Environmental
Science &
Engineering, Inc.
A EILCORP Company

TO: James River Corporation
2101 Williams Street
San Leandro, CA 94577

DATE: February 19, 1996

ATTN: Ms. Regina Colbert
Government Regulatory Coordinator

JOB NUMBER: 6595207

SUBJECT: REPORT OF PRELIMINARY SITE ASSESSMENT

WE ARE TRANSMITTING THE FOLLOWING:

Enclosed you will find two (2) bound copies of the Report of Preliminary Site Assessment for the James River Flexible Packaging Facility. If you have any questions or comments regarding this matter please call me at (510) 685-4053.

CC: Mr. Dale Klettke (One (1) copy)

DIST:
LB
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Originator

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY:
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Senior Staff Scientist

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Report of Preliminary Site Assessment
James River Flexible Packaging Facility
San Leandro, California

Prepared for:
James River Corporation
2101 Williams Street
San Leandro, CA 94577-3200

Prepared by:
Environmental Science & Engineering, Inc.
Concord, CA

February 19, 1996

ESE Project No. 6595207

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This site assessment report has been prepared by Environmental Science and Engineering, Inc. (ESE) for the exclusive use of James River Corporation (James River) as it pertains to the James River Flexible Packaging Facility located at 2101 Williams Street, San Leandro, California. This report was prepared with that degree of care and skill ordinarily exercised by other geologists and engineers practicing in this field. No other warranty, either expressed or implied, is made as to professional advice in this report.

REPORT PREPARED BY:

Eric W. Garcia
Senior Staff Geologist

2.19.96
Date

UNDER THE PROFESSIONAL SUPERVISION OF:

George Reid, R.G. 3608
Senior Geologist

2-19-96
Date

1.0 Introduction

This report presents the results of site assessment activities performed by Environmental Science & Engineering, Inc. (ESE) for the James River Flexible Packaging Facility (James River Facility) during the month of December 1995 and January 1996 (Figure 1 - Location Map). ESE submitted a workplan dated November 21, 1995 to James River and the Alameda County Health Care Services Agency (HCSA), which was subsequently approved in a letter dated December 22, 1995. The workplan described the tasks to be performed during this site assessment (ESE, 1995).

1.1 Scope of Work

The primary objectives of the site investigation were to delineate the extent of free-phase floating product and dissolved-phase product in soil and ground water in the vicinity of a vault previously containing a hydraulically powered cardboard baler (baler) (Figure 2 - Site Map).

The following sections summarize the site setting, site history, field methodologies for soil sampling, well installation and ground water sampling, and the reported analytical results for soil and ground water samples collected during this site assessment. This report also discusses the findings obtained from this investigation, presents conclusions, and provides recommendations for future site activities.

1.2 Background

1.2.1 Site Setting

The site and vicinity are at an approximate elevation of 25 feet above mean sea level (MSL) on the tidal plain bounding the eastern edge of San Francisco Bay. Surface topography is relatively flat. The site vicinity is underlain by Holocene estuarine deposits (locally known as Bay Mud), consisting primarily of dark, plastic clays and silty clays rich in organic material, with some local lenses of well-sorted fine-grained sands and shelly and peaty layers (Helley and others, 1979). The site, situated at the southeast corner of Doolittle Street and Williams Street, is located in an industrial area. Site features, including locations of the monitoring wells, are depicted in Figure 2. Regional ground water flow in the area is to the west and southwest towards the San Francisco Bay.

1.2.2 Site History

In December 1993 James River decommissioned a baler located inside the southeastern portion of the plant. The former baler was contained within a 14 feet long, ten feet wide, and twenty feet

deep concrete vault. At approximately 14 feet below the bottom of the vault was a 2 ½-foot diameter steel-lined hydraulic ram. On December 8, 1993, the ground water level was measured inside the ram housing at approximately four feet below the floor of the baler vault, or approximately ten feet below the existing water table.

Upon removal of the baler, James River personnel pumped approximately 1,700 gallons of water from the baler housing and stored in 55-gallon drums. On December 21, 1993, Harding Lawson Associates (HLA) noted approximately 0.4 feet of free product floating on top of the ground water. HLA obtained a ground water and free-phase product sample from inside the baler ram housing and submitted the ground water sample for chemical analysis. In addition, a sample of lubricant used for the bailing mechanism was obtained from James River and submitted for chemical analysis. All collected samples were transported under chain-of-custody to NET Pacific (NET) Laboratory of Santa Rosa, California.

The samples collected by HLA on December 21, 1993, were analyzed for total oil and grease (TOG) using EPA Method 5520 B, non-polar oil and grease (NPOG) using EPA Method 5520 B/F, and total petroleum hydrocarbons as motor oil (TPH-MO) using EPA Method 8015M (modified per CA LUFT). The ground water sample was reported as containing 210 milligrams per liter (mg/L) of TPH-MO. Chemical analysis of the floating product collected from the ram housing detected 310,000 mg/L of TOG and 228,000 mg/L of NPOG. Analysis of the lubricant sample obtained from James River detected 704,000 mg/L of TOG and 633,000 mg/L of NPOG. The chromatogram patterns obtained for the James River lubricant sample and the free-phase product sample collected from the ram housing were found to have similar patterns to the laboratory standard for motor oil.

Based on the laboratory results for the floating product and ground water, it was decided that a soil boring would be drilled approximately 20 feet down-gradient of the vault and a hydropunch would be completed to obtain a ground water sample. Upon removal of the baler mechanism, the vault was backfilled with concrete to match the existing grade.

On February 1, 1994, HLA completed the hydropunch investigation by drilling a 20-foot deep boring below the building floor surface, collecting two soil samples near the water table, and collecting a ground water sample with a hydropunch. At approximately 15.5 feet below the building floor surface, free product was encountered. The two soil samples and one ground water sample were submitted to NET for chemical analysis for TPH-MO. The soil samples collected from 15.5 to 16.0 and 18.0 to 18.5 feet below the building floor detected 5,700 mg/kg and 3,100 mg/kg TPH-MO, respectively. The ground water sample collected was reported as containing 110 mg/L TPH-MO.

Based on the information obtained, HLA concluded that it was evident that lubricant from the baler mechanism had leaked into the surrounding soil and ground water down-gradient of the vault and that the existing monitoring well network was inadequate for assessing the migration of hydraulic fluid from the baler. HLA suggested that if a monitoring well should be installed, it should be installed several hundred feet down-gradient of the baler, outside the building.

Pursuant to the request of the HCSA, James River was requested to investigate the potential impact to local ground water beneath the site in the area of the former baler. A workplan was prepared by ESE and submitted to James River and HCSA on November 27, 1995. The proposed scope of work was intended to investigate the vadose zone and ground water lateral to the area of known impact. ESE performed all field activities described in the workplan during December 1995 and January 1996.

2.0 Field Methodology

Prior to beginning fieldwork, ESE obtained all necessary permits for drilling soil borings and installing ground water monitoring wells at the site. In addition, ESE reviewed the site-specific Health and Safety Plan (HASP) prepared for this investigation with the onsite personnel, subcontractors, and qualified visitors. ESE performed the fieldwork in accordance with Tri-Regional Water Quality Control Board guidelines (RWQCB, 1990) and other applicable State regulations and standards.

2.1 Soil Boring and Soil Sample Collection

ESE supervised the drilling and sampling of three soil borings (TW-1, TW-2, and TW-3) which were converted to temporary ground water monitoring wells. The location of the soil boring in the area of the former vault is presented in Figure 2 - Site Map. Drilling activities were performed by Exploration Geoservices, Inc. (EGI) of San Jose, California using both a mobile B-61 hollow-stem auger drill rig (TW-2 and TW-3) and a hollow-stem remote access rig (TW-1).

All soil sampling was conducted in accordance with ESE Standard Operating Procedure (SOP) No. 1 for Soil Borings and Soil Sampling with Hollow-Stem Augers (Appendix A). The three soil borings were logged by an ESE geologist using the Unified Soil Classification System (USCS). Soil boring logs are presented in Appendix B.

On December 27, 1995, soil boring TW-1 was drilled to a depth of 25 feet bgs. Ground water was encountered at a depth of approximately 20 feet bgs. The soil samples were screened in the field for VOCs using a photionization detector (PID). One soil sample was collected from each soil boring at the vadose zone-ground water interface (soil samples TW-1-20, TW-2-15, and TW-3-15), placed in a cooler with ice, and transported under chain-of-custody to C&T for analysis. Samples were received by the laboratory on December 28, 1995.

Soil borings TW-2 and TW-3 were completed on December 27, 1995 to a depth of 20 feet below ground surface (bgs). Ground water was encountered at approximately 15 feet bgs in both of the soil borings. The soil cuttings were screened in the field for volatile organic compounds (VOCs) using a PID. Screening results indicated no detectable zones of soil impacted with volatile petroleum hydrocarbons. One soil sample was collected from each soil boring at the approximate vadose zone-ground water interface (Sample Nos. TW-2-15 and TW-3-15) and submitted to a laboratory for analysis. The two soil samples were placed in a cooler with ice and transported under chain-of-custody documentation to Curtis and Tompkins, LTD. (C&T), a State-certified laboratory of Berkeley, California. Samples were received by the laboratory on December 27, 1995.

2.2 Ground Water Monitoring Well Installation and Sampling

Ground water monitoring wells (TW-1, TW-2, and TW-3) were installed in each of the three corresponding soil borings and then developed (Figure 2: Site Map). All well installation and development activities were conducted in accordance with ESE SOP No. 2, presented in Appendix A.

Monitoring well TW-1 was constructed of six-inch schedule 40 polyvinyl chloride (PVC). Five feet of blank PVC was used from the ground surface to a depth of approximately five feet bgs. Twenty feet of 0.010-inch slotted PVC was installed from a depth of approximately five feet bgs to the bottom of the wells at 25 feet bgs. Monitoring wells TW-2 and TW-3 were constructed of four-inch schedule 40 PVC. Five feet of blank PVC was used in each monitoring well from the ground surface to a depth of approximately five feet. Fifteen feet of 0.010-inch slotted PVC was installed in each monitoring well from a depth of approximately five feet bgs to the bottom of the wells at 20 feet bgs. Information on ground water monitoring well completion is presented in Appendix B. After the wells were completed, a traffic barricade was placed over each monitoring well.

On December 28, 1995, ESE sampled the ground water in the three new monitoring wells (TW-1 through TW-3) and two existing monitoring wells (W-7 and W-10). All monitoring wells were sampled in accordance with ESE SOP No. 3 (Appendix A). Sample collection logs are presented in Appendix C. Ground water samples were collected and placed in a cooler with ice and transported under chain-of-custody documentation to C&T. Samples were received by the laboratory on December 28, 1995.

On January 11, 1996 ESE performed a vertical and horizontal survey of the top of each well casing using a Leitz automatic level. The southwest corner of the pad for a pair of above-ground storage tanks was used as the benchmark reference for the surveying activities. Using an arbitrary datum of 25 feet above MSL, as estimated from the topographic contours presented in the USGS San Leandro 7.5 Minute Quadrangle Map, ESE calculated relative ground water elevations using depth-to-water measurements observed on January 11, 1996. The ground water monitoring activities were conducted in accordance with ESE SOP No. 3 for Ground Water Monitoring and Sampling From Monitoring Wells (Appendix A). The results of the site survey, the depth to ground water measurements, and the calculated ground water elevations are summarized in Table 1: Ground Water Elevation Data.

2.3 Laboratory Analysis and QA/QC Samples

The soil samples collected were analyzed for total petroleum hydrocarbons as hydraulic fluid (TPH-HF) using EPA Method 8015M (modified per CA LUFT). C&T also compared the soil sample chromatograms with the laboratory hydraulic fluid standard.

The ground water samples collected were visually examined for the presence of free-phase product. If no free phase product was identified, the samples were decanted into appropriate laboratory containers, placed in a cooler with ice, and transported under chain-of-custody documentation to C&T. The ground water samples were analyzed for TPH-HF using EPA Method 8015M. C&T compared the ground water sample chromatograms with the laboratory hydraulic fluid standard.

A free-phase floating product sample was collected and transported under chain-of-custody documentation to C&T. The sample of product was analyzed for TPH-HF and compared to the laboratory hydraulic fluid standard and another standard chromatograph pattern supplied by James River.

For sample handling quality assurance/quality control (QA/QC) purposes, a laboratory-supplied travel blank was included in the cooler with the ground water samples. This travel blank was analyzed for BTEX using method EPA 8020. Also, for laboratory QA/QC purposes, one duplicate ground water sample was collected at monitoring well TW-3 and submitted as a blind sample to the laboratory to be analyzed for TPH-HF.

2.4 Waste Management

As a result of this investigation, various waste materials were generated including soil as drill cuttings from the soil boring activities, rinse water from the decontamination of drilling and sampling equipment, and ground water from well development and sampling. The cuttings from the soil borings, rinse water and ground water from development and sampling were placed in 55-gallon, Department of Transportation (DOT)-rated steel drums adjacent to their respective soil boring locations. The drummed materials were left at the site pending receipt of analytical results for proper disposal.

3.0 Results

3.1 Soil

3.1.1 Soil Classification

Sediments of the unsaturated zone observed in soil borings TW-2 and TW-3 are a sequence of interbedded silty sands, sandy silts, and sandy clays (Appendix B). Road base fill was encountered in the first foot of the subsurface. The soils derived from soil borings TW-2 and TW-3 indicate a moderate to well-sorted fine silty sand layer over a depth interval of one foot bgs to approximately 7.5 feet bgs. The sediments beneath the silty sand layer to approximately 12.5 feet bgs are comprised of a moist, slightly plastic sandy silt. From 12.5 feet to the base of the soil borings, approximately 20 feet bgs is a wet, highly plastic sandy clay. Below a depth of approximately 15 feet bgs the sandy clay becomes water saturated.

Sediments of the unsaturated zone observed in soil boring TW-1 are a sequence of interbedded sandy silts, and sandy clays (Appendix B). Road base fill and rubble was encountered from 1.5 feet to approximately four feet bgs of the subsurface. The soil derived from soil boring TW-1 indicated a moderately sorted sandy silt layer over a depth interval of four feet bgs to approximately 7.5 feet bgs similar to that found in soil borings TW-2 and TW-3. The sediments beneath the sandy silt layer to the base of the soil boring (approximately 25 feet bgs) are comprised of a moist, highly plastic sandy clay. Below a depth of approximately 20 feet bgs the sandy clay becomes water saturated.

Field screening of drill cuttings from the soil borings with a PID did not indicate concentrations of volatile organic vapors to be substantially higher than background. Hydraulic fluid impacted soil was not visually apparent in soil borings TW-2 and TW-3, but was observed in soil boring TW-1 from five to eight feet bgs and 18 to 20 feet bgs.

3.1.2 Soil Sample Analytical Results

Soil samples TW-1-20, TW-2-15, and TW-3-15 were collected from each soil boring at the vadose zone-ground water interface and analyzed for TPH-HF. TPH-HF was detected in soil sample TW-1-20 at a concentration of 6,700 mg/kg. Soil sample analytical results are summarized in Table 2 and the analytical reports with the chain-of-custody documentation are presented in Appendix D.

3.2 Ground Water

3.2.1 Ground Water Elevation Data

Ground water elevations were measured in all monitoring wells on January 11, 1996. The average depth to ground water for all wells on January 11, 1996 was approximately 12.3 feet below the top of each casing. The ground water gradient beneath the site was to the east at a magnitude of approximately 0.0043 feet/foot (22.7 feet per mile). Monitoring well TW-1 was found to have approximately 0.05 feet of free product floating on the ground water. Figure 3 presents a graphical representation of the ground water flow direction and ground water elevation. Table 1: Summary of Ground Water Elevation Data presents a tabular representation of ground water elevation data.

3.2.2 Ground Water Sample Analytical Results

Ground water samples were collected in monitoring wells W-7, W-10, TW-1, and TW-3, and were analyzed for TPH-HF. TPH-HF was detected in ground water samples TW-2 and W-10 at concentrations of 2,200 μg/L and 2,500 μg/L, respectively. Ground water sample analytical results are summarized in Table 3 and depicted in Figure 4. The corresponding analytical reports with the chain-of-custody documentation are presented in Appendix D.

Due to the presence of floating free product observed in monitoring well TW-1 no ground water sample was recovered. A limited quantity of product sample was collected on December 28 and analyzed by TPH-HF and was also compared to a previous standard supplied by James River (Table 4). Product sample TW-1 was found to have a concentration of 4,200 μg/L TPH-HF. On January 22, 1996 an additional product sample was collected and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), EPA Method 8020, semivolatile organic compounds, EPA Method 8270, and the LUFT Metals, EPA Method 6010A. The product sample was reported as containing benzene, toluene, ethylbenzene and total xylenes at 13 μg/L, 7,000 μg/L, 220 μg/L, and 1,230 μg/L, respectively. No semivolatiles were detected at or above their associated reporting limits. The LUFT Metals, cadmium, lead, nickel, and zinc, were reported at concentrations of 0.75 mg/kg, 26 mg/kg, 83 mg/kg, and 31 mg/kg, respectively. The LUFT Metal, chromium was not detected at or above its associated reporting limit. C&T concluded that the "Sample chromatogram is similar to the Hydraulic Oil chromatogram submitted by Environmental Science and Engineering, indicating that the samples are potentially from the same source."

4.0 Risk

In the State Water Resources Control Board's (SWRCB) Report on Hydraulic Lift Tanks (HLTs), it was concluded that leaks from HLTs do not induce a significant risk to water quality in California. Ground water remediation is not recommended as it is unlikely that hydraulic fluid would pose a detrimental effect to human health and the environment. A literature search with regard to toxicity conducted by the SWRCB, revealed no reported human toxicity associated with the ingestion of petroleum or vegetable based hydraulic oils. Regarding environmental fate of hydraulic fluids the report concluded the following:

- The base oils are relatively insoluble in water;
- The base oils are less dense than water, so any release to ground water will tend to float on top of the aquifer;
- The base oils have low volatility, tend to adhere to soil particles, and are relatively immobile in a subsurface environment. Leak plumes would be expected to be small and to not travel far from the point of release;
- The base oils are low in aromatic compounds, such as benzene, which pose a hazard in drinking water;
- The base oils will biodegrade, at least partially, after they have been released into the environment;
- The primary route of exposure after release would be possible human ingestion via degraded drinking water;
- The human toxicity (measured in terms of ingestion associated with these oils) is apparently very low or nonexistent; and
- It is unlikely that other species of organisms will be adversely affected by HLT releases under the conditions described above.

5.0 Conclusions

Based on the results of the preliminary site assessment ESE presents the following conclusions:

- Soil in the unsaturated zone observed in soil borings TW-1, TW-2, and TW-3 consists of a sequence of interbedded silty sands, sandy silts, and sandy clays. Ground water was encountered in soil borings TW-2 and TW-3 at approximately 15 bgs and in TW-1 at 20 feet bgs;

- Soil impacted by hydraulic fluid was not observed in soil borings TW-2 and TW-3, but was observed in soil boring TW-1 from five to eight feet bgs and 18 to 20 feet bgs;

- Soil in the vicinity of the former baler and in soil boring TW-1 appears to be impacted by hydraulic fluid primarily at or near the soil-ground water interface and appears to be of limited extent. TPH-HF was detected in soil sample TW-1-20 at a concentration of 6,700 mg/Kg;

- On January 11, 1996 the ground water gradient beneath the site was to the east at a magnitude of approximately 0.0043 feet/foot (22.7 feet per mile); and

- Ground water in the vicinity of the former baler and soil boring TW-1 appears to be impacted by hydraulic fluid and may extend down-gradient under the flexible packaging plant; TW-1 was found to have approximately 0.05 foot of free product floating on the ground water and TPH-HF was detected in temporary monitoring well TW-2 (down-gradient of TW-1) at a concentration of 2,200 μg/L.

Based on the conclusions of the SWRCB and the data currently available it is concluded that the free-phase product is of limited extent and poses no significant risk to the environment.

6.0 Recommendations

Based on the conclusions of this PSA at the James River Facility, ESE recommends that a resolution of no further action be issued by the HCSA.

7.0 References

ESE, November 1995, Work Plan for Preliminary Site Assessment, James River Corporation, 2101 Williams Street, San Leandro.

Helley, E.J., Lajoie, K.R., and Spangel, W.E. and Blair, M.L., 1979, Flatland Deposits of the San Francisco Bay Region, California -- Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning, Geological Survey Professional Paper #943.

Harding Lawson Associates, March 1994, Sampling Results, Cardboard Bailer Vault Groundwater Sampling and Hydropunch Investigation, James River Corporation, San Leandro, California.

Norris, R.M., and Webb, R.W., 1976. Geology of California; John Wiley & Sons, Inc., New York. 365 pp.

State of California Regional Water Quality Control Board (RWQCB), 1990. Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites; August 10, 1990.

State of California Water Resources Control Board, 1995, Report on Hydraulic Lift Tanks; February 1995.

_____, 1995, LG-141: Permanent Hydraulic Fuel Tank Exemption; November 1995.

United States Geological Survey (USGS), 1980, San Leandro, California Quadrangle, 7.5 - Minute Series (Topographic): USGS, Scale 1:24,000, 1 Sheet.

TABLE 1
SUMMARY OF GROUND WATER ELEVATION DATA
JANUARY 11, 1996
JAMES RIVER FLEXIBLE PRODUCT FACILITY
SAN LEANDRO, CALIFORNIA

Monitoring Well ID	Depth to Water (feet)	Depth to Product (feet)	Top of Casing Elevation (feet MSL*)	Product Thickness (feet)	Ground Water Elevation (feet MSL*)
W-1	11.12	--	24.34	--	13.22
W-3	11.36	--	24.49	--	13.13
W-4	11.5	--	24.62	--	13.12
W-5	12.17	--	25.39	--	13.22
W-6	11.48	--	24.72	--	13.24
W-7	11.6	--	24.04	--	12.44
W-8	11.01	--	23.83	--	12.82
W-10	11.67	--	24.77	--	13.1
B-1	11.12	--	24.25	--	13.13
TW-1	15.73	15.68	28.61	0.05	12.88
TW-2	15.29	--	25.79	--	10.5
TW-3	13.82	--	25.29	--	11.47

Notes:

* Elevation based on an arbitrary datum of 25 feet above Mean Sea Level (MSL) at southwest corner of aboveground storage tank pad.

TABLE 2
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
JAMES RIVER FLEXIBLE PRODUCT FACILITY
SAN LEANDRO, CALIFORNIA

Sample ID	Sample Date	TPH-HF (mg/Kg)
TW-1-20	12/27/95	6,700
TW-2-15	12/27/95	ND
TW-3-15	12/28/95	ND

Notes:

TPH-HF Total Petroleum Hydrocarbons as Hydraulic Fluid analyzed using EPA Method 8015 (modified per CA LUFT);
(mg/Kg) milligrams per Kilogram;
ND not detected at or above the reporting detection limit;
• Analytical Reports are presented in Appendix D of this report.

TABLE 3
SUMMARY OF GROUND WATER SAMPLE ANALYTICAL RESULTS
JAMES RIVER FLEXIBLE PRODUCT FACILITY
SAN LEANDRO, CALIFORNIA

Sample ID	Sample Date	TPH-HF (μg/L)
TW-2	12/28/95	2,200
TW-3	12/28/95	ND
DUP	12/28/95	ND
W-7	12/28/95	ND
W-10	12/28/95	2,500

Notes:

TPH-HF Total Petroleum Hydrocarbons as Hydraulic Fluid analyzed using EPA Method 8015 (modified per CA LUFT).

(μg/L) micrograms per Liter

ND not detected at or above the reporting detection limit;

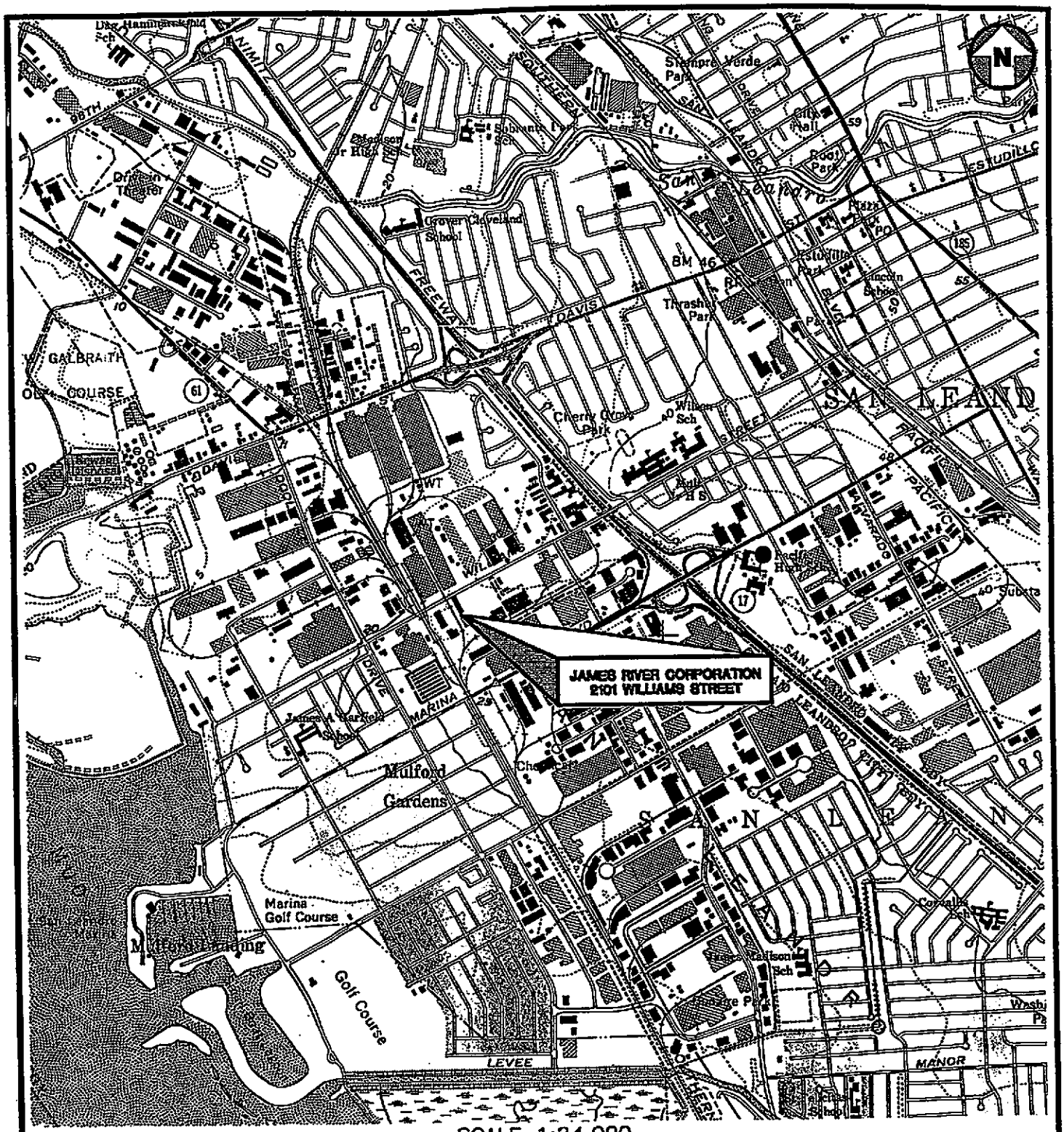
• Analytical Reports are presented in Appendix D of this report.

TABLE 4
PRODUCT SAMPLE ANALYTICAL RESULTS
JAMES RIVER FLEXIBLE PRODUCT FACILITY
SAN LEANDRO, CALIFORNIA

Sample ID	Sample Date	TPH-HF (μg/L)	EPA Method 8020				LUFT Metals					EPA Method 8270 (μg/L)
			Benzene (μg/Kg)	Toluene (μg/Kg)	Ethylbenzene (μg/Kg)	Total Xylenes (μg/Kg)	Cd (mg/Kg)	Cr (mg/Kg)	Pb (mg/Kg)	Ni (mg/Kg)	Zn (mg/Kg)	
TW-1	12/28/95	4,200	13	7,000	220	1,230	0.75	ND	26	83	31	ND

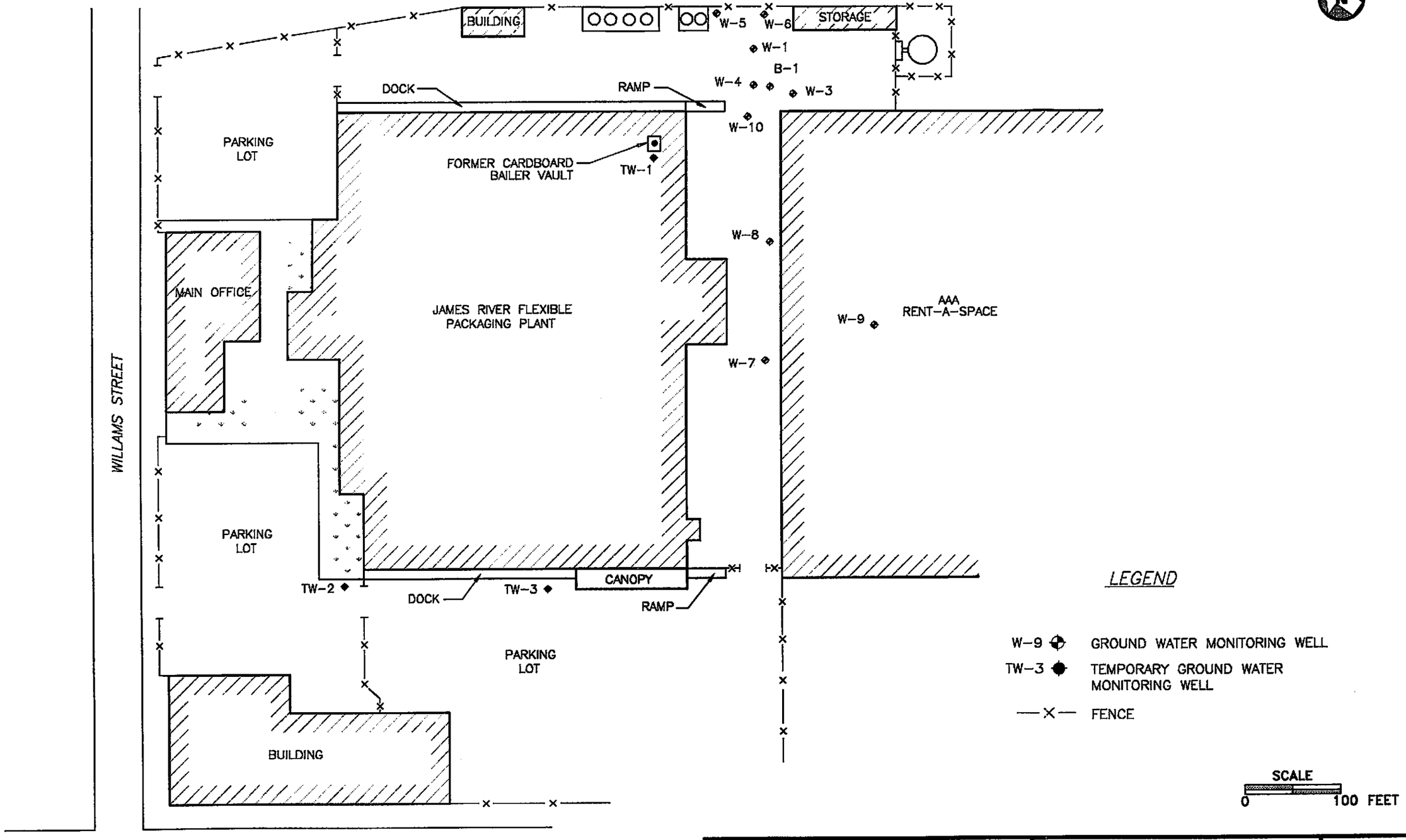
Notes:

TPH-HF Total Petroleum Hydrocarbons as Hydraulic Fluid analyzed using EPA Method 8015 (modified per CA LUFT).
(μg/L) micrograms per Liter
(μg/Kg) micrograms per Kilogram
(mg/Kg) milligrams per Kilogram
• Analytical Reports are presented in Appendix D of this report.



ADAPTED FROM U.S.G.S. SAN LEANDRO, CA. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAP 1959, PHOTOREVISED 1980.

ESE Environmental Science & Engineering, Inc.	DATE 3/10/95	LOCATION MAP	FIGURE NO. 1
	REVISED		
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	CAD FILE 50220003	JAMES RIVER CORPORATION 2101 WILLIAMS STREET SAN LEANDRO, CALIFORNIA	PROJ. NO. 6595022



Environmental Science & Engineering, Inc.

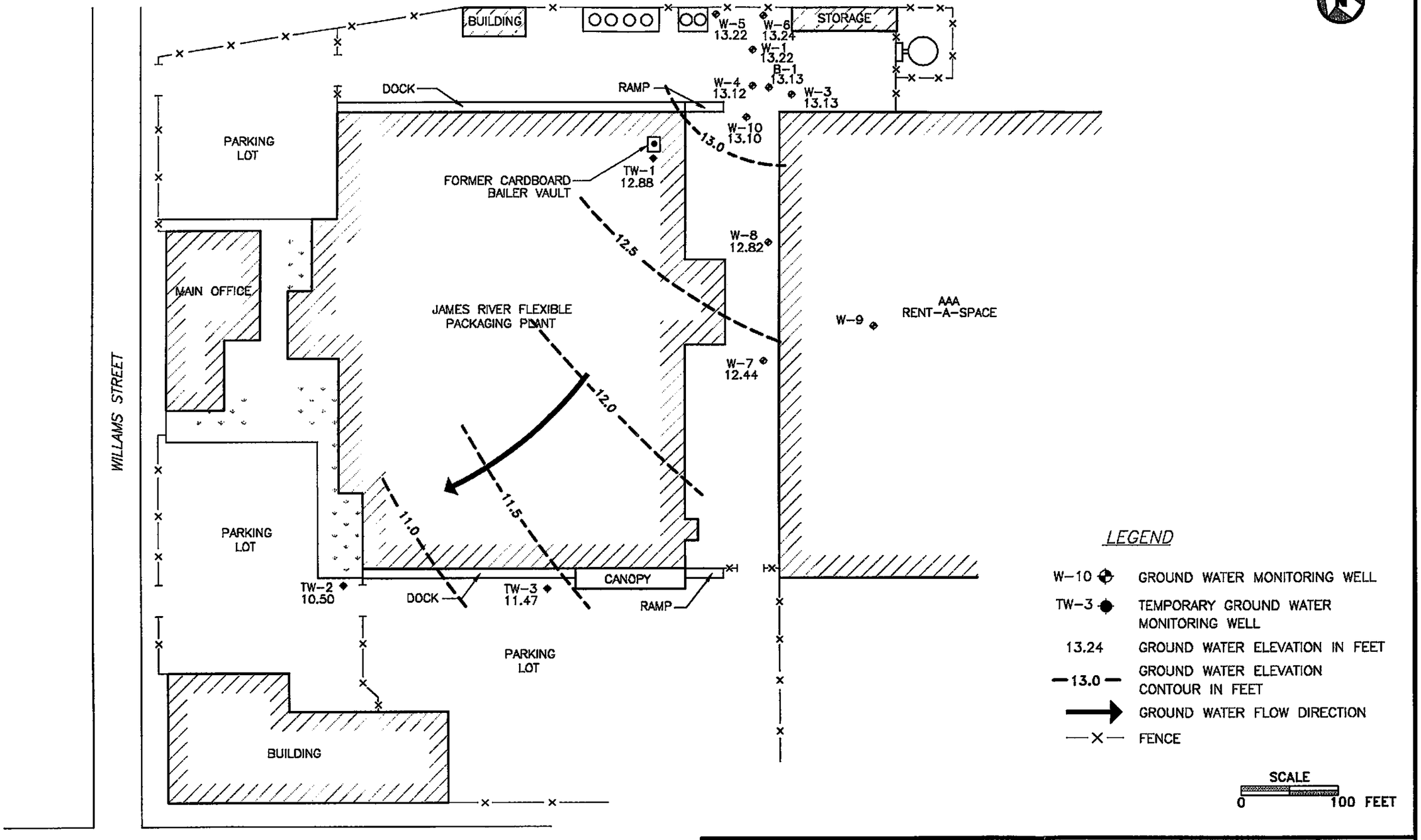
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE 11/27/95
REVISED 1/19/96
CAD FILE 65520712

SITE MAP

JAMES RIVER CORPORATION
2101 WILLIAMS STREET
SAN LEANDRO, CALIFORNIA

FIGURE NO. 2
PROJ. NO. 65-95-207



LEGEND

W-10 ⊕	GROUND WATER MONITORING WELL
TW-3 ●	TEMPORARY GROUND WATER MONITORING WELL
13.24	GROUND WATER ELEVATION IN FEET
—13.0—	GROUND WATER ELEVATION CONTOUR IN FEET
→	GROUND WATER FLOW DIRECTION
—X—	FENCE

SCALE
0 100 FEET

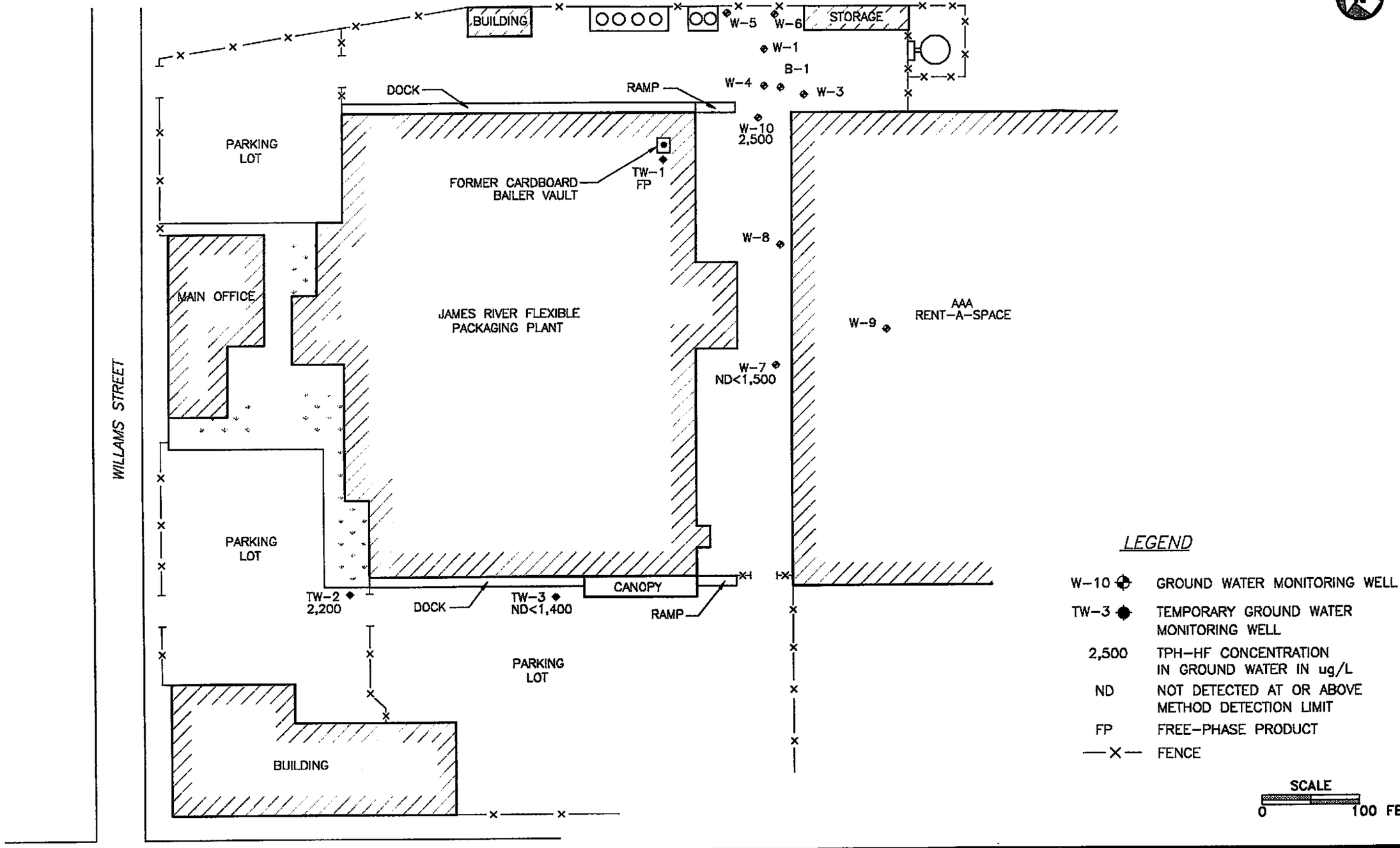
Environmental Science & Engineering, Inc.
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE 1/16/96
REVISED 1/19/96
CAD FILE 65520713

GROUND WATER ELEVATION CONTOUR MAP
JANUARY 11, 1996

JAMES RIVER CORPORATION
2101 WILLIAMS STREET
SAN LEANDRO, CALIFORNIA

FIGURE NO. 3
PROJ. NO. 65-95-207



LEGEND

W-10 ⊕	GROUND WATER MONITORING WELL
TW-3 ●	TEMPORARY GROUND WATER MONITORING WELL
2,500	TPH-HF CONCENTRATION IN GROUND WATER IN ug/L
ND	NOT DETECTED AT OR ABOVE METHOD DETECTION LIMIT
FP	FREE-PHASE PRODUCT
—X—	FENCE

SCALE
0 100 FEET

ESE Environmental Science & Engineering, Inc. 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 1/19/96 REVISED CAD FILE 65520714	TPH-HF CONCENTRATIONS IN GROUND WATER DECEMBER 28, 1995 JAMES RIVER CORPORATION 2101 WILLIAMS STREET SAN LEANDRO, CALIFORNIA	FIGURE NO. 4 PROJ. NO. 65-95-207

UNIFIED SOIL CLASSIFICATION SYSTEM (USC)

MAJOR DIVISIONS			GROUP SYMBOLS	DESCRIPTION	GRAPHIC LOG
COARSE GRAINED SOILS (50% or more retained on the No. 200 sieve.)	GRAVELS (More than half of coarse fraction retained on the No. 4 sieve.)	Clean sands	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.	
		Gravels with fines	GM	Silty gravels, gravel-sand mixtures.	
			GC	Clayey gravels, gravel-sand-clay mixtures.	
	SANDS (More than half of coarse fraction passing the No. 4 sieve.)	Clean sands	SW	Well-graded sands, gravelly sands, little or no fines.	
			SP	Poorly-graded sands, gravelly sands, little or no fines.	
		Sands with fines	SM	Silty sands, sand-silt mixtures.	
			SC	Clayey sands, sand clay mixtures.	
FINE GRAINED SANDS (More than 50% passing the No. 200 sieve.)	SILTS AND CLAYS	Liquid Limit below 50%	ML	Inorganic silts and very fine sands.	
			CL	Inorganic clays, gravelly clays, sandy clays, lean clays.	
			OL	Organic silts and organic clays.	
		Liquid Limit 50% and above	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	
			CH	Inorganic fat clays.	
			OH	Organic clays or organic silts.	
Highly organic soils			Pt	Peat, organic content greater than 60%.	

BEDROCK

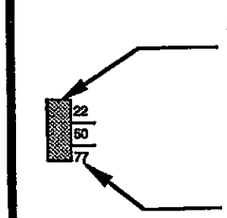
Sandstone		Metamorphics	
Shale		Volcanics	
Siltstone			

WELL INSTALLATION

SYMBOL	DESCRIPTION
	Bentonite/cement grout
	Bentonite Pellets
	Sand
	Screen section of well or piezometer
	Blank section of well or piezometer with centralizer
	Traffic rated well box with locking water-tight cap

See log for details of installation.

LEGEND



Vapor

Field Photoionization detector reading in parts per million (ppm). See remarks on log for background readings and comments.

ESE A CALCOMP COMPANY
Environmental Science & Engineering, Inc.
4090 Nelson Avenue, Suite J
Concord, CA 94520
(415) 685-4053

LEGEND TO LOGS

DRAWN BY	DATE	FILE NAME
CVS	3/91	LEGEND

APPENDIX A
ESE STANDARD OPERATING PROCEDURES

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURES NO. 1 FOR SOIL BORINGS AND SOIL SAMPLING WITH HOLLOW-STEM AUGERS

Environmental Science & Engineering, Inc. (ESE) typically drills soil borings using a truck-mounted, continuous-flight, hollow-stem auger drill rig. The drill rig is owned and operated by a drilling company possessing a valid State of California C-57 license. The soil borings are conducted under the direct supervision and guidance of an experienced ESE geologist. Prior to drilling, the ESE geologist will clear the borehole location with a hand auger to a depth of five feet. The ESE geologist logs each borehole during drilling in accordance with the Unified Soil Classification System (USCS). Additionally, the ESE geologist observes and notes the soil color, relative density or stiffness, moisture content, odor (if obvious) and organic content (if present). The ESE geologist will record all observations on geologic boring logs.

Soil samples are collected during drilling at a minimum of five foot intervals by driving an 18-inch long Modified California Split-spoon sampler (sampler), lined with new, thin-wall brass sleeves, through the center of and ahead of the hollow-stem augers, thus collecting a relatively undisturbed soil sample core. The brass sleeves are typically two inches in diameter and six inches in length. The sampler is driven by dropping a 140 pound hammer thirty inches onto rods attached to the top of the sampler. Soil sample depth intervals and the number of hammer blows required to advance the sampler each six-inch interval are recorded by the ESE geologist on geologic boring logs. The ends of one brass sleeve are covered with Teflon sheeting, then covered with plastic end caps. Each sample is then labeled and placed on ice in a cooler for transport under chain-of-custody documentation to the designated analytical laboratory. A portion of the remaining soil in the sampler is placed in either a new Ziploc® bag or a clean Mason Jar® and set in direct sunlight to enhance the volatilization of any Volatile Organic Compounds (VOCs) present in the soil. After approximately 15 minutes that sample is screened for VOCs using a photoionization detector (PID). The PID measurements will be noted on the geologic boring logs. The PID provides qualitative data for use in selecting samples for laboratory analysis. Soil samples from the saturated zone (beneath the ground water table) are collected as described above, are not screened with the PID, and are not submitted to the analytical laboratory. The samples from the saturated zone are used for descriptive purposes. Soil samples from the saturated zone may be retained as described above for physical analyses (grain size, permeability, and porosity testing).

If the soil boring is not going to be completed as a well, then the boring is typically terminated upon penetrating the saturated soil horizon or until a predetermined interval of soil containing no evidence of contamination is penetrated. This predetermined interval is typically based upon site- specific regulatory or client guidelines. The boring is then backfilled using either neat cement, neat cement and bentonite powder mixture (not exceeding 5% bentonite), bentonite pellets, or a sand and cement mixture (not exceeding a 2:1 ratio of sand to cement). However, if the boring is to be completed as a monitoring well, then the boring is continued until either a competent, low estimated-permeability, lower confining soil layer is found or ten to 15 feet

of the saturated soil horizon is penetrated, whichever occurs first. If a low estimated-permeability soil layer is found, the soil boring will be advanced approximately five feet into that layer to evaluate its competence as a lower confining layer, prior to the termination of that boring.

All soil sampling equipment is cleaned between each sample collection event using an Alconox® detergent and tap water solution followed by a tap water rinse. Additionally, all drilling equipment and soil sampling equipment is cleaned between borings, using a high-pressure steam cleaner, to prevent cross-contamination. All wash and rinse water is collected and contained onsite in Department of Transportation-approved containers (typically 55-gallon drums) pending laboratory analysis and proper disposal/recycling.

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ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 2
FOR MONITORING WELL INSTALLATION AND DEVELOPMENT

Environmental Science & Engineering, Inc. (ESE) typically installs ground water monitoring wells in unconsolidated sediments drilled using a truck-mounted hollow-stem auger drill rig. The design and installation of all monitoring wells is performed and supervised by an experienced ESE geologist. Prior to the construction of the well, the portion of the borehole that penetrates a lower confining layer (if any) is filled with bentonite pellets. The monitoring well is then constructed by inserting polyvinylchloride (PVC) pipe through the center of the hollow-stem augers. The pipe (well casing) is fastened together by joining the factory threaded pipe ends. ESE typically uses two inch or four inch diameter pipe for ground water monitoring wells. The diameter of the borehole is typically six inches greater than that of the diameter of the well casing, but is at least four inches greater than that of the well casing. The lowermost portion of the well casing will be factory perforated (typically having slot widths of 0.010-inch or 0.020-inch). The slotted portion of the well casing will extend from the bottom of the boring up to approximately five feet above the occurrence of ground water. A PVC slip or threaded cap will be placed at the bottom end of the well casing, and a locking expandable well cap will be placed over the top (or surface) end of the well casing. A sand pack (typically No. 2/12 or No. 3 Monterey sand) will be placed in the borehole annulus, from the bottom of the well casing up to one to two feet above the top of the slotted portion, by pouring the clean sand through the hollow-stem augers. One to two feet of bentonite pellets will be placed on top of the sand pack. The bentonite pellets will then be hydrated with three to four gallons of potable water, to protect the sand pack from intrusion during the placement of the sanitary seal. The sanitary seal (grout) will consist of either neat cement, a neat cement and bentonite powder mixture (containing no more than 5% bentonite), or a neat cement and sand mixture (containing no more than a 2:1 sand to cement ratio). If, the grout seal is to be greater than 30 feet in depth or if standing water is present in the boring on top of the bentonite pellet seal, then the grout mixture will be tremied into the boring from the top of the bentonite seal using either a hose, pipe or the hollow-stem augers, which serve as a tremie. The well will be protected at the surface by a watertight utility box. The utility box will be set into the grout mixture so that it is less than 0.1-foot above grade, to prevent the collection of surface water at the well head. If the well is set within the public right of way, then the utility box will be Department of Transportation (DOT) traffic rated, and the top of the box will be set flush to grade. If the well is constructed in a vacant field a brightly painted metal standpipe may be used to protect the well from traffic. If a standpipe is used, it will be held in place with a grout mixture and will extend one to two feet above ground surface. All well completion details will be recorded by the ESE geologist on the geologic boring logs.

Subsequent to the solidification of the sanitary seal of the well (a minimum of 72 hours), the new well will be developed by an ESE geologist or field technician. Well development will be performed using surging, bailing and overpumping techniques. Surging is performed by raising and lowering a surge block through the water column within the slotted interval of the well casing. The surge block utilized has a diameter just smaller than that of the well casing, thus,

forcing water flow through the sand pack due to displacement and vacuum caused by the movement of the surge block. Bailing is performed by lowering a bailer to the bottom of the well and gently bouncing the bailer off of the well end cap, then removing the full bailer and repeating the procedure. This will bring any material (soil or PVC fragments) that may have accumulated in the well into suspension for removal. Overpumping is performed by lowering a submersible pump to the bottom of each well and pumping at the highest sustainable rate without completely evacuating the well casing. Effective well development will settle the sand pack surrounding the well casing, which will improve the filtering properties of the sand pack and allow water to flow more easily through the sand pack; improve the communication between the aquifer and the well by aiding the removal of any smearing of fine sediments along the borehole penetrating the aquifer; and, remove fine sediments and any foreign objects (PVC fragments) from the well casing. The ESE geologist or technician will monitor the ground water purged from the well during development for clarity, temperature, pH and conductivity. Development of the well will proceed until the well produces relatively clear, sand-free water with stable temperature, pH and conductivity measurements. At a minimum, ten well casing volumes of ground water will be removed during the development process. Measurements of temperature, conductivity, pH and volume of the purged water and observations of purge water clarity and sediment content will be recorded on the ESE Well Development Data Forms. All equipment used during the well development procedure will be cleaned using an Alconox® detergent and tap water solution followed by a tap water rinse prior to use in each well. All ground water purged during the well development process and all equipment rinse water will be collected and contained onsite in DOT approved containers (typically 55-gallon drums) pending analytical results and proper disposal or recycling.

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ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 3 FOR GROUND WATER MONITORING AND SAMPLING FROM MONITORING WELLS

Environmental Science & Engineering, Inc. (ESE) typically performs ground water monitoring at project sites on a quarterly basis. As part of the monitoring program an ESE staff member will first gauge the depth to water and free product (if present) in each well, then collect ground water samples from each well. Depth to water measurements are taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well casing. If free-phase liquid hydrocarbons (free product) are known or suspected to be present in the well, then an electric oil/water interface probe is used to determine the depth to the occurrence of ground water and the free product in feet below the fixed datum on the top of the well casing. Depth to water and depth to product measurements are measured and recorded within an accuracy of 0.01-foot. The electric tape and the electric oil/water interface probe are washed with an Alconox® detergent and tap water solution then rinsed with tap water between uses in different wells.

Ground water samples are collected from a well subsequent to purging a minimum of three to four well casing volumes of ground water from the well, if the well bails dry prior to the removal of the required minimum volume, then the samples are collected upon the recovery of the ground water in that well to 80% of its initial static level. Ground water is typically purged from monitoring wells using either a hand-operated positive displacement pump, constructed of polyvinylchloride (PVC); a new (precleaned), disposable polyethylene bailer; or, a variable-flow submersible pump, constructed of stainless steel and Teflon®. The hand pumps and the submersible pumps are cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. During the well purging process the conductivity, pH and temperature of the ground water are monitored by the ESE staff member. Ground water samples are collected from the well subsequent to the stabilization of the of the conductivity, pH and temperature of the purge water, and the removal of four well casing volumes of ground water (unless the well bails dry). The parameters are deemed to have stabilized when two consecutive measurements are within 10% of each other, for each respective parameter. The temperature, pH, conductivity and purge volume measurements, and observations of water clarity and sediment content will be documented by the ESE staff member on ESE Ground Water Sampling Data Forms.

Ground water samples are collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer is retrieved, emptied, then filled again. The ground water from this bailer is decanted into appropriate laboratory supplied glassware and/or plastic containers (if sample preservatives are required, they are added to the empty containers at the laboratory prior to the sampling event). The containers are filled carefully so that no headspace is present to avoid volatilization of the sample. The filled sample containers are then labeled and placed in a cooler with ice for transport under chain-of-custody documentation to the designated analytical laboratory. The ESE staff member will document

the time and method of sample collection, and the type of sample containers and preservatives (if any) used. These facts will appear on the ESE Ground Water Sampling Data Forms. ESE will collect a duplicate ground water sample from one well for every ten wells sampled at each site. The duplicate will be a blind sample (its well designation will be unknown to the laboratory). The duplicate sample is for Quality Assurance and Quality Control (QA/QC) purposes, and provides a check on ESE sampling procedures and laboratory sample handling procedures. When VOCs are included in the laboratory analyses, ESE will include a trip blank, if required, in the cooler with the ground water samples for analysis for the identical VOCs. The trip blank is supplied by the laboratory and consists of deionized water. The trip blank is for QA/QC purposes and provides a check on both ESE and laboratory sample handling and storage procedures. Since disposable bailers are used for sample collection, and are not reused, no equipment blank (rinsate) samples are collected.

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APPENDIX B
SOIL BORING AND WELL INSTALLATION LOGS

Environmental Science & Engineering, Inc.
A CLCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

TW-1

Page 1 of 1

WELL COMPLETION

Completion Depth: 20 Feet

	Size/Type	From	To
Casing:	6" Diam. Sch. 40 PVC	0 Feet	5.0 Feet
Screen:	0.01" Sch 40 PVC	5.0 Feet	25 Feet
Filter:	#2/12 Sand	3.0 Feet	25 Feet
Seal:	Bentonite	2.0 Feet	3.0 Feet

Well Cap or Box:

Project Name: James River Corp. Project No: 65-85-207

Location: 2101 Williams Street
San Leandro, CA

Driller: EGI
Method: Hollow Stem Auger
Hole Diameter: 8 inches Total Depth: 25.0 Feet
Ref. Elevations:
Logged By: Eric W. Garcia

Dates:
Start: 12/27/95
Finish: 12/27/95

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor ppm	Remarks: Water, drilling/completion, summary, sample type
0	CONCRETE FLOOR						
	FOUNDATION BASE FILL						
	RUBBLE						
5	SANDY SILT: black; >70% clay and silt, slight plasticity; <30% fine sand, sub-angular, moderately well sorted; moist; few 1/32" rootlet traces, open; few charcoal chips; hydraulic fluid odor.	ML				6.8	
10	SANDY CLAY: light brown; >60% clay and silt, high plasticity; 20% sand, medium to fine grained, sub-angular; moist; abundant 1/16" rootlet and rootlet traces, open; few charcoal chips; hydraulic fluid odor.	CL/ CH				10.2	
15	Same as above.					12.0	
20	Same as above, wet.						▼ Saturation @ approx. 20 feet bgs.
25							
30							
35							

Environmental Science & Engineering, Inc.
A DELCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

TW-2

Page 1 of 1

WELL COMPLETION

Completion Depth: 20 Feet

	Size/Type	From	To
Casing:	4" Diam. Sch. 40 PVC	0 Feet	5.0 Feet
Screen:	0.01" Sch 40 PVC	5.0 Feet	20 Feet
Filter:	#2/16 Sand	3.0 Feet	20 Feet
Seal:	Bentonite	2.0 Feet	3.0 Feet

Well Cap or Box:

Project Name: James River Corp. Project No: 85-85-207

Location: 2101 Williams Street
San Leandro, CA

Driller: EGI
Method: Hollow Stem Auger
Hole Diameter: 8 inches Total Depth: 20.0 Feet
Ref. Elevations:
Logged By: Eric W. Garcia

Dates:
Start: 12/27/85
Finish: 12/27/85

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor ppm	Remarks: Water, drilling/completion, summary, sample type
0	ROAD BASE FILL						
	SILTY SAND: light brown; >85% sand, fine grained, sub-angular, moderately to well sorted; <15% silt and clay; moist; few 1/32" rootlet traces, open; no petroleum hydrocarbon odor.	SM	12 11 13			2.4	
5							
10	SANDY SILT: light yellow brown; >70% silt and clay, slight plasticity; <30% sand, fine grained, moderately well sorted, sub-angular; moist; few 1/32" rootlet traces, open; few charcoal chips; no petroleum hydrocarbon odor.	ML	9 9 11			4.2	
15	SANDY CLAY: light brown; >60% silt and clay, high plasticity; <20% sand, fine to medium grained, sub-angular; wet; abundant 1/16" rootlets and rootlet traces, open; few charcoal chips.	CL/CH	7 8 9				▼ Saturation @ appr. 15 feet bgs
	Same as above						
20							
25							
30							
35							

Environmental Science & Engineering, Inc.
A GILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

TW-3

Page 1 of 1

WELL COMPLETION

Completion Depth: 20 Feet

	Size/Type	From	To
Casing:	4" Diam. Sch. 40 PVC	0 Feet	5.0 Feet
Screen:	0.01" Sch 40 PVC	5.0 Feet	20 Feet
Filter:	#2/12 Sand	3.0 Feet	20 Feet
Seal:	Bentonite	2.0 Feet	3.0 Feet

Well Cap or Box:

Project Name: James River Corp. Project No: 65-95-207

Location: 2101 Williams Street
San Leandro, CA

Driller: EGI
Method: Hollow Stem Auger
Hole Diameter: 8 Inches Total Depth: 20.0 Feet
Ref. Elevations:
Logged By: Eric W. Garcia

Dates:
Start: 12/27/95
Finish: 12/27/95

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor ppm	Remarks: Water, drilling/completion, summary, sample type
0	ROAD BASE FILL						
	SILTY SAND: light brown; >85% sand, fine grained, subangular, moderately to well sorted; <15% silt and clay; moist; few 1/32" rootlet traces, open; no petroleum hdyrocarbon odor.	SM	7 18 26			1.2	
5							
10	SANDY SILT, Light yellow brown, moist, >70% slightly plastic fines, moderately sorted, <30% fine sub-angular sand, few 1/32" rootlet traces, open, few charcoal bits, no petroleum hydrocarbon odor.	ML	10 10 15			2.8	
15	SANDY CLAY: light brown; >60% silt and clay, high plasticity; < 20% sand, medium to fine grained, sub-angular; abundant 1/16" rootlets and rootlet traces, open; few charcoal chips	CL/CH	5 6 9				Saturation @ appr. 15 feet bgs
20	Same as above						
25							
30							
35							

APPENDIX C
SAMPLE COLLECTION LOGS

WELL MEASUREMENTS

PROJECT NO. 6595207

LOCATION 2101 Williams St.
San Leandro, CA

STAFF EWG

DATE AND TIME

WELL NO	PRODUCT LEVEL (FT)	WATER LEVEL (FT)	COMMENTS
TW-1		15.73	
TW-2		15.29	
TW-3		13.82	
W-1		11.12	
W-3		11.36	
W-4		11.50	
W-5		12.17	
W-6		11.48	
W-7		11.60	
W-8		11.01	
W-10		11.67	
B-1		11.12	

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: James River
PROJECT NO.: 65-95-207
DATE: Dec. 28, 1995

SAMPLE LOCATION I.D.: TW-1
SAMPLER: Chris Valcheff
PROJECT MANAGER: Eric Garcia

CASING DIAMETER

2"_____
4"_____
Other X - 6"

SAMPLE TYPE

Ground Water X
Surface Water____
Treat. Influent____
Treat. Effluent____
Other_____

WELL VOLUMES PER UNIT

Well Casing I.D. (Inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: 15.59 (ft.)
DEPTH TO WATER: 15.61 (ft.)
DEPTH OF WELL: 24.80 (ft.)

PRODUCT THICKNESS: 0.02 (ft.)
WATER COLUMN: – (ft.)
WELL CASING VOLUME: – (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): – (gal)
ACTUAL VOLUME PURGED: – (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____
TURBIDITY: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____

PURGE METHOD

___Displacement Pump ___Other
___Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS) ___Dedicated
___Bailer (Disposable) ___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE					
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: No Sample Collected

SAMPLER: _____ PROJECT MANAGER _____

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: James River
PROJECT NO.: 65-95-207
DATE: DEC. 28, 1995

SAMPLE LOCATION I.D.: TW-2
SAMPLER: Chris Valentine
PROJECT MANAGER: Eric Garcia

CASING DIAMETER

2"_____
4" X
Other___

SAMPLE TYPE

Ground Water X
Surface Water____
Treat. Influent____
Treat. Effluent____
Other_____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 15.19 (ft.)
DEPTH OF WELL: 19.50 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 4.31 (ft.)
WELL CASING VOLUME: 2.81 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 8.45 (gal)
ACTUAL VOLUME PURGED: 10 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
0825	0	7.35	0.94	54.4		Brown/silty
0830	5	7.38	0.91	54.5		↓
0832	10	7.41	0.89	54.7		↓

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 93086 DATE: 12-28-95 TIME: 0600 BY: CHV
TURBIDITY: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	TW-2	0040	12-28-95	C.T	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:_____

SAMPLER: Chris Valentine
PROJECT MANAGER: Eric Garcia

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Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: James River
PROJECT NO.: 65-95-207
DATE: 12-28-95

SAMPLE LOCATION I.D.: TW-3
SAMPLER: Chris Valentine
PROJECT MANAGER: Eric Garcia

CASING DIAMETER

2"_____
4" X
Other___

SAMPLE TYPE

Ground Water Y
Surface Water____
Treat. Influent____
Treat. Effluent____
Other_____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 13.71 (ft.)
DEPTH OF WELL: 19.46 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 5.75 (ft.)
WELL CASING VOLUME: 3.75 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 11.26 (gal)
ACTUAL VOLUME PURGED: 12 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
0845	0	7.61	1.08	55.2		Brown/Silty
0847	6	7.58	1.00	56.7		
0849	12	7.55	0.91	56.3		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE Horiba UNIT# 930853 DATE: 12-28-95 TIME: 0600 BY: CHV
TURBIDITY: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	TW-3	0855	12-28-95	C;T	
DUPLICATE	DUP	0855	12-28-95	C;T	
SPLIT					
FIELD BLANK					

COMMENTS:_____

SAMPLER: _____ PROJECT MANAGER _____

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Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: James River
PROJECT NO.: 65-95-207
DATE: DEC. 28, 1995

SAMPLE LOCATION I.D.: W-7
SAMPLER: Chris Valchoff
PROJECT MANAGER: Eric Garcia

CASING DIAMETER

2"____
4" X
Other___

SAMPLE TYPE

Ground Water X
Surface Water____
Treat. Influent____
Treat. Effluent____
Other____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: - (ft.)
DEPTH TO WATER: 10.51 (ft.)
DEPTH OF WELL: 36.15 (ft.)

PRODUCT THICKNESS: - (ft.)
WATER COLUMN: 25.64 (ft.)
WELL CASING VOLUME: 4.73 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 50.21 (gal)
ACTUAL VOLUME PURGED: 55 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
0900	0	7.74	0.53	54.3	-	Brown/silty
0905	25	7.75	0.50	55.1		↓
0910	50	7.77	0.49	55.2		↓

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 93088 DATE: 12-28-95 TIME: 0600 BY: CHV
TURBIDITY: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	W-7	0915	12-28-95	CTL	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: [signature]
PROJECT MANAGER [signature]

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: JAMES River
PROJECT NO.: 65-95-207
DATE: DEC. 28, 1995

SAMPLE LOCATION I.D.: W-10
SAMPLER: Chris Valcheff
PROJECT MANAGER: ERIC GARCIA

CASING DIAMETER

2"_____
4" X
Other___

SAMPLE TYPE

Ground Water X
Surface Water____
Treat. Influent____
Treat. Effluent____
Other_____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 11.58 (ft.)
DEPTH OF WELL: 16.69 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 5.11 (ft.)
WELL CASING VOLUME: 3.33 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 16.01 (gal)
ACTUAL VOLUME PURGED: 10 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
0920	0	7.31	0.31	55.4		Brown/Murky/odor
0922	5	7.28	0.36	55.8		
0924	10	7.24	0.38	56.0		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HORIBA UNIT# 93088 DATE: 12-28-95 TIME: 0600 BY: CHV
TURBIDITY: TYPE_____ UNIT#_____ DATE:_____ TIME:_____ BY:_____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	W-10	0925	12-28-95	C&T	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:_____

SAMPLER: _____ PROJECT MANAGER _____

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

APPENDIX D

ANALYTICAL REPORTS WITH CHAIN OF CUSTODY DOCUMENTS

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Environmental Science & Engineering
4090 Nelson Avenue
Suite J
Concord, CA 94520

Date: 05-JAN-96
Lab Job Number: 123866
Project ID: 65-95-207
Location: James River

Reviewed by: C. Buzzelara

Reviewed by: Tracy Bair

TEH-Tot Ext Hydrocarbons

Client: Environmental Science & Engineering
Project#: 65-95-207
Location: James River

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: LUFT

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
123866-001	TW-1-20	25078	12/27/95	12/30/95	01/05/96	
123866-002	TW-2-15	25078	12/27/95	12/30/95	01/03/96	
123866-003	TW-3-15	25078	12/27/95	12/30/95	01/03/96	

Analyte	Units	123866-001	123866-002	123866-003
Diln Fac:		50	1	1
Hydraulic Fluid	mg/Kg	6700 Y	<25	<25
Surrogate				
Hexacosane	%REC	DO	90	99

Y: Sample exhibits fuel pattern which does not resemble standard
DO: Surrogate diluted out

Curtis & Tompkins, Ltd.

Lab #: 123866 BATCH QC REPORT

TEH-Tot Ext Hydrocarbons

Client:	Environmental Science & Engineering	Analysis Method:	CA LUFT (EPA 8015M)
Project#:	65-95-207	Prep Method:	LUFT
Location:	James River		

METHOD BLANK

Matrix:	Soil	Prep Date:	12/30/95
Batch#:	25078	Analysis Date:	01/02/96
Units:	mg/Kg		
Diln Fac:	1		

MB Lab ID: QC11785

Analyte	Result	
Hydraulic Fluid	<25	
Surrogate	**%Rec**	**Recovery Limits**
Hexacosane	100	60-140

Curtis & Tompkins, Ltd.

SOIL TEH MATRIX SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Curtis & Tompkins, Ltd.

Instrument ID: GC 11 CH B

Run Date: : 01/03/96

C&T ID: QC11787,QC11788

Batch No.: 25078

Spiked sample: 123799-009

COMPOUND	SPIKE ADDED mg/Kg	SAMPLE CONC. mg/Kg	MS CONC. mg/Kg	MS % REC	#	QC LIMITS RECOVERY
DIESEL	51.3	11.8	65.8	105		60 - 140

COMPOUND	SPIKE ADDED mg/Kg	MSD CONC. mg/Kg	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS RECOVERY
DIESEL	51.3	60.6	95		10		35	60 - 140

Surrogate Recoveries - (Limits: 60 - 140)

MS: 99

MSD: 92

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 1 outside of QC limits

Spike Recovery: 0 out of 4 outside of QC limits

COMMENTS: _____

_____

12-5966

DATE Dec. 27, 1995 PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

PROJECT NAME James River

ADDRESS 2101 Williams Street
San Leandro, CA

PROJECT NO. 65-95-207

SAMPLED BY Eric Garcia

LAB NAME Curtis & Tompkins

ESE Environmental Science & Engineering, Inc.
A GILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TPH-Hydraulic Fluid (Ferrography)	BTEX (EPA 8020)	LUFT Metals (Ni, Cd, Cr, Pb, Zn)	PCB	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
TW-1-20	12-27-95	0900	San Leandro	X	X	X	X	Soil	1	6" Brass Liners
TW-2-15	〃	0938	〃	X				〃	1	〃
TW-3-15	〃	1250	〃	X				〃	1	〃

	RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1.	[signature]	[signature]	12-27-95	1700 hrs
2.	[signature]	D. Moore	12-28-95	1145 hrs
3.				
4.				
5.				

3 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Bart Miller

SPECIAL SHIPMENT REQUIREMENTS: Cold storage/transport

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
Must have results faxed to Bart Miller (ESE) @ 510-685-5323 and Regina Colbert (James River) at (510) 614-2303 by end business Thursday ~~Friday~~ Jan. 4, 1995.

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Environmental Science & Engineering
4090 Nelson Avenue
Suite J
Concord, CA 94520

Date: 05-JAN-96
Lab Job Number: 123867
Project ID: 65-95-207
Location: James River

Reviewed by: _____

Reviewed by: _____

TEH-Tot Ext Hydrocarbons

Client: Environmental Science & Engineering
Project#: 65-95-207
Location: James River

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
123867-001	W-7	25107	12/28/95	01/02/95	01/04/96	
123867-002	W-10	25107	12/28/95	01/02/95	01/05/96	
123867-003	TW-2	25107	12/28/95	01/02/95	01/05/96	
123867-004	TW-3	25107	12/28/95	01/02/95	01/04/96	

Analyte Diln Fac:	Units	123867-001 1	123867-002 1	123867-003 1	123867-004 1
Hydraulic Fluid	ug/L	<1500	2500 Y	2200 Y	<1400
Surrogate					
Hexacosane	%REC	130	116	105	130

Y: Sample exhibits fuel pattern which does not resemble standard

TEH-Tot Ext Hydrocarbons

Client: Environmental Science & Engineering
Project#: 65-95-207
Location: James River

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
123867-005	DUP	25107	12/28/95	01/02/95	01/05/96	

Analyte	Units	123867-005
Diln Fac:		1
Hydraulic Fluid	ug/L	<1400
Surrogate		
Hexacosane	%REC	130

Curtis & Tompkins, Ltd.

Lab #: 123867 BATCH QC REPORT

TEH-Tot Ext Hydrocarbons			
Client:	Environmental Science & Engineering	Analysis Method:	CA LUFT (EPA 8015M)
Project#:	65-95-207	Prep Method:	EPA 3520
Location:	James River		

METHOD BLANK			
Matrix:	Water	Prep Date:	01/02/95
Batch#:	25107	Analysis Date:	01/04/96
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC11915

Analyte	Result	
Hydraulic Fluid	<1300	
Surrogate	**%Rec**	**Recovery Limits**
Hexacosane	125	60-140

Curtis & Tompkins, Ltd.

WATER TEH BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Curtis & Tompkins, Ltd.

Instrument ID: GC 11 CH A

Run Date: : 01/04/96

C&T ID: QC11916,QC11917

Batch No.: 25107

COMPOUND	SPIKE ADDED ug/L	BLANK CONC. ug/L	BS CONC. ug/L	BS % REC	#	QC LIMITS RECOVERY
DIESEL	2565	0	3089.2	120		60 - 140

COMPOUND	SPIKE ADDED ug/L	BSD CONC. ug/L	BSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS RECOVERY
DIESEL	2565	2635.2	103		16		25	60 - 140

Surrogate Recoveries - (Limits: 65 - 135)

BS: 129

BSD: 131

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 1 outside of QC limits

Spike Recovery: 0 out of 4 outside of QC limits

COMMENTS: _____

_____

12367

CHAIN OF CUSTODY RECORD

DATE Dec. 28, 1995 PAGE 1 OF 1

PROJECT NAME James River

ADDRESS 2101 Williams Street
San Leandro, CA

PROJECT NO. 65-95-207

SAMPLED BY Chris Valcheff

LAB NAME Curtis & Tompkins

ESE Environmental Science & Engineering, Inc.
A CILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TPH Hydrocarbons Fuel (EPA 8015m)	TSE & X (EPA 8020)	Lead Metals (Cd, Cr, Pb, Ni, Zn)	RCI							MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
														MATRIX		
W-7	12-28-95	0915	San Leandro	X	X									H_2O	3	2 VOAs w/HCl; 1 Amber Liter
W-10		0925		X	X									H_2O	3	"
~~FW-1~~																
TW-2		0840		X	X	X	X							H_2O	5	2 VOAs w/HCl; 1 Amber Liter; 2-250ml Plastic
TW-3		0855		X	X									H_2O	3	2 VOAs w/HCl; 1 Amber Liter
DUP		0855		X	X									H_2O	3	"
MS/MSD					X									H_2O	1	1 VOA w/HCl

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. Chris Valcheff	D. Moore	12-28-95	1145 hrs
2.			
3.			
4.			
5.			

18 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Eric Garcia

SPECIAL SHIPMENT REQUIREMENTS: Cold storage/transport

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
Must have results by end of business Thursday Jan. 4, 1995
Fax to Bart Mallon (ESE) @ 510-685-4053 and Regina Colbert (James River) @ 510-614-2303

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Environmental Science & Engineering
4090 Nelson Avenue
Suite J
Concord, CA 94520

Date: 17-JAN-96
Lab Job Number: 123990
Project ID: 6595207
Location: James River

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 123990
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6595207
LOCATION: JAMES RIVER

DATE SAMPLED: 12/28/95
DATE RECEIVED: 01/10/96
DATE EXTRACTED: 01/11/96
DATE ANALYZED: 01/15/96

Total Extractable Hydrocarbons - Fuel Fingerprint
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	SURROGATE Hexacosane	Hydraulic Oil Result ug/L	COMMENTS
123990-001	TW-1	74%	4,200	Sample chromatogram is similar to the Hydraulic Oil chromatogram submitted by Environmental Science & Engineering, indicating that the samples are potentially from the same source.

Surrogate = Hexacosane (Limits: 60-140)

CHAIN OF CUSTODY RECORD

DATE 1.10.96 PAGE 1 OF 1

PROJECT NAME James River

ADDRESS 2101 Williams
San Leandro, CA

PROJECT NO. 65952017

SAMPLED BY Chris Valcleff

LAB NAME CDT

ESE Environmental Science & Engineering, Inc.
A CH2M HILL Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: Fingerprint-TPH	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
TW-1	12.28.95		San Leandro	X	H_2O	2	VOA's

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1.		1/10/96	2:??
2.			
3.			
4.			
5.			

2 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Eric J Garcia

SPECIAL SHIPMENT REQUIREMENTS: cold ship/store

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

Extract top Product. only

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Environmental Science & Engineering
4090 Nelson Avenue
Suite J
Concord, CA 94520

Date: 07-FEB-96
Lab Job Number: 124138
Project ID: 6595207
Location: James River

Reviewed by: Tina McMorris

Reviewed by: Tracy Babb

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 124138-001
CLIENT:ENVIRONMENTAL SCIENCE & ENG.
PROJECT ID: 6595207
LOCATION: JAMES RIVER
SAMPLE ID: TW-1

DATE SAMPLED: 01/22/96
DATE RECEIVED: 01/22/96
DATE EXTRACTED: 01/26/96
DATE ANALYZED: 02/07/96
DATE REPORTED: 02/07/96
BATCH NO: 25578

EPA 8270: Base/Neutral and Acid Extractables in Soils & Wastes
Extraction Method: EPA 3550 Sonication

	RESULT mg/Kg	REPORTING LIMIT mg/Kg
ACID COMPOUNDS		
Phenol	ND	2,000
2-Chlorophenol	ND	2,000
Benzyl Alcohol	ND	2,000
2-Methylphenol	ND	2,000
4-Methylphenol	ND	2,000
2-Nitrophenol	ND	10,000
2,4-Dimethylphenol	ND	2,000
Benzoic Acid	ND	10,000
2,4-Dichlorophenol	ND	10,000
4-Chloro-3-methylphenol	ND	2,000
2,4,6-Trichlorophenol	ND	2,000
2,4,5-Trichlorophenol	ND	10,000
2,4-Dinitrophenol	ND	10,000
4-Nitrophenol	ND	10,000
4,6-Dinitro-2-methylphenol	ND	10,000
Pentachlorophenol	ND	10,000
BASE/NEUTRAL COMPOUNDS		
N-Nitrosodimethylamine	ND	2,000
Aniline	ND	2,000
Bis(2-chloroethyl)ether	ND	2,000
1,3-Dichlorobenzene	ND	2,000
1,4-Dichlorobenzene	ND	2,000
1,2-Dichlorobenzene	ND	2,000
Bis(2-chloroisopropyl)ether	ND	2,000
N-Nitroso-di-n-propylamine	ND	2,000
Hexachloroethane	ND	2,000
Nitrobenzene	ND	2,000
Isophorone	ND	2,000
Bis(2-chloroethoxy)methane	ND	2,000
1,2,4-Trichlorobenzene	ND	2,000
Naphthalene	ND	2,000
4-Chloroaniline	ND	2,000
Hexachlorobutadiene	ND	2,000
2-Methylnaphthalene	ND	2,000
Hexachlorocyclopentadiene	ND	2,000
2-Chloronaphthalene	ND	2,000
2-Nitroaniline	ND	10,000

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 124138-001
SAMPLE ID: TW-1

EPA 8270

BASE/NEUTRAL COMPOUNDS	RESULT mg/Kg	REPORTING LIMIT mg/Kg
Dimethylphthalate	ND	2,000
Acenaphthylene	ND	2,000
2,6-Dinitrotoluene	ND	2,000
3-Nitroaniline	ND	10,000
Acenaphthene	ND	2,000
Dibenzofuran	ND	2,000
2,4-Dinitrotoluene	ND	2,000
Diethylphthalate	ND	2,000
4-Chlorophenyl-phenylether	ND	2,000
Fluorene	ND	2,000
4-Nitroaniline	ND	10,000
N-Nitrosodiphenylamine	ND	2,000
Azobenzene	ND	2,000
4-Bromophenyl-phenylether	ND	2,000
Hexachlorobenzene	ND	2,000
Phenanthrene	ND	2,000
Anthracene	ND	2,000
Di-n-butylphthalate	ND	2,000
Fluoranthene	ND	2,000
Pyrene	ND	2,000
Butylbenzylphthalate	ND	2,000
3,3'-Dichlorobenzidine	ND	10,000
Benzo(a)anthracene	ND	2,000
Chrysene	ND	2,000
Bis(2-ethylhexyl)phthalate	ND	2,000
Di-n-octylphthalate	ND	2,000
Benzo(b)fluoranthene	ND	2,000
Benzo(k)fluoranthene	ND	2,000
Benzo(a)pyrene	ND	2,000
Indeno(1,2,3-cd)pyrene	ND	2,000
Dibenzo(a,h)anthracene	ND	2,000
Benzo(g,h,i)perylene	ND	2,000

ND = Not detected at or above reporting limit.

SURROGATE RECOVERIES

2-Fluorophenol	98	Nitrobenzene-d5	101
Phenol-d5	94	2-Fluorobiphenyl	100
2,4,6-Tribromophenol	90	Terphenyl-d14	108

LABORATORY NUMBER: 124138-METHOD BLANK
CLIENT:ENVIRONMENTAL SCIENCE & ENG.
PROJECT ID: 6595207
LOCATION: JAMES RIVER
SAMPLE ID: MB

DATE EXTRACTED: 01/26/96
DATE ANALYZED: 02/21/96
DATE REPORTED: 02/07/96
BATCH NO: 25578

EPA 8270: Base/Neutral and Acid Extractables in Soils & Wastes
Extraction Method: EPA 3550 Sonication

ACID COMPOUNDS	RESULT mg/Kg	REPORTING LIMIT mg/Kg
Phenol	ND	200
2-Chlorophenol	ND	200
Benzyl Alcohol	ND	200
2-Methylphenol	ND	200
4-Methylphenol	ND	200
2-Nitrophenol	ND	1,000
2,4-Dimethylphenol	ND	200
Benzoic Acid	ND	1,000
2,4-Dichlorophenol	ND	1,000
4-Chloro-3-methylphenol	ND	200
2,4,6-Trichlorophenol	ND	200
2,4,5-Trichlorophenol	ND	1,000
2,4-Dinitrophenol	ND	1,000
4-Nitrophenol	ND	1,000
4,6-Dinitro-2-methylphenol	ND	1,000
Pentachlorophenol	ND	1,000
BASE/NEUTRAL COMPOUNDS		
N-Nitrosodimethylamine	ND	200
Aniline	ND	200
Bis(2-chloroethyl)ether	ND	200
1,3-Dichlorobenzene	ND	200
1,4-Dichlorobenzene	ND	200
1,2-Dichlorobenzene	ND	200
Bis(2-chloroisopropyl)ether	ND	200
N-Nitroso-di-n-propylamine	ND	200
Hexachloroethane	ND	200
Nitrobenzene	ND	200
Isophorone	ND	200
Bis(2-chloroethoxy)methane	ND	200
1,2,4-Trichlorobenzene	ND	200
Naphthalene	ND	200
4-Chloroaniline	ND	200
Hexachlorobutadiene	ND	200
2-Methylnaphthalene	ND	200
Hexachlorocyclopentadiene	ND	200
2-Chloronaphthalene	ND	200
2-Nitroaniline	ND	1,000

LABORATORY NUMBER: 124138-METHOD BLANK
SAMPLE ID: MB

EPA 8270

BASE/NEUTRAL COMPOUNDS	RESULT mg/Kg	REPORTING LIMIT mg/Kg
Dimethylphthalate	ND	200
Acenaphthylene	ND	200
2,6-Dinitrotoluene	ND	200
3-Nitroaniline	ND	1,000
Acenaphthene	ND	200
Dibenzofuran	ND	200
2,4-Dinitrotoluene	ND	200
Diethylphthalate	ND	200
4-Chlorophenyl-phenylether	ND	200
Fluorene	ND	200
4-Nitroaniline	ND	1,000
N-Nitrosodiphenylamine	ND	200
Azobenzene	ND	200
4-Bromophenyl-phenylether	ND	200
Hexachlorobenzene	ND	200
Phenanthrene	ND	200
Anthracene	ND	200
Di-n-butylphthalate	ND	200
Fluoranthene	ND	200
Pyrene	ND	200
Butylbenzylphthalate	ND	200
3,3'-Dichlorobenzidine	ND	1,000
Benzo(a)anthracene	ND	200
Chrysene	ND	200
Bis(2-ethylhexyl)phthalate	ND	200
Di-n-octylphthalate	ND	200
Benzo(b)fluoranthene	ND	200
Benzo(k)fluoranthene	ND	200
Benzo(a)pyrene	ND	200
Indeno(1,2,3-cd)pyrene	ND	200
Dibenzo(a,h)anthracene	ND	200
Benzo(g,h,i)perylene	ND	200

ND = Not detected at or above reporting limit.

SURROGATE RECOVERIES

2-Fluorophenol	106	Nitrobenzene-d5	102
Phenol-d5	102	2-Fluorobiphenyl	101
2,4,6-Tribromophenol	100	Terphenyl-d14	100

Curtis & Tompkins, Ltd

8270 Laboratory Control Sample Report

Curtis & Tompkins, Ltd.

Lab No: QC13755
Date Analyzed: 01-FEB-96
Matrix: FUELS
Batch No: 25578 516032015015
Dilution Factor : 1

LCS Datafile: 15_lcs25578
Extraction Chemist: CW
MS Operator: CW
Prep Final Vol : 10

ug/Kg

Compound		SpikeAmt	% Rec	Limits	
Phenol	1860000	2000000	93 %	26-90%	*
2-Chlorophenol	1919000	2000000	96 %	25-102%	
4-Chloro-3-methylphenol	1897000	2000000	95 %	26-103%	
4-Nitrophenol	1653000	2000000	83 %	11-114%	
Pentachlorophenol	1644000	2000000	82 %	17-109%	
1,4-Dichlorobenzene	983800	1000000	98 %	28-104%	
N-Nitroso-di-n-propylamine	941300	1000000	94 %	41-126%	
1,2,4-Trichlorobenzene	977100	1000000	98 %	38-107%	
Acenaphthene	923200	1000000	92 %	31-137%	
2,4-Dinitrotoluene	947700	1000000	95 %	28-89%	*
Pyrene	726900	1000000	73 %	35-142%	
Surrogate Recoveries					
2-Fluorophenol	2139000	2000000	107 %	25-121%	
Phenol-d5	2039000	2000000	102 %	24-113%	
2,4,6-Tribromophenol	2042000	2000000	102 %	19-122%	
Nitrobenzene-d5	1072000	1000000	107 %	23-120%	
2-Fluorobiphenyl	1013000	1000000	101 %	30-115%	
Terphenyl-d14	1009000	1000000	101 %	18-137%	

* Result is out of limits - Fail OK'd by TLB on 2/1/96

Curtis & Tompkins, Ltd.

SAMPLE ID: TW-1
LAB ID: 124138-001
CLIENT: Environmental Science & Engineering
PROJECT ID: 6595207
LOCATION: James River
MATRIX: Fuels

DATE SAMPLED: 01/22/96
DATE RECEIVED: 01/22/96
DATE REPORTED: 01/29/96

Metals Analytical Report

Compound	Result (mg/Kg)	Reporting Limit (mg/Kg)	QC Batch	Method	Analysis Date
Cadmium	0.75	0.050	25548	EPA 6010A	01/26/96
Chromium (total)	ND	0.50	25548	EPA 6010A	01/26/96
Lead	26	0.15	25548	EPA 6010A	01/26/96
Nickel	83	1.0	25548	EPA 6010A	01/26/96
Zinc	31	1.0	25548	EPA 6010A	01/26/96

ND = Not detected at or above reporting limit

Curtis & Tompkins, Ltd.

CLIENT: Environmental Science & Engineering
JOB NUMBER: 124138

DATE REPORTED: 01/29/96

BATCH QC REPORT
PREP BLANK

Compound	Result	Reporting Limit	Units	QC Batch	Method	Analysis Date
Cadmium	ND	0.05	mg/Kg	25548	EPA 6010A	01/26/96
Chromium (total)	ND	0.5	mg/Kg	25548	EPA 6010A	01/26/96
Lead	ND	0.15	mg/Kg	25548	EPA 6010A	01/26/96
Nickel	ND	1	mg/Kg	25548	EPA 6010A	01/26/96
Zinc	ND	1	mg/Kg	25548	EPA 6010A	01/26/96

ND = Not Detected at or above reporting limit

Curtis & Tompkins, Ltd.

CLIENT: Environmental Science & Engineering DATE REPORTED: 01/29/96
JOB NUMBER: 124138

BATCH QC REPORT
BLANK SPIKE / BLANK SPIKE DUPLICATE

Compound	Spike Amount	BS Result	BSD Result	Units	BS % Recovery	BSD % Recovery	Average Recovery	RPD	QC Batch	Method	Analysis Date
Cadmium	50	51.9	53.4	ug/L	104	107	106	3	25548	EPA 6010A	01/26/96
Chromium (total)	200	196	202	ug/L	98	101	100	3	25548	EPA 6010A	01/26/96
Lead	500	506	518	ug/L	101	104	103	2	25548	EPA 6010A	01/26/96
Nickel	500	495	509	ug/L	99	102	101	3	25548	EPA 6010A	01/26/96
Zinc	500	465	481	ug/L	93	96	95	3	25548	EPA 6010A	01/26/96

BTXE

Client: Environmental Science & Engineering
Project#: 6595207
Location: James River

Analysis Method: EPA 8020
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
124138-001	TW-1	25543	01/22/96	01/25/96	01/25/96	

Analyte	Units	124138-001	
Diln Fac:		25	
Benzene	ug/Kg	13	C
Toluene	ug/Kg	7000	
Ethylbenzene	ug/Kg	220	
m,p-Xylenes	ug/Kg	660	
o-Xylene	ug/Kg	570	
Surrogate			
Trifluorotoluene	%REC	89	
Bromobenzene	%REC	63	

C: Presence of this compound confirmed by second column, however, the confirmation concentration differed from the reported result by more than a factor of two

Curtis & Tompkins, Ltd.

BTXE

Client: Environmental Science & Engineering
Project#: 6595207
Location: James River

Analysis Method: EPA 8020
Prep Method: EPA 5030

METHOD BLANK

Matrix: Fuels
Batch#: 25543
Units: ug/Kg
Diln Fac: 1

Prep Date: 01/25/96
Analysis Date: 01/25/96

MB Lab ID: QC13632

Analyte	Result
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
m,p-Xylenes	<5.0
o-Xylene	<5.0

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	97	58-130
Bromobenzene	78	62-131

Lab #: 124138 BATCH QC REPORT Curtis & Tompkins, Ltd. Page 1 of 1

BTXE

Client: Environmental Science & Engineering
Project#: 6595207
Location: James River

Analysis Method: EPA 8020
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Fuels
Batch#: 25543
Units: ug/Kg
Diln Fac: 1

Prep Date: 01/25/96
Analysis Date: 01/25/96

BS Lab ID: QC13633

Analyte	Spike Added	BS	%Rec #	Limits
Benzene	100	85.5	86	80-120
Toluene	100	88.6	89	80-120
Ethylbenzene	100	87.5	88	80-120
m,p-Xylenes	200	173.3	87	80-120
o-Xylene	100	86.1	86	80-120

Surrogate	%Rec	Limits
Trifluorotoluene	93	58-130
Bromobenzene	77	62-131

BSD Lab ID: QC13634

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Benzene	100	85.8	86	80-120	0	<11
Toluene	100	88.7	89	80-120	0	<13
Ethylbenzene	100	88.2	88	80-120	1	<25
m,p-Xylenes	200	180.9	90	80-120	4	<25
o-Xylene	100	87.3	87	80-120	1	<25

Surrogate	%Rec	Limits
Trifluorotoluene	91	58-130
Bromobenzene	76	62-131

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

124158

CHAIN OF CUSTODY FORM

Page 1 of 1

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

C&T LOGIN # _____

Sampler: EWG

Project No: 6595207 — Report To: Eric W. Garcia

Project Name: James River - San Leandro — Company: ESE

Project P.O.: — Telephone: (510) 685-4053

Turnaround Time: 5day (Normal) — Fax: 685-5323

Lab Number	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	Product	# of Containers	Preservative: Cool	HCl	HNO3	H2SO4	None	Field Notes	Analyses: BTEX	8020	Luft Metals
1	TW-1	1.22.96/0900				/	2	1				1	1 HCl VOA & 1 Lambda	X	X	X
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																

Notes:
Sample product only!
Top layer only

RELINQUISHED BY:
1.22.96 1030 DATE/TIME
DATE/TIME
DATE/TIME
DATE/TIME

RECEIVED BY:
DATE/TIME
DATE/TIME
Damana Moore 1/22/96 DATE/TIME

Signature on this form constitutes a firm Purchase Order for the services requested above. 10:30