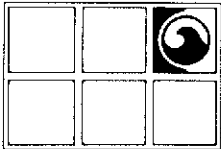


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GROUNDWATER TECHNOLOGY, INC.

4057 Port Chicago Highway, Concord, CA 94520 (415) 671-2387

FAX: (415) 685-9148

June 8, 1994

Project No. 020204554

Mr. Thomas Peacock
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, CA 94621

SUBJECT: *Work Plan for Additional Soil and Groundwater Assessment*
Former Sears Automotive Center
2633 Telegraph Avenue
Oakland, CA 94612

Dear Mr. Peacock:

On behalf of Sears, Roebuck and Co., Groundwater Technology, Inc. has prepared this *Work Plan for Additional Soil and Groundwater Assessment* at the former Oakland Automotive Center located at 2633 Telegraph Avenue in Oakland, California (Attachment 1, Figure 1). The purpose of this investigation is to further evaluate the lateral and vertical distribution of hydrocarbons in the soil and the lateral distribution of hydrocarbons in groundwater.

INTRODUCTION

Background

Seven underground storage tanks were located on site for storage of motor oil and used oil. Five of the seven tanks were 1,000-gallon, steel motor-oil tanks; one was a 2,000-gallon steel motor-oil tank; and one was a 1,000-gallon steel used-oil tank. Two 10,000-gallon steel gasoline tanks were also located on site. The motor-oil and used-oil tanks were removed in 1990. The report on tank removal activities is provided in the American Environmental Management Corporation (AEMC) letter report dated October 12, 1990. Total oil and grease (TOG) and total petroleum hydrocarbons-as-diesel fuel (TPH-D) in soil from the motor-oil tank pit have been reported by AEMC. In the area of the former used-oil tank, total petroleum hydrocarbons-as-gasoline (TPH-G), TPH-D, TOG, and benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds were detected.

In February 1991, an electronic cone penetrometer survey was conducted in conjunction with soil and groundwater sampling by AEMC. This work was initiated to determine the general soil lithology of the area as well as to provide an initial screening for possible contamination.

In December 1992, Groundwater Technology conducted a subsurface assessment which included drilling five soil borings, sampling soil, installing monitoring wells in the five borings, and monitoring and sampling groundwater. The results of this investigation indicated residual petroleum hydrocarbons present in soil, predominately in the capillary fringe, and in the shallow groundwater downgradient of the former used-oil tank (*Phase II Assessment Report*, dated March 24, 1993). The highest concentrations of total petroleum hydrocarbons in the groundwater were found in well MW-3, the furthest downgradient well.

At the request of Alameda County Health Care Services (ACHCS), a groundwater monitoring and sampling program was initiated in February 1993. Groundwater monitoring and sampling data are summarized in Attachment 2 (Tables 1 and 2).

In December 1993, Groundwater Technology conducted an additional subsurface investigation which included drilling four soil borings downgradient of MW-3. Soil and grab groundwater samples were collected and analyzed for hydrocarbon constituents. Based on the analytical results, two monitoring wells were installed along the southern property boundary and one monitoring well was installed along the southwestern property boundary (Figure 2). Analytical results of soil and groundwater samples collected during the investigation indicated that residual petroleum hydrocarbons are present in the soil and shallow groundwater downgradient of MW-3.

Objectives

The objective of this proposed additional site assessment is to further evaluate the lateral and vertical distribution of hydrocarbons in the soil and the lateral distribution of hydrocarbons in groundwater. Additional monitoring wells will be installed to the south of MW-6 and MW-7 and to the southwest of MW-8. The wells will be installed off-site within the City of Oakland public right-of-way.

SCOPE OF WORK

The scope of work is outlined below. A description of the methods and strategy of the field investigation follow.

- Obtain permits for drilling the soil borings and monitoring wells from Zone 7, Alameda County Flood Control and Water Conservation District.

- Obtain encroachment and excavation permits from the City of Oakland Public Works Department.
- Conduct an underground utility survey before drilling.
- Drill three soil borings and collect soil samples for analysis of hydrocarbon constituents.
- Install three groundwater monitoring wells in the borings. Develop monitoring wells and collect groundwater samples for analysis of hydrocarbon constituents.
- Prepare a report on the results and findings of the field investigation.

Permitting

Permits to drill three soil borings and install three monitoring wells will be obtained from the Zone 7, Alameda County Flood Control and Water Conservation District. Because the wells will be located in the City of Oakland public right-of-way, encroachment and excavation permits will be obtained from the City of Oakland Public Works Department.

Soil Borings

Three soil borings will be drilled off-site using a truck-mounted drill rig equipped with 8-inch-outside-diameter (OD), hollow stem, continuous flight augers. The drilling will be supervised by a Groundwater Technology field geologist who will describe the soil types encountered in accordance with the Unified Soil Classification System. The borings will be drilled to approximately 20 feet below surface grade. The boring locations are shown in Figure 2.

Soil samples will be collected approximately every 5-feet while drilling. A minimum of two soil samples per boring will be selected for laboratory analysis based on results of field screening with a photo-ionization detector (PID) and on field observations. Soil samples will be collected in 2-inch-diameter by 6-inch-long brass tubes, sealed with aluminum foil, capped, taped, labeled and placed on ice for transport to a California-certified analytical laboratory under chain of custody protocol.

The soil samples will be analyzed for BTEX and TPH-G using Environmental Protection Agency (EPA) Methods 8020/8015, total petroleum hydrocarbons-as-motor oil (TPH-MO) using gas chromatography/flame ionization detector GC/FID (8015), and total lead by Atomic Adsorption (AA) or Inductively Coupled Plasma (ICP).

Monitoring Wells

A groundwater monitoring well will be installed in each of the soil borings. The wells will be completed with 15 feet of 2-inch-diameter 0.020-inch slotted polyvinyl chloride (PVC) screen and finished to the surface with 2-inch-diameter PVC casing. The annular space between the borehole and casing will be backfilled with No. 3 Lonestar Sand from the well completion depth to 1.5 to 2 feet above the well screen. A sanitary seal of 1 to 2 feet of bentonite will be installed, followed by cement grout to the surface. The wells will be finished with a water-tight locking cap inside a traffic-rated street box.

The wells will be developed to improve hydraulic communication with the surrounding aquifer. Suspended sediment will be removed from the wells using a surge and bail technique. The wells will be sampled at least 72 hours after development.

Before purging and sampling, the depth to groundwater will be measured in the monitoring wells using an INTERFACE PROBE™ Well Monitoring System, which can detect both water and separate-phase product levels. Before sampling, the wells will be purged of approximately 4 well volumes. The temperature, conductivity, and pH of the purge water will be measured during purging. The wells will be allowed to recharge to a least 80 percent of their initial water level before sampling. Groundwater samples will be collected using a Teflon® bailer and placed in appropriate containers. The sample containers will be labeled and placed in an ice-chilled, insulated cooler for transport under chain-of-custody protocol to a California-certified laboratory and analyzed for BTEX and TPH-G using EPA Methods 8020/8015, TPH-MO using GC/FID (8015), and total lead by AA or ICP.

The wellhead and surface elevations will be professionally surveyed relative to the elevations of the other site wells.

Equipment Decontamination/Disposal Procedures

Drilling equipment will be steam cleaned after drilling each boring. The soil and groundwater sampling and monitoring equipment will be either steam cleaned or cleaned in a solution of Alconox and rinsed with distilled water prior to use at each sampling location.

Soil cuttings, and well development and purge water will be placed in 55-gallon drums, labeled, and stored on site pending laboratory analyses to select a proper disposal method.

Reporting

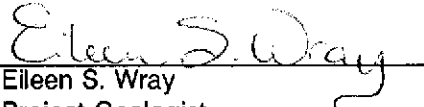
When the data from this proposed soil and groundwater investigation have been collected, they will be analyzed and presented in tabular and graphic form in a summary report. Recommendations for further investigation will be delineated if necessary.

The following tables and maps will be provided in the summary report:

- Drilling Logs/Well Construction Details
- Soil Analytical Results Summary
- Groundwater Analytical Results Summary
- Water Level Measurements
- Site Location Map
- Site Plan Map
- Potentiometric Surface Map
- Groundwater Concentration Map
- Recommendations for additional characterization or remediation, as appropriate.

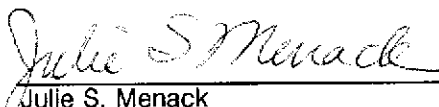
If you have any questions or comments, please call our Concord office at (510) 671-2387.

Sincerely,
Groundwater Technology
Written/Submitted by


Eileen S. Wray
Project Geologist


Michael J. Wray
Project Manager

Groundwater Technology
Reviewed/Approved by


Julie S. Menack
Certified Engineering Geologist
No. 1838

For:
Frank J. Gorry
Vice President, General Manager
National Industry Division

cc: Ms. Bernadine Palka

Attachment 1 Figures
Attachment 2 Tables

ATTACHMENT 2

Tables

TABLE 1
SUMMARY OF HISTORICAL MONITORING DATA
Former Sears Automotive Center
2633 Telegraph Avenue, Oakland, California

Well No.	Casing Elev	Date	DTW	DTP	PT	Groundwater Elevation
MW-1	26.20	12/30/92	10.60	--	--	15.60
		02/26/93	10.14	--	--	16.06
		03/24/93	10.48	--	--	15.72
		04/27/93	11.30	--	--	14.90
		05/28/93	11.43	--	--	14.77
		06/21/93	11.71	--	--	14.49
		07/22/93	11.87	--	--	14.33
		08/13/93	11.94	--	--	14.26
		09/16/93	12.05	--	--	14.15
		10/22/93	12.00	--	--	14.20
		11/03/93	12.10	--	--	14.10
		11/24/93	11.97	--	--	14.23
		12/01/93	11.46	--	--	14.74
		12/27/93	11.58	--	--	14.62
		01/05/94	11.69	--	--	14.51
MW-2	26.50	02/08/94	11.87	--	--	14.33
		03/09/94	11.08	--	--	15.12
		04/01/94	11.47	--	--	14.73
		12/30/92	10.65	--	*	15.85
		02/26/93	10.56	--	--	15.94
		03/24/93	10.52	--	--	15.98
		04/27/93	11.17	--	--	15.33
		05/28/93	11.12	--	--	15.38
		06/21/93	11.41	--	--	15.09
		07/22/93	11.50	--	--	15.00
08/13/93	11.54	--	--	14.96		
09/16/93	11.62	--	--	14.88		
10/22/93	11.57	--	--	14.93		
11/03/93	11.65	--	--	14.85		
11/24/93	11.52	--	--	14.98		
12/01/93	11.08	--	--	15.42		
12/27/93	11.27	--	--	15.23		
01/05/94	11.39	--	--	15.11		
02/08/94	11.49	--	--	15.01		
03/09/94	11.06	--	--	15.44		
04/01/94	11.25	--	--	15.25		

TABLE 1
SUMMARY OF HISTORICAL MONITORING DATA
Former Sears Automotive Center
2633 Telegraph Avenue, Oakland, California

Well No.	Casing Elev	Date	DTW	DTP	PT	Groundwater Elevation
MW-3	26.34	12/30/92	12.43	--	*	13.91
		02/26/93	12.21	--	--	14.13
		03/24/93	12.36	--	--	13.98
		04/27/93	12.70	--	--	13.64
		05/28/93	12.72	--	--	13.62
		06/21/93	12.87	--	--	13.47
		07/22/93	12.92	--	--	13.42
		08/13/93	12.96	--	--	13.38
		09/16/93	13.01	12.97	0.04	13.36
		10/22/93	NM	12.96	NM	NM
		11/03/93	13.13	13.02	0.11	13.30
		11/24/93	12.94	12.92	0.02	13.42
		12/01/93	12.71	12.69	0.02	13.65
		12/27/93	12.77	12.73	0.04	13.60
		01/05/94	12.85	12.83	0.02	13.51
		02/08/94	12.37	--	--	13.97
		03/09/94	12.53	--	--	13.81
04/01/94	12.64	--	--	13.70		
MW-4	26.17	12/30/92	11.53	--	--	14.64
		02/26/93	11.35	--	--	14.82
		03/24/93	11.46	--	--	14.71
		04/27/93	11.74	--	--	14.43
		05/28/93	11.77	--	--	14.40
		06/21/93	11.92	--	--	14.25
		07/22/93	11.95	--	--	14.22
		08/13/93	12.01	--	--	14.16
		09/16/93	12.08	--	--	14.09
		10/22/93	12.03	--	--	14.14
		11/03/93	12.10	--	--	14.07
		11/24/93	12.02	--	--	14.15
		12/01/93	11.78	--	--	14.39
		12/27/93	11.80	--	--	14.37
		01/05/94	11.91	--	--	14.26
		02/08/94	11.85	--	--	14.32
		03/09/94	11.61	--	--	14.56
04/01/94	11.73	--	--	14.44		

TABLE 1
SUMMARY OF HISTORICAL MONITORING DATA
Former Sears Automotive Center
2633 Telegraph Avenue, Oakland, California

Well No.	Casing Elev	Date	DTW	DTP	PT	Groundwater Elevation
MW-5	26.98	12/30/92	10.50	--	--	16.48
		02/26/93	10.12	--	--	16.86
		03/24/93	10.31	--	--	16.67
		04/27/93	10.75	--	--	16.23
		05/28/93	10.80	--	--	16.18
		06/21/93	10.94	--	--	16.04
		07/22/93	11.01	--	--	15.97
		08/13/93	11.07	--	--	15.91
		09/16/93	11.18	--	--	15.80
		10/22/93	11.19	--	--	15.79
		11/03/93	11.23	--	--	15.75
		11/24/93	12.00	--	--	14.98
		12/01/93	10.84	--	--	16.14
		12/27/93	10.81	--	--	16.17
		01/05/94	10.96	--	--	16.02
02/08/94	10.94	--	--	16.04		
03/09/94	10.54	--	--	16.44		
04/01/94	10.77	--	--	16.21		
MW-6	24.32	12/27/93	11.24	--	--	13.08
		01/05/94	11.39	--	--	12.93
		02/8/94	11.15	--	--	13.17
		03/09/94	10.97	--	--	13.35
		04/01/94	11.25	--	--	13.07
MW-7	24.88	12/27/93	11.80	--	--	13.08
		01/05/94	11.53	--	--	13.35
		02/08/94	11.90	--	--	12.98
		03/09/94	11.23	--	--	13.65
		04/01/94	11.34	--	--	13.54
MW-8	26.12	12/27/93	12.45	--	--	13.67
		01/05/94	12.57	--	--	13.55
		02/08/94	12.02	--	--	14.10
		03/09/94	12.22	--	--	13.90
		04/01/94	12.33	--	--	13.79

Elevation in feet above mean sea level
DTW = Depth to water (in feet)
DTP = Depth to product (in feet)
PT = Product thickness (in feet)
NM = Not monitored
* = Sheen observed (<0.01 foot)
-- = Product not detected

TABLE 2
SUMMARY OF HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS
Former Sears Automotive Center
2633 Telegraph Avenue, Oakland, California
Results in micrograms per liter [$\mu\text{g/l}$] except where noted otherwise

Well ID	Date	B	T	E	X	TPH-G	TPH-M	TPH (mg/l)	Dissolved Metals
MW-1	12/30/92	1	1	2	2	--	--	1	--
	03/24/93	0.4	1	0.3	10	--	--	1	--
	06/21/93	<0.3	1	2	6	--	**<100	--	--
	09/16/93	<0.3	0.7	<0.3	7	--	**<100	--	--
	12/01/93	0.4	1	2	7	--	--	--	--
	12/30/93	--	--	--	--	--	<100	--	--
	03/09/94	<0.3	<0.3	1	4.2	--	<100	--	--
MW-2	12/30/92	0.7	<0.3	<0.3	3	190	--	1	^a ND
	03/24/93	0.6	<0.3	<0.3	2	120	--	<1	^a ND
	06/21/93	0.3	<0.3	<0.3	0.7	82	**<100	--	^c ND
	09/16/93	<0.3	<0.3	<0.3	<0.5	28	**<100	--	^c ND
	12/01/93	<0.3	<0.3	<0.3	1	68	--	--	^c ND
	12/30/93	--	--	--	--	--	310	--	--
	03/09/94	<0.3	<0.3	<0.3	<0.5	47	<100	--	^c ND
MW-3	12/30/92	11	0.9	<0.3	2	910	--	20	^a ND
	03/24/93	28	0.7	1	8	3,300	--	28	^a 15
	06/21/93	21	5	2	19	**2,600	32,000	26	^{cd} 5
	09/16/93	--	--	--	--	--	--	--	--
	12/01/93	--	--	--	--	--	--	--	--
	12/30/93	2	1.4	4.5	13	2,000	**5,700	***63	^a ND
	03/09/94	2	1.4	4.5	13	2,000	**5,700	***63	^a ND
MW-4	12/30/92	2	<0.3	1	<0.5	1,200	--	<1	^a ND
	03/24/93	<0.3	<0.3	<0.3	<0.5	750	--	2	^a 7
	06/21/93	<0.3	2	<0.3	0.5	660	19,000	--	^a ND
	09/16/93	0.3	<0.3	2	3	410	2,500	--	^a ND
	12/01/93	<0.3	<0.3	<0.3	<0.5	150	390	--	^a ND
	12/30/93	0.7	0.8	2	3.6	1,500	780	--	^a ND
	03/09/94	0.7	0.8	2	3.6	1,500	780	--	^a ND
MW-5	12/30/92	<0.3	<0.3	<0.3	<0.5	37	--	<1	^{bc} 5
	03/24/93	<0.3	<0.3	<0.3	0.5	19	--	2	^f 341
	06/21/93	<0.3	<0.3	<0.3	<0.5	<10	<100	--	^c ND
	09/16/93	0.3	<0.3	<0.3	1	<10	<100	--	^c ND
	12/01/93	<0.3	<0.3	<0.3	1	17	--	--	^c ND
	12/30/93	--	--	--	--	--	<100	--	--
	03/09/94	<0.3	<0.3	<0.3	<0.5	22	<100	--	^c ND
MW-6	12/27/93	<0.3	<0.3	<0.3	<0.5	<10	<100	<1	^a 70
	03/09/94	<0.3	<0.3	<0.3	<0.5	15	<100	--	^c ND

TABLE 2
SUMMARY OF HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS
Former Sears Automotive Center
2633 Telegraph Avenue, Oakland, California
Results in micrograms per liter [$\mu\text{g/l}$] except where noted otherwise

Well ID	Date	B	T	E	X	TPH-G	TPH-M	TPH (mg/l)	Dissolved Metals
MW-7	12/27/93	<0.3	<0.3	1	2	140	<100	<1	^a 40
	03/09/94	<0.3	1.0	1.5	4.1	620	<100	--	^c ND
MW-8	12/27/93	0.4	4	0.4	1	390	<100	<1	^a 18
	03/09/94	0.6	0.8	0.5	1.5	420	<100	--	^a ND

- BTEX = Benzene, toluene, ethylbenzene, and total xylenes (EPA Methods 5030, 8020)
TPH-G = Total petroleum hydrocarbons-as-gasoline (EPA Methods 5030 and modified EPA Method 8015)
TPH-M = Total petroleum hydrocarbons-as-motor oil (modified EPA Method 8015)
TPH = Total petroleum hydrocarbons (EPA Method 418.1 [SM 5520 FC])
mg/l = Milligrams per liter
-- = Not analyzed
ND = Nondetectable (detection limits for each compound are listed in laboratory reports, included in Appendix D)
* = Water samples were not filtered, analytical results represent total metals present, not dissolved concentrations.
** = Uncategorized hydrocarbon compound not included in this hydrocarbon concentration.
*** = Total oil and grease by EPA Method 413.1
a = Dissolved lead
b = Dissolved lead only analyte detected
c = Dissolved lead, cadmium, total chromium, nickel, and zinc.
d = Cadmium only analyte detected.