

8 March 1995
Ref: 726104.05000

Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Attention: Ms. Madhulla Logan

Subject: Quarterly Progress Report 2 (January - March 1995)
Redwood Regional Park Service Yard, Oakland, California

Dear Ms. Logan:

INTRODUCTION

This report presents the results of the February 1995 groundwater monitoring event conducted by Parsons Engineering Science, Inc. (Parsons ES) (formerly Engineering-Science, Inc. [ES]) at the East Bay Regional Park District (EBRPD) Redwood Regional Park Service Yard in Oakland, California. This report presents the results of the second consecutive groundwater monitoring event in the site quarterly monitoring program which is designed to evaluate the extent and magnitude of groundwater contamination associated with two former leaking underground fuel storage tanks (UFSTs). A summary of previous site characterization and remedial activities associated with the former UFSTs is presented in the first quarterly progress report (Parsons ES 1994). An annual summary assessment report will be presented following the fourth quarterly monitoring event of 1994 (scheduled for August 1995). That summary report will summarize the year of quarterly groundwater monitoring activities, analyze hydrochemical trends, and evaluate regulatory agency criteria governing detected groundwater contaminants.

Site Description

The project site is located at ~~7867~~ **Redwood Road** in Oakland, Alameda County, California. Figure 1 shows the location of the project site. The project site is a service yard for Redwood Regional Park, and utilized two UFSTs (one 2,000-gallon diesel fuel and one 5,000-gallon unleaded gasoline) from the mid-1960's until their removal in 1993. Figure 2 is a site plan which shows the limits of the former UFST remedial excavation and the groundwater monitoring wells which were installed in October 1994 to monitor groundwater impacts associated with the former UFSTs.

Site Stratigraphy and Hydrogeology

Shallow soil stratigraphy beneath the project site consists of a surficial 3 to 10 foot thick clayey silt unit underlain by a 5 to 15 foot thick silty clay unit. In all monitoring

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well borings, a 5- to 10-foot thick clayey coarse-grained sand and clayey gravel unit was encountered that laterally grades to a clay or silty clay. This unit overlies a weathered siltstone at the base of the observed soil profile. Soils in the vicinity of MW-1 are inferred to be landslide debris.

Groundwater at the site occurs under unconfined or possibly partially confined conditions, as evidenced by the equilibration of static water levels relative to the first occurrence of groundwater encountered during drilling for the 1993 site characterization and November 1994 well installation program. The February 1995 data indicate that the direction of local groundwater flow beneath the project site is approximately from northeast to southwest. This groundwater flow direction is consistent with previously recorded measurements made in site wells in November 1994 (Parsons ES 1994).

PROCEDURES AND CURRENT ACTIVITIES

The current groundwater monitoring program is in accordance with the Workplan for Groundwater Characterization Program (ES 1994).

Laboratory Analyses

All laboratory analyses were conducted by a laboratory certified by the California Environmental Protection Agency (CalEPA) Environmental Laboratory Accreditation Program (ELAP) for each required analytical method. All groundwater samples were analyzed for the following constituents:

- Total petroleum hydrocarbons - gasoline, diesel and kerosene ranges (TPH-G, -D, and -K) by the State of California Department of Toxic Substances Control (DTSC) Leaking Underground Fuel Tank (LUFT) Manual Method (equivalent to modified EPA Method 8015)
- Aromatic hydrocarbons (including benzene, toluene, ethylbenzene, and total xylenes [BTEX]) by EPA Method 8020

Groundwater Monitoring and Sampling

Parsons ES personnel measured static water levels (Table 1 and Attachment A) in all six site wells on 9 February 1995. Water level measurements were made using an electric water level indicator. Initial water level measurements were collected immediately upon removal of the well casing caps. Water levels were then remeasured after a period no less than one-half hour to allow dissipation of potential air pressure and equilibration of static water levels. No differences in static water levels were noted.

Groundwater sampling was conducted on 9 February 1995 in accordance with California Water Resources Control Board (WRCB 1989) guidelines for sampling dissolved product in groundwater associated with leaking USTs. Prior to collection of groundwater samples, a pre-cleaned Teflon™ bailer or submersible pump was used to purge a minimum of three casing volumes from each well. Electrical conductivity, pH, and temperature of purge water were measured during well purging, to document the

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presence of stabilized formation-water in the wells. Attachment A includes water level data and groundwater monitoring field notes from the groundwater monitoring event.

Sample containers were filled with sample water from the pre-cleaned bailer. To prevent cross-contamination, groundwater sampling equipment was decontaminated prior to use and between each monitoring well with an Alconox™ wash followed by three deionized water rinses. Following sample collection, sample containers were labeled, placed in a cooler packed with "blue ice," and transported under chain-of-custody the same day to a CalEPA ELAP certified laboratory. Chain-of-custody records for the groundwater samples are included in Attachment B.

A total of approximately 215 gallons of wastewater (including monitoring well purge water and equipment decontamination rinsate) from the sampling event was containerized on site in a plastic storage tank.

Creek Surface Water Sampling

Surface water samples were not collected from Redwood Creek during the February 1995 monitoring event because there was no water present in the creek at the time of the event.

Analytical Results

Analytical results of the February 1995 monitoring event are presented in Table 2. ~~Fuel hydrocarbons were detected in MW-2, MW-4 and MW-5~~ during both the present and previous quarterly sampling events. Detected concentrations reported for the present quarter are greater by as much as one order of magnitude compared to concentrations reported for the previous quarter. This may be a result of water table fluctuation; measured water levels in all site wells except MW-3 were higher this quarter with an increase of 0.5 to 5.6 feet compared to the previous quarter. Future quarterly monitoring will assess trends in concentrations and water level elevations.

Two types of field quality control (QC) samples were used to assess whether field or laboratory procedures affected analytical results of the current groundwater sampling event. One equipment rinsate blank (MW-0B) was collected following sampling and decontamination activities at well MW-4 to monitor potential cross-contamination in the field due to inadequate decontamination of sampling equipment and/or sample contamination during transport. That sample was analyzed for TPH-G and BTEX; none of these constituents were detected, verifying the integrity of field decontamination procedures and sample containers.

One field duplicate sample (MW-0A) was collected from well MW-4 and analyzed for TPH-G and BTEX to assess whether field procedures produced reproducible results. The field duplicate sample contained 9,400 ~~g/L~~ TPH-G (compared to 11,000 ~~g/L~~ in the field sample), which is a variance of approximately 16 percent from the mean (aka relative percent difference [RPD]). Values of RPD for BTEX constituents were 7, 6, 7 and 9 percent, respectively. ug/l

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Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) were analyzed by the laboratory in accordance with the requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (Attachment B).

We trust that this submittal meets the needs of your agency. Please call us at our Alameda office (510-769-0100) if you have any questions or require clarification.

Very truly yours,

PARSONS ENGINEERING SCIENCE, INC.

Bruce M. Rucker

Bruce M. Rucker
Project Manager

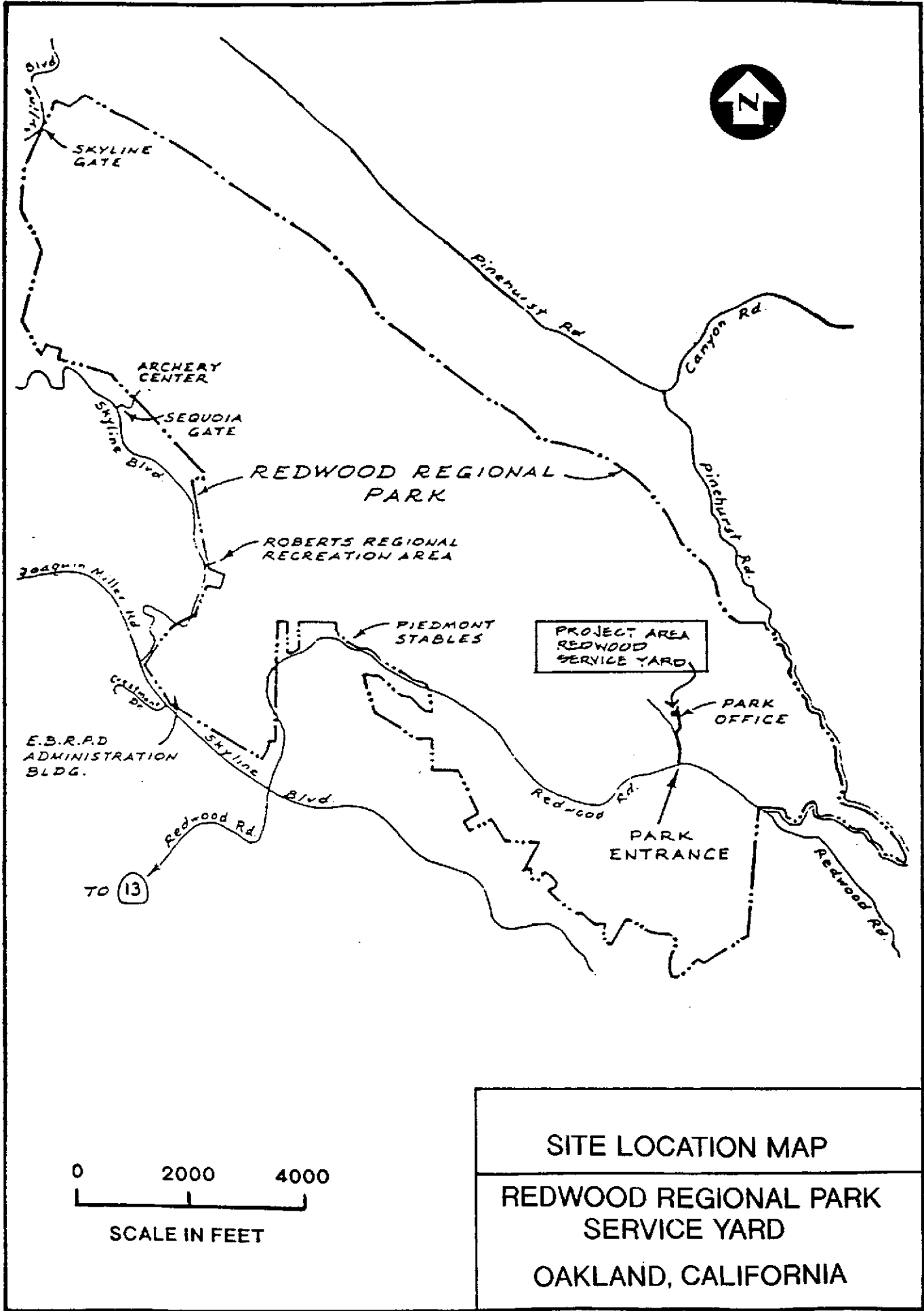


Frederick T. Stanin

Frederick T. Stanin, C.E.G.
Technical Director

REFERENCES

- Engineering-Science, Inc. (ES) 1994, Workplan for Groundwater Characterization Program at Redwood Regional Park Service Yard, Oakland, California. 17 August
- Parsons Engineering Science 1994, Quarterly Progress Report 1 (October - December 1994), Redwood Regional Park Service Yard, Oakland, California. 28 December
- Water Resources Control Board (WRCB) 1989, Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure: State of California Leaking Underground Fuel Tank Task Force. October



SITE LOCATION MAP

REDWOOD REGIONAL PARK
SERVICE YARD
OAKLAND, CALIFORNIA

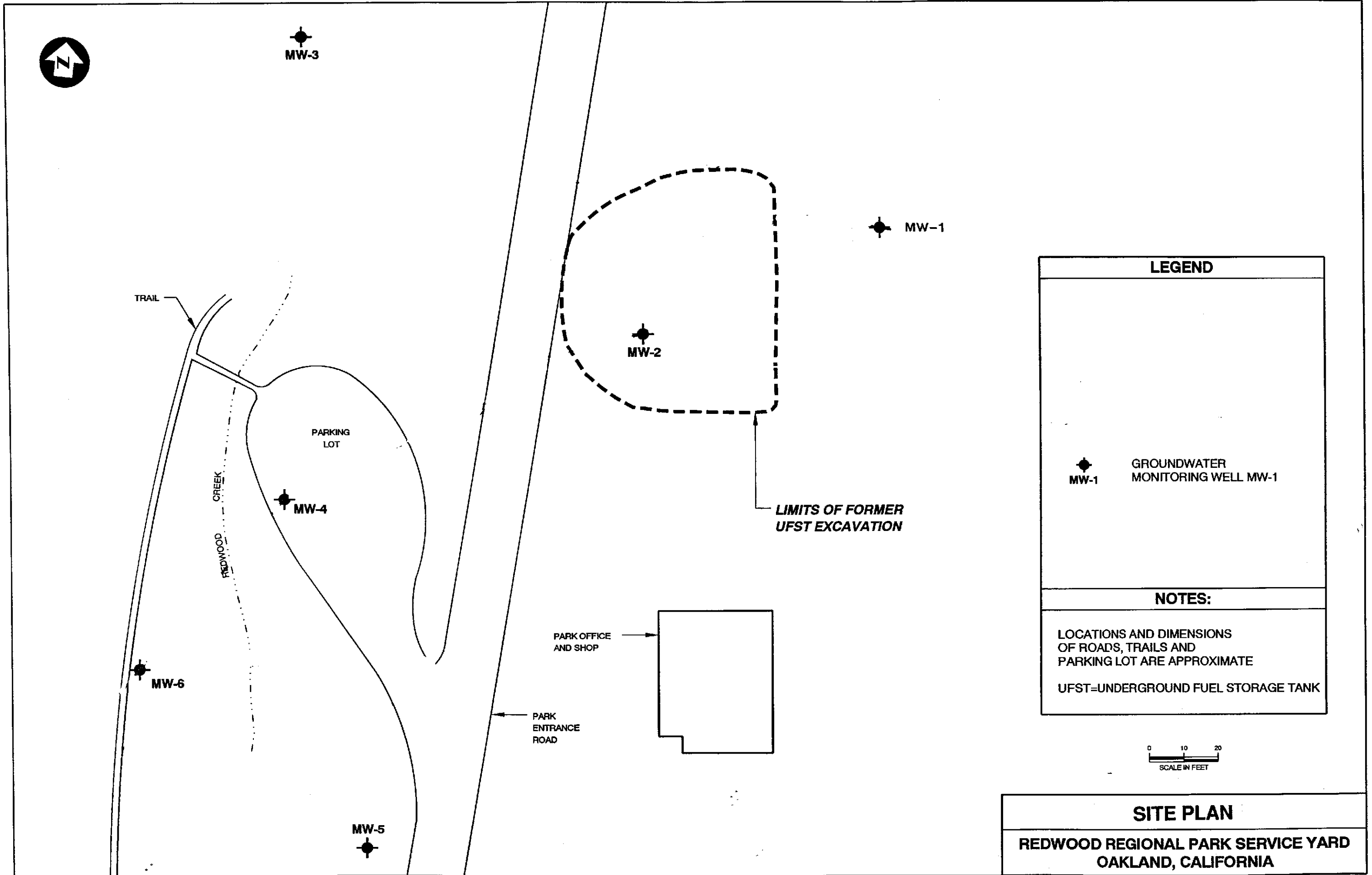


TABLE 1
WELL ELEVATIONS AND WATER LEVEL MEASUREMENTS
February 1995

Well	Well Elevation (TOC)	Water Levels
MW-1	Depth	1.64
	Elevation	565.9
MW-2	Depth	18.87
	Elevation	566.5
MW-3	Depth	18.27
	Elevation	560.9
MW-4	Depth	12.31
	Elevation	548.1
MW-5	Depth	14.40
	Elevation	547.5
MW-6	Depth	12.68
	Elevation	545.6

Remarks:

- 1) All water level depths are feet below top of well casing (TOC)
- 2) All elevations are feet above USGS mean sea level (MSL). Elevations were surveyed by EBRPD relative to USGS Survey Benchmark No. JHF-49.

TABLE 2
GROUNDWATER SAMPLE ANALYTICAL RESULTS
9 February 1995
Redwood Regional Park Service Yard, Oakland, California

Compound:	TPH-G	TPH-D/K	Benzene	Toluene	Ethylbenzene	Total Xylenes
Reporting Limit:	50	50	0.5	0.5	0.5	0.5
<u>Sample Location</u>	Concentration (g/L) ? ug/L					
MW-1	ND	ND	ND	ND	ND	ND
MW-2	89	ND	18	2.4	1.7	7.5
MW-3	ND	ND	0.8	ND	ND	ND
MW-4	11,000	330	420	17	440	460
MW-4*	9,400	NA	390	16	410	420
MW-5	70	ND	0.6	ND	ND	ND
MW-6	ND	ND	ND	ND	ND	ND

Notes:

- * = Quality control field duplicate sample designated MW-0A on the chain-of-custody and analytical laboratory report
- TPH-G = Total petroleum hydrocarbons - gasoline range
- TPH-D/K = Total petroleum hydrocarbons - diesel/kerosene ranges
- NA - Not Analyzed
- ND = Not Detected
- g/L = Micrograms per liter, equivalent to parts per billion (ppb)

**ATTACHMENT A
WATER LEVEL DATA AND
GROUNDWATER MONITORING NOTES**

WATER LEVEL DATA

PARSONS ENGINEERING SCIENCE

DATE: 9 February 1995

PROJECT/LOCATION: Redwood Regional Park Service Yard,
Oakland, California

PROJECT No.: 726104

PERSONNEL: Alan C. Peel

Well No	Water Level from T.O.C.	Well Depth From T.O.C	Depth to T.O.C	Water Level from G.S.	Well Casing Dia.	Gallons/ Casing Vol.	T.O.C. Elev. USGS	Water Level USGS
MW-1	1.64	18.0	-2.3	-0.7	4	10.6	565.9	564.3
MW-2	18.87	36.5	-2.4	16.5	4	11.5	566.5	547.6
MW-3	18.27	45.0	-2.8	15.5	4	17.4	560.9	542.6
MW-4	12.31	26.0	-2.1	10.2	4	8.9	548.1	535.8
MW-5	14.40	26.0	-2.3	12.1	4	7.5	547.5	533.1
MW-6	12.68	27.0	-2.3	10.4	4	9.3	545.6	532.9

NOTES:

T.O.C. = Top of Casing

Gallons/casing volume for 4" inner diameter casing = 0.65 gallons per linear foot

Negative value for "Depth to T.O.C." indicates that T.O.C. is above ground surface

G.S. - Ground Surface

USGS = U.S. Geological Survey mean sea level (MSL)

All elevations surveyed by East Bay Regional Parks District relative to USGS Survey Benchmark No. JHF-49

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GROUNDWATER SAMPLING FIELD NOTES

PARSONS ENGINEERING SCIENCE

PROJECT/LOCATION: REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CA

PERSONNEL: Alan Peel

PROJECT NUMBER: 726104

DATE: 9 February 1995

Well ID	Sampler Date Time	Water Level Before, Well Diameter and Depth*	Water Level After *	Gallons per Casing Volume	Well Purging Method **	Pump On	Pump Off	Temp. (o C)	Specific Cond (umhos/cm)	pH	Total Water Purged (gals)	Sample Coll. Method	Analysis & Number/type of Containers	Comments
MW-1	ACP	1.64						14.0	85	7.03	0			Turbid sample
	2/09/95	4"	1.64	10.6	G	1000	1010	14.2	650	7.65	11	B	(a) (b) & (c)	
	1025	18					14.2	650	7.75	22				
							14.5	650	7.75	33				
MW-2	ACP	18.87						14.6	700	NR	0			
	2/09/95	4"	32.88	11.5	G	1040	1130	16.0	700	8.27	12	B	(a) (b) & (c)	
	1145	36.5					16.0	700	7.83	24				
							16.0	700	7.98	33				
MW-3	ACP	18.27						15.1	500	NR	0			
	2/09/95	4"	21.07	15.4	G	1220	1256	14.7	470	8.4	18	B	(a) (b) & (c)	
	1310	45					14.7	470	7.95	36				
							14.6	480	8.08	54				
MW-4	ACP	12.31						13.5	575	8.30	0			
	2/09/95	4"	17.84	8.9	G	1544	1606	13.5	600	7.90	9	B	(a) (b) & (c)	
	1610	26					13.7	600	7.64	18				
							14.1	600	7.65	27				

NOTES

- * Measured from top of casing in feet
- ** WW -- Well Wizard; G -- Grundfos Pump; B -- Baller
- NA Not Applicable
- NR Not Recorded

- (a) Total Petroleum Hydrocarbons as diesel (TPH-D), unpreserved (1: 1L amber bottles).
- (b) BTEX, EPA Method 8020, HCl preserved (2: 40ml VOAs).
- (c) Total Petroleum Hydrocarbons as gasoline (TPH-G), HCl preserved (2: 40ml VOAs).

GROUNDWATER SAMPLING FIELD NOTES

PARSONS ENGINEERING SCIENCE

PROJECT/LOCATION: REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CA

PERSONNEL: Alan Peel

PROJECT NUMBER: 726104

DATE: 9 February 1995

Well ID	Sampler Date Time	Water Level Before, Well Diameter and Depth*	Water Level After *	Gallons per Casing Volume	Well Purging Method **	Pump On	Pump Off	Temp. (o C)	Specific Cond (umhos/cm)	pH	Total Water Purged (gals)	Sample Coll. Method	Analysis & Number/type of Containers	Comments
MW-5	ACP	14.40						14.7	465	NR	0		(a) (b) & (c)	Turbid; fuel odor
	2/09/95	4"	15.75	7.5	G	1325	1348	14.5	460	NR	8			
	1400	26						14.4	460	8.96	16	B		
								14.4	460	8.56	24			
MW-6	ACP	12.68						13.0	440	NR	0		(a) (b) & (c)	Very turbid
	2/09/95	4"	23.18	9.3	B	NA	NA	12.2	430	9.3	10	B		
	1530	27						12.1	435	8.75	20			
MW-0A	ACP												(b) & (c)	Field duplicate collected at MW-4
	2/09/95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	B		
MW-0B	ACP												(b) & (c)	Equipment rinsate blank, collected after decon. at Well MW-4
	2/09/95	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	1635													

NOTES

- * Measured from top of casing in feet
- ** WW -- Well Wizard; G -- Grundfos Pump; B -- Baller
- NA Not Applicable
- NR Not Recorded

- (a) Total Petroleum Hydrocarbons as diesel (TPH-D), unpreserved (1: 1L amber bottles).
- (b) BTEX, EPA Method 8020, HCl preserved (2: 40ml VOAs).
- (c) Total Petroleum Hydrocarbons as gasoline (TPH-G), HCl preserved (2: 40ml VOAs).

**ATTACHMENT B
CHAIN-OF-CUSTODY RECORDS
AND ANALYTICAL LABORATORY REPORT**



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

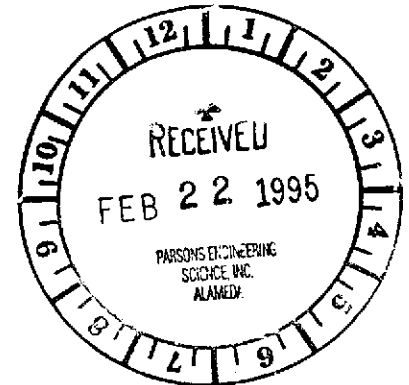
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Parsons Engineering Science, Inc.
1301 Marina Village Parkway
Suite 200
Alameda, CA 94501

Date: 17-FEB-95
Lab Job Number: 119871
Project ID: 726104
Location: EBRPD Redwood Regional



Reviewed by: James K Morris

Reviewed by: [Signature]

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Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 119871
 CLIENT: PARSONS ENGINEERING SCIENCE, INC.
 PROJECT ID: 726104
 LOCATION: EBRPD REDWOOD REGIONAL

DATE SAMPLED: 02/09/95
 DATE RECEIVED: 02/10/95
 DATE EXTRACTED: 02/14/95
 DATE ANALYZED: 02/15/95
 DATE REPORTED: 02/17/95
 BATCH NO: 19056

Extractable Petroleum Hydrocarbons in Aqueous Solutions
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)
119871-001	MW-1	ND	ND	50
119871-002	MW-2	ND	ND	50
119871-003	MW-3	ND	ND	50
119871-004	MW-5	ND	ND	50
119871-005	MW-6	ND	ND	50
119871-006	MW-4	**	330*	50
METHOD BLANK	N/A	ND	ND	50

ND = Not detected at or above reporting limit. Reporting limit applies to all analytes.

* Sample chromatogram does not resemble hydrocarbon standard.

** Kerosene range not reported due to overlap of hydrocarbon ranges.

QA/QC SUMMARY: BS/BSD

RPD, %	4
RECOVERY, %	116

LABORATORY NUMBER: 119871
 CLIENT: PARSONS ENGINEERING SCIENCE, INC.
 PROJECT ID: 726104
 LOCATION: EBRPD REDWOOD REGIONAL

DATE SAMPLED: 02/09/95
 DATE RECEIVED: 02/10/95
 DATE ANALYZED: 02/10,11/95
 DATE REPORTED: 02/17/95
 BATCH NO.: 18977

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
119871-001	MW-1	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
119871-002	MW-2	89	18	2.4	1.7	7.5
119871-003	MW-3	ND(50)	0.8	ND(0.5)	ND(0.5)	ND(0.5)
119871-004	MW-5	70	0.6	ND(0.5)	ND(0.5)	ND(0.5)
119871-005	MW-6	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
119871-006	MW-4	11000	420	17	440	460
119871-007	MW-0A	9400	390	16	410	420
119871-008	MW-0B	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
METHOD BLANK	N/A	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY: BS/BSD

RPD, %	5
RECOVERY, %	98

