Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

June 1987 IG file 167

REPORT
ENVIRONMENTAL INVESTIGATION
RELATED TO UNDERGROUND TANK REMOVAL
at
Former Beacon Station #574
22315 Redwood Road
Castro Valley, California

Applied GeoSystems Job No. 87032-1

Report prepared for:

Beacon Oil Company
525 West Third Avenue
Hanford, California

by

Charles L. Ard
Project Geologist

for
Michael N. Clark
C.E.G. 1264

June 25, 1987

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

June 25, 1987
87032-1

Mr. Jim McCutchen
Beacon Oil Company
525 West Third Street
Hanford, CA 94621

Subject: Transmittal of Report No. 87032-1, Environmental Investigation Related to Underground Tank Removal and contamination mitigation at former Beacon Service Station #574, 22315 Redwood Road, Castro Valley, California.

Mr. McCutchen:

This report presents the results of our limited environmental investigation conducted on May 5, 1987 at the above-referenced site. The purpose of the investigation was to inspect five underground storage tanks when they were removed, and assess whether hydrocarbon product was or was not present in the soil under or adjacent to the tanks.

It is our understanding that the 500-gallon tank (T1) contained waste oil, the two 5000-gallon tanks (T2,T4) contained diesel fuel, and that the 8000- and 7500-gallon tanks (T3,T5) contained gasoline. Inspection of the removed tanks indicate that tanks T2, T3, and T5 had no rust and only minor pitting. Tank T1 was rusted and pitted but showed no indications of through going holes or leaks. Product tank T4 showed slight rust and moderate to severe, possible through going pitting. Strong product odor was also noted in the soil beneath tank T4.

Laboratory analysis indicate relatively high levels of hydrocarbon contamination in soil samples from beneath tanks T2 and T4. In our opinion, these contamination levels required further soil removal. Guidelines of the Regional Water Quality Control Board, San Francisco Bay Region, recommend that all soil containing hydrocarbon contamination levels in excess of 1000 parts per million be removed.

An Applied GeoSystems geologist returned to the site on May 18, 1987 and observed further excavation of the contaminated soil. Organic vapor analyzer (OVA) readings taken during the excavation showed that hydrocarbon contamination was not confined to the tank pit, but had spread laterally to the north at the eastern end of the tank pit. Vertical excavation was halted at a depth of 20 feet due to mechanical limits of the excavation equipment and safety considerations. Excavation laterally away from the tank pit was terminated when OVA readings indicated a significant decrease in hydrocarbon contamination present in the soil. Soil samples were collected from selected areas in the tank pit cavity and adjoining excavation to be analyzed for the presence of hydrocarbons.

The results of these analyses show total hydrocarbon concentrations to be below the 1000 ppm threshold in all samples except S-20-T4D, which had 1989 ppm total volatile hydrocarbons (TVH) and 1192 ppm total extractable hydrocarbons (TEH).

In our opinion, and in accordance with guidelines of The San Francisco Bay Regional Water Quality Control Board, one ground water monitoring well should be installed at the site, because hydrocarbon contamination levels are present in the soil that exceed 100 ppm.

We are prepared to present a formal work plan for the implementation of our recommendations to Beacon Oil Company, for review by The Regional Water Quality Control Board and the Alameda County Department of Environmental Health.

We further recommend that Beacon Oil Company submit an unauthorized release report to The San Francisco Bay Regional Water Quality Control Board as soon as possible and also send a copy of this report to Mr. Ted M. Gerow, Public Health Engineer, Alameda County Division of Environmental Health, 470 27th Street, Rm. 324, Oakland, California 94612 and to Mr. Tom Callaghan, California Regional Water Quality Control Board, San Francisco Bay Region, 1111 Jackson Street, Rm. 6040, Oakland, California 94607.

Sincerely,
Applied GeoSystems

Charles L. Ard
Project Geologist

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

REPORT

ENVIRONMENTAL INVESTIGATION RELATED TO UNDERGROUND TANK REMOVAL at Former Beacon Station #574 22315 Redwood Road Castro Valley, California

INTRODUCTION

The following report summarizes the limited environmental investigation conducted in conjunction with the removal of five underground storage tanks at the former Beacon Station #574 located at 22315 Redwood Road in Castro Valley, California. Beacon Oil Company requested that Applied GeoSystems conduct an Underground Storage Tank (UST) investigation to inspect the removed tanks, and test for the presence of hydrocarbon contamination in the soil under or adjacent to the tanks. Beacon also requested that contaminated soil removed from the tank pit area be aerated on site until average hydrocarbon contamination levels are low enough to be used as backfill for the tank pit cavity. This report describes the work elements associated with tank removal and inspection, soil sampling and analysis, summarizes the analytical results obtained, and presents our recommendations.

BACKGROUND

The former Beacon Station #574 site is located at 22315 Redwood Road immediately south of Grove Way, as shown on the Site Vicinity Map (Plate P-1). The site has been abandoned as a service station and is an empty lot. The tanks to be removed were located in two separate tank pits as shown on the Generalized Site Plan (Plate P-2). It is our understanding that a 500-gallon tank (T1) contained waste oil, two 5000-gallon tanks (T2 and T4) contained diesel fuel, and that a 7000- and an 8000-gallon tank (T3 and T5) contained gasoline.

TANK REMOVAL AND INSPECTION

D&B Construction Inc. of San Jose, California excavated the tanks with a backhoe on May 5, 1987. A geologist from Applied GeoSystems arrived on site the morning of May 5, 1987 to observe removal of the tanks, inspect their outer surfaces, and inspect and sample native soil from beneath the tanks after their removal. A representative from the Fire Department was present at various times during tank removal and inspection.

The tanks were checked for contents by Applied GeoSystems personnel before their removal. All five tanks were found to be

empty except T1 which had approximately 12 inches of waste oil in the bottom. The oil in the bottom of tank T1 was noted and approval was given by the Castro Valley Fire Department representative to prepare the tank for removal. Dry ice was placed inside the tanks approximately two hours prior to their removal, creating a non-explosive environment inside the tanks. Tanks were removed, rolled on their sides for inspection, then loaded onto a flatbed truck. The outer surface of the tanks were inspected by a field geologist from Applied GeoSystems for signs of leakage, holes, pitting or areas of weakness, and particular attention was paid to seams and points directly below the fill port. A summary of the observations made is shown in Table 1.

Table 1
Summary of Observations during Tank Inspection

Tank T1 (waste oil): steel, appx. 500-gallon capacity, no external supplemental covering, rusted, pitted, no signs of leakage or through-going holes.

Tank T2 (diesel): steel, appx. 5000-gallon capacity, no rust, several 1 inch diameter pits but no indications of leaks or through going holes, slight product odor in clay below tank.

Tank T3 (gasoline): steel, appx. 8000-gallon capacity, tank was clean with no rust and minor pitting, no visible indications of leaks or through going holes or areas of weakness.

Tank T4 (diesel): steel, appx. 5000-gallon capacity, slight rust, moderate to severe pitting with possible leakage from some pits, all seams look intact, moderate to strong product odor present in pit below tank.

Tank T5 (gasoline): steel, appx. 7000-gallon capacity, no rust, minor pitting, no visible leaks or areas of weakness, moderate product odor present below the tank.

The tanks were placed on a flatbed truck and transported by H and H Ship Service Company to their site in San Francisco for cleaning and metal salvage.

SOIL INSPECTION AND SAMPLING

Native soil beneath the tanks consists of a brown to red-brown clay with some sand. Product odor was subjectively detected in the excavated material. Soil samples were collected from the native soil material beneath the fill port and opposite ends of each tank, approximately 1 foot below the bottom of the tank.

Samples were collected by driving a laboratory-cleaned brass sleeve into a backhoe-bucket load of soil material immediately after it was brought to the surface. Samples were immediately sealed with aluminum foil, plastic caps, and air-tight tape. Samples were labeled and placed in iced storage for transport to Applied GeoSystems' certified laboratory in Fremont, California. A copy of the Chain-of-Custody report for these samples is included in the Appendix of this report.

ANALYTICAL RESULTS

Samples collected from beneath the waste oil tank (T1) were analyzed for total extractable hydrocarbons (TEH), oil and grease hydrocarbons, and purgeable priority pollutants. Soil samples from beneath the gasoline tanks (T3 and T5) were analyzed for total volatile hydrocarbons (TVH) and hydrocarbon constituents (BETX- benzene, ethyl benzene, toulene, and xylene), while those from beneath the diesel tanks (T2 and T4) were analyzed for TVH, TEH, and BETX. Analyses for (TEH) and (TVH) were conducted by Applied GeoSystems laboratory using gas chromatography with attached flame ionization detector (FID) and photo-ionization detector (PID) following EPA methods 8020 and 3550. Analytical results are shown in Table 2 and in the Appendix of this report. Analyses for oil and grease hydrocarbons and purgeable priority pollutants were conducted by Brown and Caldwell Laboratories in

Emeryville, California. The Oil and Grease Hydrocarbons Test showed 33 ppm hydrocarbon contamination while the Purgeable Priority Pollutants Test revealed no contaminants above total threshold limit concentrations. Analytical results are also included in the Appendix of this report.

June 25, 1987 AGS 87032-1
Former Beacon Oil Station - Castro Valley

TABLE 2
ANALYSIS OF SOIL SAMPLES AFTER TANK REMOVAL
Former Beacon Station #574
22315 Redwood Road
Castro Valley, California

sample no.	total volatile hydrocarbons	total extractable hydrocarbons	detection limit
S-10-T1N	3.09	ND*	0.05
S-13-T2N	4.38	ND*	0.05
[redacted]	[redacted]	[redacted]	1.0
S-13-T3N	35.23		0.05
S-13-T3S	4.58		0.05
[redacted]	[redacted]	[redacted]	1.0
S-13-T4S	122.5	201.*	0.2
[redacted]	[redacted]		1.0
S-13-T5S	3.95		0.05

* Detection limit = 5 parts per million

Hydrocarbon Constituents

sample no.	benzene	ethyl benzene	toluene	total xylenes	detection limit
S-10-T1N	ND	ND	0.07	0.14	0.05
S-13-T2N	ND	0.08	0.21	0.49	0.05
✓S-13-T2S	89. 2.7%	81.	148.	559.	1.0
S-13-T3N	ND	0.70	0.62	5.50	0.05
S-13-T3S	ND	0.15	0.13	0.64	0.05
✓S-13-T4N	78. 4.5%	90.	248.	386.	1.0
S-13-T4S	2.8 3.2%	5.5	13.3	27.6	0.2
✓S-13-T5N	23. 3.3%	20.	76.	181.	1.0
S-13-T5S	ND 3.2%	0.09	0.18	0.37	0.05

Results in parts per million (ppm)
ND = Non-Detectable

Laboratory analyses indicate relatively high levels of hydrocarbon contamination in soil samples from beneath tank T2 and T4. Moderate contamination levels are present in the soil sample collected from beneath the north end of tank T5. In our opinion, and based on guidelines of the San Francisco Regional Water Quality Control Board, the hydrocarbon contamination levels in excess of 1000 ppm in samples analyzed from the north end of tank T4 and the south end of tank T2 required further soil removal.

On May 18, 1987 after authorization by Beacon Oil Company, a geologist from Applied GeoSystems returned to the site and observed further excavation of hydrocarbon contaminated soil. Soil was removed from areas shown to have high hydrocarbon contamination levels, as evaluated from the previous soil analyses and by organic vapor analyzer (OVA) readings of soil taken from the backhoe bucket during excavation. Soil in the vicinity of the high levels of contamination in the tank pit was removed to a depth of 20 feet. The OVA readings indicated relatively high levels of hydrocarbon contamination remaining in the bottom of the pit, but indicated a marked decrease in contamination laterally. Excavation was halted due to mechanical limitations of the excavation equipment and safety considerations. Seven soil samples were collected for chemical analyses from selected areas in the deepened tank pit and

adjoining excavation. The samples were collected using the same procedures and chain of custody protocol discussed previously in this report. Plate P-3 shows sample locations and the additional excavation. The results of these additional analyses show total hydrocarbon concentrations to be below 1000 ppm in all samples except S-20-T4D, which had 1989 ppm total volatile hydrocarbons and 1192 ppm total extractable hydrocarbons. Results of these analyses are presented in Table 3 and on the laboratory Record of Analyses included in the appendix of this report.

TABLE 3
ANALYSIS OF ADDITIONAL SOIL SAMPLES
Former Beacon Station #574
22315 Redwood Road
Castro Valley, California

sample no.	total volatile hydrocarbons	total extractable hydrocarbons	detection limit
S-20-T2S	0.73		0.05
[redacted]	[redacted]		0.2
S-20-T5N	1.27		0.05
S-20 T2Nb	8.67		0.05
[redacted]	0.98		0.05
[redacted]	[redacted]	53*	0.2
[redacted]	[redacted]	[redacted]	2.0

* Detection limit = 5 parts per million
Results in parts per million

RECOMMENDATIONS

In our opinion, and in accordance with guidelines of the San francisco Bay Regional Water Quality Control Board, one ground water monitoring well should be installed within 10 feet of, and in the inferred downgradient direction from the area of highest indicated hydrocarbon contamination. If significant hydrocarbon contamination is detected in the ground water from this monitoring well, it may be necessary to install additional monitoring wells to further assess ground water quality at the site.

We are prepared to present a formal work plan for the implementation of our recommendations to Beacon Oil Company, for review by the San Francisco Regional Water Quality Control Board, and the Alameda County Department of Environmental Health. We further recommend that Beacon Oil submit a copy of this report to Mr. Ted M. Gerow, Public Health Engineer, Alameda County Division of Environmental Health, 470 27th Street, Rm. 324, Oakland, California, 94612 and to Mr. Greg Zentner, California Regional Water Quality Control Board, San Francisco Bay Region, 1111 Jackson Street, Rm. 6040, Oakland, California, 94607.

LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely for the purposes of evaluating environmental conditions of the soil with respect to hydrocarbon product contamination in the vicinity of the removed tanks. No soil engineering or geotechnical implications are stated or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation are made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation.

Source: U.S. Geological Survey
Hayward
7.5 Minute Quadrangle

N

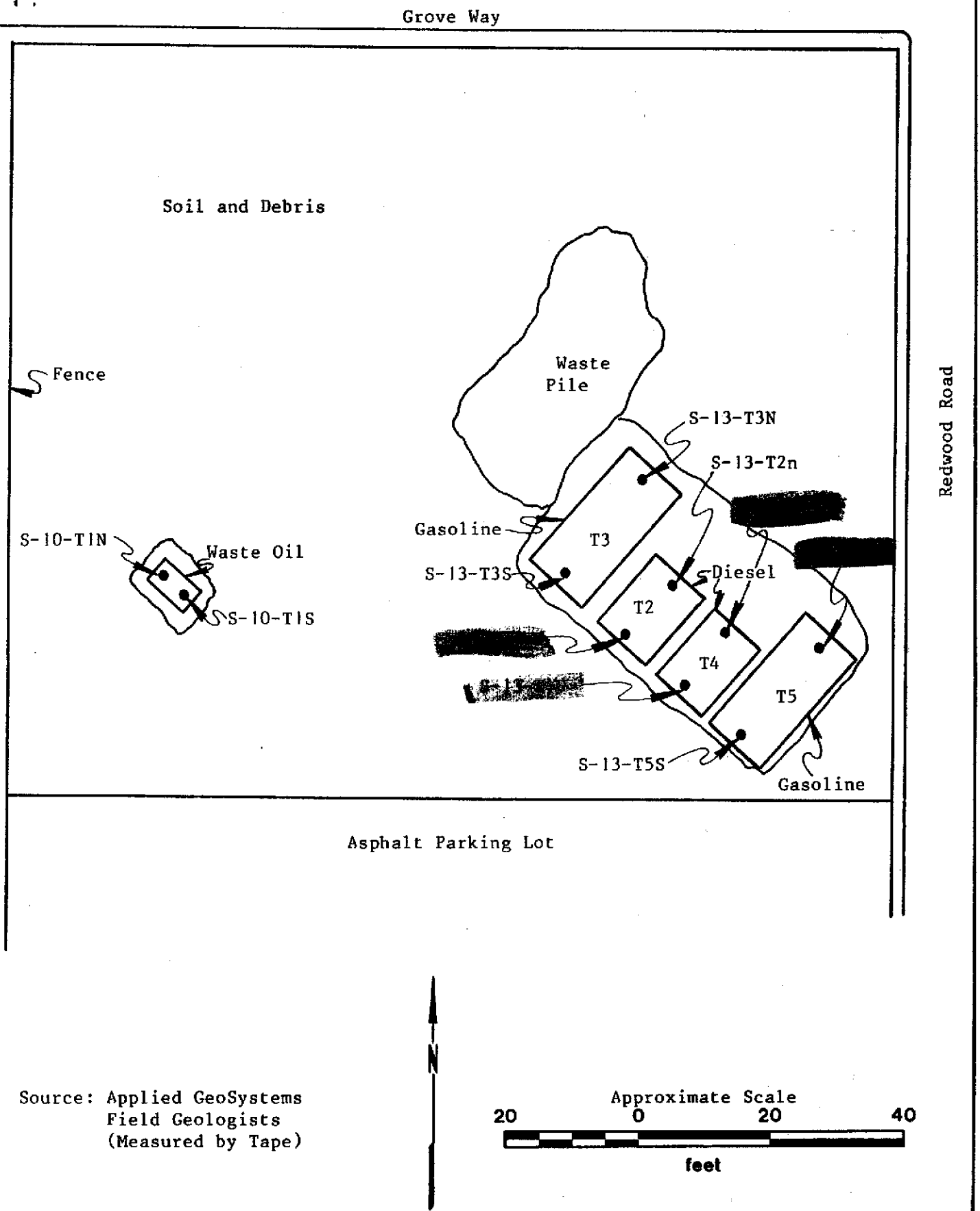
Approximate Scale
2000 1000 0 2000 4000
feet

Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

PROJECT NO. 87032-1

SITE VICINITY MAP
Beacon Station #574
22315 Redwood Road
Castro Valley, California

PLATE
P-1



Source: Applied GeoSystems
Field Geologists
(Measured by Tape)

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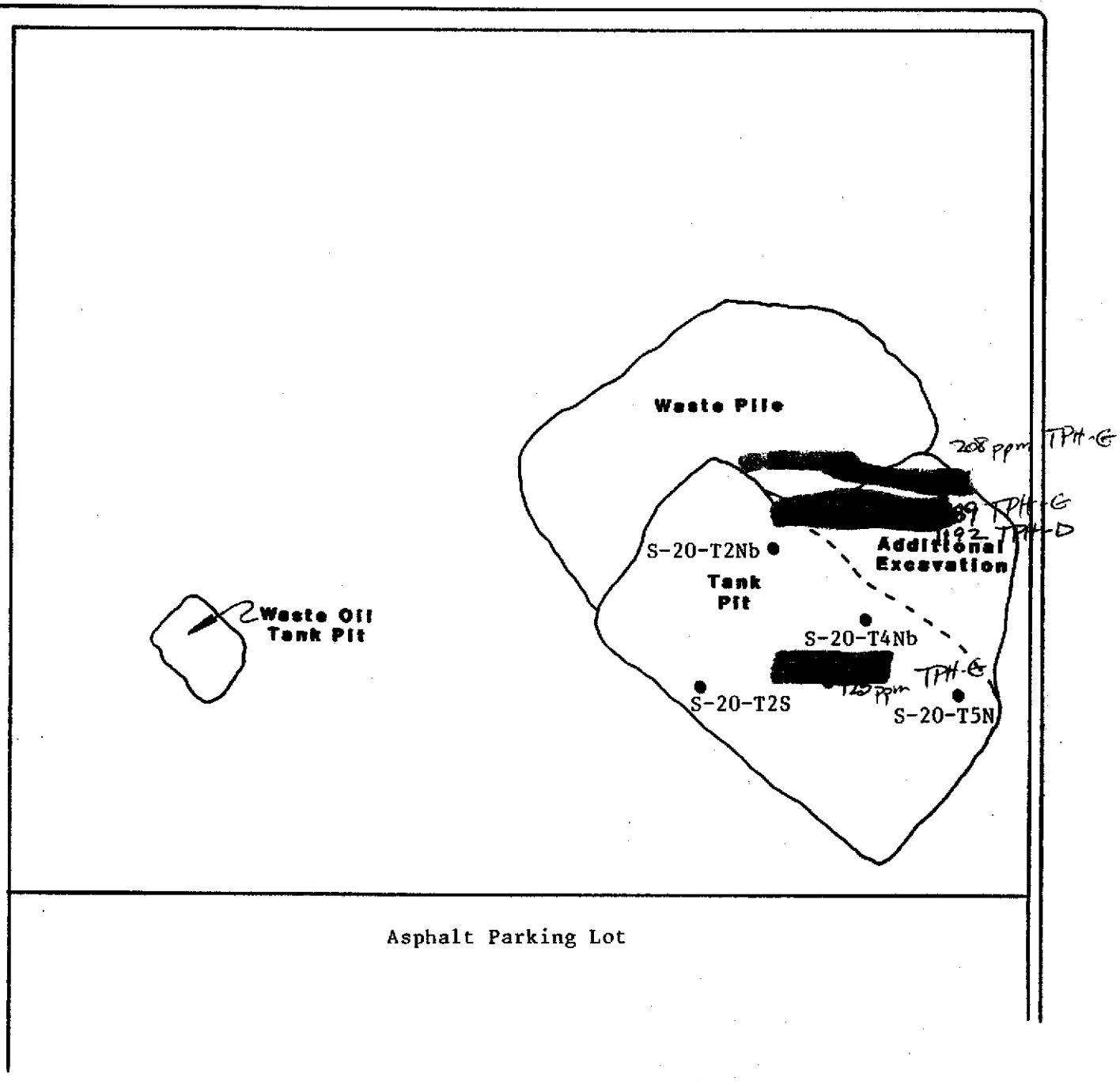
PROJECT NO. 87032-1

GENERALIZED SITE PLAN
Beacon Station #574
22315 Redwood Road
Castro Valley, California

PLATE

P-2

Grove Way



Source: Applied GeoSystems
Field Geologists
(Measured by Tape)

N

Approximate Scale
20 0 20 40
feet

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PROJECT NO. 87032-1

TANK PIT AND ADDITIONAL EXCAVATION
Beacon Station #574
22315 Redwood Road
Castro Valley, California

PLATE
P-3

APPENDIX

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Gary Barker
Phone: 415-651-1906

LABORATORY: AGS

TURNAROUND TIME: 1 week
Attention: Glenn
Phone No. 415-651-1906

SHIPPING INFORMATION:
Shipper
Address
Date Shipped
Service Used
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Gary Barker		5-18-87	3 PM
	Received for laboratory by:	5-18-87	16.PM

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-20-T2S	87032-1	5-18-87	TVH	Iced
S-20-T4N				
S-20-T5N				
S-20-T2Nb				
S-20-T4Nb				
S-20-T4E				
S-20-T4d				

CHAIN OF CUSTODY RECORD

Applied GeoSystems

SAMPLER (signature): [signature]

Phone:

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 Week

Attention: TIA TRAN

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
[signature]			
	Received for laboratory by: [signature]	5-7-87	9:00

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
				ICED
S-10-T1N	87032-1	5-5-87	TVH	
S-13-T2S			TEH - TVH	
S-13-T3S			TVH	
S-13-T4S			TEH - TVH	
S-13-T5S			TVH	
S-13-T2N			TEH - TVH	
S-13-T3N			TVH	
S-13-T4N			TEH - TVH	
S-13-T5N	↓	↓	TVH	↓

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature):

Phone:

LABORATORY: Applied geosystems

TURNAROUND TIME: 2-weeks

Attention: TIA

Phone No.

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
	Received for laboratory by:	5-29-87	10:00AM

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-10-TIN	87032-1	5-5-87	TEH	

CHAIN OF CUSTODY RECORD

SAMPLER (signature): [signature]

Phone:

LABORATORY:
Applied Geosystems

TURNAROUND TIME: 2 weeks

Attention: TIR

Phone No.

Applied GeoSystems

43255 Mission Blvd. Suite B Tremont, CA 94539 (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
[signature]			
	Received for laboratory by: [signature]	6-1-87	11:00

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-20-T4d	87032-1	5-18-87	TEH	ICED
S-20-T4NF	87032-1	5-18-87	TEH	↓
S-20-T4 Nb	87032-1	5-18-87	TEH	

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 5-27-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn Dembroff

Date Received: 5-18-87
Date Analyzed: 5-20-87

Laboratory# 8705S120

Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for these samples is 0.05 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL VOLATILE HYDROCARBONS
S-20-T2S	87032-1	0.73
S-20-T5N	87032-1	1.27
S-20-T2Nb	87032-1	8.67
S-20-T4Nb	87032-1	0.98

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 5-27-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-18-87 Laboratory# 8705S126
Date Analyzed: 5-20-87

Procedure:

The soil sample referenced on the attached Chain-of-Custody was analyzed for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for this sample is 2.0 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL VOLATILE HYDROCARBONS
S-20-T4d	87032-1	1989

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

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RECORD OF ANALYSIS

Date 5-27-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn Dembroff

Date Received: 5-18-87
Date Analyzed: 5-20-87

Laboratory# 8705S121

Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for these samples is 0.2 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL VOLATILE HYDROCARBONS
S-20-T4N	87032-1	125.5
S-20-T4NF	87032-1	208.7

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

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RECORD OF ANALYSIS

Date 6-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Charles L. Ard

Date Received: 6-1-87
Date Analyzed: 6-9-87

Laboratory# 8706DS06

Procedure:

The soil samples were analyzed for high boiling point hydrocarbons by EPA method 3550 for soil extraction. The samples were injected into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for these samples is 5 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL EXTRACTABLE HYDROCARBONS
S-20-T4d	87032-1	1192
S-20-T4F	87032-1	53
S-20-T4Nb	87032-1	ND

Results in milligrams/kilogram (parts per million = ppm).
ND=Non Detectable - Less than 5 milligrams/kilogram (ppm).

Tia Tran, Chemist

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RECORD OF ANALYSIS

Date 6-3-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Charles L. Ard

Date Received: 5-29-87
Date Analyzed: 5-29-87

Laboratory# 8705DS23

Procedure:

The soil sample was analyzed for high boiling point hydrocarbons by EPA method 3550 for soil extraction. The sample was injected into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for this sample is 5 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL EXTRACTABLE HYDROCARBONS
S-10-T1N	87032-1	ND

Results in milligrams/kilogram (parts per million = ppm).
ND=Non Detectable - Less than 5 milligrams/kilogram (ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

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RECORD OF ANALYSIS

Date 5-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-7-87
Date Analyzed: 5-11-87

Laboratory# 8705S057

Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for these samples is 0.05 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	BENZENE	ETHYL BENZENE	TOLUENE	TOTAL XYLENES	TVH
S-13-T2N	87032-1	ND	0.08	0.21	0.49	4.38
S-10-T1N	87032-1	ND	ND	0.07	0.14	3.09
S-13-T3S	87032-1	ND	0.15	0.13	0.64	4.58
S-13-T5S	87032-1	ND	0.09	0.18	0.37	3.95
S-13-T3N	87032-1	ND	0.70	0.62	5.50	35.23

Results in milligrams/kilogram (parts per million = ppm).
ND=Non Detectable - Less than 0.05 milligrams/kilogram (ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 5-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-7-87 Laboratory# 8705S056
Date Analyzed: 5-11-87

Procedure:

The soil sample referenced on the attached Chain-of-Custody was analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for this sample is 0.2 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	BENZENE	ETHYL BENZENE	TOLUENE	TOTAL XYLENES	TVH
S-13-T4S	87032-1	2.8	5.5	13.3	27.6	122.5

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 5-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Charles L. Ard

Date Received: 5-7-87
Date Analyzed: 5-13-87

Laboratory# 8705DS03

Procedure:

The soil samples were analyzed for high boiling point hydrocarbons by EPA method 3550 for soil extraction. The samples were injected into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for these samples is 5 milligrams/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	TOTAL EXTRACTABLE HYDROCARBONS
S-13-T2S	87032-1	2898
S-13-T4S	87032-1	201
S-13-T2N	87032-1	ND
S-13-T4N	87032-1	1846

Results in milligrams/kilogram (parts per million = ppm).
ND=Non Detectable - Less than 5 milligrams/kilogram (ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 5-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-7-87
Date Analyzed: 5-11-87

Laboratory# 8705S055

Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for these samples is 1.0 milligram/kilogram (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	BENZENE	ETHYL BENZENE	TOLUENE	TOTAL XYLENES	TVH
S-13-T2S	87032-1	89	81	148	559	3264
S-13-T4N	87032-1	78	90	248	386	1725
S-13-T5N	87032-1	23	20	76	181	687

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

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BROWN AND CALDWELL LABORATORIES
1256 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-05-151

Received: 07 MAY 87
Reported: 03 JUN 87

Ms. Robin Ross
Applied Geosystems
43255 Mission Boulevard, Suite B
Fremont, California 94539

Project: 87032-1

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
05-151-1	S-10-TIS	05 APR 87

PARAMETER	05-151-1
Oil and Grease, Hydrocarbons, mg/kg	33

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43255 Mission Boulevard, Suite B
Fremont, California 94539

Project: 87032-1

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
05-151-1	S-10-TIS	05 APR 87

PARAMETER	05-151-1
Purgeable Priority Pollutants	
Extraction	05.12.87
1,1,1-Trichloroethane, mg/kg	<0.2
1,1,2,2-Tetrachloroethane, mg/kg	<0.2
1,1,2-Trichloroethane, mg/kg	<0.2
1,1-Dichloroethane, mg/kg	<0.2
1,1-Dichloroethylene, mg/kg	<0.2
1,2-Dichloroethane, mg/kg	<0.2
1,2-Dichloropropane, mg/kg	<0.2
1,3-Dichloropropene, mg/kg	<0.2
2-Chloroethylvinylether, mg/kg	<0.2
Acrolein, mg/kg	<2
Acrylonitrile, mg/kg	<2
Bromodichloromethane, mg/kg	<0.2
Bromomethane, mg/kg	<0.2
Benzene, mg/kg	<0.2
Chlorobenzene, mg/kg	<0.2
Carbon Tetrachloride, mg/kg	<0.2
Chloroethane, mg/kg	<0.2
Bromoform, mg/kg	<0.2
Chloroform, mg/kg	<0.2
Chloromethane, mg/kg	<0.2
Dibromochloromethane, mg/kg	<0.2
Ethylbenzene, mg/kg	<0.2
Methylene chloride, mg/kg	<0.2

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
05-151-1	S-10-TIS	05 APR 87

PARAMETER	05-151-1
Tetrachloroethylene, mg/kg	<0.2
Trichloroethylene, mg/kg	<0.2
Trichlorofluoromethane, mg/kg	<0.2
Toluene, mg/kg	<0.2
Vinyl chloride, mg/kg	<0.2
trans-1,2-Dichloroethylene, mg/kg	<0.2
trans-1,3-Dichloropropene, mg/kg	<0.2

Linda Black Fox
D. A. McLean, Laboratory Director