LIMITED SOIL AND GROUND WATER QUALITY INVESTIGATION REPORT FOR 3810 BROADWAY OAKLAND, CALIFORNIA

11/91

Kaldveer Associates
Geoscience Consultants
Geotechnical and Environmental Engineering
Oakland, CA • San Jose, CA • Bellevue, WA • Tacoma, WA

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November 15, 1991
KE1355-1-1009, 19774

Friedkin-Becker
300 Grand Avenue
Oakland, California, 94610

Attention: Mr. Gerald S. Friedkin

RE: LIMITED SOIL AND GROUND WATER QUALITY INVESTIGATION REPORT
3810 BROADWAY
OAKLAND, CALIFORNIA

Dear Mr. Friedkin:

Kaldveer Associates, Inc. is pleased to submit our limited soil and ground water quality investigation report for the Precision Tune facility, 3810 Broadway, in Oakland, California. The purpose of this investigation was to test for the presence of waste oil related contaminants in both soil and ground water beneath the former waste oil tank site. The enclosed report contains a description of our investigation, results of soil and ground water sample analyses, and our conclusions and recommendations regarding site environmental quality.

We appreciate the opportunity to provide services to you on this project and trust this report meets your needs at this time. If you have any questions or require additional information, please don't hesitate to call.

Very truly yours,

KALDVEER ASSOCIATES, INC.

John R. Sutton, P.E./G.E.
Manager, Environmental/Hazardous
Waste Services
Associate

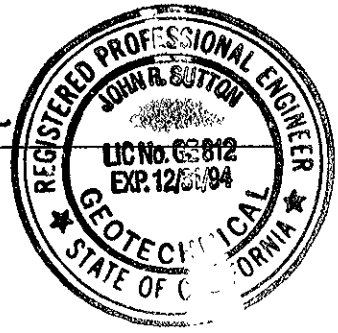
JRS:pv
Copies: Addressee (5)

LIMITED SOIL AND GROUND WATER
QUALITY INVESTIGATION REPORT

For
3810 3ROADWAY
OAKLAND, CALIFORNIA

To
Friedkin-Becker
300 Grand Avenue
Oakland, California 94610

November, 1991



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LIMITED SOIL AND GROUND WATER QUALITY INVESTIGATION REPORT FOR 3810 BROADWAY OAKLAND, CALIFORNIA

I. INTRODUCTION

This report presents the results of a limited soil and ground water quality investigation performed at the Precision Tune facility located at 3810 Broadway in Oakland, California. The location of the site is shown on the Site Vicinity Map, Figure 1.

The purpose of this investigation has been to assess the potential impact to the ground water in the area of the former waste oil tank. The investigation included the installation of a ground water monitoring well at the site, and submitting soil and water samples to Med-Tox Associates, Inc., a California Environmental Protection Agency - certified analytical laboratory. The field work was performed in accordance with Kaldveer Associates' "Proposal for Limited Soil and Ground Water Quality Investigation, 3810 Broadway, Oakland, California", dated October 9, 1991, and approved on October 9, 1991 by Mr. Gerald Friedkin.

II. BACKGROUND

The Precision Tune facility was formerly a Texaco Station. At some time in the past, Texaco removed all of the fuel tanks but left the waste oil tank in place. In May of 1991, the waste oil tank was removed and soil samples were collected by SEMCO, the tank removal, petroleum services contractor. Their work identified hydrocarbon contaminated soils to a depth of about ten feet which they removed and disposed of offsite. The excavation was then backfilled with clean imported aggregate. No groundwater was reported to have been encountered during the tank removal.

The Alameda County Department of Environmental Health (ACDEH) has required soil and water samples to evaluate if ground water has been impacted by any spillage from the former tank.

III. SCOPE OF SERVICES

The scope of work performed during this investigation is based on our site reconnaissance, a review of laboratory test information by Superior Analytical Laboratory, for SEMCO, and limited research conducted by our firm.

The scope of services included:

1. Review copies of available engineering reports on file at San Francisco Bay Regional Water Quality Control Board to obtain information concerning local ground water depth and flow direction.

2. A soil sampling program consisting of drilling a continuous flight hollow stem auger boring to a depth of 36 feet. Soil samples were collected at depths of approximately 5 feet commencing in natural soil beneath the tank cavity, and as otherwise indicated by specific field conditions.

   The soil samples were appropriately packed, refrigerated and transported to the chemical laboratory for testing. The augers, samplers and equipment were steam-cleaned prior to the field investigation.

3. A ground water testing program consisting of converting the boring into a monitoring well to a depth of approximately 34 feet and then developing the well and sampling the water. Applicable local regulations were followed in permitting and installing the well.

4. A chemical testing program consisting of analyzing selected soil and ground water samples for various of the following waste oil indicators: 1) total petroleum hydrocarbons as gasoline (TPH-G), 2) TPH as diesel, 3) total oil and grease, 4) benzene, toluene, ethyl benzene and xylene, 5) chlorinated hydrocarbons, 6) cadmium, chromium, lead, zinc and nickel, 7) PCB, PCP, PNA and creosote, all in accordance with the Tri-Regional Water Quality Control Boards' Guidelines for analysis for waste oil at fuel leak sites. A California Environmental Protection Agency certified analytical laboratory was utilized.

6. Submittal of this report presenting a description of our investigation, results of the laboratory analyses, and our conclusions and recommendations regarding site environmental quality.

IV. FIELD INVESTIGATION

A. Site Description

The site is located at 3810 Broadway, on the southeast corner of Broadway and 38th Street, in Oakland, California. The location of the site is shown on the Site Vicinity Map, Figure 1. The site is currently utilized by Precision Tune, an auto mechanic garage, located in a concrete block office and garage-bay building. The

remaining half of the site is paved asphalt parking and driveway. The site has been excavated into a hillside. There are retaining walls along the northeast and southeast property lines.

Our investigation has been performed in the specific area of the former waste oil tank at the front of the existing auto mechanic garage. As shown on our Site Plan, Figure 2, the former tank area is located just in front of the existing structure. On the day of our investigation we found the tank area to be covered by a sheet of plywood and backfilled with pea gravel. The topography of the site controls the drainage away from the structure towards Broadway in a southwesterly direction. No areas of unusual surface conditions or spills were noted during our field investigation.

B. Drilling and Soil Sampling

The field investigation was conducted on October 17, 1991, and consisted of drilling an exploratory boring and converting it to a ground water monitoring well. A Drilling Permit Application was obtained in advance from Alameda County Flood Control and Water Conservation District, Zone 7. A copy of permit No. 91601 is included in Appendix A. State of California Well Completion Report No. 427903 was prepared and issued to the California Department of Water Resources. A copy is included in Appendix A.

The boring was drilled at the approximate location shown on the Site Map, Figure 2. The soil boring was drilled with a truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. Soils encountered during drilling were classified in the field by Marcela Jimenez, Assistant Environmental Specialist, by visual examination in accordance with the Unified Soil Classification System (Figure A-1). The boring log for Monitoring Well 1 (MW-1) is presented in Appendix A.

Soil samples were collected from the boring at intervals of every five feet to 36-1/2 feet using 2-inch I.D. Modified California sampler containing thin brass liners. The sampler was driven with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the last 12 inches of an 18-inch drive are recorded as the penetration resistance (blows/foot) on the boring logs. The augers were steam-cleaned by high pressure cleaner prior to the drilling, and before the use of the sampler and brass liners they were thoroughly cleaned with Liquinox, a clinical detergent to reduce the potential for cross-contamination.

Soil samples from MW-1 were collected for chemical analysis. All samples were collected in 2-inch diameter, 6-inch long, brass liners. The samples were first examined for logging purposes, then sealed with teflon-lined lids, labeled and immediately placed in refrigerated storage. A chain-of-custody form was initiated in the field and accompanied the samples to Med-Tox Associates, Inc. of

Pleasant Hill, California, a California Environmental Protection Agency certified laboratory. All soil cuttings were cleaned from the area of the borings and placed into labeled drums for temporary storage onsite, and later disposal.

C. Subsurface Conditions

The pit backfill material encountered during drilling for MW-1 consisted of pea gravel fill to an approximate depth of 10 feet. Underlying the backfill is native tan to brown, moderately plastic silty clay which extends to an approximate depth of thirty feet. In the 20 foot sample, intermittent, fine-grained, dry sand stringers were noted. Ground water was encountered in fine-grained sandy lenses at 31 feet depth. These lenses were abundant below 30 feet in the clay to the total depth explored of 35-1/2 feet. After a period of about five hours, the ground water level was found to be at a depth of about 12 feet below the existing ground surface.

During drilling and sample logging, the soil samples were observed for obvious signs of hydrocarbon contamination. No samples from MW-1 exhibited any signs of contamination (hydrocarbon odors). The attached boring logs and related information (Appendix A) depict location-specific subsurface conditions encountered during our field investigation. The approximate location of the boring was determined by pacing and should be considered accurate only to the degree implied by the method used. The passage of time could result in changes in the surface or subsurface conditions due to natural occurrences or human intervention.

D. Monitoring Well Construction

A ground water monitoring well was installed at the site on October 17, 1991. Details of the monitoring well installation are included with the boring logs in Appendix A. Monitoring Well MW-1 was completed to a depth of approximately 34 feet, below ground surface using Schedule 40, 2-inch nominal, flush threaded, PVC well casing. The well was completed with one 10-foot section of 0.010-inch (10 slot) slotted well screen. The sand filter pack extended to one foot above the slotted casing. The well seal was completed by adding 1.0 foot of 3/8-inch, bentonite pellets to the top of the filter pack then filling the remaining annular space with neat Portland cement grout mixture. The well was completed at the surface with an expansion plug with lock and a bolted locking steel vault cover. Specific well construction details are presented along with the respective boring logs in Appendix A.

E. Well Development and Sampling

The well was sampled on October 19, 1991, using a teflon bailer. Prior to sampling, the well was developed using a suction pump to

remove about twelve gallons of water and then a teflon bailer to remove about thirty gallons of water when the pH, conductivity and temperature became constant. Water samples from each well were collected, labeled and placed in refrigerated storage, and delivered to the laboratory under chain-of-custody control. The bailer was thoroughly washed with laboratory grade detergent and rinsed with distilled water to reduce the potential for cross-contamination. Well development and sampling logs are attached to this report as Appendix B. All development water and cleaning fluids were contained in 55 gallon drums which are stored on site for later disposal.

F. Ground Water

Based on the U.S.G.S. 7.5' Quadrangle topographic map series, Oakland West and East Streets, the approximate elevation at the project site is 90 feet above Mean Sea Level, making the measured water surface elevation approximately 78 feet, Mean Sea Level.

As shown on the Site Vicinity Map (Figure 1), the Kaiser Permanente Medical Center is located approximately 500 feet southwest of the project site. Our review of contamination reports at the Regional Water Quality Control Board resulted in the finding of an on-going ground water investigation by Geomatrix Consultations at the Kaiser site. The report reviewed stated that ground water in the area was anomalous due to stratigraphic irregularities, but generally the direction of flow was west-southwest toward the San Francisco Bay.

V. ANALYTICAL RESULTS

A. Laboratory Procedures

Soil and ground water samples were analyzed by Med-Tox Associates, Inc. of Pleasant Hill, California. Med-Tox Associates, Inc. is certified by the California Environmental Protection Agency for the analyses performed. The soil samples were analyzed for oil and grease, petroleum hydrocarbons, petroleum hydrocarbons as gasoline, and purgeable aromatic compounds using EPA Methods 5520E, 5520F, 5030 GCFID and 8020, respectively. The water samples were analyzed for oil and grease and hydrocarbons using EPA Method 5520C and F, petroleum hydrocarbons as diesel and oil using EPA Method 3550 GCFID, petroleum hydrocarbons as gasoline using EPA Method 5030 GCFID, purgeable aromatic compounds using EPA Method 8020, metals using EPA Method 6010, halogenated volatile organics using EPA Method 8010 and semi volatile organics including PCB, PCP, PNA and creosote using EPA Method 8270.

B. Analytical Results - Soil

Soil samples from depths of 10-1/2, 15-1/2, 20-1/2, or 25-1/2 feet were tested for oil and grease, petroleum hydrocarbons, gasoline and purgeable aromatics. None of these petroleum hydrocarbons were

detected. Soil sample test results are presented in Table 1 and the laboratory reports are attached to this report as Appendix C.

C. Analytical Results - Water

The water sample from MW-1 detected generally low levels of petroleum hydrocarbons. The analytical results identified 1.0 parts-per-million (ppm) of oil and grease, 0.4 ppm of oil, 1.7 ppm of total petroleum hydrocarbons as diesel, 0.3 ppm of total petroleum hydrocarbons as gasoline, 0.0041 ppm of benzene and 0.02 ppm of xylene. Low levels of nickel and lead were identified at 0.02 ppm and 0.091 ppm, respectively. Analytical results also detected low levels of halogenated volatile organics, 0.0007 ppm of 1,2-dichlorobenzene, 0.0007 ppm of 1,1-dichloroethane and 0.002 ppm methylene chloride.

VI. CONCLUSIONS

A. Soil Quality

Shallow soil samples taken during the tank removal (by SEMCO) identified concentrations of oil and grease. However, the identified contaminated soils were excavated and removed from the site and a final soil sample taken at a depth of about 10-1/2 feet had no detectable soil contamination. Soil samples taken during our investigation were from depths of 10-1/2, 15-1/2, 20-1/2 and 25-1/2 feet. All of these samples were tested for various petroleum hydrocarbon constituents and none of the samples had any detectable concentrations of contaminants.

The information collected to-date indicates that soil quality from below the former waste oil tank, located at 3810 Broadway, was slightly impacted by waste oil. However, all of the contaminated soil discovered at the site has been removed.

B. Water Quality

Information collected from the monitoring well installed in the location of the former waste oil tank shows that a ground water aquitard (about 25 feet of moderately plastic clay) separates the ground water from the former tank location. Ground water was found to be contaminated with low levels of various hydrocarbon compounds, but no evidence was discovered that indicated the contaminants originated from the former waste oil storage tank. There are no known shallow zone production water wells downgradient of this site.

VII. RECOMMENDATIONS

Our investigations identify no soil contamination by hydrocarbons from below the former tank excavation. In our opinion, the discovered ground water contamination is the result of an unknown

and probably off-site source or sources. Therefore, based on our findings we recommend:

1. The monitoring well constructed for this investigation should be abandoned according to the Alameda County destruction requirements and the drummed soil and ground water be appropriately disposed of.

2. The Alameda County Department of Environmental Health (ACDEH) should close the case file for this UST removal.

3. ACDEH should notify the San Francisco Bay Regional Water Quality Control Board (RWQCB) of the findings and recommend that the RWQCB close their case file.

* * * * * * * * * * * * * * * * * *

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS
PETROLEUM HYDROCARBONS
(reported in parts-per-million, ppm)

Chemical Constituent	Sample Depth in Feet 10-1/2	15-1/2	20-1/2	25-1/2	Detection Limit
Oil and Grease (5520 E)	ND	ND	ND	ND	10
Hydrocarbons (5520 F)	ND	ND	ND	ND	10
TPH Gasoline	ND	--	--	--	0.2
Benzene	ND	--	--	--	0.001
Toluene	ND	--	--	--	0.001
Xylene	ND	--	--	--	0.003
Ethylbenzene	ND	--	--	--	0.001

Note:

ND = Not Detected
-- = Not tested

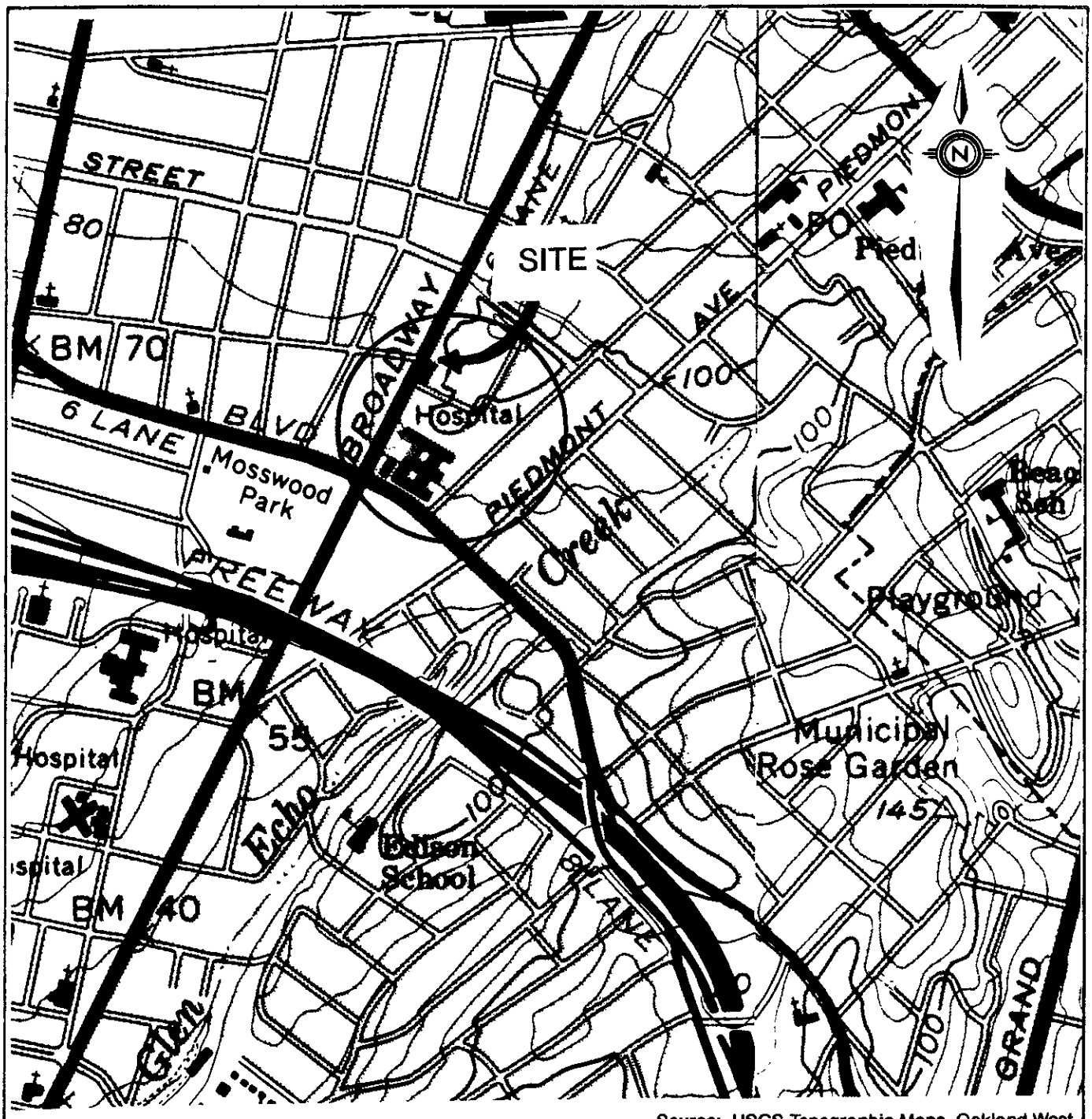
TABLE 2

WATER SAMPLE ANALYTICAL RESULTS

Chemical Constituent	Detection Limits	Detected Concentration
Petroleum Hydrocarbons		
Oil and Grease(ppm)	0.5	1.0
Hydrocarbons(ppm)	0.5	ND
Oil(ppm)	0.1	0.4
TPH Gasoline(ppm)	0.05	0.3
TPH Diesel(ppm)	0.05	1.7
Benzene(ppb)	0.3	4.1
Toluene(ppb)	0.3	ND
Xylene(ppb)	1	20
Ethylbenzene(ppb)	0.3	ND
Metals		
Cadmium(ppb)	5	ND
Chromium(ppb)	10	ND
Nickel(ppb)	20	20
Lead(ppb)	20	ND
Zinc(ppb)	50	91
Halogenated Volatile Organics (EPA 8010)		
1,2-dichlorobenzene(ppb)	0.5	0.7
1,2-dichloroethane(ppb)	0.5	0.7
Methylene Chloride(ppb)	0.5	2
Semi-Volatile Organics (EPA 8270) (including PCB, PCP, PNA and creosote)	*	ND

Notes:

- = No MCL
* = Detection limits variable, see laboratory report for specific limits
ND = Not detected



Source: USGS Topographic Maps, Oakland West and Oakland East sheets, 1980.

Approximate Scale in Feet

0 500 1000 2000

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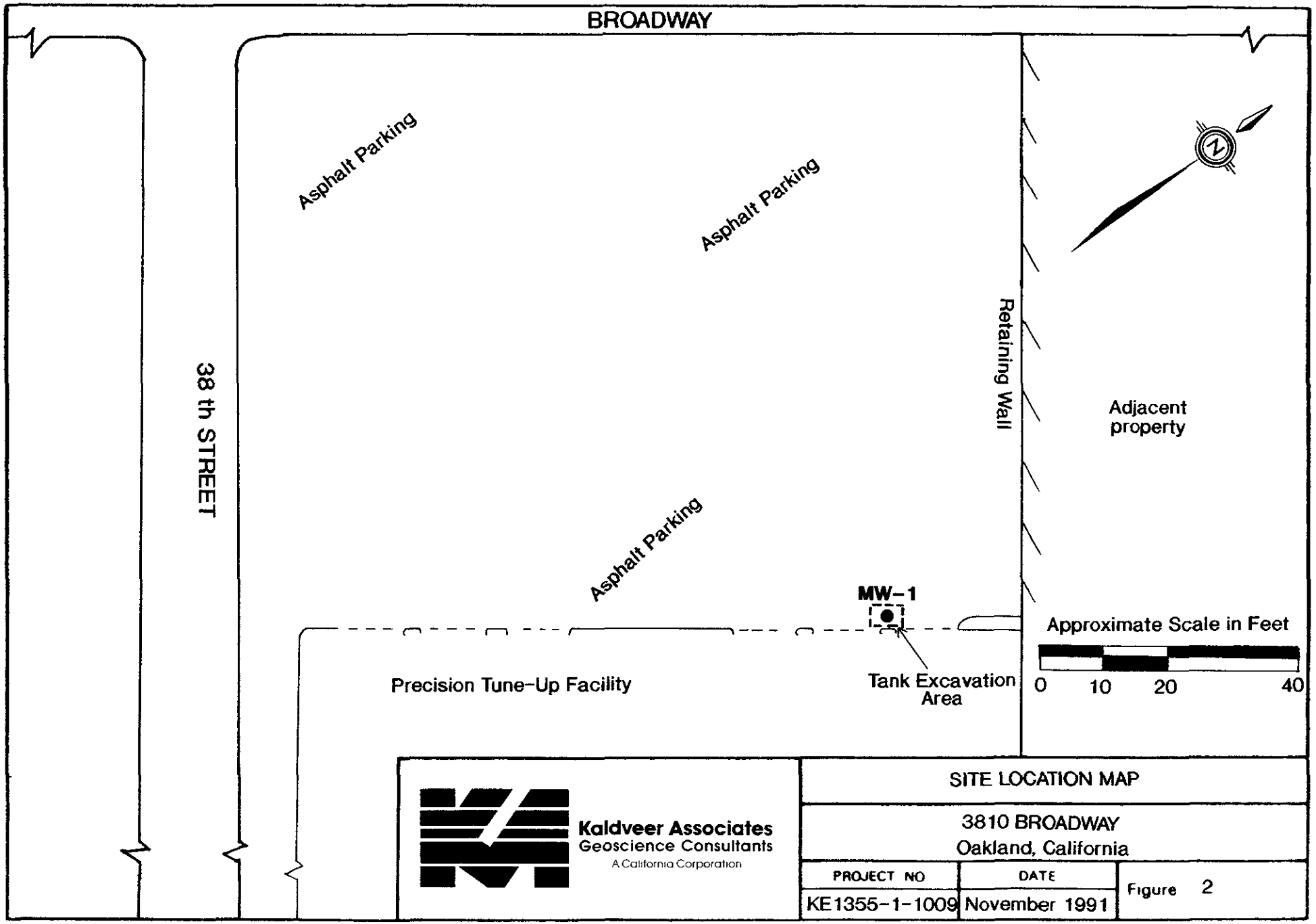
SITE VICINITY MAP

3810 BROADWAY
Oakland, California

PROJECT NO.	DATE	
KE1355-1-1009	November 1991	Figure 1


BROADWAY
38 th STREET
Asphalt Parking
Asphalt Parking
Asphalt Parking
Retaining Wall
Adjacent property
MW-1
Tank Excavation Area
Precision Tune-Up Facility
Approximate Scale in Feet
0
10
20
40
Kaldveer Associates
Geoscience Consultants
A California Corporation
SITE LOCATION MAP
3810 BROADWAY
Oakland, California
PROJECT NO
KE1355-1-1009
DATE
November 1991
Figure 2

APPENDIX A

BORING LOG AND WELL CONSTRUCTION DETAILS

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description	Major Divisions		grf	ltr	Description
Coarse Grained Soils	Gravel And Gravely Soils		gw	Well-graded gravels or gravel sand mixtures, little or no fines	Fine Grained Soils	Silts And Clays LL < 50		ml	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			gp	Poorly-graded gravels or gravel sand mixture, little or no fines				cl	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			gm	Silty gravels, gravel-sand-silt mixtures				ol	Organic silts and organic silt-clays of low plasticity
			gc	Clayey gravels, gravel-sand-clay mixtures				mh	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
	Sand And Sandy Soils		sw	Well-graded sands or gravelly sands, little or no fines		Silts And Clays LL > 50		ch	Inorganic clays of high plasticity, fat clays
			sp	Poorly-graded sands or gravelly sands, little or no fines				oh	Organic clays of medium to high plasticity
			sm	Silty sands, sand-silt mixtures				pt	Peat and other highly organic soils
			sc	Clayey sands, and-clay mixtures	Highly Organic Soils				

SYMBOLS

- Standard penetration split spoon sample
- Modified California (Porter) sample
- Shelby tube sample
- Water level observed in boring
- Stable Water level in monitoring well
- Blank casing
- Screened Casing
- Cement grout
- Bentonite
- Filter Pack

Visual Relative Moisture Content
Increasing Moisture Content

Dry
Damp
Moist
Wet
Saturated

Note(1): Penetration resistance values are recorded as the number of blows of a 140-pound hammer falling 30-inches required to drive a sampler through the last 12 inches of an 18-inch drive. Blow count for samples obtained using a Modified California sampler (indicated by an asterisk) should be multiplied by a factor of 0.8 to obtain equivalent standard penetration resistance values.

Note(2): The lines separating strata on the logs represent approximate boundaries only. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

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BORING LOG LEGEND

3810 BROADWAY
Oakland, California

PROJECT NO.	DATE	FIGURE NO
KE1355-1-1009	November 1991	A-1

DRILL RIG	CME 55 HSA	SURFACE ELEVATION	At Grade	LOGGED BY	MJ
DEPTH TO GROUNDWATER	31 ft.	BORING DIAMETER	2-inch	DATE DRILLED	10/17/91

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
GRAVEL (GW), red-gray, dry, loose, sandy,						Well Construction Details	
FILL						Cement grout surface seal with steel, traffic rated cover	
GRAVEL (GP), tan, dry, loose, pea-size subround gravel, not crushed, no odor		5				2-inch PVC, Schedule 40 solid casing	
Gravel and sampler becoming wet with depth, perched water at the bottom of tank excavation							
FILL		10					
CLAY (CL), tan, with red mottling, damp, very stiff, silty, moderate to high plasticity, no odor				20			
		15					
Same as above with black oxidation mottling, grading to sandy Clay, fine-grained sand				31			

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EXPLORATORY BORING LOG

3810 BROADWAY
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1355-1-1009	November 1991	MW-1

DRILL RIG	CME 55 HSA	SURFACE ELEVATION	At Grade	LOGGED BY	MJ
DEPTH TO GROUNDWATER	31 ft.	BORING DIAMETER	2-inch	DATE DRILLED	10/17/91

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
Same as above, with fine-grained sand stringers, very stiff, damp				29			
						Bentonite pellet plug	
CLAY (CL),brown, moist, silty, very stiff		25		21			
						2/12 washed sand filter pack	
		30					
				27		2-inch PVC, Schedule 40 slotted (0.020-inch) casing	
Clay with silty sand lenses (to 2" thick) with fine-grained sand, free water in lenses							
		35					
				30		Sand backfill in bottom of boring	
Clay grading to sand (fine-grained), moist, very stiff							

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. Ground water was measured at 31 feet at time of drilling. After 5 hours, ground water was measured at 11.8 feet.
3. N.S. = Not Surveyed

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EXPLORATORY BORING LOG

3810 BROADWAY
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1355-1-1009	November 1991	MW-1

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (415) 484-2600

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 3810 Broadway
Oakland California

CLIENT
Name Friedman - Becker
Address 300 Grand Ave Phone 510-465-7500
City Oakland Zip 94610

APPLICANT
Name Kaldveer Associates
Monika Jemenez
Address 425 Roland Way Phone 510-568-4001
City Oakland Zip 94621

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	X	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE

Domestic	___	Industrial	___	Other	X
Municipal	___	Irrigation	___		

DRILLING METHOD:

Mud Rotary	___	Air Rotary	___	Auger	X
Cable	___	Other	___		

DRILLER'S LICENSE NO. 582696

WELL PROJECTS

Drill Hole Diameter	8 in.	Maximum Depth	35 ft.
Casing Diameter	2 in.		
Surface Seal Depth	20 ft.	Number	1

GEOTECHNICAL PROJECTS

Number of Borings	___	Maximum Depth	___ ft.
Hole Diameter	___ in.		

ESTIMATED STARTING DATE 10-17-91
ESTIMATED COMPLETION DATE 10-17-91

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Monika Jemenez Date 10/11/91

FOR OFFICE USE

PERMIT NUMBER 91601
LOCATION NUMBER

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 11 Oct 91
Wyman Hong

51991

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

APPENDIX B

MONITORING WELL DEVELOPMENT
AND SAMPLING LOG

WATER SAMPLE LOG

Project Name: 3810 Broadway Date: 10/18/91
Project Number: KE1355-1-1009 Sampler: MJ
Well Number: MW-1 Weather: Sunny
Well Location: In front of garage service area

Well Construction:

Date Completed: 10/17/91
Total Depth of Well: 34 Feet
Diameter: 2 Inch
Well Elevation & Reference: Top of PVC - North side

Groundwater Levels:

Initial: 14.25 Feet
Final: 26.15 Feet
Reference Point:
Well Volume of Water: 3.4 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: Liquinox Rinse
Pump or Bailer Type: Teflon Bailer
Method of Cleaning: Liquinox Rinse
pH Meter: Orion 230A
Conductivity Meter: Orion 120
Comments: Water has a white foam, very thick at the beginning of development.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
11:10	Began Pumping	0						
11:20		2	7.11	25.7		1702	Brown/Heavy V. Silty	None
11:50		5	7.18	25.6		1945	"	"
12:05		12	6.97	28.2		2210	Brown/Heavy Mod. Silt	"
12:15	Stopped Pumping							
13:10	Resumed Bailing							
14:15		25	6.81	21.5		2020	Lt. Brown/ Moderate	None
14:40		30	6.84	21.2		2090	"	"
15:10		35	6.86	21.1		2070	"	"
15:40		40	6.96	21.1		1870	"	"

Total Discharge: 43 Gallons
Casing Volumes Removed: 12.5 Volumes
Method of Disposal: To 55 gallon drum.

Comments: RPR told to stop pumping at 12:15 and resume when he arrived.

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

3810 BROADWAY
Oakland, California

PROJECT NO.	DATE	Figure
KE1355-1-1009	October 1991	MW-1

WATER SAMPLE LOG

Project Name: 3810 Broadway Date: 10/18/91
Project Number: KE1355-1-1009 Sampler: MJ
Well Number: MW-1 Weather: Sunny
Well Location: In front of garage service area

Well Construction:

Date Completed: 10/17/91
Total Depth of Well: 34 Feet
Diameter: 2 Inch
Well Elevation & Reference: Top of PVC - North side

Groundwater Levels:

Initial: 14.25 Feet
Final: 26.15 Feet
Reference Point:
Well Volume of Water: 3.4 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: Liquinox Rinse
Pump or Bailer Type: Teflon Bailer
Method of Cleaning: Liquinox Rinse
pH Meter: Orion 230A
Conductivity Meter: Orion 120
Comments: Water has a white foam, very thick.

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°C)	Spec. Conductance (umhos/cm)		Color/ Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
16:23	Sampled	43						

Total Discharge: 43 Gallons
Casing Volumes Removed: 12.5 Volumes
Method of Disposal: To 55 gallon drum.

Comments: RPR told to stop pumping at 12:15 and resume when he arrived.

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

3810 BROADWAY
Oakland, California

PROJECT NO	DATE	
KE1355-1-1009	October 1991	Figure MW-1

APPENDIX C

CHAIN-OF-CUSTODY RECORD
LABORATORY ANALYTICAL RESULTS

R-5, S-D
R-1, S-E C-1, S-1

Lab Job # 9110159

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name / Location
KE1355-1-1009	3810 BROADWAY OAKLAND

Sampler's Name (printed): M JIMENEZ

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	Remarks
MW-1C 10½	01A	9/17	X		2"x6" BRASS	
MW-1C 15½	02A		X			
MW-1C 20½	03A		X			~~HOLD~~ off hold 10/30/91 per Marcella CM
MW-1C 25½	04A		X			~~HOLD~~
MW-1C 30½	05A		X			HOLD
MW-1C 35½	06A	↓	X		↓	HOLD
W-1	07AB	10/18		X	2-AMBER	
W-1	CD			X	2-L AMBER	
W-1	EF			X	2- PLASTIC	Run Pb by Method AA
W-1	GH			X	2 L AMBER	
W-1	IJK			X	3-40 ML VOAS	metals filtered & preserved in lab
W-1	LMN	↓		X	3-40ML VOAS	

Analytical Tests: Method 8015 - TPH as Gasoline; Method 8015 - TPH as Diesel; Method 8240 - Volatile Organics; Method 8270 - Semi-Volatile Organics; Method 8010 - Halogenated Volatile Organics; Method 8080 - Organochlorine Pesticides & PCB's; Waste Oil - 5520 E/B/F; Metals - CA, Cr, Zn, Ni, Pb; TPH gas w/ BTEX; 8010 Extract only

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	10/18/91 18:35	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	10/18/91 1835	Denise Harrington

Ship To: MED-TOX

Attention:

Phone No:

Requested Turnaround Time: NORMAL

Kaldveer Assoc. Contact: RANDY ROWLEY

Remarks:

Please address correspondence and return cooler # _____ to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

ANALYTICAL SERVICES

DOHS CERTIFICATION NO: E772

MED-TOX ASSOCIATES INC

CERTIFICATE OF ANALYSIS

NOV

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: RANDY ROWLEY

CLIENT PROJ. ID: KE1355-1-1009

REPORT DATE: 11/05/91

DATE SAMPLED: 10/17-18/91
DATE RECEIVED: 10/18/91

ADDITIONAL ANALYSIS
REQUESTED: 10/22,30/91

MED-TOX JOB NO: 9110159

ANALYSIS OF: WATER & SOIL SAMPLES

Sample Identification Client Id.	Lab No.	Oil & Grease (mg/kg)	Hydrocarbons (mg/kg)	Extractable Hydrocarbons as Diesel (mg/L)	Extractable Hydrocarbons as Oil (mg/L)	Oil & Grease (mg/L)	Hydrocarbons (mg/L)
MW-1 @ 10.5	01A	ND	ND	---	---	---	---
MW-1 @ 15.5	02A	ND	ND	---	---	---	---
MW-1 @ 20.5	03A	ND	ND	---	---	---	---
MW-1 @ 25.5	04A	ND	ND	---	---	---	---
W-1	07A	---	---	1.7	0.4	---	---
W-1	07C	---	---	---	---	1	ND
Detection Limit		10	10	0.05	0.1	0.5	0.5
Method:		5520E	5520F	3510 GCFID	3510 GCFID	5520C	5520F
Instrument:		IR	IR	E	E	IR	IR
Date Extracted		10/22,31/91	10/22,31/91	10/24/91	10/24/91	10/25/91	10/25/91
Date Analyzed:		10/23-31/91	10/23-31/91	10/28/91	10/28/91	10/25/91	10/25/91

ND = Not Detected

Andrew Bradeen, Manager
Organic Laboratory

Dave Sandusky, Manager
Inorganic Laboratory

Results FAXed 10/29-31/91

KALDVEER ASSOCIATES, INC.

DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
CLIENT PROJ. ID: KE1355-1-1009

REPORT DATE: 11/05/91
MED-TOX JOB NO: 9110159

Sample Identification Client Id.	Lab No.	Cadmium (mg/L)	Chromium (mg/L)	Nickel (mg/L)	Lead (mg/L)	Zinc (mg/L)
W-1	07E	ND	ND	0.02	ND	0.091
Detection Limit		0.005	0.01	0.01	0.02	0.005

Method: 6010

Instrument: ICP

Date Analyzed: 10/28/91

ND = Not Detected

Note: Sample was filtered through a 0.45 um filter and preserved with HNO_3 on 10/18/91.

KALDVEER ASSOCIATES, INC.

CLIENT ID: W-1
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-07I
MED-TOX JOB NO: 9110159
DATE ANALYZED: 10/25/91
INSTRUMENT: G

EPA METHOD 8010 (WATER MATRIX)
HALOGENATED VOLATILE ORGANICS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	0.5
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	0.5
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.5
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	**95-50-1**	**0.7**	**0.5**
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	0.5
1,1-Dichloroethane	**75-34-3**	**0.7**	**0.5**
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-69-4	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	**75-09-2**	**2**	**0.5**
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	0.5

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: W-1
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-07L
MED-TOX JOB NO: 9110159
DATE ANALYZED: 10/21/91
INSTRUMENT: F

BTEX AND HYDROCARBONS (WATER MATRIX)

METHOD: EPA 8020, 5030 GCFID

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	4.1	0.3
Toluene	108-88-2	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	20	1
PURGEABLE HYDROCARBONS AS:			
Gasoline		0.3 mg/L	0.05 mg/L

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: MW-1 @ 10.5
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/17/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-01A
MED-TOX JOB NO: 9110159
DATE ANALYZED: 10/22/91
INSTRUMENT: H

BTEX AND HYDROCARBONS (SOIL MATRIX)

METHOD: EPA 8020, 5030 GCFID

	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Benzene	71-43-2	ND	1
Toluene	108-88-3	ND	1
Ethylbenzene	100-41-4	ND	1
Xylenes, Total	1330-20-7	ND	3
PURGEABLE HYDROCARBONS AS:			
Gasoline		ND mg/kg	0.2 mg/kg

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: W-1
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-07G
MED-TOX JOB NO: 9110159
DATE EXTRACTED: 10/23/91
DATE ANALYZED: 10/27/91
INSTRUMENT: 11

EPA METHOD 8270 (WATER MATRIX)
GC/MS SEMI-VOLATILE ORGANIC COMPOUNDS
BASE/NEUTRAL EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acenaphthene	83-32-9	ND	10
Acenaphthylene	208-96-8	ND	10
Anthracene	120-12-7	ND	10
Benzidine	92-87-5	ND	50
Benzoic Acid	65-85-0	ND	50
Benzo(a)anthracene	56-55-3	ND	10
Benzo(b)fluoranthene	205-99-2	ND	10
Benzo(k)fluoranthene	207-08-9	ND	10
Benzo(g,h,i)perylene	191-24-2	ND	10
Benzo(a)pyrene	50-32-8	ND	10
Benzyl Alcohol	100-51-6	ND	20
Bis(2-chloroethoxy) methane	111-91-1	ND	10
Bis(2-chloroethyl)ether	111-44-4	ND	10
Bis(2-chloroisopropyl) ether	108-60-1	ND	10
Bis(2-ethylhexyl) phthalate	117-81-7	ND	10
4-Bromophenyl phenyl ether	101-55-3	ND	10
Butylbenzyl phthalate	85-68-7	ND	10
4-Chloroaniline	106-47-8	ND	20
2-Chloronaphthalene	91-58-7	ND	10
4-Chlorophenyl phenyl ether	7005-72-3	ND	10
Chrysene	218-01-9	ND	10
Dibenzo(a,h)anthracene	53-70-3	ND	10
Dibenzofuran	132-64-9	ND	10
Di-n-butylphthalate	84-74-2	ND	10
1,2-Dichlorobenzene	95-50-1	ND	10

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: W-1
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-07G
MED-TOX JOB NO: 9110159
DATE EXTRACTED: 10/23/91
DATE ANALYZED: 10/27/91
INSTRUMENT: 11

EPA METHOD 8270
BASE/NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1,3-Dichlorobenzene	541-73-1	ND	10
1,4-Dichlorobenzene	106-46-7	ND	10
3,3'-Dichlorobenzidine	91-94-1	ND	20
Diethylphthalate	84-66-2	ND	10
Dimethylphthalate	131-11-3	ND	10
2,4-Dinitrotoluene	121-14-2	ND	10
2,6-Dinitrotoluene	606-20-2	ND	10
Di-n-octylphthalate	117-84-0	ND	10
1,2-Diphenylhydrazine	122-66-7	ND	10
Fluoranthene	206-44-0	ND	10
Fluorene	86-73-7	ND	10
Hexachlorobenzene	118-74-1	ND	10
Hexachlorobutadiene	87-68-3	ND	10
Hexachlorocyclopentadiene	77-47-4	ND	10
Hexachloroethane	67-72-1	ND	10
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10
Isophorone	78-59-1	ND	10
2-Methylnaphthalene	91-57-6	ND	10
Naphthalene	91-20-3	ND	10
2-Nitroaniline	88-74-4	ND	50
3-Nitroaniline	99-09-2	ND	50
4-Nitroaniline	100-01-6	ND	50
Nitrobenzene	98-95-3	ND	10
N-Nitrosodimethylamine	62-75-9	ND	10
N-Nitrosodiphenylamine	86-30-6	ND	10
N-Nitroso-di-n-propylamine	621-64-7	ND	10
Phenanthrene	85-01-8	ND	10
Pyrene	129-00-0	ND	10
1,2,4-Trichlorobenzene	120-82-1	ND	10

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: W-1
CLIENT PROJ. ID: KE1355-1-1009
DATE SAMPLED: 10/18/91
DATE RECEIVED: 10/18/91
REPORT DATE: 11/05/91

MED-TOX LAB NO: 9110159-07G
MED-TOX JOB NO: 9110159
DATE EXTRACTED: 10/23/91
DATE ANALYZED: 10/27/91
INSTRUMENT: 11

EPA METHOD 8270
ACID EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
4-Chloro-3-methylphenol	59-50-7	ND	10
2-Chlorophenol	95-57-8	ND	10
2,4-Dichlorophenol	120-83-2	ND	10
2,4-Dimethylphenol	105-67-9	ND	10
4,6-Dinitro-2-methylphenol	534-52-1	ND	50
2,4-Dinitrophenol	51-28-5	ND	50
2-Methylphenol	95-48-7	ND	10
4-Methylphenol	106-44-5	ND	10
2-Nitrophenol	88-75-5	ND	10
4-Nitrophenol	100-02-7	ND	50
Pentachlorophenol	87-86-5	ND	50
Phenol	108-95-2	ND	10
2,4,5-Trichlorophenol	95-95-4	ND	10
2,4,6-Trichlorophenol	88-06-2	ND	10

ND = Not Detected

MED-TOX ASSOCIATES INC

QUALITY CONTROL DATA

KALDVEER ASSOCIATES, INC.

CLIENT PROJECT ID: KE1355-1-1009

MED-TOX JOB NO: 9110159

DATE EXTRACTED: 10/25/91
DATE ANALYZED: 10/25/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NO: 9110159
CLIENT PROJ. ID: KE1355-1-1009
INSTRUMENT: IR

IR DETERMINATION FOR OIL & GREASE/HYDROCARBONS
METHOD SPIKE RECOVERY SUMMARY
WATER MATRIX

ANALYTE	MS Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Oil	7.12	ND	7.12	7.12	100.0	0.0

CURRENT QC LIMITS (Revised 08/14/91)

Analyte	Percent Recovery	RPD
Oil	(87-116)	6.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE EXTRACTED: 10/22/91
DATE ANALYZED: 10/23/91
SAMPLE SPIKED: 9110159-01A

MED-TOX JOB NO: 9110159
CLIENT PROJ. ID: KE1355-1-1009
INSTRUMENT: IR

IR DETERMINATION FOR OIL & GREASE/HYDROCARBONS
METHOD SPIKE RECOVERY SUMMARY
SOIL MATRIX

ANALYTE	MS Conc. (mg/kg)	Sample Result (mg/kg)	MS Result (mg/kg)	MSD Result (mg/kg)	Average Percent Recovery	RPD
Oil	238	ND	249	254	105.6	2.0

CURRENT QC LIMITS (Revised 08/14/91)

Analyte	Percent Recovery	RPD
Oil	(66-130)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE EXTRACTED: 10/31/91
DATE ANALYZED: 10/31/91
SAMPLE SPIKED: 9110159-03A

MED-TOX JOB NO: 9110159
CLIENT PROJ. ID: KE1355-1-1009
INSTRUMENT: IR

IR DETERMINATION FOR OIL & GREASE/HYDROCARBONS
METHOD SPIKE RECOVERY SUMMARY
SOIL MATRIX

ANALYTE	MS Conc. (mg/kg)	Sample Result (mg/kg)	MS Result (mg/kg)	MSD Result (mg/kg)	Average Percent Recovery	RPD
Oil	221	ND	221	221	100.0	0.0

CURRENT QC LIMITS (Revised 08/14/91)

Analyte	Percent Recovery	RPD
Oil	(66-130)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE EXTRACTED: 10/24/91
DATE ANALYZED: 10/28/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NO: 9110159

INSTRUMENT: E

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3520
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	0.636	ND	0.359	0.351	55.8	2.2

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(49.3-101.4)	29.0

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 10/21/91
SAMPLE SPIKED: 9110167-01B
CLIENT PROJ. ID: KE1355-1-1009

MED-TOX JOB NO: 9110159
INSTRUMENT: F

METHOD SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	15.6	ND	16.0	15.8	101.9	1.3
Toluene	65.0	ND	66.7	66.3	102.3	0.6
Hydrocarbons as Gasoline	519	ND	526	510	99.8	3.1

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(77.7-118.0)	10.3
Toluene	(80.7-116.2)	10.1
Gasoline	(72.5-110.7)	13.6

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 10/22/91
SAMPLE SPIKED: 9110165-01A
CLIENT PROJ. ID: KE1355-1-1009

MED-TOX JOB NO: 9110159
INSTRUMENT: H

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(SOIL MATRIX)

ANALYTE	Spike Conc. (ug/kg)	Sample Result (ug/kg)	MS Result (ug/kg)	MSD Result (ug/kg)	Average Percent Recovery	RPD
Benzene	24.3	ND	24.9	26.0	104.7	4.3
Toluene	107	ND	107	111	101.9	3.7
Hydrocarbons as Gasoline	1040	920	1550	1620	63.9	4.4

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(80.8-125.2)	9.6
Toluene	(82.7-119.1)	10.2
Gasoline	(54.0-120.1)	14.8

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

INSTRUMEMT: G

MED-TOX JOB NO: 9110159

CLIENT PROJ. ID: KE1355-1-1009

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8010/8020
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)	
Date Analyzed	Client Id.	Lab No.	Bromochloro-methane	1,4-Dichloro-butane
10/25/91	MW-1	07I	91.7	101.3

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
Bromochloromethane	(79.5-115.3)
1,4-Dichlorobutane	(82.3-110.3)

DATE ANALYZED: 10/25/91

MED-TOX JOB NO: 9110159

CLIENT PROJ. ID: KE1355-1-1009

MATRIX SPIKE RECOVERY SUMMARY

METHOD 8010/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	ND	47.9	47.5	95.4	0.8
Trichloroethene	50.0	ND	60.9	61.9	122.8	0.2
Benzene	50.0	ND	53.8	53.9	107.7	0.2
Toluene	50.0	ND	53.2	53.1	106.3	1.9
Chlorobenzene	50.0	ND	46.7	45.9	92.6	1.7

CURRENT QC LIMITS (Revised 07/11/91)

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(66-130)	17
Trichloroethene	(83-128)	15
Benzene	(81-121)	10
Toluene	(81-119)	10
Chlorobenzene	(74-118)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 10/27/91

MED-TOX JOB NO: 9110159

CLIENT PROJ. ID: KE1355-1-1009

INSTRUMENT: 11

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8270
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)					
Date Extracted	Client Id.	Lab No.	Nitrobenzene-d_5	2-Fluorobiphenyl	Terphenyl-d_{14}	Phenol-d_5	2-Fluorophenol	2,4,6-Tribromophenol
10/23/91	W-1	07G	80.8	79.6	81.2	83.6	72.8	105.5

CURRENT QC LIMITS (Revised 10/15/91)

ANALYTE	PERCENT RECOVERY
Nitrobenzene-d_5	(41-105)
2-Fluorobiphenyl	(45-110)
Terphenyl-d_{14}	(31-139)
Phenol-d_5	(37-107)
2-Fluorophenol	(34- 95)
2,4,6-Tribromophenol	(33-145)

DATE EXTRACTED: 10/21/91
DATE ANALYZED: 10/24/91
CLIENT PROJ. ID: KE1355-1-1009

MED-TOX JOB NO: 9110159
SAMPLE SPIKED: D.I. WATER
INSTRUMENT: 11

MATRIX SPIKE RECOVERY SUMMARY
METHOD 8270
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Phenol	234	ND	176	164	72.6	7.1
2-Chlorophenol	203	ND	145	128	67.2	12.5
1,4-Dichlorobenzene	201	ND	115	108	55.5	6.3
N-Nitroso-di-n-propylamine	201	ND	163	170	82.8	4.2
1,2,4-Trichlorobenzene	209	ND	121	122	58.1	0.8
4-Chloro-3-methylphenol	204	ND	152	163	77.2	7.0
Acenaphthene	205	ND	128	135	64.1	5.3
4-Nitrophenol	201	ND	139	162	74.9	15.2
2,4-Dinitrotoluene	404	ND	307	316	77.1	2.9
Pentachlorophenol	408	ND	161	196	43.8	19.6
Pyrene	202	ND	144	140	70.3	2.8

CURRENT QC LIMITS (Revised 10/15/91)

Analyte	Percent Recovery	RPD
Phenol	(46- 92)	19
2-Chlorophenol	(51- 85)	26
1,4-Dichlorobenzene	(32- 85)	26
N-Nitroso-di-n-propylamine	(36-107)	17
1,2,4-Trichlorobenzene	(34- 87)	20
4-Chloro-3-methylphenol	(48-103)	14
Acenaphthene	(49-117)	15
4-Nitrophenol	(23-104)	16
2,4-Dinitrotoluene	(48-102)	16
Pentachlorophenol	(20-125)	22
Pyrene	(34-138)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: WATER

MED-TOX JOB NO: 9110159

CLIENT PROJ. ID: KE1355-1-1009

SAMPLE SPIKED: 9110159-07F

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
Cd, Cadmium	ICP/6010	ND	0.10	0.0901	0.0948	92.5	5.13	60.3-114.4	8.0
Cr, Chromium	ICP/6010	ND	0.50	0.470	0.477	94.7	1.50	72.9-109.7	5.0
Ni, Nickel	ICP/6010	0.018	0.50	0.491	0.498	95.2	1.55	74.6-108.7	5.0
Pb, Lead	ICP/6010	ND	0.50	0.483	0.488	97.1	1.01	74.8-110.9	5.0
Zn, Zinc	ICP/6010	0.091	0.50	0.555	0.560	93.3	0.93	67.4-109.8	5.0

ND = Not Detected