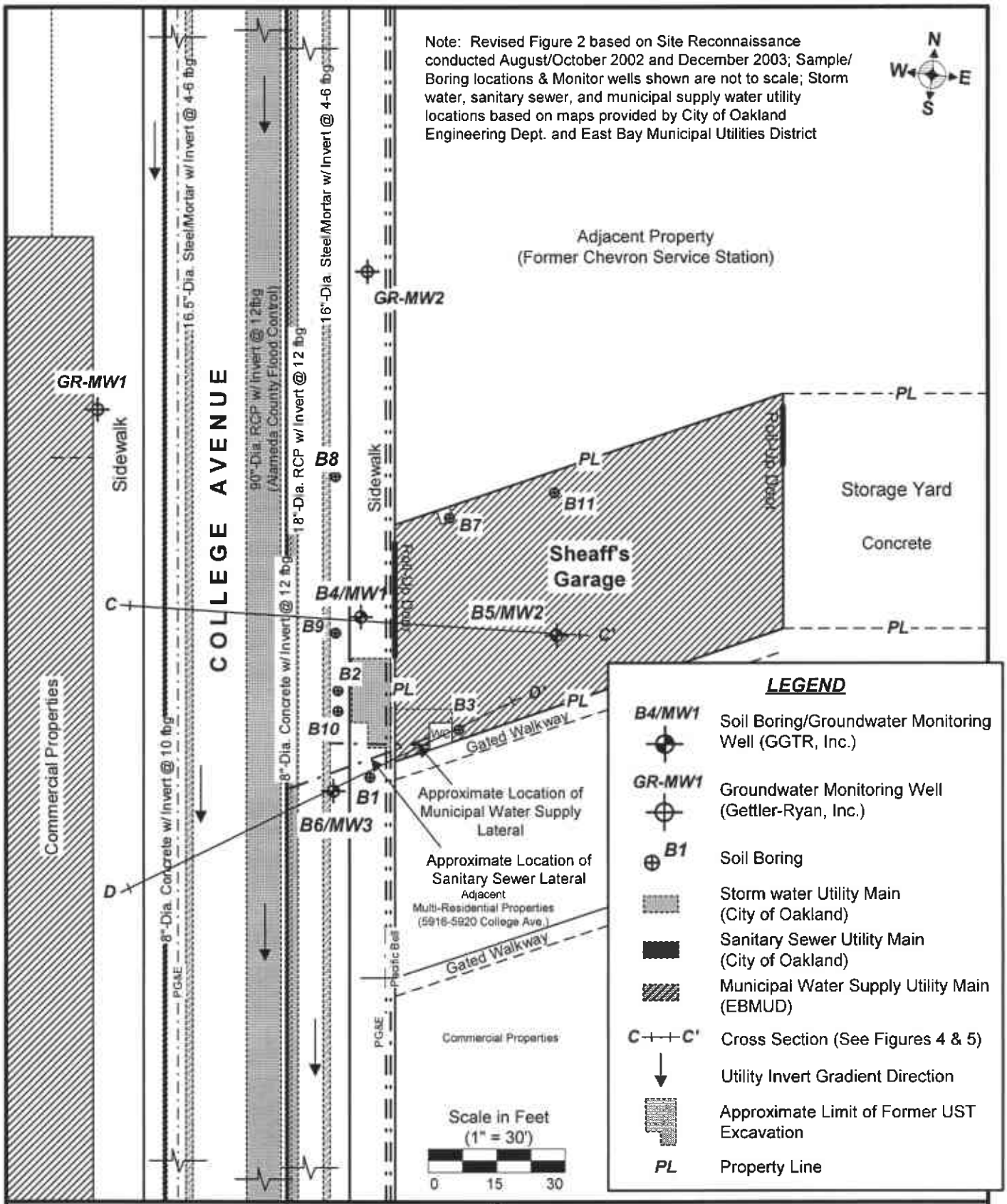
GGTR Project No. 7335	*Fn: 7335 sc.wp.F1*	*Revision By: baw/12.03*	***Figure 1***



GOLDEN GATE TANK REMOVAL
255 Shipley Street
San Francisco, CA 94107
Ph (415) 512-1555 Fx (415) 512-1555

SITE PLAN
Sheaff's Garage
5930 College Avenue, Oakland, California

GGTR Project No. 7335	Fn: 7335.sc.wp.F2	Figure By: baw/12.03	Figure 2

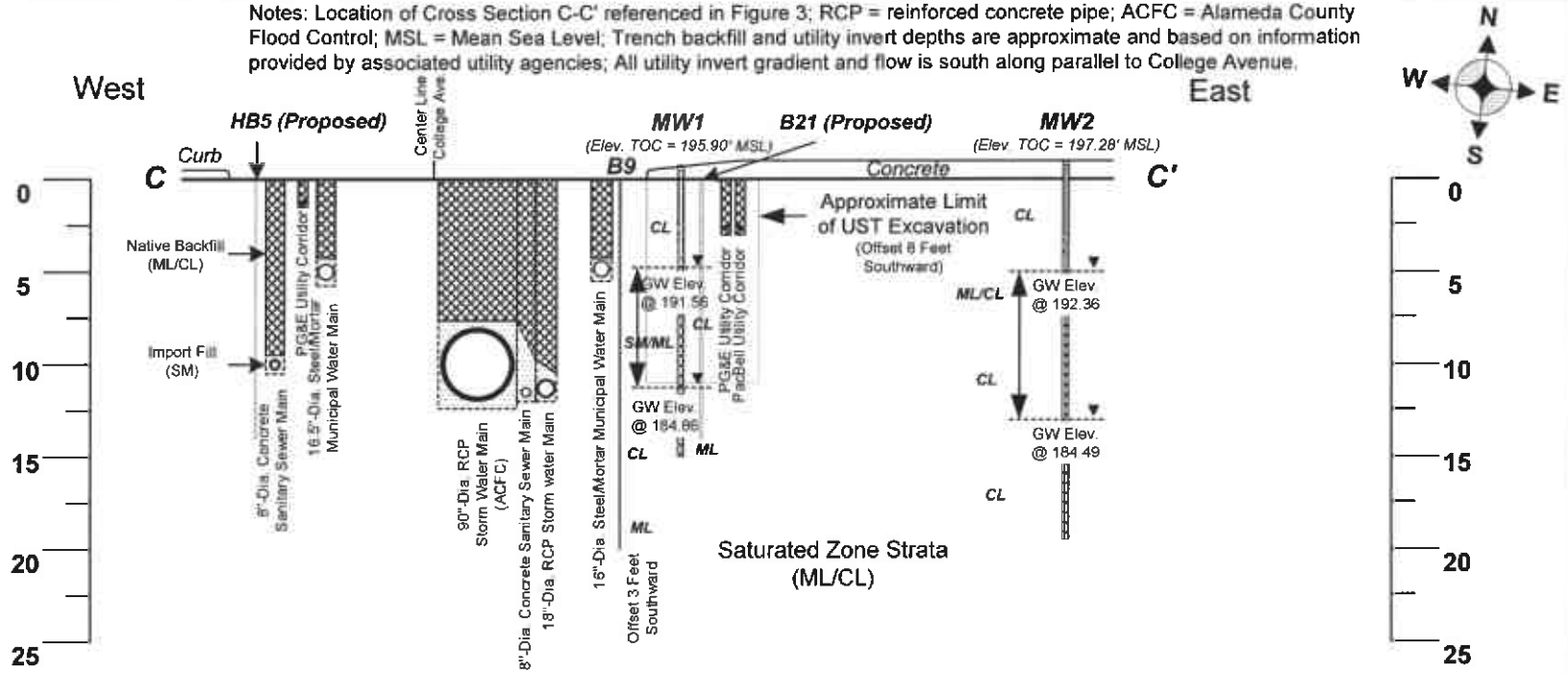


GOLDEN GATE TANK REMOVAL
255 Shipley Street
San Francisco, CA 94107
Ph (415) 512-1555 Fx (415) 512-1555

SUBSURFACE UTILITY MAP
Sheaff's Garage
5930 College Avenue, Oakland, California

GGTR Project No. 7335	Fn: 7335.sc.wp.F3	Figure By: baw/12.03	Figure 3

Notes: Location of Cross Section C-C' referenced in Figure 3; RCP = reinforced concrete pipe; ACFC = Alameda County Flood Control; MSL = Mean Sea Level; Trench backfill and utility invert depths are approximate and based on information provided by associated utility agencies; All utility invert gradient and flow is south along parallel to College Avenue.



Vertical Exaggeration
1:2

Horizontal Scale in Feet
(1" = 20')
0 10 20

LEGEND

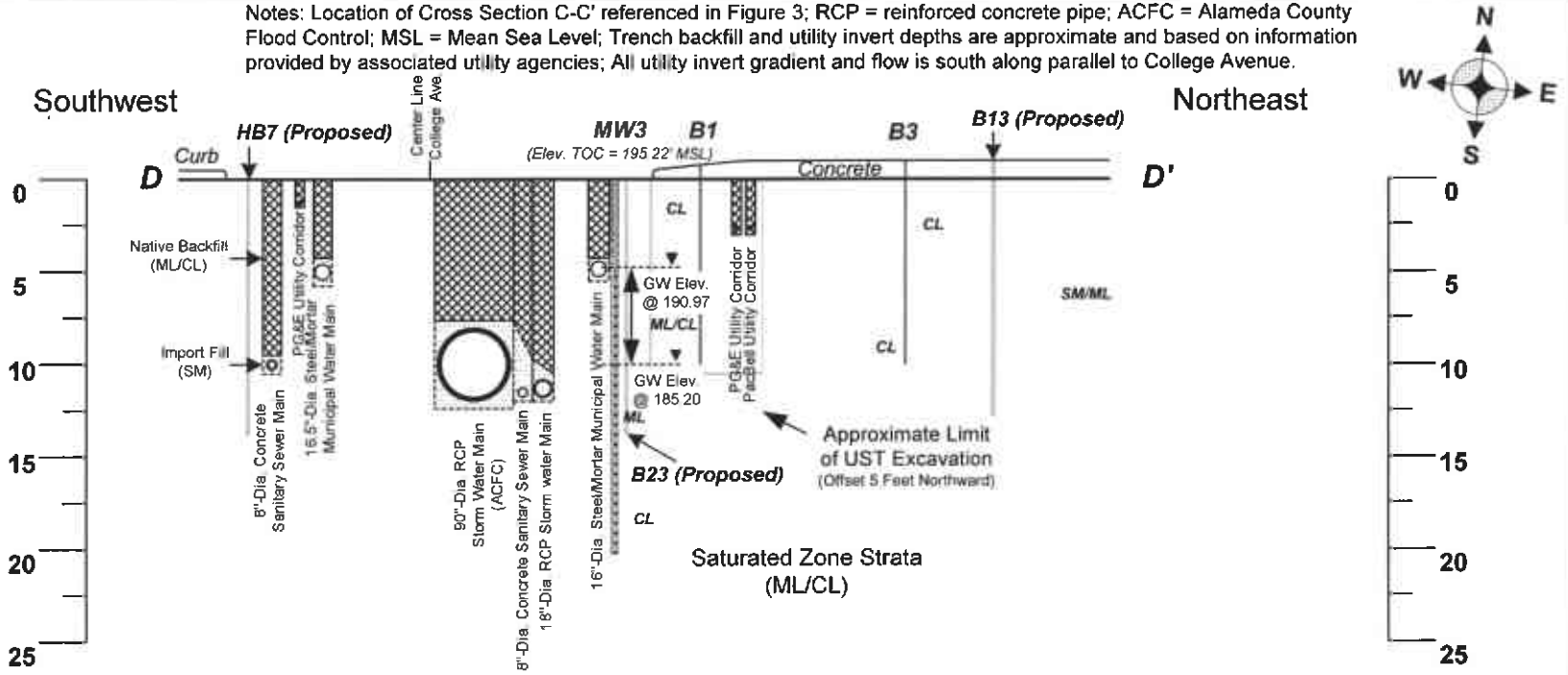
MW1	Existing Groundwater Monitor Well	ML	Clayey, Sandy SILT
B9	Soil Boring (Portland Cement Backfill)	CL	Silty CLAY
	Subsurface Utility Corridor (Backfill: Native overlying utility grade sand)	SM/ML	Clayey, Silty SAND/Sandy SILT
		ML/CL	Silty CLAY/Clayey SILT
		▼	Groundwater Elevation, October 1999-2003

GOLDEN GATE TANK REMOVAL
255 Shipley Street
San Francisco, California 94107
Phone (415) 512-1555 Fax (415) 512-1555

CROSS SECTION C-C'
Sheaff's Garage
5930 College Avenue, Oakland, California

GGTR Project No. 7335	Fn: 7335.sc.wp.F4	Figure By: baw/12.03	FIGURE 4

Notes: Location of Cross Section C-C' referenced in Figure 3; RCP = reinforced concrete pipe; ACFC = Alameda County Flood Control; MSL = Mean Sea Level; Trench backfill and utility invert depths are approximate and based on information provided by associated utility agencies; All utility invert gradient and flow is south along parallel to College Avenue.



Vertical Exaggeration
1:2

Horizontal Scale in Feet (1" = 20')

0 10 20

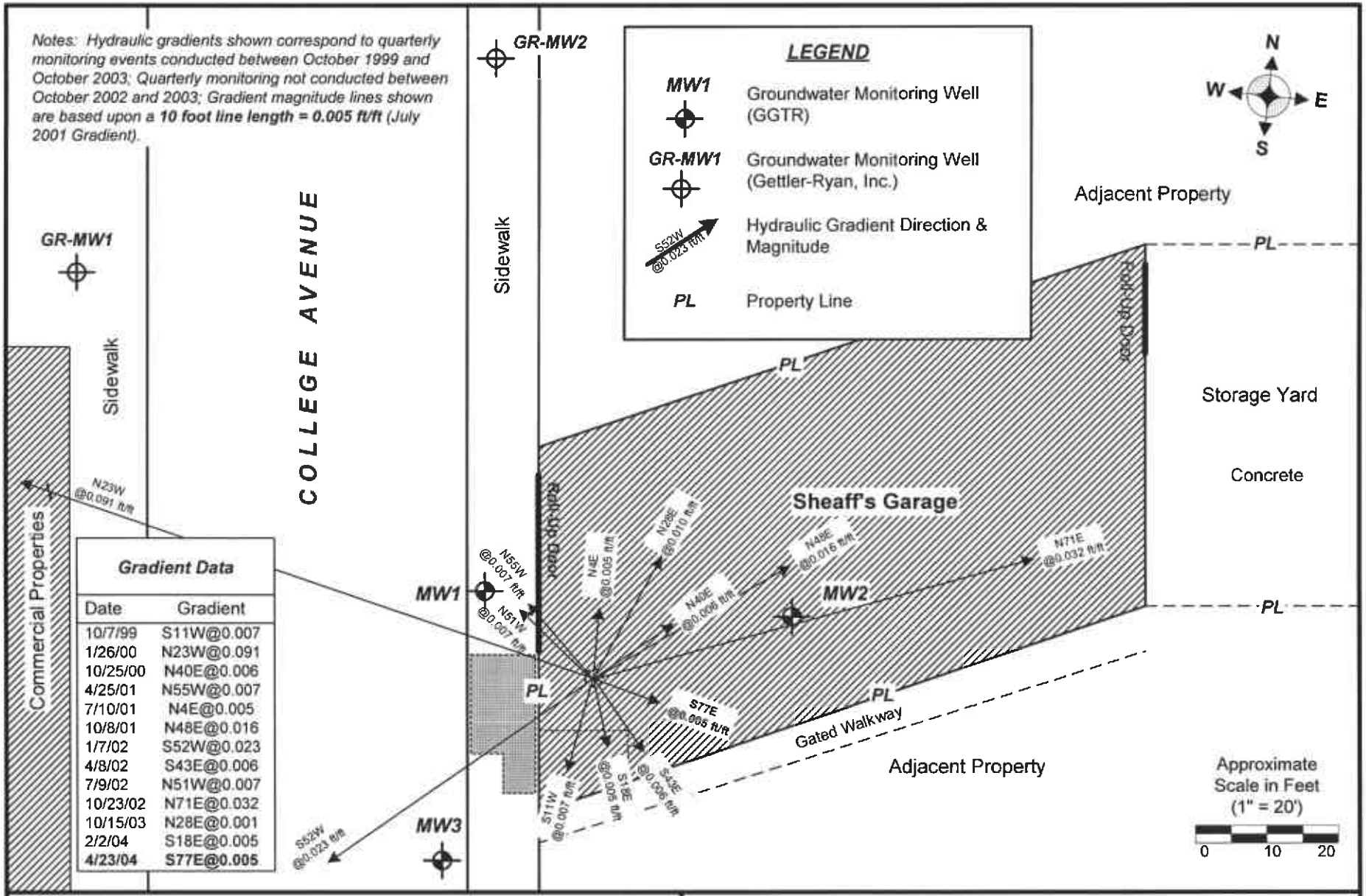
LEGEND

MW3	Existing Groundwater Monitor Well	ML	Clayey, Sandy SILT
B1	Soil Boring (Portland Cement Backfill)	CL	Silty CLAY
	Subsurface Utility Corridor (Backfill: Native overlying utility grade sand)	SM/ML	Clayey, Silty SAND/Sandy SILT
		ML/CL	Silty CLAY/Clayey SILT
		▼	Groundwater Elevation, October 1999-2003

GOLDEN GATE TANK REMOVAL
255 Shipley Street
San Francisco, California 94107
Phone (415) 512-1555 Fax (415) 512-1555

CROSS SECTION D-D'
Sheaff's Garage
5930 College Avenue, Oakland, California

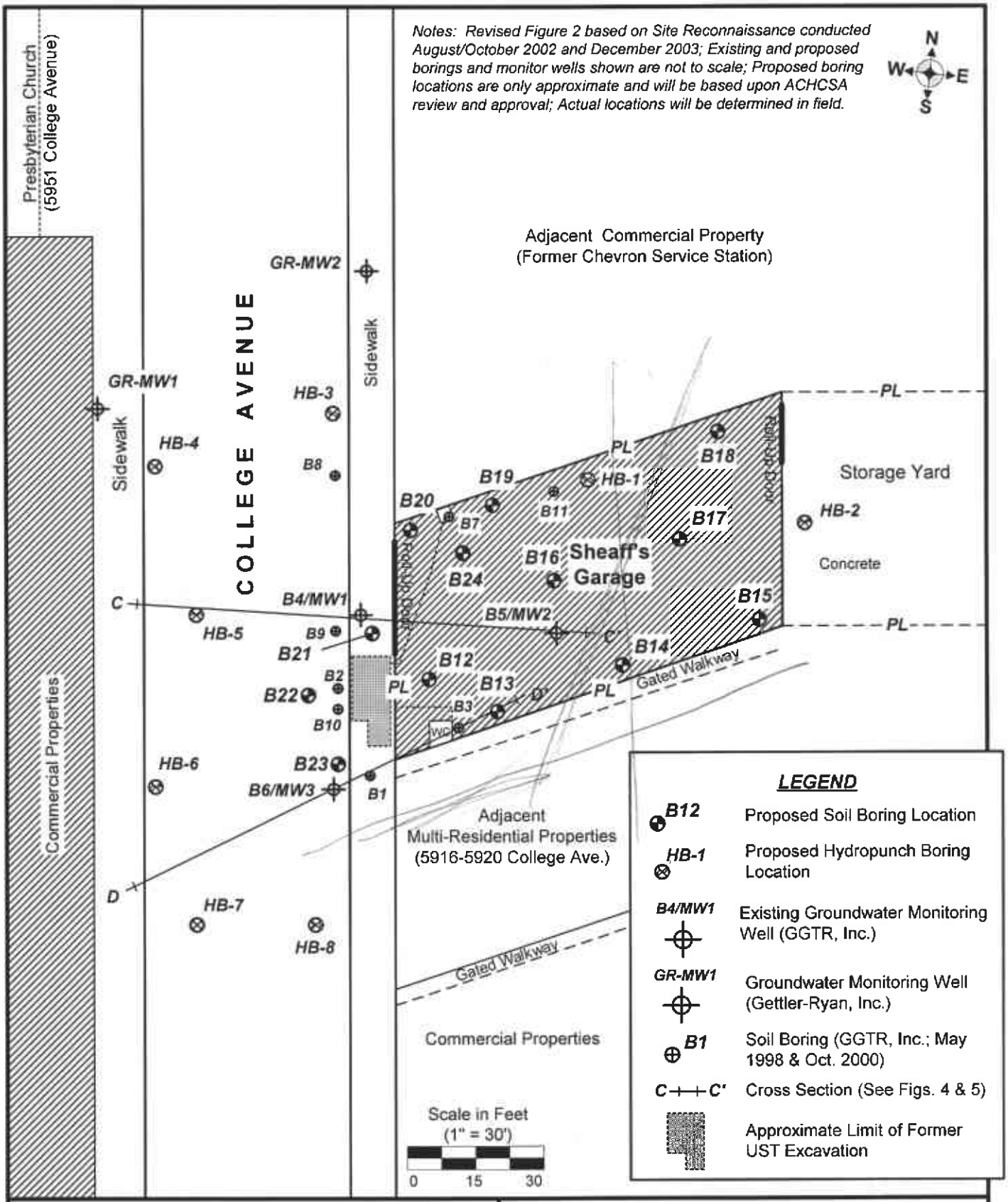
GGTR Project No. 7335	*Fn: 7335 sc.wp.F5*	*Figure By: baw/12.03*	***FIGURE 5***



GOLDEN GATE TANK REMOVAL, INC.
255 Shipley Street
San Francisco, California 94107
Phone (415) 512-1555 Fax (415) 512-0964

ROSE DIAGRAM: HISTORICAL HYDRAULIC GRADIENT
Sheaff's Garage
5930 College Avenue, Oakland, California

GGTR Project No. 7335	*Fn: 7335.wpa F6 04.04*	*Revision By: baw/08.04*	***FIGURE 6***

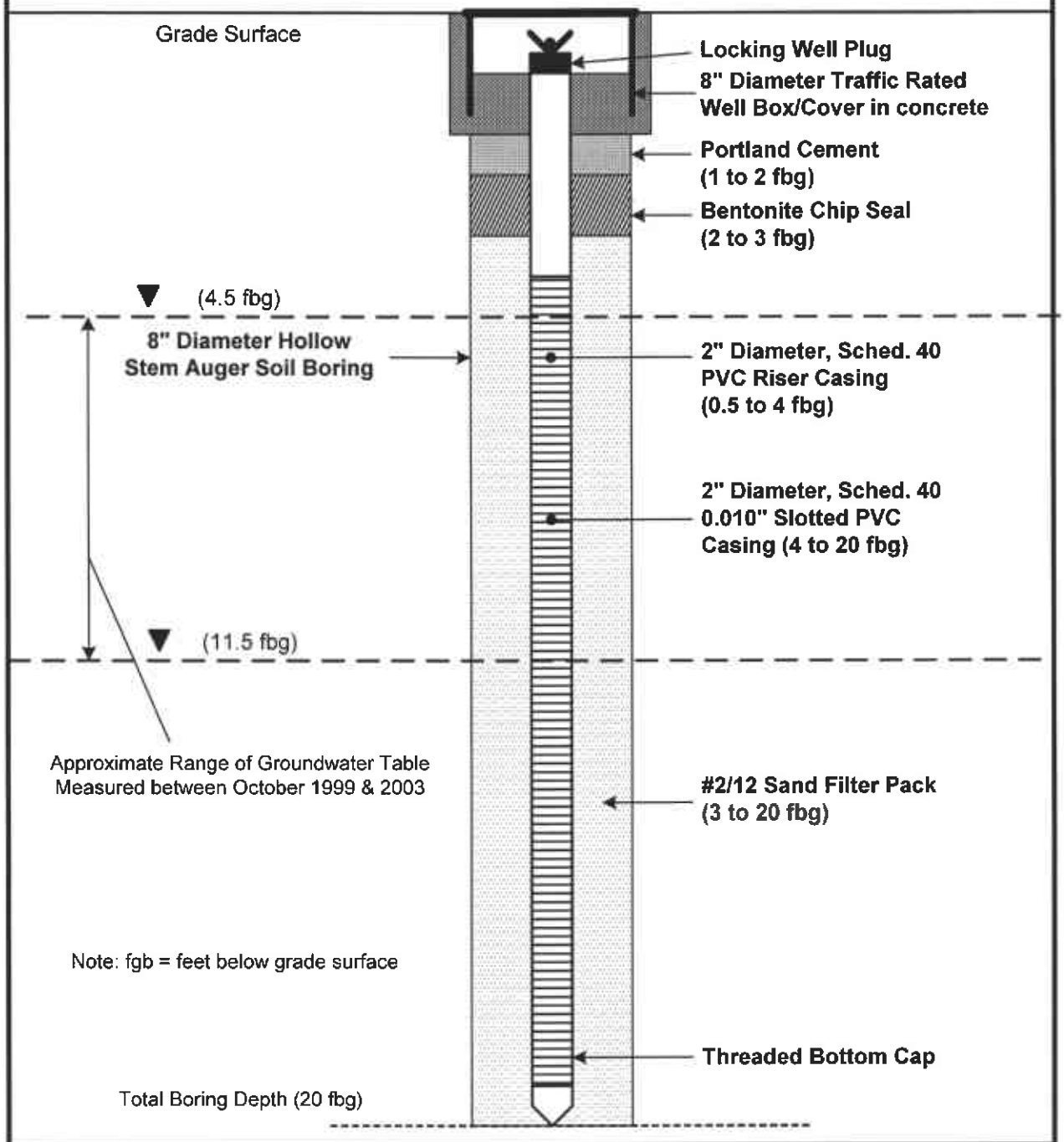


GOLDEN GATE TANK REMOVAL
255 Shipley Street
San Francisco, CA 94107
Ph (415) 512-1555 Fx (415) 512-1555

PROPOSED BORING LOCATIONS
Sheaff's Garage
5930 College Avenue, Oakland, California

GGTR Project No. 7335	Fn: 7335.sc.wpa.F7	Revision By: baw/09.04	Figure 7

Groundwater Monitor Well
Construction Specifications



GOLDEN GATE TANK REMOVAL, INC. 255 Shipley Street San Francisco, CA 94107 Ph (415) 512-1555 Fx (415) 512-0964	**WELL CONSTRUCTION DIAGRAM** Sheaff's Garage 5930 College Avenue, Oakland, California

GGTR Project #7335	*Dwg: baw/12.03*	*Not To Scale*	***Figure 8***

TABLE 1

Results of Tank Removal and Over-Excavation Soil Sample Analysis

5930 College Avenue, Oakland, CA

Sample ID	Sample Depth (fbg)	Sample Date	TPH-G (mg/kg)	TPH-D (mg/kg)	TRPH (mg/kg)	BTEX (mg/kg)	Total VOCs (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
7189-T1-N	8	8/6/96	6,000	--	--	19/240/76/470	--	--	--	--	--	--
7189-T1-S	8	8/6/96	8,100	--	--	16/240/72/530	--	--	--	--	--	--
7189-T1-C-10'	10	8/6/96	1,200	--	--	9.1/68/10/79	--	--	--	--	--	--
7189-T2-C	8	8/6/96	560	ND	16,000	2.7/16/3.3/33	38.984[2]	ND	49	48	68	210
7189-SP1	NA	8/6/96	ND	ND	--	ND/ND/ND/ND	--	--	--	--	--	--
7189-SP2	NA	8/6/96	1.3	ND	14,000	ND/ND/ND/0.020	1.384[3]	ND	34	79	32	130
7189-OE-1	10.5	10/2/96	1,400[1]	ND	1,700	9.8/81/14/110[1]	--	--	--	--	--	--
7189-OE-2	10.5	10/2/96	840[1]	ND	320	3.3/51/12/91[1]	--	--	--	--	--	--
7189-OE-3	10.5	10/2/96	ND	ND	21	ND/0.01/ND/0.027	--	--	--	--	--	--
7189-OE-4	10.5	10/2/96	430[1]	ND	240	0.93/18/4.6/41[1]	--	--	--	--	--	--
7189-OE-5	10.5	10/2/96	1,400[1]	ND	1,100	2.2/40/14/120[1]	--	--	--	--	--	--
Laboratory Detection Limit			1	10	10	≤0.015	≤250	2.0	5.0	2.0	5.0	1.0

NOTES: 7189-T1-N, -S, -C-10', -C = tank removal soil samples collected from north and south ends and center of UST cavity

7189-SP1, -SP2 = tank removal stockpile composite soil samples

7189-OE-(1-5) = over-excavation soil samples collected from sidewalls and center (-OE-5) of cavity

TPH-G = total petroleum hydrocarbons (TPH) as gasoline (CA DHS); TPH-D = TPH as diesel (CA DHS)

TRPH = total recoverable petroleum hydrocarbons (CA DHS)

BTEX = benzene, toluene, ethylbenzene, total xylenes (EPA Method 8020)

Total VOCs = total (summation of) of volatile organic compounds (EPA Method 8260)

Cd, Cr, Pb, Ni, Zn = cadmium, chromium, lead, nickel, and zinc (TTLC Metals by EPA Method 3050/7000 Series)

fbg = feet below grade; mg/kg = milligrams per kilogram (parts per million); -- = not analyzed for this constituent

NA = not applicable; ND = concentration below associated laboratory reporting limit

[1] = sample dilution required by laboratory; detection limits were adjusted accordingly

[2] = 2.3 mg/kg benzene, 0.360 mg/kg 4-methyl-2-pentanone, 6.6 mg/kg toluene, 0.024 mg/kg tetrachloroethene, 2.7 mg/kg ethylbenzene, 15 mg/kg total xylenes, 0.260 mg/kg isopropyl benzene, 1.1 mg/kg n-propyl benzene, 2.8 mg/kg 1,3,5-trimethylbenzene, 7.5 mg/kg 1,2,4-trimethylbenzene, 0.200 mg/kg sec-butylbenzene, and 0.140 mg/kg p-isopropylbenzene

[3] = 0.042 mg/kg 4-methyl-2-pentanone, 0.005 mg/kg toluene, 0.031 mg/kg tetrachloroethene, 0.010 mg/kg ethylbenzene, 0.322 mg/kg total xylenes, 0.017 mg/kg n-propyl benzene, 0.920 mg/kg 1,3,5-trimethylbenzene, 0.037 mg/kg 1,2,4-trimethylbenzene

TABLE 2

Historical Results of Subsurface Boring Soil Sample Analysis

5930 College Avenue, Oakland, CA

Boring Location	Sample ID	Sample Depth (fbg)	TPH-G (mg/kg)	TEPH (mg/kg)	BTEX (mg/kg)	MTBE (mg/kg)	Total Lead (mg/kg)
B1	7335-B1-5	5	ND	ND	ND/ND/ND/ND	ND	--
	7335-B1-9	9	75	53	0.07/0.04/0.53/1	0.06	--
B2	7335-B2-5	5	0.6	60	ND/ND/ND/ND	0.03	--
	7335-B2-9	9	2,800	ND	13/78/38/160	ND	--
B3	7335-B3-6	6	ND	ND	ND/ND/ND/ND	ND	--
	7335-B3-10	10	48	ND	0.5/0.6/0.5/2	ND	--
B4 (MW1)	7335-B4-5	5	ND	ND	ND/ND/ND/0.02	ND	8
	7335-B4-9	9	280	ND	4/8/6/27	1	11
B5 (MW2)	7335-B5-3.0	3	ND	ND	ND/ND/ND/ND	ND	--
	7335-B5-5.0	5	ND	ND	ND/ND/ND/ND	ND	--
	7335-B5-9.0	9	ND	ND	ND/ND/ND/ND	ND	--
	7335-B5-15.5	15.5	2.8	ND	0.69/0.092/0.066/0.22	ND	--
	7335-B5-20.0	20	ND	ND	0.028/0.021/0.007/0.029	ND	--
B6 (MW3)	7335-B6-5.0	5	ND	200	ND/ND/ND/ND	ND	--
	7335-B6-10.0	10	1.5	ND	ND/ND/0.005/0.013	ND	--
	7335-B6-15.0	15	ND	ND	ND/ND/ND/ND	0.031	--
	7335-B6-19.0	19	ND	ND	ND/ND/ND/ND	0.043	--
B7	7335-B7-8	8	1.710	--	0.005/ND/ND/ND	ND	--
	7335-B7-13	13	20.1	--	0.720/0.162/0.803/2.5	ND	--
	7335-B7-16	16	61.8	--	0.762/2.37/1.4/6.34	ND	--
	7335-B7-20	20	1.97	--	0.020/0.034/0.032/0.140	ND	--
B8	7335-B8-12	12	0.606	--	ND/ND/ND/ND	ND	--
	7335-B8-16	16	14.0	--	0.184/0.019/0.495/0.628	ND	--
	7335-B8-20	20	5.660	--	0.037/0.136/0.105/0.461	ND	--
Laboratory Reporting Limit			0.5	50	≤0.010	0.005	1.0
CRWQCB July 2003 ESL			100 (400)	1,000 (1,000)	0.045 (0.18) / 2.6 (8.4) / 2.5 (24) / 1.0 (1.0)	0.028 (1.0)	200 (750)

TABLE 2 (Cont'd)
Historical Results of Subsurface Boring Soil Sample Analysis
5930 College Avenue, Oakland, CA

Boring Location	Sample ID	Sample Depth (fbg)	TPH-G (mg/kg)	TEPH (mg/kg)	BTEX (mg/kg)	MTBE (mg/kg)	Total Lead (mg/kg)
B9	7335-B9-12	12	27.4	--	0.097/0.027/0.171/0.161	ND	--
	7335-B9-15	15	47.5	--	1.12/1.96/2.09/9.46	ND [1]	--
	7335-B9-20	20	0.862	--	ND/0.007/0.010/0.049	ND	--
B10	7335-B10-11 [2,3]	11	81.8	ND	0.444/2.26/1.65/8.84	0.183 [1]	19.6
	7335-B10-15	15	479	ND	4.16/15.9/9.21	ND	--
	7335-B10-17	17	7.44	ND	0.036/0.075/0.079/0.442	ND	--
B11	7335-B11-8	8	ND	--	ND/ND/ND/0.014	ND	--
	7335-B11-13	13	ND	--	ND/ND/ND/ND	ND	--
Drill Cuttings	7335-SC1 [4]	NA	0.943	--	ND/0.010/0.014/0.059	ND	24.9
Laboratory Reporting Limit			0.5	50	≤0.010	0.005	1.0
CRWQCB July 2003 ESL			100 (400)	1,000 (1,000)	0.045 (0.18) / 2.6 (8.4) / 2.5 (24) / 1.0 (1.0)	0.028 (1.0)	200 (750)

Table 2 Notes Following

TABLE 2 (Cont'd)
Historical Results of Subsurface Boring Soil Sample Analysis
5930 College Avenue, Oakland, CA

NOTES: 7335-B1-5 through 7335-B4-9 = soil boring samples collected during preliminary soil and groundwater investigation (May 1998)
7335-B5-3.0 through 7335-B6-19.0 = soil boring samples collected during additional soil and groundwater investigation (October 1999)
TPH-G = total petroleum hydrocarbons (TPH) as gasoline (EPA Method 8015M)
TEPH = total extractable petroleum hydrocarbons [SM 5520 E&F + EPA 1664 (Silica Gel Treated Hexane; B10 only)]
BTEX = benzene, toluene, ethylbenzene, total xylenes (EPA Method 8020)
MTBE = methyl tertiary-butyl ether (EPA Method 8020)
Total Lead by EPA Method 7420/AA Spectroscopy
fbg = feet below grade
mg/kg = milligrams per kilogram (parts per million)
-- = not analyzed for this constituent; ND = concentration below associated laboratory reporting limit
[1] = confirmed by EPA Method 8260
[2] = sample also analyzed (EPA 6010B ICAP) for cadmium (ND<2.0 mg/kg), chromium (38.2 mg/kg), nickel (51.5 mg/kg), and zinc (47.7 mg/kg); respective Tier 1 RBSLs, in mg/kg = 33/33 (Cd), 1.8/18 (Cr), 750/750 (Pb), 1,000/1,000 (Ni), 2,500/2,500 (Zn)
[3] = sample also analyzed for VOCs (EPA 8260) in mg/kg: MTBE (0.599), benzene (0.397), toluene (1.81), ethylbenzene (1.05), total xylenes (5.37), isopropylbenzene (0.100), n-propylbenzene (0.453), 1,3,5-trimethylbenzene (2.63), 1,2,4-trimethylbenzene (0.832), n-butylbenzene (0.313), and naphthalene (0.715; Tier 1 RBSL = 4.3/4.9 mg/kg for silty clay soil)
[4] = sample also analyzed for HVOCs (EPA 8010): All concentrations ND
CRWQCB/ESL = California Regional Water Quality Control Board's Interim Final – July 2003, Tier 1 Environmental Screening Level for soil at a residential land use permitted site with groundwater that **is (is not)** a potential source of drinking water

TABLE 3A

Historical Results of Grab Groundwater Sample Analysis & Fluid-Level Data

5930 College Avenue, Oakland, CA

Well ID	Sample Date	Casing Elevation (Feet/MSL)	DTW (Feet/ TOC)	Water Elevation (Feet/MSL)	Product/ Odor/ Sheen	TPH-G (ug/L)	TEPH (ug/L)	Total VOCs (ug/L)	MTBE (ug/L)	B/T/E/X (ug/L)
B1	5/6/98	NA	8.5 fbg	NA		31,000	6,000	--	ND	2,600 / 390 / 1,600 / 4,200
B2		NA	6.5 fbg	NA		200,000	ND	--	2,500	30,000 / 49,000 / 45,000 / 21,000
B3		NA	6.5 fbg	NA		$1x10^6$	7,000	--	18,000	17,000 / 24,000 / 20,000 / 80,000
B7	10/30/02	NA	16.4 fbg	NA	slight odor	296,000	--	--	1,360 [3]	18,400 / 21,900 / 8,310 / 33,800
B8	10/30/02	NA	11.5 fbg	NA	none	1,480	--	--	35	386 / 9 / 74 / 81
B9	11/01/02	NA	16.95 fbg	NA	none	16,100	--	--	879	1,250 / 1,380 / 820 / 3,480
B10 [8]	11/01/02	NA	13.85 fbg	NA	slight odor	49,400	ND	38,730 [13]	2,040 (2,680 [3])	6,600 / 9,940 / 1,610 / 7,600
Laboratory Reporting Limit						50	5,000	<50	0.5 (1)	0.5 / 0.5 / 0.5 / 1.0
CRWQCB MSWQO (MCL)						5 [14]	NC	Varies	5 [10]	1 / 150 / 700 / 1,750
CRWQCB July 2003 Tier 1 ESL						100/500	100/640	Varies	5/1,800	1.0 (46) / 40 (130) / 30 (290) / 13 (13)

NOTES:

TOC - top of well casing (north side)
DTW - depth to water relative to TOC
ug/L - micrograms per liter (equivalent to parts per billion)
TPH-G - Total Petroleum Hydrocarbons as Gasoline (SW8020F)
TEPH - Total Extractable Petroleum Hydrocarbons [EPA Methods 5030/8015M & EPA 1664 (B10 Only)]
Total VOCs - Total Volatile Organic Compounds by EPA Method 8260
MTBE - Methyl Tertiary Butyl Ether (EPA Method 8260)
BTEX - Benzene / Toluene / Ethylbenzene / Total Xylenes (SW8020F)
MSL - Mean Sea Level
ND - not detected above laboratory reporting limit
NC - no criteria established

TABLE 3B

Historical Results of Monitor Well Groundwater Sample Analysis & Fluid-Level Data

5930 College Avenue, Oakland, CA

Well ID	Sample Date	Casing Elevation (Feet/MSL)	DTW (Feet/ TOC)	Water Elevation (Feet/MSL)	Product/ Odor/ Sheen	TPH-G (ug/L)	TEPH (ug/L)	Total VOCs (ug/L)	MTBE (ug/L)	B/T/E/X (ug/L)
MW1	06/01/98	50.00 [1]	4.81	45.19	slight sheen	160,000	ND	--	1,900	28,000 / 21,000 / 3,800 / 21,000
	09/10/98	50.00 [1]	7.50	42.50	odor	290,000	ND	--	440	<50 / 25,000 / 7,100 / 32,000
	10/07/99	50.00 [1]	10.04	39.96	odor	85,000	ND	--	1,100	20,000 / 13,000 / 3,800 / 17,000
	01/26/00	50.00 [1]	8.26	41.74	slight sheen	130,000	--	--	470	25,000 / 18,000 / 4,500 / 22,000
	10/25/00	50.00 [1]	10.10	39.90	odor	130,000	--	ND	1,300	23,000 / 12,000 / 3,900 / 18,000
	02/02/01	50.00 [1]	9.61	40.39	odor	128,000	--	--	780	19,000 / 11,000 / 3,800 / 18,000
	04/25/01	195.90	7.39	188.51	odor	120,000	--	--	900	21,000 / 13,000 / 390 / 18,000
	07/10/01	195.90	9.72	186.18	odor	79,000	--	--	660	15,000 / 7,800 / 3000 / 15,000
	10/08/01	195.90	10.88	185.02	sheen/odor	112,000	--	--	374	25,300 / 11,800 / 4,280 / 20,600
	01/07/02	195.90	4.34	191.56	odor	96,100	--	--	596 [3]	21,100 / 13,500 / 4,160 / 21,900
	04/08/02	195.90	6.84	189.06	slight odor	111,000	--	1,040 [2]	814 (679[3])	21,200 / 13,400 / 4,230 / 21,000
	07/09/02	195.90	9.40	186.50	slight odor	110,000	--	573 [4]	746 (570[3])	20,300 / 13,300 / 4,060 / 19,800
	10/23/02	195.90	11.04	184.86	none	54,100	--	41,482 [5]	1,010 (1,080[3])	10,800 / 3,870 / 2,320 / 9,440
	10/15/03	195.90	10.80	185.10	none	90,700	--	47,837 [8]	534 (724[3])	17,800 / 4,740 / 3,150 / 13,900
	02/02/04	195.90	7.35	188.55	none	108,000	--	50,118 [12]	216 (194[3])	14,200 / 7,420 / 3,450 / 19,800
	04/23/04	195.90	6.83	189.07	slight odor	49,200	--	28,750 [15]	85 (114[3])	7,910 / 1,480 / 1,810 / 10,100
Laboratory Reporting Limit						50	5,000	≤50	0.5 (1)	0.5 / 0.5 / 0.5 / 1.0
CRWQCB MSWQO (MCL)						NC	NC	Varies	5 [11]	1 / 150 / 700 / 1,750
CRWQCB July 2003 ESL						100/500	100/640	Varies	5/1,800	1.0 (46) / 40 (130) / 30 (290) / 13 (13)

Table Notes Following

TABLE 3B (Cont'd)

Historical Results of Monitor Well Groundwater Sample Analysis & Fluid-Level Data

5930 College Avenue, Oakland, CA

Well ID	Sample Date	Casing Elevation (Feet/MSL)	DTW (Feet/ TOC)	Water Elevation (Feet/MSL)	Product/ Odor/ Sheen	TPH-G (ug/L)	TEPH (ug/L)	Total VOCs (ug/L)	MTBE (ug/L)	B/T/E/X (ug/L)
MW2	10/07/99	51.42 [1]	11.49	39.93	slight/odor	18,000	ND	--	490	3,000 / 1,700 / 1,000 / 3,900
	01/26/00	51.42 [1]	7.85	43.57	none	42,000	--	--	560	9,300 / 2,200 / 2,300 / 7,700
	10/25/00	51.42 [1]	11.57	39.85	slight/odor	31,000	--	ND	500	5,500 / 370 / 1,700 / 2,600
	02/02/01	51.42 [1]	10.77	40.65	odor	36,000	--	--	400	4,300 / 530 / 1,800 / 4,500
	04/25/01	197.28	8.52	188.76	odor	56,000	--	--	460	6,700 / 1700 / 2,600 / 8,200
	07/10/01	197.28	11.05	186.23	odor	39,000	--	--	180	6,200 / 730 / 2,300 / 6,100
	10/08/01	197.28	12.79	184.49	sheen/odor	40,700	--	--	6,460	6,310 / 399 / 2,100 / 5,320
	01/07/02	197.28	4.92	192.36	odor	59,600	--	--	366 [3]	10,300 / 3,250 / 4,180 / 14,400
	04/08/02	197.28	8.40	188.88	slight odor	66,700	--	--	583 [3]	10,200 / 2,670 / 3,840 / 13,200
	07/09/02	197.28	10.55	186.73	slight odor	37,100	--	298 (MTBE)	303 (298[3])	5,340 / 890 / 2,110 / 6,920
	10/23/02	197.28	13.85	183.43	none	13,300	--	8,686 [6]	322 (360[3])	2,420 / 216 / 922 / 1,470
	10/15/03	197.28	12.38	184.90	none	11,300	--	6,642 [9]	264 (322[3])	2,660 / 51 / 1,180 / 1,220
	02/02/04	197.28	8.80	188.48	none	21,700	--	8,020 [13]	168 (200[3])	2,130 / 51 / 1,030 / 2,060
	04/23/04	197.28	8.40	188.88	Slight odor	30,400	--	13,921 [16]	112 (203[3])	3,570 / 322 / 1,620 / 4,140
Laboratory Reporting Limit						50	5,000	<50	0.5 (1)	0.5 / 0.5 / 0.5 / 1.0
CRWQCB MSWQO (MCL)						NC	NC	Varies	5 [11]	1 / 150 / 700 / 1,750
CRWQCB July 2003 ESL						100/500	100/640	Varies	5/1,800	1.0 (46) / 40 (130) / 30 (290) / 13 (13)

Table Notes Following

TABLE 3B (Cont'd)

Historical Results of Monitor Well Groundwater Sample Analysis & Fluid-Level Data

5930 College Avenue, Oakland, CA

Well ID	Sample Date	TOC Elevation (Feet/MSL)	DTW (Feet/ TOC)	Water Elevation (Feet/MSL)	Product/ Odor/ Sheen	TPH-G (ug/L)	TEPH (ug/L)	Total VOCs (ug/L)	MTBE (ug/L)	B/T/E/X (ug/L)
MW3	10/07/99	49.39 [1]	9.67	39.72	none	6,600	ND	--	390	310 / 110 / 430 / 1,000
	01/26/00	49.39 [1]	5.40	43.99	none	3,300	--	--	40	110 / 8 / 100 / 32
	10/25/00	49.39 [1]	9.24	40.15	slight odor	4,500	--	ND	ND	100 / 2 / 120 / 130
	02/02/01	49.39 [1]	8.73	40.66	slight odor	2,900	--	--	35	35 / 3 / 160 / 298
	04/25/01	195.22	6.61	188.61	slight odor	8,400	--	--	56	260 / 33 / 290 / 510
	07/10/01	195.22	8.85	186.37	slight odor	12,000	--	--	35	39 / 10 / 690 / 1600
	10/08/01	195.22	9.75	185.47	sheen/odor	4,913	--	--	52	108 / 4 / 99 / 133
	01/07/02	195.22	4.25	190.97	sheen/odor	7,260	--	--	81.7 [3]	723 / 138 / 492 / 887
	04/08/02	195.22	6.33	188.89	odor	11,700	--	--	ND [3]	540 / 108 / 706 / 1,710
	07/09/02	195.22	8.56	186.66	odor	2,320	--	20 (MTBE)	28.3 (20 [3])	37.1 / 4.7 / 98.5 / 187
	10/23/02	195.22	10.02	185.20	Sheen/odor	2,830	--	865 [7]	ND (ND [3])	46.8 / 4.7 / 43.6 / 65.5
	10/15/03	195.22	9.80	185.42	Sheen/odor	3,040	--	436 [10]	ND (ND [3])	91.3 / 8.4 / 69.9 / 148
	02/02/04	195.22	6.85	188.37	Sheen/odor	5,140	--	769.5 [14]	ND (ND [3])	126 / 8.7 / 134 / 238
	04/23/04	195.22	6.17	189.05	none	7,210	--	2,807.9 [17]	ND (ND [3])	227 / 39.5 / 448 / 879
TB	02/02/04	NA				--	--	--	--	ND / ND / ND / ND
	04/23/04	NA				--	--	--	--	ND / ND / ND / ND
Laboratory Reporting Limit						50	5,000	≤50	0.5 (1)	0.5 / 0.5 / 0.5 / 1.0
CRWQCB MSWQO (MCL)						NC	NC	Varies	5 [11]	1 / 150 / 700 / 1,750
CRWQCB July 2003 ESL						100/500	100/640	Varies	5/1,800	1.0 (46) / 40 (130) / 30 (290) / 13 (13)

TABLE 3B NOTES ON FOLLOWING PAGE

TABLE 3B (Cont'd)
Historical Results of Monitor Well Groundwater Sample Analysis & Fluid-Level Data
5930 College Avenue, Oakland, CA

TABLE 3B NOTES (Cont'd):

TOC - top of well casing (north side)
DTW - depth to water relative to TOC
ug/L - micrograms per liter (equivalent to parts per billion)
TPH-G - Total Petroleum Hydrocarbons as Gasoline (SW8020F)
TEPH - Total Extractable Petroleum Hydrocarbons [EPA Methods 5030/8015M & EPA 1664 (B10 Only)]
Total VOCs - Total Volatile Organic Compounds by EPA Method 8260
MTBE - Methyl Tertiary Butyl Ether (EPA Method 8260)
BTEX - Benzene / Toluene / Ethylbenzene / Total Xylenes (SW8020F)
MSL - Mean Sea Level; TB = Trip Blank (7335-TB)
ND - not detected above laboratory reporting limit
NC - no criteria established; NA – not applicable
-- - not analyzed for this constituent
fbg - feet below grade surface
[1] - Arbitrary datum point with assumed elevation of 50 feet used prior to MSL survey on April 26, 2001
[2] - Fuel oxygenate concentrations reported as 1,2-Dichloroethane (361 ug/l) and MTBE (679 ug/l)
[3] - Concentration confirmed by EPA Method 8260 (analysis of VOCs of Fuel Oxygenates)
[4] - Fuel oxygenate concentrations reported as 1,2-Dichloroethane (3 ug/l) and MTBE (570 ug/l)
[5] - VOC concentrations reported as 1,080 ug/l MTBE, 14,500 ug/l benzene, 5,370 ug/l toluene, 3,360 ug/l ethylbenzene, 13,700 ug/l total xylenes, 96 ug/l isopropylbenzene, 292 ug/l n-propylbenzene, 1,730 ug/l 1,3,5-trimethylbenzene, 500 ug/l 1,2,4-trimethylbenzene, 15 ug/l sec-butylbenzene, 61 ug/l n-butylbenzene, and 778 ug/l naphthalene
[6] - VOC concentrations reported as 360 ug/l MTBE, 3,430 ug/l benzene, 319 ug/l toluene, 1,210 ug/l ethylbenzene, 1,960 ug/l total xylenes, 59 ug/l isopropylbenzene, 148 ug/l n-propylbenzene, 631 ug/l 1,3,5-trimethylbenzene, 153 ug/l 1,2,4-trimethylbenzene, 14 ug/l sec-butylbenzene, 43 ug/l n-butylbenzene, and 359 ug/l naphthalene
[7] - VOC concentrations reported as 9 ug/l chloroform, 74 ug/l benzene, 9 ug/l toluene, 72 ug/l ethylbenzene, 109 ug/l total xylenes, 42 ug/l isopropylbenzene, 112 ug/l n-propylbenzene, 216 ug/l 1,3,5-trimethylbenzene, 100 ug/l 1,2,4-trimethylbenzene, 20 ug/l sec-butylbenzene, 59 ug/l n-butylbenzene, and 43 ug/l naphthalene
[8] - VOC concentrations reported as 724 ug/l MTBE, 19,300 ug/l benzene, 5,070 ug/l toluene, 3,230 ug/l ethylbenzene, 15,470 ug/l total xylenes, 288 ug/l n-propylbenzene, 565 ug/l 1,3,5-trimethylbenzene, 2,150 ug/l 1,2,4-trimethylbenzene, 1,040 ug/l naphthalene, and ND<50 ug/L 1,2-dibromoethane (EDB) & ND<100 ug/L 1,2-dichloroethane (EDC)
[9] - VOC concentrations reported as 322 ug/l MTBE, 2,580 ug/l benzene, 53 ug/l toluene, 1,190 ug/l ethylbenzene, 1,045 ug/l total xylenes, 75 ug/l isopropylbenzene, 210 ug/l n-propylbenzene, 140 ug/l 1,3,5-trimethylbenzene, 529 ug/l 1,2,4-trimethylbenzene, 56 ug/l n-butylbenzene, 442 ug/l naphthalene, and ND<5 ug/L 1,2-dibromoethane (EDB) & ND<10 ug/L 1,2-dichloroethane (EDC)

TABLE 3B (Cont'd)
Historical Results of Monitor Well Groundwater Sample Analysis & Fluid-Level Data
5930 College Avenue, Oakland, CA

TABLE 3B NOTES (Cont'd):

[10] - VOC concentrations reported as 79 ug/l benzene, 8.3 ug/l toluene, 65 ug/l ethylbenzene, 118.6 ug/l total xylenes, 21 ug/l isopropylbenzene, 62 ug/l n-propylbenzene, 11 ug/l 1,3,5-trimethylbenzene, 30 ug/l 1,2,4-trimethylbenzene, 13 ug/l n-butylbenzene, 28 ug/l naphthalene, and ND<0.5 ug/L 1,2-dibromoethane (EDB) & ND<1 ug/L 1,2-dichloroethane (EDC)

[11] - Secondary Maximum Contaminant Level established by CRWQCB

[12] - VOC concentrations reported as 194 ug/l MTBE, 14,700 ug/l benzene, 7,620 ug/l toluene, 3,940 ug/l ethylbenzene, 18,710 ug/l total xylenes, 47 ug/l 4-methyl-2-pentanone, 116 ug/l isopropylbenzene, 342 ug/l n-propylbenzene, 701 ug/l 1,3,5-trimethylbenzene, 2,690 ug/l 1,2,4-trimethylbenzene, 66 ug/l n-butylbenzene, 992 ug/l naphthalene, and ND<50 ug/L 1,2-dibromoethane (EDB) & ND<100 ug/L 1,2-dichloroethane (EDC)

[13] - VOC concentrations reported as 200 ug/l MTBE, 2,370 ug/l benzene, 92 ug/l toluene, 1,200 ug/l ethylbenzene, 2,024 ug/l total xylenes, 73 ug/l isopropylbenzene, 186 ug/l n-propylbenzene, 306 ug/l 1,3,5-trimethylbenzene, 1,090 ug/l 1,2,4-trimethylbenzene, 66 ug/l n-butylbenzene, 413 ug/l naphthalene, and ND<5 ug/L 1,2-dibromoethane (EDB) & ND<10 ug/L 1,2-dichloroethane (EDC)

[14] - VOC concentrations reported as 110 ug/l benzene, 6.4 ug/l toluene, 148 ug/l ethylbenzene, 238.1 ug/l total xylenes, 23 ug/l isopropylbenzene, 83 ug/l n-propylbenzene, 22 ug/l 1,3,5-trimethylbenzene, 68 ug/l 1,2,4-trimethylbenzene, 38 ug/l n-butylbenzene, 33 ug/l naphthalene, and ND<0.5 ug/L 1,2-dibromoethane (EDB) & ND<1 ug/L 1,2-dichloroethane (EDC)

[15] - VOC concentrations reported as 1,210 ug/l methylene chloride, 114 ug/l MTBE, 10,300 ug/l benzene, 1,960 ug/l toluene, 2,220 ug/l ethylbenzene, 10,230 ug/l total xylenes, 180 ug/l n-propylbenzene, 417 ug/l 1,3,5-trimethylbenzene, 1,560 ug/l 1,2,4-trimethylbenzene, 559 ug/l naphthalene, and ND<50 ug/L 1,2-dibromoethane (EDB) & ND<100 ug/L 1,2-dichloroethane (EDC)

[16] - VOC concentrations reported as 203 ug/l MTBE, 4,570 ug/l benzene, 511 ug/l toluene, 1,760 ug/l ethylbenzene, 4,055 ug/l total xylenes, 215 ug/l isopropylbenzene, 469 ug/l 1,3,5-trimethylbenzene, 1,570 ug/l 1,2,4-trimethylbenzene, 568 ug/l naphthalene, and ND<5 ug/L 1,2-dibromoethane (EDB) & ND<10 ug/L 1,2-dichloroethane (EDC)

[17] - VOC concentrations reported as 341 ug/l benzene, 42.9 ug/l toluene, 547 ug/l ethylbenzene, 1,185 ug/l total xylenes, 29 ug/l isopropylbenzene, 82 ug/l n-propylbenzene, 60 ug/l 1,3,5-trimethylbenzene, 337 ug/l 1,2,4-trimethylbenzene, 24 ug/l n-butylbenzene, 160 ug/l naphthalene, and ND<0.5 ug/L 1,2-dibromoethane (EDB) & ND<1 ug/L 1,2-dichloroethane (EDC)

CRWQCB MSWQO (Primary MCL) = California Regional Water Quality Control Board, Municipal Supply Water Quality Objective; Primary Maximum Contaminant Level

CRWQCB/ESL = California Regional Water Quality Control Board's Tier 1Environmental (Risk-Based) Screening Level; Levels shown are for **Groundwater < 10 fbg (3 meters)**, which IS / IS NOT a threatened drinking water resource.

TABLE 4

Mean Groundwater Elevation, Flow Direction, and Gradient Data

5930 College Avenue, Oakland, CA

Measurement Date	Mean Groundwater Elevation (feet)	Groundwater Flow Direction	Gradient (feet / 100 feet)
10/07/99	39.87	11° west of south	0.67 foot / 100 feet
01/26/00	43.1	23° west of north	9.12 feet / 100 feet
10/25/00	39.96	40° east of north	0.64 foot / 100 feet
04/25/01	188.6	55° west of north	0.69 foot / 100 feet
07/10/01	186.26	4° east of north	0.5 foot / 100 feet
10/08/01	184.99	48° east of north	1.6 feet / 100 feet
01/07/02	191.63	52° west of south	2.3 feet / 100 feet
04/08/02	188.94	43° east of south	0.6 foot / 100 feet
07/09/02	186.63	51° west of north	0.7 foot / 100 feet
10/23/02	184.50	71° west of north	3.2 foot / 100 feet
10/15/03	185.14	28° east of north	1.0 foot / 100 feet
02/02/04	188.47	18° east of south	0.5 foot / 100 feet
04/23/04	189.00	77° east of south	0.5 foot / 100 feet

NOTES: Mean groundwater elevations prior to April 25, 2001 were referenced to an arbitrary site-specific datum point (MW1; north side of top of well casing) with an assumed elevation of 50 feet (not MSL); Flow direction and gradient based upon triangulation using MW1 through MW3 only

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

June 3, 2004

Brian Sheaff
William Sheaff Trust
1945 Parkside Dr.
Concord, CA 94519

Dear Mr. Sheaff:

Subject: Fuel Leak Case No. RO0000377, Sheaff's Garage, 5930 College Avenue, Oakland, CA

Alameda County Environmental Health (ACEH) staff has reviewed "Work Plan for Additional Site Characterization" dated December 29, 2003 by Golden Gate Tank Removal (GGTR). We request that you address the following technical comments and send us the technical reports requested below.

TECHNICAL COMMENTS

1) Site Characterization Proposal –
   a) We do not agree with the proposed monitoring wells. We feel that it would be premature to install more monitoring wells without additional groundwater sampling to determine the location of the plume for optimal well locations.
   b) Also, we feel that some proposed borings (HB-2, B19/MW4) may be too far and not downgradient of the source areas.
   c) For proposed soil borings not near the source areas (B14, B15, B17, B18, B20/MW5) it appears to be adequate to collect groundwater samples only. We request that your monitoring network be depth discrete, generally, screened intervals of 3 to 5 feet in length. Please include in the Work Plan Addendum.
   d) The collection of groundwater samples from proposed borings B12 - B18 will not be depth discrete. Please propose a method to collect depth discrete samples.

2) Source Characterization Proposal –
   a) Boring Sampling - Instead of collecting soil boring samples every 5 ft. as proposed, soil samples shall be collected at a minimum of every 5 ft., including at changes of lithology, at the soil/groundwater interface, and at areas of obvious contamination. Please include in the Work Plan Addendum.

b) No soil borings were proposed by the dispenser where B7 was collected. The dispenser area needs to be delineated. Please propose soil borings in the Work Plan Addendum.

c) The proposed 13 feet depths or 2 to 3 feet pass the first encountered groundwater appears to be inadequate for vertical delineation. The collection of groundwater samples at those depths may miss petroleum product entrapped below the water table. Minimum depths will usually be 25 – 30 feet. Please propose drilling borings to depths below the water table, which will account for entrapped petroleum product. Indicate how depths adequate for vertical delineation will be determined. Please provide the information requested in the Work Plan Addendum.

3) Preferential Pathway Survey – Your consultant stated that the utilities may "potentially act as a pathway for on- and/or off-site migration of contaminant hydrocarbons." Please propose how this will be determined.

4) Groundwater Analyses – Please include Ethanol by EPA Method 8260 for groundwater samples.

TECHNICAL REPORT REQUEST

Please submit the following technical reports to Alameda County Environmental Health (Attention: Don Hwang), according to the following schedule:

July 31, 2004 – 2nd Quarter 2004 Groundwater Monitoring Report
August 6, 2004 - Work Plan Addendum
60 days after Work Plan approval - Soil and Water Investigation Report
October 31, 2004 - 3rd Quarter 2004 Groundwater Monitoring Report
January 31, 2005 - 4th Quarter 2004 Groundwater Monitoring Report
April 30, 2005 - 1st Quarter 2005 Groundwater Monitoring Report

These reports are being requested pursuant to the Regional Water Quality Control Board's (Regional Board) authority under Section 13267 of the California Water Code. If you have any questions, please call me at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist
Local Oversight Program

c: Brent Wheeler, Golden Gate Tank Removal, 255 Shipley Street, San Francisco, CA 94107
Donna Drogos
File