# GETTLER-RYAN INC.

## TRANSMITTAL

TO: Ms. Tina Berry
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

DATE: April 9, 1998
PROJ. #: 140175.02-1
SUBJECT: Work Plan
Unocal Station No. 4186
1771 1st Street
Livermore, California

4/15/98
→ calls for 3 MWs. I think 1 in NW of USTs is adequate. lots of data that GW goes W-NW.
4/17 Tina wants 2 if not all 3 wells. Approve WP verbal.

FROM:
Clyde J. Galantine
Project Geologist
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

WE ARE SENDING YOU:

| COPIES | DATED | DESCRIPTION |
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| 1 | April 8, 1998 | Work Plan for Monitoring Well Installation |

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COMMENTS:
Enclosed is one copy of the above work plan. If you have any questions or comments, please call me at (510) 551-7555.

# GETTLER-RYAN INC.

## WORK PLAN FOR MONITORING WELL INSTALLATION

at

Unocal Service Station No. 4186
1771 1st Street
Livermore, California

Report No. 140175.02

**Prepared for:**

Ms. Tina Berry
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

**Prepared by:**

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STATE OF CALIFORNIA

April 8, 1998

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# WORK PLAN FOR MONITORING WELL INSTALLATION

at

Unocal Service Station No. 4186
1771 1st Street
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## INTRODUCTION

At the request of Tosco Marketing Company (Tosco), Gettler-Ryan Inc. (GR), has prepared this Work Plan for the installation of three groundwater monitoring wells to evaluate whether groundwater at the site is impacted by petroleum hydrocarbons. This work plan has been prepared in response to a Alameda County Environmental Health Services (ACEHS) letter received by Tosco on February 25, 1998, requesting a preliminary site assessment (PSA) at the site. The proposed work includes: writing the site safety plan; obtaining the required well installation permits; installing three on-site groundwater monitoring wells; surveying the wellhead elevations; developing and sampling the wells; collecting and submitting selected soil and groundwater samples for chemical analysis; arranging for Tosco's contractor to dispose of the waste materials; and preparing a report presenting the observations associated with the well installation.

The scope of work proposed in this Work Plan is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual* and *California Underground Storage Tank Regulations, 1994*, the Regional Water Quality Control Board's (RWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites,* and the ACEHS guidelines.

## SITE DESCRIPTION

### General

The subject site is an active service station located on the southwest corner of the intersection of 1st and "N" Streets in Livermore, California (Figure 1). Aboveground facilities consist of two dispenser islands, a canopy and a station building. Two 10,000-gallon underground storage tanks (USTs) containing gasoline are located in the common pit immediately east of the station building. The former waste oil UST was removed in June 1993. Pertinent site features are shown on Figure 2.

## Geology and Hydrogeology

The subject site is located in the Livermore Valley and is underlain by Holocene age alluvial fan deposits and gravel facies. These deposits are composed of semiconsolidated deposits of sand and gravel in a matrix of clayey sand. The Livermore Valley is host to many northwest trending faults. The site is approximately 1-mile southwest of the Mocho Fault and approximately 1 ½-miles northeast of the Livermore Fault (California Department of Water Resources, 1974). Previous investigations performed by GSI indicated the upper 4 feet bgs was a dark brown sandy gravel with silt. Groundwater is anticipated to be approximately 20 feet below ground surface with a flow towards the northwest.

## PREVIOUS ENVIRONMENTAL WORK

On June 6, 1996, GeoStrategies Inc. (GSI) collected six soil samples from beneath the fuel dispensers and along the product delivery piping during dispenser and piping replacement activities. A total of 25 cubic yards of soils was excavated and transported to Forward Landfill located in Stockton, California. Analytical results were reported as not detected for Total Petroleum Hydrocarbons calculated as gasoline (TPHg) and benzene, toluene, ethylbenzene and xylenes (BTEX) for all samples collected beneath the dispenser islands and product delivery piping (GSI, 1996).

On September 10, 1997, Pacific Environmental Group (Pacific) conducted a soil gas survey as part of a baseline site evaluation associated with the property transfer from Unocal Corporation to Tosco. Six soil gas probes were advanced and samples collected at 3 or 15 feet bgs in the vicinity of the UST complex, dispenser islands, and product lines. Analytical results ranged from 41 to 4,500 ppb of TPHg, not detected to 110 ppb of benzene and not detected to 8,000 ppb of methyl tert-butyl ether (MTBE). Field data sheets indicate that no petroleum hydrocarbon odors were noted. The area of primary impact appears to be localized around the UST complex, where the TPHg was reported up to 4,500 ppb, benzene up to 110 ppb and MtBE concentrations up to 8,000 ppb (Pacific, 1997).

## PROPOSED SCOPE OF WORK

GR proposes to install three groundwater monitoring wells to evaluate whether groundwater beneath the site has been impacted by petroleum hydrocarbons. GR Field Methods and Procedures are included in Appendix A. To perform this scope of work, GR proposes the following tasks:

## Task 1. Pre-Field Activities

Write a site-specific safety plan and obtain the necessary well installation permit from the Alameda County Flood Control Zone 7. Notify Underground Service Alert (USA) a minimum of 48 hours prior to drilling.

## Task 2. Well Installation

Install three groundwater monitoring wells to approximately 35 feet bgs at the locations shown on Figure 2. Drilling and well construction activities will be performed by Woodward Drilling Company. (C57 #581639). A GR geologist will observe the drilling, collect soil samples for chemical analyses, describe the encountered soil, and prepare a log of the borings. The well borings will be advanced by a truck-mounted drill rig using 8-inch-diameter hollow-stem augers.

The groundwater monitoring well will be constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.02-inch machine slotted PVC well screen. The screened interval will extend from 15 to 35 feet bgs to accommodate known groundwater fluctuations. Proposed Well Construction Details are shown on Figure 3.

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. Screening data will be recorded on the boring log.

Soil samples for description and possible chemical analysis will be obtained from each boring at five-foot intervals, as a minimum. Although the actual number of samples submitted for chemical analysis will depend on site conditions and field screening data, we anticipate a minimum of two unsaturated soil samples from each boring will be submitted for chemical analysis as described in Task 5.

Drill cuttings will be stockpiled at the site pending disposal. Stockpiled cuttings will be placed on and covered with plastic sheeting. Four soil samples from the drill cuttings will be collected for disposal characterization as described in Appendix A. These samples will be submitted to the laboratory for compositing into one sample, then analyzed as described in Task 5. Drill cuttings will be transported by a Tosco-approved soil hauler to Forward Landfill, located in Manteca, California.

**Task 3. Wellhead Survey**

Following installation, the top of all on-site well casings will be surveyed to mean sea level by a California-licensed surveyor. Horizontal coordinates of the well locations will be obtained at the same time.

**Task 4. Well Development and Sampling**

The newly installed groundwater monitoring wells will be developed after being allowed to stand a minimum of 72 hours following installation. The groundwater samples from all wells will be collected immediately upon completion of well development. Rinsate water and groundwater purged from the wells during development and sampling will be stored on-site in approved 55-gallon drums pending disposal at an approved disposal facility. The groundwater samples will be analyzed as described in Task 5.

**Task 5. Laboratory Analyses**

All samples will be submitted to a California-certified Hazardous Materials Testing Laboratory. Soil and groundwater samples will be analyzed for TPHg, BTEX, and MtBE by EPA Methods 5030/8015/8020. The disposal characterization sample from the soil stockpile will be analyzed for TPHg, BTEX, and total lead.

**Task 6. Well Search**

A well search will be performed to identify all municipal, industrial, commercial, irrigation and domestic wells with in a ½-mile radius. Attempts will be made to obtain well information and plot the locations on a Vicinity Map. The well information obtained will be summarized in a table.

**Task 7. Reporting**

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

## PROJECT STAFF

Mr. Stephen Carter, a Registered Geologist in the State of California (R.G. No. 5577), will provide technical oversight and review of the work. Mr. David Vossler, Project Manager, will supervise and direct field and office operations. GR employs a staff of geologist, engineers, and technicians who will assist with the project.

## SCHEDULE

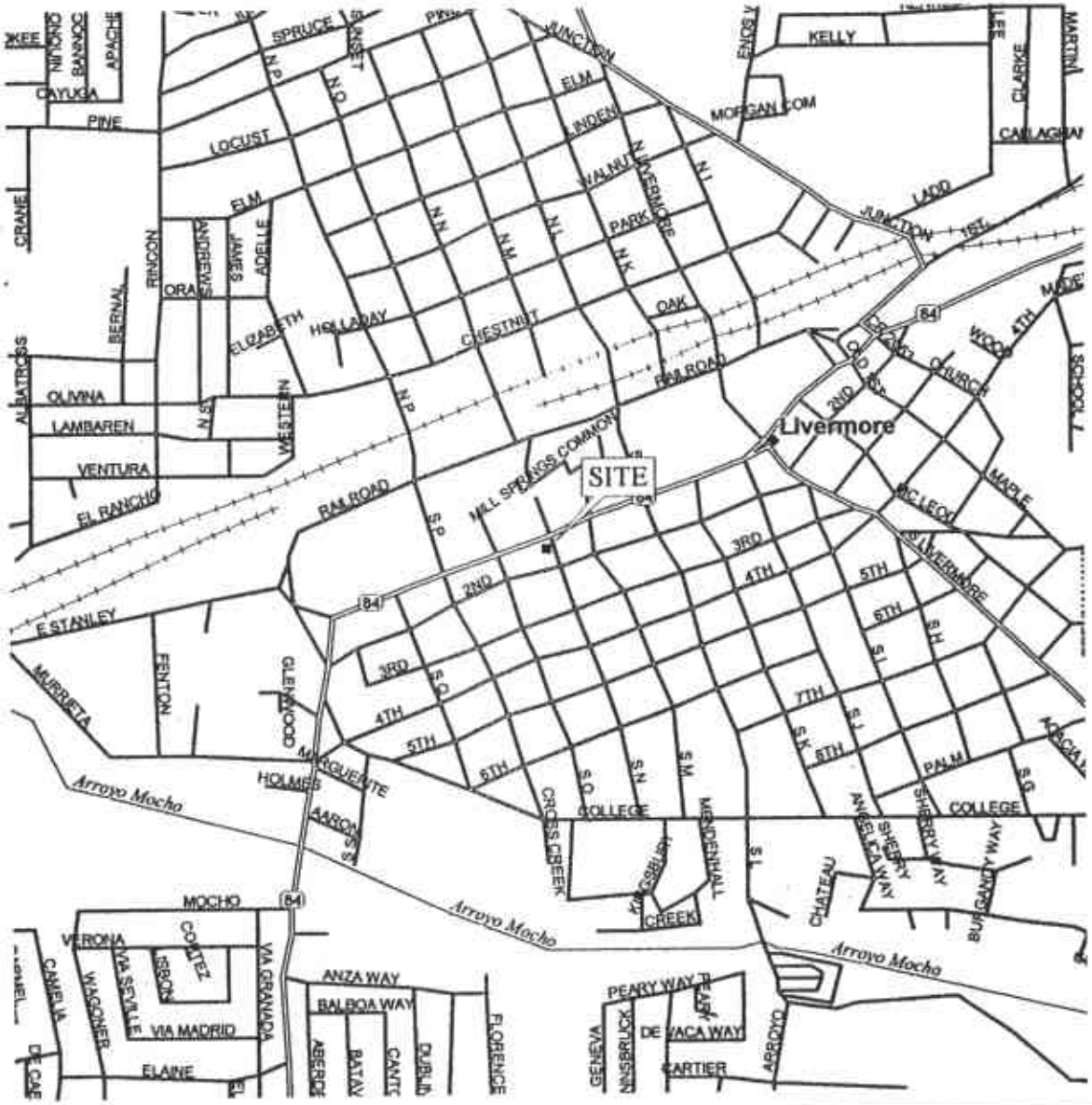
Implementation of the proposed scope of work will commence upon receipt of regulatory approval and a well installation permit.

## REFERENCES

California Department of Water Resources, 1974, Evaluation of Ground Water Resources; Livermore and Sunol Valleys: Bulletin 118-2.

GeoStrategies Inc., 1996, Product Line Replacement Report for Unocal Service Station No. 4186, 1771 1st Street, Livermore, California: Report dated August 7, 1996.

Pacific Environmental Group, 1997, Soil Gas Survey Results for Unocal Service Station No. 4186, 1771 1st Street, Livermore, California: Project 311-163.1A dated October 29, 1997.




Source: Street Atlas USA, Delorme (1995).

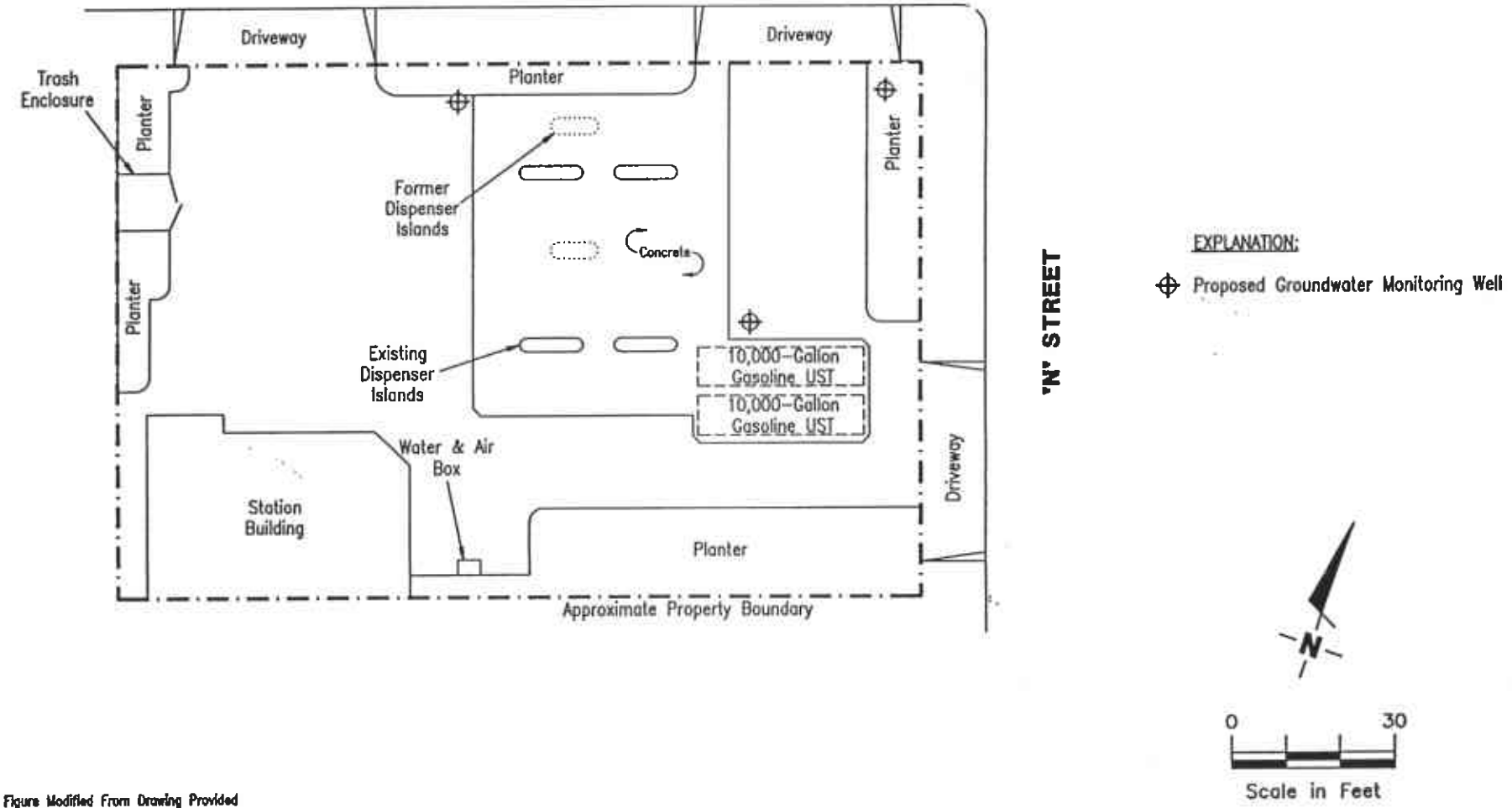
FIGURE 1

**Gettler - Ryan Inc.**

6747 Sierra Ct., Suite J
Dublin, CA 94568
(510) 551-7555

VICINITY MAP
Unocal Service Station No. 4186
1771 First Street
Livermore, California

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE |
|---|---|---|---|
| 140075 | | 04/98 | |




Source: Figure Modified From Drawing Provided By Unocal.

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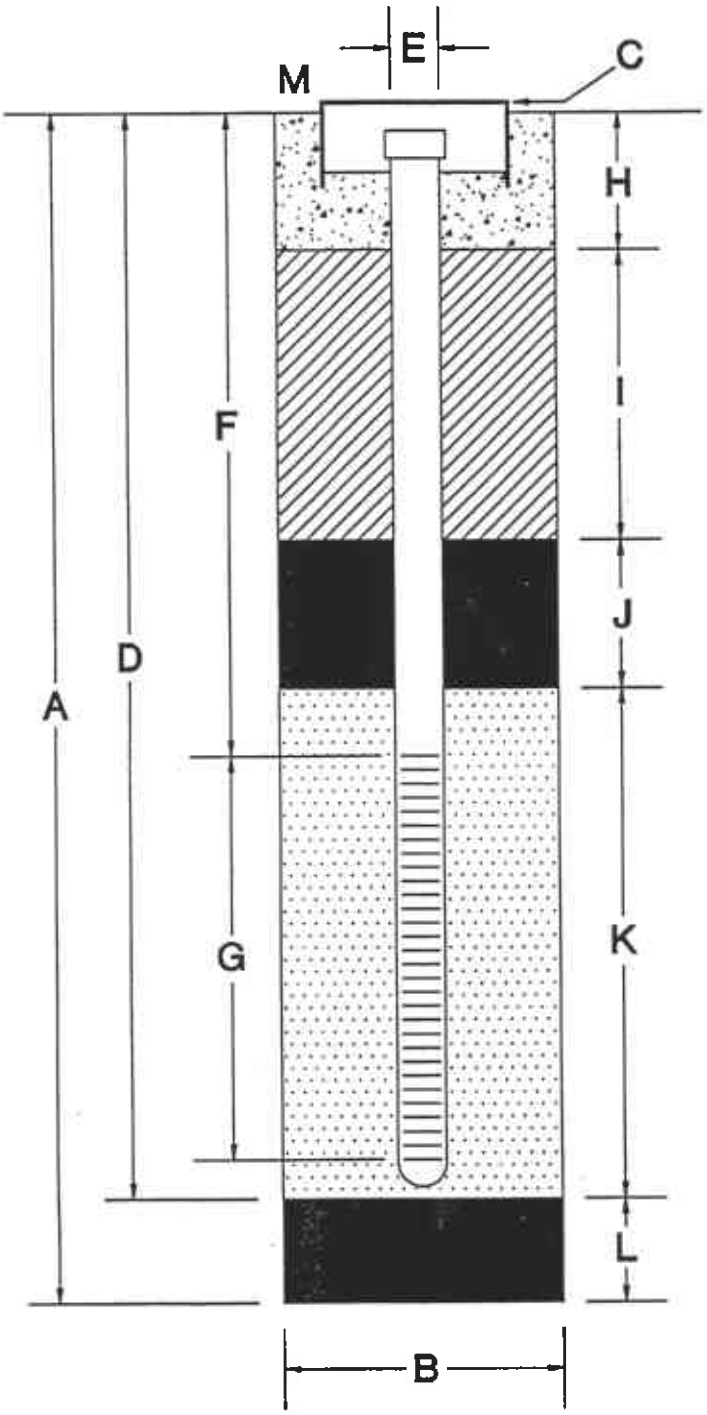
SITE PLAN
Unocal Service Station No. 4186
1771 First Street
Livermore, California

FIGURE
2

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE |
|---|---|---|---|
| 140075 | | 07/96 | 04/98 |

# WELL CONSTRUCTION DETAIL




A Total Depth Of Boring 35 ft.

B Diameter Of Boring 8 in.
Drilling Method HOLLOW STEM AUGER

C Top Of Box Elevation _____ ft.
☒ Referenced To Mean Sea Level
☐ Referenced To Project Datum

D Casing Length 35 ft.
Material PVC

E Casing Diameter 2 in.

F Depth To Top Perforations 15 ft.

G Perforated Length 20 ft.
Perforated Interval From 15 to 35 ft.
Perforation Type Machine Slot
Perforation Size .020 in.

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

I Backfill From 1 to 12 ft.
Backfill Material Neat Cement

J Seal From 12 to 14 ft.
Seal Material Hydrated Bentonite

K Gravel Pack From 14 to 35 ft.
Pack Material Lonestar #3 Sand

L Bottom Seal None ft.
Seal Material _____

M _____

Note: Depths Measured From Initial Ground Surface.

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PROPOSED WELL CONSTRUCTION DETAIL
Unocal Service Station No. 4186
1771 1st Street
Livermore, California

| JOB NUMBER | REVIEWED BY | DATE | REVISION DATE |
|---|---|---|---|
| 140175 | | 4/98 | |

# APPENDIX A

# GR FIELD METHODS AND PROCEDURES

# 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 of these plans contents 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

Exploratory 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 exploratory soil boring with a split-barrel sampler or other appropriate sampling device fitted with clean brass 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 soil is 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 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.

## Stockpile Sampling

Stockpile samples consist of four individual sample liners collected from each 100 cubic yards ($yd^3$) of stockpiled soil material. Four arbitrary points on the stockpiled material are chosen, and discrete soil sample is collected at each of these points. Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless steel or brass tube into the stockpiled material with a wooden mallet or hand driven soil sampling device. The sample tubes are then covered on both ends with teflon sheeting or aluminum foil, capped, labeled, placed in the 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.

## Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory 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 cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

## Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting or stored in drums depending on site conditions and regulatory requirements. Stockpile samples are collected and analyzed on the basis of one composite sample per 50 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 then driving the stainless 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.

## Wellhead Survey

The top of the newly-installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL).

## Well Development

The purpose of well development is to improve hydraulic communication between the well and surrounding aquifer. Prior to development, each well is monitored for the presence of separate-phase hydrocarbons and the depth-to-water is recorded. Wells are then developed by alternately surging the well with the bailer, then purging the well with a pump to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized.

## Groundwater Monitoring and Sampling

### Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

### Water-Level Measurements

Prior to sampling each well, the static water level is measured using an electric sounder and/or calibrated portable oil-water interface probe. Both static water-level and separate-phase product thickness are measured to the nearest ±0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ±0.01 foot with a decimal scale tape. The monofilament line used to lower the bailer is replaced between borings with new line to preclude the possibility of cross-contamination. Field observations (e.g. product color, turbidity, water color, odors, etc.) are noted. Water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

## Sample Collection and Labeling

A temporary PVC screen is installed in the boring to facilitate a grab groundwater sample collection. Samples of groundwater are collected from the surface of the water in each well or boring using the teflon bailer or a pump. The water samples are then gently poured into laboratory-cleaned containers and sealed with teflon-lined caps, and inspected for air bubbles to check for headspace. The samples are then labeled by an adhesive label, noted in permanent ink, and promptly placed in an ice storage. A Chain-of-Custody Record is initiated and updated throughout handling of the samples, and accompanies the samples to the laboratory certified by the State of California for analyses requested.