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Engineering & sciences applied to the earth & its environment

May 28, 1996
93C0276A-4300

Ms. Rita Sullins
Don-Sul, Inc.
187 North L Street
Livermore, CA 94550

Subject: **Installation and Sampling of Replacement Monitoring Wells**
187 North L Street, Livermore, California

Dear Ms. Sullins:

INTRODUCTION

Woodward-Clyde Consultants (WCC) has completed installation of four replacement monitoring wells, sampling and analysis of groundwater samples from those wells at the Arrow Rentals Site. The replacement of the wells was requested by Ms. Eva Chu of the Alameda County Environmental Health Services (ACEHS) in a letter dated January 19, 1996. The work was authorized by Don-Sul, Inc. by an addendum to the contract between WCC and Don-Sul, Inc. dated August 31, 1993. This report discusses the installation of the new monitoring wells and the results of the analysis of the groundwater samples.

DESCRIPTION OF FIELD ACTIVITIES

Monitoring Well Installation

Between March 11 and 13, 1996, Gregg Drilling & Testing, Inc. installed three groundwater monitoring wells W-1s, W-Bs and W-3s on the Arrow Rentals Site. Groundwater monitoring well W-Es was installed at the south end of North M Street under the observation of a WCC engineer. The locations of these monitoring wells are shown on Figure 1. Prior to the drilling of the borings for the wells, Underground Service Alert (USA) was contacted to arrange utility clearance at the North M Street location. WCC obtained an encroachment permit from the City of Livermore for this location and a permit issued by the Alameda County Flood Control and Water Conservation District for all four wells.

The borings for monitoring wells W-1s and W-Bs were drilled using 12-inch diameter, hollow stem augers, to allow installation of 6-inch diameter PVC well casing. These larger-diameter well casings may be used for groundwater extraction if required for remediation. The W-3s boring was drilled using 10-inch diameter, hollow stem augers, to allow installation of 4-inch diameter PVC well casing. The W-Es boring was drilled using 8-inch diameter, hollow stem

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① cont QMR
② is plume moving - does this explain higher conc in WBs than in WLs ?

May 31, 1996

Ms. Eva Chu
Alameda County
Environmental Health Services
1131 Harbor Bay Pkwy., #250
Alameda, CA 94502-6577

Subject: Installation and Sampling of Replacement Monitoring Wells - 187 North L Street, Livermore, California

Dear Ms. Chu:

Enclosed is the installation and sampling of replacement of four monitoring wells report submitted after completion of the work performed between March 11, 1996 and April 24, 1996 , at 187 North "L" Street in Livermore for Don-Sul, Inc.

If you have any questions, please contact me at (510) 874-3125.

Sincerely,

Mr. Albert P. Ridley, CEG
Project Manager

Enclosures: Woodward-Clyde May 28, 1996 Report.

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augers, to allow installation the 2-inch diameter PVC well casing. A WCC staff engineer observed the drilling and well installation operations and prepared a log of the soil cuttings and well construction. The logs are presented in Appendix A. The logs indicate the results of headspace readings of soil from selected depths using a photo ionization detector (PID). Soil cuttings generated during drilling are stored on-site in twenty-one labeled 55-gallon drums pending disposal arrangements. Five composite soil samples from drums were collected and analyzed for MtBE, BTEX, and lead.

The monitoring wells were constructed as follows. A 25-foot section of schedule 40 PVC, 0.010-inch-aperature slotted casing was installed between the depths of 20 feet and 45 feet. A sand filter pack consisting of 2/12 Monterey Type, Lonestar sand, was placed from the bottom of the boring to approximately 2 feet above the top of the screen. The filter pack was sealed with an approximately 2-foot-thick layer of bentonite pellets placed above the top of the sand pack. The remaining portion of the annulus was sealed with Portland cement grout. A water-tight, locking well cap was placed inside the casing and a traffic-rated Christy box was placed over each well. The well construction details are shown on the log of each monitoring well, in Appendix A.

Monitoring Well Development and Groundwater Sampling

Groundwater sampling was performed on March 22, 1996 in wells W-1s, W-Bs, W-3s, and W-Es by a WCC field technician. These well locations are shown on Figure 1. The purged water from the wells was stored in one 55 gallon barrel on site and labeled by WCC Personnel. The Groundwater Sampling Logs are shown in Appendix B.

The groundwater was sampled by using a bailer. A new length of hose and a new bailer were used for each well. The samples were placed into appropriate pre-labeled, laboratory-supplied sample containers. Sample vials were then immediately placed into a chilled cooler. The cooler was given to Inchcape Testing Services Anametrix Laboratories, San Jose, California, under chain-of-custody procedures. Each groundwater sample was analyzed for TPH gasoline using modified EPA Method 8015, benzene, toluene, ethyl benzene, xylenes (BTEX) and MtBE using modified EPA Method 8021.

Monitoring Well Survey and Groundwater Elevations

In April 24, 1996, monitoring wells were surveyed by a licensed land surveyor under the observation of a WCC staff engineer. Prior to surveying, old locks from well caps were cut-off, well caps were removed, and well names were painted on the pavement. Elevations were based on City of Livermore datum.

During the surveying, well integrity was provided to monitoring wells W-Es, W-E, W-3s, W-BS, W-B, W-C, W-A, and W-1s by locking well caps using eight locks keyed-alike. Monitoring wells W-1, W-2, and W-3 do not have adequate locking caps and, therefore, at this time, well integrity is not provided to those wells. We anticipate adding locking caps to these wells.

During the surveying, stabilized groundwater levels were measured in monitoring wells W-Es, W-3s, W-1s, and W-Bs with an electrical water level indicator and oil/water interface probe. Between each groundwater level measurement, the interface probe was decontaminated using Alconox soap and clean water.

RESULTS OF FIELD ACTIVITIES

Groundwater Results

Monitoring well elevations were reported by the surveyor at 474.44 feet/MSL in W-E, 474.66 feet/MSL in W-Es, 479.22 feet/MSL in W-2, 478.19 feet/MSL in W-3, 476.98 feet/MSL in W-3s, 478.82 feet/MSL in W-Bs, 478.61 feet/MSL in W-B, 479.04 feet/MSL in W-A, 479.09 feet/MSL in W-1s, 478.66 feet/MSL in W-1, and 479.47 feet/MSL in W-C (Table 1). Water depths were measured at 18.45 feet in W-Es, 17.70 feet in W-3s, 17.95 feet in W-1s, and 18.05 feet in W-Bs (Table 2). Local groundwater flow direction is calculated to be toward west (Figure 2). Due to a recent water pipe leak of approximately 38,000 gallons near W-1, measured water depth in W-1 may be higher than usual.

Water samples were analyzed for TPH gasoline using modified EPA Method 8015, benzene, toluene, ethyl benzene, xylenes (BTEX) and MtBE using modified EPA Method 8021. The data were reviewed by WCC and found to be of acceptable quality. The laboratory analytical data for Wells W-Es, W-1s, W-Bs, and W-3s are summarized in Table 3 and the laboratory reports are shown in Appendix C

Groundwater samples from the monitoring wells W-1s and W-Bs in the central area of the site were reported to contain 6,400 µg/L and 61,000 µg/L total petroleum hydrocarbons (TPH) quantified as gasoline, respectively. Benzene was reported at concentrations of 580 µg/L and 9,800 µg/L in the two monitoring wells. Toluene was detected in wells W-1s and W-Bs respectively at 470 and 8,000 µg/L, ethylbenzene was detected in wells W-1s and W-Bs respectively at 85 and 2,200 µg/L, and total xylenes were detected in wells W-1s and W-Bs respectively at 1,100 and 11,000 µg/L.

The groundwater sample from monitoring well W-3s in the western corner of the site was reported with 100 µg/L TPH-gasoline, 13 µg/L benzene, 6.9 µg/L toluene, 5.3 µg/L

ethylbenzene, and 14 µg/L total xylenes. No TPH-gasoline or BTEX were reported at concentrations exceeding their respective detection limits in the groundwater sample from the off-site monitoring well W-Es, located approximately 225 feet west of the western site boundary. MtBE was not reported at concentrations exceeding the detection limits in samples from any of the four monitoring wells.

Waste Disposal

Analytical results from composite soil cutting from drums are summarized in Table 4 and the laboratory reports are shown in Appendix C. The water results are from the wells and therefore representative of the purge water (Table 3).

Twenty one 55-gallon drums of waste soil will be transported and disposed to a Class II Landfill, twenty five 55-gallon drums of waste non RCRA solis soils will be transported to recycle, and 1375 gallons of purged water will be transported to recycle.

CONCLUSIONS AND RECOMMENDATIONS

Review of the field sampling and laboratory test results indicate that no floating product was observed in groundwater from wells W-1s, W-3s, W-Bs or W-Es during the 3-22-96 sampling and analysis. Comparison of the laboratory results from the previous groundwater sampling of the adjacent deeper wells on 9-13-95 to the current 3-22-96 sampling and analysis results shows that there has been a significant reduction in detected concentrations of BTEX and TPH gasoline (see Table 3 and 3A).

There is only one exception to the reduction in concentrations of BTEX and TPH gasoline. The concentration of total xylenes and TPH gasoline in groundwater from well W-Bs is higher than that reported for a groundwater sample from well W-B (see Tables 3 and 3A). The higher detected total xylenes and TPH gasoline in W-Bs may be a result of the higher elevation of the screened interval in W-Bs which samples a shallow zone of groundwater as compared to the deeper screened section in W-B. However, the concentrations of benzene and toluene in groundwater from W-Bs are significantly lower than the previous results for well W-B. The concentration of ethylbenzene reported for groundwater from W-Bs (2,200 ug/l) is about the same as reported for groundwater from W-B (2,000 ug/l).

In 1995 benzene was reported at a concentration of 4 ug/l for groundwater from the downgradient well W-E. However, in the 3-22-96 sampling of well W-Es the laboratory reports no detection above the reporting limit of 0.5 ug/l for benzene.

We believe that these observed reductions in the concentration of BTEX and TPH gasoline in groundwater from these wells is a result of natural degradation of these compounds in the

shallow groundwater. Furthermore, the absence of benzene in groundwater from the downgradient well W-Es indicates that the groundwater plume is stable and is most likely becoming smaller.

Please call if you have any questions.

Sincerely,

Albert P. Ridley, CEG
Project Manager

Attachments: Table 1 Monitoring Well Elevations
Table 2 Groundwater Elevations
Table 3 Results of Laboratory Analyses of Groundwater for 3-22-96
Table 3A Results of Laboratory Analyses of Groundwater for 9-13-95
Table 4 Summary of Laboratory Analyses of Composite Soil Samples
Figure 1 Site Plan
Figure 2 Groundwater Elevation Contour Map
Appendix A Well Logs
Appendix B Groundwater Sampling Logs
Appendix C Laboratory Reports

TABLE 1.
MONITORING WELL ELEVATIONS

Monitoring Well	Top of Casing Elevation [feet, MSL]
W-E	474.44
W-Es	474.66
W-2	479.22
W-3	478.19
W-3s	476.98
W-Bs	478.82
W-B	478.61
W-A	479.04
W-1s	479.09
W-1	478.66
W-C	479.47

Note:
MSL: Mean Sea Level (elevations based on City of Livermore datum)

TABLE 2.
GROUNDWATER ELEVATIONS

Well Number	Top of Casing Elevation [feet, MSL]	Depth to Water [feet below TOC]	Water Elevation [feet, MSL]
W-Es	474.66	18.45	456.21
W-3s	476.98	17.70	459.28
W-1s	479.09	17.95	461.14
W-Bs	478.82	18.05	460.77

Legend:
TOC: Top of PVC Casing
MSL: Mean Sea Level (elevations based on City of Livermore datum)
Groundwater levels measured on April 24, 1996.

TABLE 3.
RESULTS OF LABORATORY ANALYSES OF GROUNDWATER FOR 3-22-96

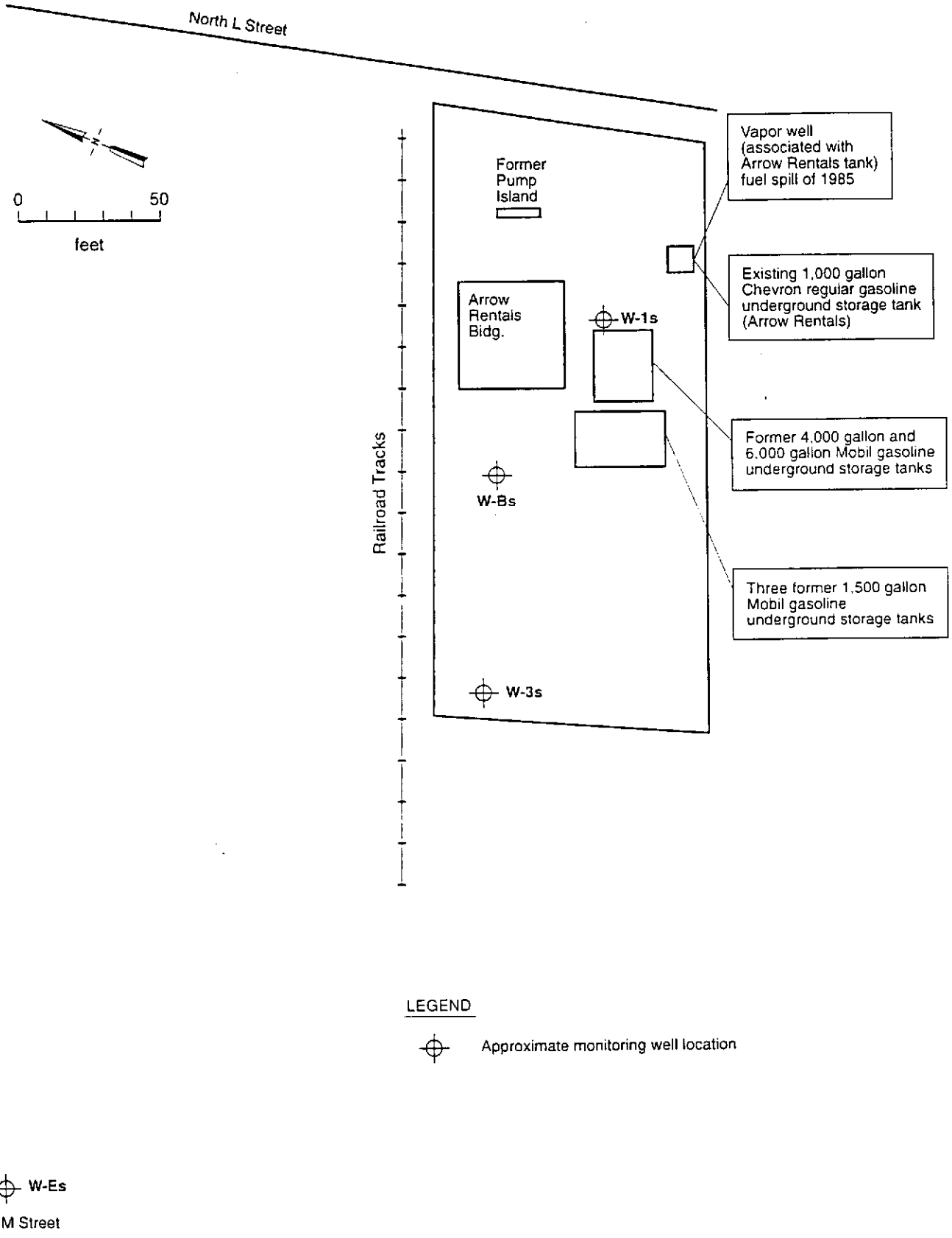
	Chemical [µg/L]					
Location	MtBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-gasoline
W-Es	<5	<0.5	<0.5	<0.5	<0.5	<50
TO 45 W-1s	<500	580	470	85	1,100	6,400
W-Bs	<5000	9,800	8,000	2,200	11,000	61,000
W-3s	<5	13	6.9	5.3	14	100

TABLE 3A.
RESULTS OF LABORATORY ANALYSES OF GROUNDWATER FOR 9-13-95

	Chemical [µg/L]					
Location	MtBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-gasoline
W-E	18	4	<.5	<.5	<.5	95
W-1	<12,500	65,000	78,000	6,400	36,000	660,000
W-B	NT	22,000	79,000	2,000	4,000	13,000
W-3	<5	5,600	290.0	460.0	280	27,000

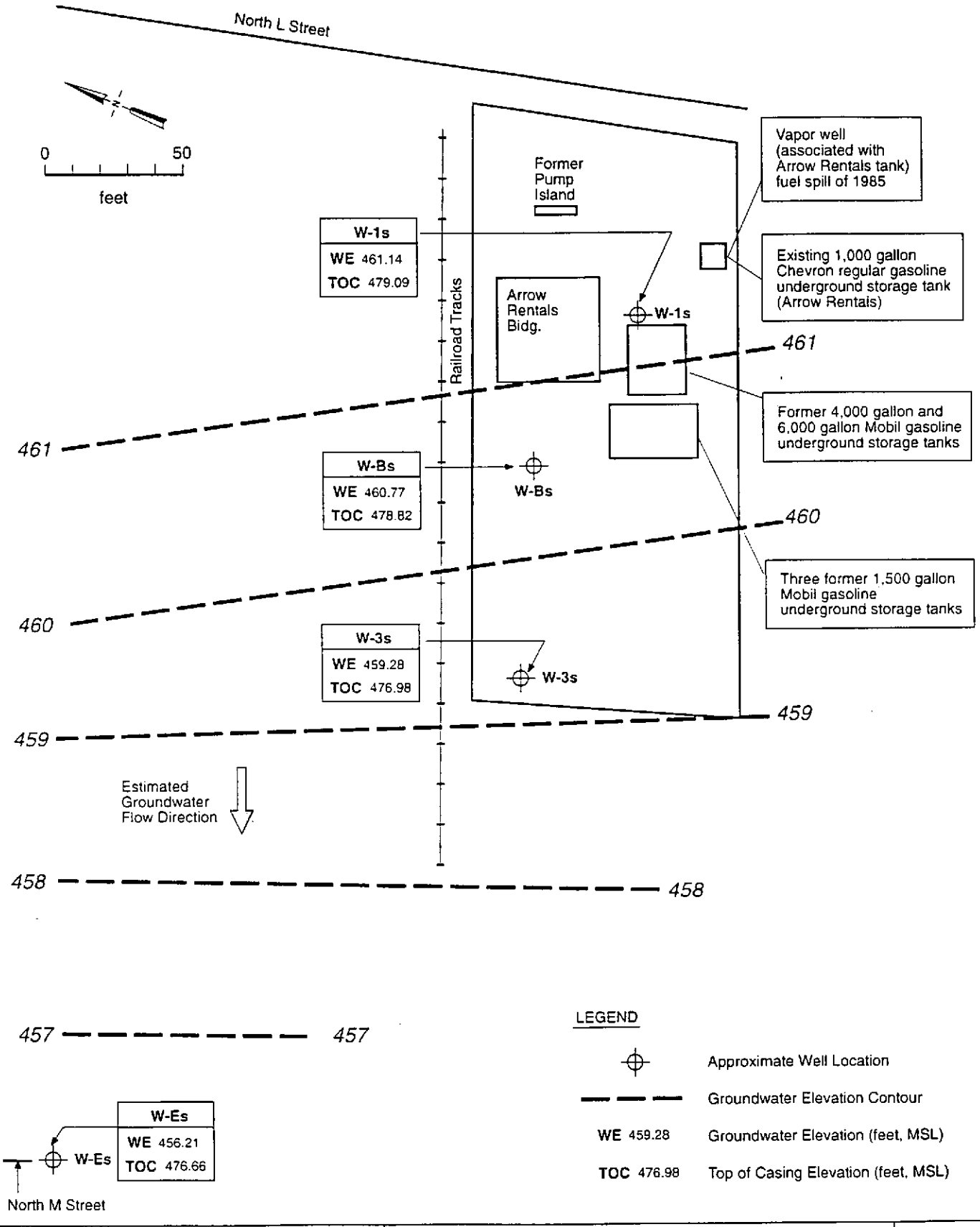
TABLE 4.
SUMMARY OF LABORATORY ANALYSES OF COMPOSITE SOIL SAMPLES (from soil cuttings in drums)

	Chemical [mg/kg]						
Location	**MtBE**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**TPH-gasoline**	**Lead**
S-1-5	7.7	15	51	29	140	2000	12
S-6-10	3.9	6.2	20	9.1	45	580	13.8
S-11-14	<0.25	0.68	1.1	0.27	3.3	83	14.8
S-15-18	<0.125	0.29	1.4	0.59	2.5	81	8.5
S-19-21	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5	6



Project No. 90C0321A	ARROW RENTALS 187 North L Street, Livermore, California	SITE PLAN	May 1996 Figure 1
Woodward-Clyde Consultants			

90C0321A-4300/052196/gos



Project No. 90C0321A	ARROW RENTALS 187 North L Street, Livermore, California	GROUNDWATER ELEVATION CONTOUR MAP	May 1996
Woodward-Clyde Consultants			Figure 2

90C0321A-4300/052196/graphics/gos.mci

APPENDIX A
WELL LOGS

Woodward-Clyde Consultants PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-1S		ELEVATION AND DATUM	
DRILLING AGENCY GREGG DRILLING	DRILLER Chris St Pierre	DATE STARTED / DATE FINISHED 3/11/96 → 3/11/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stern Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 6" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jerome Lebegue	CHECKED BY
SIZE AND TYPE OF PACK Monterey Sand #2/12	FROM 45 TO 17 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 17 TO 15 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov (in)	SAMPLES: Penetr Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid loss, Odor etc.)
0	~~Asphalt Concrete 4 inches~~								
2	Cuttings - Gravel (GP)								
4									
6									
8									
10									
12									
14									PID = 0.7 ppm
16									
18									
20									PID = 182 ppm gasoline odor
22									
24									
26	Cuttings - Gravels with silt Silty gravelly sand (GM)								PID = 329 ppm gasoline odor
28									

FIELD LOG OF BORING NO. W-1S SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov. (in)	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30									PID = 250 ppm gasoline odor
32									
34	Silty gravelly sand (GM), moist								PID = 135 ppm gasoline odor
36									
38									
40									PID = 77 ppm
42									
44									
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-15 SHEET 2 of 2

Woodward-Clyde Consultants PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-BS		ELEVATION AND DATUM	
DRILLING AGENCY GREGG DRILLING	DRILLER Chris, + Pierre	DATE STARTED / DATE FINISHED 3/12/96 → 3/12/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 6" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jerome Lebegue	CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand #2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 18 TO 16 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov. In	SAMPLES: Penetro Resist (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
0	Asphalt concrete 4 inches								
2	Cuttings Silty gravels (GM) brown to dark brown								
4									PID = 2.0 ppm
6									
8									
10									PID = 2.5 ppm
12									
14									PID = 2.8 ppm
16	Gravelly sand (GM) - brown with some silt, moist								
18									
20									PID = 3.5 ppm
22									
24									
26									PID = 3.3 ppm
28									

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov In	SAMPLES: Penetra Resist (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30									PID = 3.2 ppm
32									
34	Silt (ML), some clay, brown, moist								PID = 2.5 ppm
36									
38									
40									PID = 2.8 ppm
42									
44									PID = 4.7 ppm
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-B5 SHEET 2 of 2

Woodward-Clyde Consultants PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-35		ELEVATION AND DATUM	
DRILLING AGENCY GREGG DRILLING	DRILLER chris st Pierre	DATE STARTED 3/12/96 → DATE FINISHED 3/12/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stern Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 4" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jaime Lebegue	CHECKED BY:
SIZE AND TYPE OF PACK Monterey sand #1 2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite pellets	FROM 18 TO 16 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov ft	SAMPLES: Penetr Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Asphalt concrete 4 inches								
2	Silty gravel (GC) brown to dark brown								
4									PID = 0 ppm
6									
8									
10	clayed gravel (GC)								PID = 0 ppm
12									
14									
16									PID = 0 ppm
18									
20									PID = 0 ppm
22									
24									
26	clayed gravel brown								PID = 0 ppm
28									

FIELD LOG OF BORING NO. W-35 SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov. in	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30	Clayed gravel (GC), moist								PID = 0 ppm
32									
34									PID = 1.2 ppm
36									
38									PID = 1.7 ppm
40									
42									PID = 1.0 ppm.
44									
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-35 SHEET 2 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-ES		ELEVATION AND DATUM	
DRILLING AGENCY GREGG & DRILLING	DRILLER Trevor Joyner	DATE STARTED 3/13/96 → DATE FINISHED 3/13/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 2" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jeanne Lebeque	CHECKED BY:
SIZE AND TYPE OF PACK Monterey sand #2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 18 TO 16 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov ft	SAMPLES: Penetra Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
0	Asphalt & rock								
2	silty gravel (GC) - brown to dark brown								
4									
6									PID = 2.5 ppm
8									
10									PID = 3.3 ppm
12									
14									
16									PID = 2.9 ppm
18									
20									PID = 2.9 ppm
22									
24									
26	Silty to clayed gravel (GM/GC) brown								PID = 4.6 ppm
28									

FIELD LOG OF BORING NO. W-ES SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer installation	Water Content	Penetration Data	SAMPLES: Type No	SAMPLES: Recov in	SAMPLES: Penetr Resist (Blows/ 6 in.)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30	clayed sand (SC), brown, moist								PID = 2.4 ppm.
32									
34									
36									
38									
40									
42									
44									
46	Bottom of boring 43'								

FIELD LOG OF BORING NO. W-ES SHEET 2 of 2

APPENDIX B
GROUNDWATER SAMPLING LOGS

WATER SAMPLE LOG

Sample No. W-1s

Project No. : 93C0276A Date: 3-22-96

Project Name: Arrow Rentals

Sample Location: W-1s

Well Description: 6" PVC w/locking cap

Weather Conditions: clear, warm

Observations / Comments:

Quality Assurance

Sampling Method: Disposable bailer

Method to Measure Water Level : 200' Solinst

Pump Lines: (New) / Cleaned Bailer Lines: (New) / Cleaned

Method of cleaning Pump / Bailer: NA

pH Meter No.: 0230977 Calibrated 4.00/7.00

Specific Conductance Meter No.: 13748 Calibrated red-lined

Comments: TD 44.70 - 17.58 = 27.12 x 1.468 = 39.8 x 3 = 119.4

Sampling Measurements

Water Level (below MP) at Start: 17.58 End: 17.59

Measuring Point (MP): Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1046	20	6.98	19.5	990	LOW	Cloudy Grey	ND	
1048	40	7.12	20.2	1000	"	"	"	
1051	60	7.08	20.0	"	MOD.	TAN	"	
1055	80	7.06	"	"	HIGH	"	"	
1057	100	7.10	19.9	"	"	"	"	
1100	120	7.11	19.8	"	HIGH	TAN	"	Silty

Total Discharge: 120 gallons Casing Volumes Removed: 3

Method of disposal of discharged water: 55 gallon drums

Number and size of sample containers filled: @ 14:50; 3-40 mL VOAs (~~TPHg/BTEX~~) and MTBE

Collected by: J. Haus

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(415) 893-3600

WATER SAMPLE LOG

Sample No. W-3s

Project No. : 93C0276A Date: 3-22-96

Project Name: Arrow Rentals

Sample Location: W-3s

Well Description: 4" s.ch. 40 PVC w/locking cap

Weather Conditions: clear, warm

Observations / Comments:

Quality Assurance

Sampling Method: Disposable bailer

Method to Measure Water Level : 200' Solinst

Pump Lines: (New) / Cleaned Bailer Lines: (New) / Cleaned

Method of cleaning Pump / Bailer: N/A

pH Meter No.: 0230977 Calibrated 4.00/7.00

Specific Conductance Meter No.: 13748 Calibrated red-lined

Comments: 44.81 - 17.22 = 27.59 x .653 = 18 x 3 = 54

Sampling Measurements

Water Level (below MP) at Start: 17.22 End: 17.24

Measuring Point (MP): Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1248	10	7.27	20	850	HIGH	Grey	ND	
1249	20	7.32	20	810	"	"	"	
1251	30	7.30	20	810	"	TAN	"	
1252	40	7.25	20	810	"	"	"	
1253	50	7.21	20	810	"	"	"	
1254	60	7.19	20	810	"	"	"	

Total Discharge: 60 gal. Casing Volumes Removed: 3+

Method of disposal of discharged water: 55 gallon drums

Number and size of sample containers filled: @ 15:15; 3 VOA's

Collected by: J. HAUS

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(415) 893-3600

WATER SAMPLE LOG

Sample No. W-Es

Project No. : 93C0276A Date: 3-22-96
Project Name: Arrow Rentals
Sample Location: W-Es
Well Description: 2" sch. 40 PVC w/locking cap
Weather Conditions: clear, warm
Observations / Comments: Hand-bailed

Quality Assurance

Sampling Method: Disposable bailer
Method to Measure Water Level: 200' Solinst
Pump Lines: (New) / Cleaned Bailer Lines: (New) / Cleaned
Method of cleaning Pump / Bailer: N/A
pH Meter No.: 0230977 Calibrated 4.00/7.00
Specific Conductance Meter No.: 13748 Calibrated red-lined
Comments: 44.56 - 18.15 = 26.41 x .165 = 4.35 x 3 = 13.1 gal.

Sampling Measurements

Water Level (below MP) at Start: 18.15 End: 18.19
Measuring Point (MP): Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1405	3	7.40	19.4	730	HIGH	TAN	ND	
1411	6	7.27	19.3	730	"	"	"	
1415	9	7.28	19.0	720	"	"	"	
1421	12	7.24	18.8	720	"	"	"	
1425	14	7.27	18.5	720	"	"	"	

Total Discharge: 14 gallons Casing Volumes Removed: 3+
Method of disposal of discharged water: 55 gallon drum
Number and size of sample containers filled: @14:30, 3 VOAs

Collected by: J. H.

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(415) 893-3600

WATER SAMPLE LOG

Sample No. W-Bs

Project No. : 93C0276A Date: 3-22-96
Project Name: Arrow Rentals
Sample Location: W-Bs
Well Description: 6" sch 40 PVC w/locking cap
Weather Conditions: clear, warm
Observations / Comments:

Quality Assurance

Sampling Method: Disposable bailer
Method to Measure Water Level: 200' Solinst
Pump Lines: (New) / Cleaned Bailer Lines: (New) / Cleaned
Method of cleaning Pump / Bailer: N/A
pH Meter No.: 0230977 Calibrated 4.00/7.00
Specific Conductance Meter No.: 13748 Calibrated red-lined
Comments: TD 44.53 - 17.70 = 26.83 x 1.468 = 39.4 x 3 = 118.2

Sampling Measurements

Water Level (below MP) at Start: 17.70 End: 17.72
Measuring Point (MP): Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
11:45	20	7.21	19.6	820	MOD	Cloudy Grey	NI	
11:48	40	7.02	19.9	860	"	"	"	
11:51	60	7.02	19.6	840	"	"	"	
11:54	80	7.06	19.6	850	"	"	"	
11:57	100	7.01	19.6	860	"	"	"	
12:00	120	7.04	19.8	840	"	"	"	

Total Discharge: 120 gallons Casing Volumes Removed: 3+
Method of disposal of discharged water: 55 gallon drums
Number and size of sample containers filled: @15:00, 3 VOAs

Collected by: J. HAUS

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(415) 893-3600

APPENDIX C
LABORATORY REPORTS

Inchcape Testing Services
Anametrix Laboratories

1961 Concourse Drive
Suite E
San Jose, CA 95131
Tel: 408-432-8192
Fax: 408-432-8198

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603195
Date Received : 03/23/96
Project ID : 93C0276A
Purchase Order: N/A

The following samples were received at Inchcape for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9603195- 1	W-Es
9603195- 2	W-1s
9603195- 3	W-Bs
9603195- 4	W-3s
9603195- 5	TBLANK

This report is organized in sections according to the specific Inchcape laboratory group which performed the analysis(es) and generated the data.

The results contained within this report relate to only the sample(s) tested. Additionally, these data should be considered in their entirety and Inchcape cannot be responsible for the detachment, separation, or otherwise partial use of this report.

Inchcape is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234.

If you have any further questions or comments on this report, please call your project manager as soon as possible. Thank you for using Inchcape Testing Services.

Joace Wakida
Project Manager

4-3-96
Date

This report consists of 12 pages.

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603195
Date Received : 03/23/96
Project ID : 93C0276A
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

INCHCAPE SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9603195- 1	W-Es	WATER	03/22/96	TPHgBTEX
9603195- 2	W-1s	WATER	03/22/96	TPHgBTEX
9603195- 3	W-Bs	WATER	03/22/96	TPHgBTEX
9603195- 4	W-3s	WATER	03/22/96	TPHgBTEX
9603195- 5	TBLANK	WATER	03/20/96	TPHgBTEX

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603195
Date Received : 03/23/96
Project ID : 93C0276A
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- All holding times have been met for the analyses reported in this section.

Department Supervisor 4/3/96 Date

Chemist 04/03/96 Date

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603195-01	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	W-Es
Date Sampled:	3/22/96	Instrument ID:	HP4
Date Analyzed:	3/27/96	Surrogate Recovery:	103%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1	5.0	ND
Benzene	1	0.5	ND
Toluene	1	0.5	ND
Ethylbenzene	1	0.5	ND
Total Xylenes	1	0.5	ND
Gasoline	1	50	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

Issued on 4/3/96 at 9:46 am

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603195-02	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	W-1s
Date Sampled:	3/22/96	Instrument ID:	HP4
Date Analyzed:	3/27/96	Surrogate Recovery:	98%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	100	500	ND
Benzene	100	50	580
Toluene	100	50	470
Ethylbenzene	100	50	85
Total Xylenes	100	50	1100
Gasoline	100	5000	6400

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603195-03	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	W-Bs
Date Sampled:	3/22/96	Instrument ID:	HP4
Date Analyzed:	3/27/96	Surrogate Recovery:	97%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1000	5000	ND
Benzene	1000	500	9800
Toluene	1000	500	8000
Ethylbenzene	1000	500	2200
Total Xylenes	1000	500	11000
Gasoline	1000	50000	61000

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603195-04	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	W-3s
Date Sampled:	3/22/96	Instrument ID:	HP4
Date Analyzed:	3/27/96	Surrogate Recovery:	116%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1	5.0	ND
Benzene	1	0.5	13
Toluene	1	0.5	6.9
Ethylbenzene	1	0.5	5.3
Total Xylenes	1	0.5	14
Gasoline	1	50	100

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603195-05	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	TBLANK
Date Sampled:	3/20/96	Instrument ID:	HP4
Date Analyzed:	3/26/96	Surrogate Recovery:	102%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1	5.0	ND
Benzene	1	0.5	ND
Toluene	1	0.5	ND
Ethylbenzene	1	0.5	ND
Total Xylenes	1	0.5	ND
Gasoline	1	50	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	BM2601E1	Client Project ID:	93C0276A
Matrix:	WATER	Client Sample ID:	Method Blank
Date Sampled:	N/A	Instrument ID:	HP4
Date Analyzed:	3/26/96	Surrogate Recovery:	84%
Date Released:	4/3/96	Concentration Units:	ug/L

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1	5.0	ND
Benzene	1	0.5	ND
Toluene	1	0.5	ND
Ethylbenzene	1	0.5	ND
Total Xylenes	1	0.5	ND
Gasoline	1	50	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services approved methods.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

MATRIX SPIKE RECOVERY REPORT

Client Project ID:	93C0276A	Anametrix ID:	9603175-07
Client Sample ID:	Batch Spike	Date Released:	4/3/96
Date Sampled:	3/19/96	Instrument ID:	HP4
Date Analyzed:	3/26/96	Matrix:	WATER
		Concentration Units:	ug/L

COMPOUND NAME	SPIKE AMT	SAMPLE CONC	MS CONC	% REC MS	MSD CONC	%REC MSD	RPD
Gasoline	500	0	420	84%	410	82%	-2%
p-Bromofluorobenzene				136%		124%	

Quality control limits for MS/MSD recovery are 48-149%

Quality control limits for RPD(relative percent difference) are +/- 30%

Quality control limits for p-Bromofluorobenzene recovery are 61-139%.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	MM2601E1
Matrix:	WATER	Date Released:	4/3/96
Date Analyzed:	3/26/96	Instrument ID:	HP4
		Concentration Units:	ug/L

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
Gasoline	500	410	82%
p-Bromofluorobenzene			137%

Quality control limits for LCS recovery are 67-127%.

Quality control limits for p-Bromofluorobenzene recovery are 61-139%.

TOTAL PETROLEUM HYDROCARBONS AS BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	NM2601E3
Matrix:	WATER	Date Released:	4/3/96
Date Analyzed:	3/26/96	Instrument ID:	HP4
		Concentration Units:	ug/L

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
MtBE	10.0	9.7	97%
Benzene	10.0	10.1	101%
Toluene	10.0	9.8	98%
Ethylbenzene	10.0	10.1	101%
Total Xylenes	10.0	9.5	95%
p-Bromofluorobenzene			94%

Quality control limits for LCS recovery are 50-150% for MTBE, 52-133% for benzene, 57-136% for toluene, 56-139% for ethylbenzene, and 56-141% for total xylenes.

Quality control limits for p-Bromofluorobenzene recovery are 61-139%.

9603195

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(510) 893-3600

Chain of Custody Record

PROJECT NO. 93C0276A

SAMPLERS: (Signature)

	DATE	TIME	SAMPLE NUMBER	Sample Matrix (S)oil, (W)ater, (A)ir	EPA Method	EPA Method	EPA Method	EPA Method	TPH-g / BTEX	MTBE					Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
1	3/22/96		W-Es	W					X	X					3	
2			W-1s	W					X	X					3	
3			W-Bs	W					X	X					3	
4	3/22/96		W-3s	W					X	X					3	
5	3/20/96	—	Trip blanks	W					X	X					2	

Standard T.A.T.

Results to: Bill Copeland

TOTAL NUMBER OF CONTAINERS: 14

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
	3/22/96 16:35				

METHOD OF SHIPMENT	SHIPPED BY (Signature)	COURIER (Signature)	RECEIVED FOR LAB BY (Signature)	DATE/TIME
Federal Express				3/23/96 1038

Inchcape Testing Services
Environmental Laboratories

SAMPLE RECEIVING CHECKLIST

Workorder Number: 9603195 **Client Project ID:** 93C0276A

Cooler

Shipping documentation present? If YES, enter Carrier and Airbill #: FEDEX #4412C817981	(YES)	NO	N/A
Custody Seal on the outside of cooler? Condition: Intact ____ Broken ____	YES	NO	(N/A)
Temperature of sample(s) within range? List temperatures of cooler(s): 3°C Note: If all samples taken within previous 4 hr, circle N/A and place in sample storage area as soon as possible.	(YES)	NO	N/A

Samples

Chain of custody seal present for each container? Condition: Intact ____ Broken ____	YES	NO	(N/A)
Samples arrived within holding time?	(YES)	NO	N/A
Samples in proper containers for methods requested? Condition of containers: Intact ✓ Broken ____ If NO, were samples transferred to proper container(s)?	(YES)	NO	
Were VOA containers received with zero headspace? If NO, was it noted on the chain of custody?	(YES)	NO	N/A
Were container labels complete? (ID, date, time, preservative)	(YES)	NO	N/A
Were samples properly preserved? If NO, was the preservative added at time of receipt?	(YES)	NO	N/A
pH check of samples required at time of receipt? If YES, pH checked and recorded by:	YES	(NO)	
Sufficient amount of sample received for methods requested? If NO, has the client or PM been notified?	(YES)	NO	
Field blanks received with sample batch?	YES	NO	(N/A)
Trip blanks received with sample batch?	(YES)	NO	N/A

Chain of Custody

Chain of custody form received with samples?	(YES)	NO	
Has it been filled out completely and in ink?	(YES)	NO	
Sample IDs on chain of custody form agree with labels?	(YES)	NO	
Number of containers on chain agree with number received?	(YES)	NO	
Analysis methods specified?	(YES)	NO	
Sampling date and time indicated?	(YES)	NO	
Proper signatures of sampler, courier and custodian in appropriate spaces? With time and date?	(YES)	NO	
Turnaround time? Standard ✓ Rush			

Any NO responses and/or any BROKEN that was checked must be detailed in a Corrective Action Form.

Sample Custodian: JP Date: 3/23/96 Project Manager: WW Date: 4-3-96

f:\forms\newscr.doc

Inchcape Testing Services
Anametrix Laboratories

1961 Concourse Drive
Suite E
San Jose, CA 95131
Tel: 408-432-8192
Fax: 408-432-8198

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603182
Date Received : 03/21/96
Project ID : 93C0276A
Purchase Order: N/A

The following samples were received at Inchcape for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9603182- 1	S-1-5
9603182- 2	S-6-10
9603182- 3	S-11-14
9603182- 4	S-15-18
9603182- 5	S-19-21

This report is organized in sections according to the specific Inchcape laboratory group which performed the analysis(es) and generated the data.

The results contained within this report relate to only the sample(s) tested. Additionally, these data should be considered in their entirety and Inchcape cannot be responsible for the detachment, separation, or otherwise partial use of this report.

Inchcape is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234.

If you have any further questions or comments on this report, please call your project manager as soon as possible. Thank you for using Inchcape Testing Services.

Jane Wakida
Project Manager

4-2-96
Date

This report consists of 25 pages.

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603182
Date Received : 03/21/96
Project ID : 93C0276A
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

INCHCAPE SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9603182- 1	S-1-5	SOIL	03/21/96	TPHgBTEX
9603182- 2	S-6-10	SOIL	03/21/96	TPHgBTEX
9603182- 3	S-11-14	SOIL	03/21/96	TPHgBTEX
9603182- 4	S-15-18	SOIL	03/21/96	TPHgBTEX
9603182- 5	S-19-21	SOIL	03/21/96	TPHgBTEX

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603182
Date Received : 03/21/96
Project ID : 93C0276A
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- All holding times have been met for the analyses reported in this section.

Cheryl Balmer 3/29/96
Department Supervisor Date

Douglas Lee 03/29/96
Chemist Date

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603182-01	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	S-1-5
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/28/96	Surrogate Recovery:	99%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	5000	2.5	7.7
Benzene	5000	2.5	15
Toluene	5000	2.5	51
Ethylbenzene	5000	2.5	29
Total Xylenes	5000	2.5	140
Gasoline	5000	250	2000

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

Analyst 03/29/96 Date

Supervisor 3/29/96 Date

Issued on 3/29/96 at 4:17 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603182-02	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	S-6-10
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/28/96	Surrogate Recovery:	102%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	2500	1.25	3.9
Benzene	2500	1.25	6.2
Toluene	2500	1.25	20
Ethylbenzene	2500	1.25	9.1
Total Xylenes	2500	1.25	45
Gasoline	2500	125	580

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

Analyst 03/29/96 Date

Supervisor 3/29/96 Date

Issued on 3/29/96 at 4:18 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603182-03	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	S-11-14
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/28/96	Surrogate Recovery:	103%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	500	0.25	ND
Benzene	500	0.25	0.68
Toluene	500	0.25	1.1
Ethylbenzene	500	0.25	0.27
Total Xylenes	500	0.25	3.3
Gasoline	500	25	83

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

Analyst 3/29/96 Date

Supervisor 3/30/96 Date

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603182-04	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	S-15-18
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/28/96	Surrogate Recovery:	117%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	250	0.125	ND
Benzene	250	0.125	0.29
Toluene	250	0.125	1.4
Ethylbenzene	250	0.125	0.59
Total Xylenes	250	0.125	2.5
Gasoline	250	12.5	81

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

03/29/96

Analyst Date

Supervisor Date

Issued on 3/29/96 at 4:20 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	9603182-05	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	S-19-21
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/27/96	Surrogate Recovery:	114%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	2	0.005	ND
Benzene	2	0.005	ND
Toluene	2	0.005	ND
Ethylbenzene	2	0.005	ND
Total Xylenes	2	0.005	ND
Gasoline	2	0.5	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

03/29/96
Analyst Date

3/29/96
Supervisor Date

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	BM2701E1	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	Sand Blank
Date Sampled:	N/A	Instrument ID:	HP6
Date Analyzed:	3/27/96	Surrogate Recovery:	108%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	1	0.005	ND
Benzene	1	0.005	ND
Toluene	1	0.005	ND
Ethylbenzene	1	0.005	ND
Total Xylenes	1	0.005	ND
Gasoline	1	0.5	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

3/29/96 — Analyst — Date

Cheryl Balmer 3/29/96 — Supervisor — Date

Issued on 3/29/96 at 4:53 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	BM2702E1	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	MEOH Blank
Date Sampled:	N/A	Instrument ID:	HP6
Date Analyzed:	3/27/96	Surrogate Recovery:	101%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	50	0.025	ND
Benzene	50	0.025	ND
Toluene	50	0.025	ND
Ethylbenzene	50	0.025	ND
Total Xylenes	50	0.025	ND
Gasoline	50	2.5	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

Analyst Date

Supervisor Date

Issued on 3/29/96 at 4:24 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

DATA SUMMARY FORM

Anametrix ID:	BM2802E1	Client Project ID:	93C0276A
Matrix:	SOIL	Client Sample ID:	MEOH Blank
Date Sampled:	N/A	Instrument ID:	HP6
Date Analyzed:	3/28/96	Surrogate Recovery:	94%
Date Released:	3/29/96	Concentration Units:	mg/Kg

COMPOUND	Dilution Factor	Reporting Limit	Amount Found
MtBE	50	0.025	ND
Benzene	50	0.025	ND
Toluene	50	0.025	ND
Ethylbenzene	50	0.025	ND
Total Xylenes	50	0.025	ND
Gasoline	50	2.5	ND

ND: Not detected at or above the reporting limit for the method.

TPHg: Total Petroleum Hydrocarbons as gasoline is determined by GC/FID (modified EPA Method 8015) following sample purge and trap by EPA Method 5030.

BTEX: BTEX as Methyl tert-Butyl Ether, Benzene, Toluene, Ethylbenzene, and Total Xylenes is determined by GC/PID (modified EPA Method 8021) following sample purge and trap by EPA Method 5030.

Reporting limits are determined by dividing the dilution factor by 10 to generate an RLMF (reporting limit multiplication factor) which is then multiplied by the reporting limit for an undiluted sample. RLMFs of less than one are rounded up to one.

Surrogate recovery quality control limits for p-Bromofluorobenzene are 53-147%.

All testing procedures follow California Department of Health Services approved methods.

03/29/96
Analyst Date

3/29/96
Supervisor Date

Issued on 3/29/96 at 4:24 pm

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

MATRIX SPIKE RECOVERY REPORT

Client Project ID:	93C0276A	Anametrix ID:	9603182-05
Client Sample ID:	S-19-21	Date Released:	3/29/96
Date Sampled:	3/21/96	Instrument ID:	HP6
Date Analyzed:	3/27/96	Matrix:	SOIL
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	SAMPLE CONC	MS CONC	% REC MS	MSD CONC	%REC MSD	RPD
Gasoline	1.0	0	0.79	79%	0.70	70%	-12%
p-Bromofluorobenzene				104%		103%	

Quality control limits for MS/MSD recovery are 48-149%

Quality control limits for RPD(relative percent difference) are +/- 30%.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

MATRIX SPIKE RECOVERY REPORT

Client Project ID:	93C0276A	Anametrix ID:	9603207-02
Client Sample ID:	Batch Spike	Date Released:	3/29/96
Date Sampled:	3/23/96	Instrument ID:	HP6
Date Analyzed:	3/28/96	Matrix:	SOIL
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	SAMPLE CONC	MS CONC	% REC MS	MSD CONC	%REC MSD	RPD
MtBE	0.0200	0	0.0172	86%	0.0174	87%	1%
Benzene	0.0200	0	0.0189	95%	0.0188	94%	-1%
Toluene	0.0200	0	0.0205	103%	0.0212	106%	3%
Ethylbenzene	0.0200	0	0.0168	84%	0.0159	80%	-6%
Total Xylenes	0.0200	0	0.0163	82%	0.0176	88%	8%
p-Bromofluorobenzene				86%		83%	

Quality control limits for MS/MSD recovery are 50-150% for methyl tert-butyl ether, 45-139% for benzene, 51-138% for toluene, 48-146% for ethylbenzene, and 50-139% for total xylenes.

Quality control limits for RPD(relative percent difference) are +/- 30%.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	MM2702E1
Matrix:	SOIL	Date Released:	3/29/96
Date Analyzed:	3/28/96	Instrument ID:	HP6
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
Gasoline	0.50	0.54	108%
p-Bromofluorobenzene			99%

Quality control limits for LCS recovery are 58-130%.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

TOTAL PETROLEUM HYDROCARBONS
INCHCAPE TESTING SERVICES - ANAMETRIX
(408) 432-8192

BTEX LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	NM2701E3
Matrix:	SOIL	Date Released:	3/29/96
Date Analyzed:	3/28/96	Instrument ID:	HP6
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
Methyl tert-butyl ether	0.0100	0.0087	87%
Benzene	0.0100	0.0095	95%
Toluene	0.0100	0.0094	94%
Ethylbenzene	0.0100	0.0096	96%
Total Xylenes	0.0100	0.0090	90%
p-Bromofluorobenzene			99%

Quality control limits for LCS recovery are 50-150 % for methyl tert-butyl ether, 52-133% for benzene, 57-136% for toluene, 56-139% for ethylbenzene, and 56-141% for total xylenes.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

TOTAL PETROLEUM HYDROCARBONS
INCHCAPE TESTING SERVICES - ANAMETRIX
(408) 432-8192

BTEX LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	MM2801E3
Matrix:	SOIL	Date Released:	3/29/96
Date Analyzed:	3/28/96	Instrument ID:	HP6
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
Methyl tert-butyl ether	0.0100	0.0082	82%
Benzene	0.0100	0.0097	97%
Toluene	0.0100	0.0096	96%
Ethylbenzene	0.0100	0.0098	98%
Total Xylenes	0.0100	0.0094	94%
p-Bromofluorobenzene			107%

Quality control limits for LCS recovery are 50-150 % for methyl tert-butyl ether, 52-133% for benzene, 57-136% for toluene, 56-139% for ethylbenzene, and 56-141% for total xylenes.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

INCHCAPE TESTING SERVICES - ANAMETRIX

(408) 432-8192

LABORATORY CONTROL SAMPLE REPORT

Client Project ID:	93C0276A	Anametrix ID:	NM2801E1
Matrix:	SOIL	Date Released:	3/29/96
Date Analyzed:	3/28/96	Instrument ID:	HP6
		Concentration Units:	mg/Kg

COMPOUND NAME	SPIKE AMT	LCS CONC	%REC LCS
Gasoline	0.50	0.50	100%
p-Bromofluorobenzene			92%

Quality control limits for LCS recovery are 58-130%.

Quality control limits for p-Bromofluorobenzene recovery are 53-147%.

ANAMETRIX REPORT DESCRIPTION
INORGANICS

Analytical Data Report (ADR)

The ADR contains tabulated results for inorganic analytes. All field samples, QC samples and blanks were prepared and analyzed according to procedures in the following references:

- "Test Methods for Evaluating Solid Waste," SW-846, EPA, 3rd Edition, November 1986.
- "Methods for Chemical Analysis of Water and Wastes," EPA, 3rd Edition, 1983.
- CCR Title 22, Section 66261, Appendix II, California Waste Extraction Test.
- CCR Title 22, Section 66261, Appendix XI, Organic Lead.
- "Standard Methods for the Examination of Water and Wastewater," APHA, AWWA, WEF, 18th Edition, 1992.
- USEPA Contract Laboratory Program Statement of Work for Inorganic Analyses, ILM02.1, 1991.

Matrix Spike Report (MSR)

The MSR summarizes percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. MSRs may not be provided with all analytical reports. Anametrix control limit for MSR is 75-125% with 25% for RPD limits, except for Method 6010A, which is 80-120% with 25% RPD limits.

Laboratory Control Sample Report (LCSR)

The LCSR summarizes percent recovery information for laboratory control spikes on reagent water or soil. This information is a statement of performance for the method, i.e., the samples are properly prepared and analyzed according to the applicable methods. Anametrix control limit for LCSR is 80-120%.

Method Blank Report (MBR)

The MBR summarizes quality control information for reagents used in preparing samples. The absolute value of each analyte measured in the method blank should be below the method reporting limit for that analyte.

Post Digestion Spike Report (PDSR)

The PDSR summarizes percent recovery information for post digestion spikes. A post digestion spike is performed for a particular analyte if the matrix spike recovery is outside of established control limits. Any percent recovery for a post digestion spike outside of established limits for an analyte indicates probable matrix effects and interferences for that analyte. Anametrix control limit for PDSR is 75-125%.

Qualifiers (Q)

Anametrix uses several data qualifiers in inorganic reports. These qualifiers give additional information on the analytes reported. The following is a list of qualifiers and their meanings:

- I - Sample was analyzed at the stated dilution due to interferences.
- U - Analyte concentration was below the method reporting limit. For matrix and post digestion spike reports, a value of "0.0" is entered for calculation of the percent recovery.
- B - Sample concentration was below the reporting limit but above the instrument detection limit. Result is entered for calculation of the percent recovery only.
- H - Spike percent recovery was outside of Anametrix control limits due to interferences from relatively high concentration level of the analyte in the unspiked sample.
- L - Reporting limit was increased to compensate for background absorbances or matrix interferences.

Comment Codes

In addition to qualifiers, the following codes are used in the comment section of all reports to give additional information about sample preparation methods:

- A - Sample was prepared for silver based on the silver digestion method developed by the Southern California Laboratory, Department of Health Services, "Acid Digestion for Sediments, Sludges, Soils and Solid Wastes. A Proposed Alternative to EPA SW846, Method 3050." Environmental Science and Technology, 1989, 23, 898-900.
- T - Spikes were prepared after extraction by the Toxicity Characteristic Leaching Procedure (TCLP).
- C - Spikes were prepared after extraction by the California Waste Extraction Test (CWET) method.
- D - Reported results are dissolved, not total, metals.

Reporting Conventions

Analytical values reported are gross values, i.e., <u>not</u> corrected for method blank contamination. Solid matrices are reported on a wet weight basis, unless specifically requested otherwise.

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603182
Date Received : 03/21/96
Project ID : 93C0276A
Purchase Order: N/A
Department : METALS
Sub-Department: METALS

SAMPLE INFORMATION:

INCHCAPE SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9603182- 1	S-1-5	SOIL	03/21/96	6010
9603182- 2	S-6-10	SOIL	03/21/96	6010
9603182- 3	S-11-14	SOIL	03/21/96	6010
9603182- 4	S-15-18	SOIL	03/21/96	6010
9603182- 5	S-19-21	SOIL	03/21/96	6010

REPORT SUMMARY
INCHCAPE, INC. (408)432-8192

MR. BILL COPELAND
WOODWARD-CLYDE CONSULTANTS
500 12TH STREET, SUITE 100
OAKLAND, CA 94607-4014

Workorder # : 9603182
Date Received : 03/21/96
Project ID : 93C0276A
Purchase Order: N/A
Department : METALS
Sub-Department: METALS

QA/QC SUMMARY :

- All holding times have been met for the analyses reported in this section.

Mona Kamel for 04/01/96
Department Supervisor Date

Lisa J Naqvi 4/1/96
Chemist Date

INCHCAPE TESTING SERVICES
ANAMETRIX LABORATORIES
(408) 432-8192
DATA REPORT

Analyte-Method: **Lead-6010A**
Client Project Number: **93C0276A**
Matrix - Units: **SOIL - mg/Kg**

Analyst: FN
Supervisor: MM

Anametrix Sample ID	Client Sample ID	Prep. Method	Instr. ID	Date Sampled	Date Prepared	Date Analyzed	D.F.	Reporting Limit	Results	Q
9603182-01	S-1-5	3050A	ICP2	03/21/96	03/25/96	03/27/96	1	4.0	**12.0**	
9603182-02	S-6-10	3050A	ICP2	03/21/96	03/25/96	03/27/96	1	4.0	**13.8**	
9603182-03	S-11-14	3050A	ICP2	03/21/96	03/25/96	03/27/96	1	4.0	**14.8**	
9603182-04	S-15-18	3050A	ICP2	03/21/96	03/25/96	03/27/96	1	4.0	**8.5**	
9603182-05	S-19-21	3050A	ICP2	03/21/96	03/25/96	03/27/96	1	4.0	**6.0**	
BM256SA	METHOD BLANK	3050A	ICP2	N/A	03/25/96	03/27/96	1	4.0	**ND**	

COMMENTS:

INCHCAPE TESTING SERVICES
ANAMETRIX LABORATORIES
(408) 432-8192
MATRIX SPIKE REPORT

Anametrix. Sample ID: **9603180-05MS, MD**
Client Sample ID: **BATCH SPIKE**
Client Proj. Number: **93C0276A**
Matrix: **SOIL**
Associated W.O.# **9603182**

Analyst: FN
Supervisor: MW

Analyte	Analyt. Method	Instr. I.D.	Date Prepared	Date Analyzed	Units	Spike Amount	Sample Conc.	Matrix Spike Conc.	% Rec.	Matrix Sp. Dup. Conc.	% Rec.	RPD	Q
Lead	6010A	ICP2	03/25/96	03/27/96	mg/Kg	50.0	4.8	59.7	110	59.0	108	1.2	

COMMENTS:

INCHCAPE TESTING SERVICES
ANAMETRIX LABORATORIES
(408) 432-8192

LABORATORY CONTROL SAMPLE REPORT

Lab. Control Sample ID: **LM256SA**
Anametrix WO #: **9603182**
Client Project Number: **93C0276A**
Matrix: **SOIL**

Analyst: SC
Supervisor: MW

Analyte	Prep. Method	Analytical Method	Instr. ID	Date Prepared	Date Analyzed	Dil. Factor	Units	Spike Amount	LCS Results	% Recovery	Q
Lead	3050A	6010A	ICP2	03/25/96	03/27/96	1	mg/Kg	50.0	47.2	**94.4**	

COMMENTS:

9603182 (26)

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(510) 893-3600

Chain of Custody Record

PROJECT NO. 93C0276A

SAMPLERS: (Signature)

DATE	TIME	SAMPLE NUMBER	Sample Matrix (S)oil, (W)ater, (A)ir	ANALYSES: EPA Method	EPA Method	EPA Method	EPA Method	TPHg / BTEX	STLC for Pb	RCI				Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
3/21/96	12:39	S-1	S											1	Hold for composite information.
	12:45	S-2	S											1	
	12:51	S-3	S											1	
	13:00	S-4	S											1	
	13:07	S-5	S											1	
	13:15	S-6	S											1	
	13:23	S-7	S											1	
	13:34	S-8	S											1	
	13:40	S-9	S											1	
	13:47	S-10	S											1	
	13:57	S-11	S											1	
	14:06	S-12	S											1	
	14:15	S-13	S											1	
	14:22	S-14	S											1	
	14:30	S-15	S											1	
	14:40	S-16	S											1	
	14:45	S-17	S											1	
	14:51	S-18	S											1	
	14:57	S-19	S											1	
	15:03	S-20	S											1	
3/21/96	15:09	S-21	S											1	Results to: Bill Copeland

TOTAL NUMBER OF CONTAINERS: 21

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
	3/21/96 16:00	3.21.96 1600	3.21.96 1830		
METHOD OF SHIPMENT		SHIPPED BY (Signature)	COURIER (Signature)	RECEIVED FOR LAB BY (Signature)	DATE/TIME 3/21/96 1830

Inchcape Testing Services
Environmental Laboratories

SAMPLE RECEIVING CHECKLIST

Workorder Number: 9603182 **Client Project ID:** 93C0276A

Cooler

Shipping documentation present? If YES, enter Carrier and Airbill #:	YES	NO	(N/A)
Custody Seal on the outside of cooler? Condition: Intact Broken	YES	NO	(N/A)
Temperature of sample(s) within range? List temperatures of cooler(s): 3 °C Note: If all samples taken within previous 4 hr, circle N/A and place in sample storage area as soon as possible.	(YES)	NO	N/A

Samples

Chain of custody seal present for each container? Condition: Intact Broken	YES	NO	(N/A)
Samples arrived within holding time?	(YES)	NO	N/A
Samples in proper containers for methods requested? Condition of containers: Intact ✓ Broken If NO, were samples transferred to proper container(s)?	(YES)	NO	
Were VOA containers received with zero headspace? If NO, was it noted on the chain of custody?	YES	NO	(N/A)
Were container labels complete? (ID, date, time, preservative)	(YES)	NO	N/A
Were samples properly preserved? If NO, was the preservative added at time of receipt?	YES	NO	(N/A)
pH check of samples required at time of receipt? If YES, pH checked and recorded by:	YES	(NO)	
Sufficient amount of sample received for methods requested? If NO, has the client or PM been notified?	(YES)	NO	
Field blanks received with sample batch?	YES	NO	(N/A)
Trip blanks received with sample batch?	YES	NO	(N/A)

Chain of Custody

Chain of custody form received with samples?	(YES)	NO	
Has it been filled out completely and in ink?	YES	(NO)	
Sample IDs on chain of custody form agree with labels?	(YES)	NO	
Number of containers on chain agree with number received?	(YES)	NO	
Analysis methods specified?	(YES)	NO	
Sampling date and time indicated?	(YES)	NO	
Proper signatures of sampler, courier and custodian in appropriate spaces? With time and date?	(YES)	NO	
Turnaround time? Standard ✓ Rush			

Any NO responses and/or any BROKEN that was checked must be detailed in a Corrective Action Form.

Sample Custodian: SP Date: 3/21/96 Project Manager: W Date: 3-22-96