

ENVIRONMENTAL
PROTECTION

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REPORT OF SOIL AND GROUNDWATER INVESTIGATION

**Corwood Car Wash
6973 Village Parkway
Dublin, California**

GA Project No. 106-02-01

Prepared for:

R. L. Woodward Industries, Inc.
P O Box 2688
Dublin, CA 94568

Prepared by:

Gribi Associates
1350 Hayes Street, Suite C-14
Benicia, CA 94510
(707)748-7743

March 9, 2000

March 9, 2000

Alameda County Department of
Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Attention: Eva Chu

Subject: Report of Soil and Groundwater Investigation
Corwood Car Wash, 6973 Village Parkway
Dublin, California
GA Project No. 106-02-01

Ladies and Gentlemen:

Gribi Associates is pleased to submit this report on behalf of R. L. Woodward Industries, Inc. documenting a soil and groundwater investigation conducted at the at the Corwood Car Wash facility at 6973 Village Parkway in Dublin, California. The soil and groundwater investigation included the drilling and sampling of two soil borings, IB-1 and IB-2, at the site using direct-push coring equipment. The goal of the investigation was to assess soil and groundwater conditions in an expected downgradient (south-southeast) direction from previously removed underground storage tank (UST) system components in order to address regulatory site closure.

Both soil and grab groundwater samples from IB-1, located in an expected downgradient (south-southeast) direction from the former east dispenser island, contained detectable levels of both gasoline- and diesel-range hydrocarbons. In addition, the grab groundwater sample from IB-2, located in an expected downgradient (south-southeast) direction from the former fuel USTs, contained detectable levels of both gasoline- and diesel-range hydrocarbons. However, the laboratory chromatograms for these samples, which are presented in the laboratory data report, seem to show that the gasoline-range hydrocarbon results in these samples are primarily due to interference from diesel-range hydrocarbons. Thus, soil and groundwater impacts relative the former Corwood Car Wash UST system appear to be primarily related to past diesel releases. Given that diesel was only stored in the USTs in the distant past (probably in the early to mid-1970s), it appears that the majority of releases associated with the USTs occurred in the distant past, prior to UST system upgrades which included installing interior fiberglass linings in both of the USTs.

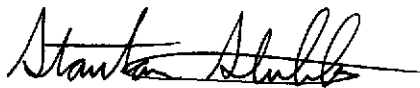
The only exception to this appears to be the detection of a low level (0.53 ppm) of MTBE in the IB-2 grab groundwater sample. This MTBE detection is significantly lower than MTBE levels of 5.4 ppm and 1.7 ppm encountered in grab groundwater samples collected from the former UST excavation cavity. These results seem to suggest minimal downgradient migration of MTBE.

Alameda County Department of
Environmental Health
March 9, 2000
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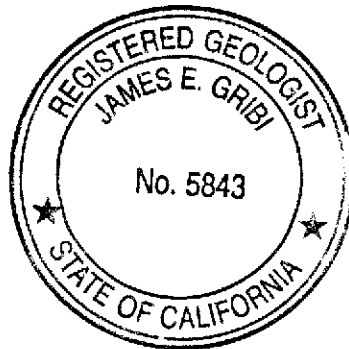
It should be noted that laboratory analytical results from grab groundwater samples are generally not representative of true groundwater conditions and can oftentimes be artificially high, particularly where hydrocarbon impacts to subsurface soils are significant. Thus, while laboratory results from the IB-1 grab groundwater sample are very high, we believe that groundwater in the boring was cross contaminated as soil coring proceeded through hydrocarbon-impacted soils.

We appreciate the opportunity to present this report for your review. Please contact us if you have questions or require additional information.

Very truly yours,



Stanton Stubbs
Environmental Scientist



James E. Gribi
Registered Geologist
California No. 5843

JEG:cc
Enclosure

c Roger Woodward, R. L. Woodward Industries, Inc.

File: C:\MyFiles\Reports\CorwoodSBI.rp1.wpd

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1.0 INTRODUCTION

This report documents a recently-completed soil and groundwater investigation conducted at the Corwood Car Wash site located at 6973 Village Parkway in Dublin, California (see Figure 1 and Figure 2). The soil and groundwater investigation included the drilling and sampling of two investigative soil borings, IB-1 and IB-2, at the site using direct-push coring equipment. The goal of the investigation was to assess soil and groundwater conditions in an expected downgradient (south-southeast) direction from previously removed underground storage tank (UST) system components in order to address regulatory site closure.

1.1 Site Background

Corwood Car Wash previously operated two unleaded gasoline USTs, located in a common excavation cavity on the northwest side of the site. The UST system was apparently installed in about 1968, and it is our understanding that diesel fuel was also stored in the USTs at some time in the distant past. In March 1991, the UST system was completely retrofitted with state-of-the-art leak prevention and monitoring devices, including interior tank linings, overfill/overspill protection, and a sophisticated leak detection monitoring system.

On January 31, 2000, both USTs were removed from the site in accordance with Alameda County Department of Environmental Health requirements. In addition, approximately 3,800 gallons of hydrocarbon-impacted groundwater was pumped from the excavation cavity for offsite disposal. Also, approximately 350 tons of hydrocarbon-impacted soil, primarily backfill material, was excavated and removed from the site. After backfilling with clean imported pea gravel, the UST excavation cavity and piping and dispenser excavations were re-surfaced with concrete to match existing surface grade.

While stockpiled soil samples contained moderate levels of predominantly diesel-range hydrocarbons, UST pit bottom samples contained low to nondetectable levels of all hydrocarbon constituents. These results, together with previous results from soil and groundwater investigations conducted at the site in the past, seem to suggest that although some releases, primarily diesel, occurred from the USTs, these releases remained in the backfill sands for the most part and did not migrate appreciably into native silts and clays surrounding the USTs. Given that diesel was only stored in the USTs in the distant past (probably in the early to mid-1970s), it appears that releases associated with the USTs occurred in the distant past, prior to UST system upgrades which included installing interior fiberglass linings in both of the USTs.

A soil sample collected at four feet in depth adjacent to the western fuel dispenser, contained a moderate level of diesel-range hydrocarbons, with no significant level of gasoline-range hydrocarbons. Soil samples collected at about four feet and seven feet in depth adjacent to the east fuel dispenser contained both diesel- and gasoline-range hydrocarbons, with no detectable Benzene, Toluene, or MTBE in these samples. Given that diesel was only stored in the USTs in the distant past, as well as the apparent aged quality of the gasoline-range hydrocarbons in the east dispenser soil samples, it appears that releases associated with the fuel dispensers occurred in the distant past, prior to UST system upgrades, which included installing secondary containment beneath each dispenser.

Two water samples collected from the UST excavation cavity following tank removal contained relatively high levels of both diesel- and gasoline-range hydrocarbons, with detections of both Benzene and MTBE. However, we do not believe that these results are representative of true groundwater conditions beneath the site. The first water sample was collected directly from the UST cavity after excavation for soil sampling and prior to water purging. The second sample was collected after 3,800 gallons of water had been purged, but also then after at least 150 tons of hydrocarbon-impacted soil had been excavated from the UST cavity. Thus, both of these water samples were obviously tainted by excavation activities and are not representative of true groundwater conditions.

On February 28, 2000, Gribi Associates submitted a draft UST removal report entitled *Report of Underground Storage Tank Removal Activities, Corwood Car Wash*. On February 28, 2000, Alameda County Department of Environmental Health issued a letter recommending that at least two soil borings be drilled and sampled to assess groundwater quality downgradient from removed UST system components.

On March 1, 2000, Gribi Associates submitted a workplan to Alameda County Department of Environmental Health proposing the drilling and sampling of two soil borings at the site using direct-push coring equipment. This workplan was approved Alameda County Environmental Health Services on March 1, 2000, with the provision that grab groundwater samples be additionally analyzed for oxygenates.

1.2 Scope of Work

Gribi Associates was contracted by R. L. Woodward Industries, Inc. to conduct the following scope of work:

- **Task 1** **Conduct prefield activities.**
- **Task 2** **Conduct drilling and sampling activities.**
- **Task 3** **Conduct laboratory analyses.**
- **Task 4** **Prepare report of findings.**

These tasks were conducted in accordance with the approved workplan and with guidelines contained in *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites*, (August 10, 1990) and *LUFT Field Manual*, (October 18, 1989).

1.3 Limitations

The services provided under this contract as described in this report include professional opinions and judgments based on data collected. These services have been provided according to generally accepted environmental protocol. The opinions and conclusions contained in this report are typically based on information obtained from:

1. Observations and measurements made by our field staff.
2. Contacts and discussions with regulatory agencies and others.
3. Review of available hydrogeologic data.

2.0 Description of Field Activities

Drilling and sampling activities were conducted on Friday, March 3, 2000. All activities were conducted in accordance with applicable State and Federal guidelines and statutes.

2.1 Prefield Activities

Prior to implementing field activities, written approval was obtained from the Alameda County Department of Environmental Health. Also, a soil boring installation permit was obtained from Alameda County Zone 7 Water Agency. A copy of this permit is contained in Appendix A. In addition, a private underground utility locator cleared proposed boring locations prior to drilling. Prior to initiating drilling activities, a Site Safety Plan was prepared, and a tailgate safety meeting was conducted with all site workers.

2.2 Location of Borings

The locations of the two soil borings, IB-1 and IB-2 are shown on Figure 2. Based on the expected south-southeasterly groundwater flow beneath the site, one boring, IB-1, was sited immediately south-southeast from the former east fuel dispenser, and the other boring, IB-2, was sited south-southeast from the former UST excavation cavity.

2.3 Drilling and Sampling of Investigative Soil Borings

The two investigative soil borings were drilled to a depth of about 15 feet below surface grade using direct-push hydraulically-driven soil coring equipment. This coring system allowed for the retrieval of almost continuous soil cores, which were contained in a clear plastic acetate tube, nested inside a stainless steel core barrel. After the core barrel was brought to the surface and exposed, the core was examined, logged, and field screened for hydrocarbons by a qualified Gribi Associates scientist using sight and smell. Boring logs for both soil borings are contained in Appendix B. Following completion, the two investigative borings were grouted to match existing grade using a cement/sand slurry.

Subsurface soils were sampled at approximately four-foot intervals starting at four feet in depth. After the sample and core barrel were raised to the surface, each sample was collected as follows: (1) The filled acetate tube was exposed for visual examination; (2) The selected sample interval was collected by cutting the sample and acetate plastic tubing to the desired length (typically about six inches); (3) The ends of the selected sample were quickly wrapped with Teflon sheets or aluminum foil, capped with plastic end caps, labeled and wrapped tightly with tape; and (4) The sealed soil sample was labeled and immediately placed in cold storage for transport to the analytical laboratory under formal chain-of-custody. All coring and sampling equipment was thoroughly cleaned and decontaminated between each sample collection by triple rinsing first with water, then with dilute tri-sodium phosphate solution, and finally with distilled water.

Following completion of soil sampling activities, 3/4 inch diameter Schedule 40 PVC well casing was placed in each boring, with 0.01-inch slotted well screen from about 15 feet to five feet in depth, followed by blank well casing to above surface grade. Grab groundwater samples were then collected from each of the borings using the clean stainless steel bailer as follows: (1) Laboratory-supplied containers were completely filled directly from the bailer with a minimum of agitation; (2) After making sure that no air bubbles are present, each container was then tightly sealed with a Teflon-lined septum; and (3) Each container was then labeled and placed in cold storage for transport to the analytical laboratory under formal chain-of-custody. All sampling equipment was thoroughly cleaned and decontaminated between each sample collection by triple rinsing as described above.

2.4 Laboratory Analysis of Soil and Water Samples

One soil sample and one grab groundwater sample from each boring, for a total of two soil samples and two grab groundwater samples, were analyzed for the following parameters:

- USEPA 8015M Total Petroleum Hydrocarbons as Gasoline (TPH-G)
- USEPA 8020/602 Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
- USEPA 8020/602 Methyl-t-butyl Ether (MTBE)
- USEPA 8260B Oxygenates

All analyses was conducted by Acculab, Inc. a California-certified analytical laboratory, with two-week turnaround on results.

3.0 RESULTS OF INVESTIGATION

3.1 General Subsurface Conditions

Native soils encountered in borings IB-1 and IB-2 were generally similar, consisting primarily of grey clays and silts, with occasional thin sandy layers. Groundwater was encountered in boring IB-1 at about six feet in depth and in boring IB-2 at about nine feet in depth.

Grey to olive grey hydrocarbon staining with moderate to strong hydrocarbon odors were noted in clayey soils in boring IB-1 from about one foot in depth down to total depth. Dark grey hydrocarbon staining with moderate to strong hydrocarbon odors were noted in clayey soils in boring IB-2 from about seven feet in depth to total depth. Grab groundwater from boring IB-1 exhibited strong hydrocarbon odors and sheens, and grab groundwater from boring IB-2 exhibited slight to moderate hydrocarbon odors with no hydrocarbon sheens.

3.2 Results of Laboratory Analyses

Soil and water analytical results are summarized in Table 1. The laboratory data report and chain-of-custody record for soil and groundwater analyses is contained in Appendix C.

Table 1
SUMMARY OF SOIL ANALYTICAL RESULTS
 Corwood Car Wash UST Site

Sample ID	Sample Type	Sample Depth	Concentration, milligrams per kilogram (ppm)							
			TPH-D	TPH-G	B	T	E	X	MTBE	OXY
IB-1.2	Soil	7.5 ft	600	110 ¹	0.10	0.13	0.34	0.24	<0.010	<0.010
IB-1W	Water	(6.0 ft)	750	50 ¹	16	<5.0	66	8.8	<20	<0.0050
IB-2.3	Soil	11.5 ft	7.1	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.0050
IB-2W	Water	(9.0 ft)	15	8.0	0.024	<0.010	0.041	<0.010	0.53	<0.0050

TPH-D = Total Petroleum Hydrocarbons as Diesel
 TPH-G = Total Petroleum Hydrocarbons as Gasoline
 B = Benzene
 T = Toluene
 E = Ethylbenzene
 X = Xylenes
 MTBE = Methyl-t-butyl Ether

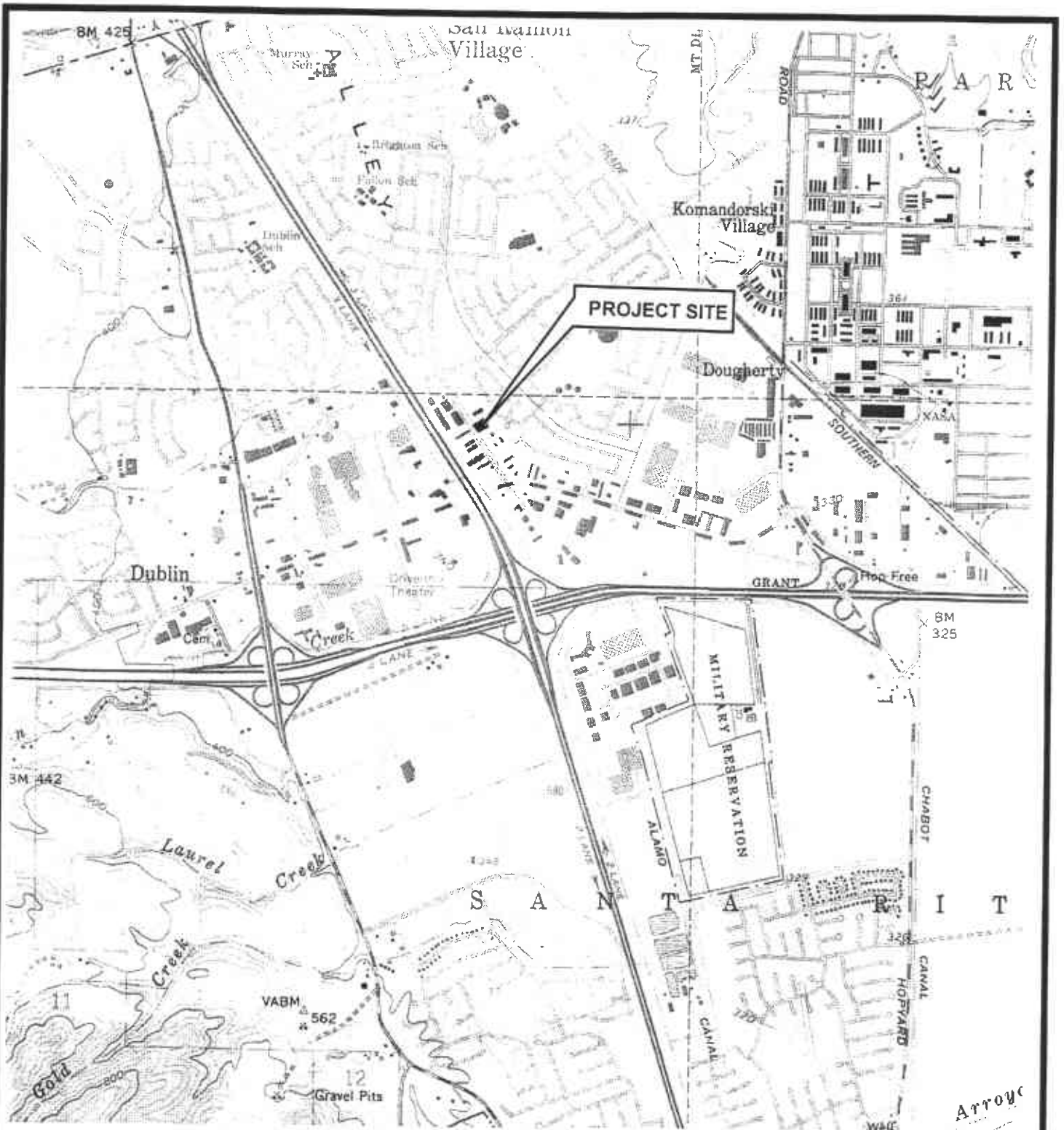
OXY = Oxygenates (except MTBE), including Ter-Butanol (TBA), Di-isopropyl Ether (DIPE), Ethyl-t-butyl Ether (ETBE), Tert-amyl Methyl Ether (TAME), and Lead Scavengers 1,2-Dibromoethane (EDB) and 1,2-Dichloroethane (EDC)
 <0.010 = Not detected above the expressed value.
¹ = Laboratory data report states "Product is not typical gasoline."

4.0 CONCLUSIONS

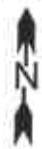
Both soil and grab groundwater samples from IB-1, located in an expected downgradient (south-southeast) direction from the former east dispenser island, contained detectable levels of both gasoline- and diesel-range hydrocarbons. In addition, the grab groundwater sample from IB-2, located in an expected downgradient (south-southeast) direction from the former fuel USTs, contained detectable levels of both gasoline- and diesel-range hydrocarbons. However, the laboratory chromatograms for these samples, which are presented in the laboratory data report, seem to show that the gasoline-range hydrocarbon results in these samples are primarily due to interference from diesel-range hydrocarbons. Thus, soil and groundwater impacts relative the former Corwood Car Wash UST system appear to be primarily related to past diesel releases. Given that diesel was only stored in the USTs in the distant past (probably in the early to mid-1970s), it appears that the majority of releases associated with the USTs occurred in the distant past, prior to UST system upgrades which included installing interior fiberglass linings in both of the USTs.

The only exception to this appears to be the detection of a low level (0.53 ppm) of MTBE in the IB-2 grab groundwater sample. This MTBE detection is significantly lower than MTBE levels of 5.4 ppm and 1.7 ppm encountered in grab groundwater samples collected from the former UST excavation cavity. These results seem to suggest minimal downgradient migration of MTBE.

It should be noted that laboratory analytical results from grab groundwater samples are generally not representative of true groundwater conditions and can oftentimes be artificially high, particularly where hydrocarbon impacts to subsurface soils are significant. Thus, while laboratory results from the IB-1 grab groundwater sample are very high, we believe that groundwater in the boring was cross contaminated as soil coring proceeded through hydrocarbon-impacted soils.



TOPOGRAPHY FROM USGS DUBLIN
7.5-MINUTE QUADRANGLE MAP, (TOPO! 1997)



Arroyo

DESIGNED BY:	CHECKED BY:	SITE VICINITY MAP	DATE: 02/28/00	FIGURE: 1
DRAWN BY: JG	SCALE: 1:24,000		GRIBI Associates	
PROJECT NO: 106-02-01				

LEWIS AVENUE

EXPECTED GROUNDWATER
FLOW DIRECTION



VILLAGE PARKWAY

UST EXCAVATION CAVITY

10,000-GAL GASOLINE
UST (REMOVED)

10,000-GAL GASOLINE
UST (REMOVED)

STANDPIPE WELL

DISPENSERS
(REMOVED)

IB-1

IB-2

CORWOOD CAR WASH
6973 VILLAGE PARKWAY

● - INVESTIGATIVE BORING LOCATION



DESIGNED BY:

CHECKED BY:

DRAWN BY: JEG

SCALE:

PROJECT NO: 106-02-02

SITE PLAN

CORWOOD CAR WASH
6973 VILLAGE PARKWAY

DATE: 03/09/00

FIGURE: 2

GRIBI Associates

APPENDIX A
DRILLING PERMIT



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 PHONE (925) 484-2600 FAX (925) 462-3914

March 2, 2000

Mr. Jim Gribi
Gribi Associates
1350 Hayes Street, Suite C-14
Benicia, CA 94510

Dear Mr. Gribi:

Enclosed is drilling permit 20026 for a contamination investigation at 6973 Village Parkway in Dublin for Corwood Car Wash.

Please note that permit condition A-2 requires that a report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 235 or Matt Katen at extension 234.

Sincerely,

Wyman Hong
Water Resources Technician II

Enc.



ZONE 7 WATER AGENCY

6997 PARKSIDE DRIVE, PLEASANTON, CALIFORNIA 94588-5127 PHONE (510) 484-2600 X235
FAX (510) 482-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT Corwood CAR WASH
6973 Village Parkway, Dublin CA

PERMIT NUMBER 20026

WELL NUMBER _____

APN _____

California Coordinates Source _____ ft. Accuracy ± _____ ft.
CCN _____ ft. CCE _____ ft.
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

CLIENT Name R L Woodward Industries
Address P.O. Box 2688 Phone 925/828-991
City Dublin CA Zip 94568

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.

APPLICANT Name Jim Gribi
Gribi Associates Fax 707/748-7763
Address 1350 Hayes STREET, STC-14 Phone 707/748-7743
City BENICIA CA Zip 94510

B. WATER SUPPLY WELLS

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.

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	<input type="checkbox"/>	General	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	Contamination	<input checked="" type="checkbox"/>
Monitoring	<input type="checkbox"/>	Well Destruction	<input type="checkbox"/>

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

PROPOSED WATER SUPPLY WELL USE

New Domestic	<input type="checkbox"/>	Replacement Domestic	<input type="checkbox"/>
Municipal	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	Other _____	<input type="checkbox"/>

D. 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.

DRILLING METHOD:

Mud Rotary	<input type="checkbox"/>	Air Rotary	<input type="checkbox"/>	Auger	<input type="checkbox"/>
Cable	<input type="checkbox"/>	Other	<input checked="" type="checkbox"/>	<u>Geoprobe</u>	

DRILLER'S LICENSE NO. 48565 (Gregg Drilling)

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

WELL PROJECTS

Drill Hole Diameter	_____ in.	Maximum	_____
Casing Diameter	_____ in.	Depth	_____ ft.
Surface Seal Depth	_____ ft.	Number	_____

F. WELL DESTRUCTION. See attached.

G. SPECIAL CONDITIONS

GEOTECHNICAL PROJECTS

Number of Borings	<u>2</u>	Maximum	_____
Hole Diameter	<u>2 1/2</u> in.	Depth	<u>20</u> ft.

ESTIMATED STARTING DATE 3/3/00
ESTIMATED COMPLETION DATE 3/3/00

Approved Wyman Hong Date 3/2/00
Wyman Hong

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-65.

APPLICANT'S SIGNATURE [Signature] Date 3/1/00

APPENDIX B
SOIL BORING LOGS

BORING NUMBER : IB-1

BORING LOCATION: EAST

BORING TYPE: INVESTIGATIVE BORING

PROJECT NAME: CORWOOD CARWASH

PROJECT NUMBER: 106-02-02

LOG OF WELL BORING

GRIBI Associates

SHEET 1 OF 1

DRILLING CONTRACTOR: GREGG DRILLING

DRILLING METHOD: DIRECT PUSH

BOREHOLE DIAMETER: 2-1/2 INCHES


COMPLETION METHOD: GROUTED

BORING TOTAL DEPTH: 15 FEET

GROUNDWATER TOTAL DEPTH: 6.0 FEET

START DATE: 03/03/00

COMPLETION DATE: 03/03/00

DEPTH SCALE (FEET)	SAMPLE NO.	SAMPLE DEPTH	INTERVAL	WATER LEVEL & PID READING	USCS	LOG OF MATERIAL	PIEZOMETER/ WELL INSTALLATION
						0 - 0.7 Ft. Concrete and Base gravel	
5	IB-1.1	3.5 FT			CL	0.7 - 6.0 Ft. Dark brown to olive clayey SILT, soft to loose, moist, strong hydrocarbon odors.	
							
	IB-1.2	7.5 FT			SM	6.0 - 7.0 Ft. Dark gray silty SAND, loose, wet, strong hydrocarbon odors.	
10							
	IB-1.3	11.5 FT			CL	7.0 - 15.0 Ft. Dark gray silty CLAY, dense, moist to wet, strong hydrocarbon odors.	
15	IB-1.4	14.5 FT				END OF BORING	
20							
25							

LOG OF WELL BORING

GRIBI Associates

SHEET 1 OF 1

BORING NUMBER : IB-2

BORING LOCATION: WEST

BORING TYPE: INVESTIGATIVE BORING

PROJECT NAME: CORWOOD CARWASH

PROJECT NUMBER: 106-02-02

START DATE: 03/03/00

COMPLETION DATE: 03/03/00

DRILLING CONTRACTOR: GREGG DRILLING


DRILLING METHOD: DIRECT PUSH

BOREHOLE DIAMETER: 2-1/2 INCHES

COMPLETION METHOD: GROUTED

BORING TOTAL DEPTH: 15 FEET

GROUNDWATER TOTAL DEPTH: 9.0 FEET

DEPTH SCALE (FEET)	SAMPLE NO.	SAMPLE DEPTH	INTERVAL	WATER LEVEL & PID READING	USCS	LOG OF MATERIAL	PIEZOMETER WELL INSTALLATION
						0 - 0.8 Ft. Concrete and Base gravel.	
5	IB-2.1	3.5 FT	[Interval bar]		ML	0.8 - 6.5 Ft. Brown to light brown sandy clayey SILT, firm to dense, moist, no hydrocarbon odor or staining.	
							
10	IB-2.2	7.5 FT	[Interval bar]		CL	6.5 - 9.0 Ft. Dark gray to gray silty CLAY, soft to firm, moist, moderate hydrocarbon odors.	
					SM	9.0 - 10.0 Ft. Dark gray silty SAND, soft, wet, strong hydrocarbon odors.	
					CL	10.0 - 15.0 Ft. Dark gray CLAY, dense, moist to wet, strong hydrocarbon odors.	
15	IB-2.4	14.5 FT	[Interval bar]			END OF BORING	
20							
25							

APPENDIX C

**LABORATORY DATA REPORT AND
CHAIN-OF-CUSTODY RECORD**



Acculabs Inc.

Davis

1046 Olive Drive, Davis, CA 95616 ■ 530-757-0920 ■ Fax 753-6091

Sample Log 21107

March 08, 2000

Jim Gribi
Gribi Associates
1350 Hayes Street, #C-14
Benicia, CA 94510

Subject : 2 Water and 8 Soil samples
Project Name : CORWOOD CW
Project Number : 106-02-01

Dear Mr. Gribi,

Chemical analysis on the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. USEPA protocols for sample storage and preservation were followed.

Acculabs - Davis is certified by the State of California (# 2330), the State of Arizona (AZ0583) and the State of Nevada. If you have any questions regarding procedures or results, please call me at 530-757-0920.

Sincerely,

Tom Kwoka



Acculabs Inc.

Davis

Subject : 2 Water and 8 Soil samples
Project Name : CORWOOD CW
Project Number : 106-02-01

Sample Log 21107
March 08, 2000

Case Narrative

Analysis: Oxygenates by EPA 8260

Sample IB-1W was analyzed at a 1:1000 dilution due to matrix interferences from petroleum containing constituents.

Sample IB-2W had the Dibromofluoromethane surrogate exceed control chart limits due to sample matrix interferences. This was confirmed by similar results on a second analysis.


Tom Kwoka



Acculabs Inc.

Davis

Sample Log 21107

MTBE (Methyl-t-butyl ether) By EPA Method 8020/602

From : CORWOOD CW (Proj. # 106-02-01)


Sampled : 03/03/00

Received : 03/03/00

Matrix : Soil

SAMPLE	Date Analyzed	(MRL) <small>ng/kg</small>	Measured Value <small>ng/kg</small>
IB-1.2 (7.5')	03/07/00	(1.0)	<1.0
IB-2.3 (11.5')	03/06/00	(.050)	<.050

Approved By:



Tom Kwoka
Lab Director



Acculabs Inc.

Davis

Sample Log 21107

MTBE (Methyl-t-butyl ether) By EPA Method 8020/602

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Received : 03/03/00

Matrix : Water

SAMPLE	Date Analyzed	(MRL) ug/L	Measured Value ug/L
IB-1W	03/06/00	(50000)	<50000
IB-2W	03/06/00	(100)	270

Approved By:



Tom Kwoka
Lab Director



Acculabs Inc.

Davis

Sample Log 21107

21107-02

Sample: IB-1.2 (7.5')

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Dilution : 1:20

Run Log : 2188D

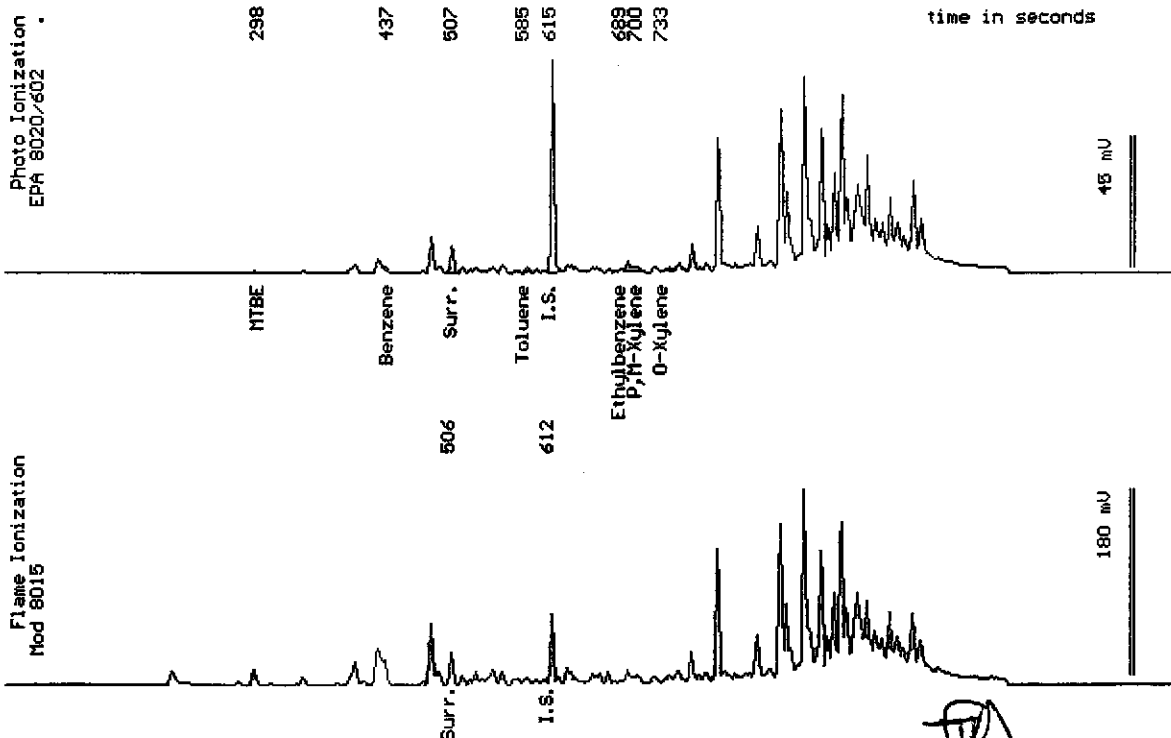
Matrix : Soil

Parameter	(MRL) $\mu\text{g}/\text{kg}$	Measured Value $\mu\text{g}/\text{kg}$
Benzene	(.10)	.10
Toluene	(.10)	.13
Ethylbenzene	(.10)	.34
Total Xylenes	(.10)	.24
TPH as Gasoline	(20)	110 *

Surrogate Recovery

98 %

* Product is not typical gasoline.



Date Analyzed: 03-07-00
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107

21107-07

Sample: IB-2.3 (11.5')

From : CORWOOD CW (Proj. # 106-02-01)

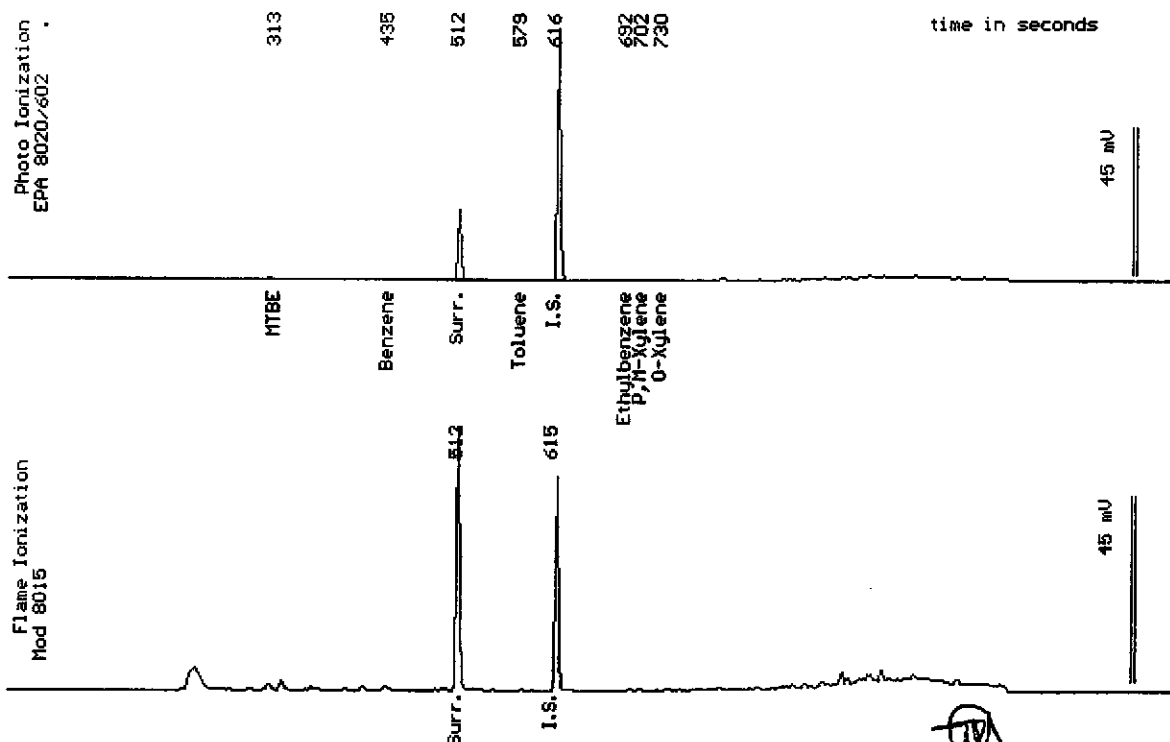
Sampled : 03/03/00

Dilution : 1:1

Run Log : 2188C

Matrix : Soil

Parameter	(MRL) $\mu\text{g}/\text{kg}$	Measured Value $\mu\text{g}/\text{kg}$
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		103 %



Date Analyzed: 03-06-00
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107

21107-09

Sample: IB-1W

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Dilution : 1:10000

Matrix : Water

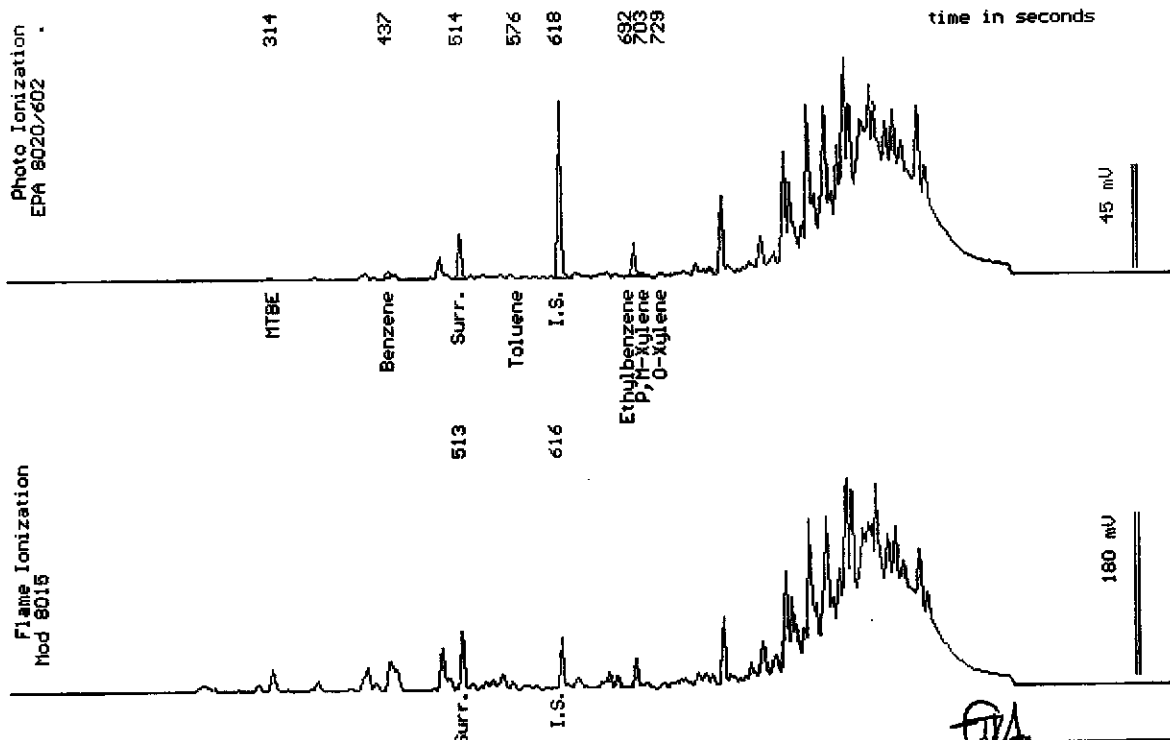
Run Log : 2188B

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(5000)	16000
Toluene	(5000)	<5000
Ethylbenzene	(5000)	66000
Total Xylenes	(5000)	8800
TPH as Gasoline	(500000)	50000 *

Surrogate Recovery

104 %

* Product is not typical gasoline.



Date Analyzed: 03-06-00
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Rodolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107

21107-10

Sample: IB-2W

From : CORWOOD CW (Proj. # 106-02-01)

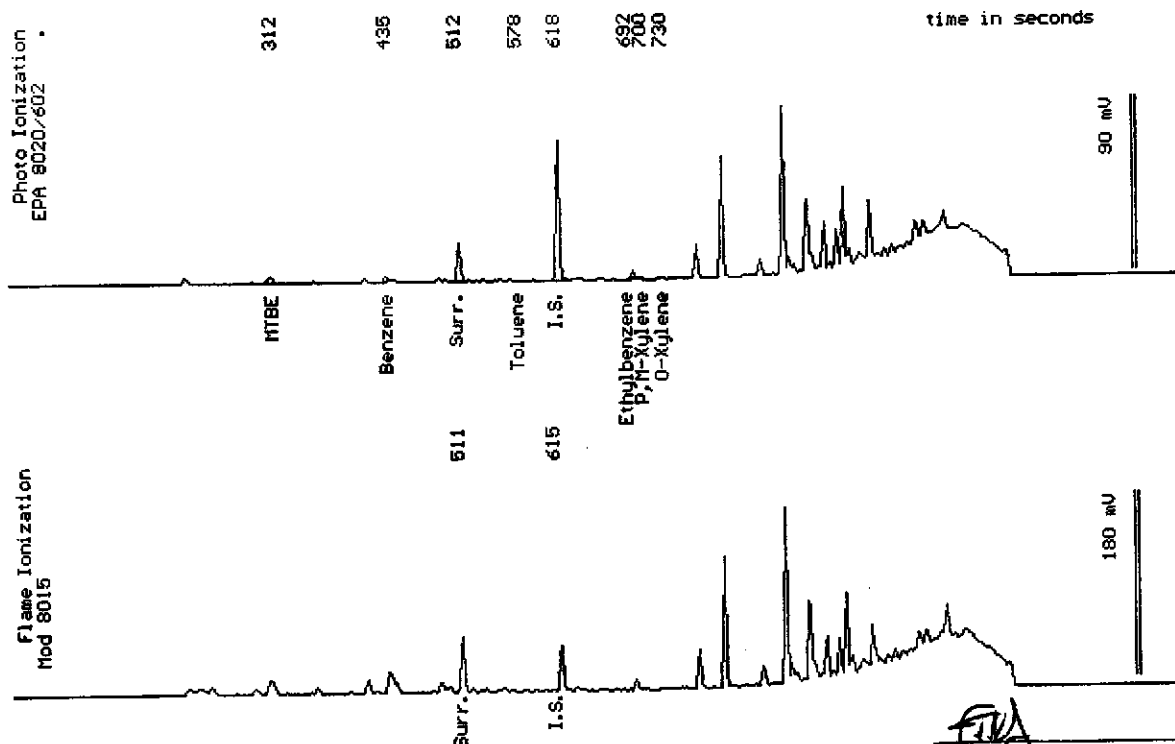
Sampled : 03/03/00

Dilution : 1:20

Run Log : 2188B

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(10)	24
Toluene	(10)	<10
Ethylbenzene	(10)	41
Total Xylenes	(10)	<10
TPH as Gasoline	(1000)	8000
Surrogate Recovery		101 %



Date Analyzed: 03-06-00
Column : 0.63mm X 60m Restek Rtx-1301

Stewart Abdolsky
Senior Chemist

Acculabs Inc.

March 8, 2000
Sample Log 21107

QC Report for EPA 8020 & Modified EPA 8015
Run Log : 2187W
From : CORWOOD CW (Proj. # 106-02-01)
Sample(s) Received : 03/03/00

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
Benzene	107	107	0
Ethylbenzene	108	110	2
TPH as Gasoline	106	111	5

* RPD = Relative Percent Difference

Parameter	Laboratory Control Sample % Recovery
Benzene	103
Ethylbenzene	108
Gasoline	108

Parameter	Method Blank
Benzene	<0.005 mg/Kg
Toluene	<0.005 mg/Kg
Ethylbenzene	<0.005 mg/Kg
Total Xylenes	<0.005 mg/Kg
TPH as Gasoline	<1.0 mg/kg


Tom Kubka
Lab Director

Acculabs Inc.

March 8, 2000
Sample Log 21107

QC Report for EPA 602 & Modified EPA 8015
Run Log : 2188B
From : CORWOOD CW (Proj. # 106-02-01)
Sample(s) Received : 03/03/00

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
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Spiked sample too contaminated for spike recovery. See LCS data.

* RPD = Relative Percent Difference

Parameter	Laboratory Control Sample % Recovery
-----------	---

Benzene	83
Ethylbenzene	95
Gasoline	123

Parameter	Method Blank
-----------	--------------

Benzene	<0.50 ug/L
Toluene	<0.50 ug/L
Ethylbenzene	<0.50 ug/L
Total Xylenes	<0.50 ug/L
TPH as Gasoline	<50 ug/L


Tom Kwoka
Lab Director



Acculabs Inc.

Davis

Sample Log 21107

21107-02

Sample: IB-1.2 (7.5')

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Extracted: 03/06/00

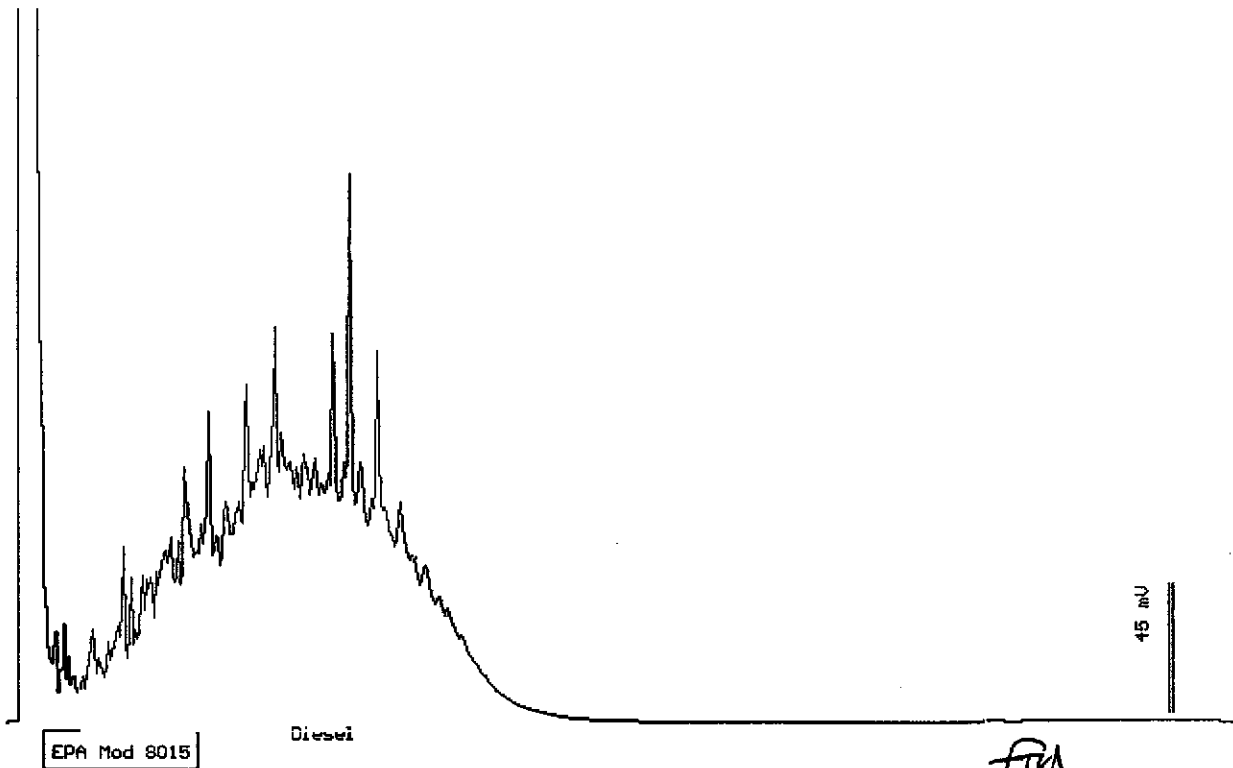
Dilution : 1:5

Matrix : Soil

QC Batch : DS000301

Run Log : 7462G

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(5.0)	600



Date: 03-07-00 Time: 00:34:50
Column : 0.53mm ID X 15m DB1 (J&W Scientific)


Stewart Rodolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107
21107-07

Sample: IB-2.3 (11.5')

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Extracted: 03/06/00

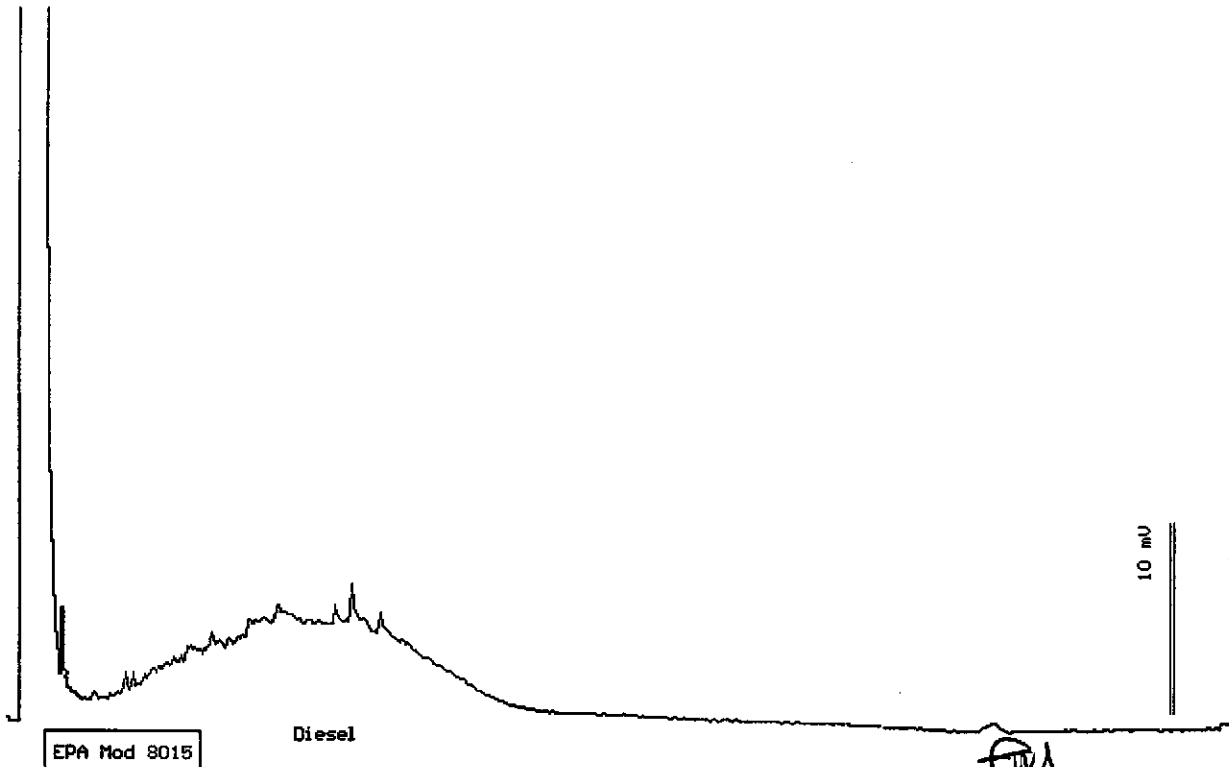
Dilution : 1:1

Matrix : Soil

QC Batch : DS000301

Run Log : 7462F

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(1.0)	7.1



Date: 03-06-00 Time: 15:05:24
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

[Signature]
Stewart Podolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107
21107-09

Sample: IB-1W

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Extracted: 03/06/00

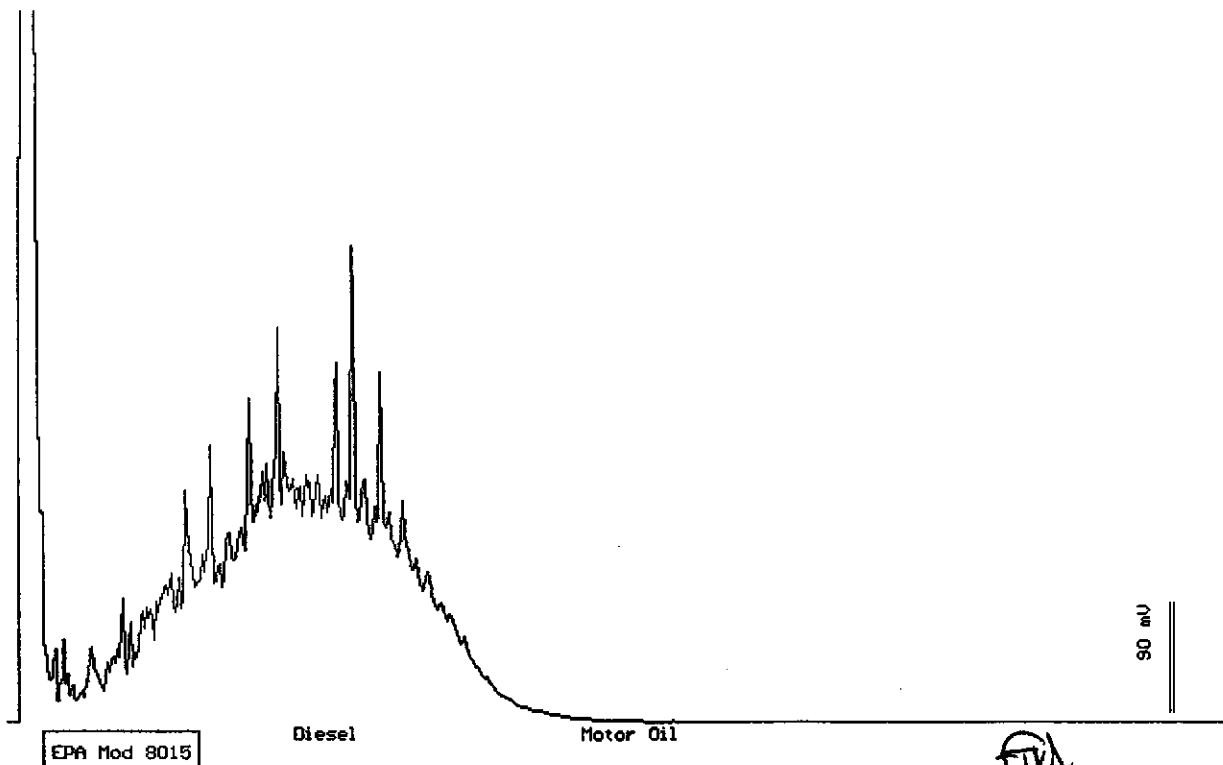
Dilution : 1:63

Matrix : Water

QC Batch : DW000301

Run Log : 7462H

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(3200)	750000



Date: 03-08-00 Time: 09:48:20
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

Stewart Rodolsky
Stewart Rodolsky
Senior Chemist



Acculabs Inc.

Davis

Sample Log 21107

21107-10

Sample: IB-2W

From : CORWOOD CW (Proj. # 106-02-01)

Sampled : 03/03/00

Extracted: 03/06/00

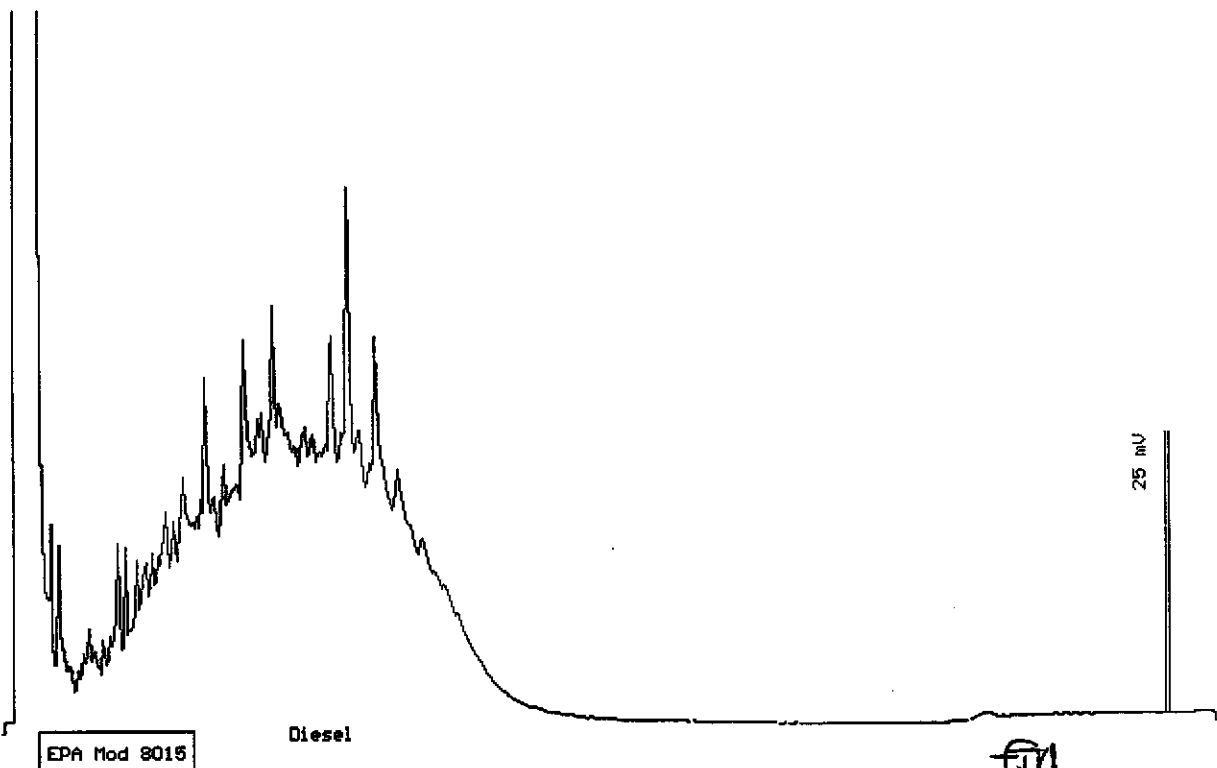
Dilution : 1:9

Matrix : Water

QC Batch : DW000301

Run Log : 7462GG

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(450)	15000



EPA Mod 8015

Diesel

Date: 03-07-00 Time: 00:01:42
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

Stu
Stewart Podolsky
Senior Chemist

Acculabs Inc.

March 6, 2000

QC Report
TPH Diesel by 8015 Mod

QC Batch: DS000301

Matrix: Soil

Spike and Spike Duplicate Results

Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
TPH as Diesel	No recovery due to high concentration of spiked sample. See LCS data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)
TPH as Diesel	97

Method Blank

Parameter	MDL(mg/Kg)	Measured Value(mg/Kg)
TPH as Diesel	(1.0)	<1.0
TPH as Motor Oil	(10)	<10



Tom Kwoka
Lab Director

Acculabs Inc.

March 08, 2000

QC Report
TPH Diesel by 8015 Mod

QC Batch DW000301

Matrix: Water

Spike and Spike Duplicate Results

Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
TPH as Diesel	Not enough sample for spiking. See duplicate LCS Data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)	Laboratory Control Spike Dup. (%Rec)	RPD %
TPH as Diesel	87	83	5

Method Blank

Parameter	MDL(ug/L)	Measured Value(ug/L)
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



Tom Kwoka
Lab Director



Acculabs Inc.

Davis

EPA 8260B Oxygenates

Sample Log 21107
March 07, 2000

Sample Name : IB-1.2 (7.5')

Project Name : CORWOOD CW

Project Number : 106-02-01

Sample Date : 03/03/00

Date Analyzed : 03/06/00

Date Received : 03/03/00

Dilution : 1:2

Sample Matrix : Soil

Lab Number : 21107-02

Parameter	MRL	Measured Conc.	Units
tert-Butanol	0.040	< 0.040	mg/Kg
Methyl-tert-butyl ether	0.010	< 0.010	mg/Kg
Diisopropyl ether	0.010	< 0.010	mg/Kg
Ethyl-tert-butyl ether	0.010	< 0.010	mg/Kg
tert-Amylmethyl ether	0.010	< 0.010	mg/Kg
Dibromofluoromethane		113	% Recovery

MRL = Method Reporting Limit Conc. = Concentration

B = Analyte was detected in Method Blank.

E = Concentration exceeded calibration range.

Approved By :


Tom Kwoka



Acculabs Inc.

Davis

EPA 8260B Oxygenates

Sample Log 21107
March 07, 2000

Sample Name : IB-2.3 (11.5')

Project Name : CORWOOD CW

Project Number : 106-02-01

Sample Date : 03/03/00

Date Analyzed : 03/06/00

Date Received : 03/03/00

Dilution : 1:1

Sample Matrix : Soil

Lab Number : 21107-07

Parameter	MRL	Measured Conc.	Units
tert-Butanol	0.020	<0.020	mg/Kg
Methyl-tert-butyl ether	0.0050	0.0086	mg/Kg
Diisopropyl ether	0.0050	<0.0050	mg/Kg
Ethyl-tert-butyl ether	0.0050	<0.0050	mg/Kg
tert-Amylmethyl ether	0.0050	<0.0050	mg/Kg
Dibromofluoromethane		109	% Recovery

MRL = Method Reporting Limit Conc. = Concentration

B = Analyte was detected in Method Blank.

E = Concentration exceeded calibration range.

Approved By :


Tom Kwoka



Acculabs Inc.

Davis

EPA 8260B Oxygenates

Sample Log 21107

March 07, 2000

Sample Name : **IB-1W**

Project Name : CORWOOD CW

Project Number : 106-02-01

Sample Date : 03/03/00

Date Analyzed : 03/06/00

Date Received : 03/03/00

Dilution : 1:1000

Sample Matrix : Water

Lab Number : 21107-09

<u>Parameter</u>	<u>MRL</u>	<u>Measured Conc.</u>	<u>Units</u>
tert-Butanol	20000	<20000	ug/L
Methyl-tert-butyl ether	5000	<5000	ug/L
Diisopropyl ether	5000	<5000	ug/L
Ethyl-tert-butyl ether	5000	<5000	ug/L
tert-Amylmethyl ether	5000	<5000	ug/L
Dibromofluoromethane		109	% Recovery

MRL = Method Reporting Limit Conc. = Concentration

B = Analyte was detected in Method Blank.

E = Concentration exceeded calibration range.

Approved By :


Tom Kwoka



Acculabs Inc.

Davis

EPA 8260B Oxygenates

Sample Log 21107

March 07, 2000

Sample Name : IB-2W

Project Name : CORWOOD CW

Project Number : 106-02-01

Sample Date : 03/03/00

Date Analyzed : 03/06/00

Date Received : 03/03/00

Dilution : 1:5

Sample Matrix : Water

Lab Number : 21107-10

<u>Parameter</u>	<u>MRL</u>	<u>Measured Conc.</u>	<u>Units</u>
tert-Butanol	100	<100	ug/L
Methyl-tert-butyl ether	25	530	ug/L
Diisopropyl ether	25	<25	ug/L
Ethyl-tert-butyl ether	25	<25	ug/L
tert-Amylmethyl ether	25	<25	ug/L
Dibromofluoromethane		126	% Recovery

MRL = Method Reporting Limit Conc. = Concentration

B = Analyte was detected in Method Blank.

E = Concentration exceeded calibration range.

Approved By :


Tom Kwoka



Acculabs Inc.

Davis

Acculabs Inc. - Davis

EPA 8260B QC Report

Matrix: Soil


Date Analyzed: 3/6/00

QC Batch: VS000306

QC Limits Set: 8/18/99

Parameter	Spike Conc mg/Kg	LCS % Rec	LCSD % Rec	RPD	Control Chart Limits	
					Lower	Upper
1,1-Dichloroethene	0.050	124	116	6.7	27	125
Benzene	0.050	117	114	2.5	82	127
Trichloroethene	0.050	123	107	13.9	68	111
Toluene	0.050	121	121	0.2	59	129
Chlorobenzene	0.050	104	106	1.4	88	112

Parameter	Control Chart Limits	
	Lower	Upper
Dibromofluoromethane	75	122
Toluene-d8	72	120
4-Bromofluorobenzene	51	120


Tom Kwoka
Laboratory Director



Acculabs Inc.

Davis

Acculabs Inc. - Davis

EPA 8260B QC Report

Matrix: Water

Date Analyzed: 3/6/00

QC Batch: VW000306

QC Limits Set: 8/18/99

Parameter	Spike Conc ug/L	LCS % Rec	LCSD % Rec	RPD	Control Chart Limits	
					Lower	Upper
1,1-Dichloroethene	50	100	97	3.7	26	139
Benzene	50	112	111	0.1	83	127
Trichloroethene	50	104	103	0.5	64	120
Toluene	50	109	102	6.2	64	129
Chlorobenzene	50	103	105	1.8	88	112

Surrogate Compound	Control Chart Limits	
	Lower	Upper
Dibromofluoromethane	80	122
Toluene-d8	67	127
4-Bromofluorobenzene	51	121


Tom Kwoka
Laboratory Director

Acculabs Inc.

[] 3902 E. University Dr. Phoenix AZ 85034
 [] 710 E. Evans Blvd. Tucson AZ 85713
 [] 2020 W. Lone Cactus Dr. Phoenix AZ 85027
 [] 4663 Table Mountain Dr. Golden CO 80403
 [] 992 Spice Islands Dr. Sparks NV 89431
 [] 1046 Olive Drive #2 Davis CA 95616

602-437-0979 Fax 437-0826
 520-884-5811 Fax 884-5812
 602-780-4800 Fax 780-7695
 303-277-9514 Fax 277-9512
 702-355-0202 Fax 355-0817
 530-757-0920 Fax 753-6091

Lab Number

21107

Report
 Due Date:

Client Gribi Associates		PUBLIC WATER SUPPLY INFORMATION	
Address 1350 Hayes Street, Ste C-14		System Name	
City, State & Zip Benicia, CA 94510		PWS No.	Report to State/EPA Y N
Contact Jim Gribi		POE No.	DWR No.
Phone 707/748-7743	Project Name CORWOOD CW		Collection Point
Fax 707/748-7763	Project Number 106-02-01		Collector's Name
P.O. Number	Fax Results <input checked="" type="radio"/> Y <input type="radio"/> N	Page 1 of 1	Location (City)

SAMPLE TYPE CODES			S a m p l e T y p e	C o n t a i n e r s	Analyses Requested										S p l. N o.			
DW = drinking water	TB = travel blank	Compliance Monitoring			TPH	GB	TEX	MTBE	TPH-D	OXYGENATES	HOLD							
WW = waste water	SD = solid	Y N																
MW = monitoring well	SO = soil																	
HW = hazardous waste	SL = sludge																	
TURNAROUND TIME REQUESTED																		
Standard	3/7/00	Lab Director Approval																
RUSH																		
Special																		
CLIENT'S SAMPLE ID/LOCATION	Date	Time																
IB-1.1 (3.5')	2/1/00		S	1													X	01
IB-1.2 (7.5')	2/1/00		S	1	X	X	X											02
IB-1.3 (11.5')	2/1/00		S	1													X	03
IB-1.4 (14.5')			S	1													X	04
IB-2.1 (3.5')			S	1													X	05
IB-2.2 (7.5')			S	1													X	06
IB-2.3 (11.5')			S	1	X	X	X											07
IB-2.4 (14.5')			S	1													X	08
IB-1W			W	5	X	X	X											09
IB-2W			W	5	X	X	X											10

Instructions/Comments/Special Requirements:

SAMPLE RECEIPT		Date	Time	Samples Relinquished By	Samples Received By
Received Cold	Y N	3/3/00	1445	<i>Acculabs</i>	<i>Jim Gribi</i>
Custody Seals	Y N				
Seals Intact	Y N				
No. of Containers					

Acculabs' terms are: Net 40 (Payment must be received by the date shown on the invoice or any discount is void)