gettler — ryan inc.

June 25, 1991

Ms. Pam Evans
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Reference Former Shell Service Station
15275 Washington Street
San Leandro, California
WIC 204-6852-1008

Ms. Evans:

As requested by Jack Brastad of Shell Oil Company, we are forwarding the June 24, 1991 Site Update / Well Installation report prepared for the referenced location. The report presents the results of the ground-water sampling conducted during the second quarter of 1991, and describes the installation of ground-water monitoring well S-18.

Should have any questions or comments please do not hesitate to call.

Sincerely,

John Werfal
Project Manager

enclosure

cc: Mr. Tom Callaghan, Regional Water Quality Control Board
Mr. Jack Brastad, Shell Oil Company.

2150 west winton avenue • hayward, california 94545-1210 • (415) 783-7500

GeoStrategies Inc.

SITE UPDATE/WELL INSTALLATION REPORT

Former Shell Service Station
15275 Washington Avenue
San Leandro, California
WIC 204-6852-1008

761502-13

June 24, 1991

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

June 24, 1991

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Attn: Mr. John Werfal

Re: SITE UPDATE/WELL INSTALLATION REPORT
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

Gentlemen:

This Site Update/Well Installation Report has been prepared by GeoStrategies Inc. (GSI) and describes the installation of ground-water monitoring well S-18 at the above-referenced location (Plate 1). This report also presents the results of the 1991 second quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) for the site. This work was performed at the request of Shell Oil Company to evaluate the extent of petroleum hydrocarbons in soils and groundwater in the uppermost water-bearing zone. The well location is shown on Plate 2. Field work was performed on May 16, 1991. Field procedures were performed to comply with State of California and local agency guidelines and was performed in accordance with the GSI Field Methods and Procedures presented in Appendix A.

EXECUTIVE SUMMARY

- One groundwater monitoring well (S-18) was installed off-site.
- Silt, sand and clay were encountered to the total explored depth of approximately 20.5 feet below ground surface. The shallow water-bearing material consists of silty sand which is encountered at 6.5 feet below ground surface. The water-bearing zone extends to 12.5 feet below ground surface. A suspected basal aquitard was identified at approximately 13 feet below grade. Groundwater was first encountered at 7.5 feet below ground surface.

- Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and benzene were not detected in the soil sample submitted for chemical analysis.

- Ground-water monitoring and sampling was performed for the monitoring network on April 25, 1991. Shallow groundwater flow is to the southwest with an approximate hydraulic gradient of 0.0025. TPH-Gasoline and benzene were not detected in the new well, S-18. TPH-Gasoline was detected at concentrations ranging from 0.06 to 120. parts per million (ppm). Benzene was detected at concentrations ranging from 0.0037 to 5.1 ppm. Ground-water was collected from newly installed S-18 on May 31, 1991. TPH-Gasoline and benzene were not detected.

FIELD ACTIVITIES AND PROCEDURES

One off-site ground-water monitoring well (S-18) was drilled on May 16, 1991, using a truck-mounted, hollow-stem auger rig. Soil samples were collected at five-foot intervals using a modified California split-spoon sampler fitted with brass or stainless steel tube liners. A GSI geologist observed the drilling, described the soil samples using the United Soil Classification System and Munsell Soil Color Chart, and prepared a lithologic log for each boring. The exploratory boring logs are presented in Appendix B.

Soil Sampling

Soils collected from each sampled interval in exploratory boring S-18 were used to perform head-space analysis in the field for the presence of organic vapor. The test procedures involved removing soil from a brass liner into a clean glass jar and immediately covering the jar with aluminum foil secured under a ring-type threaded lid. After approximately twenty minutes, the foil was pierced and the head-space within the jar was tested for total organic vapor using an Organic Vapor Monitor (OVM) photoionization detector.

These field procedures are performed and recorded as reconnaissance data. GSI does not consider field screening techniques to be verification of contamination. Soil sample selection for chemical analysis is based upon site-specific geological conditions as they relate to potential contamination migration pathways and confining layers. Head-space analysis results are presented on the appended exploratory boring log (Appendix B).

Soil samples retained for chemical analysis were collected in clean brass or stainless steel tube liners. Upon removal from the sampler, the tubes were immediately covered on both ends with aluminum foil and sealed with plastic end caps. The soil samples were labeled, entered on a Chain-of-Custody form, placed in a cooler with blue ice, and transported to International Technology (IT) Analytical Services, a State-certified laboratory located in San Jose, California.

Monitoring Well Installation

Well S-18 was installed to a depth of 18 feet below ground surface. The well completion detail is presented with the exploratory boring log in Appendix B. The monitoring well was constructed using 3-inch-diameter Schedule 40 PVC well casing with 0.020-inch machine-slotted well screen. The well screen extends from 4 to 18 feet below ground surface. Lonestar #2/12 graded sand was placed in the annular space from the bottom of the well screen to two feet above the top of the well screen. The well seal consists of a one-foot thick bentonite seal above the sand pack followed by a cement grout seal to 1.5 feet below grade. An access vault set in concrete was installed over the top of the well. A water-proof locking well cap and lock were placed on the top of the well casing.

HYDROGEOLOGIC CONDITIONS

The site is located 2.3 miles east of San Francisco Bay in Alameda County. The site is also approximately 1000 feet north of San Lorenzo Creek. The area is underlain by Holocene alluvium (Helley, et al; 1979). The alluvium consists of fine to medium grained, poorly to moderately sorted, irregularly interbedded clay, silt, sand, and gravel.

Soils encountered during the drilling of Boring S-18 consist predominantly of silt and clay, with varying amount of sand and gravel. Surficial fill overlying the vadose zone materials consists of sand with some gravel, and was encountered from ground surface to a depth of approximately 2 feet. The vadose zone overlying the shallow water-bearing zone consists of silt. The shallow water-bearing zone consists of sand with silt, was first encountered at approximately 6.5 feet below ground surface, and is about 6 feet thick. The shallow water-bearing unit is underlain by a clay layer which was encountered from approximately 12 to 21.5 feet. These findings are consistent with previous site investigations.

The potentiometric data collected on April 25, 1991 indicate that shallow groundwater flows southwest with a calculated hydraulic gradient of 0.0025. These data are presented in Table 1.

CHEMICAL ANALYTICAL RESULTS

Soil Analytical Results

One soil sample was analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) according to EPA Method 8020. TPH-Gasoline and benzene were not detected in the soil sample collected from Boring S-18 at the 4.5 foot depth interval. Toluene was detected at 0.06 ppm in the soil sample. A copy of the IT Analytical Services report and the Chain-of-Custody forms are presented in Appendix C.

Ground-water Analytical Results

Gettler-Ryan Inc. (G-R) collected ground-water samples from the monitoring network on April 25, 1991. Ground-water samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. S-18 was sampled on May 31, 1991.

TPH-Gasoline was detected in Wells S-1, S-3, S-5, S-7, S-8, S-9, S-12, S-13, S-14, and S-16 at concentrations ranging from 0.06 to 120. ppm. Benzene was detected in Wells S-1, S-3, S-5, S-8, S-9, S-12, S-13, S-14, and S-16 at concentrations ranging from 0.0038 to 5.1 ppm. These data are presented in Table 2 and were used to construct TPH-Gasoline and Benzene isoconcentration maps (Plates 4 and 5), respectively. The IT Analytical Services report and the Chain-of-Custody forms are presented in Appendix D.

If you have any questions, please call.

GeoStrategies Inc. by,

Ellen C. Fostersmith

Ellen C. Fostersmith
Geologist

David H. Peterson

REGISTERED GEOLOGIST
DAVID H. PETERSON
No. 1186
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

David H. Peterson
C.E.G. 1186

ECF/DHP/kjj

Plate 1. Vicinity Map
Plate 2. Site Map
Plate 3. Potentiometric Map
Plate 4. TPH-Gasoline Isoconcentration Map
Plate 5. Benzene Isoconcentration Map

Appendix A: Field Methods and Procedures
Appendix B: Exploratory Boring Logs and Well Construction Details
Appendix C: Soil Chemical Analytical Report
Appendix D: Groundwater Chemical Analytical Reports

QC Review: GKP

761502-13

References Cited

Helley, E.J. et al; 1979 Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning; Selected Examples from the San Francisco Bay Region; California; U.S. Geologic Survey Professional Paper 943.

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (uMHOS/cm)
S-1	25-Apr-91	3	19.9	21.55	7.18	----	14.37	6	7.24	67.7	1131
S-3	25-Apr-91	3	15.3	21.14	6.91	----	14.23	3	6.87	65.3	1414
S-5	25-Apr-91	3	18.4	21.41	7.40	----	14.01	5	6.97	65.9	1236
S-6	25-Apr-91	3	24.8	22.02	7.74	----	14.28	3	7.51	68.2	1011
S-7	25-Apr-91	3	21.7	21.47	7.25	----	14.22	3	7.25	67.7	1448
S-8	25-Apr-91	3	24.3	20.72	6.72	----	14.00	3	7.15	68.0	1576
S-9	25-Apr-91	3	17.9	20.96	6.09	----	14.87	3	6.94	66.5	1472
S-10	25-Apr-91	3	18.2	20.69	6.91	----	13.78	3	7.38	63.4	921
S-11	25-Apr-91	3	22.5	21.26	7.53	----	13.73	2	7.50	65.3	1139
S-12	25-Apr-91	3	24.0	21.05	7.08	----	13.97	3	7.28	66.0	1223
S-13	25-Apr-91	3	23.9	20.57	7.00	----	13.57	5	7.21	66.1	1567

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. pH values reported in pH units.
4. Static water-levels corrected for floating product (conversion factor = 0.80).
5. Well SR-1 was monitored, but not sampled.

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (uMHOS/cm)
S-14	25-Apr-91	3	23.1	20.44	6.40	----	14.04	5	7.24	64.9	1428
S-15	25-Apr-91	3	23.6	22.22	7.83	----	14.39	5	7.49	67.6	1021
S-16	25-Apr-91	3	24.2	21.82	7.48	----	14.34	5	7.15	65.0	1431
S-17	25-Apr-91	3	24.4	20.95	7.15	----	13.80	5	7.27	66.2	1037
SR-1	25-Apr-91	6	21.2	21.45	6.91	----	14.54	----	----	----	----

TABLE 2

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-1	25-Apr-91	03-May-91	0.08^	0.0037	<0.0005	0.0007	0.0020
S-3	25-Apr-91	03-May-91	120.	3.9	3.6	2.4	8.9
S-5	25-Apr-91	03-May-91	67.	5.1	3.1	2.8	11.
S-6	25-Apr-91	03-May-91	<0.05	<0.0005	<0.0005	<0.0005	0.0007
S-7	25-Apr-91	03-May-91	0.06*	<0.0005	<0.0005	<0.0005	<0.0005
S-8	25-Apr-91	03-May-91	0.13*	0.019	<0.0005	0.0013	0.0011

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

CURRENT DHS ACTION LEVELS
Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

SD = Duplicate Sample
SF = Field Blank
TB = Trip Blank

Note: 1. All data shown as <x are reported as ND (none detected).
2. DHS Action Levels and MCLs are subject to change pending State review.

^ Compounds detected and calculated as low boiling hydrocarbons are due to a petroleum mixture other than gasoline.

* Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the range of gasoline, but are not characteristic of the standard gasoline pattern.

~ Compounds detected and calculated as low boiling hydrocarbons are due to the volatile aromatics present. Gasoline was not detected.

TABLE 2

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-9	25-Apr-91	03-May-91	5.8	0.88	0.0090	0.36	0.50
S-10	25-Apr-91	04-May-91	<0.05	<0.0005	<0.0005	0.0011	0.0008
S-11	25-Apr-91	04-May-91	<0.05	<0.0005	<0.0005	0.0008	<0.0005
S-12	25-Apr-91	04-May-91	0.09	0.0054	<0.0005	0.0011	0.0007
S-13	25-Apr-91	04-May-91	0.44*	0.0038	<0.0005	0.0012	0.0006
S-14	25-Apr-91	03-May-91	14.	0.93	0.43	0.25	0.97
S-15	25-Apr-91	03-May-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-16	25-Apr-91	02-May-91	0.06-	0.021	0.0005	0.0032	0.0048
S-17	25-Apr-91	02-May-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-18	31-May-91	06-Jun-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
SD-1	25-Apr-91	03-May-91	0.06	0.0036	<0.0005	<0.0005	0.0014
SF-6	25-Apr-91	03-May-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	----	01-May-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	----	06-Jun-91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
08-Jul-85	S-1	0.52	N/A	N/A	N/A	N/A
06-Sep-88	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
16-Nov-88	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
27-Feb-89	S-1	<0.05	0.0005	<0.001	<0.001	<0.003
04-May-89	S-1	<0.05	0.001	<0.001	<0.001	<0.003
10-Aug-89	S-1	<0.05	0.0007	<0.001	<0.001	<0.003
10-Oct-89	S-1	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-1	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-1	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-1	0.08	0.0050	<0.0005	<0.0005	0.0030
28-Jan-91	S-1	<0.05	.0045	<0.0005	<0.0005	0.002
25-Apr-91	S-1	0.08&	0.0037	<0.0005	0.0007	0.0020
08-Jul-85	S-2	2.20	N/A	N/A	N/A	N/A
06-Sep-88	S-3	96.	3.4	9.5	2.7	17.
16-Nov-88	S-3	70.	4.6	8.4	2.5	13.
27-Feb-89	S-3	32.	2.4	3.1	1.5	6.4
04-May-89	S-3	47.	4.4	6.3	2.4	15.
09-Aug-89	S-3	110.	5.7	5.7	3.2	19.
10-Oct-89	S-3	52.	4.6	3.3	2.6	15.
25-Jan-90	S-3	420.	5.2	4.1	6.7	34.
18-Apr-90	S-3	58.	3.8	1.4	2.4	12.
23-Jul-90	S-3	49.	3.4	1.8	2.3	12.
18-Oct-90	S-3	44.	3.5	0.65	2.4	11.
28-Jan-91	S-3	64.	4.09	0.57	1.94	8.09
25-Apr-91	S-3	120.	3.9	3.6	2.4	8.9
08-Jul-85	S-4	32.	N/A	N/A	N/A	N/A

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
08-Jan-87	S-5	7.8	0.38	0.510	----	1.0
06-Sep-88	S-5	7.	2.6	0.06	0.4	0.7
16-Nov-88	S-5	3.	0.66	0.06	0.12	0.22
27-Feb-89	S-5	5.7	2.	0.22	0.26	0.32
04-May-89	S-5	9.	3.	0.6	0.63	1.7
09-Aug-89	S-5	5.1	1.1	<0.05	0.27	0.4
10-Oct-89	S-5	15.	3.3	0.16	0.83	2.2
25-Jan-90	S-5	12.	2.4	0.36	0.57	1.4
18-Apr-90	S-5	5.2	1.1	0.04	0.30	0.46
23-Jul-90	S-5	5.5	1.3	0.14	0.32	0.73
18-Oct-90	S-5	12.	3.2	0.04	0.72	0.90
28-Jan-91	S-5	2.55	0.41	.015	0.11	0.06
25-Apr-91	S-5	67.	5.1	3.1	2.8	11.
16-Nov-88	S-6	0.05	0.0007	<0.001	<0.001	<0.003
27-Feb-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
04-May-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Aug-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Oct-89	S-6	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-6	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-6	<0.050	<0.0005	0.0006	<0.0005	0.001
23-Jul-90	S-6	<0.05	<0.0005	0.0009	<0.0005	0.0018
18-Oct-90	S-6	<0.05	<0.0005	0.0007	<0.0005	0.0008
28-Jan-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-6	<0.05	<0.0005	<0.0005	<0.0005	0.0007
16-Nov-88	S-7	0.1	0.0051	0.015	0.002	0.013
27-Feb-89	S-7	0.05	0.0005	0.003	0.001	0.011
04-May-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
10-Aug-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
10-Oct-89	S-7	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-7	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-7	<0.05	<0.0005	<0.0005	0.0005	0.0041
28-Jan-91	S-7	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-7	0.06&	<0.0005	<0.0005	<0.0005	<0.0005
16-Nov-88	S-8	0.21	0.005	<0.001	0.001	0.005
27-Feb-89	S-8	<0.05	0.0024	<0.001	<0.001	<0.003
03-May-89	S-8	<0.05	0.0075	<0.001	0.002	<0.003
09-Aug-89	S-8	<0.05	0.0006	<0.001	<0.001	<0.003
09-Oct-89	S-8	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-8	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-8	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-8	<0.05	0.055	0.0005	<0.0005	0.0014
25-Apr-91	S-8	0.13&	0.019	<0.0005	0.0013	0.0011
16-Nov-88	S-9	1.4	0.069	0.003	0.052	0.18
27-Feb-89	S-9	1.6	0.24	0.004	0.13	0.18
03-May-89	S-9	2.6	0.47	0.01	0.24	0.48
09-Aug-89	S-9	0.52	0.073	<0.01	0.04	<0.03
09-Oct-89	S-9	0.38	0.082	<0.001	0.046	0.013
25-Jan-90	S-9	0.75	0.14	0.0012	0.069	0.075
18-Apr-90	S-9	0.68	0.15	0.0017	0.050	0.037
23-Jul-90	S-9	0.49	0.094	0.0012	0.032	0.024
18-Oct-90	S-9	0.39	0.14	0.0007	0.0033	0.024
28-Jan-91	S-9	1.040	0.450	.0046	0.085	0.097
25-Apr-91	S-9	5.8	0.88	0.0090	0.36	0.50

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
16-Nov-88	S-10	0.33	0.0005	<0.001	0.001	0.011
27-Feb-89	S-10	0.14	<0.0005	<0.003	0.002	0.006
03-May-89	S-10	0.22	<0.0005	0.001	0.002	0.007
09-Aug-89	S-10	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-10	0.17	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-10	<0.050	<0.0005	<0.0005	0.0011	0.004
18-Apr-90	S-10	<0.050	<0.0005	0.0009	<0.0005	0.002
23-Jul-90	S-10	0.59	<0.0005	<0.0005	0.0019	0.019
18-Oct-90	S-10	0.14	<0.0005	0.0007	<0.0005	0.0070
28-Jan-91	S-10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-10	<0.05	<0.0005	<0.0005	0.0011	0.0008
16-Nov-88	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
27-Feb-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
03-May-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-11	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-11	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-11	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-11	<0.05	<0.0005	0.0006	<0.0005	0.0011
18-Oct-90	S-11	<0.05	<0.0005	<0.0005	<0.0005	0.0005
28-Jan-91	S-11	.063	<0.0005	0.0033	0.0009	0.007
25-Apr-91	S-11	<0.05	<0.0005	<0.0005	0.0008	<0.0005
16-Nov-88	S-12	0.05	0.0035	<0.001	<0.001	<0.003
27-Feb-89	S-12	<0.05	0.0008	<0.001	<0.001	<0.003
03-May-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-12	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-12	<0.050	<0.0005	<0.0005	<0.0005	<0.001

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
18-Apr-90	S-12	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-12	0.09	0.0054	<0.0005	0.0011	0.0007
03-May-89	S-13	0.15	0.0049	0.004	0.002	0.014
09-Aug-89	S-13	0.11	0.0029	<0.001	<0.001	<0.003
09-Oct-89	S-13	0.077	0.0014	<0.001	<0.001	<0.003
25-Jan-90	S-13	0.051	0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-13	0.085	0.0087	<0.0005	<0.0005	<0.001
23-Jul-90	S-13	0.08	0.0008	<0.0005	<0.0005	<0.0005
18-Oct-90	S-13	0.13	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-13	<0.05	<0.0005	0.0009	<0.0005	0.001
25-Apr-91	S-13	0.44&	0.0038	<0.0005	0.0012	0.0006
03-May-89	S-14	5.3	0.75	0.4	0.200	0.800
09-Aug-89	S-14	1.8	0.54	0.14	0.042	0.050
09-Oct-89	S-14	1.0	0.36	0.06	0.020	0.030
25-Jan-90	S-14	0.64	0.16	0.077	0.017	0.039
18-Apr-90	S-14	1.2	0.20	0.11	0.030	0.096
23-Jul-90	S-14	5.0	0.43	0.34	0.14	0.66
19-Oct-90	S-14	1.8	0.77	0.013	0.017	0.12
28-Jan-91	S-14	0.72	0.200	0.036	0.021	0.078
25-Apr-91	S-14	14.	0.93	0.43	0.25	0.97
03-May-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Aug-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-15	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-15	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-15	<0.050	<0.0005	<0.0005	<0.0005	<0.001

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
23-Jul-90	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-15	<0.05	<0.0005	0.0006	<0.0005	0.0008
25-Apr-91	S-15	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
04-May-89	S-16	0.38	0.044	0.003	0.002	<0.003
10-Aug-89	S-16	<0.05	0.0006	<0.001	<0.001	<0.003
10-Oct-89	S-16	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-16	0.24	0.16	0.0033	0.0008	0.011
18-Apr-90	S-16	<0.050	0.0010	<0.0005	<0.0005	<0.001
23-Jul-90	S-16	<0.05	0.0011	<0.0005	<0.0005	<0.0005
18-Oct-90	S-16	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
28-Jan-91	S-16	<0.05	<0.0005	0.0006	<0.0005	0.0009
25-Apr-91	S-16	0.06*	0.021	0.0005	0.0032	0.0048
03-May-89	S-17	<0.05	<0.005	<0.001	<0.001	<0.003
09-Aug-89	S-17	<0.05	<0.0005	<0.001	<0.001	<0.003
09-Oct-89	S-17	<0.05	<0.0005	<0.001	<0.001	<0.003
25-Jan-90	S-17	<0.050	<0.0005	<0.0005	<0.0005	<0.001
18-Apr-90	S-17	<0.050	<0.0005	<0.0005	<0.0005	<0.001
23-Jul-90	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
18-Oct-90	S-17	0.39	0.010	0.062	0.022	0.11
28-Jan-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
25-Apr-91	S-17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
31-May-91	S-18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
22-Mar-89	SR-1	5.4	1.1	0.23	0.35	1.3
25-Jan-90	SR-1	2.2	0.47	0.12	0.11	0.51
18-Apr-90	SR-1	1.0	0.13	0.047	0.047	0.22

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
23-Jul-90	SR-1	3.2	0.47	0.32	0.17	0.87
18-Oct-90	SR-1	1.3	0.28	0.0066	0.11	0.13
28-Jan-91	SR-1	1.1	0.120	0.012	0.051	0.110

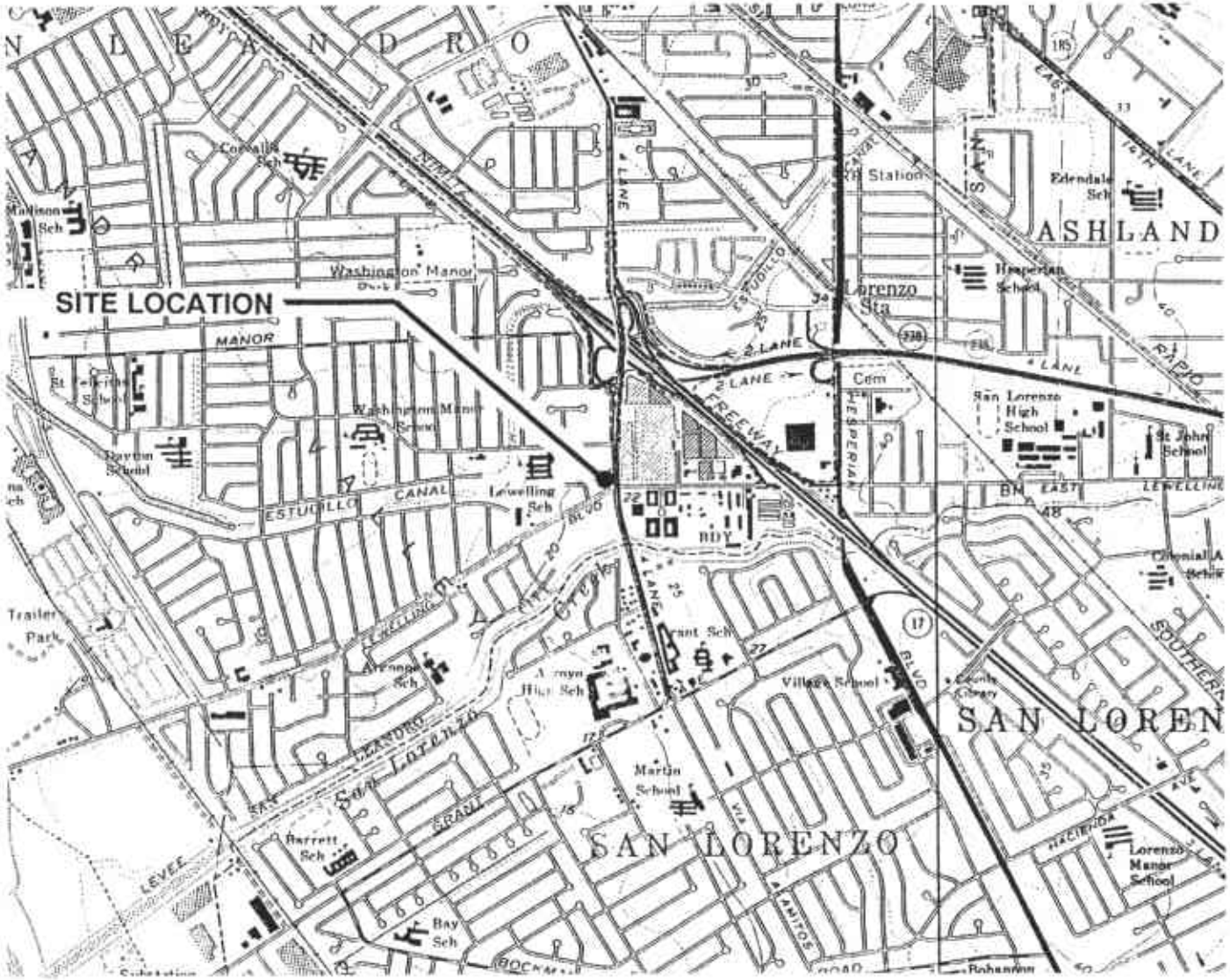
TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

Current DHS Action Levels Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million
* Compounds detected and calculated as low boiling hydrocarbons are due to the volatile aromatics (BETX) present in the sample. Gasoline was not detected.
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline pattern.
NOTE: 1. DHS Action levels and MCL's are subject to change pending State of California review.
2. All data shown as <X are reported as ND (none detected).



N

Approximate Scale : 1" = 2000'

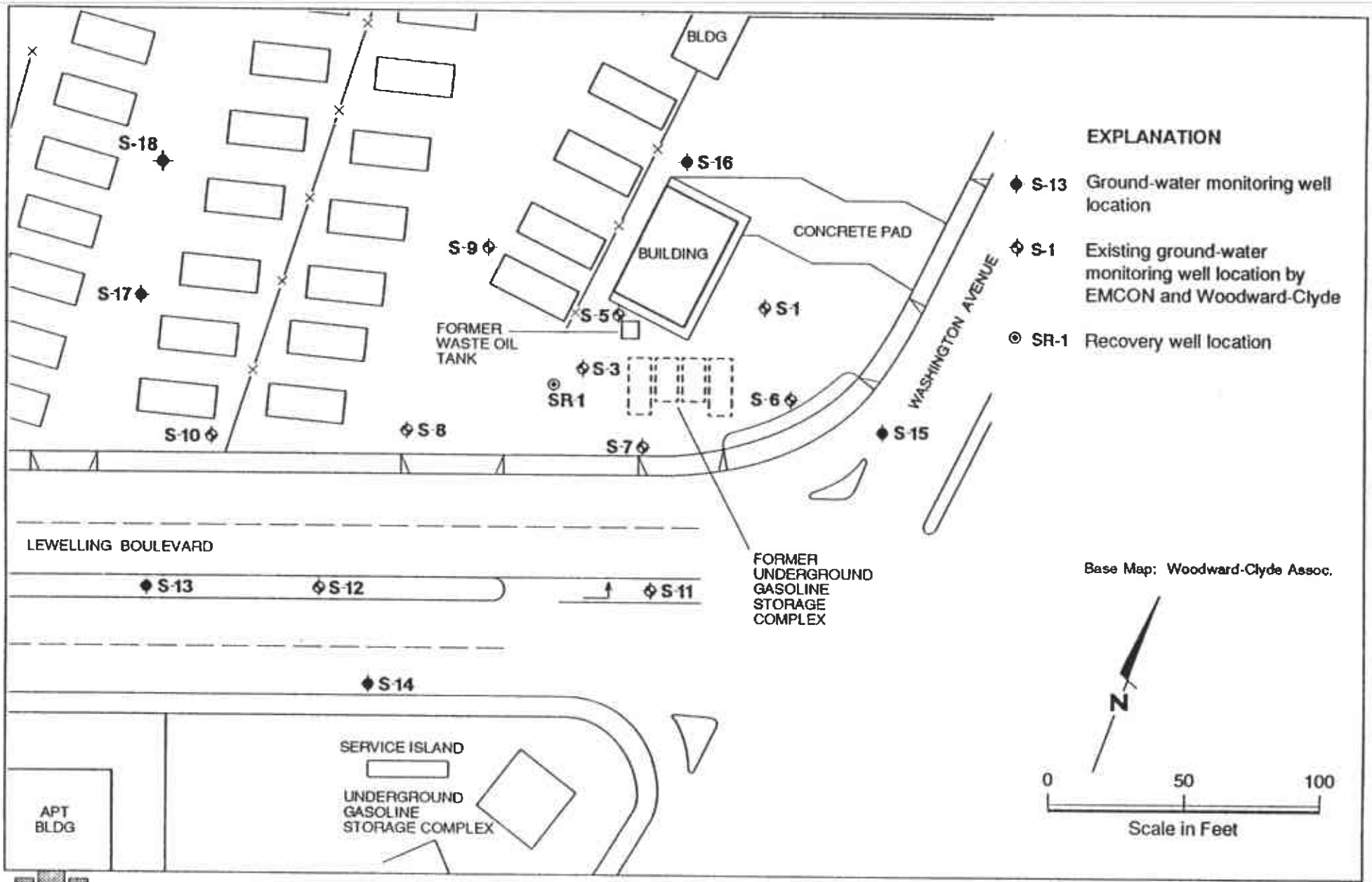
Base Map: USGS Topographic Map

GeoStrategies Inc.

Vicinity Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7615		11/89		

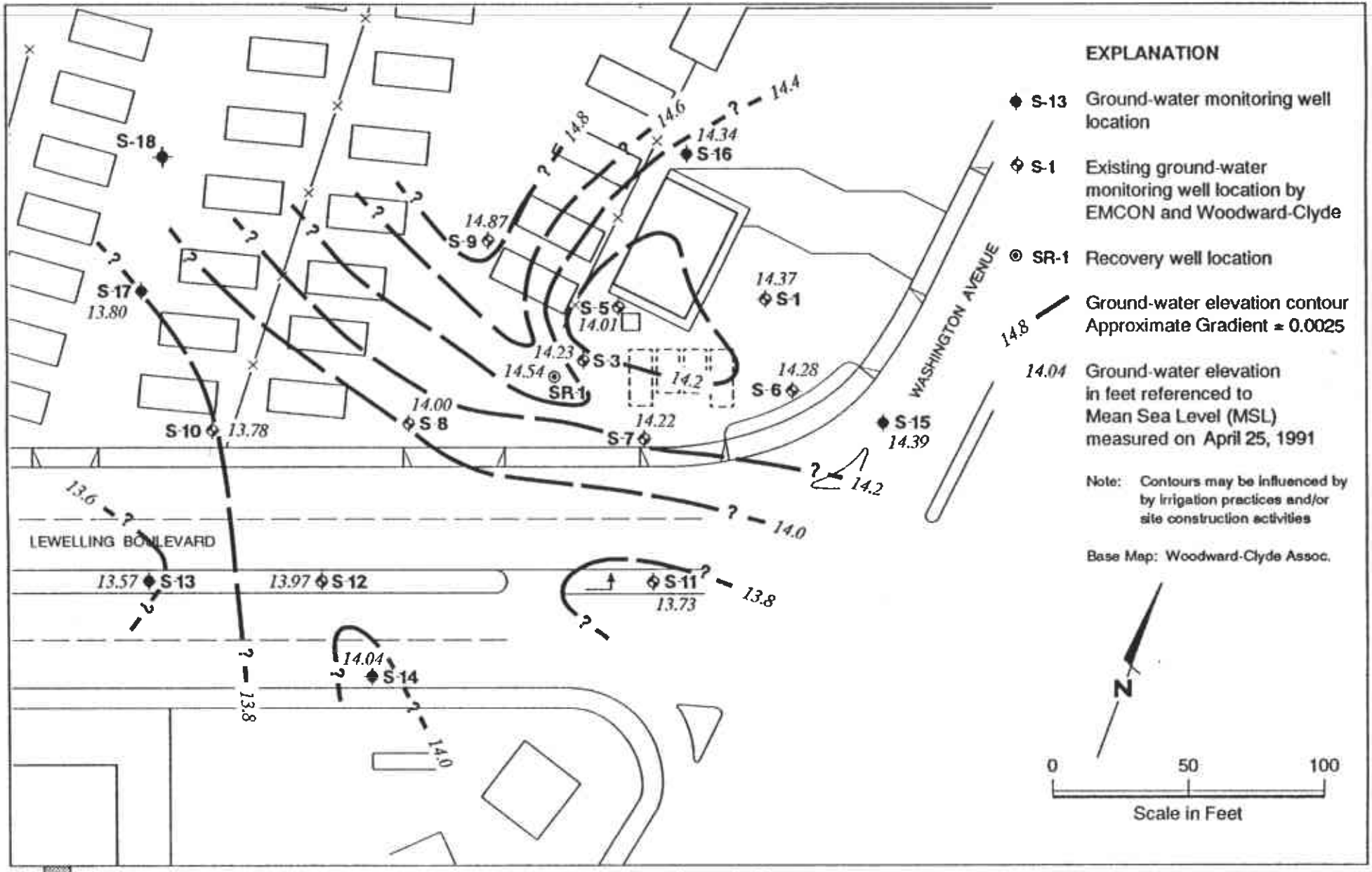


GeoStrategies Inc.

Site Plan
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761502-13	DHP	6/91		

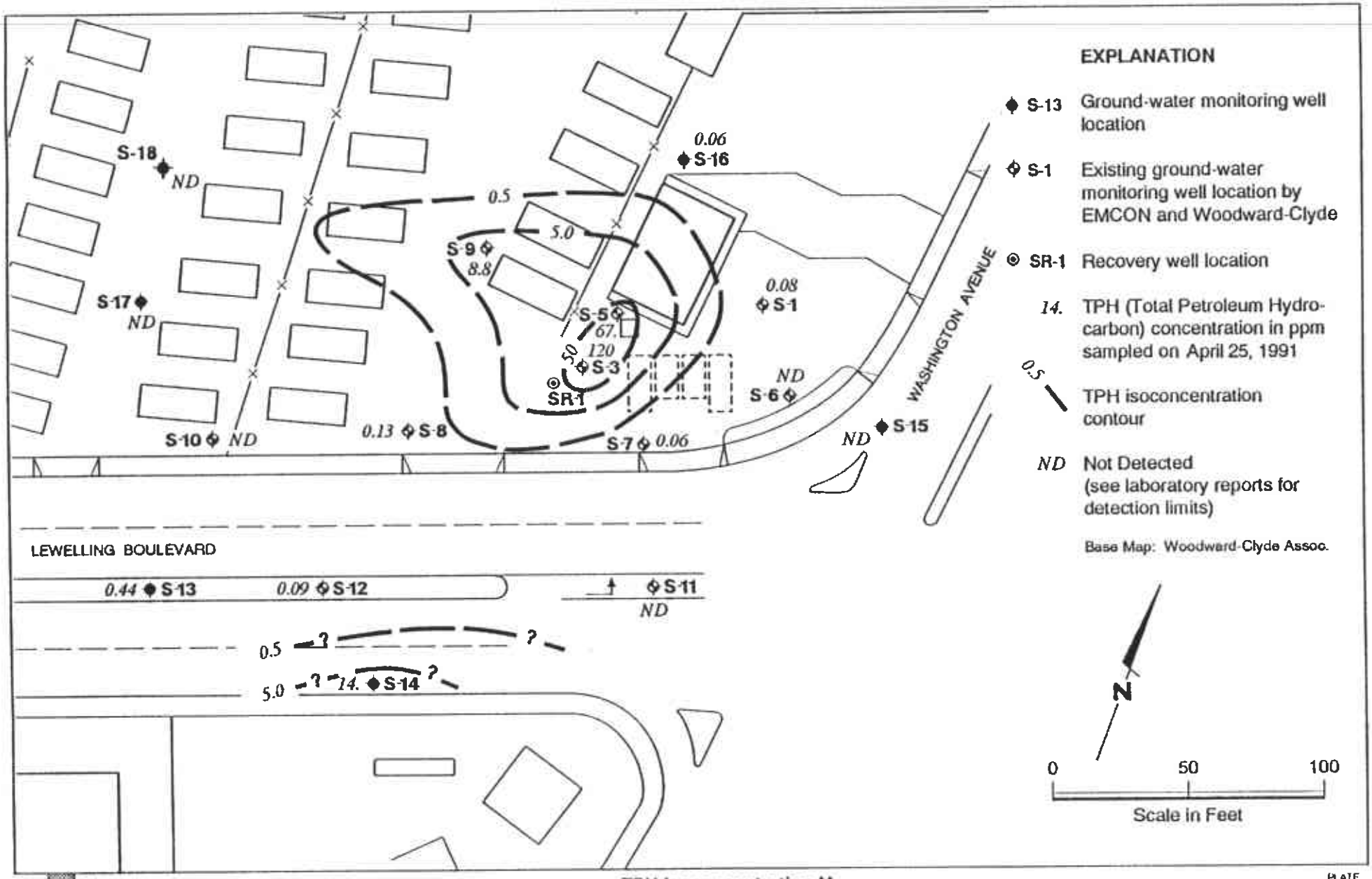


GeoStrategies Inc.

Potentiometric Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
3

JOB NUMBER	REVIEWED	DATE	REVISED DATE	REVISED DATE
761502-13	DHP	6/91		

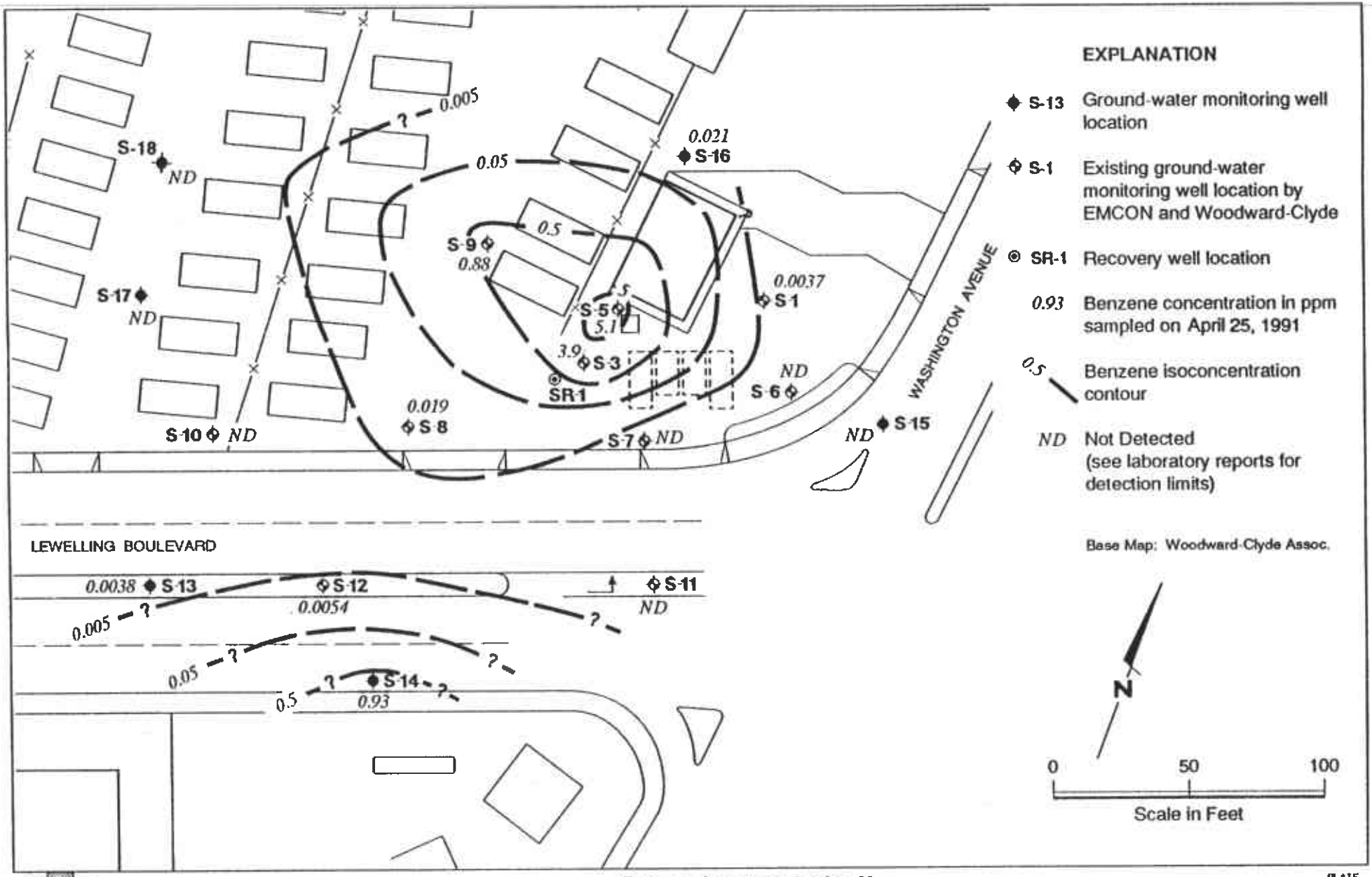


GeoStrategies Inc.

TPH Isoconcentration Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761502-13	DHP	6/91		



GeoStrategies Inc.

Benzene Isoconcentration Map
Former Shell Service Station
15275 Washington Avenue
San Leandro, California

PLATE
5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
761502-13	DHP	6/91		

APPENDIX A

GSI FIELD METHODS AND PROCEDURES

GROUND-WATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by Gettler-Ryan Inc. (G-R) for ground-water sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance objectives have been established by G-R to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality Control (QC) is maintained by G-R by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of G-R to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

- Accuracy - the degree of agreement of a measurement with an accepted referenced or true value.

- Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

- Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

- Comparability - expresses the confidence with which one data set can be compared to another.

- Representativeness - a sample or group of samples that reflects the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

As part of the G-R QA/QC program, applicable federal, state, and local reference guidance documents are followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents, and journals are incorporated into the G-R sampling procedures to assure that; (1) ground-water samples are properly collected, (2) ground-water samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analysis of samples are accurate and reproducible.

April 20, 1990

Guidance and Reference Documents Used to Collect Groundwater Samples

These documents are used to verify G-R sampling procedures and are consistent with current regulatory guidance. If site specific work and sampling plans are required, those plans will be developed from these documents, and newly received applicable documents.

U.S.E.P.A. - 330/9-51-002	NEIC Manual for Groundwater/Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 530/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - 600/4-82-057	Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (July, 1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986)
40 CFR 136.3e,Table II (Code of Federal Regulations)	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recover Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)
State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Sections 2645, 2646, 2647, and 2648; Article 7, Sections 2670, 2671, and 2672 (October, 1986: including 1988 Amendments)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (November, 1988)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis, Volume 55, Pages 2212-2218 (December, 1983)
Napa County	Napa County Underground Storage Tank Program: Guidelines for Site Investigations; February 1989.
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Santa Clara Valley Water District	Investigation and Remediation at Fuel Leak sites: Guidelines for Investigation and Technical Report Preparation (March 1989)
Santa Clara Valley Water District	Revised Well Standards for Santa Clara County (July 18, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983
American Petroleum Institute	A Guide to the Assessment and Remediation of Underground Petroleum Releases; API Publication 1628, February 1989
American Petroleum Institute	Literature Summary: Hydrocarbon Solubilities and Attenuations Mechanisms, API Publication 4414, August 1985
Site Specific (as needed)	General and specific regulatory documents as required.

Because ground-water samples collected by G-R are analyzed to the parts per billion (ppb) range for many compounds, extreme care is exercised to prevent contamination of samples. When volatile or semi-volatile organic compounds are included for analysis, G-R sampling crew members will adhere to the following precautions in the field:

1. A clean pair of new, disposable gloves are worn for each well being sampled.

2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e. background) followed by wells in increasing order of contamination.

3. Ambient conditions are continually monitored to maintain sample integrity.

When known or potential organic compounds are being sampled for, the following additional precautions are taken:

1. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.

2. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.

3. Volatile organic ground-water samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

4. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

Sample analysis methods, containers, preservatives and holding times are shown on Table 1.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

A. Trip Blank: Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are not opened, and are returned from a project site with the project site samples for analysis.

B. Field Blank: Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

C. Duplicates: Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

D. Equipment Blank: Periodic QC sample collected from field equipment rinsate to verify decontamination procedures.

The number and types of QC samples are determined as follows:

A. Up to 2 wells - Trip Blank Only

B. 2 to 5 Wells - 1 Field Blank and 1 Trip Blank

C. 5 to 10 Wells - 1 Field blank, 1 Trip Blank, and 1 Duplicate

D. More than 10 Wells - 1 Field Blank, 1 Trip Blank, and 1 Duplicate per each 12 wells

E. If sampling extends beyond one day, quality control samples will be collected for each day.

Additional QC is performed through ongoing and random reviews of duplicate samples to evaluate the precision of the field sampling procedures and analytical laboratory. Precision of QC data is accomplished by calculating the Relative Percent Difference (RPD). The RPD is evaluated to assess whether values are within an acceptable range (typically ± 20% of duplicate sample).

SAMPLE COLLECTION

This section describes the routine procedures followed by G-R while collecting ground-water samples for chemical analysis. These procedures include decontamination, water-level measurements, well purging, physical parameter measurements, sample collection, sample preservation, sample handling, and sample documentation. Critical sampling objectives for G-R are to:

1. Collect ground-water samples that are representative of the sampled matrix and,

2. Maintain sample integrity from the time of sample collection to receipt by the analytical laboratory.

Sample analyses methods, containers, preservation, and holding times are presented in Table 1.

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. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly cleaned and prepared in the laboratory. Sample bottles, bottle caps, and septa are protected from all potential chemical contact before actual usage at a sample location.

During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well. The equipment are decontaminated by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe (Figure 4). 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.

Water-Level Measurements (continued)

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g. well integrity, product color, turbidity, water color, odors, etc.) are noted on the G-R Well Sampling Field Data Sheet shown in Figure 4. Before and after each use, the electric sounder, interface probe and bailer are decontaminated by washing with Alconox or equivalent detergent followed by rinsing with deionized water to prevent cross-contamination.

As mentioned previously, water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Well Purging

Before sampling occurs, well casing storage water and interstitial water in the artificial sand pack will be purged using (1) a positive displacement bladder pump constructed of inert, non-wetting, Teflon and stainless steel, (2) a pneumatic-airlift pumping system, (3) a centrifigal pumping system, or (4) a Teflon or Stainless steel bailer (Figure 5). Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from borehole volumes which take into account the sand packed interval in the well annular space. As a general rule, a minimum of 3 and a maximum of 10 borehole volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e. low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 80 percent of the previously measured water column has been replaced by recharge, or as per local requirements. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the G-R sampling crew as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ± 10 umhos/cm, and are calibrated daily. pH meters are read to the nearest ± 0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Monitoring wells will be purged according to the protocol presented in Figure 5. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure 4. Copies of the G-R Field Data Sheets will be reviewed by the G-R Sampling Manager for accuracy and completeness.

DOCUMENTATION

Sample Container Labels

Each sample container will be labeled by an adhesive label, noted in permanent ink immediately after the sample is collected. Label information will include:

Sample point designation (i.e. well number or code)

Sampler's identification

Project number

Date and time of collection

Type of preservation used

Well Sampling Data Forms

In the field, the G-R sampling crew will record the following information on the Well Sampling Data Sheet for each sample collected:

Project number

Client

Location

Source (i.e. well number)

Time and date

Well accessibility and integrity

Pertinent well data (e.g. depth, product thickness, static water-level, pH, specific conductance, temperature)

Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record (Figure 6) shall be completed and accompany every sample and every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from time of collections. The record will contain the following information:

- Sample or station number or sample identification (ID)
- Signature of collector, sampler, or recorder
- Date and time of collection
- Place of collection
- Sample type
- Signatures of persons involved in chain of possession
- Inclusive dates of possession

Samples shall always be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. G-R will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

TABLE 1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIONS, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container	Preservation	Maximum Holding Time
Total Petroleum Hydrocarbons (Gasoline)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon	cool, 4 C HCl to pH<2	14 days (maximum)
Benzene Toluene Ethylbenzene Xylenes (BTEX	EPA 8020	mg/l ug/l	50 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	7 days (w/o preservative) 14 days (w preservative)
Oil & Grease	SM 503E	mg/l ug/l	1 l glass, Teflon lined septum	H2SO4 or HCl to pH<2	28 days (maximum)
Total Petroleum Hydrocarbons (Diesel)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Halogented Volatile Organics (chlorinated solvents)	8010	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Non chlorinated solvents	8020	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Volatile Organics	8240	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Semi-Volatile Organics	8270	mg/l ug/l	1 l amber glass, Teflon lined septum	cool, 4 C	7 days extract 40 days (maximum to analyze)
Specific Conductance (Field test)		umhos/cm			
pH (Field test)		pH units			
Temperature (Field test)		Deg F			

GeoStrategies Inc.

FIELD EXPLORATORY BORING LOG

FIGURE 1

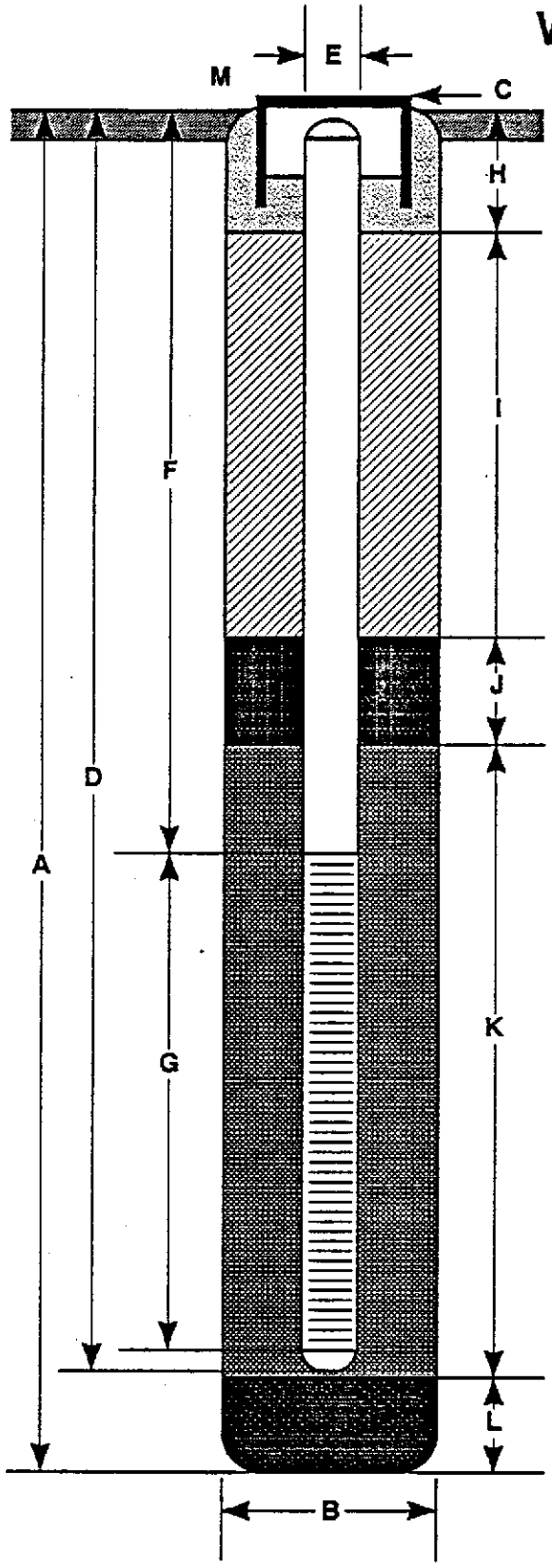
Field location of boring:	Project No.:	Date:	Boring No:
	Client:		
	Location:		
	City:		Sheet
	Logged by:	Driller:	of
Drilling method:	Casing installation data:		
Hole diameter:	Top of Box Elevation:		Datum:

								Water Level				
PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Time				
								Date				
								Description				

Remarks:

WELL CONSTRUCTION DETAIL

FIGURE 2



A Total Depth of Boring _____ ft.

B Diameter of Boring _____ in.
Drilling Method _____

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length _____ ft.
Material _____

E Casing Diameter _____ in.

F Depth to Top Perforations _____ ft.

G Perforated Length _____ ft.
Perforated Interval from _____ to _____ ft.
Perforation Type _____
Perforation Size _____ in.

H Surface Seal from _____ to _____ ft.
Seal Material _____

I Backfill from _____ to _____ ft.
Backfill Material _____

J Seal from _____ to _____ ft.
Seal Material _____

K Gravel Pack from _____ to _____ ft.
Pack Material _____

L Bottom Seal _____ ft.
Seal Material _____

M _____

Note: Depths measured from initial ground surface

GeoStrategies Inc.

Well Construction Detail

WELL NO.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE

WELL DEVELOPMENT FORM FIGURE 3

Page_____ of_____

(to be filled out in office)

Client_____ SS#_____ Job#_____

Name_____ Location_____

Well#_____ Screened Interval_____ Depth_____

Aquifer Material_____ Installation Date _____

Drilling Method_____ Borehole Diameter_____

Comments regarding well installation:_____

(to be filled out in the field) Name_____

Date_____ Development Method_____

Total Depth_____ - Depth to liquid_____ = WaterColumn_____

Product thickness_____

_____ x _____ x _____ x 0.0408 = _____gals
Water Column Diameter (in.) #Vol

Purge Start_____ Stop_____ Rate_____ gpm

Gallons	Time	Clarity	Temp.	pH	Conductivity
0					

Total gallons removed_____ Development stop time_____

Depth to liquid _____at_____(time)

Odor of water_____ Water discharged to_____

Comments_____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

FIGURE 4

COMPANY _____ JOB # _____

LOCATION _____ DATE _____

CITY _____ TIME _____

Well ID. _____ Well Condition _____

Well Diameter _____ in. Hydrocarbon Thickness _____ ft.

Total Depth _____ ft.

Depth to Liquid- _____ ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x _____ x(VF) _____ = (Estimated Purge Volume) _____ gal.

Purging Equipment _____

Sampling Equipment _____

Starting Time _____ Purging Flow Rate _____ gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume

Did well dewater? _____ If yes, time _____ Volume _____

Sampling Time _____ Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

FIGURE 5

Monitoring Well Sampling Protocol Schematic

Sampling Crew Reviews Project Sampling Requirements/Schedule

↓

Field Decontamination and Instrumentation Calibration

↓

Check Integrity of Well (Inspect for Well Damage)

↓

Measure and Record Depth to Water and Total Well Depth (Electric Well Sounder)

↓

Check for Floating Product (Oil/Water Interface Probe)

Floating Product Present

↓

Confirm Product Thickness (Acrylic or PVC Bailer)

↓

Collect Free-Product Sample

↓

Dissolved Product Sample Not Required

↓

Record Data on Field Data Form

Floating Product Not Present

↓

Purge Volume Calculation

$V = \pi (r/12)^2 h(\_\% \text{ vol})(7.48) = \_\_\_ / \text{gallons}$

V = Purge volume (gallons)

$\pi = 3.14159$

h = Height of Water Column (feet)

r = Borehole radius (inches)

↓

Evacuate water from well equal to the calculated purge volume while monitoring groundwater stabilization indicator parameters (pH, conductivity, temperature) at intervals of one casing volume.

Well Dewaters after One Purge Volume (Low yield well)

↓

Well Recharges to 80% of Initial Measured Water Column Height in Feet within 24 hrs. of Evacuation.

↓

Measure Groundwater Stability Indicator Parameters (pH, Temperature, Conductivity)

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Well Readily Recovers

↓

Record Groundwater Stability Indicator Parameters from each Additional Purge Volume

Stability indicated when the following Criteria are met:

pH :	± 0.1 pH units
Conductivity:	± 10%
Temperature:	1.0 degrees F

Groundwater Stability Achieved

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Groundwater Stability Not Achieved

↓

Continue Purging Until Stability is Achieved

↓

Collect Sample and complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Gettler - Ryan Inc.
ENVIRONMENTAL DIVISION

Chain of Custody
FIGURE 6

COMPANY _____ JOB NO. _____

JOB LOCATION _____

CITY _____ PHONE NO. _____

AUTHORIZED _____ DATE _____ P.O. NO. _____

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY LAB: _____

DESIGNATED LABORATORY: _____ DHS #: _____

REMARKS: _____

DATE COMPLETED _____ FOREMAN _____

APPENDIX B
EXPLORATORY BORING LOG
WELL CONSTRUCTION DETAIL

Field location of boring: (See Plate 2)	Project No.: 761502	Date: 05/16/91	Boring No: S-18
	Client: Shell Oil Company		
	Location: 15275 Washington		
	City: San Leandro, California		Sheet 1 of 2
	Logged by: E.C.F.	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data: (See Well Construction Detail)		
Hole diameter: 8-inches	Top of Box Elevation:		Datum:

Water Level	7.5'	7.6'
Time	10:00	12:03
Date	05/16/91	05/16/91

PID (ppm)	Blows/ft. * or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				PAVEMENT SECTION - 0.33 feet
				1			SP	SAND (SP) - yellowish brown (10YR 5/4), medium dense, damp; 80% coarse to medium sand; 15% gravel; 5% fines (FILL).
				2				
				3			ML	SILT with SAND (ML) - very dark gray (7.5YR N3/), stiff, damp; 80% silt; 20% very fine sand (ALLUVIUM).
				4				
	450	S&H		5				
0	450		S18-4.5					
	450			6				
				7				Soft drilling at 7.0 feet.
		S&H					SM	SILTY SAND (SM) - dark grayish brown (10YR 4/2),
0	4		S18-8	8				loose, [redacted]; 70% sand; 30% silt.
				9				
		S&H						Increasing moisture and silt content with depth.
0	6		S18-10	10				
				11				
				12				
				13				
				14				
		S&H					CL	CLAY (CL) - gray brown (2.5Y 5/2), stiff, moist; trace fine
0	16		S18-15	15				sand with rootholes and vertical dark stains.
				16				
				17				
				18				
				19				

Remarks:

* Converted to equivalent Standard Penetration blows/ft.

Log of Boring

BORING NO. S-18

GeoStrategies Inc.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DHP	05/91		

Field location of boring:

(See Plate 2)

Project No.:	761502	Date: 05/16/91	Boring No: S-18
Client:	Shell Oil Company		
Location:	15275 Washington		
City:	San Leandro, California		Sheet 2 of 2
Logged by:	E.C.F.	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-Inches

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. * or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
		S&H						
	12			20				
			S18-20.5					COLOR CHANGE to light yellow brown (2.5YR 6/4), stiff, damp; 80% clay; 20% coarse sand.
				21				
				22				Bottom of boring at 19.0 feet.
				23				Bottom of sample at 20.5 feet.
				24				
				25				
				26				
				27				
				28				
				29				
				30				
				31				
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				

Remarks:

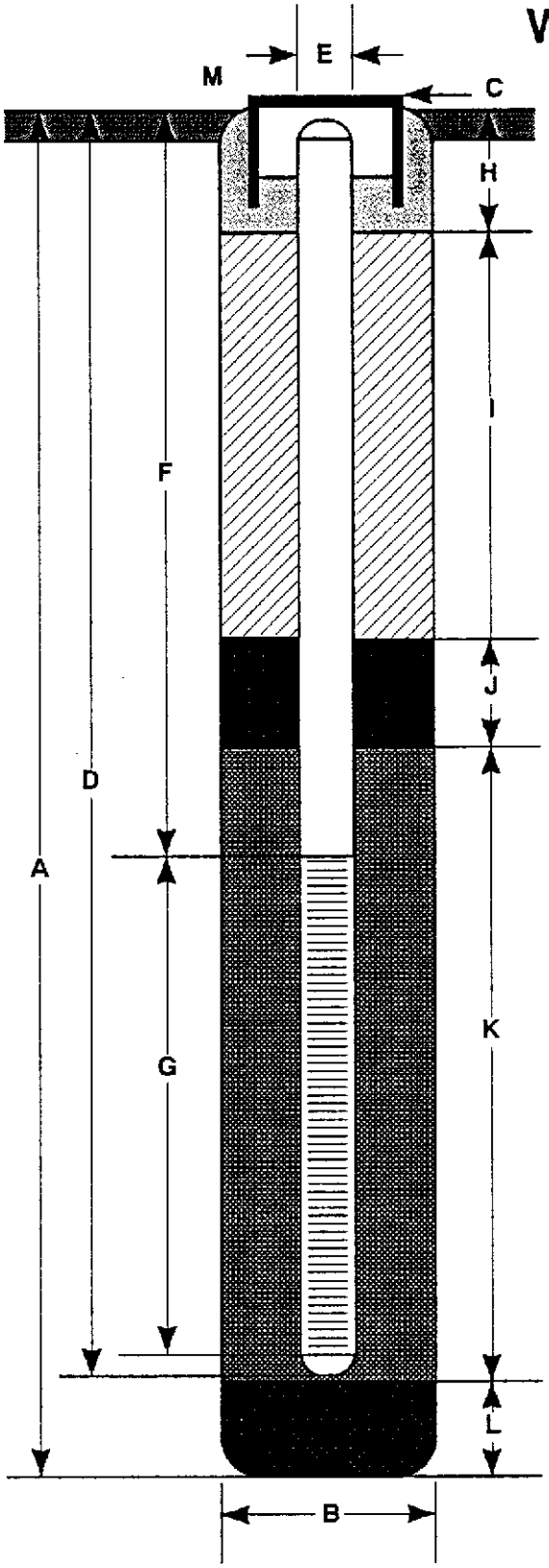
GeoStrategies Inc.

Log of Boring

BORING NO. S-18

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DHP	05/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 19.0 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 18.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 4 ft.

G Perforated Length 12 ft.
Perforated Interval from 4 to 18 ft.
Perforation Type Machine Slotted
Perforation Size 0.02 in.

H Surface Seal from 0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 2 ft.
Backfill Material Concrete

J Seal from 2 to 3 ft.
Seal Material Bentonite

K Gravel Pack from 3 to 18 ft.
Pack Material 2/12 Lonestar Sand

L Bottom Seal 1 ft.
Seal Material Bentonite

M Underground vault with cover, cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. S-18

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
761502	DHP	5/91		

APPENDIX C

SOIL ANALYTICAL REPORT

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
John Werfal

Date: 06/04/91

Work Order: T1-05-186 P.O. Number: MOE 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR7615, 15275 Wash., S.Lndro
Date Received: 05/17/91
Number of Samples: 1
Sample Type: solid

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

PAGES	LABORATORY #	SAMPLE IDENTIFICATION
3	T1-05-186-01	SP-18
6	T1-05-186-02	Quality Control

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/04/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST NAME: Metals Analysis

SAMPLE ID: SP-18
SAMPLE DATE: 05/16/91
LAB SAMPLE ID: T105186-01
SAMPLE MATRIX: solid
RECEIPT CONDITION: cool

RESULTS in Milligrams per Kilogram

PARAMETER	METHOD	DETECTION LIMIT	DETECTED
Lead	DHS	1.0	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/04/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: SP-18
SAMPLE DATE: 05/16/91
LAB SAMPLE ID: T105186-01
SAMPLE MATRIX: solid
RECEIPT CONDITION: cool

RESULTS in Milligrams per Kilogram:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020	05/28/91	05/30/91
Low Boiling Hydrocarbons	Mod.8015	05/28/91	05/30/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	None
BTEX		
Benzene	0.005	None
Toluene	0.005	0.007
Ethylbenzene	0.005	None
Xylenes (total)	0.005	None

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	130.
1,3-Dichlorobenzene (BTEX)	122.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/05/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T105186-02A
EXTRACTION DATE: 05/28/91
ANALYSIS DATE: 05/30/91
ANALYSIS METHOD: 8020

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Milligrams per Kilogram

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Benzene	ND<1.0	10.1, 10.2	11.0	10.8	109.	106.	3.
Toluene	ND<1.0	10.1, 10.2	10.6	10.5	105.	103.	2.
Ethylbenzene	ND<1.0	10.1, 10.2	10.3	10.2	102.	100.	2.
Total Xylenes	ND<1.0	30.3, 30.6	29.1	28.6	96.	93.	3.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	Diluted Out	Diluted Out

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/05/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T105186-02B
EXTRACTION DATE:
ANALYSIS DATE: 05/31/91
ANALYSIS METHOD: Metals (DFAAS)

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Milligrams per Kilogram

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Lead (Org.)	None	4.24	5.75	N/A	135.6	N/A	N/A

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/05/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T105186-02B
EXTRACTION DATE:
ANALYSIS DATE: 05/31/91
ANALYSIS METHOD: Metals (DFAA)

QUALITY CONTROL REPORT

Post Digestion Spike (PDS) Post Digestion Spike Duplicate (PDSD) Analyses

RESULTS in Milligrams per Liter

PARAMETER	Sample Amt	Spike Amt	PDS Result	PDSD Result	PDS %Rec	PDSD %Rec	RPD
Lead (Org.)	None	1.0	1.09	N/A	109.0	N/A	N/A

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/04/91
Client Work ID: GR7615, 15275 Wash., S.Lndro

Work Order: T1-05-186

TEST CODE **METALS** TEST NAME **Metals Analysis**

The methods of analysis for metals are taken from E.P.A. protocol, using methods from SW-846, 3rd Edition or Methods for Chemical Analysis of Water and Wastes, 600/4-79-020. The method used is listed adjacent to the parameter in the table.

TEST CODE **ORGPBS** TEST NAME **Organic Lead in Soil**

The method of analysis for organic lead was taken from the LUFT Field manual, Determination of Organolead (DHS Method).

TEST CODE **PDS** TEST NAME **Spike and Spike Duplicates**

The Matrix Spike and Matrix Spike Duplicate results are outside the control limits of 75-125% Recovery. Post-digestion spikes were performed.

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION — **Chain of Custody**

COMPANY Shell Oil Company JOB NO. 761502

JOB LOCATION 15275 Washington (WIC# 204-6852-1008) BWG Jeet

CITY San Leandro PHONE NO. Brazado

AUTHORIZED John Werfel DATE 5/16/91 P.O. NO.

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
SB-4.5	1	Soil	5/16/91	TPH-Gas, B.T.E.X.	

RELINQUISHED BY: 5/17/91 0745

RECEIVED BY: 5/19/91

RELINQUISHED BY: 5/17/91 1630

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY LAB:

DESIGNATED LABORATORY: ITAS DHS #: 137

REMARKS: STANDARD TURN AROUND

DATE COMPLETED 5/16/91 FOREMAN

APPENDIX D
GROUND-WATER CHEMICAL ANALYTICAL REPORTS AND CHAINS-OF-CUSTODY

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
MAY 16 1991
GETTLER-RYAN INC.
GENERAL CONTRACTORS

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 05/15/91

Work Order: T1-04-374 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro, CORRECTED REPORT
Date Received: 04/26/91
Number of Samples: 13
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

PAGES	LABORATORY #	SAMPLE IDENTIFICATION
2	T1-04-374-01	S-1
3	T1-04-374-02	S-3
4	T1-04-374-03	S-5
5	T1-04-374-04	S-6
6	T1-04-374-05	S-7
7	T1-04-374-06	S-8
8	T1-04-374-07	S-9
9	T1-04-374-08	S-10
10	T1-04-374-09	S-11
11	T1-04-374-10	S-12
12	T1-04-374-11	S-13
13	T1-04-374-12	S-14
14	T1-04-374-13	S-15
16	T1-04-374-14	Quality Control

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-1
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-01
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.08 ^
BTEX		
Benzene	0.0005	0.0037
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0007
Xylenes (total)	0.0005	0.0020

Comments:
^ Compounds detected and calculated as low boiling hydrocarbons are due to a petroleum mixture other than gasoline.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-3
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-02
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	5.0	120.
BTEX		
Benzene	0.05	3.9
Toluene	0.05	3.6
Ethylbenzene	0.05	2.4
Xylenes (total)	0.05	8.9

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-5
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-03
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	2.5	67.
BTEX		
Benzene	0.025	5.1
Toluene	0.025	3.1
Ethylbenzene	0.025	2.8
Xylenes (total)	0.025	11.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-6
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-04
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	0.0007

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-7
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-05
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.06	&
BTEX			
Benzene	0.0005	None	
Toluene	0.0005	None	
Ethylbenzene	0.0005	None	
Xylenes (total)	0.0005	None	

Comments:
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-8**
SAMPLE DATE: **04/25/91**
LAB SAMPLE ID: **T104374-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH > 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.13	&
BTEX			
Benzene	0.0005	0.019	
Toluene	0.0005	None	
Ethylbenzene	0.0005	0.0013	
Xylenes (total)	0.0005	0.0011	

Comments:
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-9
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-07
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	5.8
BTEX		
Benzene	0.0025	0.88
Toluene	0.0025	0.0090
Ethylbenzene	0.0025	0.36
Xylenes (total)	0.0025	0.50

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-10
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-08
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/04/91
Low Boiling Hydrocarbons	Mod.8015		05/04/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0011
Xylenes (total)	0.0005	0.0008

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-11
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-09
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/04/91
Low Boiling Hydrocarbons	Mod.8015		05/04/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0008
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-12
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-10
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/04/91
Low Boiling Hydrocarbons	Mod.8015		05/04/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.09
BTEX		
Benzene	0.0005	0.0054
Toluene	0.0005	None
Ethylbenzene	0.0005	0.0011
Xylenes (total)	0.0005	0.0007

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-13
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-11
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/04/91
Low Boiling Hydrocarbons	Mod.8015		05/04/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.44	&
BTEX			
Benzene	0.0005	0.0038	
Toluene	0.0005	None	
Ethylbenzene	0.0005	0.0012	
Xylenes (total)	0.0005	0.0006	

Comments:
& Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline standard pattern.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-14
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-12
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.5	14.
BTEX		
Benzene	0.005	0.93
Toluene	0.005	0.43
Ethylbenzene	0.005	0.25
Xylenes (total)	0.005	0.97

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-15
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104374-13
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH > 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None
BTEX		
Benzene	0.0005	None
Toluene	0.0005	None
Ethylbenzene	0.0005	None
Xylenes (total)	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104374-14A
EXTRACTION DATE:
ANALYSIS DATE: 05/03/91
ANALYSIS METHOD: 8020

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Benzene	ND<0.5	50.0	46.2	92.	92.	46.1	0.
Toluene	ND<0.5	50.0	45.7	91.	91.	45.7	0.
Ethyl benzene	ND<0.5	50.0	47.7	95.	95.	47.7	0.
Xylenes	ND<0.5	150.	125.	83.	83.	125.	0.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	94.	95.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104374-14B
EXTRACTION DATE:
ANALYSIS DATE: 05/03/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	627.	626.	125.	125.	0

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	78.	85.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company, CORRECTED REPORT
Date: 05/15/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-374

TEST CODE TPHVB TEST NAME TPH Gas,BTEX by 8015/8020

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 05/08/91

Work Order: T1-04-375 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro
Date Received: 04/26/91
Number of Samples: 5
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

PAGES	LABORATORY #	SAMPLE IDENTIFICATION
2	T1-04-375-01	S-16
3	T1-04-375-02	S-17
4	T1-04-375-03	SD-1
5	T1-04-375-04	SF-6
6	T1-04-375-05	TRIP BLANK
9	T1-04-375-06	Quality Control

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-16
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104375-01
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/02/91
Low Boiling Hydrocarbons	Mod.8015		05/02/91

PARAMETER	DETECTION LIMIT	DETECTED	
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.06	^
BTEX			
Benzene	0.0005	0.021	
Toluene	0.0005	0.0005	
Ethylbenzene	0.0005	0.0032	
Xylenes (total)	0.0005	0.0048	

Comments:
^ Compounds detected and calculated as low boiling hydrocarbons are due to the volatile aromatics (BETX) present in the sample. Gasoline was not detected.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: S-17
SAMPLE DATE: 04/25/91
LAB SAMPLE ID: T104375-02
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/02/91
Low Boiling Hydrocarbons	Mod.8015		05/02/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None.
BTEX		
Benzene	0.0005	None.
Toluene	0.0005	None.
Ethylbenzene	0.0005	None.
Xylenes (total)	0.0005	None.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-1**
SAMPLE DATE: **04/25/91**
LAB SAMPLE ID: **T104375-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	0.06
BTEX		
Benzene	0.0005	0.0036
Toluene	0.0005	None.
Ethylbenzene	0.0005	None.
Xylenes (total)	0.0005	0.0014

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SF-6**
SAMPLE DATE: **04/25/91**
LAB SAMPLE ID: **T104375-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/03/91
Low Boiling Hydrocarbons	Mod.8015		05/03/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	None.
BTEX		
Benzene	0.0005	None.
Toluene	0.0005	None.
Ethylbenzene	0.0005	None.
Xylenes (total)	0.0005	None.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **TRIP BLANK**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: T104375-05
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		05/01/91
Low Boiling Hydrocarbons	Mod.8015		05/01/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None.**
BTEX		
Benzene	0.0005	**None.**
Toluene	0.0005	**None.**
Ethylbenzene	0.0005	**None.**
Xylenes (total)	0.0005	**None.**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104375-06A
EXTRACTION DATE:
ANALYSIS DATE: 04/30/91
ANALYSIS METHOD: 8020

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Benzene	ND<0.5	50.0	49.9	50.9	100.	102.	2.
Toluene	ND<0.5	50.0	49.8	51.7	100.	103.	3.
Ethyl benzene	ND<0.5	50.0	48.4	50.0	97.	100.	3.
Xylenes	ND<0.5	150.	137.	141.	91.	94.	3.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	99.	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104375-06B
EXTRACTION DATE:
ANALYSIS DATE: 05/01/91
ANALYSIS METHOD: Mod. 8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	406.	389.	81.	78.	4.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	97.	94.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104375-06C
EXTRACTION DATE:
ANALYSIS DATE: 05/02/91
ANALYSIS METHOD: 8020

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Benzene	ND<0.5	50.0	44.1	50.4	88.	101.	14.
Toluene	ND<0.5	50.0	43.9	50.5	88.	101.	14.
Ethyl benzene	ND<0.5	50.0	41.1	47.5	82.	95.	14.7
Xylenes	ND<0.5	150.	114.	130.	76.	87.	13.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	103.	104.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 05/08/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-04-375

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

Gettler - Ryan Inc. T-OU-3I4 ENVIRONMENTAL DIVISION 374

2288 Chain of Custody

COMPANY [illegible] JOB NO.

JOB LOCATION 15275 Washington AV

CITY San Leandro PHONE NO. [illegible]

AUTHORIZED Tom [illegible] DATE 4-25-91 P.O. NO. [illegible]

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-1	3	Liquid	4-25-91/1215	THC (gas) BTXE	Cool
S-3	↓	↓	1310	↓	↓
S-5			0937		
S-6			1505		
S-7			1241		
S-8			1035		
S-9			1108		
S-10			1010		
S-11			1103		
S-12			1005		
S-13			0935		
S-14			1030		
S-15	↓	↓	1136	↓	↓

RELINQUISHED BY: [signature] 4-25-91 1430

RECEIVED BY: Refrig #1 4-25-91 1430

RELINQUISHED BY: Refrig 4-26-91 08:00

RECEIVED BY: [signature] 4-26-91 08:00

RELINQUISHED BY: [signature] 4-26-91 14:50

RECEIVED BY LAB: [signature] 4-26-91 1450

DESIGNATED LABORATORY: IT SCV DHS #: 137

REMARKS: Normal TAT

WIC # 204-6852-1008

Exp Code: ~~5440~~ 5461

Shell Eng: ~~[illegible]~~

Jack Brastad

DATE COMPLETED 4-25-91 FOREMAN [signature]

Gettler - Ryan Inc. - T1-04-3[illegible]75

ENVIRONMENTAL DIVISION

Chain of Custody

COMPANY Shell Oil Co

JOB NO.

JOB LOCATION 15275 - Washington AV

CITY San Leandro

PHONE NO (415) 783-7500

AUTHORIZED Tom Paulsen

DATE 4-25-91

P.O. NO. 3615.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-16	3	Liquid	4-25-91/1145	TH(Gas) BTXE	Cool
S-17			0945		
SD-1			—		
SF-6					
Trip Blank	~~4~~ 3		—		

RELINQUISHED BY: [signature] 4-25-91 1430

RECEIVED BY: Refrig #1 4-25-91 1430

RELINQUISHED BY: Refrig #1 4-26-91 08:00

RECEIVED BY: [signature] 4-26-91 08:00

RELINQUISHED BY: [signature] 4-26-91 14:30

RECEIVED BY LAB: [signature] 4-26-91 1450

DESIGNATED LABORATORY: IT (Sc.)

DHS #: 137

REMARKS: Normal TAT

WIC # 204-6852-1008

Exp Code: ~~5460~~ 5461

Shell Engr: ~~Ed Hopkins~~ Jack Brastad

DATE COMPLETED 4-25-91

FOREMAN [signature]

ORIGINAL

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 06/12/91

Work Order: T1-06-011 P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3615, 15275 Wash., S.Lndro
Date Received: 06/04/91
Number of Samples: 2
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

PAGES	LABORATORY #	SAMPLE IDENTIFICATION
2	T1-06-011-01	S-18
3	T1-06-011-02	TRIP BLANK
4	T1-06-011-03	Quality Control

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/12/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-06-011

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-18**
SAMPLE DATE: **05/31/91**
LAB SAMPLE ID: **T106011-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **cool pH <2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		06/06/91
Low Boiling Hydrocarbons	Mod.8015		06/06/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**None**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	101.
1,3-Dichlorobenzene (BTEX)	98.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/12/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-06-011

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **TRIP BLANK**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T106011-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **cool pH<2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		06/05/91
Low Boiling Hydrocarbons	Mod.8015		06/05/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**None**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	100.
1,3-Dichlorobenzene (BTEX)	97.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/12/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-06-011

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T106011-03A
EXTRACTION DATE:
ANALYSIS DATE: 06/05/91
ANALYSIS METHOD: Mod.8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50	500.	430.	425.	86.	85.	1.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	94.	96.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 06/12/91
Client Work ID: GR3615, 15275 Wash., S.Lndro

Work Order: T1-06-011

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

Gettler - Ryan Inc. TI-06-011 ENVIRONMENTAL DIVISION **2677 Chain of Custody**

COMPANY Shell JOB NO. _____

JOB LOCATION 15275 Washington

CITY San Leandro PHONE NO. 783-7500

AUTHORIZED Tom Paulson DATE 5-31-91 P.O. NO. 3615-01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-18	3	liquid	5-31-91/1530	THC BTXE	cool, DC 6/4/91
Trip	1	"	—	"	

RELINQUISHED BY: [signature] 5-31-91

RECEIVED BY: Refrig #1

RELINQUISHED BY: [signature] Refrig #1

RECEIVED BY: [signature]

RELINQUISHED BY: [signature] 6-4-91 0915

RECEIVED BY LAB: [signature] 6/4/91 0915

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: Normal TAT

DATE COMPLETED 5-31-91 FOREMAN [signature]