TerraNext 9838 Old Placerville Road, Suite 100 Sacramento, CA 95827-3559

June 10, 1997

Project No. 05100680

Ms. Susan L. Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
1131 Harbor Bay Parkway
Alameda, California 94502

Re: Ground Water Investigation Report
Union Pacific Railroad Company
1450 Sherwin Street - Emeryville, California

Dear Ms. Hugo:

Terranext, on behalf of Union Pacific Railroad Company (UP), has prepared the attached *Ground Water Investigation Report* for the UP site located adjacent to the Sherwin Williams Plant, 1450 Sherwin Street, Emeryville, California. This report presents results of ground water monitoring for the first two sampling events (April and November 1996) at the site. Terranext sampled the monitoring wells in March 1997, and is also scheduled to do so in June 1997.

If you have any questions regarding this report, please contact the undersigned at (510) 553-0600 or (916) 369-8971.

Sincerely,

TERRANEXT

Pamela K. Williams
for James B. Ackerman, R.G.
Project Geologist

Carl Taylor
Project Manager

JBA/CKW/dao

Attachment

cc: Mr. Craig Denny, Union Pacific Railroad Company (with attachment)

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TerraNext 9838 Old Placerville Road, Suite 100 Sacramento, CA 95827-3559

LOP 5016

GROUND WATER INVESTIGATION REPORT

Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Project No. 05100680

Prepared For:

Union Pacific Railroad Company
One Market Plaza
San Francisco, CA 94105

June 10, 1997

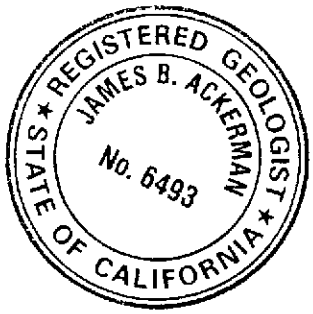
Telephone: 916 369•8971 Facsimile: 916 369•8370 www.terranext.com

GROUND WATER INVESTIGATION REPORT

Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Prepared By:

James B. Ackerman, R.G.
Project Geologist



Reviewed By:

Camilla K. Williams, C.E.G.
Senior Reviewer

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1.0 INTRODUCTION

Terranext, on behalf of Union Pacific Railroad Company (UP), is conducting quarterly ground water monitoring at the UP (formerly Southern Pacific Transportation Company [SPTCo]) property located adjacent to the Sherwin Williams Plant, 1450 Sherwin Street, Emeryville, California (Figure 1). Four underground storage tanks (USTs) containing "bunker C" oil, which were used in the early twentieth century to fuel steam locomotives, were formerly located on site. The monitoring wells used for this project were installed by Levine-Fricke to monitor the ground water surrounding the adjacent Sherwin Williams Plant site, and are sampled on a cooperative basis with Levine-Fricke. This report documents the results for the second and fourth quarters of 1996, which are the first two ground water monitoring events at the site.

2.0 BACKGROUND

According to SPTCo records, a fuel and water station was constructed at the subject site in 1930 to service steam locomotives used for transferring local customer freight in the Emeryville area. It is not known when the station was abandoned and/or demolished. The station included a 17,000 gallon water tank, pump house, and four USTs containing bunker C fuel oil. Bunker C is a #6 diesel fuel consisting of petroleum hydrocarbons in the C_{12} to C_{30+} carbon range. It is a black viscous liquid which is insoluble in water. The viscosity of bunker C at ambient air temperature requires that it be heated before pumping is possible. Steam coils were generally installed in the bunker C tanks to heat the oil.

The four former USTs were located on SPTCo property adjacent to the Sherwin Williams Plant (Figure 2). The Sherwin-Williams Plant has been in operation since the early 1900s manufacturing various types of coating products and lead-arsenate pesticides. The manufacture of pesticides was discontinued in the late 1940s, and the conversion from producing oil-based products to water-based products occurred in 1987. After the dismantling of the Sherwin-Williams oil and solvent tank facilities, two phases of soil and ground water investigations were conducted by Levine-Fricke on behalf of Sherwin Williams. During both phases of investigation, a series of monitoring wells were installed (LF-1 through LF-13) in the shallow aquifer (A-zone). The results of these investigations indicated that both soil and ground water were impacted by volatile organic compounds (VOCs), petroleum hydrocarbons in the gasoline range, and arsenic.

In 1990, Sherwin Williams retained Levine-Fricke to develop interim remedial measures for the site. Levine-Fricke recommended a remedial alternative of containment coupled with ground water extraction and treatment. A multimedia cap would seal and stabilize impacted soil, as well as impede the infiltration of additional ground water, and impacted ground water would be contained laterally with a bentonite slurry wall. These recommendations, as well

as the results of both phases of soil and ground water investigation are discussed in the Levine-Fricke report dated December 20, 1991, entitled: *Evaluation of Interim Remedial Measures at the Sherwin Williams Facility, Emeryville, California.*

On January 28, 1994, while conducting grading operations to improve an access road to the Sherwin-Williams plant, contractors for Sherwin Williams discovered an UST containing a thick petroleum product. In a request for proposal dated March 2, 1994, SPTCo authorized Terranext (then Industrial Compliance [IC]) to remove up to four USTs containing bunker C oil, and to proceed with preparation for the project. In a letter dated May 12, 1994, the Alameda County Health Care Services Agency, Department of Environmental Health (Alameda County) directed SPTCo and/or Sherwin-Williams to properly close the UST which had previously been discovered. IC responded in a letter dated May 23, 1994, which informed Alameda County that SPTCo intended to remove the UST, but negotiations to choose a contractor and to secure right-of-way access onto the Sherwin-Williams facility, delayed UST removal.

Between July 25, and August 5, 1994, all four USTs were located, evacuated of bunker C oil, and removed (location of the USTs are shown on Figure 2). Each UST was approximately 30 feet in length, 6 feet in diameter, and were joined together by a 12-inch diameter piping manifold. Using steam, a total of 30,450 gallons of bunker C oil mixed with water as evacuated from the four USTs. Approximately 250 cubic yards (cy) of soil was excavated from around the four USTs during the removal process, resulting in an excavation approximately 80-feet long, 20-feet wide, and 8-feet deep. Ground water was encountered in the southern end of the excavation.

Eight confirmation soil samples were taken from the sidewalls of the excavation. Each sample was analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-G), TPH as diesel (TPH-D), and TPH as bunker C oil (TPH-B) using Environmental Protection Agency

(EPA) Method 8015 modified; benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020; oil and grease using EPA Method 5520; halogenated VOCs using EPA Method 8010; and semivolatile organic compounds (SVOCs) using EPA Method 8270. Two grab samples were collected of the ground water which had filled the southern end of the excavation. The ground water samples were composited at the lab and analyzed for the same suite of analytes listed above, with the addition of the metals barium, cadmium, chromium, silver (all by EPA Method 6010), arsenic (EPA Method 7060), lead (EPA Method 7421), mercury (EPA Method 7470), and selenium (EPA Method 7740).

Analytical results for the soil confirmation samples are shown in Table 1. Concentrations of TPH-G were detected in four of eight confirmation samples ranging from 1.4 milligrams per kilogram (mg/kg) to 18 mg/kg. Concentrations of higher boiling petroleum hydrocarbons were greatest in soil samples taken from the eastern sidewall of the excavation (T1-SW, T1T3-SW, and T3-SW). Maximum concentrations of TPH-D, TPH-B, and oil & grease within these three samples were found in T1T3-SW at 4,400 mg/kg, 28,000 mg/kg, and 7,700 mg/kg respectively. In the remaining five samples, concentrations of TPH-D, TPH-B, and oil & grease ranged from <5.0 mg/kg to 230 mg/kg, 8.4 mg/kg to 780 mg/kg, and <50 mg/kg to 110 mg/kg respectively. Low concentrations of selected SVOCs were detected in samples T1-SW and T4-SW only. BTEX and other VOCs were not detected at or above the method reporting limit.

Within the composite ground water confirmation sample, TPH-G, TPH-D, and TPH-B were detected at concentrations of 150 micrograms per liter (μg/L), 3,200 μg/L, and 6,100 μg/L, respectively (Table 1). Benzene, toluene, and xylenes were detected at concentrations of 1.2 μg/L, 0.8 μg/L, and 2.4 μg/L. The SVOC acenaphthene was detected was detected at a concentration of 15 μg/L. Ethylbenzene, VOCs analyzed by EPA method 8010, and remaining SVOCs were not detected at or above the respective method reporting limits within the ground water sample.

Although confirmation soil samples contained high concentrations of petroleum hydrocarbons, it was not feasible to extend the limits of the excavation due to SPTCo railroad tracks to the west and the proposed bentonite slurry cutoff wall for the Sherwin-Williams Plant to the east. Results of the UST removal were documented in a report dated September 29, 1994, entitled: *Tank Closure Report, Southern Pacific Transportation Company, 1450 Sherwin Avenue, Emeryville, California.*

As a result of reviewing the *Tank Closure Report*, Alameda County requested that SPTCo submit a workplan to investigate the vertical and lateral extent of soil and ground water impacts in a letter dated February 28, 1995. On April 28, 1995, IC submitted a workplan to SPTCo which was subsequently submitted to Alameda County in February 1996. The workplan proposed the use of monitoring wells which were scheduled to be installed by Levine-Fricke to monitor the ground water in the area of the former USTs. In addition, soil samples were to be collected from the well boring adjacent the former UST location (LF-21).

In July 1995, two USTs were discovered by Sherwin Williams contractors during construction of the bentonite slurry wall, which was part the interim remedial measures recommended by Levine-Fricke. Due to the proximity of these two USTs to the four USTs removed the previous year, it is possible that both sets of USTs were part of the same fueling facility. However, because the USTs straddled the Sherwin Williams/SPTCo property line, and of the need to ensure the timely construction of the bentonite-slurry cutoff wall, Sherwin Williams directed Levine-Fricke to remove the USTs. Between July 18 and August 2, 1995, the two USTs were removed and approximately 35 cy of visually impacted soil were excavated (location of the two USTs are shown on Figure 2). The USTs contained a viscous petroleum product, 540 gallons of which were evacuated prior to removal. A similar petroleum product was found in the slurry wall trench northeast of the USTs. Analysis of the product within the USTs, the product in the trench, and the confirmation samples indicated heavy hydrocarbons in the motor oil range. Results of the UST removal

was documented in a Levine-Fricke report dated March 15, 1996, entitled: *Underground Storage Tank Removal Report, Sherwin-Williams Facility, Emeryville, California.*

Between February 5, and April 5, 1995, Levine-Fricke installed monitoring wells LF-20, LF-21, LF-23, LF-24, and LF-25 (shown on Figure 2). Unfortunately, due to a break in the chain of communication between Levine-Fricke, SPTCo, and Terranext, LF-21 was completed before soil samples could be collected. To date, Terranext has collected split ground water samples with the cooperation of Levine-Fricke for two quarters of ground water monitoring[1]. This ground water investigation documents the results of these two sampling events.

1. Due to a miscommunication regarding the sampling schedule, samples were not collected for the third quarter, 1996.

3.0 HYDROGEOLOGY

The 1450 Sherwin Williams site is located approximately 1600 feet (0.3 mile) east of the San Francisco Bay (Emeryville Crescent Area), at an approximate elevation of 10 feet above mean sea level. The original shoreline of the bay as of 1883 was approximately 700 feet to the west, and a salt marsh was located approximately 150 feet to the south prior to the placement of artificial fill[2]. The local hydrology consists of a shallow aquifer (A-zone) and a deeper aquifer (B-zone) which are separated by 10 to 18 feet of fine-grained sediments[3]. The A-zone aquifer is being monitored for this investigation. Based on two quarters of ground water level measurements, ground water within the shallow aquifer is between 4 to 7 feet below the ground surface (bgs).

The following description of soil lithology is based on the well boring logs of LF-20, LF-21, LF-23, LF-24, and LF-25, which were installed by Levine-Fricke[4] (Appendix A). The Levine-Fricke well boring logs were used to prepared cross-sections which depict site lithology (Figures 3 through 6). Figure 3 is the index map for the cross-sections. The soil lithology at the site typically consists of 1.5 to 4.5 feet of artificial fill, which overlies native bay sediments. The fill, which covers the site continuously, consists of gravel mixtures which range from silty to poorly sorted (well graded) gravel, and may have wholly or partially resulted from older railroad ballast. The native sediments consist primarily of silt and clay mixtures with occasional lenses of sand and gravel mixtures. These sediments are interpreted as tidal channels and/or shoals in a tidal depositional environment, and are gently dipping to the west, toward the bay.

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2. *Map of Oakland and Vicinity*, W.F. Boardman, city and county surveyor, submitted to the Alameda County recorder April 23, 1883.

3. *Evaluation of Interim Remedial Measures at the Sherwin-Williams Facility, Emeryville, California*. Levine-Fricke, December 20, 1991.

4. *Report of Quarterly Groundwater Monitoring for the period from April 1 through June 30, 1996, the Sherwin Williams Plant, Emeryville, California*. Levine Fricke, July 24, 1996.

4.0 FIELD PROCEDURES

This section describes the procedures used for monitoring well installation, development, and sampling. Because the monitoring wells were installed and developed by Levine-Fricke, this section summarizes the procedures used by Levine-Fricke[5].

4.1 Monitoring Well Installation and Development

All monitoring wells used for this investigation were installed by Levine-Fricke on February 5, 1996 (LF-20, LF-21); and April 4 (LF-24, LF-25) and April 5, 1996 (LF-23). These wells were installed utilizing a truck mounted hollow-stem auger drill rig with 8 inch outer diameter augers. The monitoring wells were constructed using 2 inch diameter schedule 40 PVC casing. The bottom ten feet of each well was screened with 0.010 inch factory slotted schedule 40 PVC casing. The artificial sand pack consisted of #2/16 sand which was poured to depth of at least one foot above the screened interval. One to two feet of bentonite pellets were added above the artificial sand pack, and were allowed sufficient time to hydrate. A 5 percent bentonite cement grout slurry was poured above the bentonite seal to the surface. Monitoring wells LF-20 and LF-21 were completed with a christy box at present grade. Monitoring wells LF-23, LF-24, and LF-25 were finished with "stove pipe" monuments to 3 feet above grade. Horizontal well locations and top of casing elevations were surveyed by Nolte and Associates Inc., a licensed surveyor.

Between April 9 and April 11, 1996, the monitoring wells were developed by bailing, swabbing, and pumping. During well development, specific conductance, pH, and temperature were measured and recorded during the process to access changes in water quality.

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5. *Report of Quarterly Groundwater Monitoring for the period from April 1 through June 30, 1996, the Sherwin Williams Plant, Emeryville, California.* Levine Fricke, July 24, 1996.

4.2 Monitoring Well Sampling

On April 10 and 11, 1996, for the second quarter, and on November 21, 1996, for the fourth quarter, depth to ground water was measured and the monitoring wells were sampled in cooperation with Levine-Fricke. On the basis of depth to water measurements, the saturated well volume was calculated and a minimum of 3 well volumes were purged by bailing with a disposable polyethylene bailer. Ground water characterization data, consisting of temperature, specific conductance, and pH, were measured for each well volume. After purging was complete, each well was allowed to recover to 80 percent of the initial well volume before sampling. Fourth quarter 1996 ground water purge characterization data are presented in Table 2 and ground water level measurements and purge characterization logs are included in Appendix B[6].

Ground water samples were collected using a disposable polyethylene bailer. The water sample from the bailer was transferred into two glass amber bottles. After sample collection was completed, each sample was labeled with a unique sample number, the site name, date of collection, time of collection, initials of collector, and any other pertinent information. The samples were then placed in a chilled ice chest for transport to the analytical laboratory. A chain-of-custody document was completed concurrent with sample collection and accompanied the samples. All ground water samples were analyzed for TPH by EPA Method 8015 Modified. Samples with detectable concentrations of TPH were reanalyzed using Method 8015 following a silica gel cleanup (EPA Method 3630)[7]. The analytical reports and chain-of-custody forms can be found in Appendix C.

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6. Purge characterization data were not recorded for the second quarter 1996.

7. No samples collected during the fourth quarter were reanalyzed for 8015M using the silica gel cleanup.

5.0 GROUND WATER INVESTIGATION RESULTS

5.1 Ground Water Flow and Direction

Depth to ground water measurements during second and fourth quarters 1996 were taken by Levine-Fricke on April 24, and November 21, 1996. Ground water elevations are listed in Table 3 and maps depicting the ground water elevation for the second and fourth quarters are shown on Figures 7 and 8, respectively. Ground water elevations measured during the second quarter (April) 1996 ranged from 4.16 to 6.72 feet mean sea level (MSL) and averaged 5.50 feet. Ground water elevations measured during the fourth quarter (November) 1996 ranged from 3.87 to 6.10 feet MSL and averaged 4.78 feet. Between the second and fourth quarters 1996 ground water elevations decreased in all wells an average of 0.72 feet.

The average local hydraulic gradients calculated from water level measurements taken during the second and fourth quarters are 0.008 and 0.009, respectively. The apparent ground water flow direction has varied slightly from north-northeast during the second quarter to northeast during the fourth quarter. Prior to the placement of the slurry-bentonite cutoff wall, the hydraulic gradient was 0.005 and the flow direction was to the northwest in the A-zone aquifer[8]. The decrease in ground water elevations and the slight changes in hydraulic gradient and flow direction are likely due to the readjustment of the A-zone aquifer to the placement of the bentonite-slurry cutoff wall and/or seasonal variations.

5.2 Analytical Results

Analytical results for the second and fourth quarters 1996, are summarized below and in Table 5. Analytical laboratory reports are included in Appendix C.

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8. *Evaluation of Interim Remedial Measures at the Sherwin-Williams Facility, Emeryville, California*, December 20, 1991, by Levine-Fricke.

* TPH was not detected at or above the reporting limit in samples collected in LF-24 during the second and fourth quarters 1996. TPH was also not detected in the sample collected from LF-25 during fourth quarter 1996. Hydrocarbons in the motor oil range were not detected in any of these samples at or above the reporting limit of 590 μg/L.

* Hydrocarbons in the diesel range[9] were detected in samples collected from LF-20, LF-21, LF-23, and LF-25 during second quarter 1996 at concentrations of 1,000 μg/L, 910 μg/L, 340 μg/L, and 88 μg/L, respectively. Of these four samples, only the sample from LF-20 had detectable concentrations of TPH (82 μg/L) using a silica get cleanup.

* Hydrocarbons in the diesel range were detected in the samples from LF-20, LF-21[10], and LF-23 during fourth quarter 1996 at concentrations of 1,800 μg/L, 1,100 μg/L, and 420 μg/L, respectively. The samples from these wells were not rerun using a silica gel cleanup.

All laboratory procedures (holding times, methods used, method blanks, documentation, etc.) and subsequent results were monitored throughout the analytical process according to standard quality assurance/quality control (QA/QC) procedures. In addition, all laboratory reports were evaluated as part of QA/QC procedures for ground water monitoring. The analytical data for the second and fourth quarters, 1996 are considered quantitatively valid.

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9. The hydrocarbons detected in samples collected on 04/12/96 were described as an unknown mixture in the range of C_{10}-C_{32}, atypical of diesel fuel. Only hydrocarbons from C_{10}-C_{24} were quantified based on comparison with a diesel standard.

10. The hydrocarbons detected in the sample collected from LF-21 on November 21, 1996, were reported as being within the diesel range, but did not match the diesel standard.

6.0 DISCUSSION

6.1 Distribution of Total Petroleum Hydrocarbons in Ground Water

Hydrocarbons were either not detected or could not be confirmed in samples collected from LF-24 and LF-25 during the second and fourth quarters 1996. Analytical results for TPH suggest that hydrocarbons are present in the vicinity of wells LF-20, LF-21 and LF-23. However, only the sample from LF-20 had detectable concentrations of TPH using a silica gel cleanup based on second quarter 1996 results.

Treatment of samples using a silica gel cleanup prior to analysis using EPA Method 8015, removes polar biogenic compounds that can result in exaggerated TPH concentrations. Therefore, the majority of hydrocarbons detected in the monitoring well samples are not petroleum hydrocarbons dissolved in the ground water, but rather polar biogenic compounds resulting from either biodegradation of petroleum hydrocarbons on site, or other biogenic materials.[11] This is supported by the interpretation of chromatograms by Friedman & Bruya, Inc. of the second quarter 1996 samples (Appendix D).

In addition, chromatograms from the analysis of both second and fourth quarter samples (Appendices D and E, respectively) suggest that the biogenic hydrocarbons detected in LF-20 are different than that of LF-21. The chromatographic curve for the sample from LF-20 contains erratic peaks and extends from a carbon range $C_{<10}$ to C_{30}, while the chromatographic curve for LF-21 is broad, lacking erratic peaks, and extends from carbon range C_{12} to C_{34}, which would be expected from a sample which contains bunker C fuel oil (or the biodegraded equivalent). This would suggest the polar biogenic hydrocarbons

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11. Source: Zemo, D. A. and Synowiec, K. A. 1995. *Portions in Ground Water: Identification and Elimination of Positive Interferences*. Proceedings of the 1995 Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention Detection and Remediation (Conference). NGWA/API, Houston, Texas.

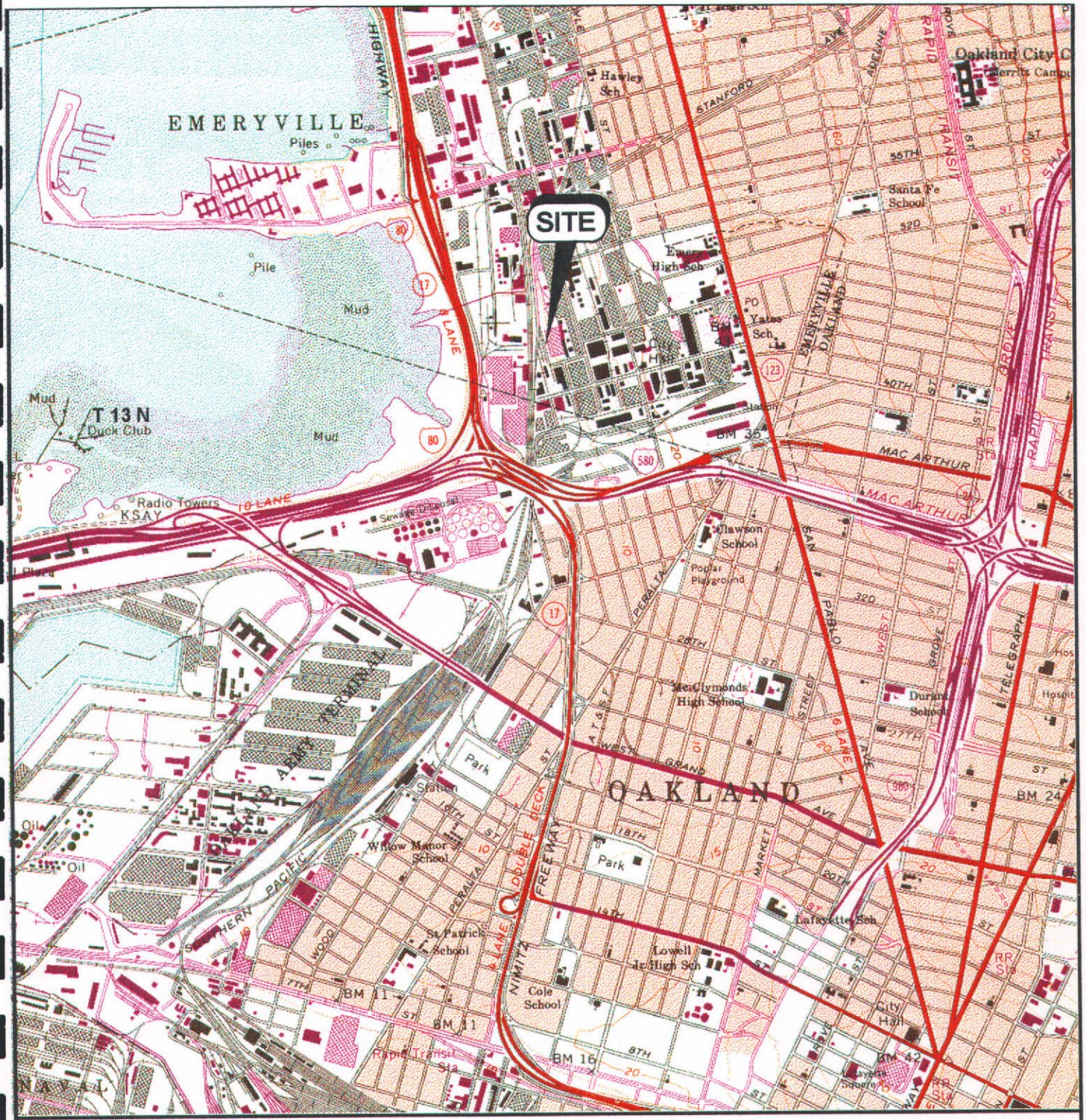
detected in the LF-20 samples were produced from the degradation of a petroleum source other than the bunker C oil USTs.

6.2 Recommendations

Given that: a) the majority of hydrocarbons detected in site ground water are polar biogenic compounds and not dissolved petroleum hydrocarbons, b) the biogenic hydrocarbons may have come from a source other than the USTs, and c) the hydraulic gradient in the vicinity is relatively low (0.008-0.009), the impact of the USTs to the surrounding ground water is limited and/or negligible. Therefore, the status of the site should be designated as a "low-risk". It is recommended that the site ground water be monitored for two additional quarters, after which closure of the site will be pursued. It is also recommended that future monitoring include other pertinent Levin-Fricke wells to confirm the status of the low-risk designation for this site.

7.0 GLOSSARY OF ACRONYMS

bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene and xylenes
cy	Cubic yards
EPA	Environmental protection agency
IC	Industrial Compliance
mg/kg	Milligrams per kilogram
MSL	Mean sea level
QA/QC	Quality Assurance/Quality Control
SPTCo	Southern Pacific Transportation Company
SVOCs	Semivolatile organic compounds
TPH	Total petroleum hydrocarbons
TPH-B	Total petroleum hydrocarbons as bunker C oil
TPH-D	Total petroleum hydrocarbons as diesel
TPH-G	Total petroleum hydrocarbons as gasoline
UP	Union Pacific Railroad Company
USTs	Underground storage tanks
VOCs	Volatile organic compounds
μg/L	Micrograms per liter



Reference:
U.S.G.S. 7.5 Minute Series (Topographic)
Oakland West Quadrangle
California
Dated: 1959, photorevised 1980

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1/2 0 1 MILE

APPROXIMATE SCALE (MILES)

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

APPROXIMATE SCALE (FEET)

Project No.: 05100680	Figure No: 1
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File No.: 680SM	Drawn By: Patti Decker
Date: 06/22/97	Approved By: James Ackerman

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SITE LOCATION MAP

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

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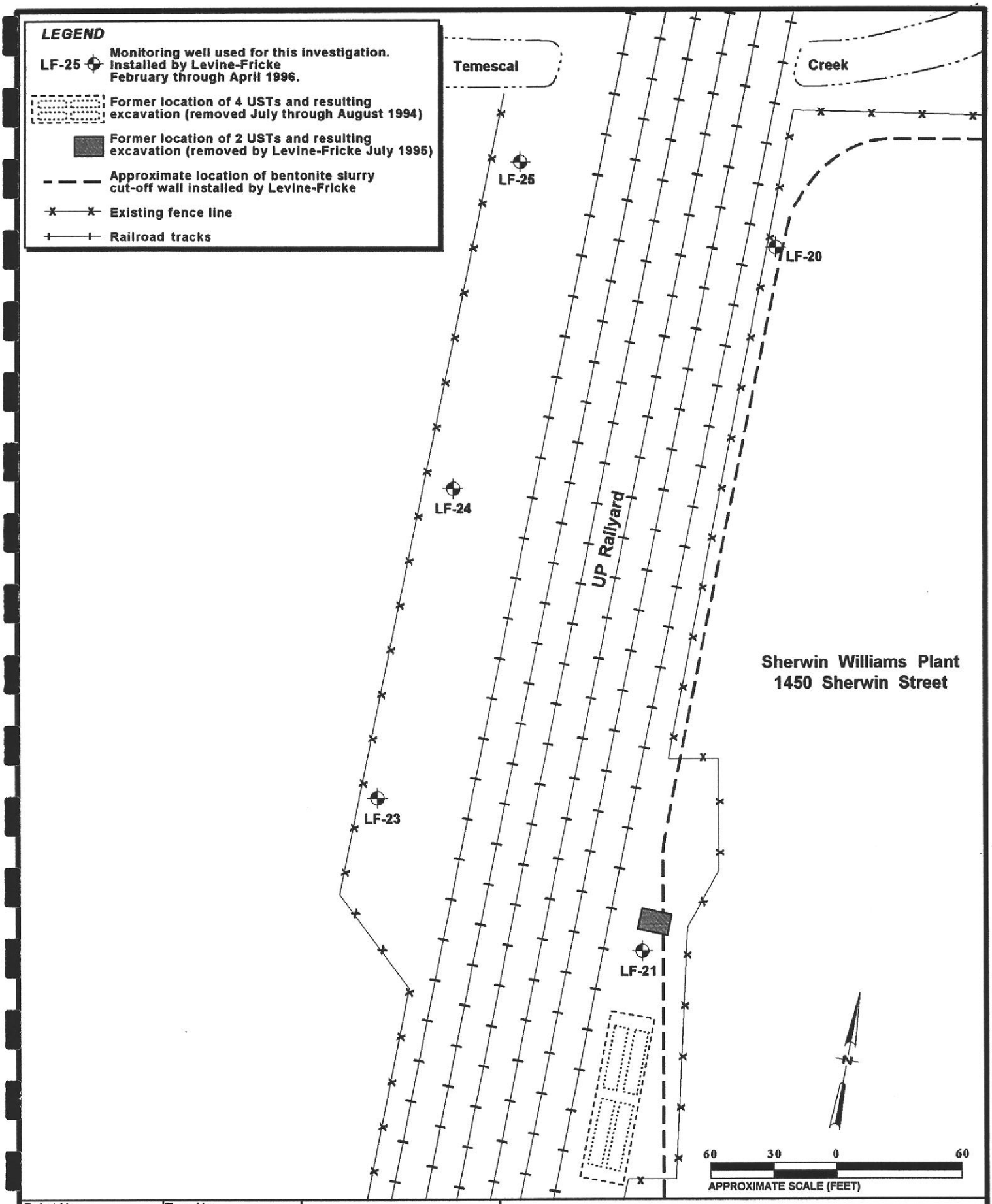

Project No.: 05100680	Figure No.: 2
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File No.: D5001175	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

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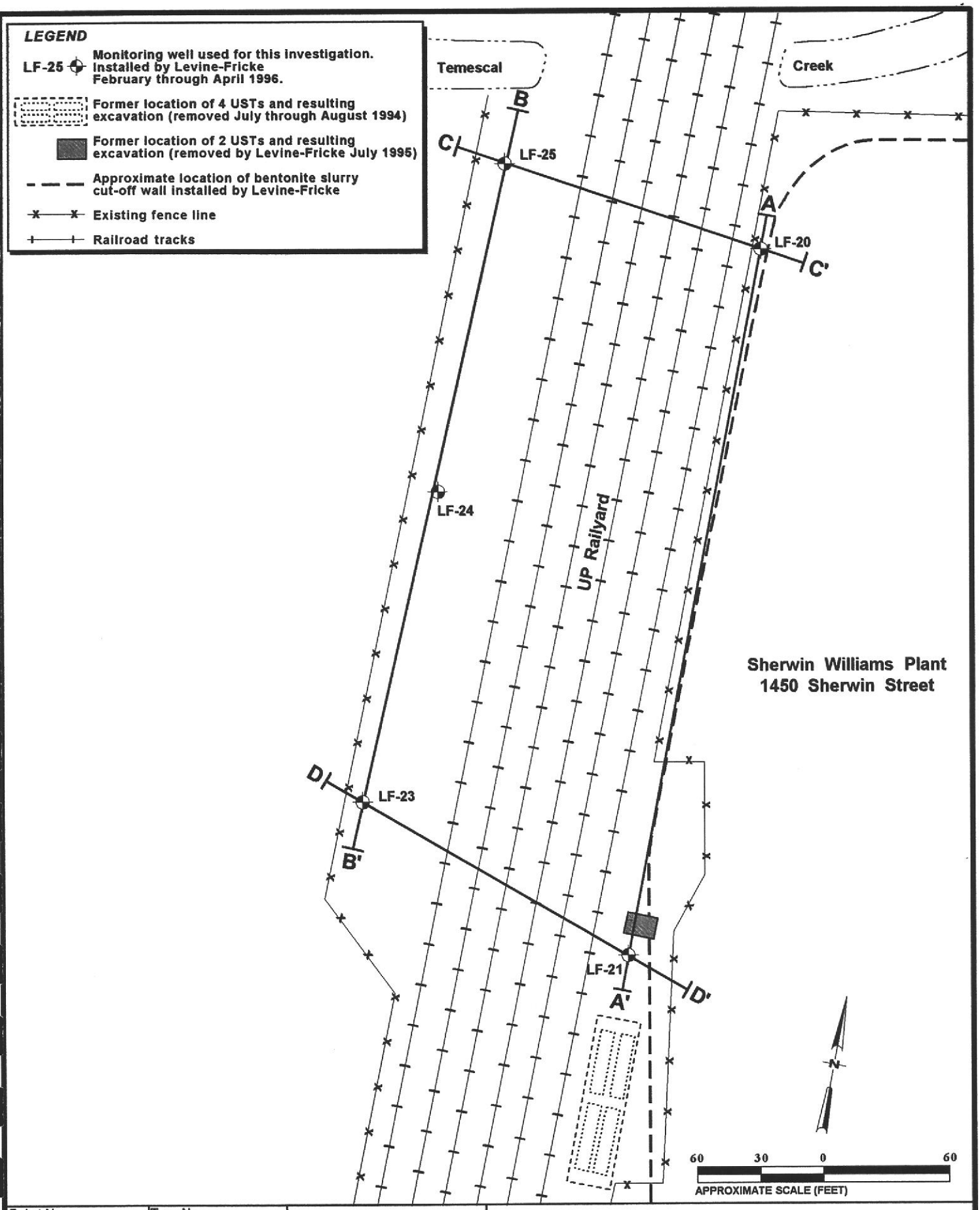
SITE PLAN
UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA



Project No.: 05100680	Figure No.: 3
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File No.: D5001177	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

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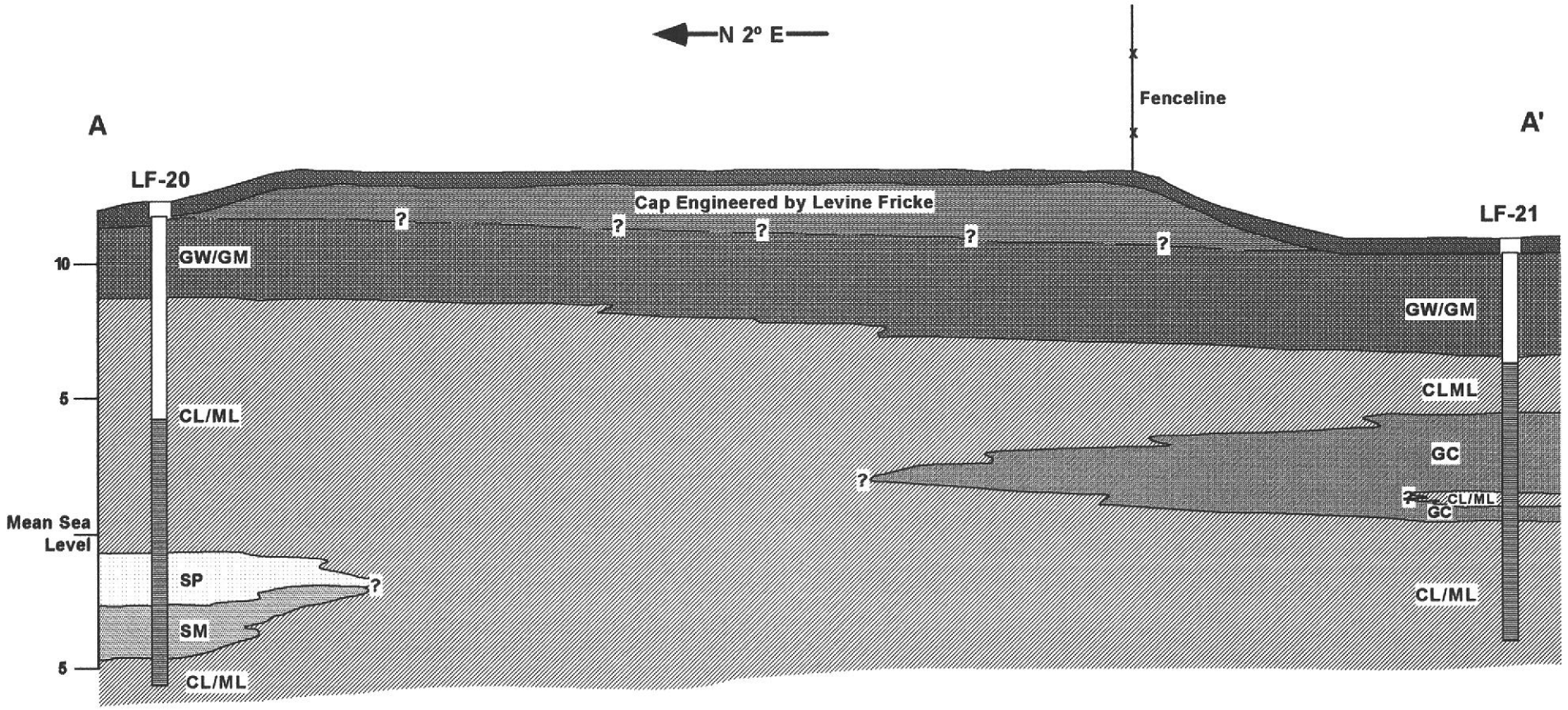
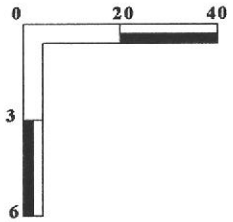
INDEX MAP FOR CROSS-SECTIONS
A-A', B-B', C-C', D-D'
UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA



LEGEND

- Asphalt
- GW/GM — Silty Gravel to Well Graded Gravel Fill
- CL/ML — Silty Clay to Clayey Silt
- GC — Clayey Gravel
- SP — Poorly Graded Sand
- SM — Silty Sand

Note: All soil lithology and well information from Levine-Fricke well boring/construction logs.



APPROXIMATE HORIZONTAL SCALE: 1" = 40'
APPROXIMATE VERTICAL SCALE: 1" = 6'

Project No.: 05100680	Figure No: 4
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File No.: D5001179	Drawn By: Janelle Hurtado
Date: 03/04/97	Approved By: James Ackerman

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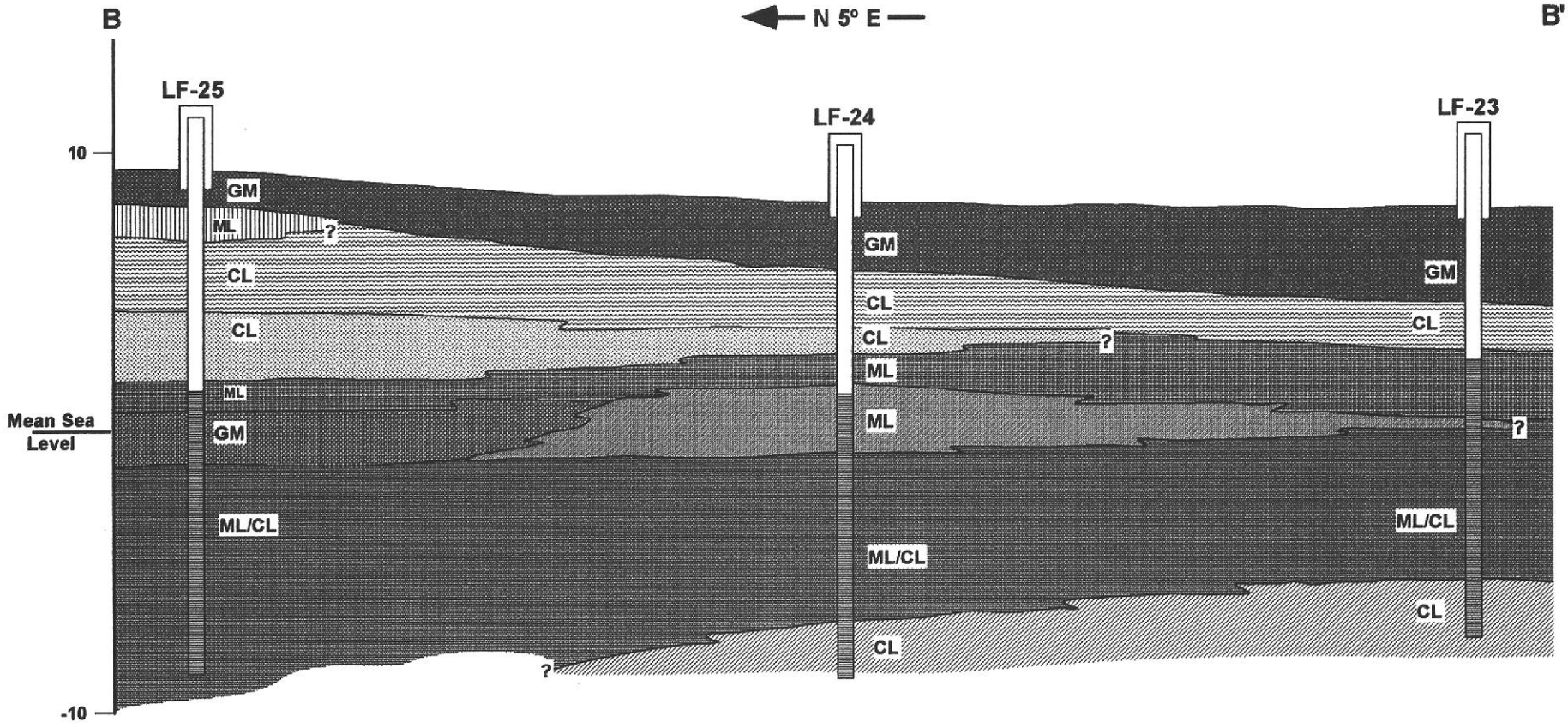
CROSS-SECTION THROUGH LINE A-A'

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA



LEGEND

GM	Silty Gravel (FILL)	ML ML/CL	Silt to Clayey Silt
ML	Sandy Silt	GM	Silty Gravel (Native)
CL/ML	Silty Clay with Organic Rich Zones	ML	Sandy to Gravelly Silt
CL	Gravelly Clay	CL	Very Stiff Silty Clay

0 20 40

3

6

APPROXIMATE HORIZONTAL SCALE: 1" = 40'
APPROXIMATE VERTICAL SCALE: 1" = 6'

Project No.: 05100680	Figure No: 5
Scale: As Above	Page No.: -
File No.: D5001181	Drawn By: Janelle Hurtado
Date: 03/04/97	Approved By: James Ackerman

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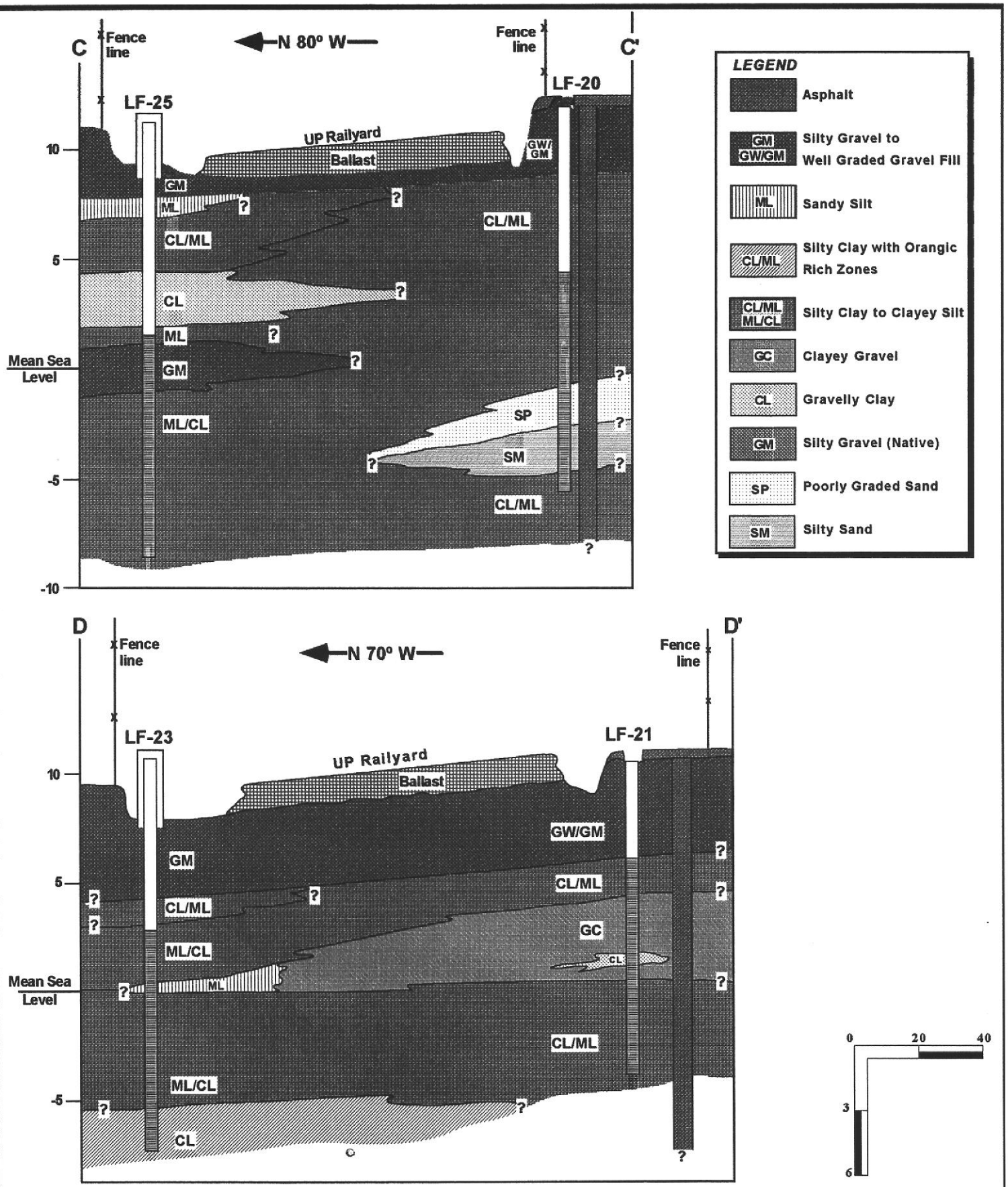
CROSS-SECTION THROUGH LINE B-B'

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

Note: All soil lithology and well information from Levine-Fricke well boring/construction logs.



Note: All soil lithology and well information from Levine-Fricke well boring/construction logs.

APPROXIMATE HORIZONTAL SCALE: 1" = 40'
APPROXIMATE VERTICAL SCALE: 1" = 6'

Project No.: 05100680	Figure No: 6
Scale: As Above	Page No.: -
File No.: D5001183	Drawn By: Janelle Hurtado
Date: 03/04/97	Approved By: James Ackerman

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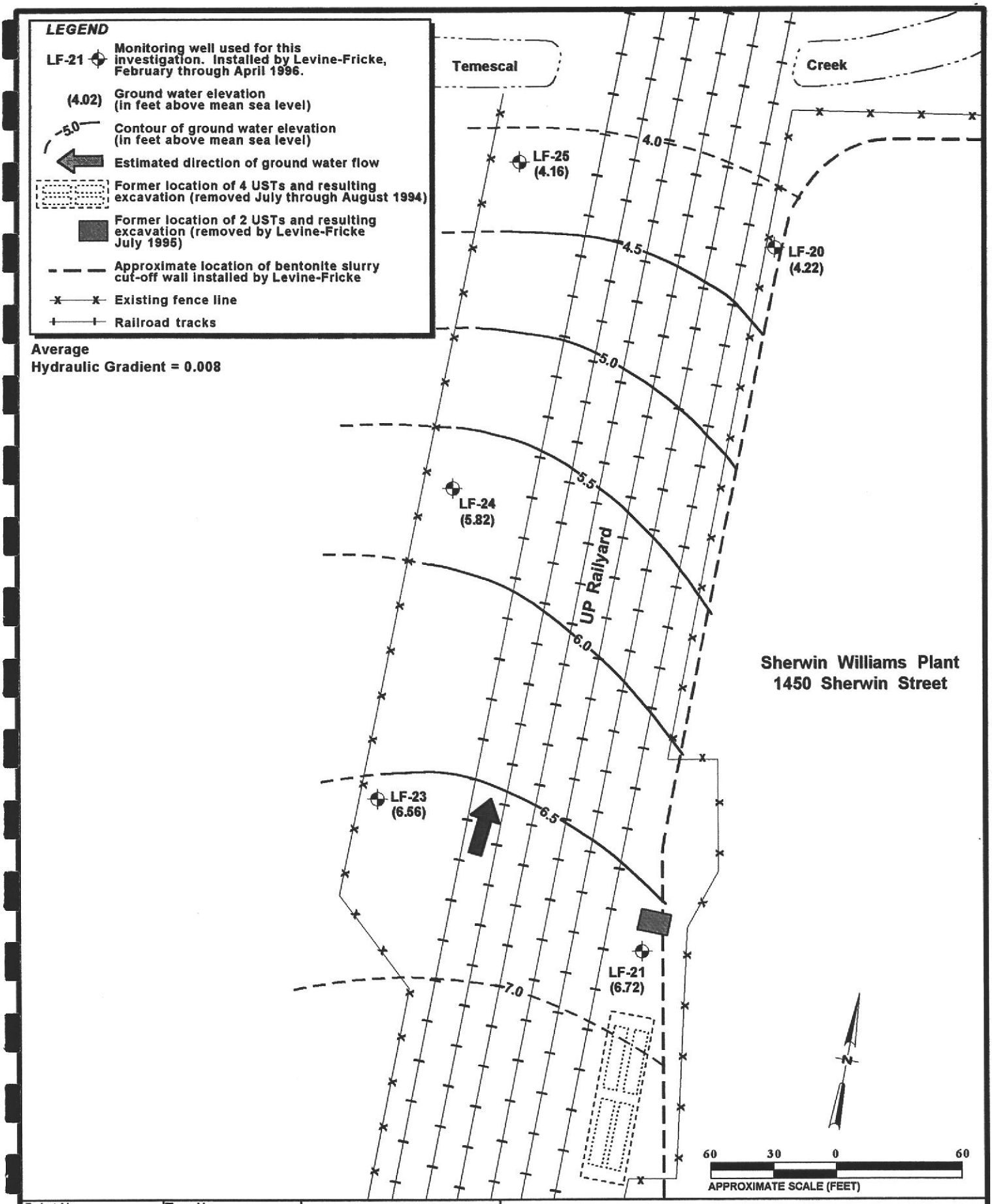
CROSS-SECTIONS THROUGH LINES C-C' AND D-D'

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

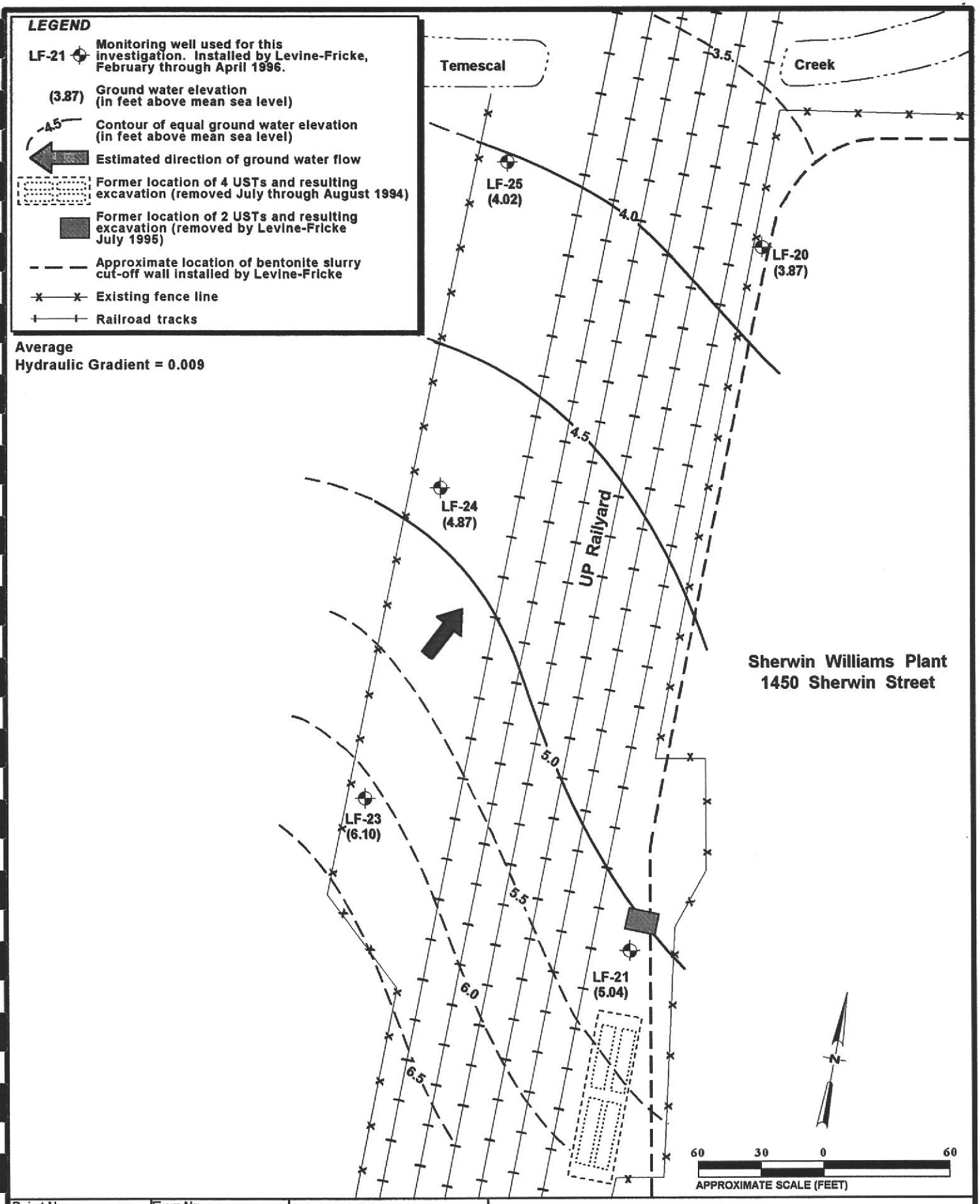


Project No.: 05100680	Figure No.: 7
Scale: 1" = 60'	Page No.: -
File No.: D5001185	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

Terranext

CONTOUR MAP OF GROUND WATER ELEVATIONS
APRIL 1996

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

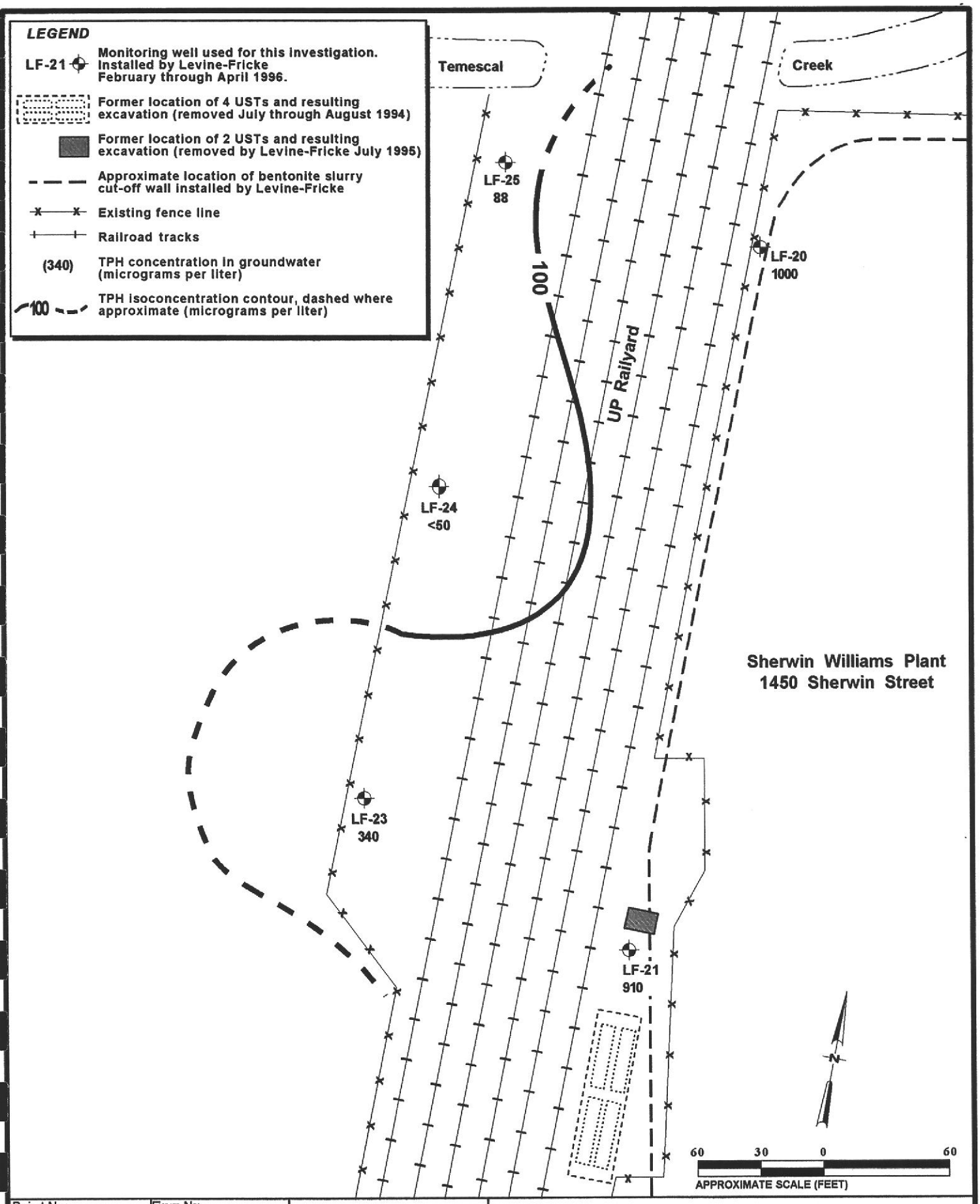


Project No.: 05100680	Figure No.: 8
Scale: 1" = 60'	Page No.: -
File No.: D5001187	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

Terranext

CONTOUR MAP OF GROUND WATER ELEVATIONS NOVEMBER 1996

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

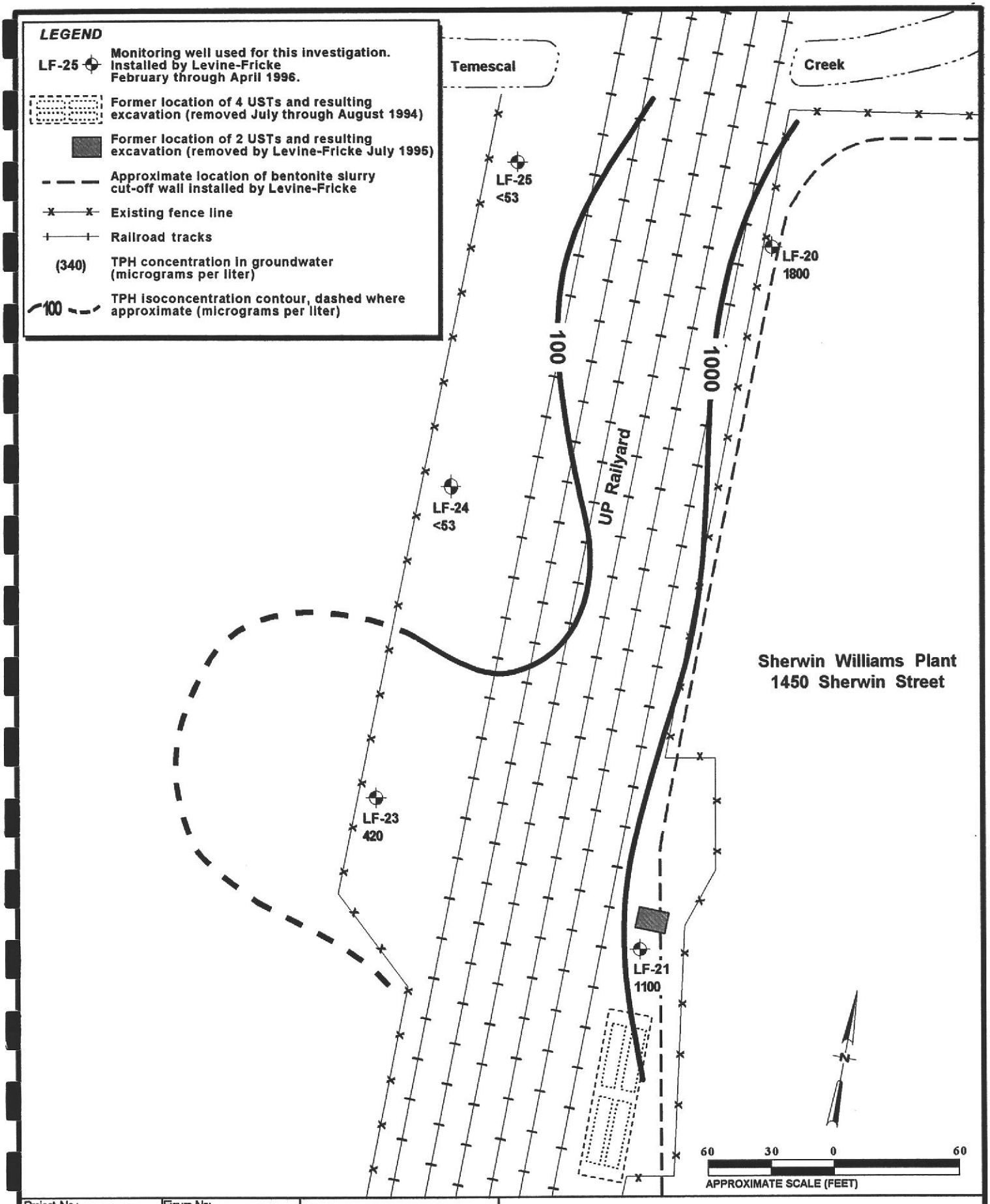


Project No.: 05100680	Figure No.: 9
Scale: 1" = 60'	Page No.: -
File No.: D5001175B	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

Terranext

TPH CONCENTRATIONS IN GROUNDWATER
APRIL 1996

UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA



Project No.: 05100680	Figure No: 10
Scale: 1" = 60'	Page No.: -
File No.: D5001175A	Drawn By: Janelle Hurtado
Date: 03/03/97	Approved By: James Ackerman

TerraNext

TPH CONCENTRATIONS IN GROUNDWATER
NOVEMBER 1996
UNION PACIFIC RAILROAD COMPANY
1450 SHERWIN STREET
EMERYVILLE, CALIFORNIA

TABLE 1
ANALYTICAL RESULTS - CONFIRMATION SAMPLES
UST EXCAVATION

Sample Number	Date Sampled	Total Petroleum Hydrocarbons			Oil and Grease	Volatile Organic Compounds					Semivolatile Compounds[a]					
		Gasoline	Diesel	Bunker C Oil		Benzene	Toluene	Ethylbenzene	Xylenes	Halogenated Compounds	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
EPA Analysis Method		8015			5520	8020				8010[b]	8270					
Confirmation Soil Samples[c] (mg/Kg)																
T1-SW	08/03/94	4.3	1,700	7,400	2,800	<0.005	<0.005	<0.005	<0.005	NA	<1.6	<1.6	4.5	1.9	<1.6	2.9
T1T2-SW	08/03/94	<1.0	<5.0	40	13	<0.005	<0.005	<0.005	<0.005	NA	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
T2-SW	08/03/94	<1.0	<5.0	8.4	<50	<0.005	<0.005	<0.005	<0.005	NA	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
T1T3-SW	08/03/94	18	4,400	28,000	7,700	<0.005	<0.005	<0.005	<0.005	ND	<33	<33	<33	<33	<33	<33
T3-SW	08/03/94	2.5	540	1,800	880	<0.005	<0.005	<0.005	<0.005	NA	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
T3T4-SW	08/03/94	<1.0	30	230	67	<0.005	<0.005	<0.005	<0.005	NA	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
T2T4-SW	08/03/94	<1.0	<5.0	37	110	<0.005	<0.005	<0.005	<0.005	ND	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
T4-SW	08/03/94	1.4	230	780	83	<0.005	<0.005	<0.005	<0.005	NA	0.54	0.43	1.4	0.37	0.99	0.75
Confirmation Ground Water Sample[d] (µg/L)																
28215/28216	08/03/94	150	3,200	6,100	<5.0	1.2	0.8	<0.5	2.4	ND	15	<10	<10	<10	<10	<10

a Only constituents which were detected above the reporting limits are included in table.

b Reporting limits for analysis by EPA Method 8010 range from 0.005 to 0.02 mg/kg for soil, and 0.5 to 2.0 µg/L

c All confirmation soil samples were collected at an approximate depth of 7 feet below ground surface from the sidewall.

d The confirmation water sample was a composite of two water samples collected from the ground water which filled the southern end of the UST excavation.

mg/kg Milligrams per kilogram

µg/L Micrograms per liter

< Symbol indicates the constituent was not detected at or above the reporting limit as noted.

ND Not detected above the reporting limit for any analyte included in the analysis.

NA Not Analyzed.

EPA Environmental Protection Agency

UST Underground storage tank

TABLE 2
GROUND WATER PURGE CHARACTERIZATION DATA
NOVEMBER 1996

Monitoring Well[a]	Date Measured	Purge Volume (gallons)	Electrical Conductivity (μS/cm)	Temperature (°C)	Field pH
LF-20	11/21/96	2	1322	20.1	6.68
		4	1294	20.1	6.66
		6	1324	20.1	6.65
LF-21	11/21/96	2	996	20.9	6.79
		4	996	21.0	6.73
		6	994	21.0	6.65
LF-23	11/21/96	2.5	876	19.3	6.87
		5.0	826	19.5	6.83
		7.5	815	19.5	6.80
LF-24	11/21/96	2.5	594	18.9	7.00
		5.0	606	19.0	6.93
		7.5	608	18.9	7.03
LF-25	11/21/96	2	710	18.6	6.98
		4	709	18.7	6.91
		6	700	18.7	6.86

a See Figure 2 for approximate monitoring well locations.

μS/cm Microsiemens per centimeter

°C Degrees Celsius

Note: Purge characterization logs for November 1996 are included in Appendix B.

TABLE 3
GROUND WATER ELEVATION DATA

Monitoring Well[a]	Date Measured	Top of Casing Elevation[b] (feet MSL)	Depth to Ground Water[c] (feet TOC)	Ground Water Elevation[d] (feet MSL)
LF-20	04/24/96	11.77	7.55	4.22
	11/21/96		7.90	3.87
LF-21	04/24/96	10.37	3.65	6.72
	11/21/96		5.33	5.04
LF-23	04/24/96	10.64	4.08	6.56
	11/21/96		4.54	6.10
LF-24	04/24/96	10.22	4.40	5.82
	11/21/96		5.35	4.87
LF-25	04/24/96	11.31	7.15	4.16
	11/21/96		7.29	4.02

a See Figure 2 for approximate monitoring well locations.

b Top of casing elevation is a surveyed point marked on the top of the well casing.

c Depth to ground water measured from top of casing.

d Ground water elevation in feet above MSL. Ground water elevation is calculated by subtracting the depth to ground water from the top of casing elevation.

MSL Mean sea level

TOC Top of casing

TABLE 4
GROUND WATER ANALYTICAL RESULTS

Monitoring Well[a]	Date Sampled	Total Petroleum Hydrocarbons (µg/L)		
		Standard Analysis		With Silica Gel Cleanup
		Diesel (C_{10}-C_{24})[b]	Motor Oil (>C_{24})	Diesel (C_9-C_{13})
EPA Method		8015M		8015M/3630 Modified
LF-20	04/12/96	**1,000**	NQ	**82**
	11/21/96	**1,800**	<540	NA
LF-21	04/10/96	**910**	NQ	<50
	11/21/96	**1,100**	<590	NA
LF-23	04/10/96	**340**	NQ	<50
	11/21/96	**420**	<540	NA
LF-24	04/12/96	<50	<50	NA
	11/21/96	<50	<530	NA
LF-25	04/12/96	**88**	NQ	<50
	11/21/96	<53	<530	NA

a See Figure 2 for approximate monitoring well locations.

b The hydrocarbons detected in samples collected on 04/12/96 were described as an unknown hydrocarbon mixture in the carbon range of C_{10}-C_{32}, atypical of diesel fuel. Only hydrocarbons from C_{10}-C_{24} were quantified based on comparison with a diesel standard.

µg/L Micrograms per liter

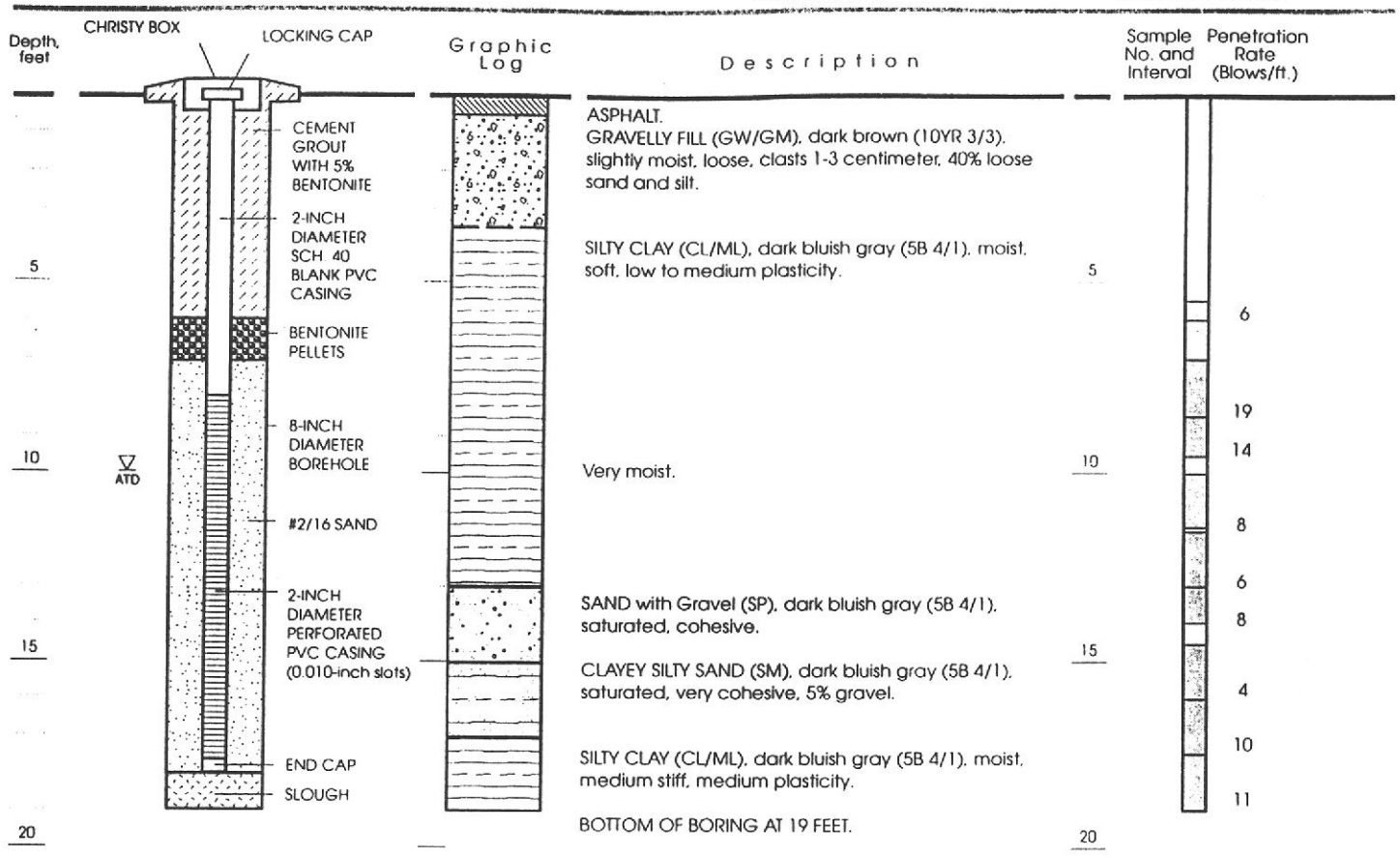
< Symbol indicates the constituent was not detected at or above reporting limit as noted.

NA Not analyzed

NQ Hydrocarbons in the motor oil range (>C_{24}) were not quantified.

APPENDIX A

WELL BORING AND CONSTRUCTION LOGS FROM LEVINE-FRICKE



Well Permit No.: 96048
Date well drilled: February 5, 1996
Drilling company: Gregg Drilling
Sampling Method: Modified California Sampler
Drillind method: Hollow-stem auger
LF Geologist: James P. Schwartz

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using Modified California Sampler
- ATD — Water level at time of drilling

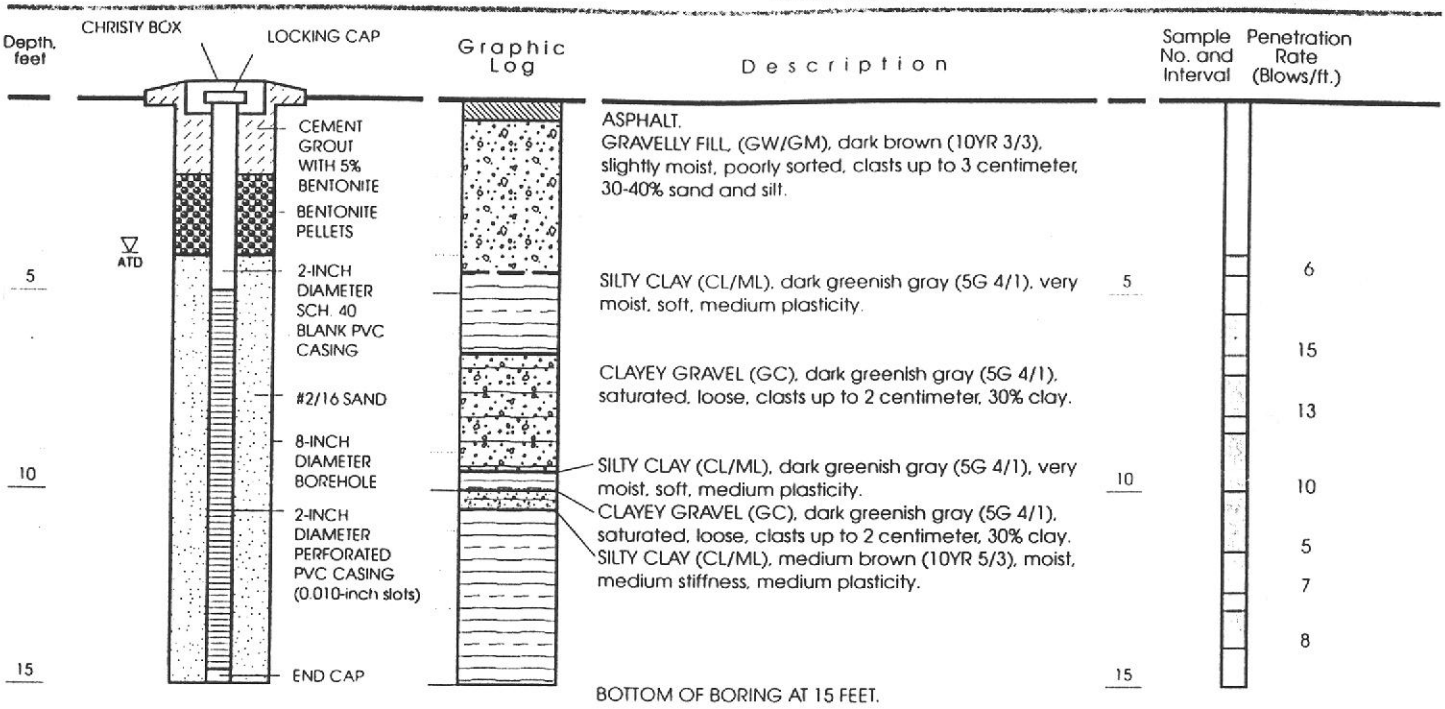
Approved by: MBM

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-20

Project No. 3435

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

3435L009.CDR 070296RYL:KAG



Well Permit No.: 96048
Date well drilled: February 5, 1996
Drilling company: Gregg Drilling
Sampling Method: Modified California Sampler
Drillind method: Hollow-stem auger
LF Geologist: James P. Schwartz

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using Modified California Sampler
- ATD — Water level at time of drilling

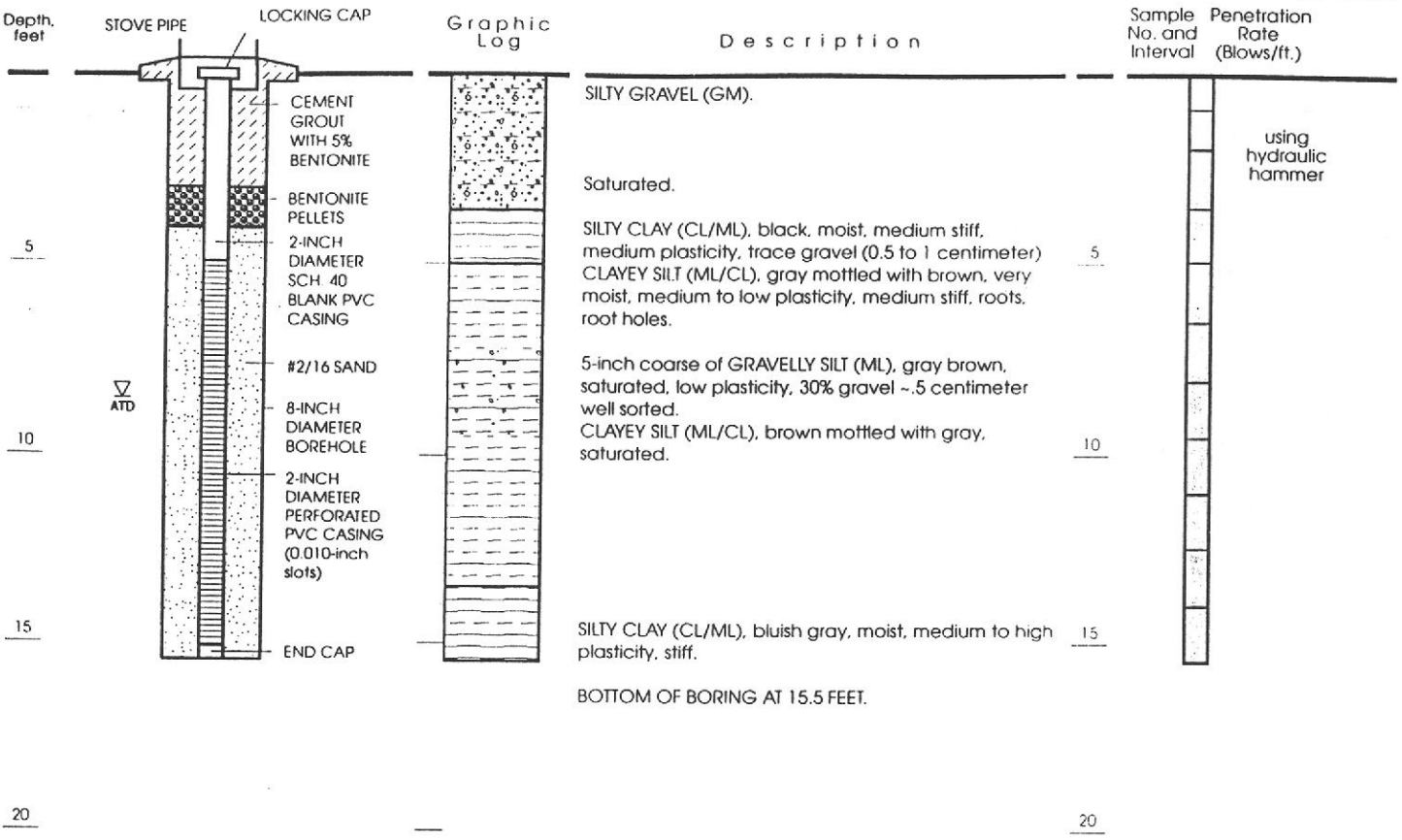
Approved by: MPM

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-21

Project No. 3435

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

3435L010.CDR 070296RYL:KAG



Well Permit No.: 96048
Date well drilled: April 5, 1996
Drilling company: Gregg Drilling
Sampling Method: Modified California Sampler
Drillind method: Hollow-stem auger
LF Geologist: Robin W. Barber

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using Modified California Sampler
- ATD Water level at time of drilling

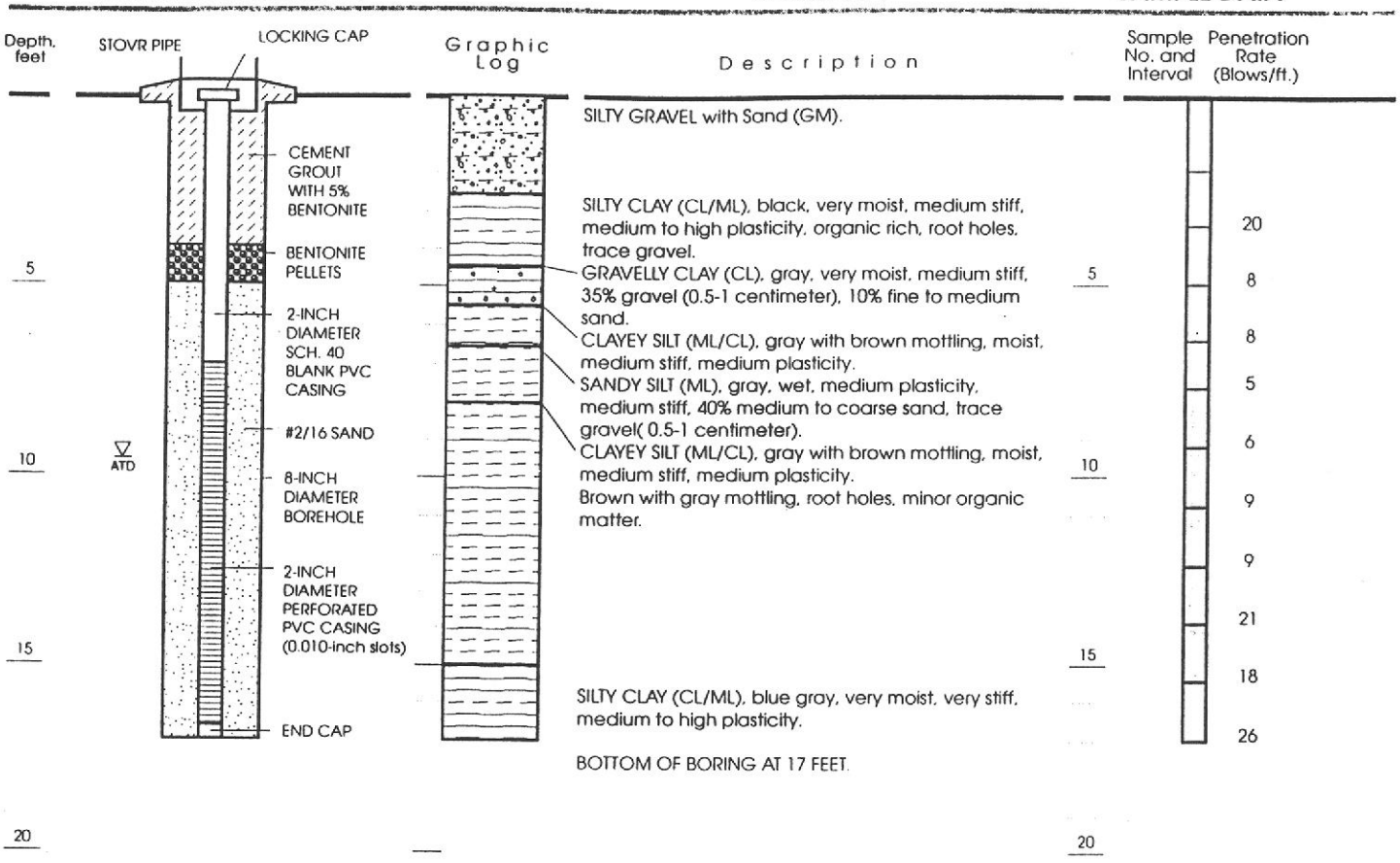
Approved by: MBM

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-23

Project No. 3435

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

3435L011.CDR 070296RYL:KAG



Well Permit No.: 96048
Date well drilled: April 4, 1996
Drilling company: Gregg Drilling
Sampling Method: Modified California Sampler
Drillind method: Hollow-stem auger
LF Geologist: Robin W. Barber

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using Modified California Sampler
- ATD — Water level at time of drilling

Approved by: MRBM

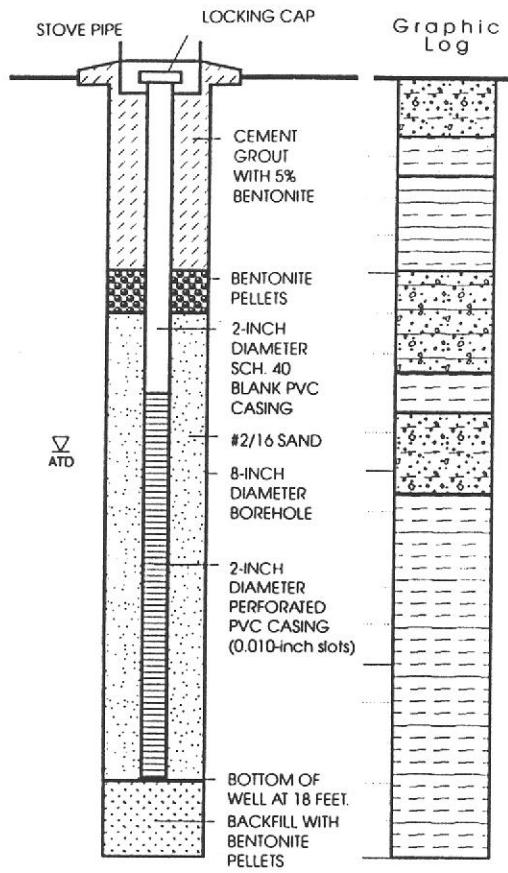
WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-24

Project No. 3435

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

3435L012.CDR 070296RYL:KAG

WELL CONSTRUCTION



LITHOLOGY

Graphic Log	Description	Depth, feet
	SILTY GRAVEL (GM).	
	SILT with Sand (ML), brown moist, stiff, low plasticity, 5% fine sand, some lenses with 80% fine sand.	
	SILTY CLAY (CL/ML), dark gray brown, moist, stiff, medium plasticity, trace fine sand.	
	Color change to black.	5
	GRAVELLY CLAY (CL), very dark gray, moist, stiff, medium plasticity, 20% gravel (0.5-1 centimeter), 10% coarse sand, root hole saturated with water.	
	SILT (ML), very dark gray, very moist, stiff, low to medium plasticity.	
	SILTY GRAVEL (GM), very dark gray, saturated, very loose, 60% gravel .5-1 centimeter, 10% fine to coarse sand.	10
	CLAYEY SILT (ML/CL), very dark gray, saturated, medium stiff, low to medium plasticity, trace fine sand.	
	Brown mottling.	15
	Black organic matter.	
	BOTTOM OF BORING AT 20 FEET.	20

SAMPLE DATA

Sample No. and Interval	Penetration Rate (Blows/ft.)
	15
	13
	13
	11
	5
	5
	11
	7
	13
	17
	21
	16

Well Permit No.: 96048
Date well drilled: April 4, 1996
Drilling company: Gregg Drilling
Sampling Method: Modified California Sampler
Drillind method: Hollow-stem auger
LF Geologist: Robin W. Barber

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using Modified California Sampler
- ATD — Water level at time of drilling

Approved by: MBM

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-25

Project No. 3435

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

3435L013.CDR 070296RYL:KAG

APPENDIX B

GROUND WATER ELEVATION MEASUREMENTS AND PURGE CHARACTERIZATION LOGS NOVEMBER 1996

GROUND WATER ELEVATION MEASUREMENT LOG

Sheet 1 of 1

Project Name: EMERYVILLE LFTS Project No. 05.00680 Task/Phase: 01/44000

Date: 11-21-96 Equipment: ELETRIC SOUNDE * SUPPLIED BY LEVINE-FRICKE Weather: OVERCAST

Well Number	Reference Elevation (feet-MSL)	Time (military)	Depth to Water (feet)	Depth to Product (feet)	Total Depth (feet)	PT (feet)	PT x 0.8 (feet)	Adjusted DTW[1] (feet)	Ground Water Elevation[2] (feet-MSL)
LF-20	11.77	0910	7.90	—	19.15	—	—	7.90	3.87
LF-21	10.37	0830	5.33	—	15.40	—	—	5.33	5.04
LF-23	10.64	1020	4.64	—	18.30	—	—	4.54	6.10
LF-24	10.22	1045	5.35	—	19.60	—	—	5.35	4.87
LF-25	11.31	1005	7.29	—	20.30	—	—	7.29	4.02
Comments:	ACTUAL WATER LEVEL MEASUREMENTS TAKEN BY JEFF ROGERS OF L.F.								

1 Adjusted depth to water = DTW - (PT x 0.8)

2 Ground water elevation = Reference elevation - Adjusted DTW

MSL Mean sea level

DTW Depth to water (to 0.01 foot)

PT Product thickness (0.01 foot)

Signature James Ackerman

TerraNext

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100690 **Project Name:** EMERYVILLE LIST **Date:** 11-21-96

Well Number: LF-20 **Sampler:** JAMES ACKERMAN * JEFF ROGERS OF LIVINE-FRICKE **Weather:** OVERCAST

Military Time	0915	0917	0919	0930			
Gallons Purged	2	4	6	S			Depth to Bottom (DB): 19.15
Purge Rate				A			Depth to Water (DW): 7.90
pH	6.68	6.66	6.65	M			Height of Water Column (H) = DB - DW: 11.25
Conductivity	1322	1294	1324	P			One Casing Volume (CV) = H x multiplier: 1.8
Temperature (C)	20.1	20.1	20.1	L			Three Casing Volumes (3CV): 5.4
Salinity				E			Multipliers = (2" well = 0.16 gallons/foot
Turbidity	HIGH	→	→				4" well = 0.65 gallons/foot
Color	GREENISH GRAY	→	→				6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH:						S.C.:

Sample No.	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equipment	Purge Equipment	Field Comments
LF-20	2	1L+	AMBER	NONE	8015/BTX	CHROMA LAB	DISPOSABLE TEFLON BAILER	SAME	SALT SAMPLES TAKEN WITH LIVINE-FRICKE
Cleaning:									
Comments:	SLIGHT SHEEN & MILD PETROLEUM/SOLVENT? ODOR OBSERVED								

Sampler's Signature: _____

TerraNext

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100680 **Project Name:** EMERYVILLE UST **Date:** 11-21-96

Well Number: LF-21 **Sampler:** JAMES ACKERMAN **Weather:** OVERCAST

* JEFF RODGERS OF LIVINE-FRICKE

	0834	0836				
Military Time	X	X	0838	0850		
Gallons Purged	2	4	6	5		
Purge Rate	—	—	—	A.		
pH	6.79	6.73	6.65	M		
Conductivity µS	996	996	994	P		
Temperature (C)	20.9	21.0	21.0	L		
Salinity				E		
Turbidity	CLOUDY	→	→			
Color	GREENISH GRAY	→	→			
Water Level Casing						
Calibration	pH:					

Depth to Bottom (DB): 15.40

Depth to Water (DW): 5.33

Height of Water Column (H) = DB - DW: 10.07

One Casing Volume (CV) = H x multiplier: 1.61

Three Casing Volumes (3CV): 4.83

Multipliers (2" well) = 0.16 gallons/foot

4" well = 0.65 gallons/foot

6" well = 1.47 gallons/foot

8" well = 2.61 gallons/foot

S.C.:

Sample No.	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equipment	Purge Equipment	Field Comments
LF-21	2	1L	AMBER	NONE	TPH/EDB	CHROMA LAB	TEFLON DISPOSABLE BAILER	SAME	SPLIT TAKEN W/ LIVINE-FRICKE

Cleaning:

Comments: SLIGHT SHEEN & MILD PETROLEUM ODOR OBSERVED

Sampler's Signature: _____

TerraNext

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100680 **Project Name:** EMERYVILLE 1ST **Date:** 11-21-96

Well Number: LF-23 **Sampler:** JAMES ACKERMAN **Weather:** OVERCAST

*JEFF RODGERS OF LIVINE-PRICE

Military Time	1124	1127	1133	1145		
Gallons Purged	2.5	5.0	7.5	S		
Purge Rate	✓	—	—	A		
pH	6.87	6.83	6.80	M		
Conductivity MS	876	826	815	P		
Temperature (C)	19.3	19.5	19.5	L		
Salinity				E		
Turbidity						
Color						
Water Level Casing						
Calibration	pH:					

Depth to Bottom (DB):	18.30'
Depth to Water (DW):	4.54'
Height of Water Column (H) = DB - DW:	13.76'
One Casing Volume (CV) = H x multiplier:	2.26
Three Casing Volumes (3CV):	6.6C
Multipliers = 2" well	= 0.16 gallons/foot
4" well	= 0.65 gallons/foot
6" well	= 1.47 gallons/foot
8" well	= 2.61 gallons/foot
S.C.:	

Sample No.	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equipment	Purge Equipment	Field Comments
LF-23	2	1LT	AMBER	NONE	8015/TPH	CHROMA LAB	DISPOSABLE TEFLON BAILER	SAME	SPLIT SAMPLE TAKEN WITH LIVINE-PRICE
Cleaning:									
Comments:									

Sampler's Signature: _____

TerraNext

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100680 **Project Name:** EMERYVILLE 1.5T **Date:** 11-21-96

Well Number: LF-24 **Sampler:** JAMES ACKERMAN **Weather:** OVERCAST

Military Time	1050	1053	1056	1110			
Gallons Purged	2.5	5.0	7.5	S			Depth to Bottom (DB): 19.60
Purge Rate	—	—	—	A			Depth to Water (DW): 5.35
pH	7.00	6.93	7.03	M			Height of Water Column (H) = DB - DW: 14.25
Conductivity MS	594	606	608	P			One Casing Volume (CV) = H x multiplier: 2.28
Temperature (C)	18.9	19.0	18.9	L			Three Casing Volumes (3CV): 6.84
Salinity	—	—	—	E			Multipliers = 2" well = 0.16 gallons/foot
Turbidity	HIGH	→	→				4" well = 0.65 gallons/foot
Color	GRAYISH GREEN	→	→				6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH:						S.C.:

Sample No.	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equipment	Purge Equipment	Field Comments
LF-24	2	1L+	AMBER	NONE	8015/TPH	CHROMA LAB	DISPOSABLE TEFLON BAILER	SAME	SPLIT SAMPLES TAKEN WITH LUNE-TRICE

Cleaning:

Comments: NO SHEEN, NO ODOR OBSERVED

Sampler's Signature: _____

TerraNext

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100680 **Project Name:** EMERYVILLE UST **Date:** 11-21-96

Well Number: LF-25 **Sampler:** JAMES ALKERMAN *JEFF RODGERS OF LIVINE-FRILKE **Weather:** OVERCAST

Military Time	1012	1014	1016	1030		
Gallons Purged	2	4	6	5		
Purge Rate	—	—	—	A		
pH	6.98	6.91	6.86	M		
Conductivity MS	710	709	706	P		
Temperature (C)	18.6	18.7	18.7	L		
Salinity				E		
Turbidity						
Color						
Water Level Casing						
Calibration	pH:					

Depth to Bottom (DB): 20.30'
Depth to Water (DW): 7.29'
Height of Water Column (H) = DB - DW: 13.01'
One Casing Volume (CV) = H x multiplier: 2.08'
Three Casing Volumes (3CV): 6.24'
Multipliers = (2" well) = 0.16 gallons/foot
4" well = 0.65 gallons/foot
6" well = 1.47 gallons/foot
8" well = 2.61 gallons/foot
S.C.:

Sample No.	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equipment	Purge Equipment	Field Comments
LF-25	2	1LT	AMBER	NONE	8015/TPH	CHROMA LAB	DISPOSABLE TEFLON BAILER	SAME	SPLIT SAMPLE TAKEN WITH LIVINE FRILKE
Cleaning:									
Comments:	NO SHEEN, MILD PETROLEUM ODOR? OBSERVED								

Sampler's Signature: _____

APPENDIX C

ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTS

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605

916 373-5600 Telephone
916 372-1059 Fax

May 1, 1996

QUANTERRA PROJECT NUMBER: 087215
PO/CONTRACT: 05100680

Ron Derrick
Terranext
9838 Old Placerville Road
Sacramento, CA 95827

Dear Mr. Derrick:

This report contains the analytical results for the two aqueous samples which were received under chain of custody by Quanterra Environmental Services on 11 April 1996. This sample set is associated with your Emeryville project.

The case narrative is an integral part of this report.

Preliminary results were sent via facsimile on 30 April 1995.

If you have any questions, please call me at (916)374-4414.

Sincerely,

Bonnie McNeill

Bonnie McNeill
Project Manager

BM/myg

Enclosures

Quanterra
Environmental Services

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QUANTERRA PROJECT NUMBER 087215

Quanterra
Environmental Services

CASE NARRATIVE

QUANTERRA PROJECT NUMBER 087215

There were no anomalies associated with this report.

Quanterra
Environmental Services

QUANTERRA'S QUALITY ASSURANCE PROGRAM

Quanterra has implemented an extensive Quality Assurance (QA) program to ensure the production of scientifically sound, legally defensible data of known documentable quality. A key element of this program is Quanterra's Laboratory Control Sample (LCS) system. Controlling lab operations with LCS (as opposed to matrix spike/matrix spike duplicate samples), allows the lab to differentiate between bias as a result of procedural errors versus bias due to matrix effects. The analyst can then identify and implement the appropriate corrective actions at the bench level, without waiting for extensive senior level review or costly and time-consuming sample re-analyses. The LCS program also provides our client with information to assess batch, and overall laboratory performance.

Laboratory Control Samples - (LCS)

Laboratory Control Samples (LCS) are well-characterized, laboratory generated samples used to monitor the laboratory's day-to-day performance of routine analytical methods. The results of the LCS are compared to well-defined laboratory acceptance criteria to determine whether the laboratory system is "in control". Three types of LCS are routinely analyzed: Duplicate Control Samples (DCS), Single Control Samples (SCS), and method blanks. Each of these LCS are described below.

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand, sodium sulfate or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits.

Single Control Samples. An SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g. metals or conventional analyses) a single control sample identical to the DCS serves as the control sample. An SCS is prepared for each sample lot. Accuracy is calculated identically to the DCS.

Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

Quanterra
Environmental
Services

SAMPLE DESCRIPTION INFORMATION
for
Terranext

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
087215-0001-SA	LF-21	AQUEOUS	10 APR 96	10:15	11 APR 96
087215-0002-SA	LF-23	AQUEOUS	10 APR 96	13:45	11 APR 96

CHAIN-OF-CUSTODY RECORD

P.O. Box 24374 Oakland CA 94623-1374

No. 20790

INDUSTRIAL COMPLIANCE • ~~9930 OLD PLACERVILLE ROAD, SUITE 100 • SACRAMENTO, CA 95827-3559~~ • Phone ~~916-369-8971~~ 510 238-9540 • FAX ~~916-369-8370~~ 510-238-9145

PROJECT NAME: EMERYVILLE UST	PROJECT LOCATION: EMERYVILLE, CA
PROJ. NO.: 05100 (68	PROJECT CONTACT: JAMES ACKERMAN / RON D.
PROJECT TELEPHONE NO.: (510) 238-9540 (916) 369-8971	
CLIENT'S REPRESENTATIVE:	PROJECT MANAGER/SUPERVISOR: RON DERRICK

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE LOCATION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS): TPH (Bunker-C) & TPH Silica Gel Cleanup; BTEX	REMARKS
1	LF-21	4-10	1015		X	WATER SAMPLE FROM LEVINE & FRICKE WELL * LF-21	4	X X	* NOTE: RUN ON IF CONCENTRA DETECTED IN 801
2	LF-23	↓	1345		X	WATER SAMPLE FROM LEVINE & FRICKE WELL * LF-23	4	X X	
3									
4									
5									
6									
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	8	James Ackerman			
2			Karla Tillery	04/11/96	1220
3					
4					

REMARKS

STANDARD T.A.T.

SEND COPIES OF CHROMATOGRAPHS IF CONCENTRATIONS ARE DETECTED

SAMPLER'S NAME: JAMES ACKERMAN

SAMPLER'S SIGNATURE: James Ackerman

LAB COPY

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Terranext
Client ID: LF-21
Lab ID: 087215-0001-SA
Matrix: AQUEOUS
Authorized: 11 APR 96
Sampled: 10 APR 96
Prepared: 12 APR 96
Received: 11 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Fuel Oil #6	ND	ug/L	50	
Hydrocarbon mixture	910	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	116	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C32. Quantitation is based on a diesel reference from n-C10 to n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed
Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Terranext
Client ID: LF-23
Lab ID: 087215-0002-SA
Matrix: AQUEOUS
Authorized: 11 APR 96

Sampled: 10 APR 96
Prepared: 12 APR 96

Received: 11 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Fuel Oil #6	ND	ug/L	50	
Hydrocarbon mixture	340	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	86	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C32. Quantitation is based on a diesel reference from n-C10 to n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Hydrocarbon Work Cell

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
087215-0001-SA	AQUEOUS	TPHD-SPE-A	12 APR 96-11A	12 APR 96-11A
087215-0002-SA	AQUEOUS	TPHD-SPE-A	12 APR 96-11A	12 APR 96-11A

Quanterra
Environmental Services

METHOD BLANK REPORT
Hydrocarbon Work Cell

Analyte	Result	Units	Reporting Limit
Test: TPH-D-TR-SPE-A			
Matrix: AQUEOUS			
QC Lot: 12 APR 96-11A QC Run: 12 APR 96-11A			
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: TPHD-SPE-A				
Matrix: AQUEOUS				
QC Lot: 12 APR 96-11A QC Run: 12 APR 96-11A				
Concentration Units: ug/L				
o-Terphenyl	40	41	102	50-150

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

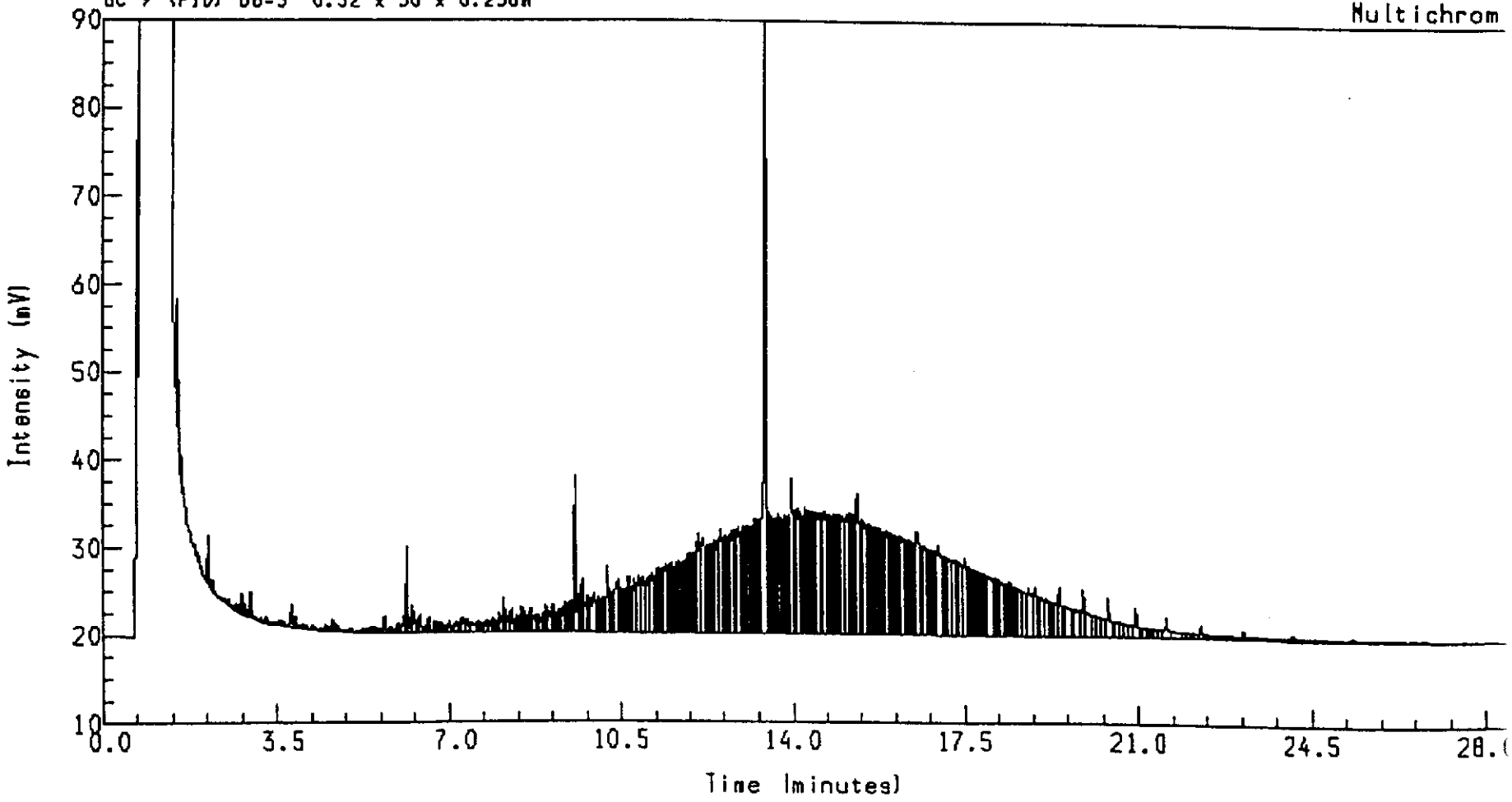
Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS Limit
Category: TPHD-SPE-A Matrix: AQUEOUS QC Lot: 12 APR 96-11A Concentration Units: ug/L							
Diesel Fuel	300	265	296	281	94	56-122	11 26.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100,7,1.
87215-1 (TR) D.892/3 T=SR Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom

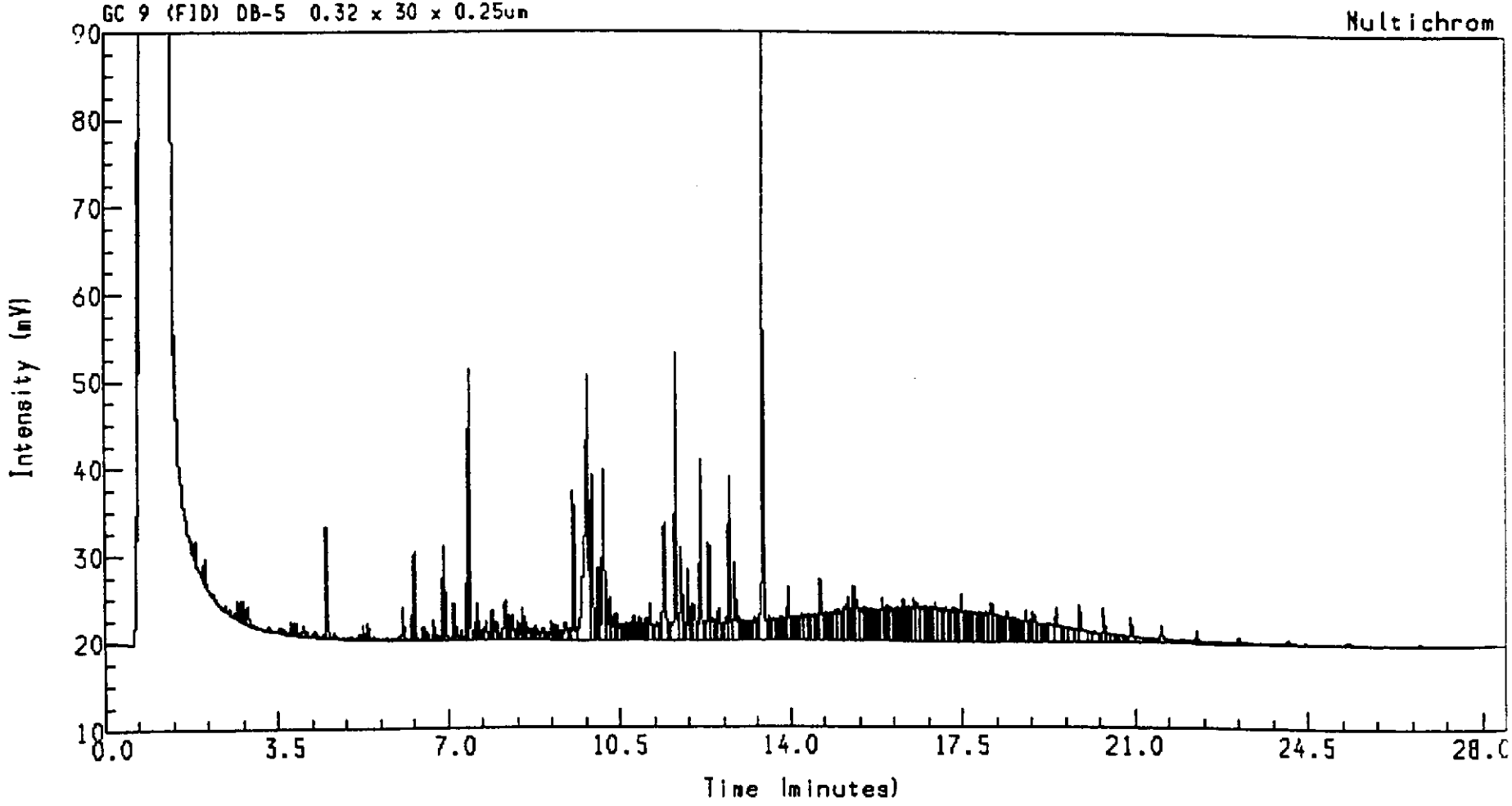


Instrument : GC #D9
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 15:47
Reported on 29-APR-1996 at 16:18

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.8.1.
87215-2 (TR) 0.988/3 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

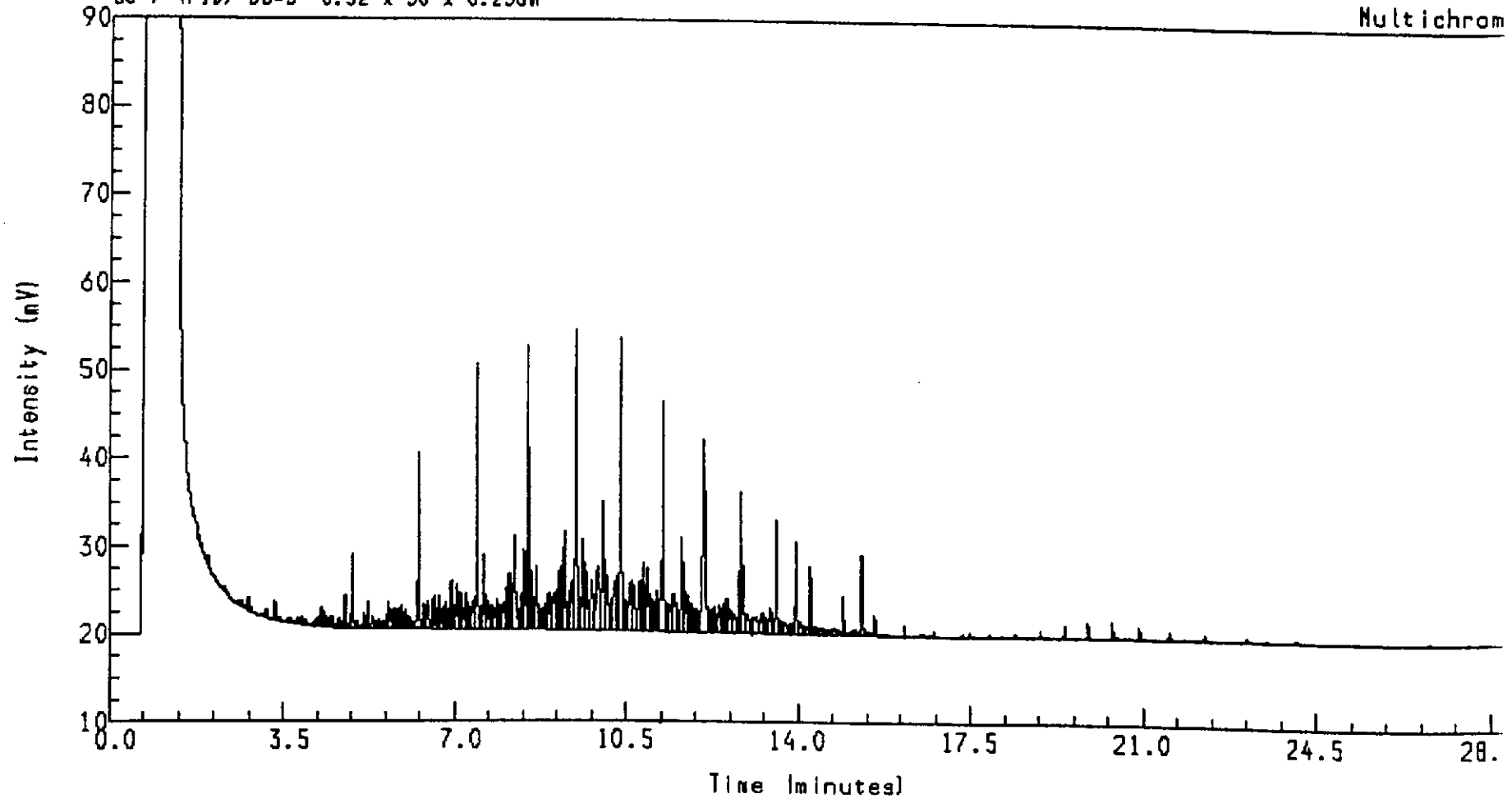


Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 16:28
Reported on 29-APR-1996 at 16:58

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.3.1.
100 ppm Diesel H121495D t=st Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

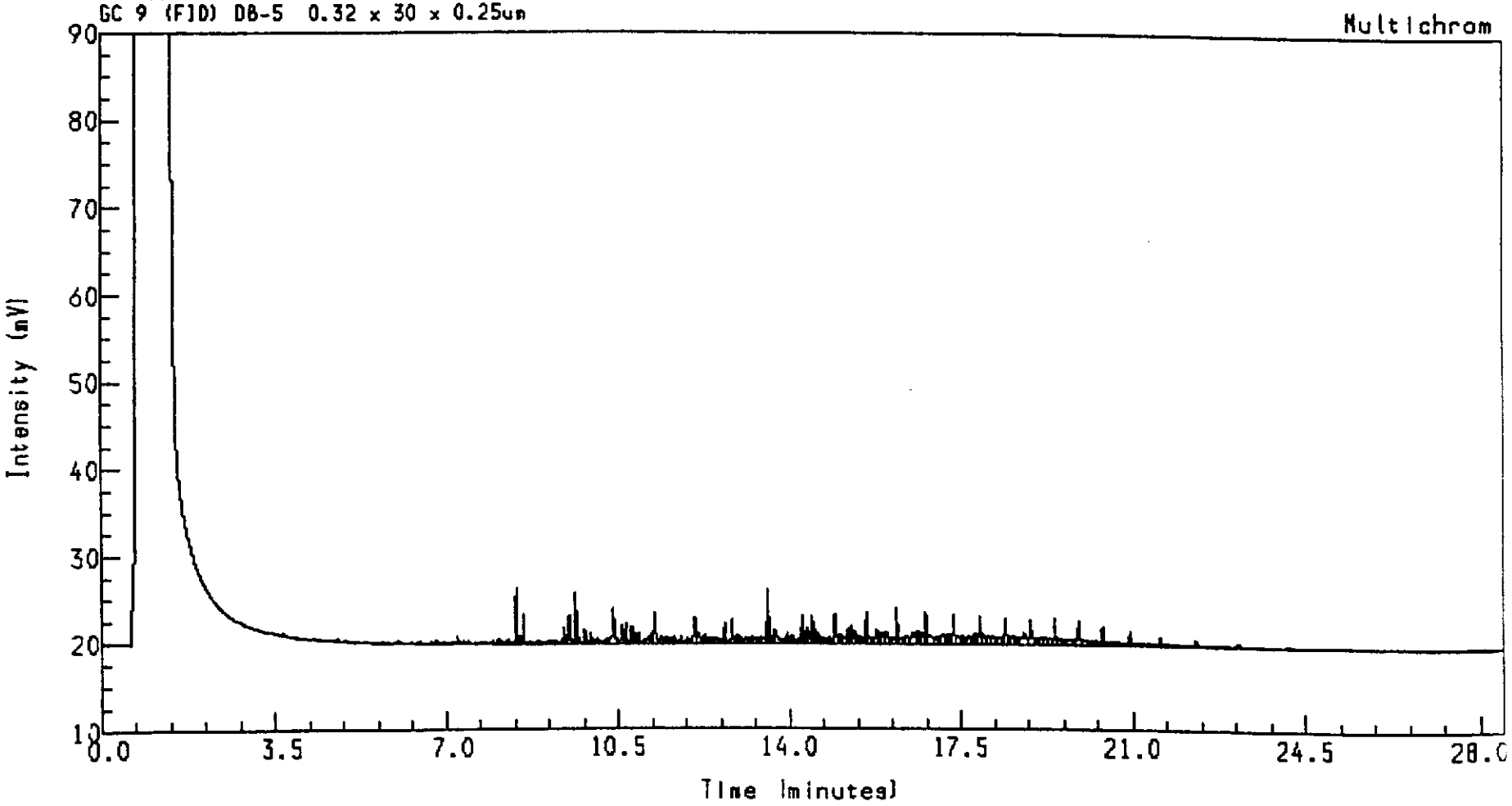


Instrument : GC s09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 13:01
Reported on 29-APR-1996 at 13:31

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.5.1.
100 ppm Fuel Oil #6 HD42496A test Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um



Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 14:21
Reported on 29-APR-1996 at 14:52

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID (Triregional) Method TPH-Diesel (TR)/Silica Gel Cleanup

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-Diesel(TR)/Silica Gel Clnup

Client Name: Terranext
Client ID: LF-21
Lab ID: 087215-0001-SA
Matrix: AQUEOUS
Authorized: 11 APR 96
Sampled: 10 APR 96
Prepared: 16 APR 96
Received: 11 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	86	%	

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed
Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-Diesel(TR)/Silica Gel Clnup

Client Name: Terranext
Client ID: LF-23
Lab ID: 087215-0002-SA
Matrix: AQUEOUS
Authorized: 11 APR 96

Sampled: 10 APR 96
Prepared: 16 APR 96

Received: 11 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	86	%	

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Hydrocarbon Work Cell

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
087215-0001-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11A	16 APR 96-11A
087215-0002-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11A	16 APR 96-11A

Quanterra
Environmental Services

METHOD BLANK REPORT
Hydrocarbon Work Cell

Analyte	Result	Units	Reporting Limit
Test: TPH-D-TR-SPE-SIL-A			
Matrix: AQUEOUS			
QC Lot: 16 APR 96-11A QC Run: 16 APR 96-11A			
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: TPHD-SPE-A Matrix: AQUEOUS QC Lot: 16 APR 96-11A QC Run: 16 APR 96-11A Concentration Units: ug/L				
o-Terphenyl	60	53	88	50-150

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS Limit
Category: TPHD-SPE-A Matrix: AQUEOUS QC Lot: 16 APR 96-11A Concentration Units: ug/L							
Diesel Fuel	450	404	382	393	87	56-122	5.6 26.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra Environmental Services

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605

916 373-5600 Telephone
916 372-1059 Fax

May 1, 1996

QUANTERRA PROJECT NUMBER: 087235
PO/CONTRACT: 05100680

Ron Derrick
Terranext
9838 Old Placerville Road
Sacramento, CA 95827

Dear Mr. Derrick:

This report contains the analytical results for the three aqueous samples which were received under chain of custody by Quanterra Environmental Services on 12 April 1996. This sample set is associated with your Emeryville project.

The case narrative is an integral part of this report.

Preliminary results were sent via facsimile on 30 April 1995.

If you have any questions, please call me at (916)374-4414.

Sincerely,

Bonnie McNeill

Bonnie McNeill
Project Manager

BM/myg

Enclosures

Quanterra
Environmental Services

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QUANTERRA PROJECT NUMBER 087235

Quanterra
Environmental Services

CASE NARRATIVE

QUANTERRA PROJECT NUMBER 087235

There were no other anomalies associated with this report.

Quanterra
Environmental Services

QUANTERRA'S QUALITY ASSURANCE PROGRAM

Quanterra has implemented an extensive Quality Assurance (QA) program to ensure the production of scientifically sound, legally defensible data of known documentable quality. A key element of this program is Quanterra's Laboratory Control Sample (LCS) system. Controlling lab operations with LCS (as opposed to matrix spike/matrix spike duplicate samples), allows the lab to differentiate between bias as a result of procedural errors versus bias due to matrix effects. The analyst can then identify and implement the appropriate corrective actions at the bench level, without waiting for extensive senior level review or costly and time-consuming sample re-analyses. The LCS program also provides our client with information to assess batch, and overall laboratory performance.

Laboratory Control Samples - (LCS)

Laboratory Control Samples (LCS) are well-characterized, laboratory generated samples used to monitor the laboratory's day-to-day performance of routine analytical methods. The results of the LCS are compared to well-defined laboratory acceptance criteria to determine whether the laboratory system is "in control". Three types of LCS are routinely analyzed: Duplicate Control Samples (DCS), Single Control Samples (SCS), and method blanks. Each of these LCS are described below.

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand, sodium sulfate or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits.

Single Control Samples. An SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g. metals or conventional analyses) a single control sample identical to the DCS serves as the control sample. An SCS is prepared for each sample lot. Accuracy is calculated identically to the DCS.

Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
Terranext

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
087235-0001-SA	LF-25	AQUEOUS	11 APR 96	11:15	12 APR 96
087235-0002-SA	LF-24	AQUEOUS	11 APR 96	11:30	12 APR 96
087235-0003-SA	LF-20	AQUEOUS	11 APR 96	12:00	12 APR 96

CHAIN-OF-CUSTODY RECORD

P.O. Box 24374 Oakland CA 94623-1374

No. 20814

INDUSTRIAL COMPLIANCE • ~~9838 OLD PLACERVILLE ROAD, SUITE 100~~ • SACRAMENTO, CA 95827-3659 • Phone ~~916-369-8971~~ 510-238-9540 • FAX ~~916-369-8370~~ 510-238-9545

PROJECT NAME	PROJECT LOCATION
EMERYVILLE UST	EMERYVILLE, CA

PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO.
05100680	JAMES ACKERMAN/RON DERRICK	(510) 238-9540

CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE LOCATION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) TPH (Bunker) (Diesel) * TPH Silica Gel Cleanup								REMARKS
1	LF-25	4-11-96	1115		X	WATER SAMPLE FROM LEVINE? FRICKE WELL # LF-25	4	X	X							
2	LF-24	"	1130		X	WATER SAMPLE FROM LEVINE? FRICKE WELL # LF-24	4	X	X							
3	LF-20	"	1200		X	WATER SAMPLE FROM LEVINE? FRICKE WELL # LF-20	4	X	X							
4																
5																
6																
7																
8																
9																
10																

* NOTE: RUN ONLY IF TPH CONCENTRATIONS DETECTED FROM 8015

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	12	James Ackerman	R.J. Bonaly	041296	1230
2					
3					
4					

REMARKS

STANDARD T.A.T.

SEND COPIES OF CHROMATOGRAPH IF CONCENTRATIONS ARE DETECTED

SAMPLER'S NAME: JAMES ACKERMAN

SAMPLER'S SIGNATURE: James Ackerman

LAB COPY

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Terranext
Client ID: LF-25
Lab ID: 087235-0001-SA
Matrix: AQUEOUS
Authorized: 12 APR 96

Sampled: 11 APR 96
Prepared: 16 APR 96

Received: 12 APR 96
Analyzed: 30 APR 96

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Fuel Oil #6	ND	ug/L	50	
Hydrocarbon mixture	88	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	91	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C32. Quantitation is based on a diesel reference from n-C10 to n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Terranext
Client ID: LF-24
Lab ID: 087235-0002-SA
Matrix: AQUEOUS
Authorized: 12 APR 96

Sampled: 11 APR 96
Prepared: 16 APR 96

Received: 12 APR 96
Analyzed: 30 APR 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	90	%	

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Terranext
Client ID: LF-20
Lab ID: 087235-0003-SA
Matrix: AQUEOUS
Authorized: 12 APR 96

Sampled: 11 APR 96
Prepared: 16 APR 96

Received: 12 APR 96
Analyzed: 30 APR 96

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Fuel Oil #6	ND	ug/L	50	
Hydrocarbon mixture	1000	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	97	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C32. Quantitation is based on a diesel reference from n-C10 to n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Hydrocarbon Work Cell

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
087235-0001-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11C	16 APR 96-11C
087235-0002-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11C	16 APR 96-11C
087235-0003-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11C	16 APR 96-11C

Quanterra
Environmental Services

METHOD BLANK REPORT
Hydrocarbon Work Cell

Analyte	Result	Units	Reporting Limit
Test: TPH-D-TR-SPE-A			
Matrix: AQUEOUS			
QC Lot: 16 APR 96-11C QC Run: 16 APR 96-11C			
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: TPHD-SPE-A				
Matrix: AQUEOUS				
QC Lot: 16 APR 96-11C QC Run: 16 APR 96-11C				
Concentration Units: ug/L				
o-Terphenyl	40	35	87	50-150

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra
Environmental Services

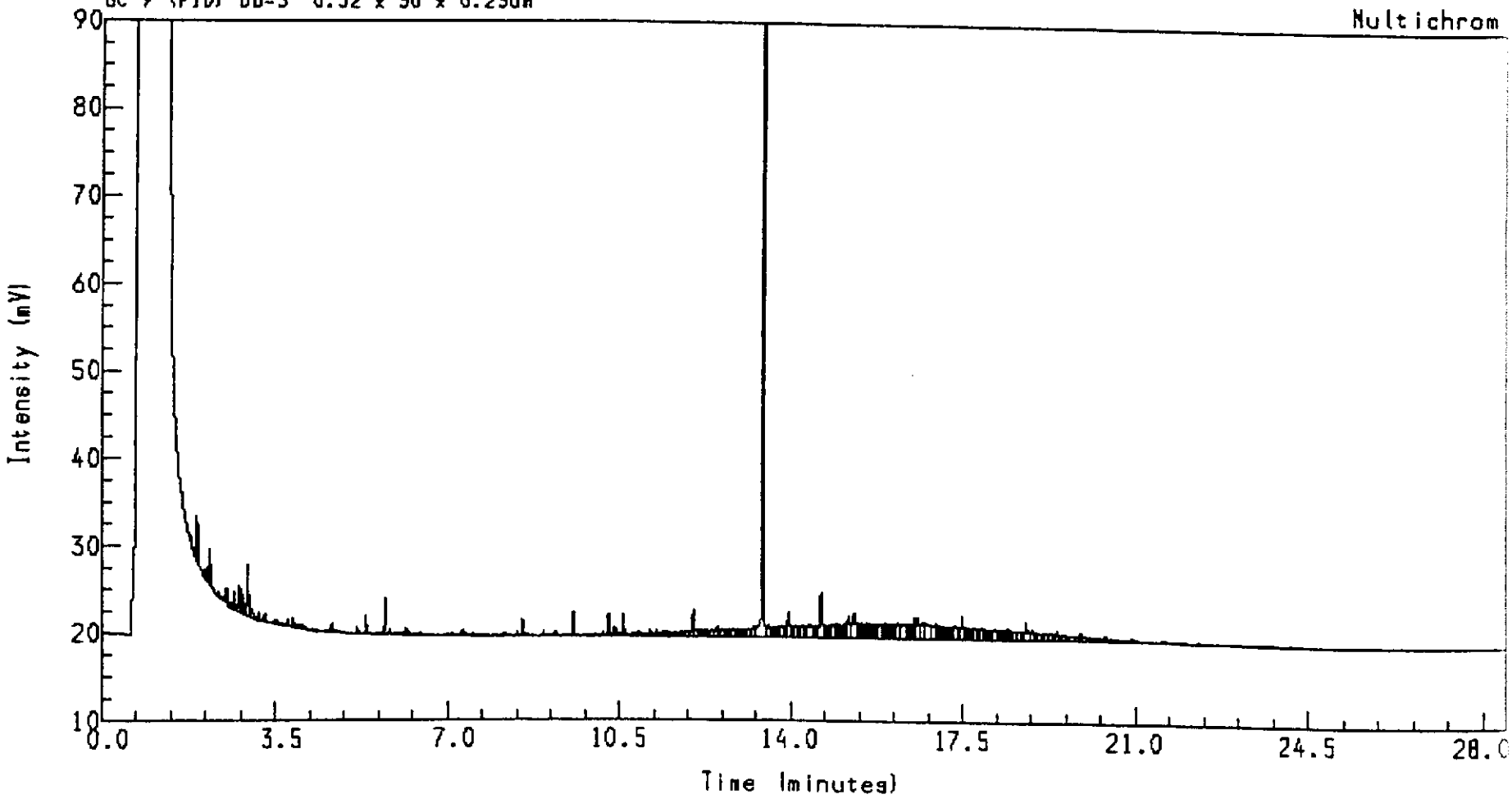
DUPLICATE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: TPHD-SPE-A Matrix: AQUEOUS QC Lot: 16 APR 96-11C Concentration Units: ug/L								
Diesel Fuel	300	311	308	309	103	56-122	1.0	26.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100,23,1.
87235-1 (TR) D.965/3 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

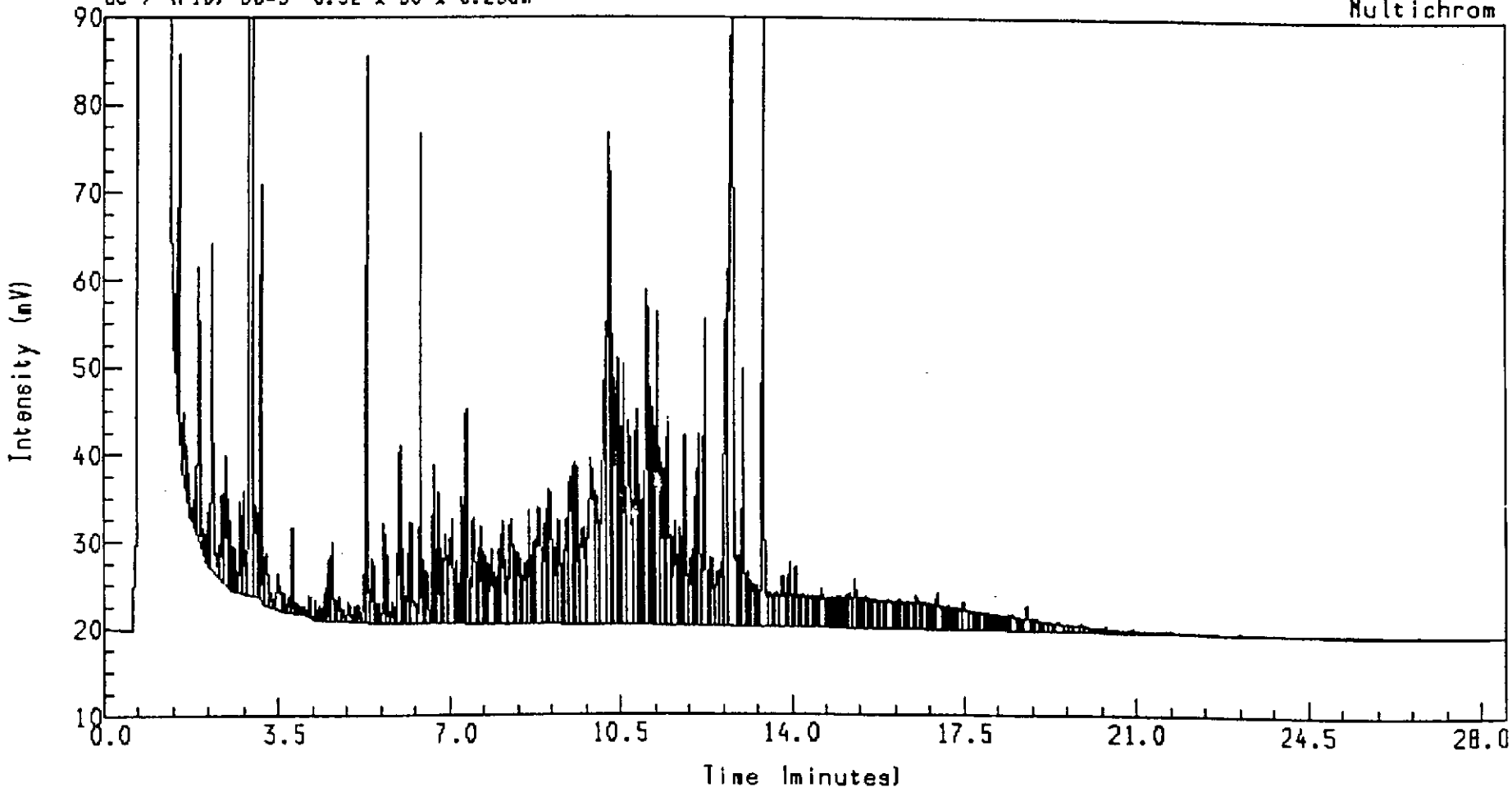


Instrument : GC #D9
Channel Title : Varian 3700 FID
Lims ID :
Acquired on 30-APR-1996 at 02:33
Reported on 30-APR-1996 at 03:04

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.25,1.
87235-3 (TR) D.994/3 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

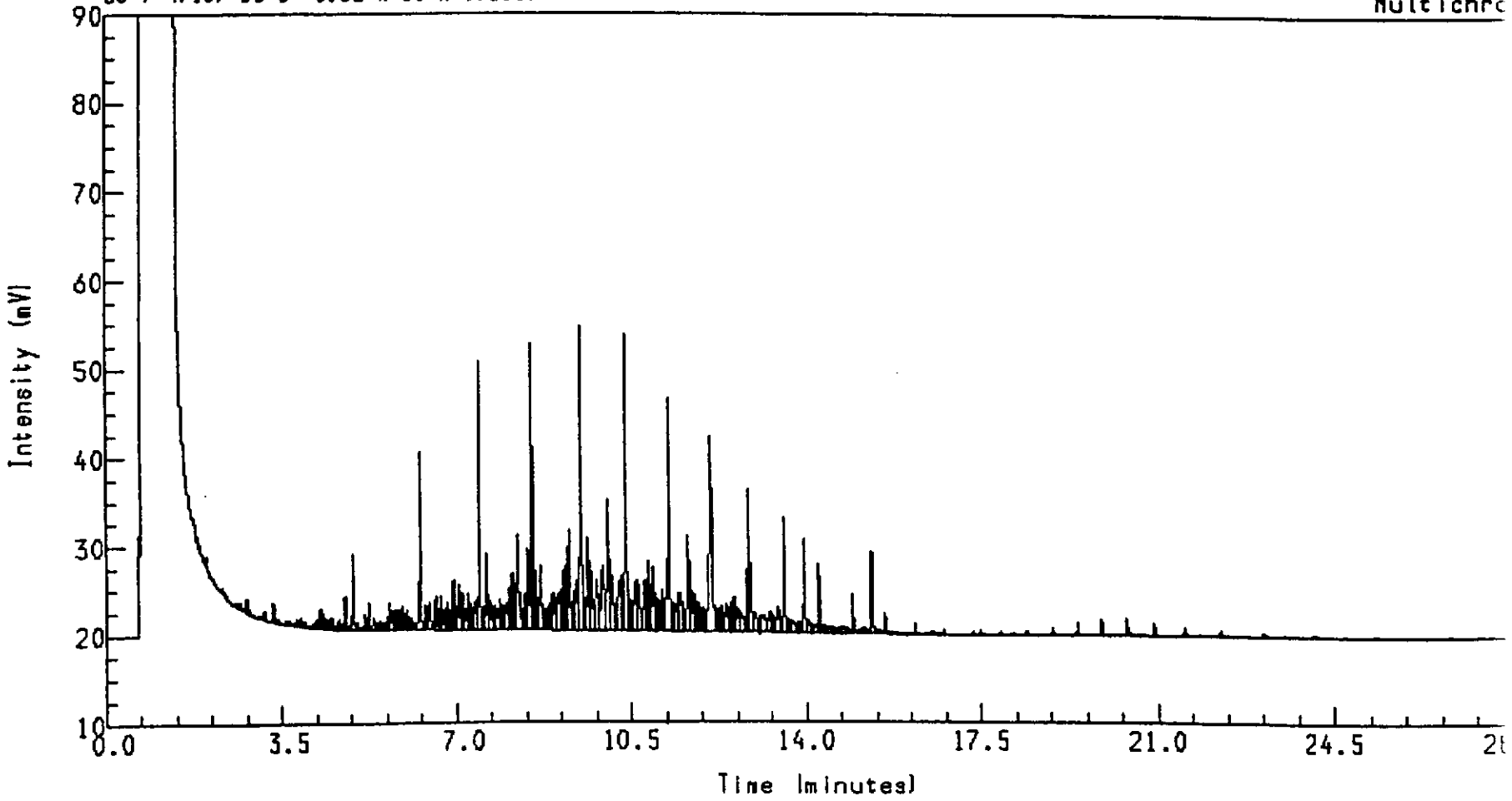


Instrument : GC #D9
Channel Title : Varian 3700 FID
Line ID :
Acquired on 30-APR-1996 at 03:54
Reported on 30-APR-1996 at 04:24

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100,3,1.
100 ppm Diesel H121495D t=st Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

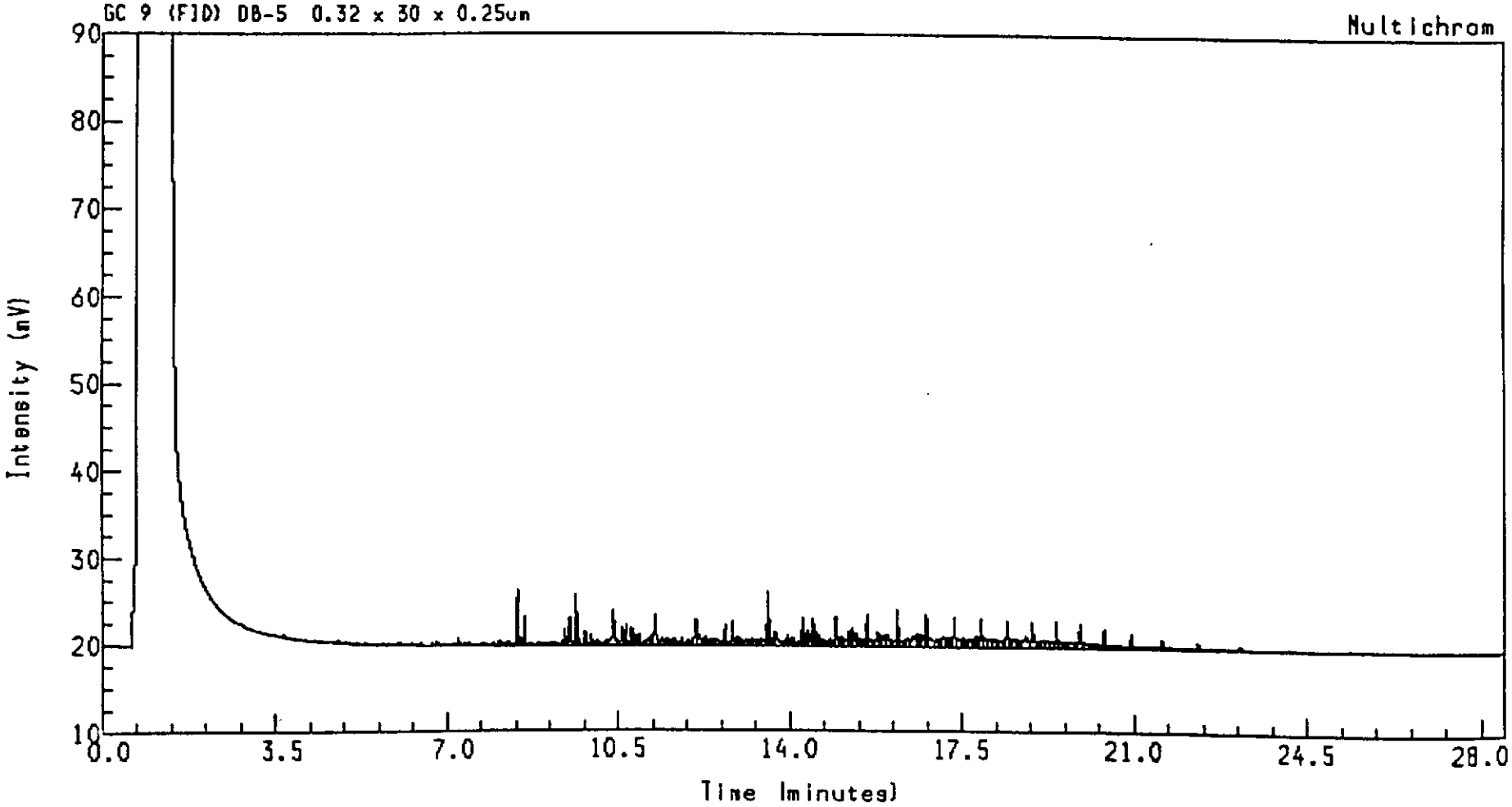


Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 13:01
Reported on 29-APR-1996 at 13:31

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.5.1.
100 ppm Fuel Oil #6 HD42496A t=st Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um



Instrument : GC #D9
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 14:21
Reported on 29-APR-1996 at 14:52

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID (Triregional) Method TPH-Diesel (TR)/Silica Gel Clnup

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-Diesel(TR)/Silica Gel Clnup

Client Name: Terranext
Client ID: LF-25
Lab ID: 087235-0001-SA
Matrix: AQUEOUS
Authorized: 12 APR 96

Sampled: 11 APR 96
Prepared: 16 APR 96

Received: 12 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	88	%	

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-Diesel(TR)/Silica Gel Clnup

Client Name: Terranext
Client ID: LF-20
Lab ID: 087235-0003-SA
Matrix: AQUEOUS
Sampled: 11 APR 96
Received: 12 APR 96
Authorized: 12 APR 96
Prepared: 16 APR 96
Analyzed: 29 APR 96

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Fuel Oil #6	ND	ug/L	50	
Hydrocarbon mixture	82	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	88	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C09 to n-C13 Quantitation is based on a diesel reference from n-C10 to n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed
Approved By: Karla Buechler

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Hydrocarbon Work Cell

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
087235-0001-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11A	16 APR 96-11A
087235-0002-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11A	16 APR 96-11A
087235-0003-SA	AQUEOUS	TPHD-SPE-A	16 APR 96-11A	16 APR 96-11A

Quanterra
Environmental Services

METHOD BLANK REPORT
Hydrocarbon Work Cell

Analyte	Result	Units	Reporting Limit
Test: TPH-D-TR-SPE-SIL-A			
Matrix: AQUEOUS			
QC Lot: 16 APR 96-11A QC Run: 16 APR 96-11A			
Diesel Fuel	ND	ug/L	50
Fuel Oil #6	ND	ug/L	50
Hydrocarbon mixture	ND	ug/L	50

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: TPHD-SPE-A				
Matrix: AQUEOUS				
QC Lot: 16 APR 96-11A QC Run: 16 APR 96-11A				
Concentration Units: ug/L				
o-Terphenyl	60	53	88	50-150

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra
Environmental Services

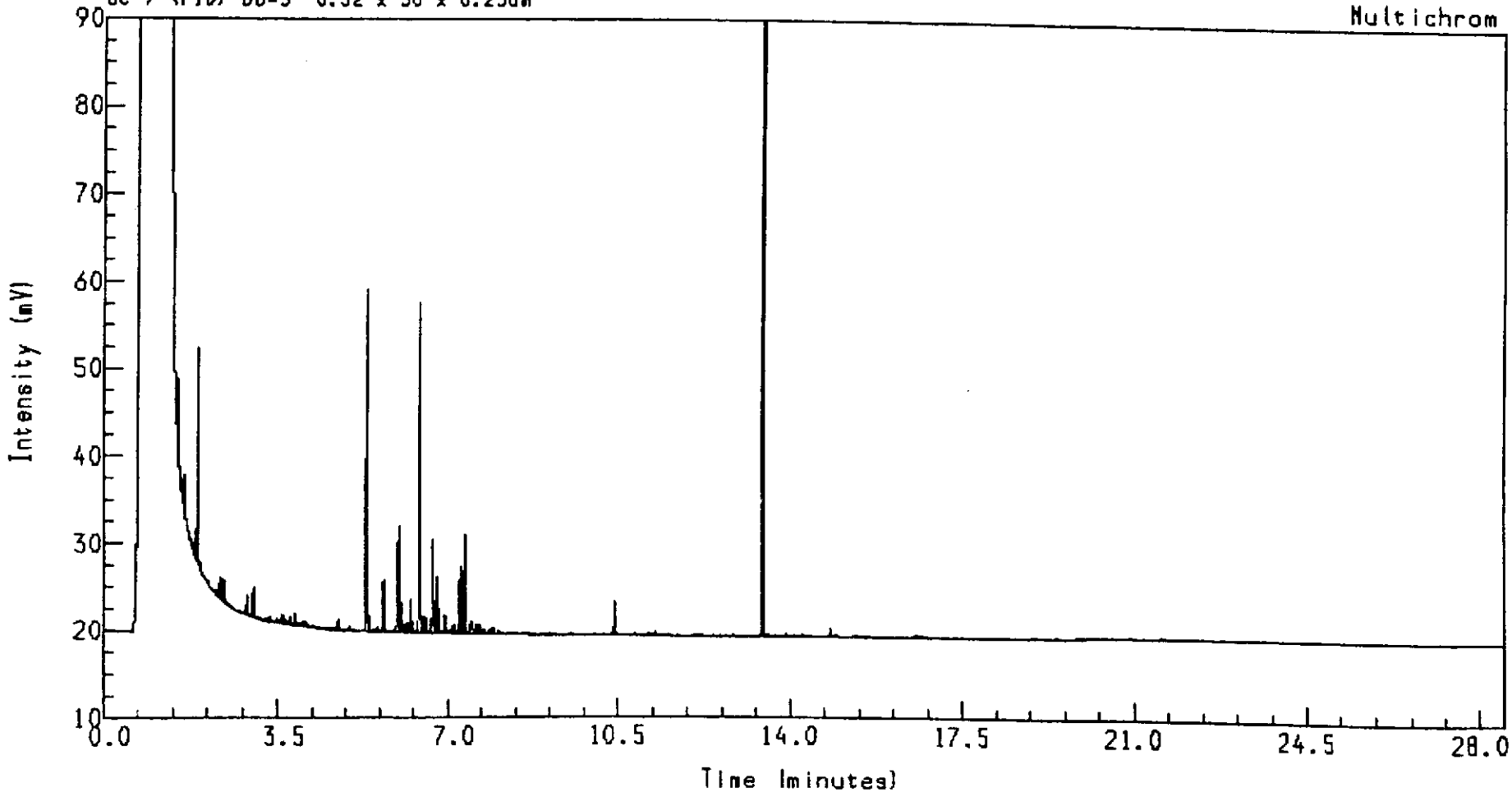
DUPLICATE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS Limit
Category: TPHD-SPE-A Matrix: AQUEOUS QC Lot: 16 APR 96-11A Concentration Units: ug/L							
Diesel Fuel	450	404	382	393	87	56-122	5.6 26.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.19.1.
87235-3 (SILI 0.996/5 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um



Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 23:52
Reported on 30-APR-1996 at 00:23

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

CHROMALAB, INC.

Environmental Services (SDB)

February 14, 1997 *Submission #:* 9611271

TERRANEXT-OAKLAND

Atten: Carl Taylor

Project: EMERYVILLE UST *Project#:* 05100680
Received: November 21, 1996

re: One sample for TEPH analysis.
Method: *EPA 8015M*

Client Sample ID: **LF-20**
Spl#: 108249 *Matrix:* WATER *Extracted:* November 27, 1996
Sampled: November 21, 1996 *Run#:* 4255 *Analyzed:* November 28, 1996

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
DIESEL	1800	54	N.D.	77.0	1
MOTOR OIL	N.D.	540	N.D.	77.0	1

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 14, 1997 *Submission #:* 9611271

TERRANEXT-OAKLAND

Atten: Carl Taylor

Project: EMERYVILLE UST *Project#:* 05100680
Received: November 21, 1996

re: One sample for TEPH analysis.
Method: *EPA 8015M*

Client Sample ID: **LF-21**
Spl#: 108248 *Matrix:* WATER *Extracted:* November 27, 1996
Sampled: November 21, 1996 *Run#:* 4255 *Analyzed:* November 28, 1996

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
DIESEL	1100	59	N.D.	77.0	1
Note: Hydrocarbon reported as Diesel, does not match the pattern of our Diesel standard.					
MOTOR OIL	N.D.	590	N.D.	77.0	1

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 14, 1997 *Submission #:* 9611271

TERRANEXT-OAKLAND

Atten: Carl Taylor

Project: EMERYVILLE UST *Project#:* 05100680
Received: November 21, 1996

re: One sample for TEPH analysis.
Method: *EPA 8015M*

Client Sample ID: **LF-25**
Spl#: 108250 *Matrix:* WATER *Extracted:* November 27, 1996
Sampled: November 21, 1996 *Run#:* 4255 *Analyzed:* November 28, 1996

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
DIESEL	N.D.	53	N.D.	77.0	1
MOTOR OIL	N.D.	530	N.D.	77.0	1

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 14, 1997 *Submission #:* 9611271

TERRANEXT-OAKLAND

Atten: Carl Taylor

Project: EMERYVILLE UST *Project#:* 05100680
Received: November 21, 1996

re: One sample for TEPH analysis.
Method: *EPA 8015M*

Client Sample ID: **LF-24**
Spl#: 108251 *Matrix:* WATER *Extracted:* November 27, 1996
Sampled: November 21, 1996 *Run#:* 4255 *Analyzed:* November 28, 1996

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
DIESEL	N.D.	53	N.D.	77.0	1
MOTOR OIL	N.D.	530	N.D.	77.0	1

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

February 14, 1997 *Submission #:* 9611271

TERRANEXT-OAKLAND

Atten: Carl Taylor

Project: EMERYVILLE UST *Project#:* 05100680
Received: November 21, 1996

re: One sample for TEPH analysis.
Method: *EPA 8015M*

Client Sample ID: **LF-23**
Spl#: 108252 *Matrix:* WATER *Extracted:* November 27, 1996
Sampled: November 21, 1996 *Run#:* 4255 *Analyzed:* November 28, 1996

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
DIESEL	420	54	N.D.	77.0	1
Note: Hydrocarbon reported as Diesel, has characteristics of weathered/aged Diesel.					
MOTOR OIL	N.D.	540	N.D.	77.0	1

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

271 | 108248-108252

30868

CHAIN-OF-CUSTODY RECORD

P.O. Box 24374 Oakland CA 94623-1374

No. 20621

INDUSTRIAL COMPLIANCE • ~~9080 OLD PLACERVILLE ROAD, SUITE 100~~ • ~~SACRAMENTO, CA 95827-3559~~ — Phone ~~916-369-8971~~ 510-235-4530 • FAX ~~916-369-8370~~ 510-235-9145

PROJECT NAME: EMERYVILLE UST	PROJECT LOCATION: EMERYVILLE, CA
PROJ. NO.: 05100680	PROJECT CONTACT: JAMES ACKERMAN
PROJECT TELEPHONE NO.: (510) 238-9540	
CLIENT'S REPRESENTATIVE:	PROJECT MANAGER/SUPERVISOR: CARL TAYLOR

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE LOCATION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	TPH (Bkwell) 8015M	*TPH/Silica Gel Cleanup Method 8015M	REMARKS
1	LF-21	11-21	0850		X	SPLIT GROUND WATER SAMPLE FROM LIVING BRICK WELL: LF21	2	X	X	SUBM #: 9611271 REP: MV
2	LF-20	"	0930		X	" : LF20	2	X	X	CLIENT: TERRA-OAK
3	LF-25	"	1030		X	" : LF25	2	X	X	DUE: 12/02/96
4	LF-24	"	1110		X	" : LF24	2	X	X	REF #:30868
5	LF-23	"	1145		X	" : LF23	2	X	X	
6										
7										
8										
9										
10										

* NOTE: RUN SILICA GEL CLEANUP ONLY IF CONCENTRATIONS OF TPH ARE DETECTED WITH METHOD 8015M

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	5	James Ackerman	[signature]	11-21-96	1411
2		[signature]	Minnie Park	11/21/96	1925
3					
4					

REMARKS: STANDARD T.A.T.
SEND COPIES OF CHROMATOGRAMS IF CONCENTRATIONS ARE DETECTED
P.O. # 24187

SAMPLER'S NAME: JAMES ACKERMAN

SAMPLER'S SIGNATURE: James Ackerman

LAB COPY

APPENDIX D

CHROMATOGRAMS OF 8015M ANALYSIS — APRIL 1996
CHROMATOGRAM INTERPRETATION BY FRIEDMAN & BRUYA, INC.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Beth M. Albertson, M.S.
Bradley T. Benson
Kelley D. Wilt

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044

March 27, 1997

James Ackerman, Project Manager
Terranext
PO Box 24374
Oakland, CA 94623-1374

RE: Project 05100680, PO #28128

Dear Mr. Ackerman:

Per your request, I have reviewed the chromatograms and information you provided for your 1450 Sherwin Avenue, Emeryville, CA site. The following are my observations and conclusions.

Samples LF-20, LF-21, and LF-23 were sampled on April 10th and 11th, 1996, and were analyzed by Quanterra. The FID chromatograms provided are of diesel extended analyses of the samples before and after a silica gel cleanup.

The analyses performed prior to silica gel cleanup for samples LF-20 and LF-23 indicate material that elutes in the diesel and motor oil range. The calculated concentration for each of these samples is 1,000 ug/L and 340 ug/L, respectively. The diesel range material is not indicative of diesel. It lacks the characteristic hump, *n*-alkanes, and isoprenoids such as pristane and phytane, that are associated with diesel and other middle distillates. The random pattern of individual peaks is suggestive of biological or biogenic materials such as terpenes, tannins, or other non-petroleum based material. The motor oil range material forms a hump. This can be indicative of either a lubricating oil or biogenic material.

The reanalysis of samples LF-20 and LF-23 after a silica gel cleanup removed much of the diesel range material, and completely removed the large hump in the motor oil range. The calculated concentration for each of these samples is 82 ug/L and <50 ug/L, respectively. This indicates that the material was not a petroleum hydrocarbon. The remaining material not removed by the silica gel is likely due to naturally occurring hydrocarbons. Again, the pattern of peaks is not indicative of diesel for the same reasons given above.

The analysis performed prior to silica gel cleanup of sample LF-21 indicates material that elutes in the motor oil range. The calculated concentration for this sample was 910 ug/L. The hydrocarbon distribution is similar to the motor oil range material found in sample LF-20 and LF-23. The reanalysis after silica gel cleanup completely removed the entire hump. The calculated concentration following silica gel cleanup was <50 ug/L. This indicates that the material was not a petroleum hydrocarbon.

We appreciate this opportunity to be of service. Please call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kelley Wilt

Kelley Wilt
Chemist

keh
Enclosures
NAA0327R.DOC

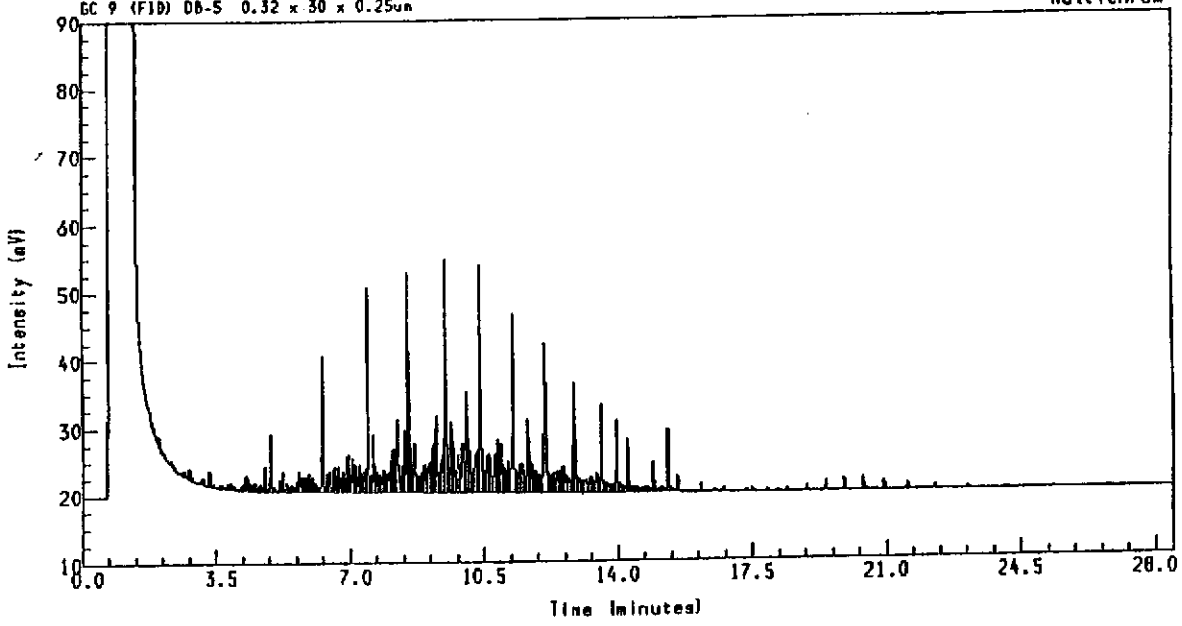
QUANTERRA - SACRAMENTO

CHROMATOGRAPHY

DIESEL STANDARD

Analysis Name : [APR_SV] 89 9_29APR961100.3.1.
100 ppm Diesel H1214950 test Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 13:01
Reported on 29-APR-1996 at 13:31

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

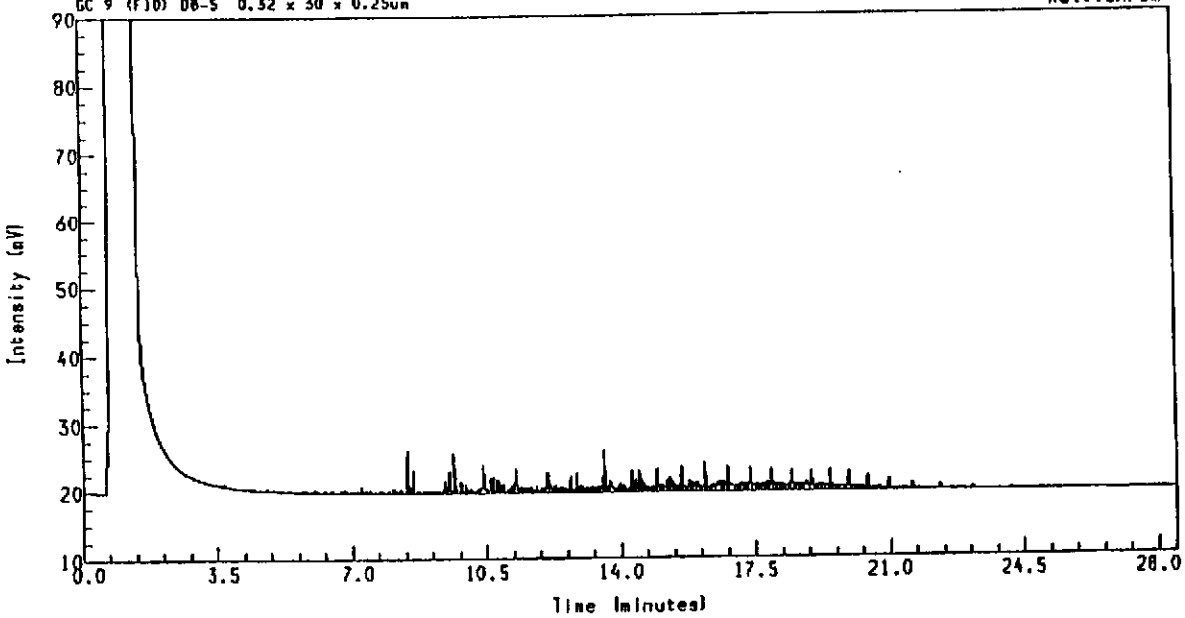
QUANTERRA - SACRAMENTO

CHROMATOGRAPHY

FUEL OIL #6 STANDARD

Analysis Name : [APR_SV] 89 9_29APR961100.5.1.
100 ppm Fuel Oil #6 HD62496A test Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 14:21
Reported on 29-APR-1996 at 14:52

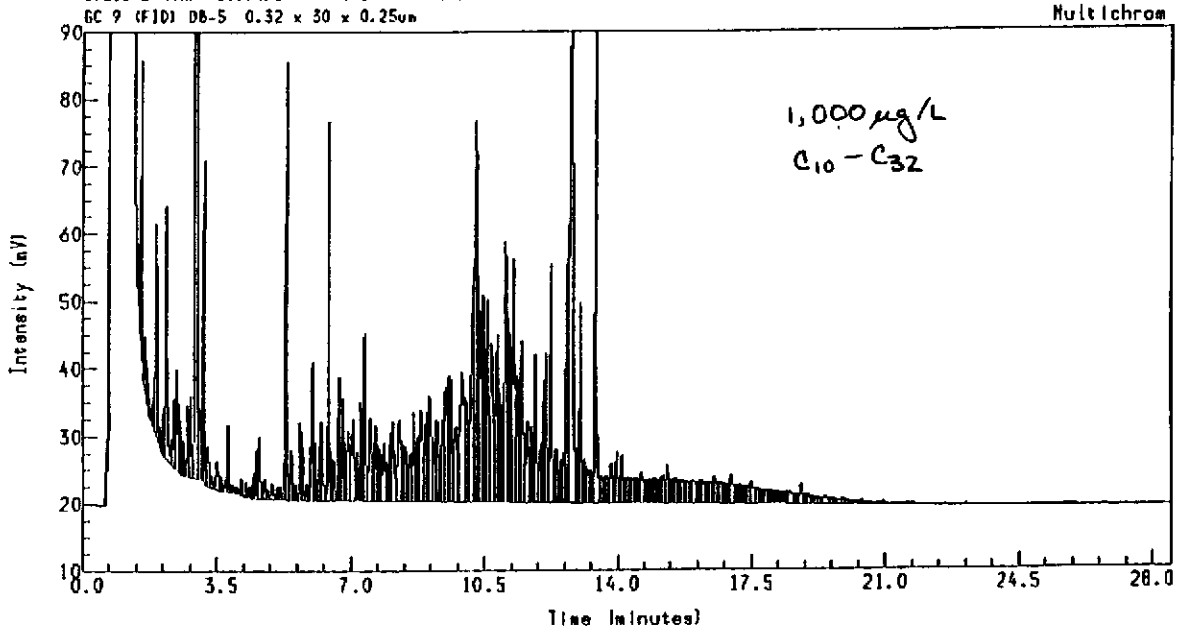
Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY LF-20

SAMPLED 4/11/96

Analysis Name : [APR_SV] 89 9_29APR961100.25.1.
87235-5 (IR) D.994/5 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



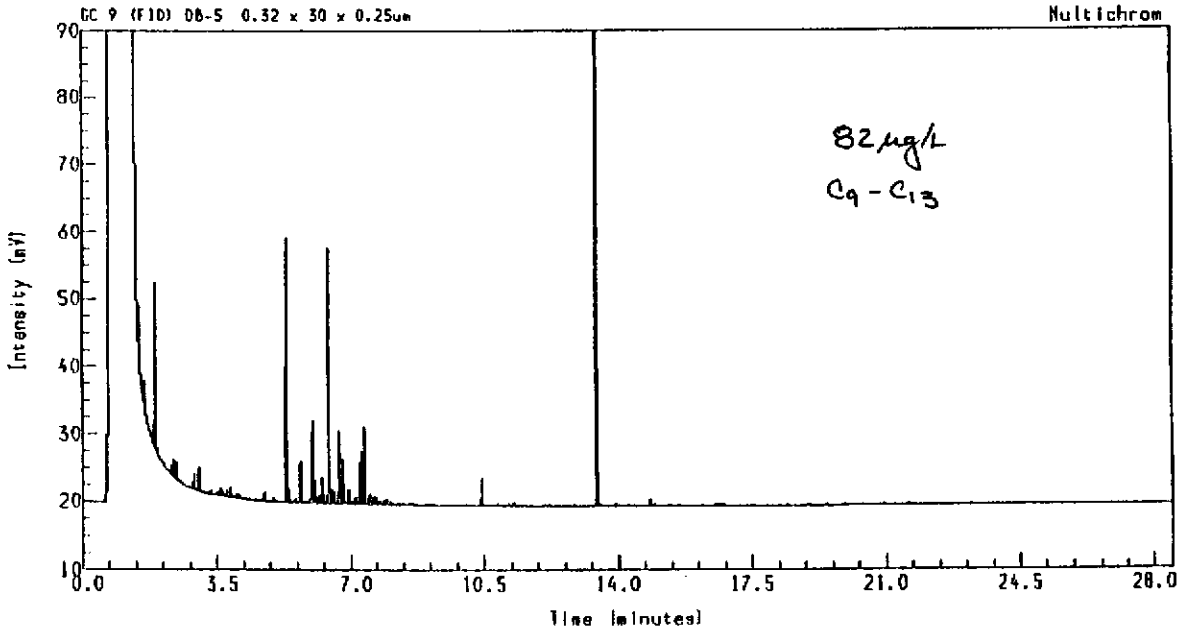
Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 30-APR-1996 at 03:54
Reported on 30-APR-1996 at 04:24

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.19.1.
87235-5 (SIL) D.996/5 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 23:52
Reported on 30-APR-1996 at 00:23

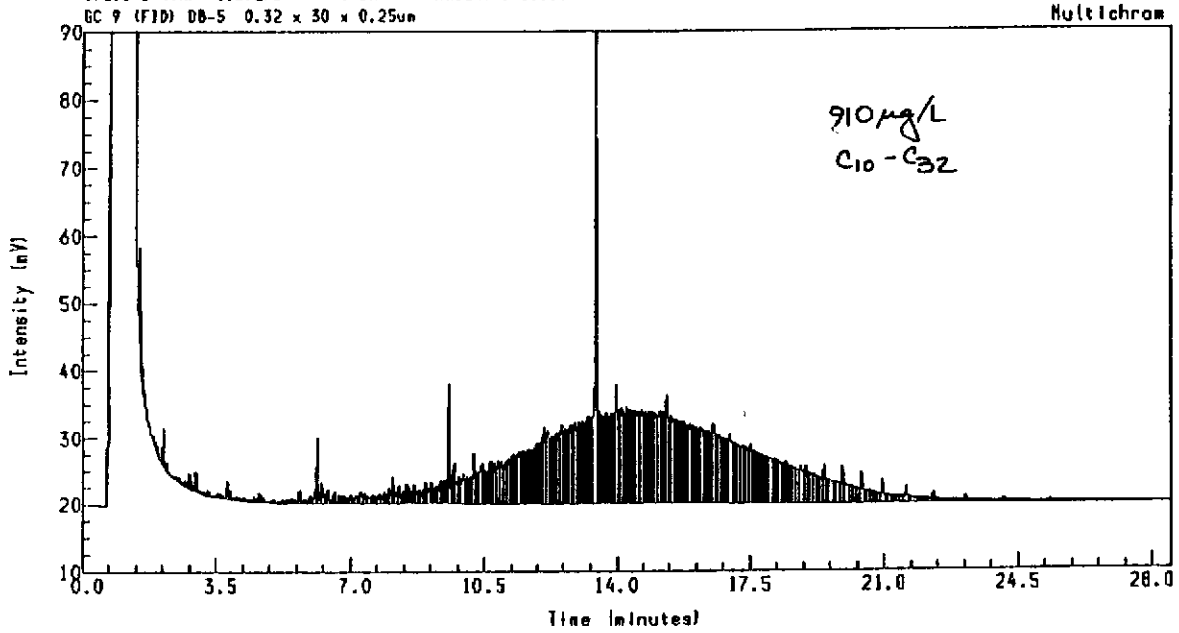
Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY LF-21

SAMPLED 4/11/96

Analysis Name : [APR_SV] 09 9_29APR961100.7.1.
87215-1 (TR) D.B92/3 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



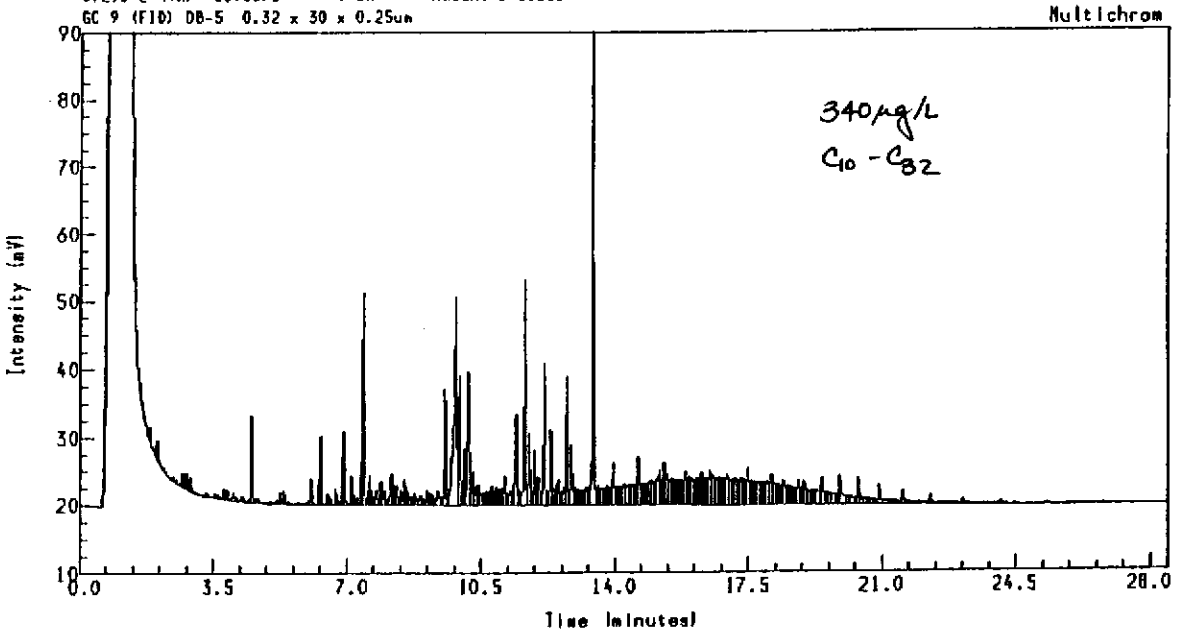
Instrument : GC #09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 15:47
Reported on 29-APR-1996 at 16:18

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

LF-23
SAMPLED 4/10/96

QUANTERRA - SACRAMENTO CHROMATOGRAPHY

Analysis Name : [APR_SV] 89 9_29APR961100.8.1.
87215-2 (TR) D.98B/5 T=SA Amount : 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um Multichrom



Instrument : GC e09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 29-APR-1996 at 16:28
Reported on 29-APR-1996 at 16:58

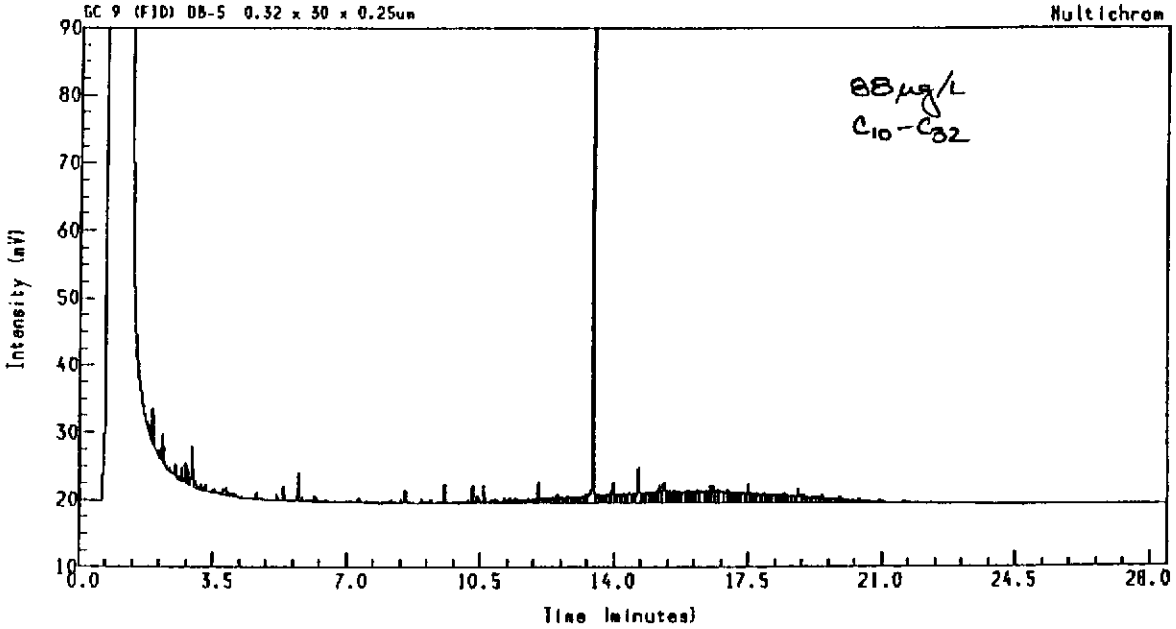
Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

QUANTERRA - SACRAMENTO CHROMATOGRAPHY LF-25

SAMPLED 4/11/96

Analysis Name : [APR_SV] 89 9_29APR961100.23.1.
B7235-1 (IR) D.965/5 I=SR Amount = 1.000
GC 9 (FID) DB-5 0.32 x 30 x 0.25um

Multichrom



Instrument : GC 09
Channel Title : Varian 3700 FID
Line ID :
Acquired on 30-APR-1996 at 02:33
Reported on 30-APR-1996 at 03:06

Method : GC9
Calibration : 25APR_XX
Run Sequence : GC9

APPENDIX E

CHROMATOGRAMS OF 8015M ANALYSIS
NOVEMBER 1996

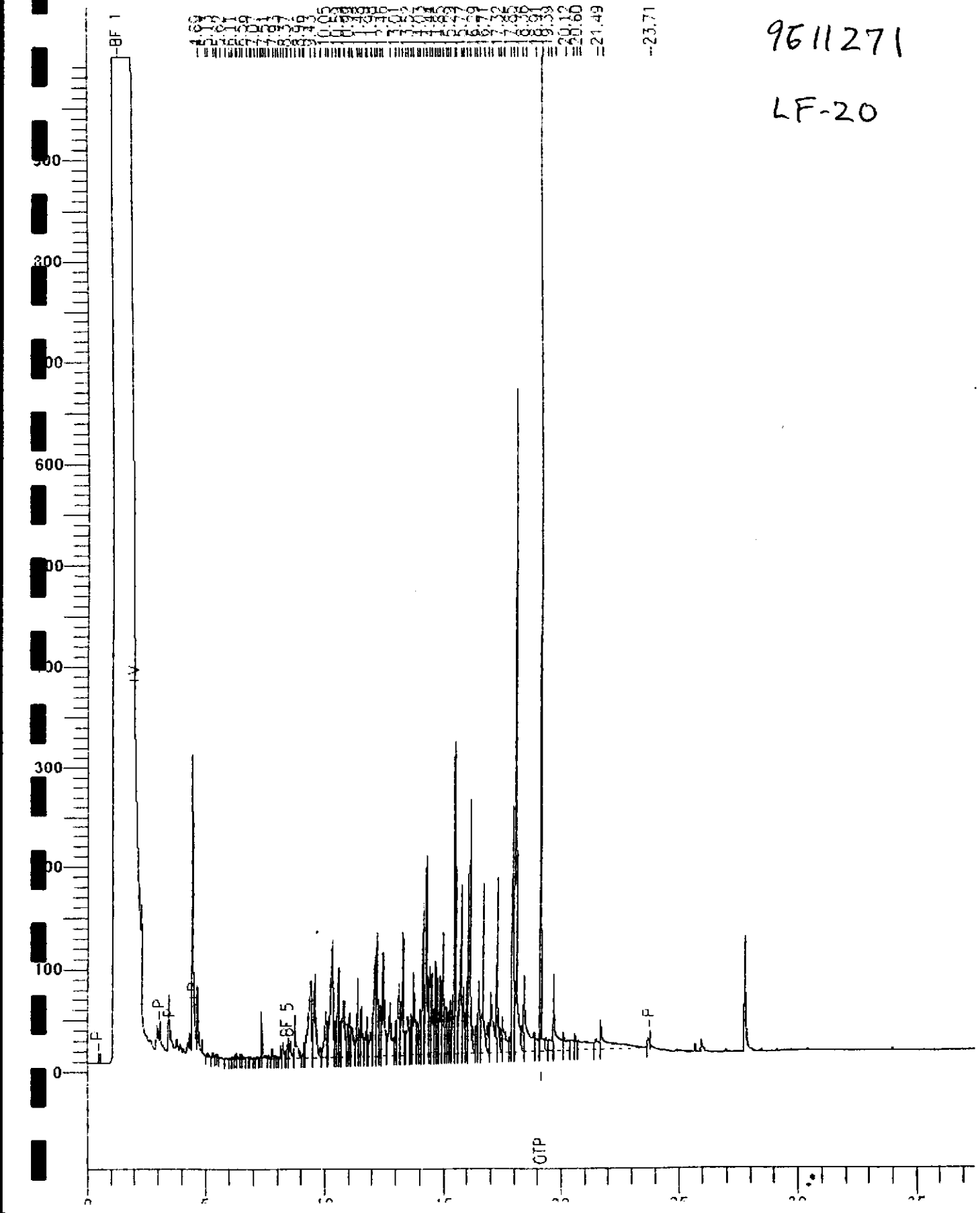
diesel analysis

le Name : 11271/LF20
Na : N:\TN27024.raw
od : 2D1115
t Time : 0.00 min End Time : 37.50 min
e Factor: 0.0 Plot Offset: 0 mV

Sample #: 108249 Page 1 of 1
Date : 11/28/96 06:20
Time of Injection: 11/28/96 05:43
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV

9611271

LF-20

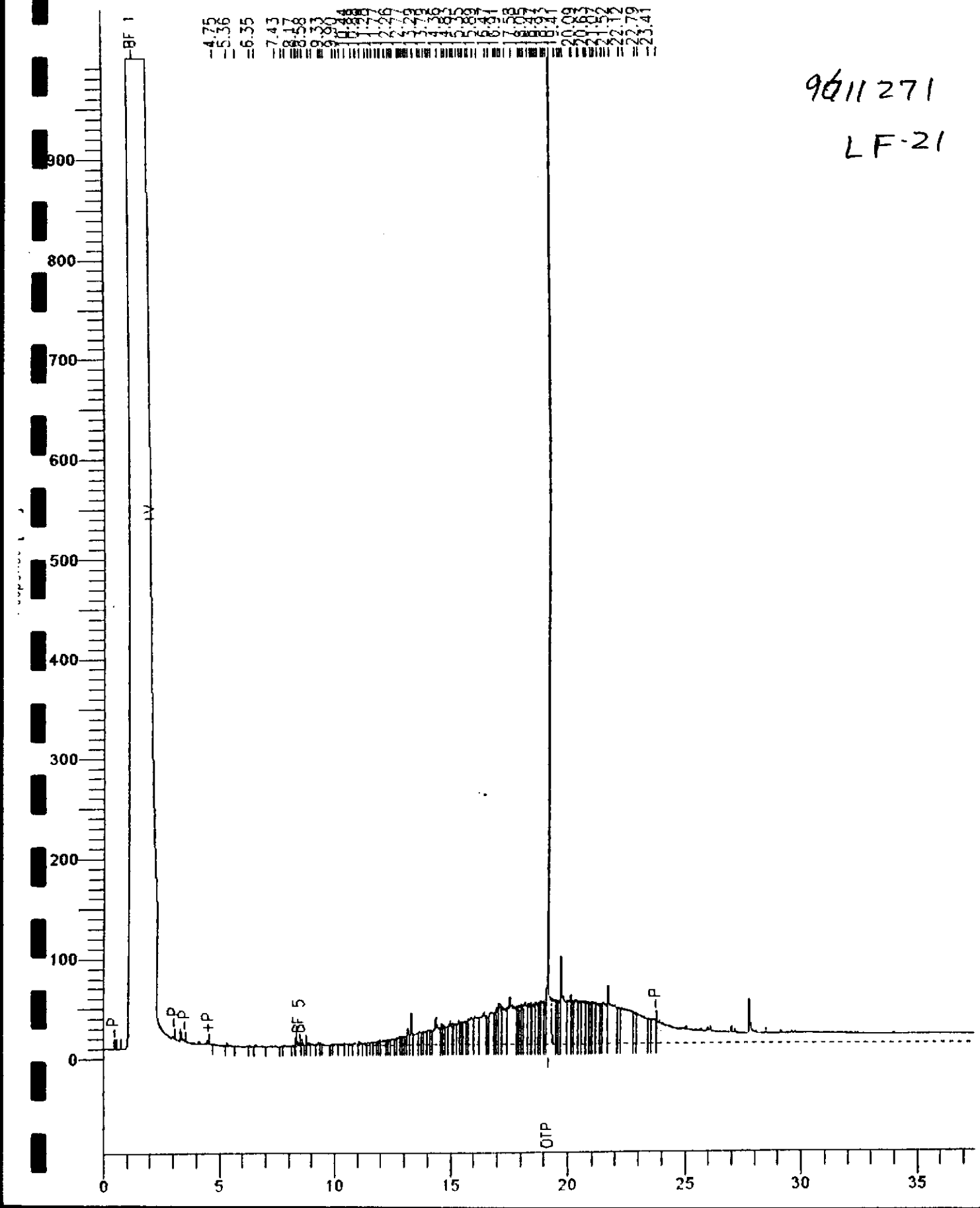


diesel analysis

[redacted] Name : 11271/LF21
[redacted]e : D:\DIESEL2\TW27023.RAW
th[redacted] : ZD1115.MTH
art Time : 0.00 min End Time : 37.50 min
ale Factor: 0.0 Plot Offset: 0 mV

Sample #: 108240
Date : 2/14/97 13:32
Time of Injection: 11/28/96 04:59
Low Point : 0.00 mV High Point : 1000.00 mV

9611271
LF-21



diesel analysis

Name : 11271/LF-23
e : D:\DIESEL2\TN27027.RAW
: 2D1115.MTH
rt Time : 0.00 min
le Factor: 0.0

End Time : 37.50 min
Plot Offset: 0 mV

Sample #: 108252
Date : 2/14/97 13:33
Time of Injection: 11/28/96 07:55
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

High Point : 1000.00 mV

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