Kaldveer Associates
Geoscience Consultants

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Associate

David F. Hoexter, C.E.G.
Associate

Michael McRae, P.E.

Dawn Rinaldi, P.E.

April 22, 1988
KE431-93, 11409

Kragen Auto Supply Inc.
P.O. Box 6030
Phoenix, Arizona 95005

Attention: Mr. Tom Brown

RE: SOIL TESTING PROGRAM FOR
PETROLEUM STORAGE TANK
EXCAVATION
4200 MAC ARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Gentlemen:

In this letter report, we present the results of our soil testing program associated with the removal of four underground petroleum storage tanks at the proposed Kragen Auto Supply store. The site is located at 4200 MacArthur Boulevard, on the southeast corner of MacArthur Boulevard and MayBell, in Oakland, California. The purpose of our soil sampling and analytical testing has been to determine the concentrations (if any) of petroleum hydrocarbons in the native soil below the underground tanks.

The scope of work included the following: 1) sample and analytically test fluids found in each tank, 2) observe the tank removal operations, 3) sample and analytically test soil from below the underground tanks, 4) sample and analytically test bedding and fill soils from under and around the tanks, 5) sample and analytically test water seeping into the main tank excavation, and 6) preparation of this letter report. The investigation and preparation of this report was conducted by Mr. Randy P. Rowley, Project Geologist.

Tank Information

Four underground steel tanks were located at the western end of the property, approximately as shown on the enclosed Site Plan, Figure 1. The tank volumes are estimated to be: Tank 1 - 500 gallons; Tank 2 - 5000 gallons; and Tanks 3 and 4 - 8000 gallons each. It is believed that Tank 1 contained waste oil, Tank 2 gasoline or diesel and Tanks 3 and 4, gasoline. The ages of the tanks are not known.

Tank Removal and Sampling

On March 29, and April 4, 1988, samples were taken of the residual fluids

425 Roland Way
Oakland, California 94621
(415) 568-4001
FAX: 415-568-2205
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within Tanks 2 and 3 and Tanks 1 and 4, respectively. The samples were obtained to assist in the fluid hauling and disposal process. The fluid sampling was not related to the soil sampling subsequently performed. After the contents of the tanks were identified and quantified, the tanks were vacuum pumped and the fluid transported from the site for disposal by Erickson Incorporated, of Richmond, California.

On April 12, 1988, the remaining vapors in the tanks were purged by placing dry ice in the tanks and using an air blower to assist in evacuating the tanks. The tanks were removed from the excavations by Charles S. Campanella Inc., of Oakland, California. The tanks were immediately removed from the site by Erickson Incorporated.

After the tanks were removed from the ground, representatives of Kaldveer Associates took one soil sample from approximately two feet below the center of Tank 1. In addition, samples were obtained from approximately two feet below each end of Tanks 2, 3 and 4.

To obtain the samples, a backhoe bucket was used to scrape away any residual bedding materials and surficial soils. Then the bucket was pushed into the native undisturbed soil to retrieve fresh undisturbed soil. The full bucket was then brought to the surface where the upper approximately six inches of soil was scraped away and the soil samples obtained by driving a six-inch long brass tube into the soil. Prior to sampling, the brass tubes were cleaned with trisodium phosphate solution, rinsed with fresh water and then a final rinse of deionized water. After the sample was retrieved, the sample tube ends were covered with aluminum foil, rubber-capped, tagged with a sample identification, sealed in a zip-lock bag and refrigerated until delivery to the analytical laboratory for testing.

Three additional soil samples were taken of backfill and bedding soils which had an odor and appeared to be contaminated with hydrocarbons. The three samples were taken from separate locations from within the tank excavation and were later composited in the laboratory for testing as one composite sample. The samples were retrieved as described previously.

Water from a possible spring was observed to be seeping into the up-gradient eastern end of the tank excavation. As directed by the Alameda County Department of Health Services representative, Inspector Lowell Miller, the water was sampled and tested. Using the backhoe, a small sump was dug to accumulate the water. When enough water had accumulated, two water samples were taken. The samples were retrieved using a bailer cleaned prior to sampling using the same cleaning procedures as described previously. However, the backhoe bucket was not cleared, and could have introduced contamination into the water.

After all the sampling was performed, the contractor covered the stockpiled bedding and backfill material in the excavation with soils resulting from the cutting back of trench walls for safety concerns.

All of the soil samples and water samples were delivered on the same day, under chain-of-custody control, to Trace Analysis Laboratory in Hayward, California.

Analytical Testing Results

The testing program consisted of the following analyses as specified by Alameda County Health Services personnel and in accordance with Standard EPA Test Methods and attachment 2 of the "Guidelines for Addressing Fuel Leaks" (September, 1985), by the California Regional Water Quality Control Board, San Francisco Bay Region.

Test Name	EPA Test Method
PCB Analysis	8080 (For PCB)
Purgeable Halocarbons	8010 (Standard)
Total Volatile Hydrocarbons	8015 (Modified)
Total Extractable Hydrocarbons	8015 (Modified)
Purgeable Aromatics	8020 (Modified)
Oil and Grease	503E (Standard)

No 8270.

A summary of the analytical test results of all the samples which had identified compounds at concentrations greater than the detection limits of each test is presented on the following table. The complete analytical test results, including the chain-of-custody records, are presented in the attached Appendix A.

SUMMARY OF TEST RESULTS ABOVE DETECTION LIMITS
(In parts per million)

Soil or Water Sample	Location	TVH	TEH	Benzene	Toluene	Xylene	Ethyl Benzene	Oil and Grease
SS-8 (composite)	Fill	29	230	1.4	1.0	5.0	2.3	39
SS-5	Tank 1, Center	ND	ND	ND	ND	ND	ND	52
W-1	East End Excavation	220 0.22	ND	.76 0.00076	1.2 0.0012	6.6 0.0066	.99 0.00099	-

ppb

Note: TVH is Total Volatile Hydrocarbons ("gasoline")
TEH is Total Extractable Hydrocarbons ("diesel")
ND is non-detected
- is not tested for

Tank Fluid Sample	TVH	TEH	Benzene	Toluene	Xylene	Ethyl Benzene	1, 2- Dichloroethane	Chloroform
Tank 2	1000	90	21	11	57	3.1	-	-
Tank 3	1400	480	ND	0.370	72	0.580	-	-
Tank 4	1700	97	14	91	5.6	0.920	1.4	0.770

From Inside of Tanks. All tanks contained diesel.

Conclusions and Recommendations

Samples from the native undisturbed soils from below the removed underground Tanks 1, 2, 3 and 4 contain less than 100 ppm total petroleum hydrocarbons. Therefore, in our opinion, no further excavation needs to be performed of those soils.

The water sample taken of a water seep in the tank excavation resulted in a trace amount of hydrocarbons being identified. In our opinion, the trace amount detected is likely to be the result of poor water sampling conditions and the trace amount of contaminate is sampling error. The probable source of the water was a spring up-gradient from the tank excavation. Therefore, we recommend no further testing of water seepage at this site.

The backfill and bedding materials were found to have levels of Total Extractable Hydrocarbons which exceed 100 ppm but are less than 1000 ppm. Because the concentration exceeds the level which is acceptable to leave in place, without groundwater monitoring, we recommend that the backfill and bedding materials be disposed of. Because it is not prudent to attempt to aerate the soils of extractable hydrocarbons, the most cost effective disposal method would be disposal at a site which will accept hydrocarbons. Such a site is located in Bakersfield, California and it would be possible to truck the soil as a non-hazardous material, which would greatly reduce the cost of disposal.

Alternatives to disposal do exist. These include bioremediation and other primary experimental methods. However, there is currently no room at the site to remediate the soil and transfer and treatment costs at another location, combined, would likely exceed the cost of disposal. Burying of the material under parking areas might be feasible, but would require acceptance by regulatory authorities and, most likely, groundwater monitoring.

We therefore recommend that disposal of the backfill and bedding material be performed as soon as possible and that a Kaldveer Associates representative be present during removal to observe and confirm the removal of contaminated soils.

Limitations

Our services have been performed in accordance with generally accepted soil and environmental engineering principles and practices. No other warranty, either expressed or implied is made. The analysis and conclusions contained in this letter report are based on the site conditions as they existed at the time of our investigation, discussions with site owners and governmental agents and on field and laboratory results from subcontractors. Changes in the information or the data gained from any of these sources could result in changes in our conclusions. If such changes do occur, we should be advised so that we can review our report in light of those charges.

It has been a pleasure to be of service to you. If you have any further questions, please call.

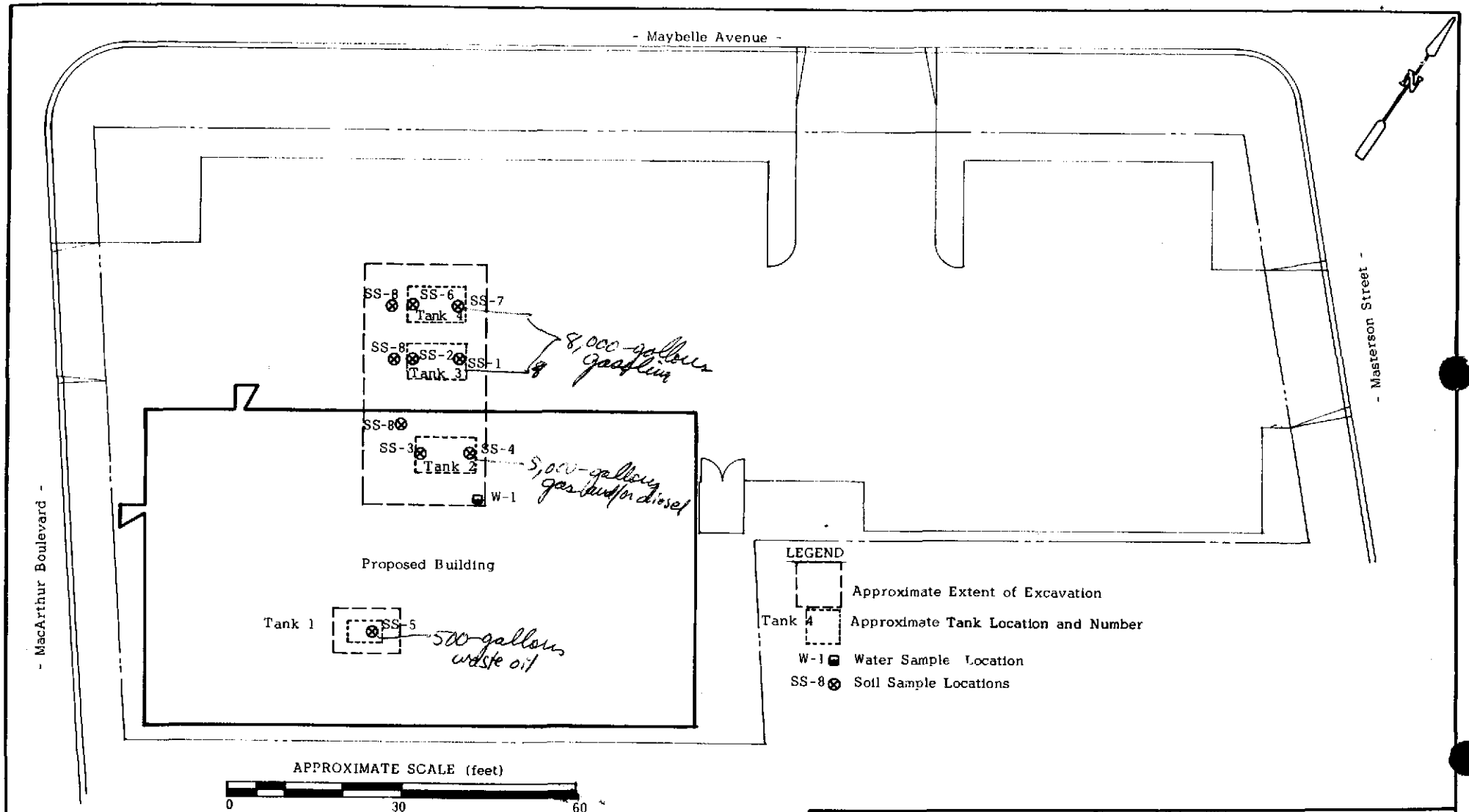
Very truly yours,

KALDVEER ASSOCIATES, INC.

David F. Hoexter, CEG 1158
Manager, Environmental/
Geological Services

Ronald L. Bajuniemi
Vice President Engineering

DFH/RLB:jb
Copies: Addressee (2)
CSB (2)
Alameda County Hazardous Materials Division (2)
Enclosures: Figure 1 - Site Plan
Appendix A - Analytical Laboratory Results and Chain-of-Custody



Base: Topographic and Boundary Survey Map, by Michael Ward Vittitow, dated February 12, 1987.

PETER KALOVEER AND ASSOCIATES, INC.
Geotechnical Consultants

SITE PLAN

KRAGEN UNDERGROUND TANKS
Oakland, California

PROJECT NO.	DATE	Figure
KE431-93	April 1988	1

APPENDIX A

ANALYTICAL LABORATORY RESULTS
AND
CHAIN-OF-CUSTODIES

Requester Dave Hoexter
48 hr.

CHAIN-OF-CUSTODY RECORD

Project Number: KE431-93

Project Name: Oakland ~~Krapa~~ Underground Tanks

Sampler's Name (printed): Richard Harc

Tank ~~Boring~~ Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TVH/BTX&E	TEH				Remarks
1	3-29-88	~~[illegible]~~		X	Tank 1 1½' in tank	1	40ml (2)	/					Note: ~~[illegible]~~ samples designated
1	3-29-88	9:45		X	⊥	1	1-l		/				Tank 1 should be Tank 2
		3:45											And those designated Tank
2	3-29-88	4:05		X	Tank 2 approx 3½' in tank	2	40ml (2)	/					2 should be Tank 3
2	3-29-88	4:05		X	⊥	2	1-l		/				RPR

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Richard Harc	3-29-88 4:45	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
		TRACE ANALYSIS LABORATORY 3423 INVESTMENT BLVD., UNIT 8 HAYWARD, CA 94545 (415) 783-6960 [signature]

Ship To: Trace Analysis Laboratory, 3423 Investment Blvd.

Attention:

Phone No.: 415 783 6960

Requested Turnaround Time: 48 hr.

Kaldveer Contact: Randy Rowley

Remarks:

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

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Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hay[redacted]d, California 94545 *(415) 783-6960*

TAL

DATE: 4/4/88

LOG NO.: 5818

DATE SAMPLED: 3/29/88

DATE RECEIVED: 3/29/88

CUSTOMER: Kaldveer Associates, Inc.

REQUESTER: Dave Hoexter

PROJECT: No. KE431-93, Kragen Underground Tanks, Oakland

Tank Fluid

Sample Type: Water

RPR

Method and Constituent	Units	Tank 1 2 Concentration	Tank 1 2 Detection Limit	Tank 2 3 Concentration	Tank 2 3 Detection Limit
Modified EPA Method 8015:					
Volatile Hydrocarbons	ug/l	1,000,000	500,000	1,400,000	50,000
Extractable Hydrocarbons	ug/l	90,000	30	480,000	30
Modified EPA Method 8020:					
Benzene	ug/l	21,000	500	< 50	50
Toluene	ug/l	11,000	400	370	40
Xylenes	ug/l	57,000	1,000	72,000	100
Ethyl Benzene	ug/l	3,100	700	580	70

Hugh R. McLean

Hugh R. McLean
Supervisory Chemist

HRM:mln

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE431-93	Oakland Kroger Underground Tanks

Sampler's Name (printed): Randy Rowley

Boring Number	Date (1988)	Time	Time Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TVH & BTXE	Analytical Tests: TEH	Analytical Tests: PCB's (sludge)	Remarks
Tank 4	4-4	1140	1530	✓		Tank 4	2-WM	✓			
↓	↓	↓		✓		Tank 4	1L		✓		
Tank 1	4-4	1530	1540	✓		Tank 1	1-L			✓	"Sludge"
											Train log #5836

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time: 4-4-88 / 1644	Received for Laboratory by: (Signature) 4/8/88 1645

Ship To: Trace Analysis Laboratory
3423 Investment Blvd

Attention:

Phone No: 415-783 6960

Requested Turnaround Time: 48hr

Remarks:

Kaldveer Assoc. Contact: Randy Rowley

TRACE ANALYSIS LABORATORY
3423 INVESTMENT BLVD., UNIT B
HAYWARD, CA 94545
(415) 783-6960

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

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3423 Investment Boulevard, #8 • Hayward, California 94545 *(415) 783-6960*

TAL

DATE: 4/7/88

LOG NO.: 5836

DATE SAMPLED: 4/4/88

DATE RECEIVED: 4/4/88

APR 11 1988

CUSTOMER: Kaldveer Associates, Inc.

REQUESTER: Dawn Rinaldi

PROJECT: No. KE431-93, Kragen Underground Tanks, Oakland

Sample Type: Water Tank Fluid

Method and Constituent	Units	Tank No. 4 Concentration	Tank No. 4 Detection Limit
Modified EPA Method 8015:			
Volatile Hydrocarbons	ug/l	1,700,000	7,000
Extractable Hydrocarbons	ug/l	97,000	50
Modified EPA Method 8020:			
Benzene	ug/l	14,000	40
Toluene	ug/l	9,100	30
Xylenes	ug/l	5,600	50
Ethyl Benzene	ug/l	920	50

DATE: 4/[redacted]/88
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PAGE: Two

Sample Type: Water Tank Flood

Method and Constituent	Units	Tank No. 4 Concentration	Detection Limit
EPA Method 8010:			
Benzyl chloride	ug/l	< 10	10
Bis (2-chloroethoxy) methane	ug/l	< 10	10
Bis (2-chloroisopropyl) ether	ug/l	< 10	10
Bromobenzene	ug/l	< 10	10
Bromodichloromethane	ug/l	< 10	10
Bromoform	ug/l	< 10	10
Bromomethane	ug/l	< 10	10
Carbon tetrachloride	ug/l	< 10	10
Chloracetaldehyde	ug/l	< 10	10
Chloral	ug/l	< 10	10
Chlorobenzene	ug/l	< 10	10
Chloroethane	ug/l	< 10	10
Chloroform	ug/l	770	10
1-Chlorohexane	ug/l	< 10	10
2-Chloroethyl vinyl ether	ug/l	< 10	10
Chloromethane	ug/l	< 10	10
Chloromethyl methyl ether	ug/l	< 10	10
Chlorotoluene	ug/l	< 10	10
Dibromochloromethane	ug/l	< 10	10
Dibromomethane	ug/l	< 10	10
1,2-Dichlorobenzene	ug/l	< 10	10
1,3-Dichlorobenzene	ug/l	< 10	10
1,4-Dichlorobenzene	ug/l	< 10	10
Dichlorodifluoromethane	ug/l	< 10	10
1,1-Dichloroethane	ug/l	< 10	10
1,2-Dichloroethane	ug/l	1,400	10

DATE: /88
LOG NO.: 5836
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PAGE: Three

Sample Type: Water

Tank Blend

Tank No. 4

Method and Constituent	Units	Concentration	Detection Limit
EPA Method 8010 (Continued):			
1,1-Dichloroethylene	ug/l	< 10	10
trans-1,2-Dichloroethylene	ug/l	< 10	10
Dichloromethane	ug/l	< 10	10
1,2-Dichloropropane	ug/l	< 10	10
1,3-Dichloropropylene	ug/l	< 10	10
1,1,2,2-Tetrachloroethane	ug/l	< 10	10
1,1,1,2-Tetrachloroethane	ug/l	< 10	10
Tetrachloroethylene	ug/l	< 10	10
1,1,1-Trichloroethane	ug/l	< 10	10
1,1,2-Trichloroethane	ug/l	< 10	10
Trichloroethylene	ug/l	< 10	10
Trichlorofluoromethane	ug/l	< 10	10
Trichloropropane	ug/l	< 10	10
Vinyl chloride	ug/l	< 10	10

DATE: 4/[redacted]88
LOG NO.: 5836
DATE SAMPLED: 4/4/88
DATE RECEIVED: 4/4/88
PAGE: Four

Sample Type: Sludge Tank Contents

Method and Constituent	Units	Tank No. 1 Concentration	Tank No. 1 Detection Limit
EPA Method 8080 for PCB:			
Aroclor 1016	ug/kg	< 5,000	5,000
Aroclor 1221	ug/kg	< 5,000	5,000
Aroclor 1232	ug/kg	< 5,000	5,000
Aroclor 1242	ug/kg	< 5,000	5,000
Aroclor 1248	ug/kg	< 5,000	5,000
Aroclor 1254	ug/kg	< 5,000	5,000
Aroclor 1260	ug/kg	< 5,000	5,000

Hugh R. McLean

Hugh R. McLean
Supervisory Chemist

HRM:mln

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE 431-93	KRAGEN Auto 4200 MacArthur

Sampler's Name (printed): Keith B. Craig and Randy Rowley

Tank ~~Boring~~ Number	Date	Time	Soil	Water	Sample Location or Depth	Sample ~~Number~~	Number/Type of Containers (6")	Analytical Tests: TVH & BTX&E (gas)	TEH diesel	Oil & grease 503E	TD	Remarks
3	4-12-88	12:20	✓		-12'	East	1-Brass				SS-1	
3		12:26	✓			West					SS-2	
2		1235	✓			west					SS-3	
2		1250	✓			East					SS-4	
1		1255	✓			Tank 1					SS-5	
4		1350	✓			west					SS-6	
4		1350	✓			east					SS-7	
2		1330		✓	near tank 2	Spl-g (water)	2-40ml				W-1	
2		1330		✓	↓	Spl-g (water)	1-liter	~~X~~ TR			W-2	
Spoils		1400	✓		Spoils ~~Location~~	~~Spoils~~	3-Tubes				SS-8	Three tubes need to be composited

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
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Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	4-12-88 1545	[illegible] 4/13/88

Ship To: Trace Analysis Lab

Attention:

Phone No:

Requested Turnaround Time: 48 hrs

Remarks:

Kaldveer Assoc. Contact: (415) 785-0960

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

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TAL

DATE: 4/15/88

LOG NO.: 5856

DATE SAMPLED: 4/12/88

DATE RECEIVED: 4/12/88

CUSTOMER: Kaldveer Associates, Inc.

REQUESTER: Randy Rowley

PROJECT: No. KE431-93, Kragen Auto

Sample Type: Soil

Method and Constituent	Units	SS-1 Concentration	SS-1 Detection Limit	SS-2 Concentration	SS-2 Detection Limit	SS-3 Concentration	SS-3 Detection Limit
Modified EPA Method 8015:							
Volatile Hydrocarbons	ug/kg	< 100	100	< 100	100	< 100	100
Extractable Hydrocarbons	ug/kg	< 2,000	2,000	< 2,000	2,000	< 2,000	2,000
Modified EPA Method 8020:							
Benzene	ug/kg	< 20	20	< 20	20	< 20	20
Toluene	ug/kg	< 20	20	< 30	30	< 20	20
Xylenes	ug/kg	< 40	40	< 50	50	< 40	40
Ethyl Benzene	ug/kg	< 30	30	< 40	40	< 30	30

DATE: 4/25/88
LOG NO.: 5856
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Sample Type: Soil

Method and Constituent	Units	SS-4 Concentration	SS-4 Detection Limit	SS-5 Concentration	SS-5 Detection Limit	SS-6 Concentration	SS-6 Detection Limit
Modified EPA Method 8015:							
Volatile Hydrocarbons	ug/kg	< 100	100	< 100	100	< 100	100
Extractable Hydrocarbons	ug/kg	< 2,000	2,000	< 2,000	2,000	< 2,000	2,000
Modified EPA Method 8020:							
Benzene	ug/kg	< 20	20	< 20	20	< 20	20
Toluene	ug/kg	< 30	30	< 30	30	< 20	20
Xylenes	ug/kg	< 50	50	< 50	50	< 40	40
Ethyl Benzene	ug/kg	< 40	40	< 40	40	< 30	30
Standard Method 503E, Hydrocarbons:							
Oil and Grease	ug/kg			**52,000**	**10,000**		

Method and Constituent	Units	SS-7 Concentration	SS-7 Detection Limit	Composite of SS-8 Tube 1, Tube 2, and Tube 3	ppm	Det. Lim.
Modified EPA Method 8015:						
Volatile Hydrocarbons	ug/kg	< 100	100	29,000	29	80
Extractable Hydrocarbons	ug/kg	< 2,000	2,000	**230,000**	230	2,000
Modified EPA Method 8020:						
Benzene	ug/kg	< 20	20	1,400	1.4	10
Toluene	ug/kg	< 30	30	1,000	1.0	10
Xylenes	ug/kg	< 50	50	5,000	5.0	30
Ethyl Benzene	ug/kg	< 40	40	2,300	2.3	20
Standard Method 503E, Hydrocarbons:						
Oil and Grease	ug/kg			**39,000**		**10,000**

DATE: 4/[illegible]/88
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DATE SAMPLED: 4/12/88
DATE RECEIVED: 4/12/88
PAGE: Three

Sample Type: Water Groundwater

Method and Constituent	Units	W-1 Concentration	W-1 Detection Limit	W-2 (-?) Concentration	W-2 (-?) Detection Limit
Modified EPA Method 8015:					
Volatile Hydrocarbons	ug/l	220	9		
Extractable Hydrocarbons	ug/l			< 60	60
Modified EPA Method 8020:					
Benzene	ug/l	0.76	0.1		
Toluene	ug/l	1.2	0.1		
Xylenes	ug/l	6.6	0.1		
Ethyl Benzene	ug/l	0.99	0.1		

Hugh R. McLean

Hugh R. McLean
Supervisory Chemist

HRM:mln