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Consultants, Inc.

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WORK PLAN FOR MONITORING WELL INSTALLATION

At
Former Chevron Service Station No. 20-6145
800 Center street
Oakland, California

JUN 06 2001

GR Report No. 346492.02
Delta Project No. DG26/145

Prepared for:

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May 25, 2001

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INTRODUCTION

At the request of Chevron Products Company (Chevron), Delta Environmental Consultants Inc. Network Associate Gettler-Ryan Inc. (GR) have prepared this Work Plan to install one off-site groundwater monitoring well southwest of MW-3. This work was requested by the Alameda Count Division of Environmental Protection (ACDEP) in a letter dated August 1, 2000. The purpose of this proposed well is to delineate the extent of petroleum hydrocarbons in groundwater southwest of this site.

The proposed scope of work includes: obtaining the required well installation permit from the Alameda County Public Works Department (ACPWD), and an encroachment permit from the City of Oakland; updating the site safety plan; installing one off-site monitoring well; collecting soil samples for possible chemical analysis and preparing a log of the well boring; surveying the newly installed monitoring well; developing and sampling the well; and preparing a report presenting the findings of the investigation.

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 ACDEP guidelines.

SITE DESCRIPTION

The subject site is located on the northeastern corner of the intersection of 8th Street and Center Street in the City of Oakland, California (Figure 1). The topography in the vicinity of the site is relatively flat at an elevation of approximately 15 feet above mean sea level. The nearest surface water is Oakland Inner Harbor approximately 1 mile south of the site.

The site was first developed as a service station in 1932. Four 1,000 gallon underground fuel storage tanks (USTs) and one waste oil UST, apparently installed when the site was built, where removed in 1973 when the station was closed. The original station facilities, including the building, USTs and the dispenser islands have been removed and the site is now vacant. Properties in the vicinity are developed as residential housing, Churches and retail business.

SUMMARY OF ENVIRONMENTAL WORK

The information discussed below was obtained from files provided by Chevron. Soil and groundwater analytical data are summarized in attached tables. Locations of the wells and borings are shown on Figure 2. Three subsurface investigations have been performed at the subject site. In 1989, Subsurface Consultants Inc. drilled five soil borings (1 through 5) to depths between 4.5 and 26 feet below ground surface (bgs). Temporary wells were installed in two of these borings. Borings 1 through 4 were installed in the vicinity of the former USTs, the dispenser island, and sumps along the eastern property boundary. Concentrations up to 14,000 parts per million (ppm) of Total Petroleum Hydrocarbons as diesel (TPHd), up to 31,000 ppm of Total Petroleum Hydrocarbons as

gasoline (TPHg) and up to 500 ppm of benzene were detected in soil collected from depths up to 15 feet bgs. One sample from 3.5 feet bgs in boring 5, situated near the hydraulic hoist, contained 16,000 ppm oil and grease. Grab groundwater samples were collected from borings 1 and 3. TPHd was not detected in either sample. The sample from boring 3 contained benzene (340 parts per billion, or ppb).

Groundwater Technology Inc. drilled three soil borings (SB-1 through SB-3) to 12 feet bgs and installed four groundwater monitoring wells (MW-1 through MW-4) to 15 feet bgs in 1995. Concentrations of TPHg (up to 14,000 ppm) and benzene (up to 120 ppm) were detected in soil samples collected at 5 and 10 feet bgs in borings SB-1, SB-2 and MW-1. TPHg or benzene was not detected in soil samples from borings SB-3 or MW-2 through MW-4 (except for 0.24 ppm of benzene in the sample from boring MW-3 at 10 feet bgs).

Pacific Environmental Group advanced 5 soil vapor points (SV-1 through SV-5) to depths up to 12 feet bgs in 1997. Petroleum hydrocarbons were detected in soil samples collected from all borings at concentrations up to 8,000 ppm of TPHg and 52 ppm of benzene. Soil vapor samples from these borings contained up to 50,000 micrograms per liter (µg/l) of TPHg and 65 µg/l of benzene. The highest soil vapor concentrations were encountered in soil between 6 and 10 feet bgs.

In 1999, Chevron contracted GR to remove the dispenser island, sumps, hydraulic hoist, building foundations, trash enclosure, yard lights and asphalt remaining at the site. This work was initiated in September 1999. At that time, GR encountered one 1,000 gallon UST in the area of the former fuel UST pit along the western property boundary, adjacent to Center Street. On 550 gallon waste oil UST was encountered in front of the existing station building situated along the eastern property boundary. One buried 55 gallon steel drum, apparently used as some sort of UST, was encountered in the vicinity of the hydraulic hoist inside the station building. At that time, work at the site was discontinued while negotiations between Chevron and the property owner were initiated on UST ownership. The USTs were not removed, and compliance samples were not collected. Locations of the USTs are shown on Figure 2. [Also on that date, well MW-5 contained TPHg (3,000 ppb), benzene (20 ppb), and diesel-range hydrocarbons (1,390 ppb)]

Quarterly monitoring since, October 1995, confirm that hydrocarbons are present in the groundwater. Depth to water fluctuates from approximately 5 to 10 feet below ground surface. Groundwater generally flows from northeast to southwest.

PROPOSED SCOPE OF WORK

To further delineate the extent of dissolved petroleum hydrocarbons in groundwater, GR proposes to install one off–site groundwater monitoring well, downgradient (southwest) of well MW-3 (Figure 2). G.R. Field Methods and Procedures are included in Appendix A. To complete installation of the groundwater monitoring well GR proposes the following six tasks:

Task 1. Pre-Field Activities

GR will update the site-specific safety plan and obtain the necessary well installation permit from ACPWD. An encroachment permit will be obtained from the City of Oakland and Underground Service Alert (USA) will be notified a minimum of 48 hours prior to drilling.

Task 2. Well Installation

GR will install one groundwater monitoring well at the location shown on Figure 2. A California licensed well driller will install the well. A GR geologist will observe the drilling activities and prepare a log

be

of the boring. Prior to drilling, the borehole will be hand augered to a depth of 5 feet bgs to confirm that the location is clear of underground utilities. The well boring will be drilled with 8-inch-diameter hollow-stem augers. The well will be constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.02-inch machine-slotted well screen. The total depth of the borehole will be 20 feet bgs with a screened interval from 5 to 20 feet. Proposed well construction details are presented in Figure 3.

Soil samples for description and possible chemical analysis will be obtained from the boring at a minimum of 5 foot intervals and they will be collected with a split-spoon sampler fitted with clean brass sample rings. The actual number of samples submitted for chemical analysis will depend on site conditions and field screening data. As a minimum, it is expected that one unsaturated soil sample from the boring will be submitted for chemical analysis as described in Task 5.

Soil from each sampled interval will be screened in the field for the presence of volatile organic compounds using a photoionization detector (PID). These data will be collected for reconnaissance purposes only, and will not be used as verification of the presence or absence of petroleum hydrocarbons.

Drill cuttings will be stockpiled at the site pending receipt of chemical analytical data. The drill cuttings will be stockpiled on and covered with plastic sheeting pending disposal. Four samples of the drill cuttings will be collected for disposal characterization. These samples will be submitted to the laboratory for compositing into one sample, and then analyzed as described in Task 5.

Task 3. Survey Well Elevations

Following installation of the well, a California licensed surveyor will measure the elevation of the well casing, relative to mean sea level. Horizontal coordinates of the well will also be obtained at this time.

Task 4. Well Development and Sampling

GR will develop the newly installed groundwater monitoring well after it has been allowed to stand a minimum of 72 hours following installation. Groundwater removed from the well during development and sampling will be transported by Chevron's contractor Integrated Wastestream Management (IWM) to McKittrick for proper disposal. Immediately following development a groundwater sample will be collected from the well. This well will then be added to the regularly scheduled quarterly monitoring and sampling program.

Task 5. Laboratory Analyses

Selected soil and groundwater samples will be submitted for chemical analyses to a California state-certified Hazardous Material Testing Laboratory. Samples will be analyzed for TPHg and TPHd by EPA Method 8015 (Modified), and benzene, toluene, ethylbenzene, and xylenes (BTEX) and MtBE by EPA Method 8020. The stockpile soil sample will be analyzed for TPHg and BTEX, as well as total lead by EPA Method 6010.

& confirmation 8260.

Task 6. Report Preparation

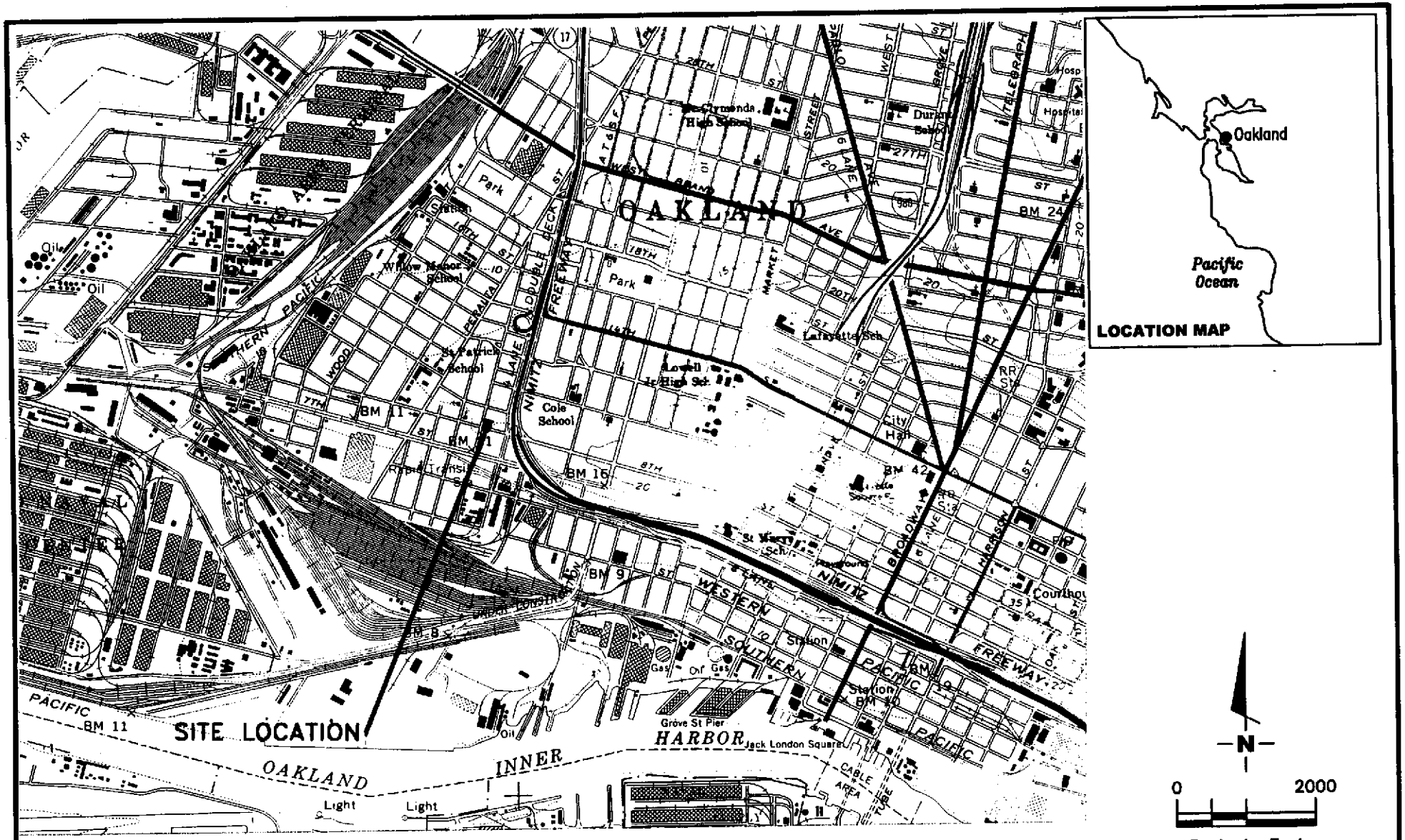
Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and findings associated with this investigation. This report will be submitted to Chevron for their use and distribution.

PROJECT STAFF

Mr. Stephen J. Carter, a Registered Geologist in the State of California (R.G. No. 5577) will provide technical oversight and review of the work. Mr. Greg A. 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

Chevron will initiate the encroachment permit process immediately. Installation of the proposed well will be scheduled.



Source: USGS Topographic Map, Oakland West, 7.5

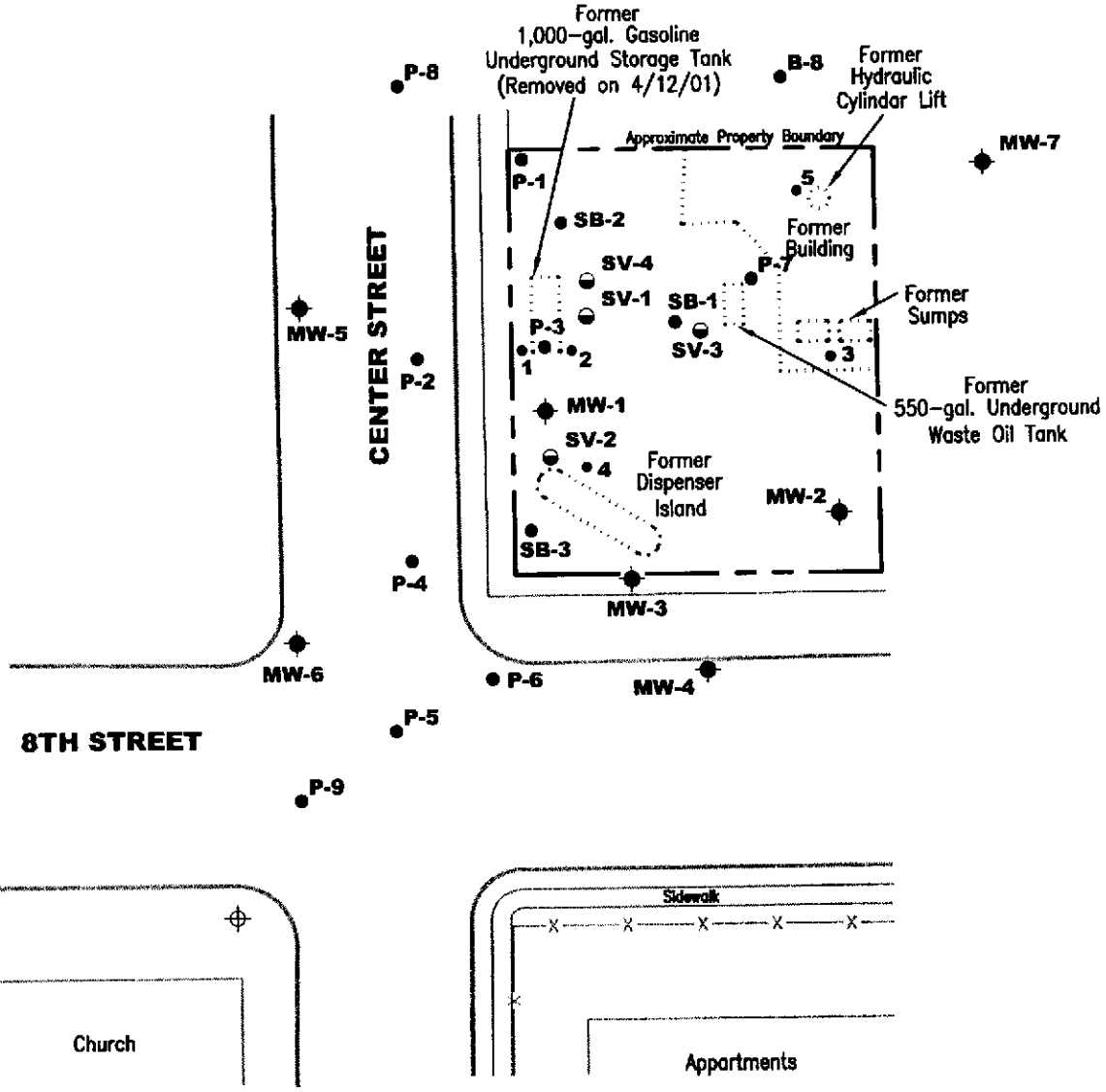
FIGURE 1

Gettler - Ryan Inc.
6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7555

VICINITY MAP
Former Signal Oil Service Station No 20-6145
800 Center Street
Oakland, California

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
347492		12/00	

FILE NAME: P:\ENVIRO\CHEVRON\20-6145\VIC-20-6145.DWG | Layout Tab: CA



EXPLANATION

- Groundwater monitoring well
- Soil boring
- Soil vapor probe
- Test boring
- Proposed groundwater monitoring well

N

0 40

Scale in Feet

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

FIGURE 2

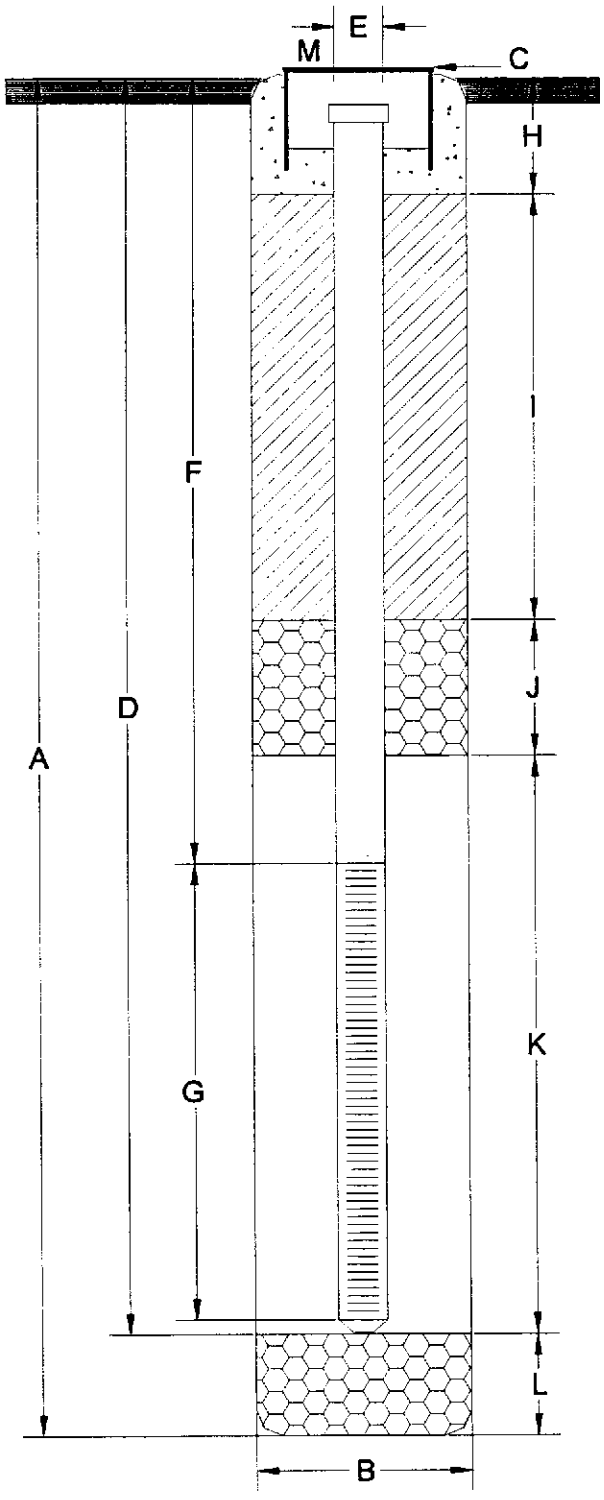
GETTLER - RYAN INC.
6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7555

SITE PLAN
Former Chevron (Signal Oil) Service Station No 20-6145
800 Center Street
Oakland, California

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
DG26145C.4C01		5/01	

FILE NAME: P:\ENVIRO\CHEVRON\20-6145\A01-20-6145.DWG | Layout Tab: Work Plan 5-01

WELL CONSTRUCTION DETAIL



A Total Depth of Boring: 20 ft.

B Diameter of Boring: 8 in.
Drilling Method: Hollow-stem auger

C Top of Casing Elevation: ____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project-Datum

D Casing Length: 20 ft.
Material: Schedule 40 PVC

E Casing Diameter: 2 in.

F Depth to Top Perforations: 5 ft.

G Perforated Length: 15 ft.
Perforated Interval from: 5 to 20 ft.
Perforation Size: 0.02 in.

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

I Backfill from: 1 to 3 ft.
Backfill Material: Neat Cement

J Seal from: 3 to 4 ft.
Seal Material: Bentonite

K Gravel Pack from: 4 to 20 ft.
Pack Material: #3 Lonestar Graded Sand

L Bottom Seal: None ft.
Seal Material: None

M Water-resistent vault box, locking expandable well cap, and lock

Note: Depths measured from initial ground surface.

GETTLER - RYAN, INC.
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Proposed well Construction Detail
Former Chevron Station #20-6145
800 Center Street
Oakland, California

FIGURE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
346492.02		05/25/01		

GETTLER-RYAN INC.

FIELD METHODS AND PROCEDURES

Site Safety Plan

Field work performed by Gettler-Ryan Inc. (GR) is conducted in accordance with GR's Health and Safety Plan and the Site Safety Plan. GR personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The GR geologist or engineer at the site when the work is performed acts as the Site Safety Officer. GR 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 GR 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 place 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 in part on:

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

Field Screening of Soil Samples

A PID is used to perform head-space analysis in the field for the presence of organic vapors from the soil sample. This test procedure involves removing some soil from one of the sample tubes not retained for chemical analysis and immediately covering the end of the tube with a plastic cap. The PID probe is inserted into the headspace inside the tube through a hole in the plastic cap. Head-space screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. GR 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 which generally extends from the total well depth to a point above the groundwater. An appropriately-sized sorted sand is placed in the annular space adjacent to the entire screened interval. A bentonite transition 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.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on and covered with plastic sheeting and samples are collected and analyzed for disposal classification 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.