CHEMICAL PROCESSORS, INC.

Northern California Division

A Burlington Environmental Inc Company

90 MAR 15 AM 8:38

March 14, 1990
Project No. 1196

Mr. Gil Wistar
Alameda County
Environmental Health
80 Swan Way, Suite 200
Oakland, California 94621

WORKPLAN FOR SOIL AND GROUNDWATER INVESTIGATION AT
CHEVRON SERVICE STATION NO. 9-5542,
7007 SAN RAMON ROAD, DUBLIN, CALIFORNIA,

Dear Mr. Wistar:

Please find attached the workplan for the additional subsurface work Chevron is proposing at the above captioned site. The borings/wells will help delineate the extent of the hydrocarbon contamination in both soil and groundwater, and provide valuable information to be incorporated into the development of a remedial action plan if required.

As I mentioned in our telephone conversation on March 14, we are trying to proceed at an accelerated pace and would appreciate your quick response. We will proceed with this work upon your approval. Please call John Randall at (415) 842-9625 or myself at (415) 524-9372, with your verbal approval.

If additional workplan processing fees are required in excess of the amount you presently hold for Chevron, please bill Chevron directly or contact John Randall.

Please call me at (415) 524-9372 if you have any questions or comments regarding this workplan.

Very truly yours,
CHEMICAL PROCESSORS, INC.

Craig C. Schwyn

Craig C. Schwyn
Project Hydrogeologist

cc: John Randall

Enclosure

approved 3/28/90
via phone call to
John Randall

950 Gilman Street, Suite B
Berkeley, California 94710
(415) 524-9372

CHEMICAL PROCESSORS, INC.
Northern California Division

CHEMPRO SM
A Burlington Environmental Inc. Company

March 12, 1990
Project No. 1196

Mr. John Randall
Chevron U.S.A.
2410 Camino Ramon
San Ramon, California 94583

WORKPLAN FOR SOIL AND GROUNDWATER INVESTIGATION:
CHEVRON SERVICE STATION NO. 9-5542,
7007 SAN RAMON ROAD, DUBLIN, CALIFORNIA

Dear Mr. Randall:

Chemical Processors, Inc. (Chempro) is pleased to submit this workplan to perform a soil and groundwater investigation at Chevron U.S.A., Inc. (Chevron) Service Station No. 9-5542, located at 7007 San Ramon Road, Dublin, California. The purpose of this investigation is to determine if fuel hydrocarbons have impacted the soil and groundwater beneath the site.

The proposed work includes a survey of all water wells located within one-half mile of the site, the decommission of the existing on-site monitor well, and the installation and sampling of four groundwater monitor wells. Upon completion of this work, a report will be prepared presenting our findings.

SITE DESCRIPTION

The site is occupied by a service station which is currently under construction for remodeling, at the intersection of San Ramon Road and Dublin Boulevard in Dublin, California (see Figure 1). The former service station structures and tanks were removed and new facilities are being installed at the site. The former site contained four underground storage tanks, including three fuel tanks and one waste oil tank. The tanks were removed in February 1990 and will be replaced with three 12,000-gallon underground storage tanks.

There is currently one 4-inch diameter, schedule 40 polyvinyl chloride (PVC) monitor well located on site (see Figure 2). The well has been damaged during the remodeling construction and is currently unusable.

The site is located approximately 1,500 feet north of Interstate 580 and 3,150 feet east of Interstate 680. The site is situated at the southern end of the San Ramon Valley and the western end of the Livermore Valley. The former station is approximately 360 feet above sea level and the topography surrounding the site slopes to the east toward San Ramon Creek. The regional groundwater flow

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direction is anticipated to follow local topography to the east-southeast toward San Ramon Creek.

Properties surrounding the site consist of commercial businesses. Shopping malls with major department stores and restaurants are prevalent in the area.

Previous Work

In February 1990, a soil sampling investigation was conducted at the former Chevron service station during the removal of the four underground storage tanks (see Figure 2). Soil samples were collected along the product lines, and composite samples were collected from each spoil stock pile generated during the shallow surface excavation of the gasoline tanks, waste oil tank, and product lines. Two sets of soil samples were collected from the tank excavation area after removal of the tanks. The samples were analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX).

TPH and BTEX compounds were detected in relatively low concentrations (<10 parts per million [ppm]) in all four product line samples. The composite samples had detectable concentrations of BTEX (between 0.5 and 10 ppm) and moderate concentrations of TPH (between 50 and 100 ppm). The composite sample collected from the tank stock pile contained the highest concentrations of TPH with a value of 200 ppm.

Two sets of soil samples were collected after the tanks were pulled from the tank area. During the first sampling event, a sample at either end of each gasoline storage tank was collected at the base of the excavation, approximately 11 feet below ground level (BGL). The gasoline tank excavation was deepened to approximately 16 feet where 6 additional soil samples were collected for analysis. Five composite samples were collected from the stock piled spoils.

All samples contained detectable concentrations of BTEX. The samples collected from the eastern and southern portion of the excavation had elevated concentrations (>1000 ppm) of TPH. The composite samples reduced concentrations of TPH.

During the second sampling event, a second set of soil samples were collected from the southern face of the tank excavation after an additional 5 feet of soil was removed from the excavation. The samples were collected from a depth of 22 feet BGL. The TPH values increased from west to east with a maximum concentration of 3,100 ppm. A composite sample was collected from the spoils pile and relatively high concentrations (>1,000 ppm) of TPH were detected.

Two samples were collected from the base of the waste oil tank excavation. However, these results have not yet been reported.

SCOPE OF WORK

The following scope of work has been prepared to characterize the soil and groundwater beneath the site. The scope of work includes: performing prefield activities, conducting a survey of water wells located within one-half mile of the site, decommissioning one on-site well, drilling and sampling four soil borings, constructing groundwater monitor wells in the borings, developing the monitor

wells, and collecting and analyzing the groundwater samples from each of the wells installed.

A detailed description of these tasks follows.

Task 1 - Prefield Activities

To prepare for field activities, Chempro will review previous reports, interview site personnel regarding past site activities, obtain drilling permits, arrange for field materials and equipment, and contract an underground utility locating service to clear the boring locations.

Task 2 - Well Survey

A survey will be conducted of the active, inactive, and destroyed wells within a one-half mile radius of the site. The survey will consist of a review of all water wells on file at appropriate county agencies.

Task 3 - Decommissioning On-Site Well

The on-site monitor well which was damaged during the remodeling construction operation will be decommissioned. The original boring will be drilled out with 10-inch outside-diameter hollow-stem auger drilling equipment to a depth of approximately 40 feet. The boring will be sealed with cement from the bottom to the surface using a tremie pipe.

Task 4 - Monitor Well Installation

Four soil borings will be drilled at the proposed monitor well locations shown on Figure 2. The borings will be drilled with 7-inch outside-diameter hollow-stem augers.

The borings will provide geologic and geochemical data for the soils near the tank field, pump island, and waste oil tank. Soil samples will be collected for soil classification and chemical analysis at 5-foot intervals using a modified-California split-spoon sampler.

The total depth of each boring will be determined by the hydrogeologic conditions encountered during drilling. The borings will be drilled to a maximum depth of 45 feet if groundwater is not encountered. If groundwater is encountered, the borings will be drilled 10 feet into the saturated aquifer. If the aquifer is less than 10 feet thick, the boring will be drilled no more than 5 feet into an underlying low permeability zone.

Soil sample collection and chemical analyses will be conducted under strict chain-of-custody procedures and will follow the guidelines established by Chevron and the Environmental Protection Agency (EPA). The procedures are presented in Appendix A. Samples will be chosen for analysis using a portable photoionization detector (PID) to determine the presence or absence of total volatile organic compounds in the soil samples. The soil samples will be selected for analysis where 1) the PID reading first detects a reading above the background level, 2) at the point above this interval where the PID reading is negligible, 3) at the first point below the contaminated interval where the PID reading is negligible, and 4) at the water

table. If no contaminants are detected with the PID, the sample collected 5 feet above the water table will be submitted for analysis.

The soil samples collected from MW-4, which is located hydraulically downgradient from the former waste oil and gasoline storage tanks, will be analyzed for TPH (as gasoline and diesel) using EPA Method 8015, BTEX and chlorinated hydrocarbons using EPA Method 8240, total oil and grease using EPA Method 503, and the selected total metals cadmium (Cd), lead (Pb), zinc (Zn), and chromium (Cr) by atomic absorption. The soil samples collected from MW-1, MW-2, and MW-3 will be analyzed for TPH (as gasoline) using EPA Method 8015 and BTEX using EPA Method 8020. Soil sample analyses will be performed by a Chevron-approved analytical laboratory.

If groundwater is encountered during drilling, the boring will be converted into a 2-inch-diameter groundwater monitor well, according to the procedures described in Appendix A. The screened interval will extend from the bottom of the boring to 5 feet above static water level. If more than one aquifer zone is encountered, the well design will be modified to prevent cross-communication between separate hydraulic zones. Schedule 40 PVC, 0.020-inch machine-slotted well screen will be used, and No. 3 rounded sand will be packed around the casing to a minimum of 2 feet above the screened section. The sandpack will be capped with a bentonite and cement seal and the wellhead will be protected with a locking vault box, as described in Appendix A. The monitor wells will be developed to remove trapped sediments from within the gravel pack prior to sampling (see Appendix A).

Following well development, groundwater samples will be collected and analyzed. Samples from well MW-4 will be analyzed for TPH (as gasoline and diesel) using EPA Method 8015, BTEX and chlorinated hydrocarbons using EPA Method 8240/624, ethylene dibromide (EDB) using the Department of Health Service's (DHS) Method AB1803, total oil and grease by EPA Method 503, and the selected total metals Cd, Pb, Zn, and Cr by atomic absorption methods. Samples collected from wells MW-1, MW-2 and MW-3 will be analyzed for TPH (as gasoline) using EPA Method 8015, BTEX using EPA Method 8020/602, and EDB using the DHS Method AB1803. Groundwater samples will be collected under strict chain-of-custody procedures in accordance with the guidelines presented in Appendix B. A Chevron-approved analytical laboratory will perform the analyses.

Task 5 - Report Preparation

Following completion of the site characterization, a Soil and Groundwater Investigation Report will be prepared and submitted to Chevron. The report will be reviewed, signed, and stamped by a California registered geologist.

SCHEDULE

Barring regulatory constraints or unforeseen delays, the Investigation Report will be submitted to Chevron by May 1, 1990.

May 8

If you have any questions regarding this workplan, please do not hesitate to call.

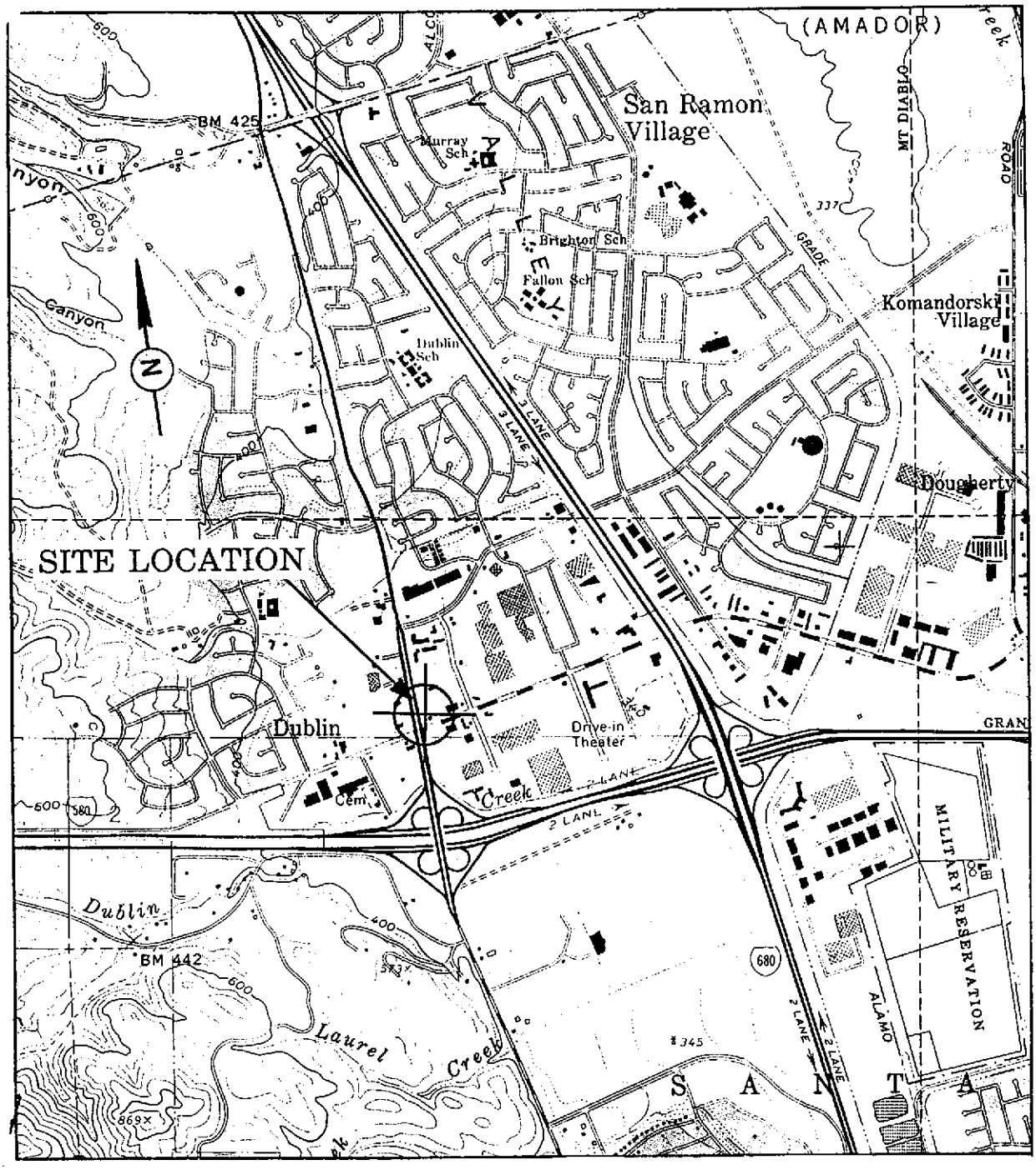
Very truly yours,
CHEMICAL PROCESSORS, INC.

Craig C. Schwyn
Project Hydrogeologist

David C. Tight
Site Remediation Manager
R.G. No. 4603

Enclosures

Figure 1 - Site Location
Figure 2 - Site Plan
Appendix A - Exploratory Boring, Soil Sampling, And Well Installation Procedures
Appendix B - Groundwater Sampling And Analysis Procedures



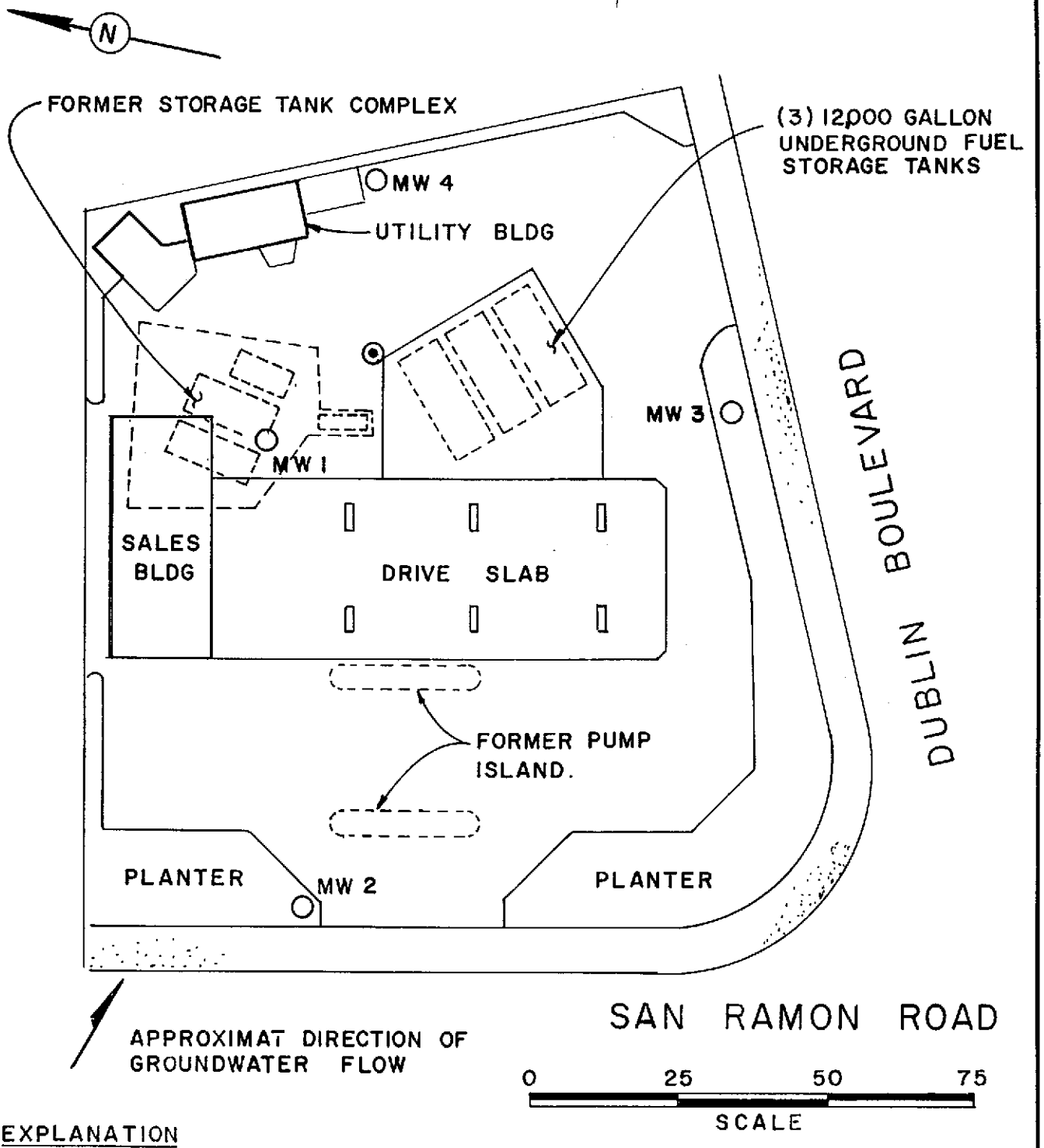
ADOPTED FROM USGS
7.5 MINUTE DUBLIN QUADRANGLE 1980

CHEMPRO

CHEMICAL PROCESSORS, INC.
950-B GILMAN STREET
BERKELEY, CALIFORNIA

SITE LOCATION
CHEVRON S.S NO 9-5542
7007 SAN RAMON ROAD
DUBLIN, CA

FIGURE
1



EXPLANATION

- ○ PROPOSED GROUNDWATER MONITOR WELL
- ◉ EXISTING GROUNDWATER MONITOR WELL(TO BE DECOMISSIONED)

CHEMICAL PROCESSORS, INC. 950-B GILMAN STREET BERKELEY, CALIFORNIA	SITE PLAN CHEVRON S.S NO 9-5542 7007 SAN RAMON ROAD DUBLIN, CA.	FIGURE 2

Appendix A

EXPLORATORY BORING, SOIL SAMPLING, AND WELL INSTALLATION PROCEDURES

Appendix A

Exploratory Boring, Soil Sampling, and Well Installation Procedures

EXPLORATORY BORING

Before the exploratory borings are drilled at Chevron Service Station No. 9-5542, a number of actions will be taken: drilling permits will be obtained from the Alameda County Flood Control and Water Conservation District, and West Coast Locators of San Jose California, an underground utility-locating service, will be hired to clear the proposed drilling sites for subsurface and overhead utilities. In addition, Underground Service Alert (USA) will be contacted to schedule visits to the site by public and private utility companies. Each company will locate its utilities with the aid of maps, and the locating service will verify and mark these locations. All utility clearances will be coordinated with the Chevron maintenance mechanic before drilling begins.

Exploratory borings will be drilled by first excavating the top four feet of soil with a hand auger to ensure that there are no subsurface obstructions. B & F Drilling Inc., of Rancho Cordova, California, will then complete the borings with a Mobile B-61 drill rig. Extraction wells will be drilled with 12-inch OD (8-inch ID) hollow-stem augers. Seven-inch outer-diameter (OD) hollow-stem augers will be used in the borings to be sampled with well points or converted to monitor wells. In confined quarters, where compact drilling equipment is required, the borings will be drilled with 4-inch-OD solid-stem augers, and reamed with 7-inch-OD hollow-stem augers. If well points are to be used in these small borings, the holes will not be reamed with the larger hollow-stem augers. The augers will be steam-cleaned before each boring is drilled.

SOIL SAMPLING

Analysis of the soil samples collected during drilling will permit evaluation of the geochemistry and stratigraphy of the soil beneath the site. The soil will be sampled by means of an 18-inch-long, modified-California split-spoon sampler fitted with 2-inch-diameter brass liners, which is driven into undisturbed soil

beyond the tip of the auger. The sampler is driven with a 145-pound hammer, and the blow counts are recorded for each 6 inches of penetration. The blows will be recorded on the boring logs. Samples will be collected every 5 feet or less, depending on the lithology. Soil samples will be classified and logged according to the Unified Soil Classification System, and the work shall be supervised by a California State-registered geologist in compliance with regulatory standards.

Soil samples will be selected for chemical analysis by means of a photoionization detector (PID). The PID measures the relative concentration of volatile hydrocarbons at each 5-foot sample interval. The samples will be selected for analysis where 1) the PID reading first detects a reading above the background level, 2) at the point above this interval where the PID reading is negligible, 3) at the first point below the contaminated interval where the reading PID reading is negligible, and 4) at the water table. If no contaminants are detected with the PID, the sample collected 5 feet above the water table will be submitted for analysis.

Samples selected for chemical analysis will be sealed inside the brass liners with aluminum foil and polypropylene end-caps, and wrapped with tape. The soil samples will be labeled, and stored in refrigerated coolers pending shipment to the Chevron-approved laboratory. At the time of sampling, each sample is logged on a chain-of-custody record which accompanies the sample to the laboratory.

Soil-sampling equipment will be steam-cleaned between each boring and washed in an Alconox solution and rinsed in distilled water between each sampling point.

Drill cuttings will be drummed and temporarily stored on site. Each drum will be labeled with the soil boring number and depth from which the soils were extracted. Drill cuttings will be disposed of by an appropriate method which will be based on analyses of the soil samples collected during drilling.

WELL INSTALLATION

Exploratory borings converted to groundwater monitor wells will be extended to a depth of 10 feet into groundwater. Care will be taken to prevent cross-communication between distinct hydraulic zones.

Monitor wells will be constructed with 2-inch-diameter, flush-threaded, PVC casing inside the boring. No solvent cements will be used on the casing. The casing will be screened with 0.010-inch machine-slotted screens, which will extend across the saturated interval to as much as 5 feet above first-encountered groundwater. A threaded bottom cap will be attached to the bottom of the casing. The annular space surrounding the casing will be at least 2 inches thick, and packed with No. 2/12 sand to approximately 2 feet above the top of the screened interval. A minimum of 1 foot of bentonite will plug the space above the sandpack, and neat cement will be grouted to the surface through a tremie pipe.

A traffic-rated vault box with a locking device will be set in concrete to protect the well. Well tags will be affixed to the casing for identification. Well locations will be surveyed to the closest 1-foot Northing and Easting and top-of-casing elevations will be measured to the nearest 0.01 foot. Detailed well completion diagrams will be prepared.

Well Development

Monitor and extraction wells will be developed by surging, swabbing, and bailing, or by submersible-pump water evacuation, until a non-turbid discharge is obtained. All development equipment will be steam-cleaned between wells. Development and steam-cleaning water will be contained in 55-gallon drums until a Chevron contractor can collect the water and transport it offsite for treatment.

Appendix B

GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

Appendix B

Groundwater Sampling and Analysis Procedures

INTRODUCTION

The sampling and analysis procedures for water-quality monitoring programs are contained in this Appendix. These procedures will ensure that consistent and reproducible sampling methods are used, proper analytical methods are applied, that analytical results are accurate, precise, and complete, and the overall objectives of the monitoring program are achieved.

SAMPLE COLLECTION

Sample collection procedures include equipment cleaning, water-level and total well-depth measurements, and well purging and sampling.

Equipment Cleaning

Precleaned sample bottles, caps, and septa will be provided by a Chevron-approved laboratory. All sampling containers will be used only once and discarded after analyses are completed.

Before the sampling event is begun and between each event, all equipment to be placed in the well or to come in contact with groundwater will be disassembled and cleaned thoroughly with detergent water, steam-cleaned with tap water, and rinsed with Arrowhead™ distilled water. Any parts that may absorb contaminants, such as plastic pump valves or bladders, will be cleaned as described above or replaced. The water-level sounder will be washed with detergent and rinsed with distilled water before use in the each well. The rinse water will be stored in 55-gallon drums onsite and will be disposed of by Chevron.

Quality Control Samples

To determine if the Teflon™ (Teflon) bailer used for sampling is sufficiently decontaminated, rinse samples will be taken. One rinsate sample will be collected at the beginning of each day and additional rinsate samples will collected every 20 samples. The samples will be collected by filling the Teflon sampling bailer with distilled water and decanting it into the sample vials. The rinsate samples will be analyzed for the same parameters as the groundwater.

Water-Level, Floating-Hydrocarbon, and Total Well-Depth Measurements

Before wells are purged and sampled, the depth to water, floating hydrocarbon thickness, and the total well depth are measured with an electric sounder, a bottom-filling clear Lucite™ bailer, or an oil-water interface probe. The electric sounder, manufactured by Slope-Indicator, Inc., is a transistorized instrument that has a reel-mounted, two conductor, coaxial cable connecting the control panel to the sensor. Cable markings are stamped at 1-foot intervals. An engineer's rule will be used to measure the depths to the closest 0.01 foot. The water level will be measured by lowering the sensor into the monitor well. A low current circuit is completed when the sensor contacts the water, which serves as an electrolyte. The current is amplified and fed across an indicator light and audible buzzer, signaling contact with water. A sensitivity control compensates for very saline or conductive water. When the water level has been measured, the bailer will be lowered to a point just below the liquid level, retrieved, and inspected for floating hydrocarbons.

If there is floating product, its thickness is measured with an oil-water interface probe. This instrument's dual-sensing probe utilizes an optical liquid sensor and electrical conductivity probe. The instrument emits a solid tone when immersed in oil, and an oscillating tone when immersed in water. If floating product greater than 1/32-inch in thickness is detected, a sample will not be collected from that well.

All liquid measurements will be recorded to the nearest 0.01 foot in the field logbook. The groundwater elevation at each monitor well will be calculated by subtracting the measured depth to water from the surveyed well-casing elevation.

Total well depth, which is measured by lowering the sensor to the bottom of the well, is used to calculate purge volumes and to determine whether the well screen is partially obstructed by silt. The depth will be recorded to the nearest 0.5 foot in the field logbook.

Well Purging

Before a monitor well is sampled, standing water in the casing is purged by means of a bailer or piston pump. Samples will be collected after three well-casing volumes have been purged, and the pH, specific conductance, and temperature have stabilized, or until a maximum of 5 well volumes have been evacuated. Some low yield monitor wells are expected to be evacuated to dryness before three casing volumes have been removed. Such low yield monitor wells will be allowed to recover for a minimum of two hours. If the well has recovered to 80 percent of its original water level after two hours, a sample will be collected. Otherwise, the well will be allowed to recover up to 24 hours before being sampled. If insufficient water has recharged after 24 hours, the monitor well will be recorded as dry for the sampling event.

All field measurements will be recorded in a waterproof field logbook. Water sample field data sheets will be prepared to record the field data. These data sheets will be reviewed by the sampling coordinator when the sampling event is completed.

The pH, specific conductance, and temperature meter will be calibrated each day before beginning field activities. The calibration will be checked once each day to verify meter performance. All field meter calibrations will be recorded in the field logbook.

Groundwater generated from well-purging operations will be contained for temporary storage in 55-gallon drums. Drums will be labeled and stored onsite in a location designated by the station manager. The sampler will record the following information on the drum label for each drum generated:

* Drum content (groundwater)
* Source (well designation)

* Date generated
* Client contact
* Project number
* Name of sampler

The groundwater will be stored onsite for a maximum of 90 days. Chempro will notify the Chevron representative that the water is ready for removal and will transport the drums offsite after the drums have been emptied.

Well Sampling

A Teflon bailer will be used for well sampling. Glass bottles of at least 40 milliliters in volume, fitted with Teflon-lined septa will be used in sampling for volatile organics. These bottles will be filled completely to force air from the bottle. A positive meniscus which is formed when the bottles are full will be covered with a convex Teflon septum to eliminate air. After capping, the bottles will be inverted and tapped to verify that no air bubbles remain. The sample containers for other parameters will be filled, and capped as specified. Duplicate sample analyses will be performed on five percent of the groundwater samples collected.

SAMPLE HANDLING AND DOCUMENTATION

The following section describes the procedures and documentation for sample handling.

Sample Handling

All sample containers will be labeled immediately following sample collection. Samples will be kept cool with cold packs until received by the laboratory. Cold packs will be replaced each day to maintain refrigeration. At the time of sampling, each sample will be logged on a chain-of-custody record which accompanies the sample to the Chevron-approved laboratory.

Sample Documentation

The following procedures will be used during sampling and analysis to provide chain-of-custody control:

* Field logbooks to document sampling activities in the field
* Labels to identify individual samples
* Chain-of-custody record sheets for documenting possession and transfer of samples

Field Logbook

In the field, the sampler will record the following information on the water sample field data sheet for each sample collected:

* Project number
* Client name
* Location
* Name of sampler
* Date and time
* Pertinent well data (e.g., casing diameter, depth to water, total well depth)
* Calculated and actual purge volumes
* Purging equipment used
* Sampling equipment used
* Appearance of each sample (e.g., color, turbidity, sediment)
* Results of field analyses (i.e., temperature, pH, specific conductance)
* General comments

The field logbooks will be signed by the sampler.

Labels

Sample labels will contain the following information:

* Project number
* Sample number (i.e., well designation)
* Sampler's initials
* Date and time of collection
* Type of preservative used (if any)

Sampling and Analysis Chain-of-Custody Record

The Sampling and Analysis Chain-of-Custody record, initiated at the time of sampling includes, the well designation, sample type, analytical request, date of sampling, the name of the sampler, and other pertinent information. The record sheet will be signed, and dated by the sampler when the samples are transferred. The number of custodians in the chain of possession will be kept to a minimum.