Chevron U.S.A. Products Company
2410 Camino Ramon, San Ramon, California • Phone (510) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

92 OCT 30 AM 8:02

October 28, 1992

Ms. Susan Hugo
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

Re: Former Chevron Service Station No. 9-3864
5101 Telegraph Avenue, Oakland, California

Dear Ms. Hugo :

Enclosed is a work plan from Pacific Environmental Group dated October 6, 1992. The same work plan was sent to you earlier by facsimile.

The work plan should satisfy Alameda County Health Care Services' request of defining the lateral and vertical extent of the hydrocarbon plume. Briefly, the work plan proposes five (5) temporary groundwater monitoring wells. The location of the wells will depend on the approval of various county agencies, and it will also depend on the analytical results. The temporary wells will be replaced with permanent wells with the possible exception of the well located in front the former Shell service station.

If you have any questions or comments, please call me at (510) 842-8752.

Sincerely,

Chevron U.S.A. Products Co.

Kenneth Kan
Engineer

LEAN/MacFile 9-3864R8

Enclosure

cc : Mr. Eddie So
RWQCB-San Francisco Bay Area
2101 Webster Street, Suite 500
Oakland, CA 94612

Ms. Bette Owen
Chevron U.S.A. Products Co.

PACIFIC
ENVIRONMENTAL
GROUP, INC.

October 13, 1992
Project 325-17.01

Mr. Kenneth Kan
Chevron U.S.A. Products Company
P.O. Box 5004
San Ramon, California 94583-0804

Re: Former Chevron Service Station 9-3864
5101 Telegraph Avenue
Oakland, California

Dear Mr. Kan:

This letter presents a brief work plan prepared by Pacific Environmental Group, Inc. (PACIFIC) to further investigate groundwater conditions in the vicinity of the site referenced above. The purpose of this investigation is to: (1) define the off-site extent of hydrocarbons in groundwater and (2) determine if the Shell station located northeast of the site is a potential source of hydrocarbons found in groundwater beneath and in the vicinity of the Chevron site. The proposed scope of work consists primarily of collection of groundwater samples at five off-site locations. Included in this letter is a brief discussion of site conditions, the proposed scope of work, and a time schedule. Field and analytical procedures are documented in Attachment A.

SITE BACKGROUND

Four on-site groundwater monitoring wells (C-1 through C-4) were installed in November 1990 (Figure 1). Depth to groundwater has ranged from approximately 14 to 17 feet below ground surface. Groundwater flow is to the west.

Groundwater samples collected semi-annually from the upgradient well (C-1) and Wells C-2 and C-3 have contained concentrations of total petroleum hydrocarbons calculated as gasoline (TPH-g) ranging between 210 and 6,700 parts per billion

2025 Gateway Place, Suite 440, San Jose, California 95110 (408) 441-7500 FAX (408) 441-7539
620 Contra Costa Blvd., Suite 209, Pleasant Hill, California 94523 (510) 825-0855 FAX (510) 825-0882

(ppb) (Table 1). Groundwater samples collected from Well C-4, located adjacent to the waste oil tank located in the downgradient (western) portion of the site, have contained TPH-g at concentrations ranging from none detected to 70 ppb.

SCOPE OF WORK

In order to document the off-site extent of hydrocarbons in groundwater in the vicinity of the site, PACIFIC proposes the following scope of work: (1) installation of five temporary groundwater monitoring wells, (2) collection and analysis of a groundwater sample from each temporary well, and (3) preparation of a report documenting the findings of the field work.

Drilling and Temporary Well Installation

The locations of the proposed wells are shown of Figure 1 and are discussed below:

- Two temporary wells will be drilled on the east side of Telegraph Avenue, at locations north and south of Claremont Avenue, in order to further characterize upgradient groundwater conditions.
- One temporary well will be drilled on the south side of 51st Street in order to characterize groundwater conditions southwest (lateral/downgradient) of the site. Two temporary wells will be drilled on the north side of 52nd Street (one possibly in the island at the intersection of 51st Street and 52nd Avenue) in order to characterize groundwater conditions northwest (lateral/ downgradient) of the site.

All proposed locations are approximate and may be modified based upon encroachment agreement conditions and overhead and underground utility clearance.

Groundwater Sampling

Groundwater samples will be collected from each temporary well and will be analyzed for TPH-g and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds).

Reporting

A letter report will be prepared documenting the field and laboratory procedures and findings of the proposed investigation.

TIME SCHEDULE

Field work will commence after encroachment with the City of Oakland has been obtained. Field work will be scheduled within 2 weeks of obtaining encroachment. A report documenting the findings of this investigation will be submitted 4 to 6 weeks after the completion of field work. The Alameda County Health Department will be notified prior to initiating field activities.

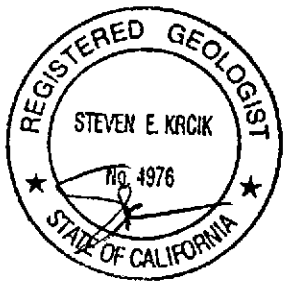
If you have any questions please do not hesitate to call.

Sincerely,

Pacific Environmental Group, Inc.

John Cavanaugh
Senior Staff Geologist

Steve Krcik
Project Geologist
RG 4976



Attachments: Table 1 - Summary of Groundwater Elevation Data
Table 2 - Summary of Groundwater Analytical Results
Figure 1 - Proposed Well location Map
Attachment A - Field and Analytical Procedures

GERAGHTY & MILLER, INC.
Risk Evaluation Group

Ground Water *Hydrocarbon* *Remediation* *Education*

December 29, 1992

Dr. Ravi Arulanantham
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

RE: Work Plan for Risk-Based Analysis, Former Chevron Service Station #9-3864, 5101 Telegraph Avenue, Oakland, California.

Dear Dr. Arulanantham:

Geraghty & Miller, Inc., is pleased to submit this work plan for the preparation of a risk-based analysis for the former Chevron Service Station #9-3864 at 5101 Telegraph Avenue in Oakland, California. This purpose of this risk-based analysis is to evaluate the suitability of this site for future development. Investigating this question involves assessing the potential risks due to future hypothetical exposure to impacted media at the site. Also included is an additional analysis to assess the potential impact of off-site migration of constituents detected in ground water at the site.

BACKGROUND

In 1991, the Chevron service station was demolished and the underground storage tanks were removed. The removed tanks were inspected visually and probed for failure points; no leaks were observed. Soil in the tank pits was over-excavated to a depth of 17.5 to 18 feet (2 to 2.5 feet below ground water) and confirmatory samples were collected in the capillary zone on the sidewalls of the excavation pit and in the trench dug to remove the product lines. Approximately 600 cubic yards of soil were removed during this excavation, with approximately 300 cubic yards disposed of at BFI in Livermore. The remaining soil which had been excavated was aerated and used as backfill along with clean imported soil. The excavation activities were monitored, and sampling activities were performed under the direction of Susan Hugo of the Alameda County Health Agency. Analytical results for this sampling are documented in a Blaine Tech Services report dated October 28, 1991. These data will be used to represent current subsurface soil conditions for the risk-based analysis.

On-site ground-water samples have been collected regularly at the site since December 1990, when the installation of four on-site monitoring wells was completed. The most recent data (from samples collected on September 16, 1992) (Sierra Analytical, 1992) will be used to represent current ground-water conditions at the site. Soil samples obtained during the monitoring well installation will be included in the soil data set.

CrossPointe II, 2840 Plaza Place, Suite 350 • Raleigh, North Carolina 27612 • (919) 571-1662 • FAX (919) 571-7994

APPROACH

The main thrust of the current work plan is toward evaluating potential risk due to future development of the site. Health-based remediation goals will be derived based upon potential risks for residents (adult and child) living in a home built on the site (the most conservative hypothetical land-use scenario from a risk standpoint) and for a construction worker involved in excavating soil during the hypothetical building project. Health-based soil and ground-water remediation goals will be compared to existing site-related concentrations to determine whether exposure to the site presents significant risk to human health and whether further remediation of the site is warranted from a risk-based standpoint.

For the construction worker scenario, exposure to impacted soils will be evaluated as the primary route of exposure. For the residents, however, exposure to both soil and ground water will be considered. The general quality of ground water in this area is poor (based on Chevron's communications with Tim Collins of East Bay Municipal Utilities District), and potable water in the area is supplied by the municipal water-supply system. Should the site be redeveloped, there is very little likelihood of direct exposure to the ground water. Therefore, the most likely exposure route to contaminants in ground water would be via volatilization through the soil and infiltration into the air within the home.

Therefore, this work plan proposes evaluating the health-based soil remediation goals for three hypothetical future exposure scenarios: (1) oral, dermal, and inhalation exposure for a construction worker, (2) oral, dermal, and inhalation exposure for a child resident, and (3) oral, dermal, and inhalation exposure for an adult resident. For each constituent of concern in soil (benzene, ethylbenzene, toluene, xylenes, TPH as diesel, TPH as gasoline, and soluble lead) the minimum health-based remediation goal obtained from these three exposure scenarios will be compared to on-site soil concentrations. Health-based remediation goals for ground water will be based upon hypothetical future adult and child resident exposure, using a model presented by Mayer et al. (1974) to determine potential air concentrations within the home. The minimum health-based ground-water remediation goals for benzene, ethylbenzene, toluene, xylenes, and TPH as gasoline will be compared to the most recently measured ground water concentrations (from samples collected on September 16, 1992).

Currently, there are no USEPA-accepted toxicity values for lead because of the correlation between exposure and blood-lead levels. Therefore, the soil remediation goal for lead will be obtained using the USEPA Uptake Biokinetic model. The child resident exposure scenario will be evaluated using the USEPA computer program (LEAD5) (USEPA, 1991) designed for determining potential blood-lead levels for children aged 0 to 6 years, based upon

concentrations of lead in the child's environment. Adult exposure will be evaluated using methodology similar to that in the Uptake Biokinetic model (Sager et al.,1992).

Also included as a part of the risk-based analysis for the site is an assessment of the potential for on-site ground-water constituents to be released into San Francisco Bay. The potential for on-site ground-water contaminants to migrate downgradient will be evaluated using ground-water flow information gathered during previous investigations and a ground-water transport model (Bear, 1972), making conservative assumptions in selecting unknown parameter values. The model will be used to predict the maximum distance the contaminant plume (hypothetically originating from the site) will travel. The contaminant plume will be represented as benzene since it is more mobile and has a slower biodegradation rate than the other BTEX compounds. The maximum potential transport distance calculated by the model will be compared to the actual distance from the site to San Francisco Bay to determine whether there is potential impact due to the release of site-related constituents into the bay.

REPORT

The product of the proposed risk-based analysis of the former Chevron service station will be a stand-alone report presenting the results of the analysis, along with relevant site information, detailed explanations of the techniques of analysis, supporting toxicity and chemical/physical information for the contaminants of concern in on-site media, and a discussion of the inherent uncertainties associated with such an analysis. The following subsections describe the major components of the work which will go into generation of this report.

Site Characterization

Characteristics of the site, such as history, climate, topography, local land use, soil type, depth to ground water, ground-water flow, and distance to ground-water discharge, will be presented. Site characterization data provide the basis for realistic assessment of exposure pathways. The site characterization task will refer to previously prepared documents and briefly discuss the results of previous investigations and remediation activities. The results of previous sampling efforts at the site will be presented and analyzed, identifying the contaminants of concern in soil and ground water.

Toxicity Assessment

The inherent toxicological properties, potential adverse health effects, and dose-response relationships for site-related constituents will be reviewed. Because TPH are a class of

Table 1
Summary of Historical Groundwater Elevation Data

Chevron U.S.A. Station 9-3864
5101 Telegraph Avenue
Oakland, California

Well Number	Sample Date	TOC Well Elevation (feet, MSL)	Depth to Water (feet)	Groundwater Elevation (feet, MSL)
C-1	12/06/90	117.45	15.34	102.11
	06/06/91		14.62	102.83
	12/04/91		14.48	102.87
	06/02/92		14.53	102.92
C-2	12/06/90	116.16	15.34	100.82
	06/06/91		14.62	101.54
	12/04/91		15.43	100.73
	06/02/92		14.42	101.74
C-3	12/06/90	115.70	16.86	98.84
	06/06/91		15.69	100.01
	12/04/91		15.38	100.32
	06/02/92		15.40	100.30
C-4	12/06/90	116.10	17.68	98.42
	06/06/91		16.49	99.61
	12/04/91		16.82	99.28
	06/02/92		16.92	99.18

TOC = Top of casing
MSL = Mean sea level

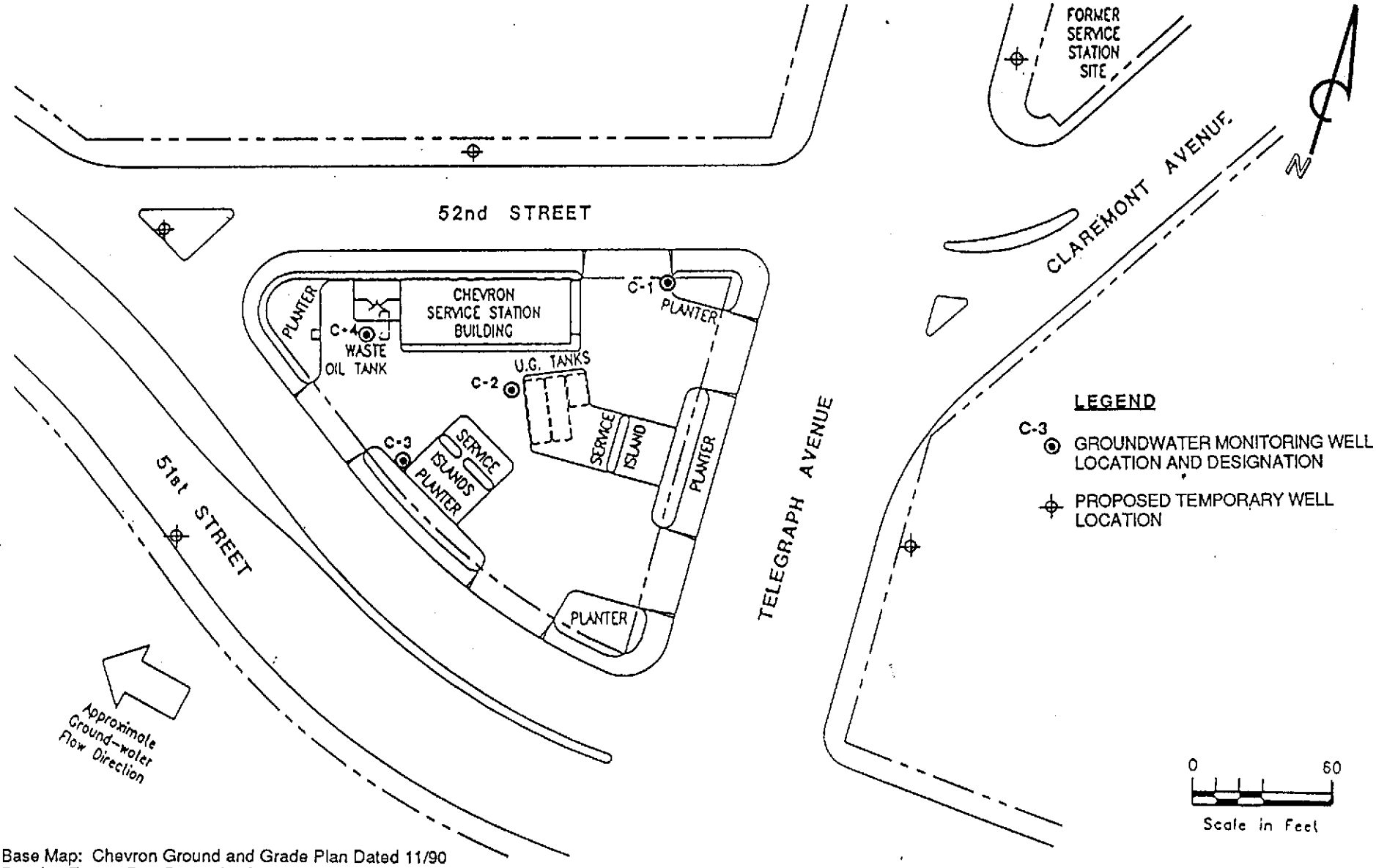
Depth to water measurements and top of casing elevations prior to June 6, 1992 were compiled from the January 17, 1991 Site Update Report prepared for this site by GeoStrategies, Inc. of Hayward, California.

Table 2
Summary of Historical Groundwater Analytical Results

Former Chevron U.S.A. Station 9-3864
5101 Telegraph Avenue
Oakland, California

Well Number	Sample Date	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-Benzene (ppb)	Xylenes (ppb)
C-1	12/06/90	1,900	17	11	3	21
	06/06/91	3,400	21	15	11	18
	12/04/91	2,700	22	16	13	23
	06/02/92	1,900	170	170	13	83
C-2	12/06/90	210	140	9	2	11
	06/06/91	4,800	340	23	19	23
	12/04/91	3,900	85	15	9.1	15
	06/02/92	3,300	76	9.2	14	15
C-3	12/06/90	210	2	<0.5	<0.5	1
	12/06/90[a]	220	2	0.6	<0.5	2
	06/06/91	6,400	310	21	16	21
	12/04/91	5,100	120	18	17	20
	06/02/92	6,700	140	44	17	37
C-4	12/06/90	<50	<0.5	<0.5	<0.5	<0.5
	12/18/90[b]	<50	<0.5	<0.5	<0.5	<0.5
	06/06/91	<50	1.0	1.0	<0.5	0.7
	12/04/91	70	6.5	9.8	1.7	8.6
	06/02/92	70	3.0	4.4	1.8	9.0

ppb = Parts per billion
< = Compound not detected above specified detection limit.
a. Duplicate sample
b. Well C-4 was also analyzed for halogenated volatile organic compounds (HVOCs) by EPA Method 8010, and metals (Cd, Cr, Pb, Ni, and Zn) by EPA-approved methods. Two ppb chloroform, 0.18 ppm chromium, 0.25 ppm nickel and 0.23 ppm zinc were detected. Other HVOCs, Cd, and Pb were not detected.



Base Map: Chevron Ground and Grade Plan Dated 11/90
Drawing From: Geo-Strategies Inc.

PACIFIC ENVIRONMENTAL GROUP INC.	CHEVRON SERVICE STATION 9-3864 5101 Telegraph Avenue Oakland, California SITE PLAN	FIGURE: 1 PROJECT: 325-17.01

REORDER NO. A54082

ATTACHMENT A

FIELD AND ANALYTICAL PROCEDURES

ATTACHMENT A
FIELD AND ANALYTICAL PROCEDURES

Drilling and Well Construction Procedures

The soil boring for the temporary monitoring well will be drilled using 2-inch diameter hydraulically driven equipment and will be logged by a PACIFIC geologist using the Unified Soil Classification System and standard geologic techniques. Soil samples for logging and possible chemical analysis will be collected continuously, as part of the drilling process, by advancing sampler with brass liners into undisturbed soil. Soil samples selected for possible chemical analysis will be retained in the brass liners, capped with Teflon and plastic end caps, and sealed in clean zip lock bags. These samples will be placed on ice for transport to the laboratory, accompanied by chain-of-custody documentation. All down-hole drilling and sampling equipment will be steam-cleaned following the completion of the soil boring. Down-hole sampling equipment removed from the boring will be washed in a TSP solution between samples.

The soil borings will be converted to a temporary groundwater monitoring well by the installation of 1 1/2-inch diameter, PVC casing with 0.020-inch factory slotted screen. Approximately 5 to 10 feet of screen will be placed in the upper portion of the first encountered water-bearing zone in each borehole, anticipated to be at a depth of approximately 15 feet. Borehole are anticipated to be advanced to a total depth of approximately 20 feet. The drive casing will be removed from the water-bearing zone prior to sampling to allow horizontal flow of groundwater in to the temporary casing. Upon completion of sampling the temporary casing, will be removed and the borehole grouted from the bottom to the surface.

Organic Vapor Analysis Procedures

Soil samples collected in the field will be analyzed using a HNU Model PI 101 photo-ionization detector (or equivalent) with a 10.2 eV lamp. The test procedure involves measuring approximately 30 grams from an undisturbed soil sample, placing this sub-sample in a clean glass jar, and sealing the jar with aluminum foil secured under a ring-type threaded lid. The jar is warmed for approximately 20 minutes, then the foil is

pierced and the head-space within the jar tested for total organic vapor, measured in parts per million as benzene (ppm; volume/volume). The instrument will be previously calibrated using a 100 ppm isobutylene standard (in air) and a sensitivity factor of 0.55 which relates the photo-ionization sensitivity of benzene to the sensitivity of isobutylene. The results of these tests will be recorded on the boring logs.

Groundwater Sampling Procedures

The sampling procedure consist of first measuring the water level in the boring each with an electronic water-level indicator, and checking the boring for the presence of separate-phase hydrocarbons using a clear Teflon bailer. If the recharge rate is high, the well will be purged of approximately four casing volumes of water using a bailer during which time temperature, pH, and electrical conductivity will be monitored to indicate that a representative sample is obtained. After purging, the water level in the well will be allowed to restabilize. A groundwater sample will then be collected using a Teflon bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to the laboratory. All well development and purge water will be stored on site in DOT approved 55-gallon drums pending disposal.

Laboratory Analysis Procedures

The groundwater samples and selected soil samples will be analyzed for total petroleum hydrocarbons calculated as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) by EPA Methods 5030/8015/8020. The samples will be examined using the purge and trap technique, with final detection by gas chromatography. The analysis will be performed by a state-certified laboratory.