



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

SR

January 13, 1993

Ms. Eva Chu
Alameda County Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Re: Chevron station # 9-5542, 7007 San Ramon Valley Blvd., Dublin, CA
Attached report of groundwater and vapor extraction and monitoring wells (GM, 1/5/93)

Dear Ms. Chu:

Attached is a report dated January 5, 1993, which was prepared by Chevron's consultant, Geraghty & Miller (GM), to describe the drilling, sampling, and construction of one groundwater and vapor extraction well and two vapor monitoring wells at the subject site.

GM is currently drafting a proposal for a vapor and groundwater extraction pilot test to collect information concerning the feasibility of vapor and groundwater extraction as a remedial option. I will forward a copy of GM's proposal to you when it is finished.

If you have any questions or comments, I can be reached at (510) 842-8658.

Sincerely,

Clint B. Rogers
Environmental Engineer

Attachment

cc: Eddy So, San Francisco Bay RWQCB, Oakland, CA
Argy Mena, Sierra Environmental Services, Martinez, CA



*Ground Water**Engineering**Hydrocarbon**Remediation**Education*

January 5, 1993
Project No. RC09303

Mr. Clint Rogers
Chevron U.S.A. Products Company
2410 Camino Ramon
San Ramon, California 94583

SUBJECT: Letter Report for the Installation of Ground-Water and Vapor-Extraction Well
and Vacuum-Monitoring Wells
Chevron Service Station #9-5542
7007 San Ramon Road, Dublin, California.

Dear Mr. Rogers:

This letter report presents the results of the installation of a ground-water and vapor-extraction well, and the installation and completion of two vacuum-monitoring wells by Geraghty & Miller, Inc. (Geraghty & Miller) at the Chevron U.S.A. Products Company (Chevron) site referenced above (Figure 1). The objective of the well installations was to provide wells appropriately constructed for concurrent ground water extraction and the performance of a soil-vapor extraction (SVE) pilot test at this site. The scope of work for this project was presented in a Geraghty & Miller work plan dated August 21, 1992.

DRILLING AND WELL INSTALLATION

Prior to drilling, a request for a Monitor-Well Construction permit was submitted to Alameda County on November 10, 1992. Ground Water Protection Ordinance Permit #92597 was subsequently issued by the Alameda County Flood Control and Water Conservation District on November 17, 1992 (Attachment 1).

One ground-water and vapor-extraction well (MW-1) and two vacuum monitoring wells (VW-1 and VW-2) were drilled at the project site on November 24 and 25, 1992. The well locations are presented in Figure 2. Well MW-1 was a re-drilling and deepening of existing Well MW-1 and its location did not change. Well VW-1 is located approximately 25 feet to the east/southeast of Monitor Well MW-1, and Well VW-2 is located approximately 20 feet to the east/southeast of Well VW-1. The borings were drilled by Great Sierra Exploration of Union City, California, using a CME-75 truck-mounted auger

drilling rig. The original 2-inch diameter Monitor Well MW-1, which was originally drilled with 8-inch hollow-stem augers, was destroyed by overdrilling and deepened using 10-inch hollow-stem auger drilling. Wells VW-1 and VW-2 were drilled using 8-inch diameter hollow-stem auger drilling. All drilling equipment that entered the borehole was steam cleaned prior to drilling each boring.

Boring VW-1 was sampled via continuous-core sampling methods for the entire depth of the boring. Boring MW-1 was continuously cored from a depth of 40 feet to 51 feet, the section which was below the destroyed upper portion of original well MW-1. Soil samples from VW-2 were collected at 5-foot depth intervals using a modified California split-spoon sampler equipped with three brass liners, which was advanced into the undisturbed soil beyond the tip of the augers. The split-spoon sampler and the continuous-core tubes were either washed in a nonphosphate cleaner solution and rinsed with deionized water, or decontaminated using a steam cleaner prior to each use. The brass sample liners were used in the split-spoon sampler and to collect the samples from the continuous core. The soil samples were collected from the continuous core by driving the sample cylinder into the cored soil at the interval to be sampled. Each brass sample liner was sealed with Teflon™ tape and plastic end caps, placed on ice, and transported, along with appropriate chain-of-custody documentation, to Superior Precision Analytical, Inc. (Superior), a State-certified laboratory (Department of Health Services Certification #319) in Martinez, California. The soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (USEPA Method 8015, modified) and benzene, toluene, xylene, and ethylbenzene (USEPA Method 8020).

The soil from one of the two remaining brass liners from the split-spoon sampler or the soil from the continuous-core tube was logged according to the Unified Soil Classification System by a Geraghty & Miller geologist. The exploratory boring logs are included in Attachment 2.

The drilling was terminated at the depths planned for the wells in the original work plan to maximize their potential for ground-water and soil-vapor extraction. The total depths planned for the wells were determined from previous boring logs prepared by others and from cross sections prepared by Geraghty & Miller. Based on the available information, the well depths were planned to maximize the potential for soil-vapor and

ground-water extraction and monitoring. The total depths were 51 feet (Well MW-1), 31 feet (Well VW-1), and 30 feet (Well VW-2) below the ground surface.

Upon completion of drilling, Boring MW-1 was completed as a ground-water and vapor-extraction well by installing 4-inch diameter, flush-threaded, Schedule 40 PVC casing. Slotted well screen (0.010-inch manufactured slots) was installed through the hollow-stem augers. The annular space between the well screen and borehole was backfilled using #2/16 sand to approximately 2 feet above the top of the well screen. Three to four feet of bentonite were placed above the sand pack, and the remainder of the annular space was backfilled with cement grout containing approximately 5 percent bentonite. A locking watertight well cap and traffic-rated flush-mounted well box were installed at the ground surface. Vapor-extraction Monitoring Wells VW-1 and VW-2 were completed in a similar manner, except that they were completed using 2-inch PVC casing and screen. Monitor-well construction details are included on the boring logs presented in Attachment 2.

Upon completion, the top-of-casing elevation and location for each well were surveyed relative to the United States Coast and Geodetic Survey control datum to Mean Sea Level by a State-licensed surveyor from Field Design Registered Land Surveyors of Richmond, California. A copy of the survey map and the field survey data are included in Attachment 3.

The soil generated during the drilling activities was stockpiled on plastic and covered. Four separate soil samples were collected from different locations within the stockpiled soil. The soil samples were collected by advancing a clean, brass sample liner approximately 6 inches into the soil stockpile at each location. The four samples were placed on ice and transported to Superior, where they were composited into one sample for analysis. Per current Chevron procedures, the composite soil sample was analyzed for TPH as gasoline (USEPA Method 8015, modified), and BTXE (USEPA Method 8020). The water generated during the steam cleaning of drilling equipment was placed in drums. The soil and water were retained onsite for proper handling and disposal by Chevron.

WELL DEVELOPMENT

Ground-water and soil-vapor Extraction Well MW-1 was developed by West Hazmat Drilling Corporation of Hayward, California, on December 10, 1992. The well was alternately surged and bailed to remove sediment from within the well casing and the sand pack to improve the water-production capabilities of the well. The surge block was used to progressively surge along the well screen in distinct 4-foot increments throughout the entire 20-foot screen interval between 30 and 50 feet below the ground surface. Approximately 120 gallons of water were purged from the well during the development process. Field parameters of temperature, specific conductance, pH, and turbidity were monitored throughout the development work, and the field parameters are presented in Attachment 4.

RESULTS OF SITE ACTIVITIES

HYDROGEOLOGIC CONDITIONS

Based on the results of the exploratory drilling activities conducted during the assessment activities, the project site is underlain primarily by silts, clays, silty to clayey sand, and occasional gravelly sand to a depth of approximately 51 feet below the ground surface, the total depth explored (Well MW-1). Depth to water measured on November 24, 1992, for Well MW-1 was 28.27 feet below ground surface.

SOIL ANALYTICAL RESULTS

The analytical results for soil samples are summarized in Table 1. Copies of the certified analytical reports and chain-of-custody documentation are included in Attachment 5. Soil samples from Boring VW-2 collected from depths of approximately 5 feet, 10 feet, 15 feet, 20 feet, 25 feet, and 30 feet below the ground surface were analyzed. Soil samples collected from the continuous-cored soil from Boring VW-1 from depths of approximately 5 feet, 14 feet, 14.5 feet, 19.5 feet, 24 feet, 27 feet, and 31 feet below the ground surface were analyzed. No soil samples collected from Boring MW-1 were analyzed because all soil samples were from below the ground-water level. TPH as gasoline was detected in the soil samples collected from Boring VW-1 at depths of 14.5 feet (2 milligrams per kilogram [mg/kg]), 19.5 feet (250 mg/kg), 24 feet (990 mg/kg),

27 feet (230 mg/kg) and 31 feet (130 mg/kg) below the ground surface. TPH as gasoline was also detected in the soil samples collected from Boring VW-2 at 20 feet (220 mg/kg), 25 feet (650 mg/kg), and 30 feet (1 mg/kg) below the ground surface. Concentrations of BTXE were detected in the soil samples collected from Boring VW-1 at depths of 5 feet, 14.5 feet, 19.5 feet, 24 feet, 27 feet, and 31 feet below the ground surface, and from Boring VW-2 at depths of 10 feet, 15 feet, 20 feet, 25 feet, and 30 feet below the ground surface (see Table 1).

Geraghty & Miller is pleased to be of service to Chevron. If you have any questions or need further information regarding this letter report, please do not hesitate to call.

Sincerely,
GERAGHTY & MILLER, INC.



Paul V. Hehn
Project Hydrogeologist/Project Manager



Gary W. Keyes, P.E.
Principal Engineer/Associate
Richmond, California Office Manager

Attachments:	Table 1	Summary of Soil Sample Analytical Results
	Figure 1	Site Location
	Figure 2	Well Locations
	Figure 3	Cross Section A-A'
	Attachment 1	Ground Water Protection Ordinance Permit
	Attachment 2	Boring Logs
	Attachment 3	Survey Data
	Attachment 4	Field Data from Well Development
	Attachment 5	Copies of Certified Laboratory Reports and Chain-of-Custody Documentation

REFERENCES

Geraghty & Miller, Inc. 1992. Work Plan for the Installation of Ground-Water and Vapor-Extraction Well, and Vacuum-Monitoring Wells, Chevron Service Station #9-5542, 7007 San Ramon Road, Dublin, California. August 21, 1992.

Table 1: Summary of Soil Sample Analytical Results
 Chevron Service Station #9-5542
 7007 San Ramon Road, Dublin, California

Well	Date	Depth (feet)	TPH		Toluene (b) (mg/kg)	Ethyl- benzene (b) (mg/kg)	Xylenes (b) (mg/kg)
			Gasoline (a) (mg/kg)	Benzene (b) (mg/kg)			
VW-1	24-Nov-92	5	ND(<1)	ND(<.005)	0.006	ND(<.005)	ND(<.005)
		14	ND(<1)	ND(<.005)	ND(<.005)	ND(<.005)	ND(<.005)
		14.5	2	ND(<.005)	0.058	0.029	1.4
		19.5	250	0.081	5.6	3.4	20
		24	990	2.4	60	15	99
		27	230	2.0	15	5.4	27
		31	130	ND(<.005)	0.73	1	3.9
VW-2	25-Nov-92	5	ND(<1)	ND(<.005)	ND(<.005)	ND(<.005)	ND(<.005)
		10	ND(<1)	0.006	ND(<.005)	ND(<.005)	ND(<.005)
		15	ND(<1)	ND(<.005)	ND(<.005)	ND(<.005)	0.009
		20	220	0.65	8.1	2.6	13
		25	650	2.7	23	9	49
		30	1	0.07	0.01	0.012	0.025
<hr style="border-top: 1px dashed black;"/>							
Composite Soil Sample							
SP-1A,B,C,D	25-Nov-92		290	0.83	11	5.2	27

(a) Analyzed by USEPA Method 8015, modified.

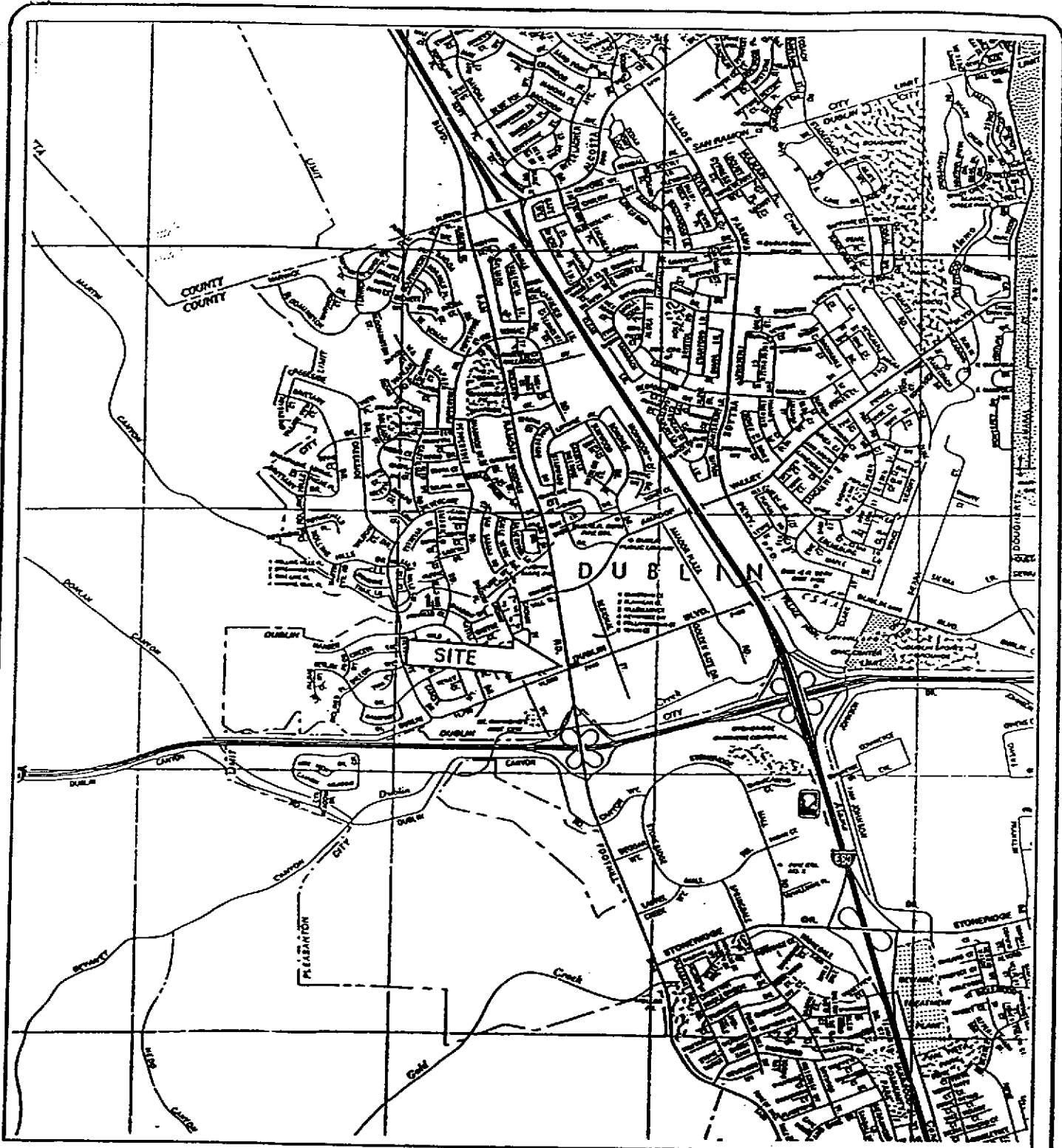
(b) Analyzed by USEPA Method 8020.

mg/kg Milligrams per kilogram

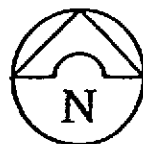
() Detection limit

ND Not detected

Analysis by Superior Precision Analytical, Inc., Martinez, California.



Reference: California State Automobile Association
 Map of Pleasanton and Vicinity
 Scale: 1:24,000



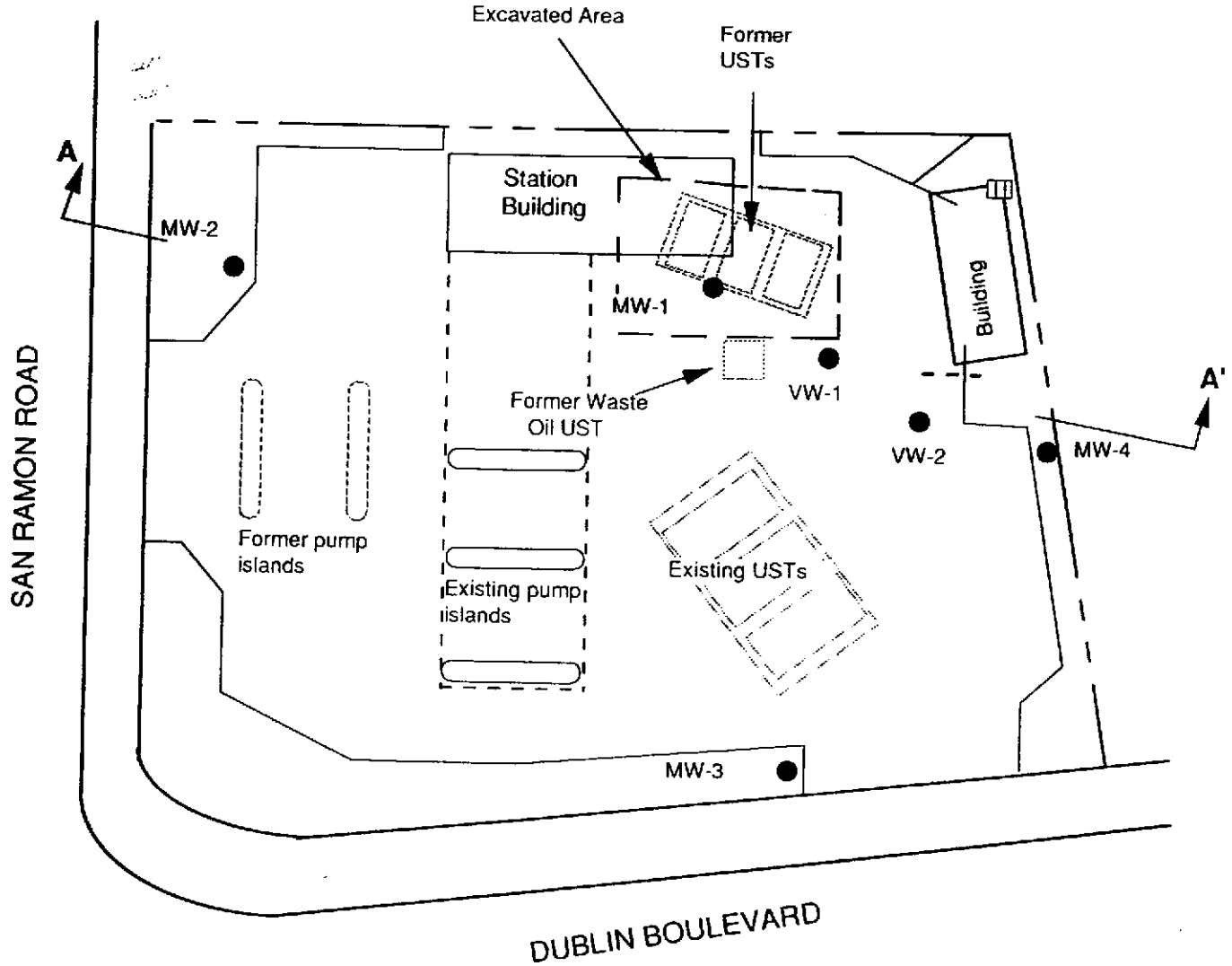
 **GERAGHTY
& MILLER, INC.**
Environmental Services
 Project No. RC09300

SITE LOCATION
 Chevron Service Station # 9-5542
 7007 San Ramon Road
 Dublin, California

FIGURE
1



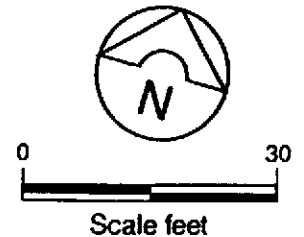
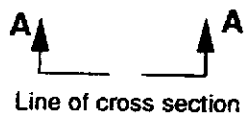
Historical range of ground-water flow direction



EXPLANATION

MW-3 ● Approximate locations of ground-water monitor wells.

USTs Underground Storage Tanks



Reference: Sierra Environmental Services



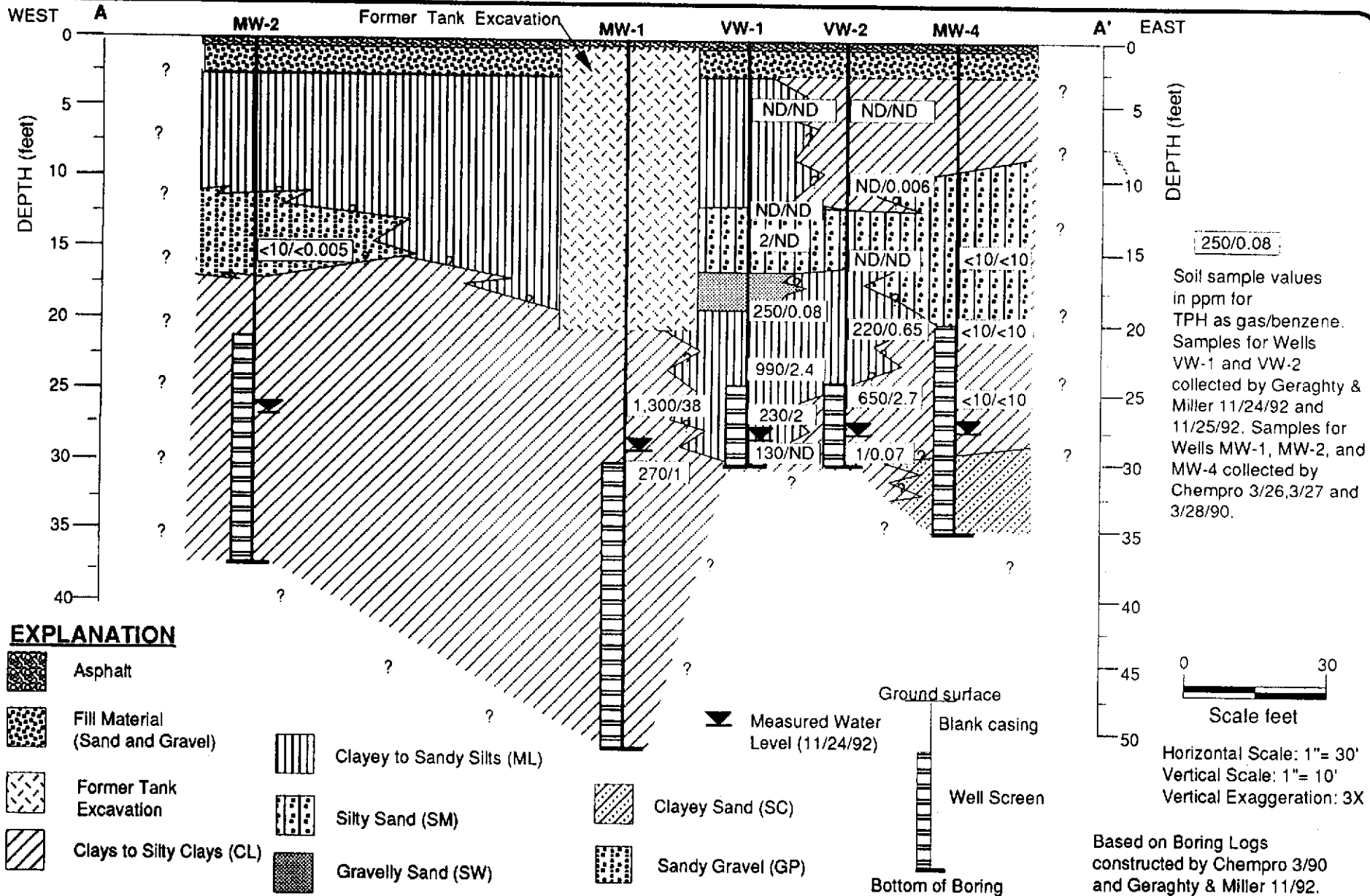
Project No. RC09300

WELL LOCATIONS

Chevron Service Station #9-5542
7007 San Ramon Road
Dublin, California

FIGURE

2



Soil sample values in ppm for TPH as gas/benzene. Samples for Wells VW-1 and VW-2 collected by Geraghty & Miller 11/24/92 and 11/25/92. Samples for Wells MW-1, MW-2, and MW-4 collected by Chempro 3/26, 3/27 and 3/28/90.



Project No. RC09303

CROSS SECTION A - A'
Chevron Service Station #9-5542
7007 San Ramon Road
Dublin, California

FIGURE
3

ATTACHMENT 1

GROUND WATER PROTECTION ORDINANCE PERMIT



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT Chevron Service Station #9-5542
7007 San Ramon Road
Dublin, California

PERMIT NUMBER 92597

LOCATION NUMBER

CLIENT

Name Chevron U.S.A. Products Co. Attn: Mr. Clint Rogers
Address 2410 Camino Ramon Phone (510) 842-8658
City San Ramon, CA Zip 94583-0804

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT

Name Geraghty & Miller, Inc.
Attn: Mr. Paul V. Heber
Address 1050 Marina Way South Phone (510) 233-3200
City Richmond, CA Zip 94804

TYPE OF PROJECT

Well Construction Geotechnical Investigation
Cathodic Protection General
Water Supply Contamination
Monitoring X Well Destruction X

PROPOSED WATER SUPPLY WELL USE

Domestic Industrial Other
Municipal Irrigation

DRILLING METHOD:

Mud Rotary Air Rotary Auger X
Cable Other

DRILLER'S LICENSE NO. C57610487

WELL PROJECTS

Drill Hole Diameter 8 1/2 in. Maximum
Casing Diameter 2 1/4 in. Depth 50 ft.
Surface Seal Depth 20+ ft. Number 3

GEOTECHNICAL PROJECTS

Number of Borings Maximum
Hole Diameter in. Depth ft.

ESTIMATED STARTING DATE November 24, 1992
ESTIMATED COMPLETION DATE

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [Signature]
















Approved: [Signature] Date 17 Nov 92
Wyman Hong







- A. GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling log and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.
B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.
E. WELL DESTRUCTION. See attached.




ATTACHMENT 2

BORING LOGS

KEY TO BORING LOG SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488					
MAJOR DIVISIONS			SYMBOL/ GRAPHIC	DESCRIPTIONS	
COARSE GRAINED SOILS (>50% by weight larger than #200 sieve)	GRAVELS (More than 50% of coarse fraction is larger than the #4 sieve size.)	Clean gravels with little or no fines	GW		Well Graded Gravels, Gravel - Sand Mixtures
		Gravels with over 12% fines	GP		Poorly Graded Gravels, Gravels - Sand Mixtures
		Gravels with over 12% fines	GM		Silty Gravels, Poorly Graded Gravel - Sand - Silt Mixtures
		Gravels with over 12% fines	GC		Clayey Gravels, Poorly Graded Gravel - Sand - Clay Mixtures
	SANDS (More than 50% of coarse fraction is smaller than #4 sieve size.)	Clean sands with little or no fines	SW		Well Graded Sands, Gravelly Sands
		Sands with over 12% fines	SP		Poorly Graded Sands, Gravelly Sands
		Sands with over 12% fines	SM		Silty Sands, Poorly Graded Sand - Silt Mixtures
		Sands with over 12% fines	SC		Clayey Sands, Poorly Graded Sand - Clay Mixtures
FINE GRAINED SOILS (>50% smaller than #200 sieve)	SILTS AND CLAYS (liquid limit less than 50)		ML		Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands
	SILTS AND CLAYS (liquid limit less than 50)		CL		Inorganic Clays of Low to Medium Plasticity, Gravelly, Sandy or Silty Clays; Lean Clays
	SILTS AND CLAYS (liquid limit less than 50)		OL		Organic Clays and Organic Silty Clays of Low Plasticity
	SILTS AND CLAYS (liquid limit greater than 50)		MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
	SILTS AND CLAYS (liquid limit greater than 50)		CH		Inorganic Clays of High Plasticity, Fat Clays
	SILTS AND CLAYS (liquid limit greater than 50)		OH		Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt		Peat and other Highly Organic Soils

-  Stabilized water level (date)
-  Water level encountered during drilling
-  Shaded interval represents soil sample. Blackened interval indicates portion of sample prepared for laboratory analysis.
-  Indicates no recovery of sample
-  Monitoring well
-  Soil boring

	Asphaltic Concrete
	Portland Cement Concrete
	Cement Grout

- PID Photo-ionization detector readings (ppmv)
- FID Flame-ionization detector readings (ppmv)
- EXP Gastech explosimeter readings (ppmv)



San Ramon Road

Station Building

MW-1

LOG OF BORING MW-1

Chevron Service Station #9-5542

7007 San Ramon Road

Dublin, California

Dublin Boulevard

Project No.: RC09303
 Logged By: M. M. Bessette
 Drilling Co.: Great Sierra
 Driller: Scott Irwin

Date Drilled: November 25, 1992
 Drilling Method: 10" hollow-stem auger
 Sampling Method: Continuous
 Inclination: Vertical

WELL CONSTRUCTION

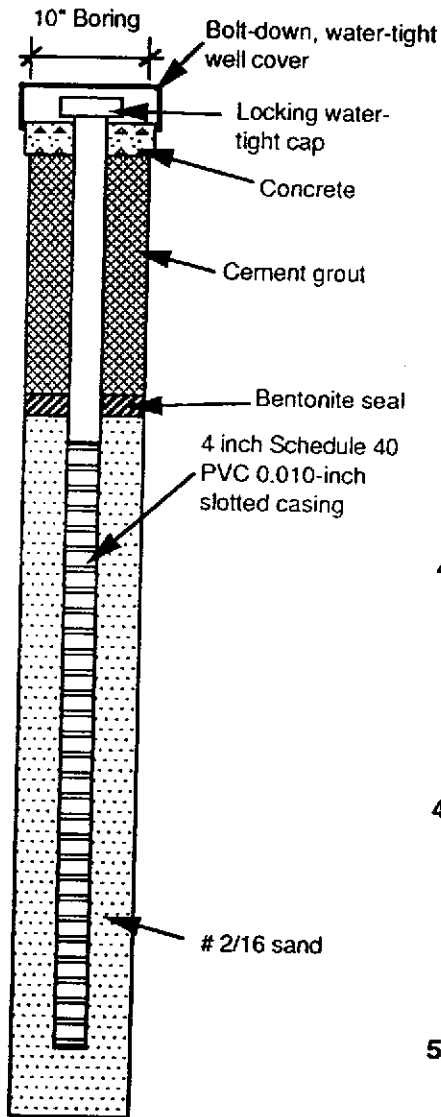
Depth (ft.)

Blows/ft.

Samples

Graphic

DESCRIPTION



Surface Elevation: 364.89 feet
 Casing Elevation: 364.53 feet

0 - 40 FEET BELOW GROUND SURFACE:

Geologic description of soil from ground surface to 40 feet below ground surface (BGS) previously logged by Chempro during the installation of the original Monitor Well MW-1 which was destroyed and rebores by Geraghty & Miller on this date to the depth of 50-feet below ground surface.

▼
11/25/92

SILTY CLAY (CL); dark yellowish brown (10 YR 5/3); 25-35% silt; trace coarse-grained sand; medium firm; damp.

@ 47 feet; SANDY CLAY (CL); brown (10YR, 5/3); 30-40% fine-grained sand; 5-10% medium-grained sand; very stiff; damp.

@ 50 feet; SILTY SANDY CLAY (CL); brown (10YR, 5/3); 40-50% clay; 35-45% fine to medium-grained sand; 10-20% silt; medium firm, damp.

Bottom of boring: 51.5 feet BGS



San Ramon Road

Station Building

VW-1

LOG OF BORING VW-1

Chevron Service Station #9-5542

7007 San Ramon Road

Dublin, California

Dublin Boulevard

Project No.: RC09303
 Logged By: M. M. Bessette
 Drilling Co.: Great Sierra
 Driller: Scott Irwin

Date Drilled: November 24, 1992
 Drilling Method: 10" hollow-stem auger
 Sampling Method: Continuous
 Inclination: Vertical

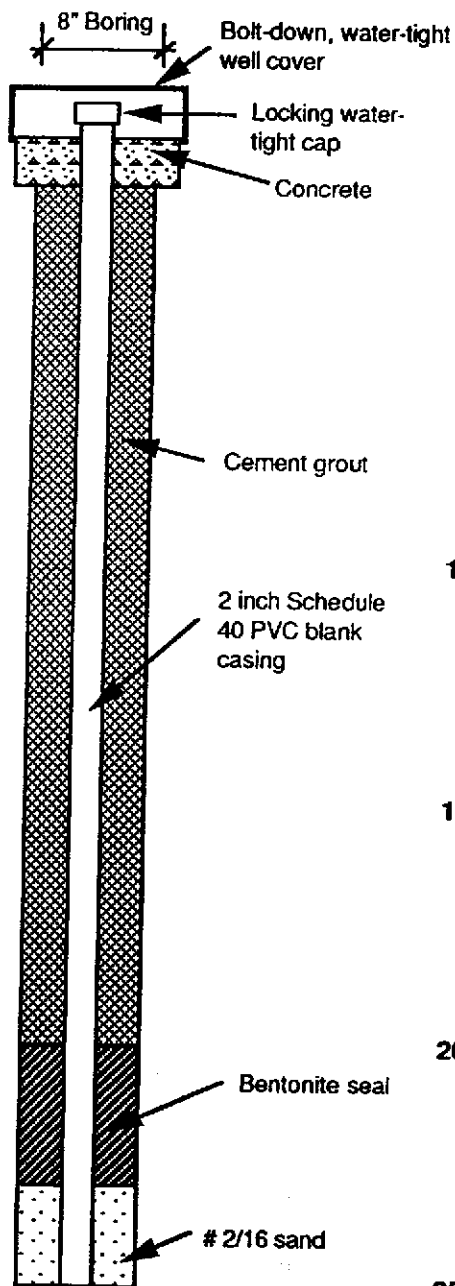
WELL CONSTRUCTION

Depth (ft.)
Blows/ft.

Samples

Graphic

DESCRIPTION



Surface Elevation: 363.80 feet
 Casing Elevation: 363.57 feet

SILTY GRAVEL (GM); Backfill material; dark brown (10YR, 4/3); poorly sorted; 50-60% fine-gravel; 40-50% silt; dense; dry.

CLAYEY SILT (ML); dark brown (10YR, 3/3); 5-15% fine-grained sand; 5-10% clay; 5-10% fine gravel; dense; dry; roots.

@ 8 feet: dark yellowish brown (10YR, 4/4); 75-85% silt; 15-25% fine-grained sand; trace coarse-grained sand; dry; dense; extensive root galleries.

@ 10 feet: very dark greyish brown (10YR, 5/4); 15-20% clay; trace fine-grained sand; hard; damp.

SILTY SAND (SM); brown (10YR 5/3); moderate sorting; 70-80% fine-grained sand; 20-30% silt; loose; damp.

@ 15 feet: trace coarse-grained sand.

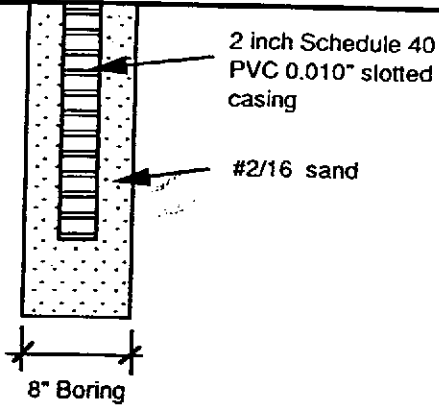
@ 17.5 feet: dark brown (10YR 4/3); poorly sorted; 60-70% fine-grained sand; 15-25% coarse gravel; 5-10% silt; 5-10% coarse-grained sand; damp.

SILT (ML); yellowish brown (10YR, 5/4); soft; damp.

@ 22 feet; dark brown (10YR, 4/3); 70-80% silt; 20-30% clay; trace fine-grained sand; stiff; damp.

@ 24 feet: dark grey; 60-70% silt; 15-25% clay; 10-15% fine-grained sand; stiff; damp.

WELL CONSTRUCTION



Depth (ft.)
Blows/ft.

Samples
Graphic

**LOG OF BORING VW-1
(continued)**

DESCRIPTION

30

35

40

45

50

55

60

@ 28 feet: dark greyish brown (SGY, 4/1); 60-70% silt; 20-25% very fine-grained sand; 5-15% clay; medium firm; damp.



11/24/92

Bottom of boring: 31.5 feet.



San Ramon Road

Station Building

VW-2

LOG OF BORING VW-2
Chevron Service Station #9-5542
7007 San Ramon Road
Dublin, California

Dublin Boulevard

Project No.: RC09303
 Logged By: M. M. Bessette
 Drilling Co.: Great Sierra
 Driller: Scott Irwin

Date Drilled: November 25, 1992
 Drilling Method: 8" hollow-stem auger
 Sampling Method: Split Spoon
 Inclination: Vertical

WELL CONSTRUCTION

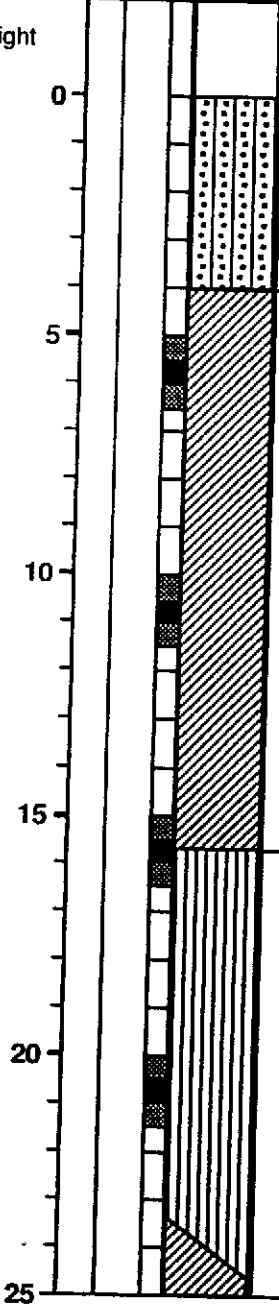
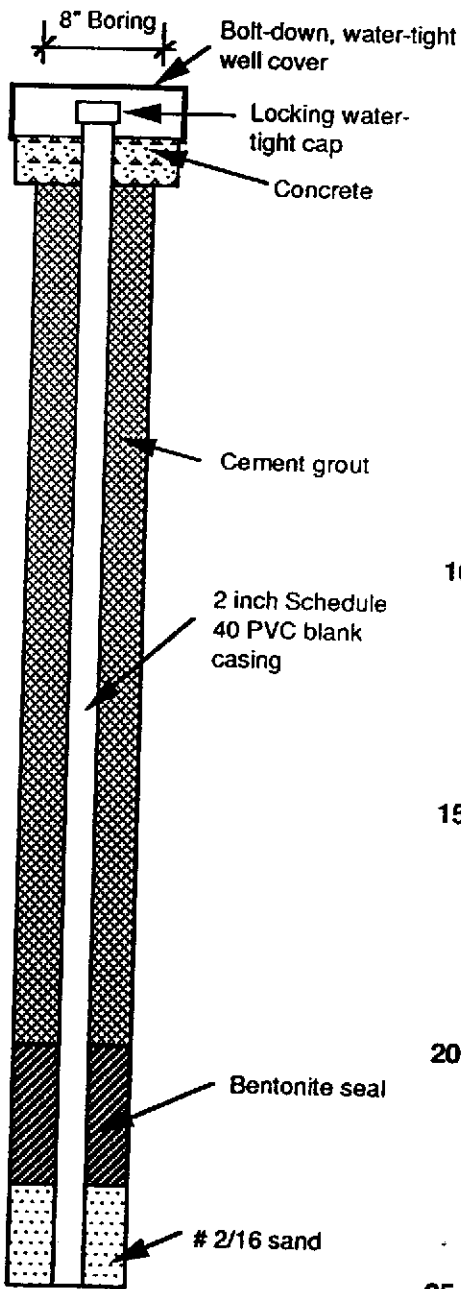
Depth (ft.)

Blows/ft.

Samples

Graphic

DESCRIPTION



Surface Elevation: 363.39 feet
 Casing Elevation: 363.10 feet

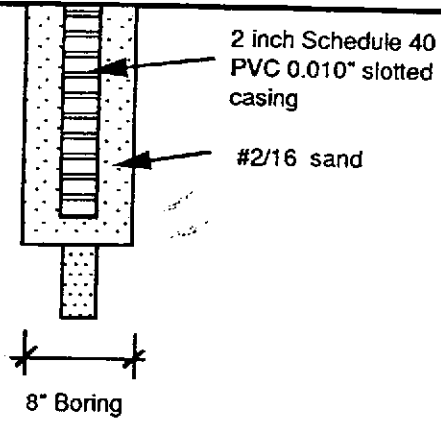
SILTY GRAVEL (GM); Backfill material; dark brown (10YR, 4/3); poorly sorted; 50-60% fine-gravel; 40-50% silt; dense; dry.

SILTY CLAY (CL); dark brown (10YR, 3/3); 60-70% clay; 15-25% fine-grained sand; 10-20% silt; roots; very stiff; dry.

SANDY SILT (ML); brown (10YR 5/3); poorly sorted; 50-60% silt; 30-40% fine-grained sand; trace coarse-grained sand; roots; stiff; damp.

@ 20 feet: same as above with moderate sorting; 15-25% fine-grained sand; trace medium-grained sand; stiff; damp.

WELL CONSTRUCTION

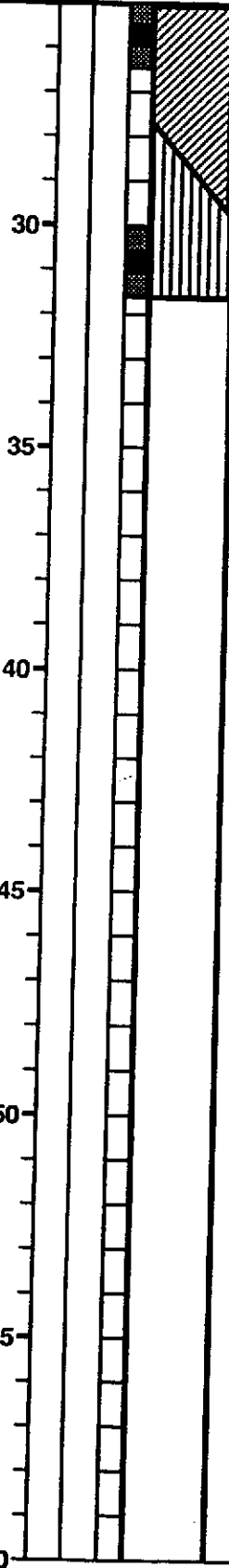


Depth (ft.)
Blows/ft.

Samples
Graphic

**LOG OF BORING VW-2
(continued)**

DESCRIPTION



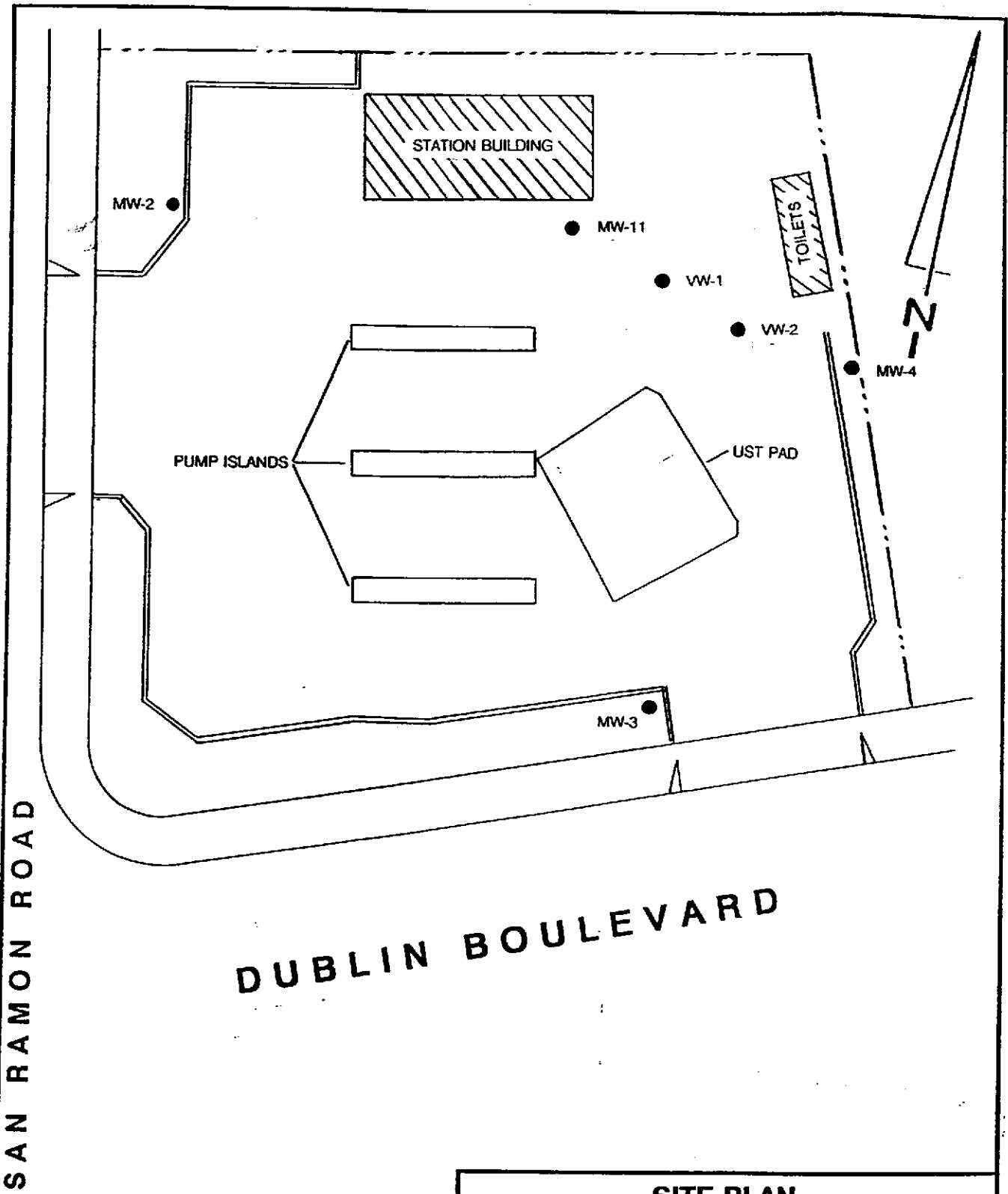
SILTY CLAY (CL); dark grayish brown (2.5Y, 4/2); 55-65% clay; 20-30% silt; 10-20% fine-grained sand; stiff; damp.

SANDY SILT (ML); dark greenish gray (5GY, 4/1); 50-60% silt; 35-45% fine-grained sand; 5-10% medium-grained sand; trace coarse-grained sand; stiff; damp.

Bottom of boring: 31.5 feet BGS

ATTACHMENT 3

SURVEY DATA



SAN RAMON ROAD

DUBLIN BOULEVARD

LEGEND

● Monitor Well

SITE PLAN

Chevron Service Station # 9-5542
 7007 San Ramon Road
 Dublin, California

PREPARED BY: FIELD DESIGNS

SCALE: 1" = 30'

DATE: 12/10/92

GROUND AND CASING ELEVATIONS

JOB #: RCO9303

DATE: 12/10/92

DATUM: N. SIDE TOP CASING OF MW-4

WELL #	ELEV.@ GROUND	ELEV.ON TOP CASING
MW-2	365.13 (on grass)	364.66
MW-3	362.56 (on ground)	362.28
MW-4	363.42 (on ground)	363.07
MW-1	364.89 (on AC)	364.53
VW-1	363.80 (on AC)	363.57
VW-2	363.39 (on AC)	363.10

RAWDATA FILE

JOB: 9234 Date 12-10-1992 Time 09:23:26.33
 Mode setup:North Azm,Dist ft,scale 1.000000, Earth crv OFF,offset 0.00
 Store :Pt 1 N 1000.00 E 5000.00, Elv 100.00, START
 Occupy:Pt 1 N 1000.00 E 5000.00, Elv 100.00, START
 Backsight:1-1, BS azm 0.0000, BS cir 0.0000
 HI / HR : Inst H 5.40 Rod H 4.60
 Side shot : 1-10 Ang-Rt 0.0001 Zen 89.3905 SlpD 98.16 ,BC
 Side shot : 1-11 Ang-Rt 21.2355 Zen 89.2533 SlpD 59.22 ,BC
 Side shot : 1-12 Ang-Rt 32.0614 Zen 89.3614 SlpD 76.38 ,BC
 Side shot : 1-13 Ang-Rt 60.5434 Zen 90.2006 SlpD 48.30 ,BC
 Side shot : 1-14 Ang-Rt 70.0304 Zen 90.3414 SlpD 24.14 ,BC
 Side shot : 1-15 Ang-Rt 86.3234 Zen 90.3529 SlpD 27.90 ,BC
 HI / HR : Inst H 5.40 Rod H 4.62
 Side shot : 1-16 Ang-Rt 122.4821 Zen 93.0452 SlpD 17.10 ,MW4
 Store :Pt 1 N 1000.00 E 5000.00, Elv 363.21, START
 Occupy:Pt 1 N 1000.00 E 5000.00, Elv 363.21, START
 Backsight:1-1, BS azm 0.0000, BS cir 0.0000
 Side shot : 1-16 Ang-Rt 122.3911 Zen 93.0453 SlpD 17.16 ,MW4
 Side shot : 1-16 Ang-Rt 122.3910 Zen 93.0453 SlpD 17.14 ,MW4
 HI / HR : Inst H 5.40 Rod H 8.00
 Side shot : 1-17 Ang-Rt 14.1922 Zen 86.0644 SlpD 57.82 ,MW11
 Side shot : 1-18 Ang-Rt 21.0544 Zen 85.2214 SlpD 36.64 ,VW1
 Side shot : 1-19 Ang-Rt 35.5328 Zen 82.3301 SlpD 19.18 ,VW2
 Side shot : 1-20 Ang-Rt 268.0624 Zen 88.3521 SlpD 67.68 ,MW-3
 Side shot : 1-21 Ang-Rt 352.0058 Zen 88.1653 SlpD 135.10 ,MW-2
 HI / HR : Inst H 5.40 Rod H 4.62
 Side shot : 1-22 Ang-Rt 349.5650 Zen 89.4445 SlpD 53.52 ,END ISLAND 5' W
 Side shot : 1-23 Ang-Rt 321.3340 Zen 90.1255 SlpD 52.34 ,END ISLAND 5' W
 Side shot : 1-24 Ang-Rt 297.5021 Zen 90.2533 SlpD 63.08 ,END ISLAND 5' W
 Side shot : 1-25 Ang-Rt 311.1241 Zen 90.0214 SlpD 97.68 ,END ISLAND 5' W
 Side shot : 1-26 Ang-Rt 328.0952 Zen 89.4634 SlpD 90.84 ,E IS. N. SIDE
 Side shot : 1-27 Ang-Rt 341.2433 Zen 89.3353 SlpD 91.30 ,E IS. S. SIDE
 Side shot : 1-28 Ang-Rt 324.1246 Zen 90.1135 SlpD 51.90 ,COR TANK PAD
 Side shot : 1-29 Ang-Rt 342.5212 Zen 91.0546 SlpD 28.70 ,COR TANK PAD
 Side shot : 1-30 Ang-Rt 340.5104 Zen 91.2713 SlpD 25.94 ,COR TANK PAD
 Side shot : 1-31 Ang-Rt 264.3403 Zen 93.3859 SlpD 24.96 ,COR TANK PAD
 Side shot : 1-32 Ang-Rt 263.5921 Zen 93.2013 SlpD 27.78 ,COR TANK PAD
 Side shot : 1-33 Ang-Rt 285.3450 Zen 91.1533 SlpD 52.98 ,COR TANK PAD
 Store :Pt 10 N 1098.16 E 5000.00, Elv 0.00, BC
 Store :Pt 11 N 1055.13 E 5021.61, Elv 0.00, BC
 Store :Pt 12 N 1064.70 E 5040.59, Elv 0.00, BC
 Store :Pt 13 N 1023.48 E 5042.21, Elv 0.00, BC
 Store :Pt 14 N 1008.24 E 5022.69, Elv 0.00, BC
 Store :Pt 15 N 1001.68 E 5027.85, Elv 0.00, BC
 Store :Pt 16 N 990.77 E 5014.41, Elv 363.07, MW-4
 Store :Pt 17 N 1055.89 E 5014.27, Elv 364.53, MW-11
 Store :Pt 18 N 1034.07 E 5013.14, Elv 363.57, VW-1
 Store :Pt 19 N 1015.41 E 5011.15, Elv 363.10, VW-2

(C) Copyright QUICK SURVEYOR (unpublished)

Date 12-11-1992 Time 08:54:35 Total Computer Time 2 MIN

Job 9234 Scope LOCATE M-WELLS Client GERAGHTY & MILLE City DUBLIN

Point#	Northing	Easting	Elev.	Description
1	1000.0000	5000.0000	363.210	START
10	1098.1582	5000.0005	0.000	BC
11	1055.1349	5021.6056	0.000	BC
12	1064.6989	5040.5916	0.000	BC
13	1023.4826	5042.2063	0.000	BC
14	1008.2357	5022.6904	0.000	BC
15	1001.6824	5027.8477	0.000	BC
16	990.7655	5014.4103	363.069	MW-4
17	1055.8939	5014.2708	364.530	MW-11
18	1034.0729	5013.1446	363.567	VW-1
19	1015.4072	5011.1493	363.097	VW-2
20	997.7646	4932.3775	362.276	MW-3
21	1133.7303	4981.2438	364.662	MW-2
22	1052.6978	4990.6579	364.227	END ISLAND 5' W
23	1040.9962	4967.4615	363.793	END ISLAND 5' W
24	1029.4570	4944.2223	363.521	END ISLAND 5' W
25	1064.3554	4926.5169	363.927	END ISLAND 5' W
26	1077.1739	4952.0838	364.345	E IS. N. SIDE
27	1086.5334	4970.8937	364.684	E IS. S. SIDE
28	1042.1007	4969.6503	363.815	COR TANK PAD
29	1027.4218	4991.5482	363.441	COR TANK PAD
30	1024.4968	4991.4938	363.332	COR TANK PAD
31	997.6418	4975.2025	362.401	COR TANK PAD
32	997.0959	4972.4196	362.373	COR TANK PAD
33	1014.2266	4948.9791	362.826	COR TANK PAD

DESCRIPTION CODES

AP = ANGLE POINT
AC = ASPHALT
BW = BACK WALK
BM = BENCH MARK
BB = BOTTOM BANK
BS = BOTTOM SLOPE (TOE)
BCxx = BUILDING CORNER
CTV = CABLE TV
CB = CATCH BASIN
CTR = CENTER
C/L = CENTER LINE
CLF = CHAIN LINK FENC
CONC = CONCRETE
CBLK = CONCRETE BLOCK
CONP = CONCRETE PIPE
CP = CONTROL POINT
COR = CORNER
CFxx = CORNER FENCE
CMP = CORRUGATED METAL PIPE
CUL = CULVERT
CULD = CUL D'SAC
DD = DRAINAGE DITCH
DL = DRIP LINE
DI = DROP INLET
DWY = DRIVEWAY
E = EDGE
EAC = EDGE AC
EACR = EDGE AC ROAD
ECR = EDGE CONCRETE ROAD
EP = EDGE PAVEMENT
EW = EDGE WATER
EL = ELEVATION
FC = FACE CURB @ TOP CURB
F = FENCE
FI = FIELD INLET
FH = FIRE HYDRANT
FL = FLOW LINE
FND = FOUND
FW = FRONT WALK
G = GAS
GND = GROUND
HP = HIGH POINT
INT = INTERSECTION
INV = INVERT
IR = IRRIGATION
JP = JOINT POLE
LF = FENCE LINE
LP = LIGHT POLE
LOP = LOW POINT
NH = MAN HOLE
M = METER

OC = ON CURVE
OS = ON SLOPE
OVH = OVERHEAD
P = PARALLEL
PGE = P, G & E
PC = PROPERTY CORNER
PL = PROPERTY LINE
R = RIGHT ANGLE
RET = RETURN (CURB)
RW = RETAINING WALL
ROW = RIGHT OF WAY
RD = ROAD
RK = ROCK
STN = STONE
ST = STREET
TEL = TELCO/TELEPHONE
TBM = TEMPORARY BENCH MARK
TB = TOP BANK
TS = TOP SLOPE
V = VALVE
VD = V-DITCH
VG = VALLEY GUTTER
VLT = VAULT
H2O = WATER
WL = WATER LINE
W = WOOD
WI = WIRE
WP = WORK POINT

ATTACHMENT 4

FIELD DATA FROM WELL DEVELOPMENT

Well Development
WATER SAMPLING LOG

Project Number RC0930 Date 12-10-92
 Project Name (Chevron) Dublin Well No. _____
 Weather Cloudy Time Sampling Began _____ Time Sampling Completed _____
 Developer's Name Darryl Corbin West. Hazard Drilling

EVACUATION DATA

Description of Measuring Point (MP) _____
 Total Sounded Depth of Well Below MP 50' Diameter of Casing 4"
 Held _____ Depth to Water Below MP 27.8 Calculated Gallons Purged Prior to Sampling 120
 Wet _____ Water Column in Well 22.2 Sampling Pump Intake Setting (feet below measuring point) _____
 Gallons per Foot .65
 Gallons in Well 14.43
 Purge Method: PVC Bailer 1" Diaphragm Pump 2" Submersible Pump
 Disposable Bailer 2" Diaphragm Pump 4" Submersible Pump
 Other Stainless Steel Bailer

FIELD PARAMETERS

START TIME	Time	Cumulative Gallons	Temperature (°F) °C	Specific Cond. µS/cm	pH	NTU	Color
	<u>10:15</u>	<u>35</u>	<u>63.2</u>	<u>6.75 x 100</u>	<u>10.53</u>	<u>Over 200</u>	<u>Golden Brown</u>
	<u>11:40</u>	<u>75</u>	<u>62.2</u>	<u>5.67 x 100</u>	<u>9.71</u>	<u>Over 200</u>	<u>Lite Golden Brown</u>
	<u>12:10</u>	<u>100</u>	<u>63.3</u>	<u>9.95 x 100</u>	<u>7.99</u>	<u>Over 200</u>	<u>Cloudy</u>
	<u>12:30</u>	<u>120</u>	<u>62.7</u>	<u>10.32 x 100</u>	<u>7.63</u>	<u>Over 200</u>	<u>Cloudy</u>

SAMPLING

Sampling Method _____ Actual Gallons Purged Prior to Sampling _____
 Time _____ Depth to Water _____ Color _____ NTU _____

REMARKS: _____

ATTACHMENT 5

COPIES OF CERTIFIED LABORATORY REPORTS

AND

CHAIN-OF-CUSTODY DOCUMENTATION



Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Geraghty & Miller
Attn: PAUL HEHN

Project RC09303
Reported 12/10/92

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed Matrix
87290- 1	VW-1-5	11/24/92	12/06/92 Soil
87290- 2	VW-1-14	11/24/92	12/07/92 Soil
87290- 3	VW-1-14.5	11/24/92	12/06/92 Soil
87290- 4	VW-1-19.5	11/24/92	12/06/92 Soil
87290- 5	VW-1-24	11/24/92	12/06/92 Soil
87290- 6	VW-1-27	11/24/92	12/05/92 Soil
87290- 7	VW-1-31	11/24/92	12/06/92 Soil
87290-11	VW-2-5	11/24/92	12/04/92 Soil
87290-12	VW-2-10	11/24/92	12/04/92 Soil
87290-13	VW-2-15	11/24/92	12/06/92 Soil

RESULTS OF ANALYSIS

Laboratory Number: 87290- 1 87290- 2 87290- 3 87290- 4 87290- 5

Gasoline:	ND<1	ND<1	2	250	990
Benzene:	ND<.005	ND<.005	ND<.005	0.081	2.4
Toluene:	0.006	ND<.005	0.058	5.6	60
Ethyl Benzene:	ND<.005	ND<.005	0.029	3.4	15
Xylenes:	ND<.005	ND<.005	1.4	20	99
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Laboratory Number: 87290- 6 87290- 7 87290-11 87290-12 87290-13

Gasoline:	230	130	ND<1	ND<1	ND<1
Benzene:	2.0	ND<0.05	ND<.005	0.006	ND<.005
Toluene:	15	0.73	ND<.005	ND<.005	ND<.005
Ethyl Benzene:	5.4	1.0	ND<.005	ND<.005	ND<.005
Xylenes:	27	3.9	ND<.005	ND<.005	0.009
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg



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Geraghty & Miller
Attn: PAUL HEHN

Project RC09303
Reported 12/10/92

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed Matrix
87290-14	VW-2-20	11/24/92	12/06/92 Soil
87290-15	VW-2-25	11/24/92	12/06/92 Soil
87290-16	VW-2-30	11/24/92	12/06/92 Soil

RESULTS OF ANALYSIS

Laboratory Number: 87290-14 87290-15 87290-16

Gasoline:	220	650	1
Benzene:	0.65	2.7	0.070
Toluene:	8.1	23	0.010
Ethyl Benzene:	2.6	9.0	0.012
Xylenes:	13	49	0.025
Concentration:	mg/kg	mg/kg	mg/kg



Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 87290
CLIENT: Geraghty & Miller
CLIENT JOB NO.: RC09303

DATE RECEIVED: 11/27/92
DATE REPORTED: 12/02/92
DATE SAMPLED : 11/25/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by MODIFIED EPA SW-846 METHOD 5030 and 8015

LAB #	Sample Identification	Concentration (mg/kg) Gasoline Range
10	SP-1A,B,C,D	290

mg/kg - parts per million (ppm)

Method Detection Limit for Gasoline in Soil: 1 mg/kg

QAQC Summary:

Daily Standard run at 2mg/L: RPD Gasoline = <15
MS/MSD Average Recovery = 89% : Duplicate RPD = 0%

Richard Srna, Ph.D.


Laboratory Director



Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 87290
CLIENT: Geraghty & Miller
CLIENT JOB NO.: RC09303

DATE RECEIVED: 11/27/92
DATE REPORTED: 12/02/92
DATE SAMPLED : 11/25/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration (mg/kg)			
		Benzene	Toluene	Ethyl Benzene	Xylenes
10	SP-1A,B,C,D	0.83	11	5.2	27

mg/kg - parts per million (ppm)

Method Detection Limit in Soil: 0.005 mg/kg

QAQC Summary:

Daily Standard run at 20 $\mu\text{g/L}$: RPD = <15%
MS/MSD Average Recovery = 93% : Duplicate RPD = <1%

Richard Srna, Ph.D.


Laboratory Director



Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

Page 3 of 3
QA/QC INFORMATION
SET: 87290

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
mg/kg = parts per million (ppm)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Soil: 50mg/kg

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Soil: 1mg/kg

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Soil: 1mg/kg

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Soil: 0.005mg/kg

ANALYTE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	200 ng	91/91	0%	70-130
Benzene:	200 ng	103/95	8%	70-130
Toluene:	200 ng	104/95	9%	70-130
Ethyl Benzene:	200 ng	106/97	9%	70-130
Xylenes:	200 ng	107/98	9%	70-130

Richard Srna, Ph.D.

Richard Srna
Laboratory Director

4009

copy of Lab Report and COC to Chevron Contact: Yes No

Hold time Dec. 9 87290 Chain-of-Custody-Record

U.S.A. Inc.
 DX 5004
 on, CA 94583
 5)842-9591

Chevron Facility Number 9-5542
 Facility Address 7007 SW RAMON ROAD, DUBAI, CA
 Consultant Project Number RC09303
 Consultant Name GERAGHTY & MILLER, INC.
 Address 1050 MARINA WAY SOUTH, RICHMOND, CA
 Project Contact (Name) PAUL HEHN
 (Phone) (510) 233-3200 (Fax Number) (510) 233-3204

Chevron Contact (Name) CLINT ROGERS
 (Phone) _____
 Laboratory Name SUPERIOR
 Laboratory Release Number 5464460
 Samples Collected by (Name) MICHAEL BERRIETTE
 Collection Date 11/24/92 to 11/25/92
 Signature m. m. [unclear]

Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iod (Yes or No)	Analyses To Be Performed										Remarks			
							ENEX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)						
#1	1	S	G	11/24		Yes	X													
#2	1	S		11/24			X													
#3	1	S		11/24			X													
#4	1	S		11/24			X													
#5	1	S		11/24			X													
#6	1	S		11/24			X													
#7	1	S		11/24			X													
#8	1	S		11/25			X													
#9	1	S		11/25			X													
#10	1	S	C	11/25																
#10	1	S		11/25																
#10	1	S		11/25																
#10	1	S		11/25																

Fax Copy of CAR w/CHEV. STATION # ADDRESS TO: BENCH PETROLEUM ATTN: SHREER BIPER FAX (408) 942-0131

Please Initial: _____
 Samples Stored in ice. _____
 Appropriate containers. _____
 Samples preserved. _____
 VOA's without headspace. _____
 Comments: _____

COMPOSITE
 4:1
 48 hr
 TAT

Prepared By (Signature) <u>[Signature]</u>	Organization <u>GEM</u>	Date/Time <u>11/25/92 1420</u>	Received By (Signature) <u>J. O'Connell</u>	Organization <u>Express-H</u>	Date/Time <u>11-25-92 1420</u>	Turn Around Time (Circle Choice) 24 Hrs. 48 Hrs. <u>ONLY ON COMPOSITE</u> 6 Days 10 Days <u>As Contracted</u>
Prepared By (Signature) <u>[Signature]</u>	Organization <u>Express-H</u>	Date/Time <u>11-25-92 1637</u>	Received By (Signature) _____	Organization _____	Date/Time _____	
Prepared By (Signature) <u>[Signature]</u>	Organization <u>Express-H</u>	Date/Time <u>11/25/92 1319</u>	Received For Laboratory By (Signature) _____	Organization _____	Date/Time <u>11/27/92 12:30</u>	