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GETTLER-RYAN INC.

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TO: Mr. Thomas Bauhs
Chevron Products Company
P.O. Box 6004
San Ramon, California 94583

DATE: November 6, 2001
PROJ. #: DG92960C.3C01
SUBJECT: Former Chevron Station #9-2960
2416 Grove Way
Castro Valley, California

FROM:
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Project Geologist
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Mr. Phil Conley, President Board of Trustees, First Presbyterian Church, 2490 Grove Way, Castro Valley, CA 94546
Mr. James Brownell, Delta Environmental Consultants, Inc.,3164 Gold Camp Dr., Suite 200, Rancho Cordova, CA 95670-6021

If you have any questions please call us in Rancho Cordova at 916.631.1300.

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WORK PLAN FOR MONITORING WELL INSTALLATION

at

Chevron Service Station No. 9-2960
2416 Grove Way
Castro Valley, California

Report No. DG92960G.3C01
Delta Project No. DG92-960

Prepared for:

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November 6, 2001

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at

Chevron Service Station #9-2960
2416 Grove Way
Castro Valley, California

Report No. DG92960G.3C01
Delta Project No. DG92-960

INTRODUCTION

At the request of Chevron Products Company (Chevron), Delta Environmental Consultants, Inc. network associate Gettler-Ryan Inc. (GR) has prepared this Work Plan for the installation of a groundwater monitoring well to further evaluate the concentrations of dissolved hydrocarbons in groundwater at the subject site. The proposed scope of work includes: obtaining the required well installation permit from the Alameda County Public Works Agency (ACPWA); updating the site safety plan; installing one groundwater monitoring well; collecting soil samples from the well boring for description and possible analysis; developing and sampling the newly installed groundwater monitoring well; analyzing selected soil and groundwater samples; surveying the new wellhead elevation; and preparing a report that presents the findings of the investigation. This work has been requested by Alameda County Health Cares Services Agency (ACHCSA) in letter dated October 9, 2001.

The scope of work described in this work plan is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual*, the California Regional Water Quality Control Board (CRWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*, and ACHCSA and Zone 7 Water District guidelines.

SITE DESCRIPTION

The subject site is a former service station located on the northeast corner of the intersection of Grove Way and Redwood Road in Castro Valley, California (Figure 1). Site facilities consisted of a station building, four underground storage tanks (USTs), and two fueling dispenser islands. Locations of pertinent site features are shown on Figure 2.

PREVIOUS ENVIRONMENTAL WORK

In October 1986, EMCON Associates (EMCON) installed four groundwater monitoring wells (C-1 through C-4) at the subject site. The highest concentrations of petroleum hydrocarbons were detected in groundwater samples collected from well C-1. Total Petroleum Hydrocarbons as gasoline (TPHg) and benzene were detected in samples at concentrations as high as 120,000 and 25,000 parts per billion (ppb), respectively.

In March 1987, GR began monthly groundwater monitoring of the wells at the subject site (C-1 through C-4).

In October 1989, GR began quarterly groundwater monitoring and sampling at the site. During the initial sampling, well C-1 contained 0.91 feet of separate-phase hydrocarbons (SPH).

In January 1990, GR began interim recovery of the SPH from C-1. Bailing and pumping of SPH continued on a monthly basis until January 1995.

In August 1990, GeoStrategies, Inc. installed three offsite wells (C-5, C-6, and C-7) to delineate the lateral extent of petroleum hydrocarbons in groundwater at the subject site.

Weiss Associates installed and initiated operation of a groundwater and soil vapor extraction system along with groundwater and soil vapor extraction well RW at the subject site in November 1993. Operation of the system continued through 1996. Approximately 8,900 pounds of petroleum hydrocarbons were removed during the system's operation. The system was turned off and dismantled in 1997 after graphs revealed asymptotic behavior of TPH concentrations removed, and approval was issued from ACHCSA.

In January 1997, semi-annual monitoring and sampling was initiated at the site for all monitoring wells (C-1 through C-7). Groundwater monitoring wells were put on a first and third quarter monitoring and sampling schedule and have continued on the same schedule to date.

On February 5, 1997, GR observed Bay Area Exploration Services, Inc. (BAE) drill six on-site borings (B-1 through B-6) to investigate the soil near the former product piping and dispenser island areas. Borings B-1 through B-4 were drilled to a total depth of 16.5 feet below surface grade (bsg), and B-5 and B-6 were drilled to 19.5 feet bsg. TPHg and benzene were detected at concentrations up to 2,300 and 13 parts per million (ppm), respectively, from samples collected from capillary fringe zone (15.5 to 18.5 feet bsg).

On April 30, 1997, GR observed BAE abandoned one offsite groundwater monitoring well (C-5).

On September 15, 1998, at the request of the ACHCSA and ACPWA to facilitate the Redwood Road widening project, BAE drilled out onsite groundwater monitoring wells C-1, C-2, and C-3. On September 18, 1998, soil vapor and groundwater extraction well RW was abandoned by BAE.

Three wells currently exist at the site (C-4, C-6, and C-7), of which two have been paved over and lost (C-4 and C-6).

Groundwater Monitoring Data

On July 10, 2001, well C-7 was monitored and sampled as part of the regular scheduled, semi-annual monitoring and sampling event. The groundwater sample was analyzed for TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary-butyl ether (MtBE) by EPA Method 8015/8020, and oxygenating compounds tertiary-butyl alcohol (TBA), MtBE, di-isopropyl ether (DIPE), ethyl tertiary-butyl ether (EtBE), and tertiary-amyl methyl ether (TAME) by EPA Method 8260. None of the analytes were detected in the sample. Historically, the groundwater flow direction has been consistently to the west-southwest at an approximate depth between 14 and 20 feet bsg.

Historic groundwater analytical data suggest that the plume is delineated, stable, and shrinking.

SCOPE OF WORK

To further evaluation the concentrations of the dissolved petroleum hydrocarbon plume in the vicinity of [redacted] C-1 and C-2, GR proposes to install one groundwater monitoring well at the location shown on Figure 2. GR's Field Methods and Procedures are included in Appendix A. To implement the scope of work, GR proposes the following six tasks:

Task 1. Pre-field Activities

GR will update the site safety plan. The required well installation permit will be obtained from the Alameda County Public Works Agency and Zone 7 Water Agency. Underground Service Alert (USA) will be notified at least 48 hours prior to beginning drilling.

Task 2. Well Installation and Soil Sampling

GR will install one groundwater monitoring well at the location shown on Figure 2. Drilling and well construction will be performed by a California licensed driller using 8-inch diameter hollow-stem augers and a truck-mounted drill rig. A GR geologist will monitor the drilling activities and prepare a log of the boring. Soil samples for description and possible chemical analysis will be obtained from the boring at 5-foot intervals, as a minimum. Selected soil samples will be submitted for chemical analysis as described in Task 5.

The groundwater monitoring well will be constructed with 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.02-inch machine-slotted well screen. The proposed well will be constructed with 15 feet of screen as shown on the Proposed Well Construction Detail (Figure 3). However, the actual screen interval will depend on the conditions encountered during drilling.

Soil from each sampled interval will be screened in the field for the presence of volatile organic compounds using a photoionization detector (PID). This data will be collected for reconnaissance purposes only, and will not be used as verification of the presence or absence of petroleum hydrocarbons. Screening data will be recorded on the boring logs. Drill cuttings will be stored at the site pending disposal.

The drill cuttings will be stockpiled on and covered with plastic sheeting. Soil samples will be collected from the drill cuttings as described in Appendix A. Stockpile samples will be analyzed as described in Task 5. Drill cuttings will be removed by Chevron's contractor Integrated Wastestream Management (IWM) for disposal, and steam cleaning rinsate wastewater will be transported by IWM for disposal at McKittrick.

Task 3. Well Development and Sampling

Newly installed groundwater monitoring well will be developed after standing a minimum of 72 hours following completion. During development, the clarity of the discharged well water and selected groundwater parameters (pH, temperature, and conductivity) will be monitored. When the discharge water runs clear and the groundwater parameters have stabilized, a groundwater sample will be collected. The groundwater sample will be analyzed as described in Task 5. Groundwater removed from the well during development and sampling will be transported by IWM to McKittrick for disposal.

Task 4. Wellhead Survey

Following installation, a California licensed surveyor will survey the top of casing elevation of the well to mean sea level, and establish horizontal coordinates of the well. GPS measurements will also be obtained for the well.

Task 5. Laboratory Analyses

Soil samples will be submitted for chemical analysis to a California state-certified Hazardous Material Testing Laboratory. Selected soil samples from the well boring will be analyzed for TPHg by EPA Method 8015 (Modified), and for the gasoline constituents benzene, toluene, ethylbenzene, and xylenes (BTEX), and MtBE by EPA Method 8020. Groundwater samples will be analyzed for TPHg, BTEX, and MtBE by EPA Methods 8015M/8020 and fuel oxygenates (MtBE, TBA, EtBE, TAME, DIPE) by EPA Method 8260. The soil samples from the drill cuttings stockpile will be analyzed as required by the disposal facility.

Task 6. Report Preparation

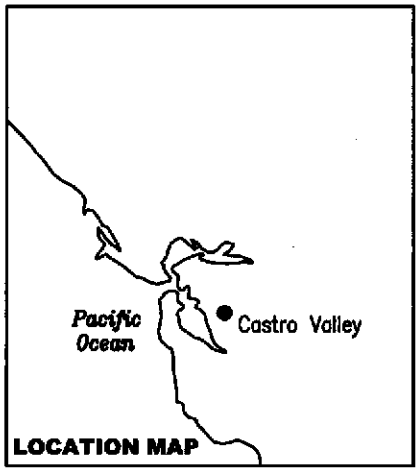
Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and findings associated with this investigation. This report will be submitted to Chevron for their use and distribution.

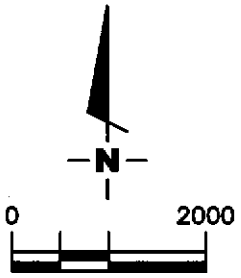
PROJECT STAFF

Mr. David W. Herzog, a Registered Geologist in the State of California (R.G. No. 7211) will provide technical oversight and review of the work. Mr. Greg Gurss, Senior Project Manager, will supervise implementation of field and office operations. GR employs a staff of geologists, engineers, and technicians who will assist with the project.

SCHEDULE

Upon approval of the Work Plan, GR will implement the proposed scope of work. The report of the findings will follow approximately 60 days after completion of the field work.





Source: National Geographic California Seamless USGS Topographic Maps on CD-ROM.

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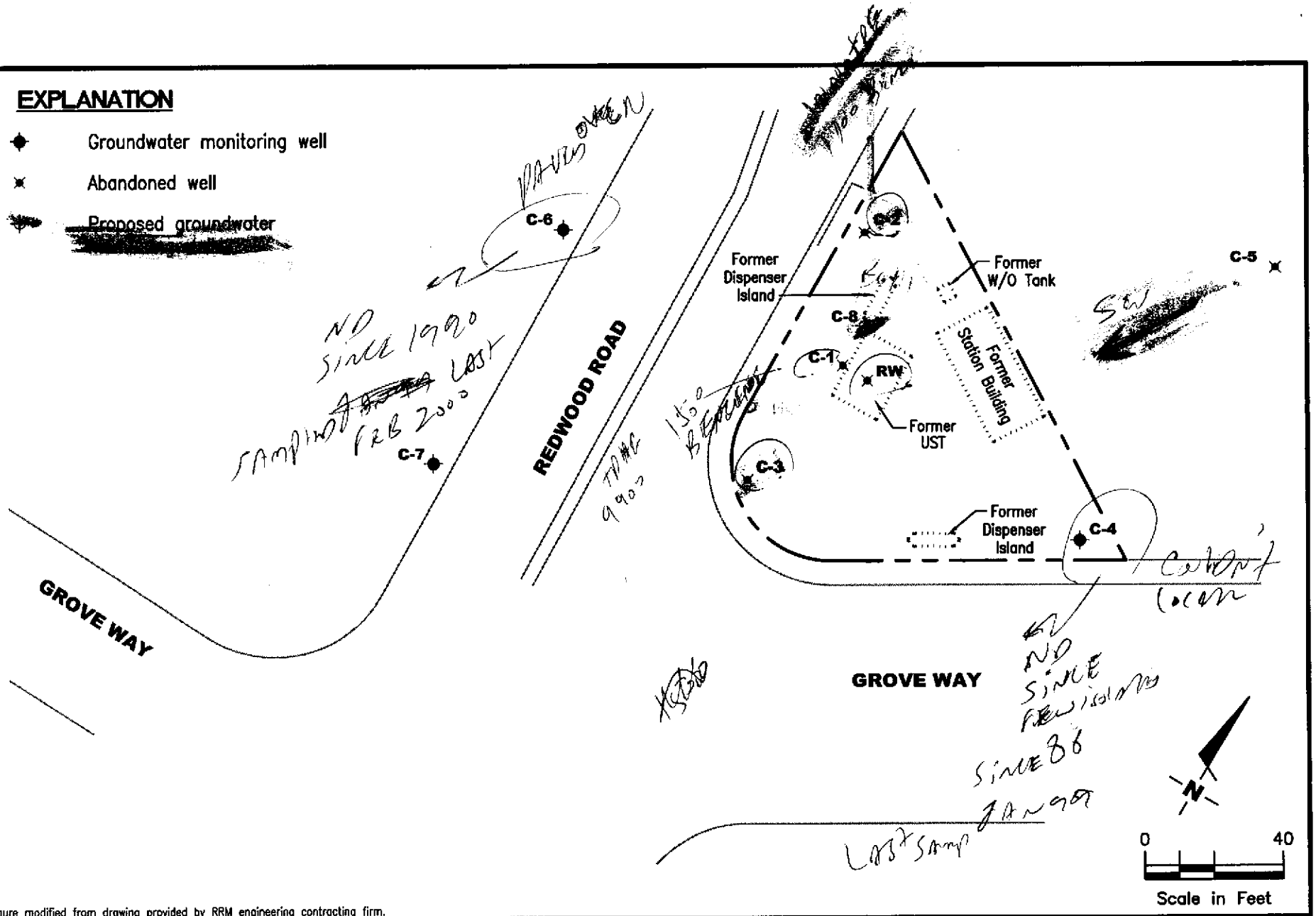
VICINITY MAP
Former Chevron Service Station No. 9-2960
2416 Grove Way
Castro Valley, California

FIGURE
1

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
DG92960G.3C01		11/01	

FILE NAME: P:\ENVIRO\CHEVRON\9-2960\VIC-9-2960.DWG | Layout Tab: Vic Map



Source: Figure modified from drawing provided by RRM engineering contracting firm.

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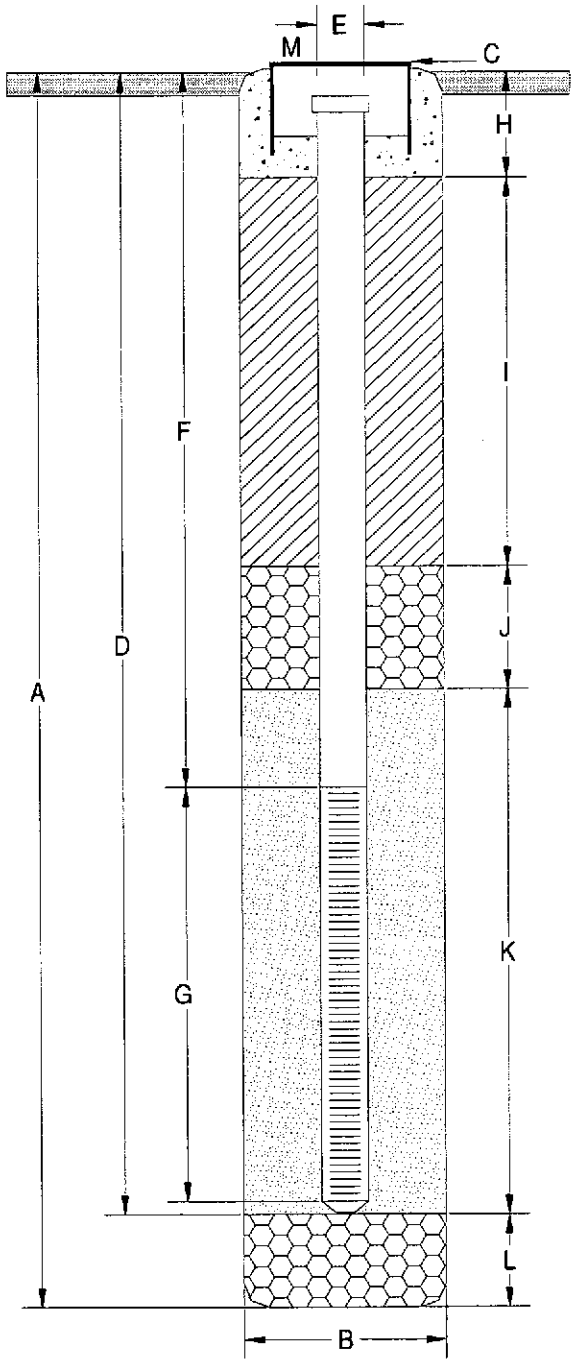
SITE PLAN
Former Chevron Service Station No. 9-2960
2416 Grove Way
Castro Valley, California

FIGURE
2

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
DG92960G.3C01		11/01	

FILE NAME: P:\ENVIRO\CHEVRON\9-2960\A01-9-2960.DWG | Layout Tab: Work Plan 11-01

PROPOSED WELL CONSTRUCTION DETAIL



A Total Depth of Boring 25 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow-Stem Auger

C Top of Box Elevation NA ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project-Datum

D Casing Length 25 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 10 ft.

G Perforated Length 15 ft.
Perforated interval from 10 to 25 ft.
Perforation Size 0.02 in.

H Surface Seal from 0 to 1 ft.
Seal Material Concrete

I Backfill from 1 to 6 ft.
Seal Material Neat Cement

J Seal from 6 to 8 ft.
Seal Material Bentonite

K Gravel Pack from 8 to 25 ft.
Pack Material Lonestar #3 Sand

L Bottom Seal NA ft.
Seal Material NA

M Vault box, locking well cap, and lock.

Note: Depths measured from initial ground surface. All wells will be constructed and completed at surface as required by local agencies.

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Proposed Well Construction Detail
Former Chevron Station #9-2960
2416 Grove Way, Castro Valley, CA

FIGURE
3

JOB NUMBER	REVISED DATE	REVISED DATE	REVISED DATE
DG92960G.3C01			10/30/2001

GETTLER-RYAN INC.

FIELD METHODS AND PROCEDURES

Site Safety Plan

Fieldwork performed by Gettler-Ryan Inc. (G-R) is conducted in accordance with G-R's Health and Safety Plan (revised January 16, 1995) and the Site Safety Plan. G-R personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The G-R geologist or engineer at the site when the work is performed acts as the Site Safety Officer. G-R utilizes a photoionization detector (PID) to monitor ambient conditions as part of the Health and Safety Plan.

Collection of Soil Samples

Soil borings are drilled by a California-licensed well driller. A G-R geologist is present to observe the drilling, collect soil samples for description, physical testing, and chemical analysis, and prepare a log of the exploratory soil boring. Soil samples are collected from the soil boring with a split-barrel sampling device fitted with 2-inch-diameter, clean brass tube or stainless steel liners. The sampling device is driven approximately 18 inches with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler each successive 6 inches is recorded on the boring log. The encountered soils are described using the Unified Soil Classification System (ASTM 2488-84) and the Munsell Soil Color Chart.

After removal from the sampling device, soil samples for chemical analysis are covered on both ends with Teflon sheeting or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Samples are selected for chemical analysis based on:

a. depth relative to underground storage tanks and existing ground surface
b. depth relative to known or suspected groundwater
c. presence or absence of contaminant migration pathways
d. presence or absence of discoloration or staining
e. presence or absence of obvious gasoline hydrocarbon odors
f. presence or absence of organic vapors detected by headspace analysis

Field Screening of Soil Samples

A PID is used to perform headspace analysis in the field for the presence of organic vapors from the soil sample. A small volume of sample (20-30 cm^3) is placed in a Ziplock®-type plastic bag with headspace. After allowing the sample to warm for approximately 10 minutes, the PID sample tube is inserted into the headspace above the sample and a measurement taken. PID screening results are recorded on the boring log as reconnaissance data. G-R does not consider field-screening techniques to be verification of the presence or absence of hydrocarbons.

Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory soil borings with Schedule 40 polyvinyl chloride (PVC) casing. All joints are thread-joined; no glues, cements, or solvents are used in well construction. The screened interval is constructed of machine-slotted PVC well screen that generally extends from the total well depth to a point above the groundwater. Appropriately sized sorted sand is placed in the annular adjacent to the entire screened interval. A bentonite seal is placed in the annular space above the sand, and the remaining annular space is sealed with neat cement or cement grout.

Wellheads are protected with water-resistant traffic-rated vault boxes placed flush with the ground surface. The top of the well casing is sealed with a locking waterproof cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

Measurement of Water Levels

The top of the newly installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL). Depth-to-groundwater in the well is measured from the top of the well casing with an electronic water-level indicator. Depth-to-groundwater is measured to the nearest 0.01-foot, and referenced to MSL.

Well Development and Sampling

The purpose of well development is to improve hydraulic communication between the well and the surrounding aquifer. Prior to development, each well is monitored for the presence of floating product and the depth-to-water is recorded. Wells are then developed by alternately surging the well with a vented surge block, then purging the well with a pump or bailer to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized. After the wells have been developed, groundwater samples are collected. Well development and sampling is performed by Gettler-Ryan Inc. of Dublin, California.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting and samples are collected and analyzed on the basis of one composite sample per 100 cubic yards of soil. Stockpile samples are composed of four discrete soil samples, each collected from an arbitrary location on the stockpile. The four discrete samples are then composited in the laboratory prior to analysis.

Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and them driving the stainless steel or brass sample tube into the stockpiled material with a hand, mallet, or drive sampler. The sample tubes are then covered on both ends with Teflon sheeting or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS (MORE THAN HALF IS COARSER THAN NO. 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	Well graded gravels with or without sand, little or no fines
			GP	Poorly graded gravels with or without sand, little or no fines
		GRAVELS WITH OVER 15% FINES	GM	Silty gravels, silty gravels with sand
			GC	Clayey gravels, clayey gravels with sand
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	Well graded sands with or without gravel, little or no fines
			SP	Poorly graded sands with or without gravel, little or no fines
		SANDS WITH OVER 15% FINES	SM	Silty sands with or without gravel
			SC	Clayey sands with or without gravel
FINE-GRAINED SOILS (MORE THAN HALF IS FINER THAN NO. 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT 50% OR LESS)		ML	Inorganic silts and very fine sands, rock flour, silts with sands and gravels
			CL	Inorganic clays of low to medium plasticity, clays with sands and gravels, lean clays
			OL	Organic silts or clays of low plasticity
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50%)		MH	Inorganic silts, micaceous or diatomaceous, fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic silts or clays of medium to high plasticity
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils

PID	Volatile vapors in ppm
(2.5YR 6/2)	Soil color according to Munsell Soil Color Charts (1993 Edition)
BLOWS/FT.	Sample drive hammer weight – 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs.

———	Observed contact
– – – –	Inferred contact
⊘	No soil sample recovered
■	"Undisturbed" sample
▽	First encountered groundwater level
▼	Static groundwater level

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UNIFIED SOIL CLASSIFICATION
ASTM D 2488-85
AND
KEY TO SAMPLING DATA