SOIL AND GROUNDWATER INVESTIGATION WORKPLAN

GOLDEN GATE PETROLEUM
HAYWARD BULK PETROLEUM
DISTRIBUTION FACILITY
HAYWARD, CALIFORNIA

Bonkowski & Associates, Inc.
6400 Hollis Street, Suite 4
Emeryville, California 94608

February 12, 2004

BONKOWSKI & ASSOCIATES, INC.
Geotechnical Services and
Hazardous Materials Management

Corporate Headquarters
6400 Hollis Street, Suite 4
Emeryville, California 94608
Phone: (510) 450-0770
Fax: (510) 450-0801

February 12, 2004
L98184

Mr. Scott O. Seery
Alameda County Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Soil and Groundwater Investigation Workplan
1565 Industrial Parkway, Hayward, California

Dear Mr. Seery:

The attached Soil and Groundwater Investigation Workplan for 1565 Industrial Parkway was prepared by Bonkowski & Associates, Inc. (B&A) on behalf of Bay Area Diablo/Golden Gate Petroleum. This workplan is submitted to ACDEHS per your letter directive dated October 6, 2003. A preliminary Site Conceptual Model is included as Appendix A.

We look forward to your review of this workplan and implementation of the recommended tasks. Please do not hesitate to contact Mr. James Springer or Ms. Cynthia Dittmar at (510) 450-0770 if you have any questions or need additional information.

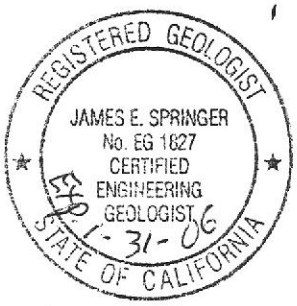
Sincerely,
BONKOWSKI & ASSOCIATES, INC.

James E. Springer, CEG
Project Geologist

Cynthia Dittmar, RG
Project Engineer

JES:jes

cc. Wenche Lier, Golden Gate Petroleum



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SOIL AND WATER INVESTIGATION WORKPLAN

Golden Gate Petroleum
Hayward Bulk Distribution Facility
Hayward, California

1.0 INTRODUCTION

Golden Gate Petroleum's Hayward Bulk Petroleum Distribution Facility (Site) is located at 1565 Industrial Parkway West in Hayward, California (Figure 1). USTs were removed from the site in 1999 after fuel hydrocarbon contamination was discovered in the soil and groundwater (B&A, 1999). In their October 6, 2003 directive, Alameda County Department of Environmental Health Services (ACDEHS) requested a three-dimensional characterization of the release by way of a Soil and Water Investigation (SWI) using a preferential pathway study and a Site Conceptual Model (SCM). Data for an SCM are sparse, therefore, this report is primarily a Workplan. A preliminary SCM and Preferential Pathway Summary are presented in Appendix A. The preliminary SCM conforms to the specifications of ASTM E 1689-95. This SCM should be considered as a work in progress that is subject to revision as more data become available.

Although USTs and contaminated soil have been removed from the site, residual concentrations of hydrocarbons are still present in soil at the site. The purpose of this work is to evaluate the hydrocarbon contaminant pathways and their potential impacts on receptors such as the Niles Cone Aquifer. This work will be used to find locations and depths where specific geologic units can be targeted for sampling and monitoring. This work will provide additional information that may be used to locate additional monitor wells and sampling points.

2.0 SITE DESCRIPTION

The facility is located along the north side of Industrial Parkway West in an area zoned for industrial and commercial use. The site has been used for the retail sale of gasoline and petroleum fuel products since approximately 1960. The terrain in the site vicinity slopes gently to the southwest. Alameda Creek flows to the west and is about ¼ mile south of the Site at its closest point. Ward Creek, a tributary to Alameda Creek flows southward and is about ¼ mile west of the site at its closest location.

The site presently has three (3) 20,000-gallon fiberglass underground fuel storage tanks (USTs); nine (9) dispenser islands that dispense diesel, unleaded regular, plus unleaded, and premium unleaded regular gasoline and seven (7) monitor wells (Figure 2). Groundwater occurs beneath the site in silt, silty clays, and silty sand lithologies from depths of 10 to 18 feet below ground surface (Bonkowski & Associates, Inc. [B&A], 1999, 2002).

3.0 BACKGROUND

Between November 1998 and January 1999, nine (9) underground storage tanks, the dispenser islands, and a bulk rack were removed from the Facility (Figure 3). Soil samples collected beneath the tanks and dispenser islands showed high concentrations of TPHG, TPHD, BTEX, and MTBE. About 7,000 cubic yards of soil were over-excavated from the Site, and approximately 49,700 gallons of contaminated groundwater containing separate phase hydrocarbons (SPH) were pumped from the excavations. A groundwater sample collected from a tank pit prior to its backfilling contained up to 9,800, 12,000,000 and 6,000 ppb of TPHG, TPHD and MTBE, respectively.

The nine underground storage tanks removed in 1998 and 1999 included: a 12,000-gallon mid-grade unleaded gasoline (Tank 1), 12,000-gallon red dye diesel (Tank 2), a 12,000-gallon premium unleaded gasoline (Tank 3), 4,000-gallon Stoddard solvent (Tank 4), 2,000-gallon kerosene (Tank 5), 1,000-gallon waste oil (Tank 6), two 20,000-gallon diesel fuel (Tanks 7 and 8), and a 20,000-gallon unleaded regular gasoline (Tank 9).

In 2002 B&A conducted a preliminary Site Assessment. Seven (7) monitor wells (MW-1 through MW-7) were installed (Figure 2). Soil and groundwater samples were collected, and quarterly groundwater monitoring was initiated. Up to 160 mg/kg of TPHG, up to 5,400 mg/kg of TPHD, up to 1,000 mg/kg of TPH as motor oil and up to 5.7 mg/kg of lead were detected in soil samples from the monitor well borings.

During the most recent quarterly monitoring event (4th Quarter 2003), the maximum TPHG concentration in groundwater was 0.0067 mg/l. TPHD was detected in groundwater from three of the seven wells with a maximum concentration of 0.30 mg/l. TPH as motor oil was detected at a maximum concentration of 0.22 mg/l. Benzene was detected at up to 1.9 µg/l and MTBE was detected at up to 940 µg/l. Figure 4 is a potentiometric surface map generated from the 4th Quarter 2003 sampling data. The subsurface extent of dissolved phase hydrocarbons is not defined.

4.0 FIELD INVESTIGATION

The proposed field investigation will consist of a Geoprobe survey, stratigraphic CPT borings and installation of three additional monitor wells. Rationale for each boring and well are presented in Table 1. The proposed Geoprobe borings, CPTs and monitor wells are presented in Figure 5.

4.1 Health and Safety Plan, Permitting, Underground Utility Location

Prior to conducting any fieldwork, B&A will prepare a Health and Safety Plan to conduct the proposed scope of work. The Health and Safety Plan will address the requirements of 29 Code of Federal Regulations (CFR) 1910.120 requirements

regarding basic 40-hour health and safety training, supervisor training, and annual refresher training. All B&A and subcontractor field personnel will have medical clearances to perform work at sites with hazardous materials. In addition, at least one field worker will be trained and certified in the administration of CPR and first aid.

Permits will be obtained from the Alameda County Public Works Department to advance Geoprobe borings and install monitor wells. Any additional permits required by law will be obtained from the implementing agency. Underground utilities will be checked by notifying Underground Service Alert and confirmed at each well and boring location using a commercial underground utility locator.

4.2 Geoprobe Survey

In order to more accurately evaluate the vertical and lateral extent of the hydrocarbon plume, a Geoprobe will be used to advance fourteen (14) borings to 50 feet below ground surface or refusal (whichever is less), at the approximate locations shown on Figure 5. The Geoprobe borings are deeper than previous ones in order to evaluate potential contaminant pathways at depth. The locations of the Geoprobes are mostly outbound of the known contaminant points delineated by past site investigations. Continuous soil samples will be taken from each of the Geoprobe borings.

A B&A subcontractor will advance a sampler containing a 4-foot-long rigid clear plastic tube into the undisturbed soil to the desired depth. This tube, when extracted from the boring can be divided into segments. The B&A geologist will log the lithologies of the sample noting any lithologic changes. The sample will be field screened for volatile hydrocarbons using a hand held Organic Vapor Meter (OVM). The selected soil sample will be placed in a plastic zip-lock bag and allowed to sit in the sun and volatilize for about five minutes. The tip of the OVM will be inserted into the bag and a reading will be recorded on the geologic log of the boring. Two soil samples from each Geoprobe boring will be selected for chemical testing. Sample selection will be based on OVM readings, proximity to utility inverts and lithologic changes. The selected samples will be placed in a cooler on ice and transported to a California Certified Analytic Laboratory under chain-of-custody.

One grab groundwater sample will be collected from each Geoprobe boring. If the it takes more than 30 minutes for the boring to produce enough water for a sample, a 1-inch slotted PVC casing will be placed in the hole overnight and the water sampling will be attempted the next day.

4.3 CPT Stratigraphic Borings

Three CPT test borings will be advanced (at the locations shown on Figure 5) to 80 feet or refusal, whichever occurs first. These borings will be used to evaluate potential contaminants and/or contaminant pathways at depth beneath the site. Two water samples will be taken from each of the CPT borings. One water

sample will be taken in the upper 20 feet to sample the shallow water table. The other sample will be taken at the bottom of the boring to evaluate water quality at depth. The CPT logs will be correlated with nearby Geoprobes and wells to interpret shallow soils. At depth, the CPT logs will be correlated with each other to get a view of the deeper strata.

4.4 Monitor Well Installation, Development, and Sampling

After the analytical data from the Geoprobe survey have been reviewed, three additional monitor wells (MW-8, MW-9 and MW-10) will be constructed at the anticipated locations shown on Figure 5. The locations may be adjusted based on the results of the Geoprobe survey in order to best delineate the extent of the hydrocarbon plume.

The monitor wells will be constructed of 2-inch diameter schedule 40 PVC well casing and advanced to 35 feet below grade or at least 10 feet below the top of the groundwater surface. One soil sample from each well boring will be collected for chemical analysis. The well will be screened with 0.020-inch slots from the bottom to five feet above the static water level. A filter pack of No. 3 Monterey Sand will be placed around the casing from the bottom to one foot above the top of the screened section. One to two feet of hydrated bentonite chips will be placed over the filter pack and the rest of the well annulus will be sealed with neat Portland cement containing up to 5% bentonite powder. All drill cuttings and decontamination fluid will be placed in 55-gallon DOT drums and left on the property for disposal pending analyses.

A B&A field geologist will log soil from each well boring. The soil will be described according to the Unified Soil Classification System Description and Identification of Soils Visual-Manual Procedure ASTM Designation D2488-84. Soil samples will be collected at five-foot intervals using a modified California Sampler equipped with laboratory cleaned brass tubes. The sampler will be thoroughly decontaminated prior to collecting each sample. The equipment will be scrubbed in an Alconox solution and double rinsed in deionized water.

The sampler will be dropped down the hollow stem of the auger. A 140-pound hammer will be dropped 30 inches to drive the sampler. The number of blows required to advance the sampler for each six-inch increment will be recorded on the geologic log. The sampler will be winched from the soil and brought to the surface. The sampler will be opened and the brass tubes removed.

Soil from one of the tubes will be placed in a Ziplock bag, allowed to volatilize, and then tested for organic vapor using an OVM. The field geologist will describe soil from one of the tubes and record it on the field log. One soil sample from each well boring will be selected for chemical testing. This brass tube sample will be immediately capped with Teflon tape and plastic end caps, and placed on ice in a refrigerator cooler. The samples will be shipped under chain-of-custody to a California Certified analytical laboratory for chemical analysis.

At least 24 hours after completion, the newly constructed monitor wells will be developed by over pumping and block surging until the discharge water is relatively free of settleable solids. All well development equipment coming into contact with the water will be decontaminated by washing in an Alconox solution followed by tap and deionized water rinses.

At least 24 hours after the new wells have been developed, groundwater samples will be collected for chemical analyses. The seven existing monitor wells will also be sampled during this sampling event in order to obtain a complete view of the distribution of groundwater contamination. Prior to sampling, the water level elevation will be determined in each well with an electric sounder. The wells will be evacuated of 3 well casing volumes with a Grundfus Redi Flow 2 pump and will be sampled when either: the water level returns to at least 80 percent of its static level or the water quality parameters pH, conductivity, temperature and salinity are within 10 % of each other on three consecutive readings. The wells will be sampled using dedicated disposable polyethylene bailers.

Groundwater samples will be collected in containers prepared by the analytical laboratory and sealed to prevent loss of volatile constituents. They will be stored on ice in a refrigerator cooler in accordance with EPA standards, and transported to a California Certified analytical laboratory under chain-of-custody.

4.5 Well Survey

The location and elevation of the newly constructed groundwater monitor wells will be surveyed to +/- 0.01 feet and tied to a local feature or datum. The new wells will also be tied to the seven wells already existing at the site. The well survey data will be plotted on a base map.

4.6 Soil and Groundwater Chemical Analyses

Soil and groundwater samples will be analyzed for TPHG, TPHD, motor oil, BTEX, 7 oxygenates, and lead scavengers using modified EPA Methods 8015/8020 and 8260. A total of 31 soil samples and 24 groundwater samples will be tested.

4.7 Sensitive Receptor Survey

B&A will search historic maps, reports, and public agency files for the presence of sensitive receptors within ¼ mile of the Site. Sensitive receptors include domestic and municipal wells, sensitive aquifers, streams, wetlands, and bodies of fresh or salt water.

5.0 REPORTING

A technical report will be prepared that describes the field methods; presents the data; and provides our evaluation of the extent of hydrocarbon contamination, and the preferential pathways for contaminant migration. The report will include:

- Tabulated results of this and previous investigations
- Groundwater elevation and contamination contour maps of hydrocarbon contamination from the new and existing wells and Geoprobe borings
- Recommendations based on the site conditions consistent with Chapter 18 Cleanup Fund Regulations and amendments to Chapter 16 Underground Storage Tank Regulations
- An updated SCM and preferential pathway study, and
- If necessary, recommendations for further work.

6.0 SCHEDULE

B&A is prepared to begin the field investigation of the SWI within 30 days of approval of this Workplan by the ACDEHS. We are prepared to submit a report within 30 days of commencing the fieldwork.

7.0 REFERENCES

ASTM E 1689-95, Guide for Developing Conceptual Models for Contaminated Sites: Compilation of Standards on Environmental Site Characterization, pp. 155-162, 1997.

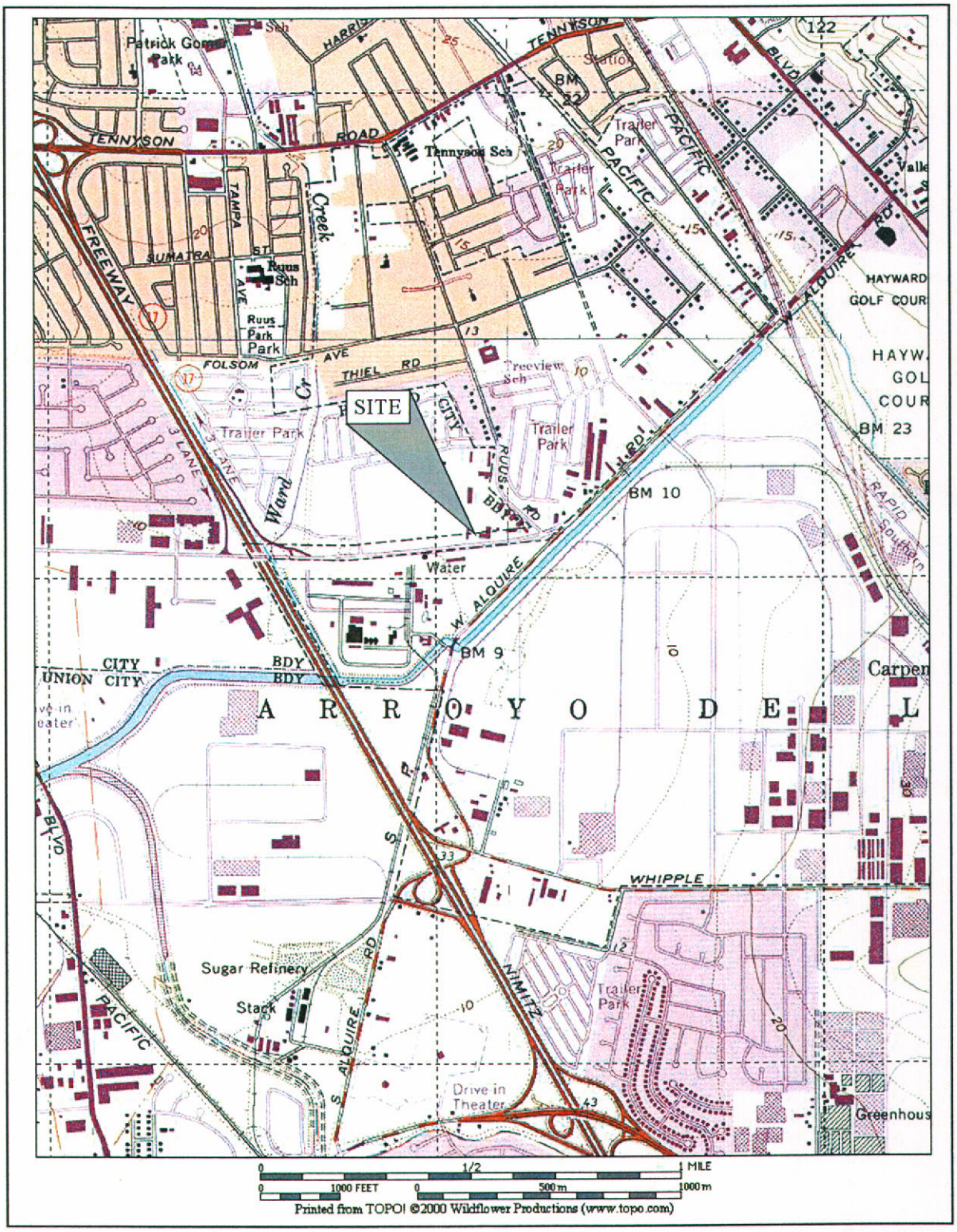
Bonkowski & Associates, Inc., Underground Storage Tank Closure – Interim Remedial Measures Report: April 1999.

Bonkowski & Associates, Inc., Preliminary Site Assessment Report, Golden Gate Petroleum, Hayward Bulk Petroleum Distribution Facility: December 2002.

Bonkowski & Associates, Inc., Fourth Quarter 2003 Groundwater Monitoring Report, Golden Gate Petroleum, Hayward Bulk Petroleum Distribution Facility: November 2003.

Table 1 Rationale for Geoprobe Borings, Wells, and CPT Tests
1565 Industrial Parkway West, Hayward, California

	Boring/ Well	Depth (Feet)	Rationale for Location and Depth
Geoprobe Borings			
	GP-1	50	Evaluate cross-gradient limits of plume.
	GP-2	50	Evaluate cross-gradient limits of plume.
	GP-3	50	Evaluate possible contamination under storm drain inlet.
	GP-4	50	Evaluate potential contamination in trench backfill and along electrical conduit.
	GP-5	50	Evaluate potential contamination in trench backfill and along electrical conduit.
	GP-6	50	Evaluate potential contamination below trench backfill and along electrical conduit.
	GP-7	50	Evaluate potential contamination below electrical conduit.
	GP-8	50	Evaluate possible contamination under storm drain.
	GP-9	50	Evaluate possible contamination under storm drain inlet.
	GP-10	50	Evaluate possible contamination under storm drain inlet.
	GP-11	50	Evaluate down-gradient limits of plume.
	GP-12	50	Evaluate down-gradient limits of plume.
	GP-13	50	Evaluate MTBE near MW-3.
	GP-14	50	Evaluate MTBE near MW-3.
CPT Stratigraphic Borings			
	CPT-1	80	Evaluate down-gradient limits of plume and deep stratigraphy.
	CPT-2	80	Evaluate down-gradient limits of plume and deep stratigraphy.
	CPT-3	80	Evaluate MTBE near MW-3 and deep stratigraphy.
Monitor Wells			
	MW-8	35	Evaluate cross-gradient limits of plume and groundwater elevation contours.
	MW-9	35	Evaluate down-gradient limits of plume and groundwater elevation contours.
	MW-10	35	Evaluate down-gradient limits of plume and groundwater elevation contours.



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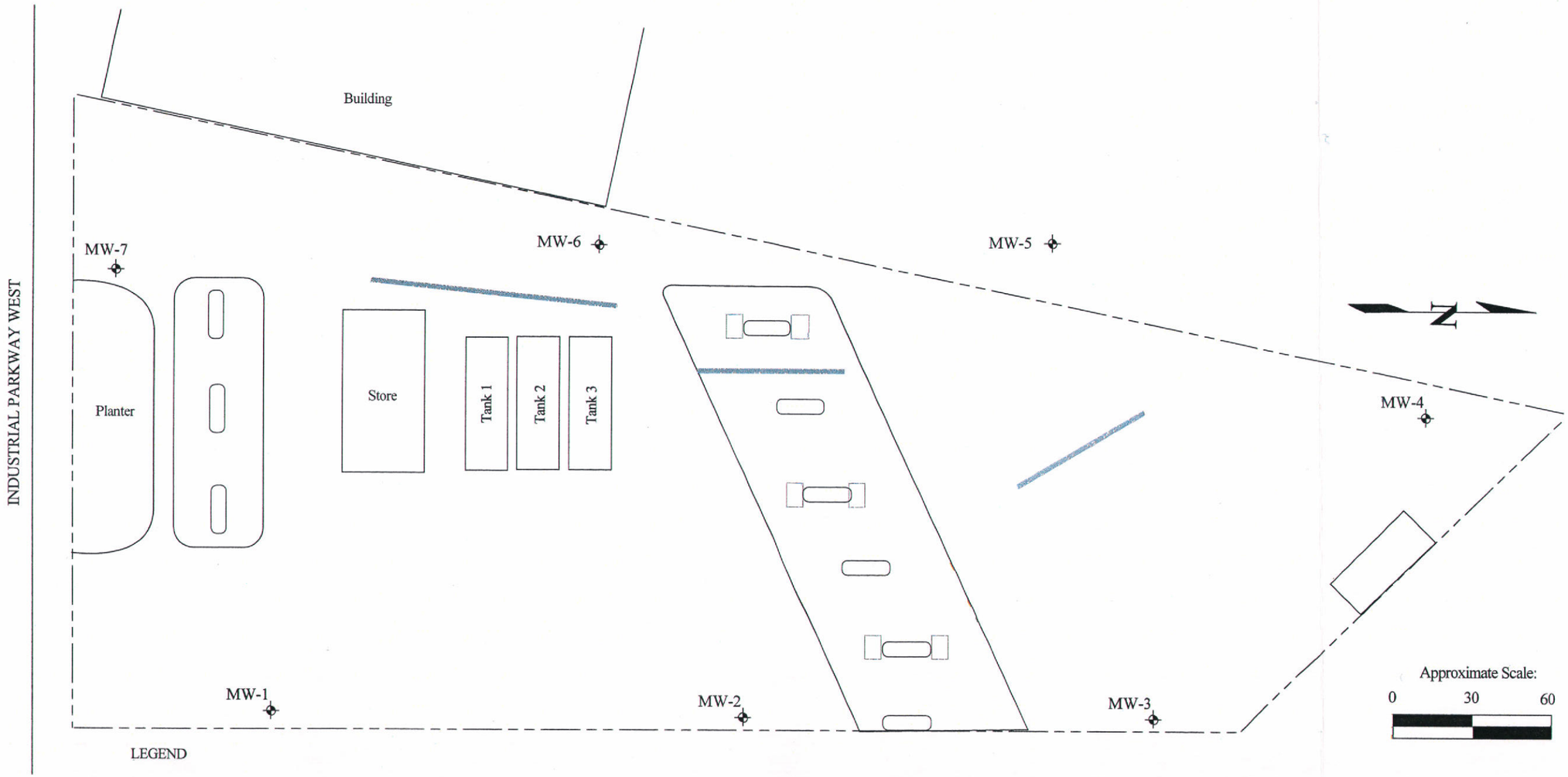
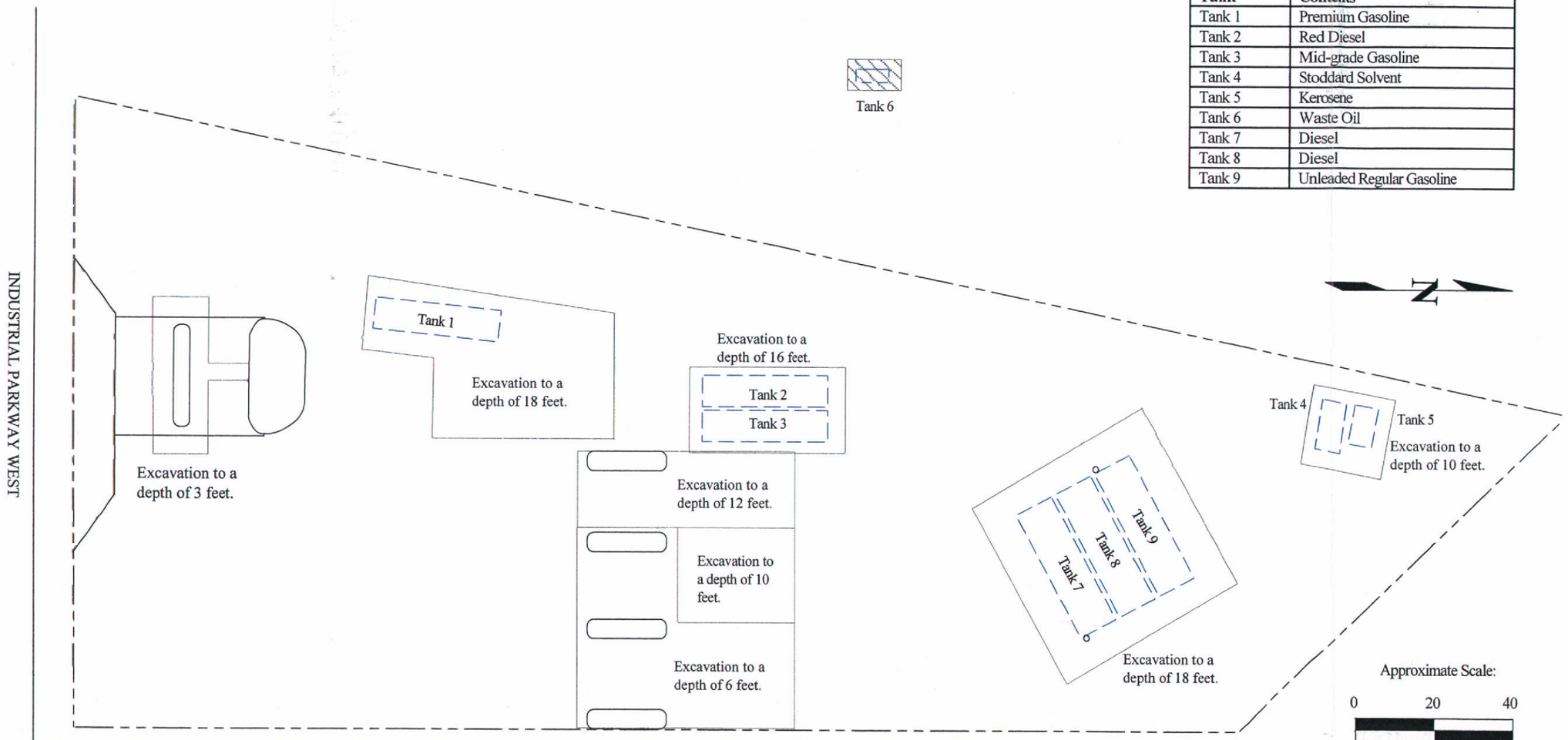
Project No. L98184	Golden Gate Petroleum	SITE LOCATION MAP 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure 1
Bonkowski & Associates, Inc.			

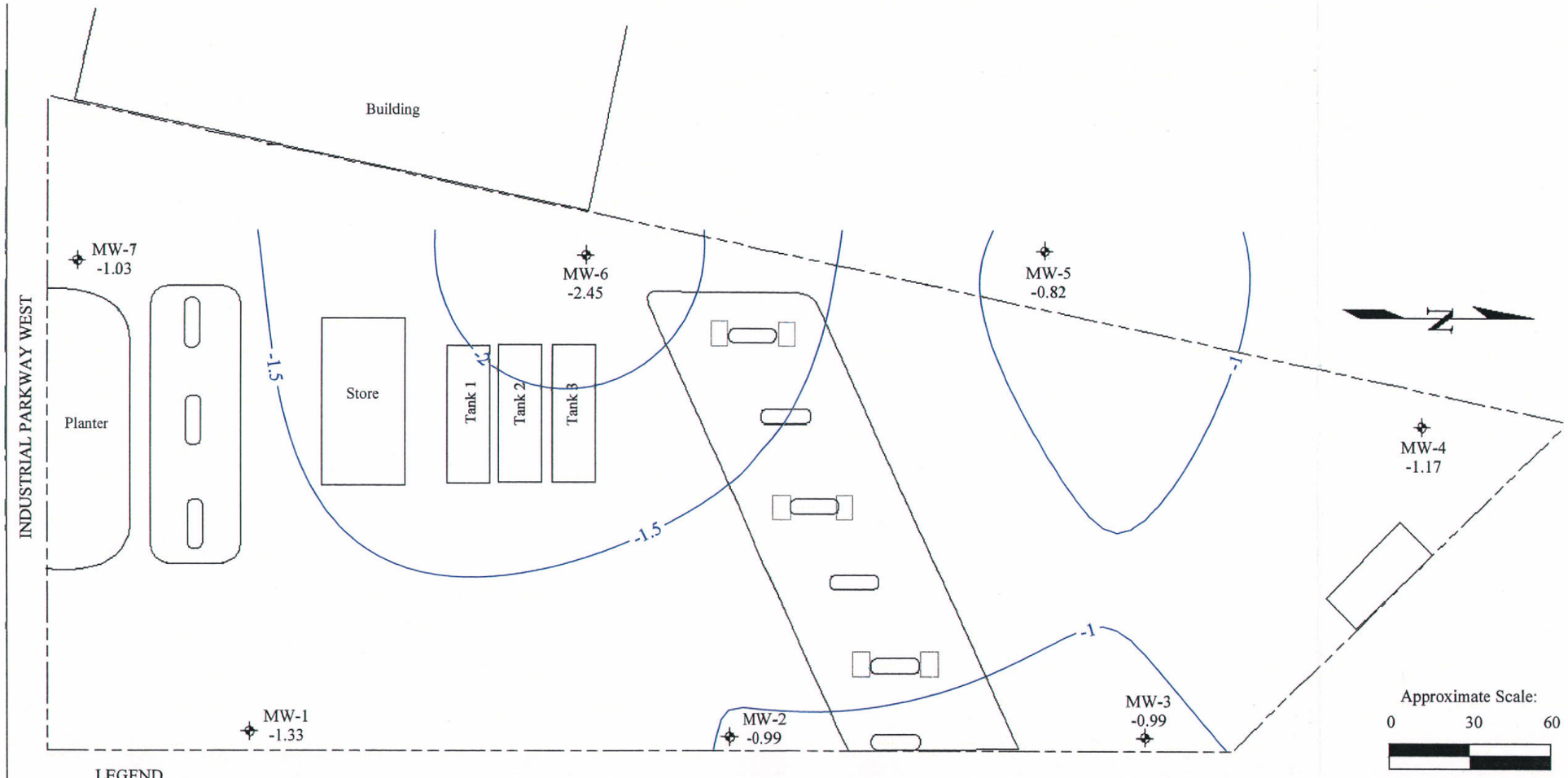


Project No. L98184	Golden Gate Petroleum	SITE PLAN 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure 2
Bonkowski & Associates, Inc.			

Tank	Contents
Tank 1	Premium Gasoline
Tank 2	Red Diesel
Tank 3	Mid-grade Gasoline
Tank 4	Stoddard Solvent
Tank 5	Kerosene
Tank 6	Waste Oil
Tank 7	Diesel
Tank 8	Diesel
Tank 9	Unleaded Regular Gasoline



Project No. L98184	Golden Gate Petroleum	LOCATION OF FORMER USTS 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure 3
Bonkowski & Associates, Inc.			



LEGEND

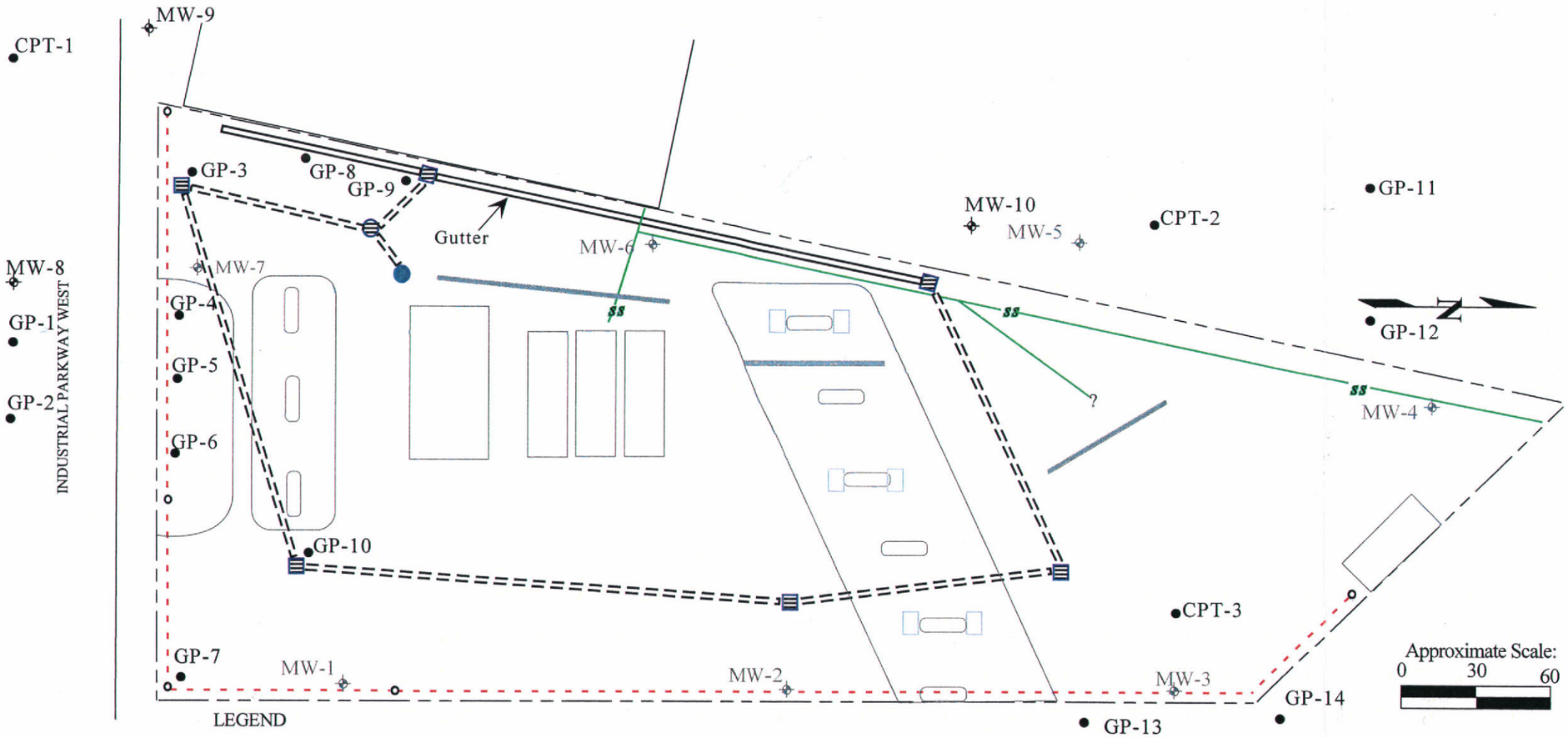
Monitor well

-1.07 Potentiometric Surface Elevation Above Mean Sea Level (National Geodetic Vertical Datum 1929)

Dispenser Island

Canopy Footing

Project No. L98184	Golden Gate Petroleum	POTENTIOMETRIC SURFACE ELEVATION MAP OCTOBER 21, 2003 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure 4
Bonkowski & Associates, Inc.			



Project No. L98184	Golden Gate Petroleum	PLANNED MONITOR WELLS , CPTS AND GEOPROBE SAMPLING LOCATIONS 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure 5
Bonkowski & Associates, Inc.			

PRELIMINARY SITE CONCEPTUAL MODEL

Golden Gate Petroleum
Hayward Bulk Distribution Facility
Hayward, California

1.0 INTRODUCTION

This Preliminary Site Conceptual Model (PSCM) is preliminary and its purpose is to find data gaps that need to be investigated. According to ASTM E 1689-95, "Standard Guide for Developing Conceptual Site Models for Contaminated Sites", there is six components of a Site Conceptual Model:

1) Potential Contaminants
2) Sources of Contaminants
3) Potential Migration Pathways
4) Background Areas of Contaminants
5) Potential Receptors
6) Limits of Study Area or System Boundaries

This report documents what is known about these six components and what needs to be known in order to form a complete SCM.

2.0 POTENTIAL CONTAMINANTS

2.1 Known Contaminants

From previous investigations, the following contaminants have been detected in soil and groundwater at the site:

- TPHG
- TPHD
- TPHMO
- BTEX
- MTBE and TAME

During the tank removal activities in 1998 and 1999, contaminated groundwater samples contained up to 9,800 ppb of TPHG, up to 12,000,000 ppb of TPHD, and up to 6,000 ppb of MTBE. During those activities, about 49,700 gallons of contaminated groundwater containing separate phase hydrocarbons were pumped from the excavations and removed from the site.

2.2 Data Gaps in Known Contaminants

The data collected to date on contaminants include the hydrocarbon contaminants generally associated with fuels. This includes constituents that have not been detected at the site. The oxygenates ETBE, DIPE and TBA as well as lead scavengers 1,2-DCA and EDB continue to be tested during quarterly monitoring even

though they have not been detected to date. The number of contaminants tested for appears to be sufficient to characterize the soil and water quality.

3.0 SOURCES OF CONTAMINANTS

3.1 Known Contaminant Sources

Contaminant sources included nine USTs as shown in the Workplan on Figure 3. The USTs included:

Tank Number	Capacity	Reported Use
1	12,000 gallons	Mid-grade unleaded gasoline
2	12,000 gallons	Red dye diesel
3	12,000 gallons	Premium unleaded gasoline
4	4,000 gallons	Stoddard solvent
5	2,000 gallons	Kerosene
6	1,000 gallons	Waste oil
7	20,000 gallons	Diesel
8	20,000 gallons	Diesel
9	20,000 gallons	Regular unleaded gasoline

In addition, underground piping and backfill was removed and some piping from a previous generation of tanks was left in place.

3.2 Contaminant Source Data Gaps

During tank and fuel line removal, soil in the vicinity of the excavations and groundwater in the excavations was sampled and tested. There has not been any work done to locate and characterize potential off-site contaminant sources.

4.0 POTENTIAL MIGRATION PATHWAYS

Figure 5 of the Workplan is a site plan showing the locations of known underground utilities. Figure A1 is an index map showing the locations of draft Geologic cross-sections relative to the existing wells and underground utilities. Draft geologic cross-sections showing interpreted subsurface conditions are presented in Figures A2 and A3. The cross-sections include the approximate configuration of underground structures, pea gravel and engineered fill placed in the former UST cavities. Groundwater flows more readily in layers and lenses of granular material (sand and gravel). The pea gravel placed in the bottoms of the tank cavities readily transmits groundwater. However, this filter material is limited to the locations of the former tank and pipeline excavations and transmits groundwater across those former excavations. The general flow of contaminants is to the west-southwest (B&A, 2003).

The overall groundwater gradient at the site is about 0.008 feet per foot in a west-

southwest direction. The gradient may be higher within lenses and stringers of granular sediments with higher hydraulic conductivities. The groundwater flow therefore may be variable. The groundwater elevation generally varies seasonally. During the wet season, the water table may be higher than during the dry season.

Hydrocarbon contaminants in the soil tend to be concentrated in a zone above the top of the groundwater surface. These contaminants were deposited into the soil from SPH floating on top of the groundwater. The seven monitor wells currently on the site do not contain SPH. However, residual contamination may exist in the soil.

Underground utilities such as storm drains, sewers, and electrical conduits are capable of carrying contaminants from surface runoff and surface spills. However, the calculated potentiometric surface as shown on cross-sections A-A' and B-B' is 5 to 10 feet below the bottom of these utilities. Contaminant migration from the groundwater plume into the utility pathways is therefore unlikely.

4.1 Contaminant Pathway Data Gaps

Data gaps in our knowledge of potential contaminant pathways include sparse knowledge of the site stratigraphy and uncertainty with respect to contaminant transport within utilities. In order to obtain more complete data on the stratigraphy, deep stratigraphic CPT borings and continuously cored Geoprobe borings are planned. In order to ascertain whether contaminants are being transported through underground utilities and their backfill, soil and groundwater sampling points are planned beneath the utilities.

5.0 BACKGROUND AREAS OF CONTAMINANTS

5.1 Known Background Contamination

The Site is in an industrial area of Hayward. Fuels may have been handled and used at various nearby properties.

5.2 Data Gaps in Background Contamination

The overall background concentrations of fuel hydrocarbons contaminants in the area around the site are not known.

6.0 POTENTIAL RECEPTORS

6.1 Known Potential Receptors

Potential receptors have been identified from the attached Environmental Data Resources, Inc. file search. This file search includes State and Federal environmental databases. All wells found in this search are at least ¾ mile from the Site. Two creeks, Ward Creek and Alameda Creek are about ¼ mile from the Site at their closest points.

6.2 Potential Receptor Data Gaps

The potential receptor data obtained to date came from Federal and State databases. In addition, the Geotracker database (http://geotracker.swrcb.ca.gov/) shows that the Site is not within ½ mile of any public well. A search for additional information in on possible wells in City and County files is planned.

7.0 LIMITS OF STUDY AREA OR SYSTEM BOUNDARIES

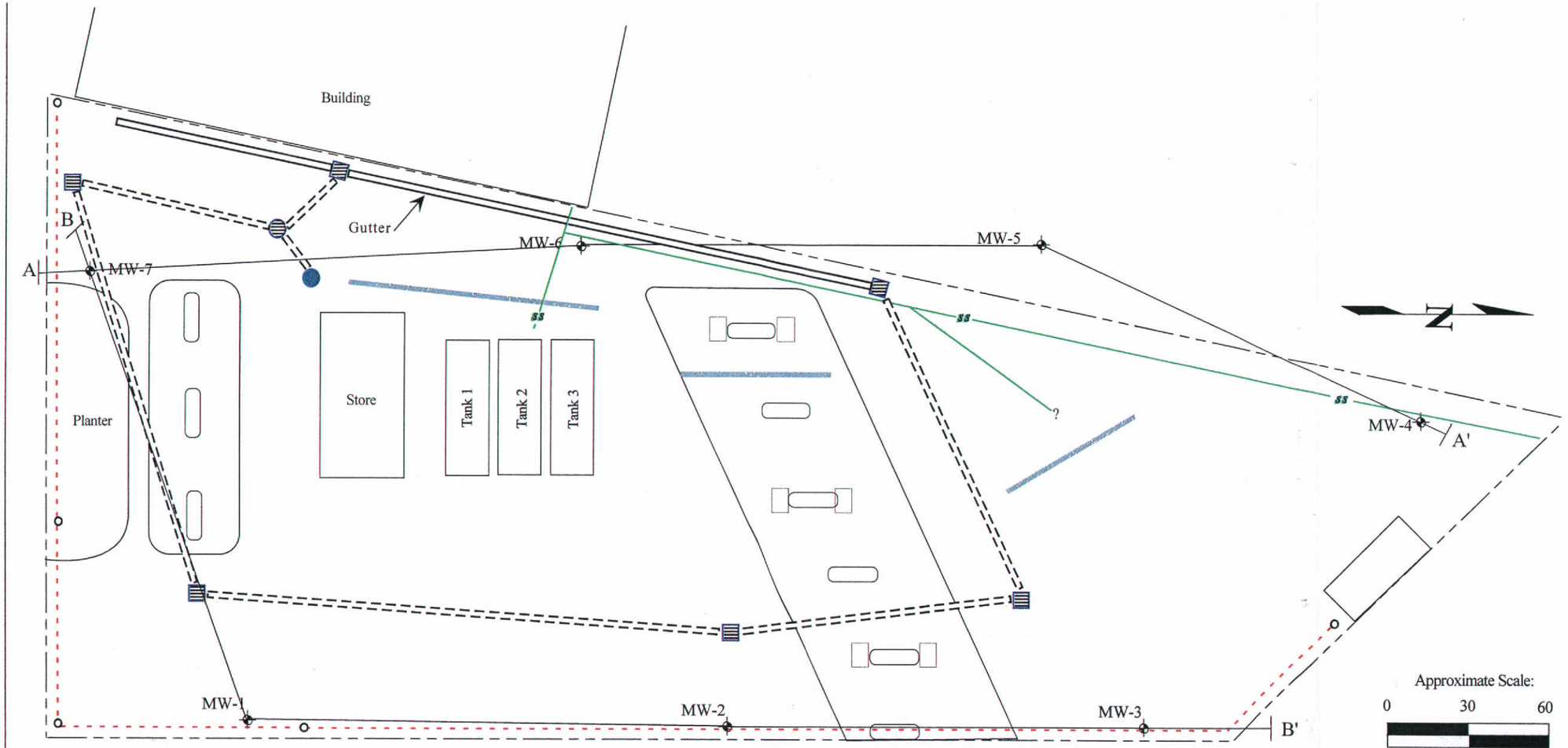
7.1 Known Distribution of Contaminants

Bonkowski & Associates, Inc.'s Preliminary Site Assessment Report (B&A, 2002) presents the distribution of soil and groundwater contaminants from the seven monitor wells. The latest groundwater monitoring data are presented in the Fourth Quarter, 2003 monitoring report (B&A, 2003).

Within the investigated area, TPHD appears concentrated mainly in the up-gradient (east and north) side of the site. MTBE appears concentrated in the northeast and southwest portions of the site.

7.2 Data Gaps in System Boundaries

There are no groundwater data for the areas immediately east and west of the investigated area. Additional soil and groundwater sampling points both up gradient and down gradient from the investigated area are planned.



LEGEND

MW-1 Monitor well	Buried Electric Line	SS Sanitary Sewer
Dispenser Island	Storm Drain Inlet	Buried Storm Sewer
Conopy footing	Light Pole	
Collector Trench	Manhole Cover	

Project No. L98184	Golden Gate Petroleum	SITE PLAN WITH UNDERGROUND UTILITIES AND LOCATIONS OF GEOLOGIC CROSS-SECTIONS 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure A1
Bonkowski & Associates, Inc.			

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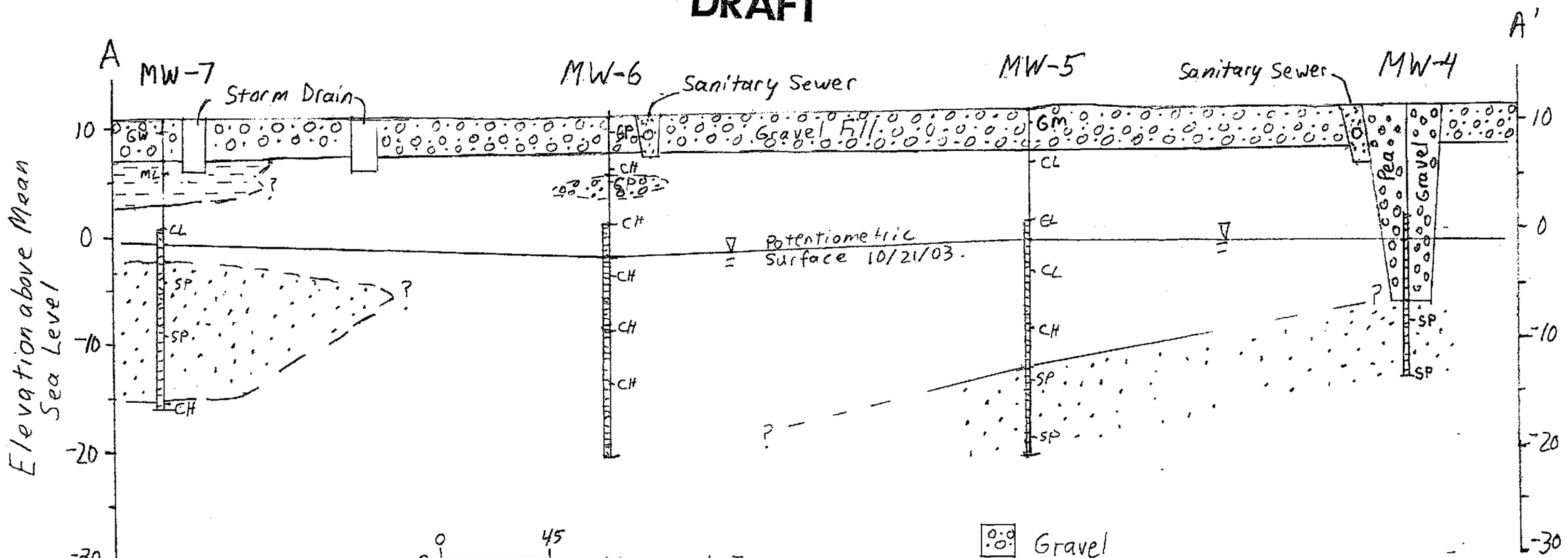

Project No. L98184	Golden Gate Petroleum	GEOLOGIC CROSS-SECTION A-A' 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure A2
Bonkowski & Associates, Inc.			

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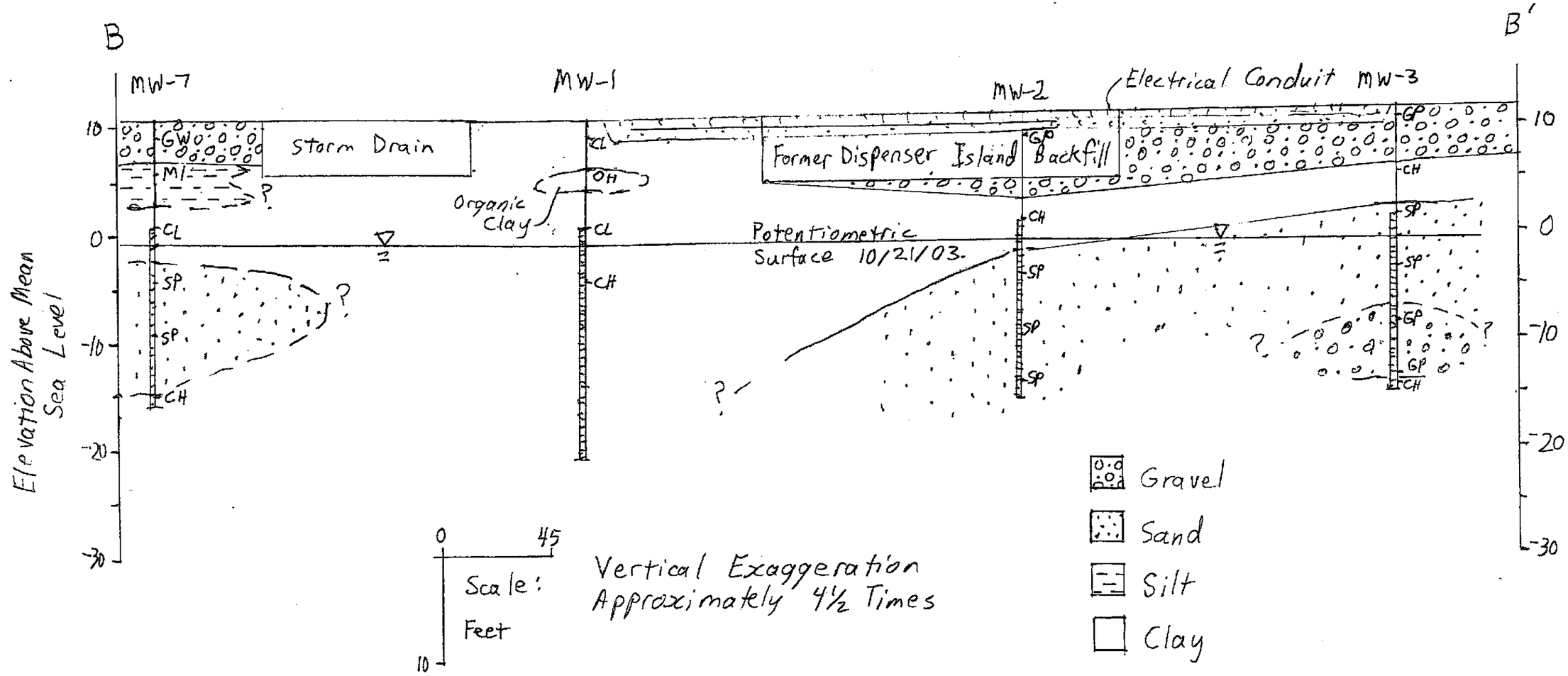

Project No. L98184	Golden Gate Petroleum	GEOLOGIC CROSS-SECTION B-B' 1565 INDUSTRIAL PARKWAY WEST HAYWARD, CALIFORNIA	Figure A3
Bonkowski & Associates, Inc.			

The EDR GeoCheck® Report

GGP Hayward
1565 Industrial Parkway
Hayward, CA 94544

Inquiry Number: 01126077.1r

February 09, 2004

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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GEOCHECK ADDENDUM

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

GEOCHECK® - PHYSICAL SETTING SOURCE REPORT

TARGET PROPERTY ADDRESS

GGP HAYWARD
1565 INDUSTRIAL PARKWAY
HAYWARD, CA 94544

TARGET PROPERTY COORDINATES

Latitude (North):	37.617599 - 37° 37' 3.4"
Longitude (West):	122.069199 - 122° 4' 9.1"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	582147.2
UTM Y (Meters):	4163591.0
Elevation:	12 ft. above sea level

EDR's GeoCheck Report has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Report is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

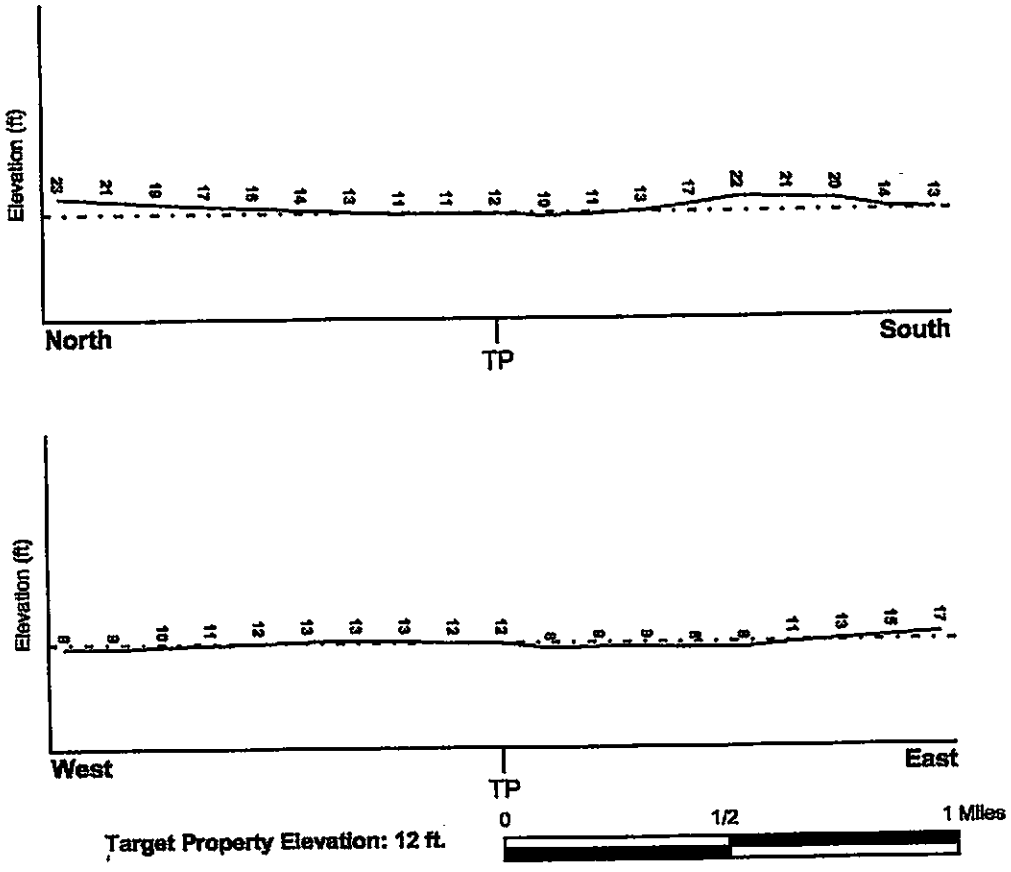
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	37122-E1 NEWARK, CA
General Topographic Gradient:	General East
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
ALAMEDA, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0650330020D

Additional Panels in search area:
0650330019D
0600010180B
0600140010B
0650330025C

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NEWARK	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
1	1/4 - 1/2 Mile SSE	W
A2	1/4 - 1/2 Mile West	W
A3	1/4 - 1/2 Mile West	SE
4	1/4 - 1/2 Mile SSE	NW
A5	1/4 - 1/2 Mile West	W, NW, Varie
6	1/2 - 1 Mile South	NE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
7	1/2 - 1 Mile South	Varies
B8	1/2 - 1 Mile SSW	SW
B9	1/2 - 1 Mile SSW	SW
11	1/2 - 1 Mile South	WSW
12	1/2 - 1 Mile SSE	SW
15	1/2 - 1 Mile SSE	NW
16	1/2 - 1 Mile East	WSW
17	1/2 - 1 Mile South	Varies
18	1/2 - 1 Mile North	S

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	DANVILLE
Soil Surface Texture:	silty clay loam
Hydrologic Group:	Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 7.80 Min: 6.60
2	18 inches	38 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60
3	38 inches	50 inches	gravelly - sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 0.60 Min: 0.20	Max: 8.40 Min: 7.40
4	50 inches	67 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 8.40 Min: 7.40
5	67 inches	78 inches	stratified	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 0.60 Min: 0.20	Max: 8.40 Min: 7.40

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: loam
clay loam
silt loam
clay

Surficial Soil Types: loam
clay loam
silt loam
clay

Shallow Soil Types: gravelly - sandy clay loam

Deeper Soil Types: sandy clay loam
silt loam

clay
silty clay loam

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	1.000
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
C14	USGS0119477	1/2 - 1 Mile WSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
10	3489	1/2 - 1 Mile NE
C13	25	1/2 - 1 Mile WSW

PHYSICAL SETTING SOURCE MAP - 01126077.1r

- County Boundary
- Major Roads
- Contour Lines
- Power transmission lines
- Earthquake Fault Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

0 1/4 1/2 1 Miles

- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells
- 100-year flood zone
- 500-year flood zone
- Wetlands

TARGET PROPERTY:	GGP Hayward	CUSTOMER:	Bonkowski & Associates
ADDRESS:	1565 Industrial Parkway	CONTACT:	James Springer
CITY/STATE/ZIP:	Hayward CA 94544	INQUIRY #:	01126077.1r
LAT/LONG:	37.6176 / 122.0692	DATE:	February 09, 2004 5:06 pm

GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
1 SSE 1/4 - 1/2 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	01-0708 W 5 10 Not Reported 09/01/1992	AQUIFLOW	50120
A2 West 1/4 - 1/2 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	01-1398 W Not Reported Not Reported 9.5 10/24/1986	AQUIFLOW	55556
A3 West 1/4 - 1/2 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	01-1103 SE Not Reported Not Reported 8 07/1998	AQUIFLOW	55560
4 SSE 1/4 - 1/2 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	0198 NW 3.43 10.64 Not Reported 03/17/1997	AQUIFLOW	50748
A5 West 1/4 - 1/2 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	01-0400 W, NW, Varie Not Reported Not Reported 10 07/02/1997	AQUIFLOW	55581
6 South 1/2 - 1 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	01-0159 NE Not Reported Not Reported 6.5 12/1995	AQUIFLOW	50117
7 South 1/2 - 1 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	0147 Varies 3.99 9.05 Not Reported 10/23/1996	AQUIFLOW	50749

GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
B8 **SSW** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	0151 SW 3.23 6.10 Not Reported 10/17/1997	**AQUIFLOW**	**50747**
B9 **SSW** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	Not Reported SW 3.23 6.10 Not Reported 10/17/1997	**AQUIFLOW**	**50746**
10 **NE** **1/2 - 1 Mile** **Higher**			**CA WELLS**	**3489**

Water System Information:

Prime Station Code:	03S/02W-35M04 M	User ID:	01C
FRDS Number:	0103049001	County:	Alameda
District Number:	31	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Agricultural/Irrigation Well
Source Lat/Long:	373738.0 1220336.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01 - AGRICULTURAL		
System Number:	0103049		
System Name:	VAN COURT PUBLIC WATER SUPPLY		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

Sample Information: * Only Findings Above Detection Level Are Listed

Sample Collected:	03/29/1988	Findings:	9.700 UG/L
Chemical:	BROMOFORM (THM)		
Sample Collected:	03/29/1988	Findings:	3.100 UG/L
Chemical:	TRICHLOROETHYLENE		
Sample Collected:	03/29/1988	Findings:	9.700 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	07/25/1988	Findings:	.560 UG/L
Chemical:	BROMODICHLORMETHANE (THM)		
Sample Collected:	07/25/1988	Findings:	7.000 UG/L
Chemical:	BROMOFORM (THM)		
Sample Collected:	07/25/1988	Findings:	3.000 UG/L
Chemical:	TRICHLOROETHYLENE		

11 **South** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	0334 WSW Not Reported Not Reported 6' 10/06/1998	**AQUIFLOW**	**89663**

GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
12 **SSE** **1/2 - 1 Mile** **Higher**	Site ID:	01-0809	**AQUIFLOW**	**64058**
	Groundwater Flow:	SW		
	Shallow Water Depth:	Not Reported		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	7		
	Date:	11/27/1995		

C13
WSW
1/2 - 1 Mile
Higher

CA WELLS **25**

Water System Information:

Prime Station Code:	0110006-005	User ID:	ENG
FRDS Number:	0110006005	County:	Alameda
District Number:	04	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Standby Raw
Source Lat/Long:	373639.0 1220456.0	Precision:	100 Feet (one Second)
Source Name:	WELL C - PEPSI WELL - EMERGENCY STANDBY		
System Number:	0110006		
System Name:	CITY OF HAYWARD		
Organization That Operates System:	25151 CLAWITER ROAD HAYWARD, CA 94541		
Pop Served:	125000	Connections:	28615
Area Served:	HAYWARD		

C14
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS0119477**

Agency:	USGS	Site ID:	373638122045901
Site Name:	004S002W04R001M		
Dec. Latitude:	37.61058		
Dec. Longitude:	-122.08328		
Coord Sys:	NAD83		
State:	CA		
County:	Alameda County		
Altitude:	6.0		
Hydrologic code:	Not Reported		
Topographic:	Valley flat		
Site Type:	Ground-water other than Spring		
Const Date:	Not Reported	Inven Date:	20020307
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	466		
Hole depth:	600	Source:	owner
Project no:	Not Reported		

GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
2002-10-29	14.90		2002-03-07	8.28	

15
SSE
1/2 - 1 Mile
Higher

Site ID:	01-0463	**AQUIFLOW**	**63989**
Groundwater Flow:	NW		
Shallow Water Depth:	3		
Deep Water Depth:	5		
Average Water Depth:	Not Reported		
Date:	06/29/1997		

16
East
1/2 - 1 Mile
Higher

Site ID:	01-1892	**AQUIFLOW**	**50015**
Groundwater Flow:	WSW		
Shallow Water Depth:	12		
Deep Water Depth:	14		
Average Water Depth:	Not Reported		
Date:	12/26/1991		

17
South
1/2 - 1 Mile
Higher

Site ID:	0061	**AQUIFLOW**	**50745**
Groundwater Flow:	Varies		
Shallow Water Depth:	4.75		
Deep Water Depth:	5.40		
Average Water Depth:	Not Reported		
Date:	03/30/1999		

18
North
1/2 - 1 Mile
Higher

Site ID:	6506	**AQUIFLOW**	**49924**
Groundwater Flow:	S		
Shallow Water Depth:	5.0		
Deep Water Depth:	7.7		
Average Water Depth:	Not Reported		
Date:	04/26/1995		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zip	Total Sites	> 4 Pci/L	Pct. > 4 Pci/L
94544	11	0	0.00

Federal EPA Radon Zone for ALAMEDA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 94544

Number of sites tested: 3

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.100 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5 and 6
Source: Department of Conservation
Telephone: 916-323-1779

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

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

FILE COPY

October 6, 2003

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

Mr. Dennis O'Keefe
Golden Gate Petroleum
501 Shell Avenue
Martinez, 94553

Re: Fuel Leak Case No. RO160, Hayward Bulk Petroleum Distribution Facility, 1565 Industrial Parkway, Hayward

Dear Mr. O'Keefe:

This letter follows staff review of the historic fuel leak case file for the above referenced site, up to and including the April 4, 2003 Bonkowski & Associates, Inc. 1st quarter 2003 sampling and monitoring report. We are concerned that that there are elevated concentrations of residual hydrocarbons still present in soil at the site, that the extent of the contaminant plume is still largely unknown, and that the mechanisms controlling the migration of these hydrocarbons are not yet well understood or evaluated. We are also concerned that this site lies along the northern fringes of the Niles Cone groundwater basin, a groundwater basin used for municipal water supplies.

This letter presents a request to complete a three-dimensional characterization of the release by way of a Soil and Water Investigation (SWI), and completion of a Site Conceptual Model (SCM) and Corrective Action Plan (CAP) for the subject site in accordance with California Code of Regulations (CCR), Title 23, Division 3, Chapter 16, Article 11, "Corrective Action Requirements"; State Water Resources Control Board Resolution 9249, "Policies and Procedure for Investigation, Cleanup and Abatement of Discharges Under Water Code Section 13304"; and the Regional Water Quality Control Board (Regional Board) Water Quality Control Plan for the basin.

The following technical comments address investigation and related performance objectives that shall be considered as part of the required SCM, SWI, and CAP. **We request that you prepare and submit a work plan for the SWI that addresses the following comments.**

TECHNICAL COMMENTS

A substantial release of petroleum hydrocarbons was identified in 1998 from several source areas across this large contiguous site. Measurable free-phase product (FP) was first observed in an underground storage tank (UST) observation well in July 1998. This well served a tank cluster that included both gasoline and diesel USTs. Beginning in November 1998 through January 1999, nine (9) USTs were removed from five discrete locations about the site. FP was reportedly identified on groundwater encountered in all but one of the resultant UST excavations, as well as in soil encountered beneath product lines and dispensers. Multiple leak sources were identified, most significant of which were leaking product conveyance and vapor return lines and gate valve. Further, additional product lines were discovered abandoned in place during the course of this removal project, some of which were subsequently removed, while others were left in situ. These lines appear to have served a previous generation of USTs.

Up to 260,000 ug/l of the fuel oxygenate Methyl tert-Butyl Ether (MtBE) was identified in water sampled from the UST observation well prior to initiation of the 1998 closures. Initial soil samples collected at the time of UST, piping, and dispenser removals included Total Petroleum Hydrocarbons as Diesel (TPH-D) as high as 5700 mg/kg, Benzene as high as 18 mg/kg, and MtBE as high as 100 mg/kg, at depths of 12' below grade (bg). Residual soil concentrations, after substantial over excavation efforts, revealed up to 26,000 mg/kg of TPH-D, 1500 mg/kg of TPH as Gasoline (TPH-G), 26 mg/kg of Benzene, and 12 mg/kg of MtBE at depths between 8 and 17' bg.

Boring logs representing materials encountered during the September 2002 installation of seven (7) monitoring wells report sequences of sand, sandy gravel/gravelly sand, silty sand, sandy clay, and clay to total depths explored of between 25 and 32' bg. Groundwater was reportedly encountered at the time of drilling at depths of 13 – 13.5' bg in five of seven wells. Groundwater was reportedly not encountered at the time of drilling in two wells (MW-1 and MW-6) where logs report the absence of higher permeability lithologies, e.g., sand. All wells were constructed with 15 or 20' screens.

Drilling logs suggest that encountered sediments were deposited in a fluvial, or stream, environment. These depositional environments make more difficult the ability to identify the location of dissolved-phase groundwater plumes. Plumes often exploit high-permeability channel deposits typical of fluvial environments, features easily missed using "traditional" petroleum investigation techniques. Further, other subsurface features, such as utility trenches or previous subsurface construction remnants, e.g., backfilled excavations, can divert groundwater plumes in directions that might otherwise not be anticipated.

Consequently, a Preferential Pathway Study, Site Conceptual Model and Soil and Water Investigation are required to fully investigate and evaluate the releases at this site.

1. **Preferential Pathway Study**

   A conduit / preferential pathway study shall be prepared for the site that identifies potential migration pathways and conduits (utilities, storms drains, etc.) that may be present at, and in the general vicinity of, the site. This survey must include, among other components, the submittal of comprehensive map(s) clearly showing the location and depth of all utility lines and trenches identified in the study, utility/trench slope or grade, flow directions, and type of backfill materials present. You shall also identify the presence of other anthropogenic or geogenic features that may also act as potential preferential flow pathways. Data shall be interpreted and a professional opinion rendered as to whether or not any identified features may present potential plume migration pathways.

   You shall also identify the presence of all wells within a ½ mile radius of the site (i.e., monitoring and production wells; active, inactive, standby, destroyed, abandoned). Include a listing of all wells within this radius, their use and status, date of completion, total depth and screen interval(s), as well as a map showing their locations relative to the site.

Using the results of the conduit / preferential pathway study and other data discussed, below, you are to develop the initial three-dimensional *Site Conceptual Model* (SCM) of site conditions. You are to use this initial SCM to determine the appropriate configuration for sampling points in the pending SWI phase of work at this site. Discuss your analysis and interpretation of the results of the conduit studies and explain your rationale for the configuration of sampling points in the SWI work plan.

2. Site Conceptual Model

Starting with a critical review of the conduit / preferential pathway studies, data from previous investigations and tank operational records for this site, as well as those derived from logs of supply wells within ¼ mile of the site, followed by an evaluation of regional and area-specific geology and hydrogeology based on published U.S. Geological Survey and California Geological Survey reports, as well as other reports published for public works or other projects in the general vicinity of the site, you are to develop the initial three-dimensional SCM of site conditions. You should include in the SCM a series of cross-sections drawn along transects both normal and parallel to the anticipated groundwater flow direction to illustrate your interpretation of underlying geology, the locations of utility corridors and trenches, and other salient features.

An SCM is a set of working hypotheses pertaining to all aspects of the contaminant release, including site geology, hydrogeology, release history, residual and dissolved contamination, attenuation mechanisms, pathways to nearby receptors, and likely impacts to receptors, among other possible topics to be considered. The SCM is used to identify data gaps that are subsequently filled as the investigation proceeds. As the data gaps are filled, the working hypotheses are modified, and the overall SCM is refined and strengthened. Subsurface investigations continue until the SCM no longer changes as new data are collected. At this point the SCM is considered "validated". The validated SCM forms the foundation for developing the most cost-effective final Corrective Action Plan (CAP).

Your attention is directed to *"Strategies for Characterizing Subsurface Releases of Gasoline Containing MtBE"*, American Petroleum Institute Publication No. 4699 dated February 2000 as a resource for development of the SCM. Your attention is also directed to the State Water Resources Control Board (SWRCB) *"Guidelines for Investigation and Cleanup of MTBE and Other Ether-Based Oxygenates, Final Draft"*, dated March 27, 2000, as well as the June 2002 ChevronTexaco Energy Research and Technology Company technical bulletin entitled *"Mass Flux Estimates to Assist Decision-Making"* to help in development and strategies for refinement of the SCM, among other related tasks. I can provide copies of any of these documents if you need them.

You are requested to use this initial SCM and referenced guidance documents to help you determine the appropriate configuration for samplings points in the pending SWI phase of work at this site. Please discuss in the SWI work plan your analysis and interpretation of the results of the conduit study and SCM, and explain your rationale for the configuration of proposed sampling points.

3. Contaminant Plume Definition

Further assessment is necessary to better understand site geology and hydrogeology, determine the mode of contaminant transport from the source areas, and to refine the SCM. We therefore request a three-dimensional investigation. Vertical and horizontal distribution of impacts is to be determined. Multiple transects of sampling points across and along the (anticipated) plume axes are anticipated. The SWI work plan, the scope of which should be substantially based on the completed SCM, shall present your plan to accomplish these tasks.

Conventional investigation techniques and monitoring well networks currently used at fuel leak sites are generally insufficient to adequately characterize modern fuel impacts, including those caused by MtBE and other oxygenates. It is recommended that your investigation initially incorporate expedited site assessment techniques and borings. The borings are to be continuously cored and logged, with close attention paid to changes in lithologies that might facilitate solute transport (e.g., silty/sandy stringers in otherwise fine grained sediments).

In general, soil samples should be collected for laboratory analysis at 5-foot intervals, areas of obvious contamination, the soil/groundwater interface, and at each lithologic change noted during boring advancement, at a minimum. Water samples are to be collected at discrete depths to total depth explored. Detailed cross-sections, fence diagrams, structural contours and isopachs, and rose diagrams for groundwater flow (incorporating all groundwater data), should be subsequently incorporated into the SWI report. Cross-sections should be scaled to clearly illustrate subsurface lithologies, including the locations of stringers and other zones of relatively higher permeability, particularly in those areas where such zones may be intercepted by buried utilities.

Final well locations and screen depths will be substantially based on the results of the SWI and refined SCM. The monitoring of multiple discrete water-bearing zones with short-screened intervals should be anticipated in most cases, and is fully dependent upon what is found during the SWI. Generally, these screened intervals should not be greater than 3' in length. We will expect that the Interim SWI Report will propose the locations of such wells, the anticipated well screen depths, their configurations (e.g., single well, well cluster or multi-level, as appropriate), and the reasoning behind the location and configuration of each.

Discuss your proposal for performing this work outlined, above, in the SWI work plan. The results of the conduit studies and the initial SCM are to be discussed in the SWI work plan to justify your proposed scope of work.

Expedited site assessment tools and methods are a scientifically valid and cost-effective approach to fully define the three-dimensional extent of the plume. Technical protocol for expedited site assessments are provide in the US EPA *"Expedited Site Assessment Tools for Underground Storage Tank Sites: A guide for Regulators"* (EPA 510-B-97-001), dated March 1997.

4. **Corrective Action Plan**

The purpose of the CAP is to use the information obtained during investigation activities to propose cost-effective final cleanup objectives and remedial alternatives for both soil and groundwater impacts, including those caused by MtBE and other fuel oxygenates, that will adequately protect human health and safety, the environment, eliminate nuisance conditions, and protect water resources.

A final CAP for the soil and groundwater impacts caused by an unauthorized release(s) at the site will be requested upon completion of the SWI and final SCM in accordance with the schedule specified below. The CAP shall address at least two technically and economically feasible methods to restore and protect beneficial uses of water and to meet the cleanup objectives for each contaminant established in the CAP. The CAP should incorporate both on-site and distal plume corrective action elements. The CAP must propose verification monitoring to confirm completion of corrective actions and evaluate CAP implementation effectiveness.

TECHNICAL REPORT REQUEST

Please submit technical reports according to, or otherwise comply with, the following schedule:

December 6, 2003 – Work plan for Soil and Water Investigation

December 6, 2003 - Site Conceptual Model (incorporating Preferential Pathway Study)

60 Days from SWI Work Plan Approval – Interim Soil and Water Investigation Report (which contains the results of the initial SWI assessment work, and a proposal for the installation of new monitoring wells)

90 Days from Completion of Soil and Water Investigation – Soil and Water Investigation Completion Report (which incorporates all data generated during completion of the SWI, both initial and subsequent phases, including the installation of the new monitoring wells)

90 Days after Submittal of Soil and Water Investigation Completion Report - Corrective Action Plan

October 15, 2003 – Quarterly Reports for 2nd and 3rd Quarters 2003

January 15, 2004 – Quarterly Report for the Fourth Quarter 2003

April 15, 2004 – Quarterly Report for the First Quarter 2004

July 15, 2004 – Quarterly Report for the Second Quarter 2004

October 15, 2004 – Quarterly Report for Third Quarter 2004

These reports and work plans are being requested pursuant to the Regional Board's authority under Section 13267(b) of the California Water Code. Each technical report shall include conclusions and recommendations for the next phases of work required at the site should more appear necessary to refine the SCM. We request that all required work be performed in a prompt and timely manner, as suggested by the noted schedule, above. Revisions to this schedule shall be requested in writing with appropriate justification for anticipated delays.

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that all work plans and technical reports containing professional geologic or engineering evaluations and/or judgments be completed under the direction of an appropriately registered or certified professional. This registered or certified professional shall sign and wet stamp all such reports and work plans.

All reports and work plans are to be submitted under cover, signed under penalty of perjury, by the Responsible Party(ies) who have taken a lead role in compliance with corrective action directives.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the Alameda County District Attorney, for possible enforcement follow up. Enforcement follow up may include administrative action or monetary penalties of up to $10,000 per day for each day of violation of the California Health and Safety Code, Division 20, Chapter 6.76.

If you have any questions, I can be reached at (510) 567-6783.

Sincerely,

Scott O. Seery, R.G., CHMM
Hazardous Materials Specialist

c: Betty Graham, RWQCB
Dave Charter, SWRCB UST Fund
Danilo Galang, Hayward Fire Department
Steven Inn, Alameda Co. Water District
✓Cynthia Dittmar, Bonkowski & Associates, Inc.
6400 Hollis St., Ste. 4, Emeryville, CA 94608
D. Drogos