**Chevron** U.S.A. Inc.
2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

Marketing Operations

D. Moller
Manager, Operations
S. L. Patterson
Area Manager, Operations
C. G. Trimbach
Manager, Engineering

November 17, 1989

Mr. Larry Seto
Alameda County Dept. of Health
HAZMAT Section
470 27th Street, Room 324
Oakland, California 94612

Re: Chevron Service Station #98139
16304 Foothill Boulevard
San Leandro, California

Dear Mr. Seto:

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

Additionally, a check in the amount of $831.00 is attached for the deposit refund fee your office requires for workplan processing.

Chevron will proceed with this work upon approval from your office. As I may be on vacation, please contact Mr. Dave Tight of CHEMPRO (415) 524 - 9372, with your verbal approval to begin.

I declare under penalty of perjury that the information contained in the attached report is true and correct, and that any recommended actions are appropriate under the circumstances, to the best of my knowledge.

If you have any questions or comments regarding this letter, please feel free to call me at (415) 842 - 9040.

Very Truly Yours,

D. Moller

by Michael R. Brown
Michael R. Brown
CUSA Environmental Engineer

cc: RWQCB, Ms. Dyan Whyte
City of San Leandro, Mr. Robert Nolan
File

# CHEMICAL PROCESSORS, INC.

*Northern California Division*

A Burlington Environmental Inc. Company


Chevron U.S.A., Inc.
P.O. Box 5004
San Ramon, California
Attn: Mr. Michael Brown

November 9, 1989
Job No. 987158

WORKPLAN FOR PRELIMINARY SOIL AND GROUND-WATER CHARACTERIZATION: CHEVRON SERVICE STATION NO. 9-8139, 16304 FOOTHILL BOULEVARD, SAN LEANDRO, CALIFORNIA

Dear Mr. Brown:

Chemical Processors, Inc. (Chempro) is pleased to submit this workplan to perform an environmental investigation at Chevron U.S.A., Inc. (Chevron) Service Station No. 9-8139, located at 16304 Foothill Boulevard, San Leandro, California. The purpose of this investigation is to obtain additional data to characterize the impact of fuel hydrocarbons on the soil and ground water beneath the site.

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

## BACKGROUND

### Site Description

The site is occupied by an operating service station on Foothill Boulevard in southern San Leandro, California (see Figure 1). The service station is located approximately 250 feet east of Highway 580, and 6,000 feet south of Lake Chabot. Properties surrounding the site are occupied primarily by residential housing and small commercial businesses.

The site is approximately 120 feet above sea level and the topography slopes gently to the southwest. Regional ground-water flow direction is to the southwest toward San Francisco Bay.

### Previous Work

On June 29, 1989, EA Engineering Science and Technology, Inc. (EA) conducted a soil-vapor survey at the Chevron facility. The soil-vapor sampling points are shown on Figure 2. Very low concentrations of light hydrocarbons were detected near the tank field and at the west end of the south pump island. Measurable




950 Gilman Street, Suite B
Berkeley, California 94710
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near the tank field and at the west end of the south pump island. Measurable concentrations of benzene, toluene, xylenes and ethylbenzene (BTXE) were detected at V4, near the west corner of the tank field, at a value of 1 part per million (ppm). No BTXE were found above the detection limits at any of the other sampling points.

High vacuums and long release times were required to obtain vapor samples from almost every sampling point. This indicates that soil conditions at the site are tight (low permeability). Because of the poor transport of vapors into the probe, the results of the vapor analyses may have been lower than actual concentrations (EA, "Report of Investigation, Soil Vapor Contaminant Assessment; Chevron SS 9-8139"; July, 1989).

There are currently two monitor wells at the facility, located adjacent to soil-vapor sampling points V1 and V3 (see Figure 2). Both wells are composed of 6-inch diameter polyvinyl chloride (PVC) casing. The well next to V1 has a total depth of 11.2 feet below ground level, and the well adjacent to V3 has a depth of 13.5 feet. On October 13, 1989, the wells were inspected by Chempro and found to be dry.

## SCOPE OF WORK

The following scope of work has been prepared to characterize the soil and ground water beneath the site. The scope of work includes performing prefield activities, conducting a survey of wells located within one-half mile of the site, drilling and sampling four soil borings, converting the borings to ground-water monitor wells (if water is found), and sampling the ground water 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 exploratory boring locations.

*Task 1.1 - Well Survey* A survey will be conducted of the active, inactive, and destroyed water wells within a one-half mile radius of the site. The survey will consist of a review of all wells on file at appropriate county agencies.

### Task 2 - 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 8-inch outer-diameter hollow-stem augers.

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

The total depth of each boring will be determined by the hydrogeologic conditions encountered during drilling. The borings will be drilled to 45 feet unless ground water is encountered. If ground water is found, the boring will be drilled 10 feet into the ground water or five feet into a confining layer beneath ground water.

Based on geologic maps of the area, it is likely that bedrock will be encountered at a depth of fewer than 45 feet, which may prevent auger advance. If this occurs, the drilling will be terminated at that depth. The boring will then be either tremmie-grouted to the surface if ground water has not been encountered, or the boring will be converted to a monitor well.

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 B. A minimum of one sample and a maximum of three samples will be analyzed from each boring. Samples will be chosen for analysis using a portable photoionization detector (PID) to determine the presence or absence of volatiles in the samples. The samples collected from the upgradient soil boring (MW-1) and the boring located south of the waste oil tank (MW-2) will be analyzed for the parameters specified by Chevron to be used in the vicinity of used oil or fuel oil tanks (see Table 1). The soil samples collected in the vicinity of the Tank Field and pump islands (borings MW-3 and MW-4) will be analyzed for the parameters listed in Table 2, which are the Chevron minimum requirements. Soil sample analyses will be performed by Superior Analytical Laboratories of San Francisco.

If ground water is encountered during the drilling of any of the borings, each of these borings will be converted to 2-inch-diameter ground-water monitor wells, according to the procedures cited in Appendix A. The screened interval will extend from the bottom of the boring to 5 feet above static water level. Care will be taken to prevent cross-communication between distinct hydraulic zones if more than one hydraulic zone is encountered. The screen will be packed with No. 3 rounded sand to a minimum of 2 feet above the screened section. The sand pack will be capped with a bentonite and cement seal and the well head will be protected with a locked 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, ground-water samples will be collected and analyzed for TPH-as-gasoline using EPA method 8015, BTXE using EPA method 602, and ethylene dibromide (EDB) using the Department of Health Service's method AB1803. In addition to those parameters, samples from wells MW-1 and MW-2, located by the waste oil tank, will also be analyzed for oil and gas by EPA method 503, and Cd, Pb, Zn, and Cr by Atomic Absorption methods. Ground-water samples will be collected under strict chain-of-custody in accordance with the guidelines presented in Appendix B. Superior Analytical Laboratories will perform the analyses.

Task 3 - Report Preparation

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

SCHEDULE

An estimated schedule to complete this scope of work is presented in Table 1. Barring regulatory constraints or unforeseen delays, the Characterization Report will be submitted to Chevron within 8 weeks of completion of the site work.

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

Very truly yours,
CHEMICAL PROCESSORS, INC.

David C. Tight

David C. Tight, R.G. No. 4603
Senior Hydrogeologist

D. L. N.

Dorian L. Nicol
Manager, Site Remediation

## ATTACHMENTS

TABLE 1

SOIL SAMPLE ANALYTICAL METHODS
Used-Oil or Fuel-Oil Tank Locations

| Analysis | Method |
|---|---|
| TPH (G & O) | Modified EPA 8015 |
| Oil & Grease | 503D & E |
| BTXE | EPA 8240 |
| Metals: Cd, Cr, Pb, Zn | Atomic Absorption |

TABLE 2

SOIL SAMPLE ANALYTICAL METHODS
Minimum Chevron Analytical Methods Required

| Analysis | Method |
|---|---|
| TPH as Gasoline | Modified EPA 8015 |
| BTXE | EPA 8240 |

## PROJECT SCHEDULE

| ACTIVITY / WEEK: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre -Field Scheduling | | | | | | | | | | |
| Monitor Well Installation | | | | | | | | | | |
| Well Development and Sampling | | | | | | | | | | |
| Sample Analysis | | | | | | | | | | |
| Well Survey | | | | | | | | | | |
| Report Preparation | | | | | | | | | | |

**CHEVRON SERVICE STATION #9-8135**
**16304 FOOTHILL BOULEVARD**
**SAN LEANDRO, CALIFORNIA**

Schedule assumes:

*Regulatory or other constraints do not create unforseen delays

TABLE 3


Note: ( Map adapted from EA Engineering Science, and Technology, Inc. July 1989 report)

October 1989

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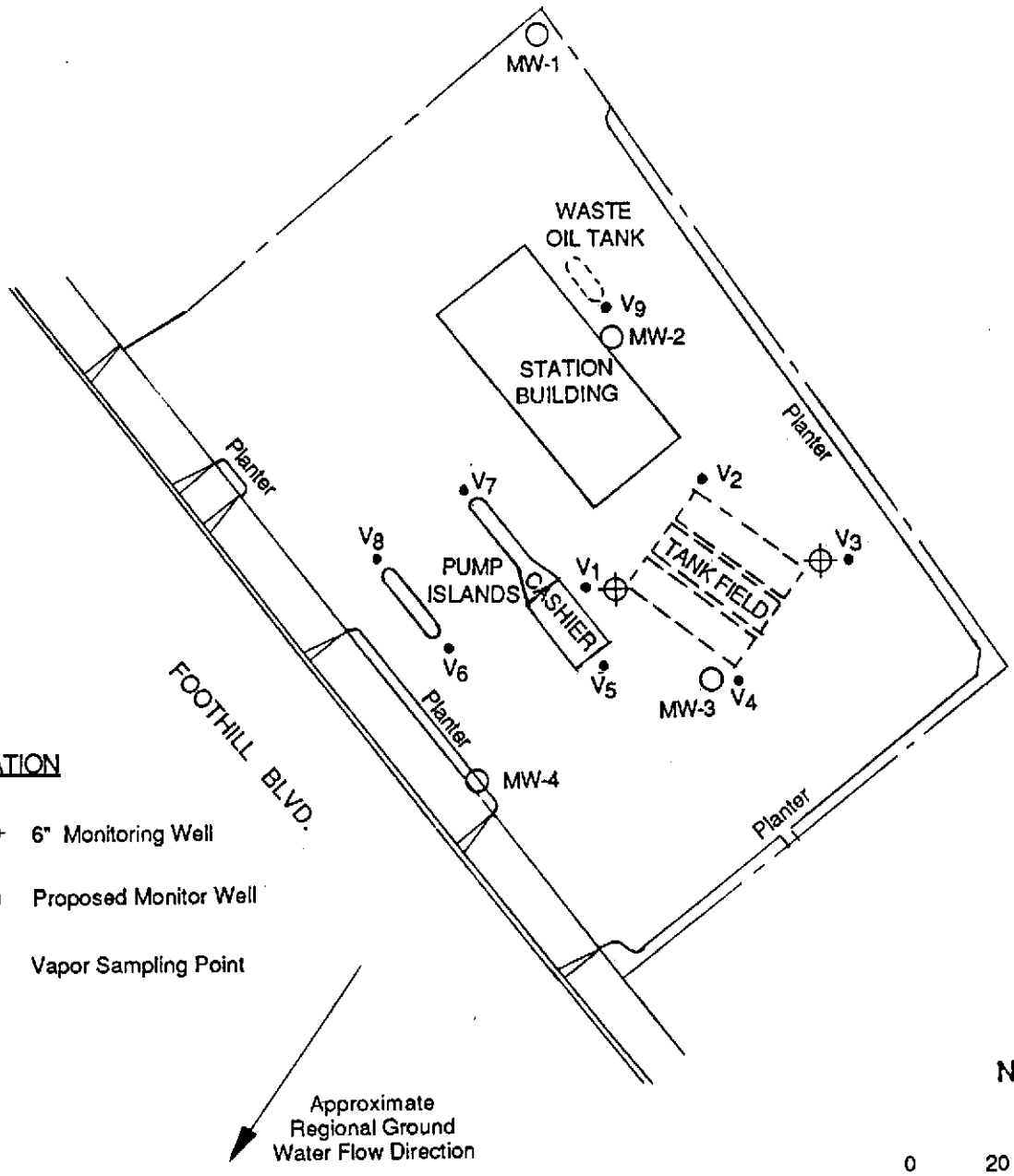
CHEMICAL PROCESSORS, INC.
950 "B" Gilman Street
Berkeley, CA 94710

**SITE LOCATION MAP**
Chevron SS 9-8139
16304 Foothill Boulevard
San Leandro, California

Figure 1

987158




Note: ( Map adapted from EA Engineering Science, and Technology, Inc. July 1989 report)

October 1989

CHEMPRO
A Burlington Environmental Inc Company

CHEMICAL PROCESSORS, INC.
950 "B" Gilman Street
Berkeley, CA 94710

**SITE PLAN**
Chevron SS 9-8139
16304 Foothill Boulevard
San Leandro, California

Figure 2

987158

# Appendix A

# Exploratory Boring and Well Installation Procedures

# Appendix A
# EXPLORATORY BORING AND WELL INSTALLATION PROCEDURES

Before drilling exploratory borings at a site, a number of actions are taken to prepare for this work. Drilling permits must be obtained from local and state regulatory agencies. Access issues must be resolved with private property owners. Since the location of a well is partially determined by subsurface and overhead utilities which may obstruct drilling, an underground utility-locating service is hired to investigate proposed drilling sites. The locating service contacts Underground Service Alert (USA) which schedules visits to the site by public and private utility companies. Each company locates its utilities with the aid of maps, and the locating service verifies and marks these locations. All utility clearances will be coordinated with an appropriate Chevron representative.

Field personnel begin work at the site by excavating the first four feet of soil with a posthole digger to ensure that there are no subsurface obstructions. Exploratory borings which will not be converted to monitor wells will be drilled with 6- to 8-inch outer diameter (OD) hollow-stem augers. At sites with relatively shallow (< 100-feet deep) ground water, exploratory borings for 4-inch monitor wells are drilled with 8- to 10-inch OD hollow-stem augers. For 5- to 6-inch extraction wells, 12-inch OD augers are used. Augers are steam-cleaned before each boring is drilled. In addition, sampling equipment is steam-cleaned if soil samples are required.

To collect samples for analysis and/or stratigraphic data, the soil is sampled within the borings by driving a modified California split-spoon sampler fitted with brass liners beyond the tip of the auger into undisturbed soil. The samples are collected every 5 feet or less, depending on the soil type(s) encountered. Samples selected for chemical analysis are sealed inside the liners with aluminum foil and polypropylene end caps. The liners are then hermetically sealed with inert tape. The samples are stored on ice and transported to a Chevron-certified laboratory. Samples scheduled for laboratory analysis are accompanied by chain-of-custody documentation. Unless

otherwise noted, selection of samples for analysis is based on the results of a headspace analysis performed in the field with a portable photoionization detector (PID) to obtain a reading of volatile petroleum-hydrocarbon content. At least one sample (the sample with the highest PID reading) from each boring will be submitted for chemical analysis.

Soil samples are classified and logged according to the Unified Soil Classification System. This work is supervised by a California State-registered geologist.

Drill cuttings are drummed or stockpiled on site until the condition of the soil is determined. The soil is characterized by analyzing a composite of the samples collected from the subsurface of the stockpile to obtain a petroleum-hydrocarbon level representative of the entire stockpile. Drill cuttings will be disposed of using the appropriate method based on the analyses of the composite sample.

Exploratory borings that will not be converted to ground-water monitor wells are drilled and sampled to a total depth of either 10 feet below the first-encountered ground water, 5 feet into a confining layer, or 45 feet in unsaturated soils, whichever is least. The borings are then backfilled from the bottom of the boring to the surface with neat cement using a tremmie pipe. This grouting technique will help prevent bridging and ensure a continuous column of grout.

Exploratory borings that will be converted to ground-water monitor wells are extended to a depth of 20 feet into ground water or 5 feet into a confining layer beneath ground water. Care shall be taken to prevent cross-communication between distinct hydraulic zones. If a sufficient interval of aquitard is encountered below the permeable zone, the auger is pulled and the aquitard is backfilled with bentonite pumped through a tremmie pipe. The boring is then converted to a monitor well by installing 4-inch-diameter, flush-threaded, polyvinyl chloride (PVC) casing and 0.020-inch machine-slotted screen inside the boring. For extraction wells the boring is reamed with a 12-inch-diameter auger and 5 to 6-inch-diameter casing is installed inside the enlarged boring.

Screened sections of casing will extend across the saturated interval to as much as 5 feet above first-encountered ground water. The screened interval shall be extended accordingly if there are suspected possible seasonal fluctuations of the water table. The annular space surrounding the casing will be at least 2 inches thick, and packed with No. 3 sand to approximately 2 feet above the top of the screened interval. A bottom cap shall be fastened to the bottom of the casing either by using a threaded bottom cap, stainless steel screws, or by popping stainless steel rivets through a slip cap into the casing. No solvent cements will be used. A minimum 1-foot thickness of bentonite plug will be set above the sand pack, and neat cement will be used to grout to the surface.

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 and top-of-casing elevations shall be measured to the nearest 0.01 foot. Detailed well completion diagrams will then be prepared.

## MONITOR WELL DEVELOPMENT

Monitor wells will be developed by surging and bailing or by submersible pump evacuation until a non-turbid discharge is obtained. All development equipment will be steam-cleaned between wells. Development water will be contained in 55-gallon drums until analytical results from samples are obtained. The water will then be disposed of by Chevron in accordance with Chevron guidelines.

## WELL-POINT SAMPLING

Well points are tools used to collect ground-water samples. They are essentially temporary steel-cased wells installed by driving a stainless steel screened section into the soil beyond the tip of a hollow-stem auger. once in place, standard well developing, purging, and sampling methods are used to collect a ground-water sample. The well point is then pulled and the boring is sealed. For details on sampling methods, refer to Appendix B.

# Appendix B

# Ground-Water Sampling and Analysis Procedures

# Appendix B
# GROUND-WATER SAMPLING AND ANALYSIS PROCEDURES

## INTRODUCTION

The sampling and analysis procedures for water-quality monitoring programs are contained in this appendix. The procedures will ensure that consistent and reproducible sampling methods are used, proper analytical methods are applied, 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

Sample bottles, caps, and septa will be precleaned and provided by the Chevron-approved laboratory. All sampling containers will be used only once and discarded after analysis is complete.

Before starting the sampling event, all equipment to be placed in the well or to come in contact with ground water will be disassembled and cleaned thoroughly with detergent water, then steam-cleaned, and rinsed with distilled water. Any parts that may absorb contaminants, such as plastic pump valves or bladders, will be cleaned as described above or replaced. A minimum of one equipment rinsate sample will be collected at the beginning of each day and additional rinsate samples will be collected after 20 ground-water samples have been collected. The samples will be sent to the Chevron-approved laboratory for analysis.

During field sampling, all equipment that is placed in the well or that will contact ground water will be detergent-washed, steam-cleaned, and rinsed with distilled water before purging or sampling the next well.

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

Before purging and sampling, the depth to water, floating hydrocarbon thickness, and the well total depth will be measured using an electric sounder, a bottom-filling clear Teflon™ bailer, and/or and oil/water interface probe. The electric sounder is a transistorized instrument that uses a reel-mounted, two conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. 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 when water has been contacted. A sensitivity control compensates for very saline or conductive water. The bailer will be lowered to a point just below the liquid level, retrieved, and inspected for floating hydrocarbons. The electric sounder and Teflon™ bailer will be decontaminated by steam-cleaning and rinsing with distilled water. Following equipment decontamination, rinsate samples will be collected by filling the bailer with distilled water, then filling the sample vials from the bailer.

If floating hydrocarbon is encountered, 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.

All liquid measurements will be recorded to the nearest 0.01 foot in the field logbook. The ground-water elevation at each monitor well will be calculated by subtracting the measured depth to water from the surveyed well-casing elevation. Well total depth is then measured by lowering the sensor to the bottom of the

well. Well total depth, used to calculate purge volumes and to determine whether the well screen is partially obstructed by silt, will be recorded to the nearest 0.5 foot in the field logbook.

Well Purging

Before sampling, standing water in the casing will be purged from the monitor well using a centrifugal pump, pneumatic displacement pump, or bailer made of stainless steel or Teflon™. When possible, a minimum of three casing volumes will be purged prior to sampling. Samples will be collected when pH, specific conductance, and temperature have stabilized, or a maximum of five well volumes has been purged. Some low yield monitor wells are expected to be evacuated to dryness after the removal of fewer than three casing volumes. Such a low yield monitor well will be allowed to recover for a minimum of two hours. If the well has recovered to 80% of its static water level after two hours, the water sample will be taken. Otherwise, the well will be allowed to recover for up to 24 hours prior to sampling. 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 after 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 on a Field Meter Log Form.

Ground water recovered from well-purging operations will be contained for temporary storage in 55-gallon drums. All drums will be labeled and stored on site in a client designated location. The sampler will record the following information on the drum label for each drum generated:

* Drum content (ground water)
* Quantity of content
* Drum identification code
* Source (well identification code)
* Date generated
* Site name and location
* Client contact
* Project number
* Name of sampler

Well Sampling

A Teflon™ bailer or an approved pump will be the only equipment acceptable for well sampling. Glass bottles of at least 40 milliliters volume and fitted with Teflon™-lined septa will be used to sample for volatile organics. These bottles will be filled completely to prevent air from remaining in the bottle. A positive meniscus forms when the bottle is completely full and a convex Teflon™ septum is placed over the meniscus to eliminate air. After capping, the bottle is inverted and tapped to verify that it contains no air bubbles. The sample containers for other parameters will be filled, filtered as required and capped. Duplicate sample analysis shall be performed on five percent of the groundwater samples taken and will be analyzed for the same volatile components.

When required, dissolved concentrations of metals will be determined using appropriate field filtration techniques. When a Teflon™ bailer is used, the sample will be filtered by emptying the contents of the bailer into a pressure transfer vessel. A disposable 0.45 micron acrylic copolymer filter will be threaded onto the transfer vessel at the discharge point and the vessel will be sealed. Pressure will be applied to the vessel with a hand pump and the filtrate will be directed into the appropriate containers. Each filter will be used once and discarded.

## SAMPLE PRESERVATION AND HANDLING

The following section specifies sample containers, preservation methods, and sample handling procedures.

### Sample Handling

All sample containers will be labeled immediately following 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 will accompany 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 during sample handling from collection through storage. Sample documentation will include the use of the following:

* 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

* Laboratory analysis request sheets for documenting analyses to be performed

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

* Well accessibility and integrity

* Pertinent well data (electrical conductivity, casing diameter, depth to water, well depth)

* Calculated and actual purge volumes

* Purging equipment used

* Sampling equipment used

* Appearance of each sample (electrical conductivity, color, turbidity, sediment)

* Results of field analyses (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 (IE, 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, contains, but is not limited to, the well number, sample type, analytical request, date of sampling, and the name of the sampler. The record sheet will be signed, timed, and dated by the sampler when transferring the samples. Custody transfers will be recorded for each individual sample; for example, if samples are split and sent to more than one laboratory, a record sheet will accompany each sample. The number of custodians in the chain of possessions will be kept to a

minimum. A copy of the Sampling and Analysis Chain-of-Custody Record is returned to Chempro with the analytical results.

Ground-Water Sampling and Analysis Request

A Ground-Water Sampling and Analysis Request and/or release number will accompany the samples delivered to the laboratory of the particular analysis(es) required for each sample. The request will provide evidence that the chain-of-custody is complete.

At a minimum, the Ground-Water Sampling and Analysis Request includes the following information:

* Date submitted
* Specific analytical parameters
* Well number
* Sample source