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May 27, 1992

Mr. Jim Bosch
Environmental Manager
Target Stores
33 South Sixth Street
Minneapolis, Minnesota 55440

Dear Mr. Bosch:


MARCH 1992 QUARTERLY GROUNDWATER MONITORING AND INTERIM REMEDIATION REPORT FOR FORMER ALAMEDA SERVICE STATION A-578 LOCATED AT 7608 AMADOR VALLEY BOULEVARD, DUBLIN, CALIFORNIA


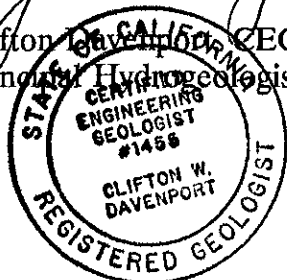
Enclosed is the "Quarterly Groundwater Monitoring Report" for the former Alameda Service Station A-578 near Target store T-328 at 7608 Amador Valley Boulevard in Dublin, California. This report was prepared in accordance with McLaren/Hart's work plan entitled "Proposal and Cost Estimate to Conduct Quarterly Groundwater Sampling and Interim Remediation at the Target Store T-328 Dublin, California" dated September 4, 1991. The work plan was approved by the Alameda County Department of Environmental Health. This report also includes a summary of interim groundwater remediation activities that were conducted as specified in the letter entitled "Update of Schedule for Interim Groundwater Remediation at the Former Target Store T-328 Dublin, California" dated November 15, 1991.

Please provide your comments as soon as possible.

If you have any questions, please do not hesitate to call us at (510) 521-5200.

Sincerely,


Campbell McLeod
Supervising Geoscientist


Clifton W. Davenport CEG #1455
Principal Hydrogeologist


Enclosure

0421RN1

**MARCH 1992 QUARTERLY
GROUNDWATER MONITORING AND
INTERIM REMEDIATION REPORT
FORMER ALAMEDA SERVICE
STATION A-578
7608 AMADOR VALLEY BLVD.
DUBLIN, CALIFORNIA**

MAY 19, 1992



**MARCH 1992 QUARTERLY GROUNDWATER MONITORING REPORT
FORMER ALAMEDA SERVICE STATION A-578
7608 AMADOR VALLEY BOULEVARD
DUBLIN, CALIFORNIA**

INTRODUCTION

This letter report presents the results of the March 1992 quarterly groundwater monitoring activities at the former Alameda Service Station A-578 near Target store T-328, located at 7608 Amador Valley Boulevard in Dublin, California. This report was prepared in accordance with McLaren/Hart's work plan entitled "Proposal and Cost Estimate to Conduct Quarterly Groundwater Sampling and Interim Remediation at the Target Store T-328 Dublin, California" dated September 4, 1991 and approved by the Alameda County Department of Environmental Health. The new quarterly schedule for interim remediation was detailed in a letter entitled "Update of Schedule for Interim Groundwater Remediation at Former Target Store T-328 Dublin, California" dated November 15, 1991.

SCOPE OF WORK AND OBJECTIVES

The work associated with the March quarterly monitoring event included sampling six monitoring wells (MW-1 through MW-6) for petroleum-related hydrocarbons and the extraction of 400 gallons of impacted groundwater from monitoring well MW-6. A map showing the site location is presented as Figure 1 and a site map showing monitoring well locations is included as Figure 2. Quarterly monitoring of the wells is being conducted to aid in determining the lateral extent of petroleum hydrocarbons in the shallow groundwater beneath the site, while the removal of groundwater from MW-6 serves as an interim remediation of impacted groundwater in the area of the former underground fuel tank excavation.

Groundwater Elevations

Groundwater surface elevations were measured prior to pumping activities on March 26, 1992, and are presented in Table 1 along with well construction details. This data was used to construct the March 1992 groundwater contour map, presented as Figure 2. The inferred groundwater flow direction is generally toward the east, varying locally to the southeast. This variation is a result of a relatively high level of groundwater in the former tank excavation. This flow direction is consistent with the observed groundwater flow direction in December 1991. Based on the observed contour pattern, MW-2 and MW-4 both appear to be downgradient of the former excavation area.

The static depth to groundwater ranges from 4.58 to 6.44 feet below ground surface or 336.42 to 335.67 feet above mean sea level. The average hydraulic gradient is approximately 0.010 feet/foot. The March water level measurements indicate that groundwater levels have rose in the six wells since the December 1991 quarterly sampling, ranging from 0.48 to 1.17 feet, with an average rise of 0.77 feet. A summary of groundwater elevation data is presented in Table 2.

Interim Remediation

Three interim remediation episodes have occurred at MW-6. The first groundwater remediation was conducted on October 17 and 18, 1991, shortly after MW-6 was constructed, and the second was on December 30 and 31, 1991. The third interim remediation occurred during this quarterly sampling event on March 26 and 27, 1992.

During the first episode, a maximum pumping rate of approximately 0.69 gpm was achieved at MW-6 and a total of 220 gallons were extracted. Groundwater elevations were measured prior to commencement of pumping on October 17 and 18, 1991, and then every two hours during pumping. These measurements are presented on Table 3. As shown on Table 3, it appears that in wells MW-3, MW-5 and MW-4 had the greatest drawdown (0.24, 0.20 and 0.17 feet, respectively) after pumping was completed on October 18, 1991.

On December 30 and 31, 1991, during the quarterly sampling event, 300 gallons of groundwater were extracted from MW-6 at a pumping rate of approximately 0.65 gpm. Groundwater elevations were measured prior to commencement of pumping, and again immediately upon completion. These measurements are also presented on Table 3. Wells MW-1, MW-2 and MW-5 showed the greatest response to pumping (0.19, 0.17 and 0.16 feet, respectively) during this event.

The third interim remediation event was conducted on March 26 and 27, 1992. A total of 400 gallons were extracted from MW-6 at an average rate of 0.66 gpm. Groundwater elevations were measured prior to commencement of pumping and at the end of each day prior to shutting off the pump. Measurements presented on Table 3 show that water levels in MW-3, MW-5, and MW-4 showed the greatest response to pumping (decreases of 0.43, 0.35, and 0.26 feet, respectively) on the first day of this event. Measurements collected after the second day of pumping again showed the most response in MW-5, MW-3 and MW-4 (decreases of 1.31 feet, 0.46 feet, and 0.28 feet, respectively).

Monitoring Well Sampling

Groundwater samples were collected at MW-1, MW-3, and MW-5 on March 26, and at MW-2, MW-4, and MW-6 on March 27, 1992. Prior to sampling MW-1 through MW-5, four casing volumes were purged from each well using a centrifugal pump. During purging, the temperature, pH, electric conductivity, and turbidity were measured after each casing volume was removed. After all parameters had stabilized, with the turbidity below 100

NTU's, sampling was performed using a disposable bailer. At MW-6, 65 casing volumes were removed prior to sample collection and parameters were collected during the last four of these casing volumes.

The groundwater samples were stored in a container filled with ice and delivered to McLaren/Hart Analytical Laboratory, a state-certified laboratory located in Rancho Cordova, California. A chain-of-custody record was completed during sampling and accompanied each sample shipment to the laboratory. The samples were submitted for analysis by the California Department of Health (DHS) LUFT Manual Method for Total Petroleum Hydrocarbons as gasoline (TPH/G), and for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) analyses by EPA Method 8020. Additionally, a groundwater sample was collected at MW-6 for TPH/Diesel analysis by DHS LUFT method. Trip blanks were included in the shipments to the laboratory to be analyzed for TPH/G and BTEX.

Monitoring Well Sampling Results

Table 4 and Figure 3 present the analytical results of the groundwater samples collected during the March 1992 sampling event. Water samples collected at monitoring wells MW-1, MW-3, and MW-5 did not contain concentrations of either TPH/G or BTEX at or above the reporting limit. The highest concentrations of petroleum chemicals were detected in the sample from MW-6, which contained 2,600 ppb TPH/G, 400 ppb benzene, and 280 ppb ethylbenzene. Benzene, toluene, and ethylbenzene were detected in groundwater from MW-4 at 120 ppb, 6 ppb, and 5 ppb, respectively, along with TPH/G at 560 ppb. Benzene was detected in groundwater samples from MW-2 at 3.6 ppb. TPH/Diesel was not detected in the sample from MW-6.

Analysis

Ethylbenzene and total xylenes concentrations reported at MW-4 have decreased from those detected in the December 1991 sampling event, from 16 to 5 ppb and 25.8 to <0.5 ppb, respectively. However, the TPH/G and benzene concentrations have increased during this time period from 180 to 560 ppb and 6.4 to 120 ppb, respectively. The March 1992 analytical results present the first detection of toluene at MW-4 (6 ppb).

The March 1992 analytical results reported at MW-6 generally confirm the relatively high concentration of petroleum chemicals (TPH/G, benzene, ethylbenzene) reported in December 1991. The December 1991 analytical results of <0.5 ppb for TPH/Diesel were confirmed in the March 1992 sampling event. Additionally, the relatively low levels of benzene historically detected at MW-2 were confirmed in the March 1992 analytical results.

The trip blank sample did not contain TPH/G or BTEX at concentrations at or above the reporting limits. The analytical data sheets and chain-of-custody records for the groundwater samples are included as Attachment II.

The DHS Maximum Contaminant Levels (MCLs) for the analyzed compounds in drinking water include: 1 ppb benzene; 2,000 ppb toluene; 680 ppb ethylbenzene; and 1,750 ppb total xylenes. The Federal MCL for toluene is 100 ppb. There is no state action level for TPH/G. Benzene is present in monitoring wells MW-4 and MW-6 in concentrations in excess of its MCL. However, groundwater beneath the site is apparently not used for drinking water or other beneficial uses, and the MCL concentrations are presented only for purposes of comparison.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the data collected to date:

- No free-floating petroleum product was observed in any of the wells.
- The analytical results from water samples collected at MW-6 in March 1992 confirm the relatively high petroleum chemical concentrations of TPH/G, benzene and ethylbenzene reported historically at this well.
- No TPH/Diesel concentrations were reported at MW-6, confirming the December 1991 analytical results.
- The March 1992 analytical data from MW-4 indicate that ethylbenzene and total xylenes concentrations have decreased, whereas TPH/G and benzene concentrations have increased since the December sampling event.
- Concentrations of benzene at MW-2 were below its MCL during this sampling event.
- As shown on Figure 2, the apparent groundwater flow direction at the site is generally to the east, locally varying to the southeast, generally consistent with historic flow directions.
- Groundwater elevations in the six wells have risen an average of 0.77 feet since December 1991.
- Based on the analytical results from MW-3, no petroleum chemicals appear to be migrating in the groundwater beneath the site from off-site locations.
- Based on historical results from downgradient wells MW-2 and MW-5, chemicals of concern do not appear to be migrating offsite at MW-5 and are below MCLs at MW-2.

- The interim groundwater remediation at MW-6 appears to be capable of lowering water levels at other wells on-site. The highest responses to pumping at MW-6 are exhibited at MW-3, MW-4, and MW-5, although all wells on site appear to be influenced. MW-5 has consistently shown good response to pumping, as expected, since it is in the average downgradient direction from the former tank area. Future remediation episodes will be analyzed to determine trends of influence.

Based on the above conclusions, McLaren/Hart recommends the following:

- Quarterly monitoring of all six wells should be continued.
- Groundwater extraction from MW-6 in the area of the tank excavation should be continued in conjunction with quarterly monitoring as proposed.
- As stipulated in the November 15, 1991 letter, diesel was tested for at MW-6 during December 1991 and March 1992 sampling. Since diesel concentrations were not reported during either event, no further testing for diesel is recommended.

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FIGURE 1
SITE LOCATION MAP
TARGET STORE T-328
DUBLIN, CA.

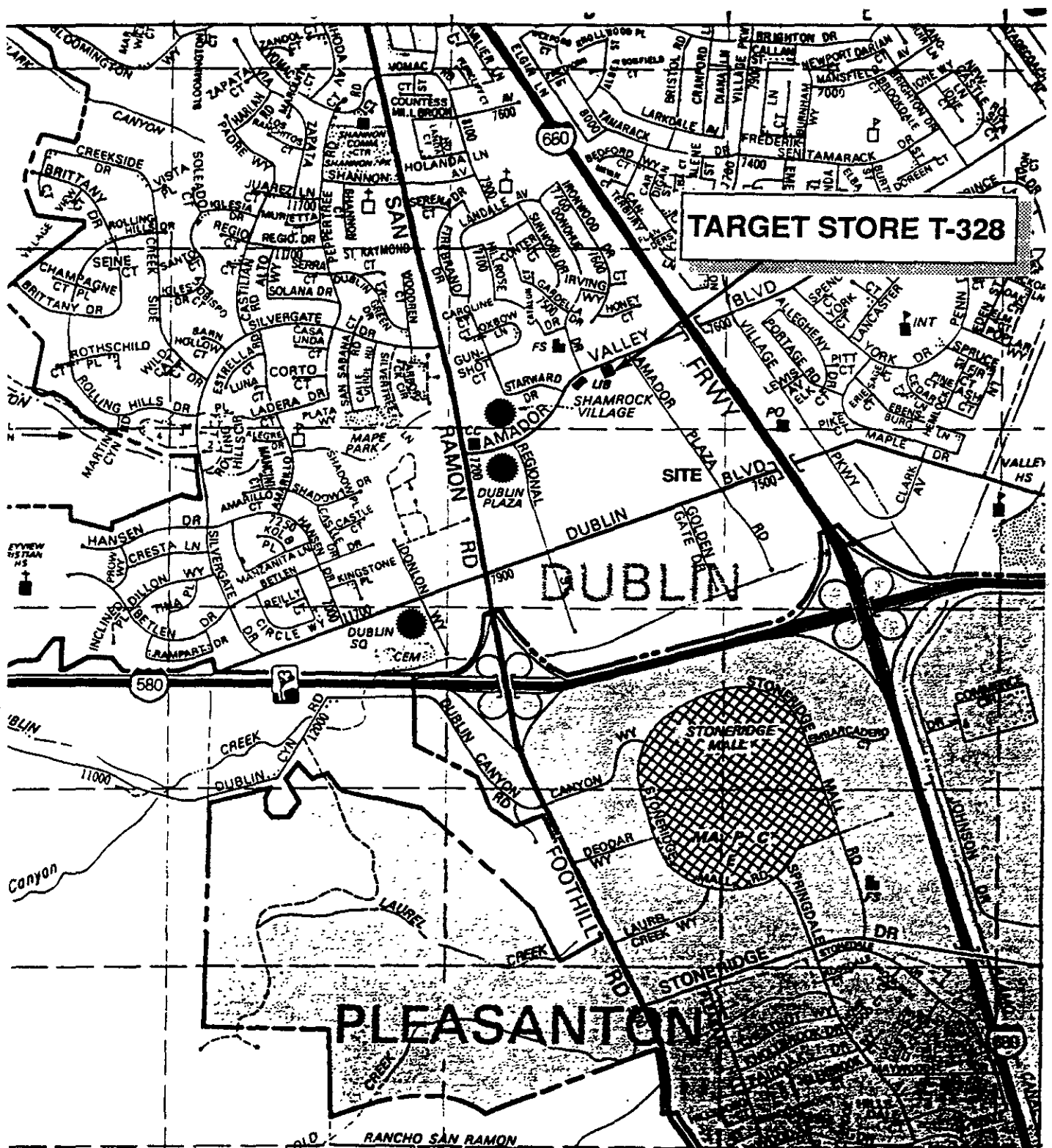
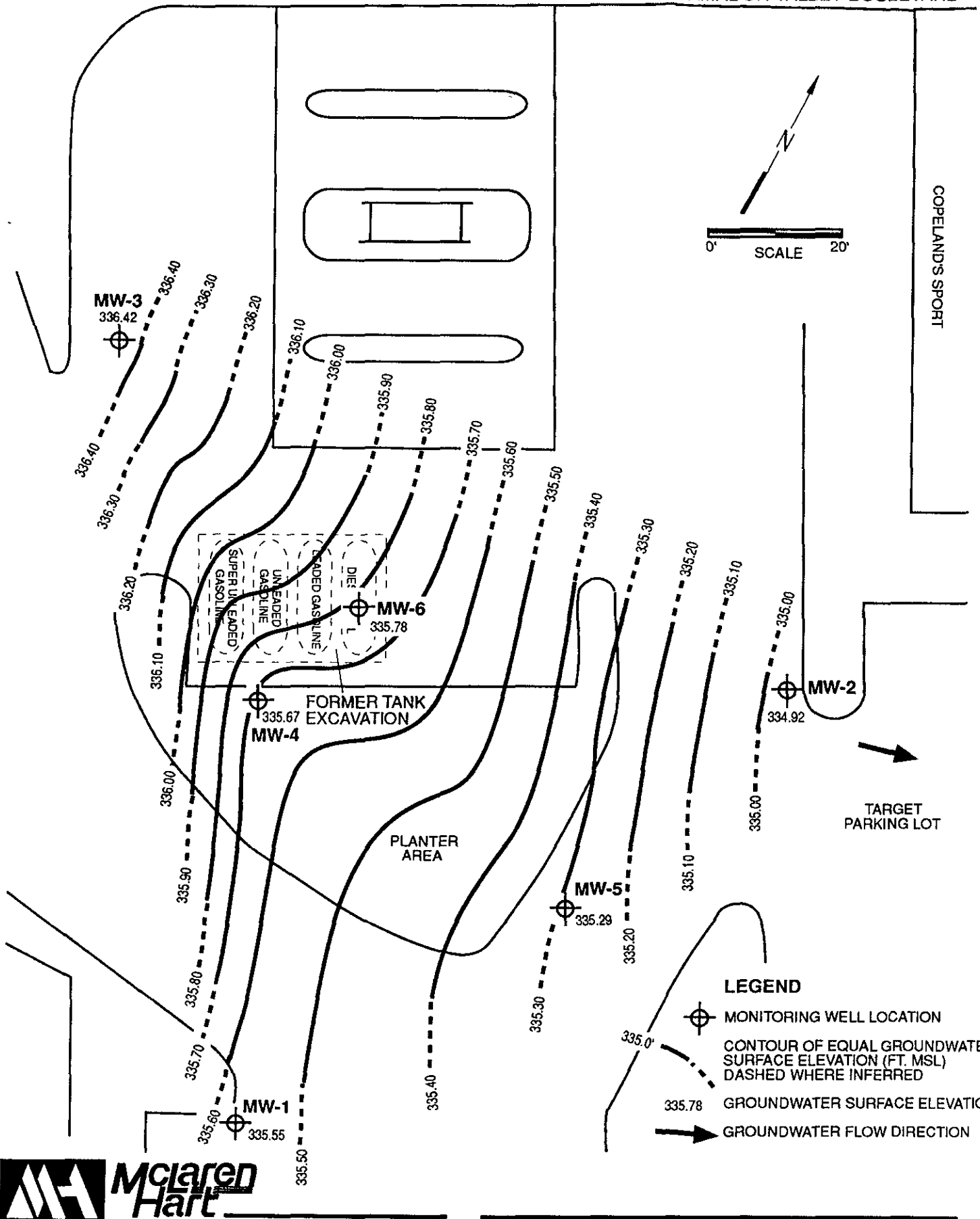
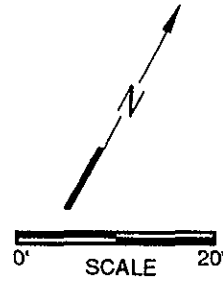


FIGURE 2
 GROUNDWATER CONTOUR MAP
 MARCH 26, 1992
 FORMER ALAMEDA SERVICE A-578
 AMADOR VALLEY BOULEVARD

PLANTER AREA

COPELAND'S SPORT



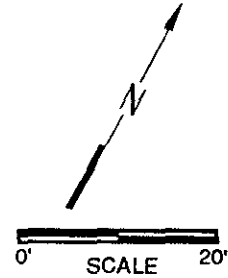
LEGEND

- MONITORING WELL LOCATION
- CONTOUR OF EQUAL GROUNDWATER SURFACE ELEVATION (FT. MSL)
DASHED WHERE INFERRED
- 335.78 GROUNDWATER SURFACE ELEVATION
- GROUNDWATER FLOW DIRECTION



FIGURE 3
 GROUNDWATER MONITORING WELL
 CHEMICAL CONCENTRATIONS
 MARCH, 1992
 FORMER ALAMEDA SERVICE STATION A-578
 AMADOR VALLEY BOULEVARD

PLANTER AREA



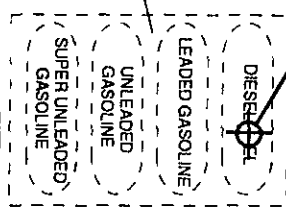
COPELAND'S SPORT

MW-3

MW-3	ppb
TPH/G	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND

MW-6	ppb
TPH/D	ND
TPH/G	2600
Benzene	400
Toluene	ND
Ethylbenzene	280
Xylenes	ND

FORMER TANK EXCAVATION



MW-2	ppb
TPH/G	ND
Benzene	3.6
Toluene	ND
Ethylbenzene	ND
Xylenes	ND

MW-4	ppb
TPH/G	560
Benzene	120
Toluene	6.0
Ethylbenzene	5
Xylenes	ND

PLANTER AREA

MW-5	ppb
TPH/G	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND

TARGET PARKING LOT

MW-1	ppb
TPH/G	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND

- LEGEND**
- MONITORING WELL LOCATION
 - ND NON-DETECT
 - ppb PARTS PER BILLION
 - TPH/G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
 - TPH/D TOTAL PETROLEUM HYDROCARBONS AS DIESEL



TABLE 1

WELL CONSTRUCTION DETAILS AND GROUNDWATER SURFACE ELEVATIONS
 ALAMEDA SERVICE STATION, A-578
 DUBLIN, CALIFORNIA

WELL DESIGNATION	SCREENED INTERVAL (feet below grade)	GROUND SURFACE ELEVATION (MSL)*	SCREENED INTERVAL (MSL)	TOP OF CASING ELEVATION (MSL)	STATIC WATER LEVEL 3/26/92 (feet below grade)	GROUNDWATER ELEVATION 3/26/92 (MSL)
MW-1	5-20	340.30	335.30 - 320.30	340.20	4.65	335.55
MW-2	5-20	340.52	335.52 - 320.52	340.27	5.35	334.92
MW-3	5-20	341.67	336.67 - 321.67	341.00	4.58	336.42
MW-4	5-20	342.31	337.31 - 322.31	342.11	6.44	335.67
MW-5	5-20	340.52	335.52 - 320.52	340.09	4.80	335.29
MW-6	4.5-14.5	341.13	336.63-326.63	340.81	5.03	335.78

* Feet above mean sea level

TABLE 2

SUMMARY OF GROUNDWATER ELEVATION DATA
ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA

WELL I.D.	TOP OF CASING ELEVATION (MSL)*	DATE MEASURED	DEPTH TO WATER (ft)	WATER ELEVATIONS (MSL)	CHANGE SINCE LAST READING (ft)
MW-1	340.20	2/28/91	5.00	335.20	
		6/14/91	5.53	334.67	-0.59
		9/26/91	5.97	334.23	-0.38
		12/30/91	5.50	334.70	0.47
		3/26/92	4.65	335.55	0.85
MW-2	340.27	2/28/91	5.46	334.81	
		6/14/91	5.90	334.37	-0.44
		9/26/91	6.54	333.73	-0.64
		12/30/91	5.83	334.44	0.71
		3/27/92	5.35	334.92	0.48
MW-3	341.00	2/28/91	5.61	335.39	
		6/14/91	5.40	335.60	0.21
		9/26/91	6.29	334.71	-0.89
		12/30/91	5.75	335.25	0.54
		3/26/92	4.58	336.42	1.17
MW-4	342.11	2/28/91	7.01	335.10	
		6/14/91	7.01	335.10	0.00
		9/26/91	7.81	334.30	-0.80
		12/30/91	7.17	334.94	0.64
		3/27/92	6.44	335.67	0.73
MW-5	340.09	6/14/91	5.81	334.28	
		9/26/91	5.92	334.17	-0.11
		12/30/91	5.52	334.57	0.40
		3/26/92	4.80	335.29	0.72
MW-6	340.81	9/26/91	6.45	334.36	
		12/30/91	5.71	335.10	0.74
		3/27/92	5.03	335.78	0.68

* MSL = Mean Sea Level

TABLE 3

CHANGE IN GROUNDWATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-6
ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA

DATE	TIME	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
		Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change
10-17-91	1000	6.19	---	6.74	---	6.40	---	7.96	---	6.28	---	6.65	---
	1600	6.24	-0.05	6.80	-0.06	6.59	-0.19	8.10	-0.14	6.45	-0.17	11.26	4.61
10-18-91	0900	6.24	-0.05	6.82	-0.08	6.55	-0.15	8.04	-0.08	6.40	-0.12	6.72	-0.07
	1600	6.28	-0.09	6.84	-0.10	6.64	-0.24	8.13	-0.17	6.48	-0.20	12.80	-6.15
12-30-91	0800	5.50	---	5.83	---	5.75	---	7.17	---	5.52	---	5.72	---
12-31-91	1500	5.69	-0.19	6.00	-0.17	5.83	-0.08	7.29	-0.12	5.68	-0.16	7.36	-1.65
3/26/92	1000	4.65	---	5.35	---	4.58	---	6.44	---	4.80	---	5.03	---
	1500	4.82	0.17	5.43	-0.08	5.01	-0.43	6.70	-0.26	5.15	-0.35	12.72	-7.69
3/27/92	0845	4.74	-0.09	5.41	-0.06	4.95	-0.37	6.52	-0.08	5.01	-0.21	5.10	-0.07
	1400	4.80	-0.15	5.48	-0.13	5.04	-0.46	6.72	-0.28	6.11	-1.31	13.12	-8.07

*NOTE: Changes in water elevation are measured from the initial depth to groundwater on 10/17/91, 12/30/91, or 3/26/92 and 3/27/92. Groundwater was pumped from MW-6 at approximately 0.65 GPM.

TABLE 4

ANALYTICAL RESULTS OF GROUNDWATER SAMPLES (ppb)
ALAMEDA SERVICE STATION, A-578
DUBLIN, CALIFORNIA

<u>WELL DESIGNATION</u>	<u>DATE</u>	<u>TPH/G</u>	<u>TPH/D</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYL BENZENE</u>	<u>TOTAL XYLENES</u>
MW-1	2/91	<50	<0.5	<0.5	<0.5	<0.5	<0.5
	6/91	<50	---	<0.5	<0.5	<0.5	<0.5
	9/91	<50	---	<0.5	<0.5	<0.5	<0.5
	12/91	<50	---	<0.5	<0.5	<0.5	<0.5
	3/92	<50	---	<0.3	<0.3	<0.3	<0.3
MW-2	2/91	50	<0.5	2.0	0.8	1.1	5.8
	6/91	51	---	6.6	<0.5	1.1	1.33
	9/91	<50	---	5.0	<0.5	0.64	<0.5
	12/91	<50	---	6.1	<0.5	<0.5	<0.5
	3/92	<50	---	3.6	<0.5	<0.5	<0.5
MW-3	2/91	<50	<0.5	<0.5	<0.5	<0.5	<0.5
	6/91	<50	---	<0.5	<0.5	<0.5	<0.5
	9/91	<50	---	<0.5	<0.5	<0.5	<0.5
	12/91	<50	---	<0.5	<0.5	<0.5	<0.5
	3/92	<50	---	<0.3	<0.3	<0.3	<0.3
MW-4	2/91	6,000	<0.5	680	<20	160	250
	6/91	6,100	---	680	<25	150	<25
	9/91	<50	---	100	<0.5	45	8.1
	12/91	180	---	6.4	<1.0	16	25.8
	3/92	560	---	120	6.0	5.0	<0.5
MW-5	6/91	<50	---	<0.5	<0.5	<0.5	<0.5
	9/91	<50	---	<0.5	<0.5	<0.5	<0.5
	12/91	<50	---	<0.5	<0.5	<0.5	<0.5
	3/92	<50	---	<0.3	<0.3	<0.3	<0.3
MW-6	9/91	2,300	---	760	11	360	236
	10/91	1,900	---	230	<5	140	12.1
	12/91	2,500	<0.5	360	<50*	260	<50*
	3/92	2,600	<0.5	400	<50*	280	<50*

* = The analysis was run at a 1:100 dilution to bring target analytes within linear working range of the GC.

--- = Not analyzed.

ATTACHMENT I

MARCH EVENT



HYDRODATA

DATE: 3/26/92

PROJECT: Target Dublin EVENT: Quarterly SAMPLER: CMS

NO.	WELL OR LOCATION	DATE		TIME	MEASUREMENT	CODE	COMMENTS
		MO	DAY	YR			
1	✓ MW-1	3	26	92	10	10	4.65 SWL 0 ppm
2	MW-2	✓			10	10	5.35 (339 ppm
3	MW-3	✓			9	15	4.58 (0 ppm
4	MW-4	✓			10	15	6.44 (0 ppm
5	MW-5	✓			10	05	4.80 (0 ppm
6	MW-10	✓			9	50	5.03 ✓ 4 ppm
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)
- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.
 Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.
 Note flooding of vault box, odor, access problems.
 *Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)



PROJECT: Tarnet Dublin EVENT: Quarterly SAMPLER: CMS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	3	26	92	15	17	4.82	SWL	TAKEN AFTER 5 HRS OF PUMPING
2	MW-2				15	14	5.43		AT MW-6. 200 gals
3	MW-3				15	12	5.01		
4	MW-4				15	10	6.70		
5	MW-5				15	15	5.15		
6	MW-6				15	19	12.72	↓	↓
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)

- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.

Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action. Note flooding of vault box, odor, access problems.

*Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)



HYDRODATA

DATE: 3/27/02

PROJECT: Export Dublin EVENT: Quarterly SAMPLER: CMS

NO.	WELL OR LOCATION	DATE		TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR			
1	MW-1	3	27	02	8	47	SWL	TAKEN ON MORNING AFTER 200 GALS.
2	MW-2				8	50		REMOVED
3	MW-3				8	42		
4	MW-4				8	40		
5	MW-5				8	48		
6	MW-10				8	45	✓	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)
- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.
 Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.
 Note flooding of vault box, odor, access problems.
 *Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)



HYDRODATA

PROJECT: Target Dublin EVENT: Quarterly SAMPLER: CMS

NO.	WELL OR LOCATION	DATE		TIME		MEASUREMENT	CODE	COMMENTS
		MO	DAYR	HR	MIN			
1	MW-1	3	27	14	19	4.80	SWL	TAKEN AFTER 2 DAYS OF PUMPING
2	MW-2	/	/	14	20	5.48	/	AT MW-6
3	MW-3	/	/	14	15	5.04	/	
4	MW-4	/	/	14	10	6.72	/	
5	MW-5	/	/	14	21	6.11	/	
6	MW-6	V	/	14	33	13.12	V	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)

- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.

Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.

Note flooding of vault box, odor, access problems.

*Negative pressure (Vacuum) psi = approx $-(1/2 \times \text{mmHg})$

SAMPLING EVENT DATA SHEET

(fill out completely)

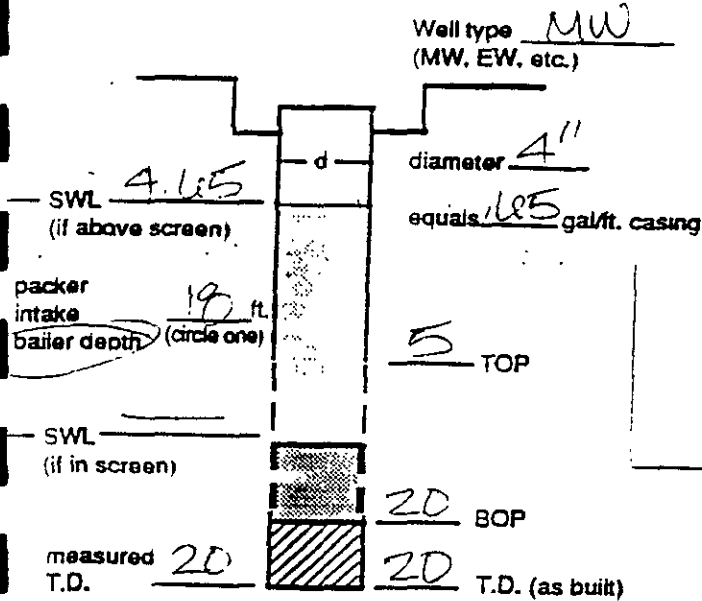


McLaren

WELL OR LOCATION MW-1

PROJECT Tarriet Field EVENT Quarterly SAMPLER CMS DATE 3-26-92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1310	1.33	
		GPM	
	1335		10.51
Stop	1340	✓	9.50
Sampled	1350		7.31
(Final IWL)			

Purge calculation

165 gal/ft. · 1535 ft. = 997 gals × $\frac{1}{4}$ = 40 gals.

SWL to BOP or one packer to BOP purge volume- volume 3 casings

Head purge calculation (Airlift only) ...

gal/ft. _____ ft. _____ gals.

packer to SWL _____

Equipment Used / Sampling Method / Description of Event:
centrifugal pump used to purge 4 casing volumes.
Disposable bailer used to sample.

Actual gallons purged	<u>40</u>	
Actual volumes purged	<u>4</u>	
Well yield (see below)	<u>MY</u>	
COC #	<u>226069-70</u>	
Sample I.D.	Analysis	Lab
<u>212909</u>	<u>IPH/G</u>	<u>MAL</u>
<u>212910</u>	<u>+BTEX</u>	<u>↓</u>
<u>212911</u>	<u>↓</u>	<u>↓</u>
<u>212912</u>	<u>↓</u>	<u>↓</u>

Additional comments:

Gallons purged	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
<u>10</u>	<u>80.2</u>	<u>1170</u>	<u>8.08</u>	<u>10.6</u>
<u>20</u>	<u>78.6</u>	<u>1210</u>	<u>7.90</u>	<u>2.9</u>
<u>30</u>	<u>77.4</u>	<u>1250</u>	<u>7.85</u>	<u>1.7</u>
<u>40</u>	<u>77.1</u>	<u>1250</u>	<u>7.86</u>	<u>4.6</u>

Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. LY - Able to purge 3 volumes by returning later or next day. VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)



McLaren

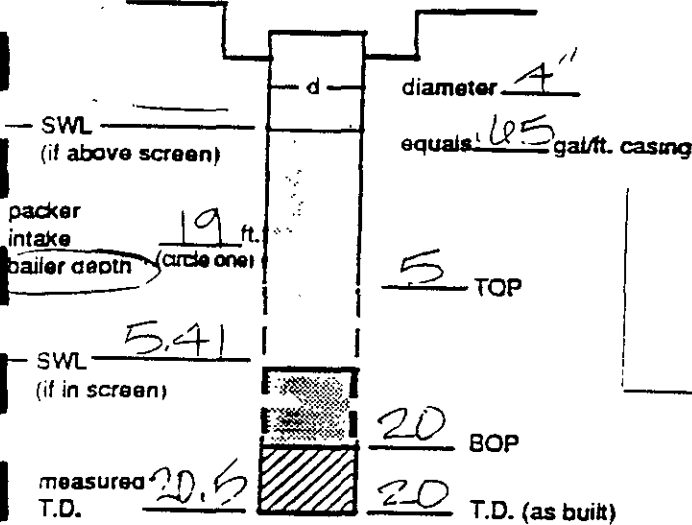
WELL OR LOCATION MW-2

PROJECT Target Dublin EVENT Quarterly SAMPLER CMS DATE 3-27-92

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)

diameter 4"
equals 6.5 gal/ft. casing



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	9:45	133	16.31
		CIPM	while pumping
Stop	10:15	✓	15.27
Sampled	10:30		8.30
(Final IWL)			

Purge calculation
 $6.5 \text{ gal/ft.} \cdot 4.12 \text{ ft.} = 9.5 \text{ gals} \times \frac{1}{4} = 38 \text{ gals.}$
 SWL to BOP or packer to BOP one volume = 38 gals. / 3 casings

Head purge calculation (Airlift only)
 gal/ft. : ft. : gals.
 packer to SWL:

Equipment Used / Sampling Method / Description of Event:
 Centrifugal pump used to purge 4 casing volumes. Disposable bailer used to sample.

Actual gallons purged 40
 Actual volumes purged 4
 Well yield (see below) \oplus MY

COC #	Sample I.D.	Analysis	Lab
226071	212917	TPH/G	MAL
	212918	TBTEX	↓
	212919	↓	↓
	212920	↓	↓

Additional comments:

80% recharge = 8.32

Gallons purged *	TEMP °C/°F (circle one)	EC (µs/cm)	PH	TURBIDITY (NTU)
10	77.7	1100	8.89	46.4
20	78.1	1180	8.70	30.1
30	78.6	1210	8.64	31.2
40	83.4	1210	8.104	11.18

Take measurement at approximately each casing volume purged.
 \oplus HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. LY - Able to purge 3 volumes by returning later or next day. VL - Minimal recharge - unable to purge 3 volumes.



McLaren

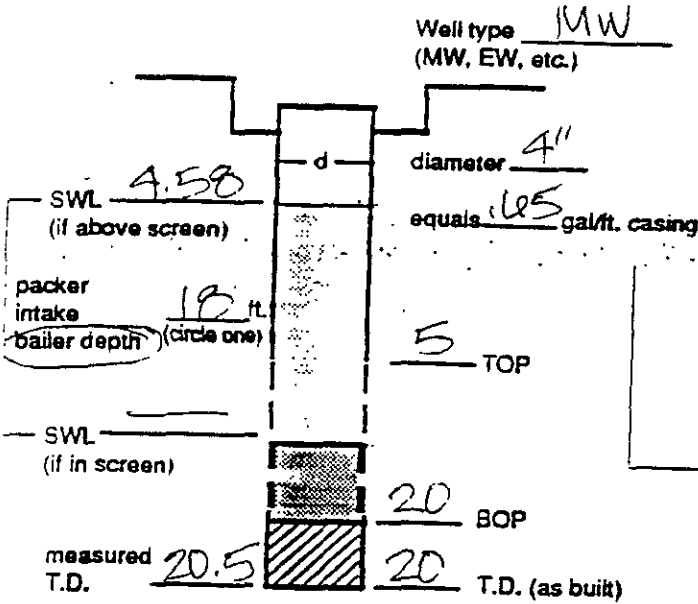
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-3

PROJECT Tarant Dublin EVENT Quarterly SAMPLER CMS DATE 3-26-92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:20	2.5	
Stop	11:30	GPM	19.63
Start	12:00		9.76
		3 GPM	
Stop	12:05		14.42
Sampled	12:40		
(Final IWL)			5.08

Purge calculation
 $1.65 \text{ gal/ft.} \cdot 154 \text{ ft.} = 112 \text{ gals} \times \frac{4}{3} = 40 \text{ gals.}$
 SWL to BOP or packer to BOP one volume
 4 purge volume- 3 casings

Head purge calculation (Airlift only)
 gal/ft. _____ ft. _____ gals.
 packer to SWL _____

Equipment Used / Sampling Method / Description of Event:
centrifugal pump used to purge 4 casing volumes, disposable bailer used to sample

Actual gallons purged 40
 Actual volumes purged 4
 Well yield \oplus MY
 (see below)

COC #	Analysis	Lab
226069		
212905	TPH/G	MAI
212906	TBTEX	
212907	↓	↓
212908	↓	↓

Additional comments:

8090 = 7.68 IWL

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)
10	70.3	1210	8.51	75.9
20	77.2	1280	8.26	41.2
30	79.7	1300	8.14	116.7
40	80.0	1300	8.16	21.2

* Take measurement at approximately each casing volume purged.

\oplus HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. LY - Able to purge 3 volumes by returning later or next day. VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)

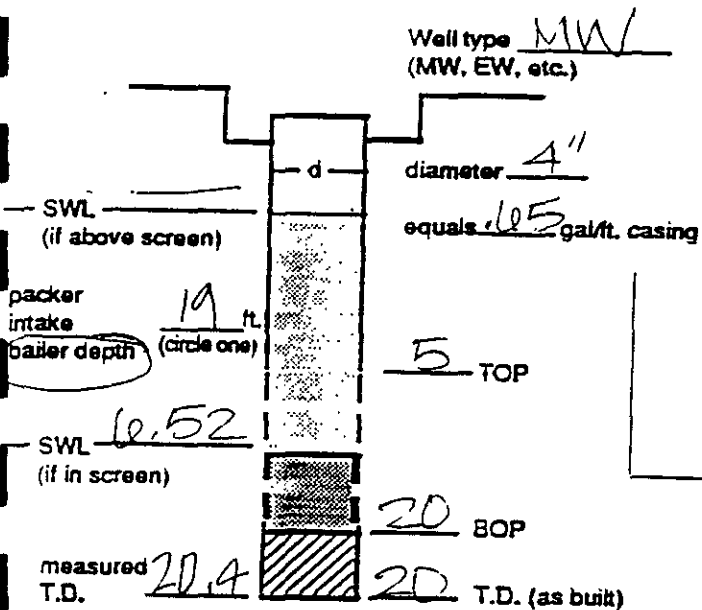


McLaren

WELL OR LOCATION MW-4

PROJECT Target Dukin EVENT Quarterly SAMPLER CMS DATE 3/27/92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1055		14.08
		2 GPM	while pumping
Stop	1115	↓	12.92
Sampled (Final IWL)	1130		9.00

Purge calculation
 $105 \text{ gal/ft.} \cdot 13.5 \text{ ft.} = 1417.5 \text{ gals} \times \frac{1}{4} = 354.4 \text{ gals.}$
 SWL to BOP or packer to BOP one volume purge volume- 3 casings

Head purge calculation (Airlift only)
 gal/ft. * ft. = gals.
 packer to SWL

Equipment Used / Sampling Method / Description of Event:
 Centrifugal pump used to surge 4 casing volumes. Disposable bailer used to sample.

Actual gallons purged	<u>39</u>
Actual volumes purged	<u>4</u>
Well yield (see below)	<u>MY</u>

COC #	<u>226071</u>	
Sample I.D.	Analysis	Lab
<u>212921</u>	<u>TPH/G</u>	<u>MAC</u>
<u>212922</u>	<u>+BTEX</u>	<u>↓</u>
<u>212923</u>	<u>↓</u>	<u>↓</u>
<u>212924</u>	<u>↓</u>	<u>↓</u>

Additional comments:
80% recharge = 9.20 IWL

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)
9	75.8	840	8.11	10.10
13	75.6	860	8.18	4.3
27	76.6	880	8.26	5.5
35	76.7	880	8.26	10.0

Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. LY - Able to purge 3 volumes by returning later or next day. VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)



WELL OR LOCATION MW-5

PROJECT Target Dublin EVENT Quarterly SAMPLER CMS DATE 3/26/92

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)

diameter 4"
equals 165 gal/ft. casing

5 TOP

20 BOP

20 T.D. (as built)

SWL 4.80
(if above screen)

packer intake 18 ft
bailer depth (circle one)

SWL _____
(if in screen)

measured 19.9
T.D.

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1410		
	1420	2 GPM	12.88
Stop	1438		12.92
Sampled	1435		6.98
(Final IWL)			

Purge calculation
 $165 \text{ gal/ft.} \cdot 152 \text{ ft.} = 9.9 \text{ gals} \times 4 = 39.5 \text{ gals.}$
 SWL to BOP or one 4 purge volume-
 packer to BOP volume 3 casings

Head purge calculation (Airlift only)
 gal/ft. * ft. = gals.
 packer to SWL

Equipment Used / Sampling Method / Description of Event:
Centrifugal pump used to surge 4 casing volumes. Disposable bailer used to sample.

Actual gallons purged 40
 Actual volumes purged 4
 Well yield (see below) \oplus MY

COC #	Sample I.D.	Analysis	Lab
<u>226070</u>	<u>212913</u>	<u>TPH/G</u>	<u>UAL</u>
	<u>212914</u>	<u>+BTEX</u>	<u> </u>
	<u>212915</u>	<u> </u>	<u> </u>
	<u>212916</u>	<u> </u>	<u> </u>

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)
<u>10</u>	<u>81.2</u>	<u>1170</u>	<u>8.22</u>	<u>6.8</u>
<u>20</u>	<u>80.5</u>	<u>1170</u>	<u>8.17</u>	<u>5.9</u>
<u>30</u>	<u>80.2</u>	<u>1170</u>	<u>8.13</u>	<u>6.0</u>
<u>40</u>	<u>80.0</u>	<u>1170</u>	<u>8.12</u>	<u>5.8</u>

Take measurement at approximately each casing volume purged.
 \oplus HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.
LY - Able to purge 3 volumes by returning later or next day. VL - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)



WELL OR LOCATION MW-6

PROJECT Target Dublin EVENT Quarterly SAMPLER oms DATE 3-26-92

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)

diameter 4"
equals 1.05 gal/ft. casing

4.5 TOP

14.5 BOP

14.5 T.D. (as built)

SWL 5.03
(if above screen)

packer (intake) 13 ft.
bailer depth (circle one)

SWL 5.03
(if in screen)

measured 14.3
T.D.

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1030	0.66	12.72
stop	1530	0.66	while pumping
3/27/92	900		
Stop	1425		13.06
Sampled (Final IWL)	1455		6.90

Purge calculation
1.05 gal/ft. * 9.5 ft. = 6.17 gals x 3 = _____ gals.
 SWL to BOP or one purge volume -
 packer to BOP volume 3 casings

Head purge calculation (Airlift only)
 _____ gal/ft. * _____ ft. = _____ gals.
 packer to SWL

Equipment Used / Sampling Method / Description of Event:
centrifugal pump used to purge 400 gallons. Disposable bailer used to sample.

Actual gallons purged 400
 Actual volumes purged 1.05
 Well yield \oplus MY
 (see below)

85% recharge = 6.90 IWL

Additional comments:
3-26 -> 200 gallons purged
3-27 -> 200 gallons purged
400 total

Sample I.D.	Analysis	Lab
<u>212925</u>	<u>TPH/G</u>	<u>MAL</u>
<u>212926</u>	<u>+BTEX</u>	<u> </u>
<u>212927</u>	<u>TPH/D</u>	<u> </u>
<u>212928</u>	<u> </u>	<u> </u>
<u>212929</u>	<u> </u>	<u> </u>
<u>212930</u>	<u>V</u>	<u>V</u>

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)
<u>350</u>	<u>82.1</u>	<u>940</u>	<u>8.42</u>	<u>0.7</u>
<u>200</u>	<u>82.0</u>	<u>945</u>	<u>8.42</u>	<u>0.7</u>
<u>350</u>	<u>82.0</u>	<u>940</u>	<u>8.43</u>	<u>0.7</u>
<u>400</u>	<u>82.0</u>	<u>940</u>	<u>8.42</u>	<u>0.7</u>

Take measurement at approximately each casing volume purged.

\oplus HY - Minimal W.L. drop MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. LY - Able to purge 3 volumes by returning later or next day. VL - Minimal recharge - unable to purge 3 volumes.

ATTACHMENT II



Date: April 6, 1992
LP #: 5775

Campbell McLeod
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. McLeod:

Enclosed are the laboratory results for the four samples submitted by you to the McLaren Analytical Laboratory on March 27, 1992, for the project *Target Dublin*.

The analyses you requested are:

Mod. EPA 8020 (BTEX) & TPH/G (4 - Water)

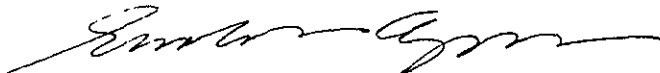
The report consists of the following sections:

1. A copy of the chain of custody
2. Quality Control Definitions and Report
3. Comments
4. Analytical results
5. Copy of final billing submitted to accounting.

Unless otherwise instructed by you, samples will be disposed of two weeks from the date of this letter.

Thank you for choosing McLaren Analytical Laboratory. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,


for. Anthony S. Wong, Ph.D.
Director, Laboratory/Managing Principal



CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No: 5775
Storage Refrigerator ID: 1
Storage Freezer ID: _____

Secured
Yes
No _____

Project Name: Target Dublin Project # 122601 Sampler: Colette Shelly Colette Shelly

Relinquished by: (Signature and Printed Name) Colette Shelly Received by: (Signature and Printed Name) Fed Ex Date: 3/26/92 Time: 1700

Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) [Signature] Date: 3/27/92 Time: 0930

Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

SHIP TO:
McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696
FAX (916) 638-2842

Method of Shipment: Fed EX
Shipment ID: _____

- 601/8010 (Halogenated Volatiles-GC)
- 602/8020 (Aromatic Volatiles-GC)
- 604/8040 (Phenols-GC)
- 608/8080 (Pesticides-GC)
- 610/8100 (PNA-GC)
- 624/8240 (Volatiles-PCR-GC)
- 625/8270 (BNA-GC/MS)
- TPH/G (Gasoline-GC)
- 418.1 (IR)
- 8015 Modified (GC)
- Metals - Total a
- Metals - Soluble a
- Chloride/pH
- TDS/Percent Solid
- Specific Conductivity (EC)
- BTEX
- LUFT

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description		Date	Time	Description	Analysis Requested										Container(s)		FOR LABORATORY USE ONLY		
	TAT	#				Type	Lab ID													
1	212901	Trip Blank	3/26/92	800	(CFORS)													4	V-HC	5775-1001
2	212902																			
3	212903																			
4	212904																			
5	212905	MW-3		1240																7002
6	212906																			
7	212907																			
8	212908																			
9																				
10																				

Special Instructions/Comments: _____
Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O=Other _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES TO TAT, TEND. EARLY
SAMPLES 212902 + 212904 HAVE AIR BUBBLES.

SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: Campbell McLeod / Alameda
 Client Name: _____
Company: _____
Address: _____
Phone: _____ (____) _____
Fax: _____



CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No. 5775
 Storage Refrigerator ID L
 Storage Freezer ID _____

Secured
 Yes
 No

Project Name: Target Dublin Project #: 122601 Sampler: Collette Shelly Collette Shelly

Relinquished by: (Signature and Printed Name) Collette Shelly Received by: (Signature and Printed Name) Fed Ex Date: 3/26/92 Time: 1700

Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: 3/27/92 Time: 0950

Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

SHIP TO:
 McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: Fed Ex
 Shipment ID: _____

Circle or Add Analysis(es) Requested

- 601/8010 (Halogenated Volatiles-GC)
- 602/8020 (Aromatic Volatiles-GC)
- 604/8040 (Phenols-GC)
- 608/8080 (Pesticides-GC)
- 610/8100 (PNA-GC)
- 624/8240 (Volatiles-GC/MS)
- 625/8250 (BNA-GC/MS)
- TPH/D (Gasoline-GC) LUFT
- 418.1 (IR)
- 8015 Modified (GC)
- Metals: Total a
- Metals: Soluble a
- Fluoride/Perchlorate
- Chloride/pH
- TDS/Percent Solid
- Specific Conductivity (EC)
- BIEX LUFT

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description			Analysis Requested												Container(s)		FOR LABORATORY USE ONLY						
	Date	Time	Description	601/8010	602/8020	604/8040	608/8080	610/8100	624/8240	625/8250	TPH/D	418.1	8015	Metals: Total a	Metals: Soluble a	Fluoride/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	TAT	#	Type	Lab ID	
1	2/29/93	1435	MW-5																			4	VHC	5775-003
2	2/29/94		(spare)																					
3	2/29/95																							
4	2/29/96																							
5	2/29/09	1350	MW-1																					
6	2/29/10		(spare)																					
7	2/29/11																							
8	2/29/12																							
9																								
10																								

Special Instructions/Comments: _____
 Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one):

Project Manager/Office: Campbell McLeod/Alameda

Client Name: _____

Company: _____

Address: _____

Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES IN TRAY, TEMP. 600 (K)

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS: A method blank (MB) is a laboratory generated sample free of any contamination. The method blank assesses the degree to which the laboratory operations and procedures cause false-positive analytical results for your samples. The method blank results associated with your samples are attached.

LABORATORY CONTROL SPIKES

The LCS Program:

The laboratory control spike is a well characterized matrix (organic pure type II water for water samples and contamination free sand for soil samples) which is spiked with certain target parameters and analyzed in duplicate at approximately 5% of the sample load in order to assure the accuracy and precision of the analytical method. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\% \text{ Recovery of Spike}_{(1)} - \% \text{ Recovery of Spike}_{(2)}}{(\% \text{ Recovery of Spike}_{(1)} + \% \text{ Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also vary with the different sample matrices. They are based on laboratory average historical data and EPA limits which are approved by the Quality Assurance Department.

(DC1-CN5775)



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 03/31/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.30	BRL
Toluene	0.30	BRL
Ethyl Benzene	0.30	BRL
1,2-Xylene	0.30	BRL
1,3-Xylene	0.30	BRL
1,4-Xylene	0.30	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/01/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.30	BRL
Toluene	0.30	BRL
Ethyl Benzene	0.30	BRL
1,2-Xylene	0.30	BRL
1,3-Xylene	0.30	BRL
1,4-Xylene	0.30	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/02/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.30	BRL
Toluene	0.30	BRL
Ethyl Benzene	0.30	BRL
1,2-Xylene	0.30	BRL
1,3-Xylene	0.30	BRL
1,4-Xylene	0.30	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Method 8020

LP#: 5775

Analyst: TL

Batch #: NA

Date Of Analysis: 03/31/92

Spike Sample ID: LCS/LCSD W-7

Column: DB Wax

Spike ID Code: W-1-448

Instrument #: 6

Surrogate ID Code: W-1-458

Matrix: Water Units: ug/L

EPA METHOD	COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
		SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC.%	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD%	% REC.	RPD
8020	Chlorobenzene	0	4.0	3.9	98	3.7	92	6	80 - 120	≤20
8020	Benzene	0	4.0	3.9	98	3.7	92	6	80 - 120	≤20
8020	Ethyl Benzene	0	4.0	4.0	100	3.8	95	5	80 - 120	≤20

Spike Recovery = d = ((c-a)/b) x 100
 Spike Duplicate Recovery = f = ((e-a)/b) x 100
 Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

EPA METHOD	SURROGATE COMPOUNDS	DET.	(h)	(i)	(j)	(k)	(l)	ACCEPTANCE LIMITS	
			SUR. SPIKE CONC.	SAMPLE + SUR. SPIKE CONC.	SUR. REC. %	SAMPLE DUP. + SUR. SPIKE CONC.	SUR. DUP. RECOVERY %	% REC.	RPD
8020	a.a.a.-Trifluorotoluene	PID	4.0	3.5	88	3.3	83	80 - 120	

Surrogate % Recovery = j = (i/h) x 100
 Surrogate Dupe % Recovery = l = (k/h) x 100

Comments:



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Method 8020

LP#: 5775

Analyst: TL

Batch #: NA

Date Of Analysis: 03/31/92

Spike Sample ID: LCS/LCSD W-7

Column: DB624

Spike ID Code: W-1-448

Instrument #: 6

Surrogate ID Code: W-1-458

Matrix: Water Units: ug/L

EPA METHOD	COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
		SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC.%	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD%	% REC.	RPD
8020	Chlorobenzene	0	4.0	4.1	102	4.0	100	2	80 - 120	≤20
8020	Benzene	0	4.0	4.1	102	3.9	98	5	80 - 120	≤20
8020	Ethyl Benzene	0	4.0	4.2	105	4.1	102	2	80 - 120	≤20

Spike Recovery = d = ((c-a)/b) x 100
 Spike Duplicate Recovery = f = ((e-a)/b) x 100
 Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

EPA METHOD	SURROGATE COMPOUNDS	DET.	(h)	(i)	(j)	(k)	(l)	ACCEPTANCE LIMITS	
			SUR. SPIKE CONC.	SAMPLE + SUR. SPIKE CONC.	SUR. REC. %	SAMPLE DUP. + SUR. SPIKE CONC.	SUR. DUP. RECOVERY %	% REC.	
8020	a.a.a.-Trifluorotoluene	PID	4.0	4.1	102	3.9	98	80 - 120	

Surrogate % Recovery = j = (i/h) x 100
 Surrogate Dupe % Recovery = l = (k/h) x 100

Comments:



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Total Petroleum Hydrocarbons/TPH-Gasoline

Analyst: TL

LP#: 5775

Date of Analysis: 03/31/92

Spike Sample ID: LCS/LCSD W-7

Column: DB624

Spike ID Code: W-1-447

Instrument #: 6

Surrogate ID Code: W-1-458

Batch #: NA

Matrix: Water Units: ug/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC.	RPD
Gas	0	100.0	100.	100	100.	100	0	80 - 120	≤20

Spike Recovery = d = ((c-a)/b) x 100
 Spike Duplicate Recovery = f = ((e-a)/b) x 100
 Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	% REC.
a,a,a-Trifluorotoluene	4.0	4.5	112	80 - 120

Surrogate % Recovery = j = (i/h) x 100

Comments: _____



McLaren Analytical Laboratory
Spike/Spike Duplicate Recovery
Method 8020

LP#: 5775

Analyst: TL

Batch #: NA

Date Of Analysis: 03/31/92

Spike Sample ID: 5775-002 MS

Column: DB Wax

Spike ID Code: W-1-448

Instrument #: 6

Surrogate ID Code: W-1-458

Matrix: Water Units: ug/L

EPA METHOD	COMPOUNDS	(a) SAMPLE CONC.	(b) SPIKE CONC.	(c) SAMPLE + SPIKE CONC.	(d) SPIKE REC.%	(e) SAMPLE DUP. + SPIKE CONC.	(f) SPIKE DUP. REC. %	(g) RPD%	ACCEPTANCE LIMITS	
									% REC.	RPD
8020	Chlorobenzene	0	4.0	3.8	95	NA	NA	NA	80 - 120	≤20
8020	Benzene	0	4.0	3.8	95	NA	NA	NA	80 - 120	≤20
8020	Ethyl Benzene	0	4.0	3.9	98	NA	NA	NA	80 - 120	≤20

Spike Recovery = $d = ((c-a)/b) \times 100$
 Spike Duplicate Recovery = $f = ((e-a)/b) \times 100$
 Relative Percent Difference = $g = (|c-e|)/((c+e) \times .5) \times 100$

EPA METHOD	SURROGATE COMPOUNDS	DET.	(h) SUR. SPIKE CONC.	(i) SAMPLE + SUR. SPIKE CONC.	(j) SUR. REC. %	(k) SAMPLE DUP. + SUR. SPIKE CONC.	(l) SUR. DUP. RECOVERY %	ACCEPTANCE LIMITS	
								% REC.	
8020	a,a,a-Trifluorotoluene	PID	4.0	3.3	83	NA	NA	80 - 120	

Surrogate % Recovery = $j = (i/h) \times 100$
 Surrogate Dupe % Recovery = $l = (k/h) \times 100$

Comments:



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Total Petroleum Hydrocarbons/TPH-Gasoline

Analyst: TL

LP#: 5775

Date of Analysis: 04/01/92

Spike Sample ID: 5775-002 MS

Column: DB624

Spike ID Code: W-1-447

Instrument #: 6

Surrogate ID Code: W-1-458

Batch #: NA

Matrix: Water Units: ug/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC.	RPD
Gas	0	100.	110.	110	NA	NA	NA	80 - 120	≤20

Spike Recovery = $d = ((c-a)/b) \times 100$
 Spike Duplicate Recovery = $f = ((e-a)/b) \times 100$
 Relative Percent Difference = $g = (|c-e|)/((c+e) \times .5) \times 100$

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS % REC.
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	
a,a,a-Trifluorotoluene	4.0	3.4	85	80 - 120

Surrogate % Recovery = $j = (i/h) \times 100$

Comments: _____



ABBREVIATIONS USED IN THIS REPORT

BRL	Below Reporting Limit
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
RPD	Relative Percent Difference
NS	Not Specified
NA	Not Applicable

COMMENTS

Test methods may include minor modifications of published EPA methods (e.g., reporting limits or parameter lists). Reporting limits are adjusted to reflect dilution of the sample when appropriate. Solids and waste are analyzed with no correction made for moisture content. Blank results are reported in the Case Narrative.

Values for total petroleum hydrocarbons gasoline were calculated based only on detected peaks.

The reporting limits for BTEX and TPH/G reported meet those specified in the California LUFT Manual.

Results are reported on the attached data sheets.

(DC1-CN5775)





Date: April 7, 1992
LP #: 5781

Campbell McLeod
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. McLeod:

Enclosed are the laboratory results for the three samples submitted by you to the McLaren Analytical Laboratory on March 28, 1992, for the project *Target Dublin*.

The analyses you requested are:

EPA 8020 (BTEX) and TPH/G (3 - Water)
TPH/D (1 - Water)


The report consists of the following sections:

1. A copy of the chain of custody
2. Quality Control Definitions and Report
3. Comments
4. Analytical results
5. Copy of final billing submitted to accounting.

Unless otherwise instructed by you, samples will be disposed of two weeks from the date of this letter.

Thank you for choosing McLaren Analytical Laboratory. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,


for. Anthony S. Wong, Ph.D.
Director, Laboratory/Managing Principal



CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No: 5781
 Storage Refrigerator ID: 1, 44
 Storage Freezer ID: _____

Secured
 Yes
 No

Project Name: Target Dublin Project #: 122601 Sampler: Colette Shnelly Colette Shnelly

Relinquished by: (Signature and Printed Name) Colette Shnelly Received by: (Signature and Printed Name) Fed Ex Date: 3/27/92 Time: 1700
 Relinquished by: (Signature and Printed Name) Fed Ex Received by: (Signature and Printed Name) [Signature] Date: 3/28/92 Time: 1000
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) [Signature] Date: 3/30/92 Time: 1145

SHIP TO:
 McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: Fed Ex
 Shipment ID: _____

601/8010 (Halogenated Volatiles-GC)	602/8020 (Aromatic Volatiles-GC)	604/8040 (Phenols-GC)	608/8080 (Pesticides/PCB-GC)	610/8100 (PNA-GC)	624/8240 (Volatiles-GC/MS)	TPHIG (TPHIG)	TPH/D (TPH/D)	418.1 (IR)	8015 Modified (GC)	Metals-Total a	Fluoride-Soluble a	Chloride/pH	TDS/Percent Perchlorate	Specific Conductivity (EC)
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a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description		Description	Analysis(es) Requested														TAT	Container(s)		Lab ID
	Date	Time		601/8010	602/8020	604/8040	608/8080	610/8100	624/8240	TPHIG	TPH/D	418.1	8015	Metals	Fluoride	Chloride	TDS		Specific	#	
1	2/29/92	1030	MW-2						X									X	4	VHC	5781-1001
2	2/29/92		(spare)						X									X			1001
3	2/29/92								X									X			1001
4	2/29/92								X									X			1001
5	2/29/92	1130	MW-4						X									X			1001
6	2/29/92		(spare)						X									X			1002
7	2/29/92								X									X			
8	2/29/92								X									X			
9																					
10																					

Special Instructions/Comments: _____
 Sample Archive/Disposal: Laboratory Standard Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one).
 Project Manager/Office: Campbell McLeod/Alameda
 Client Name: _____
 Company: _____
 Address: _____
 Phone: (____) _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES IN TMS, TEMP. GOOD - ASP



CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No 5781 Secured Yes No
 Storage Refrigerator ID 1,4-4
 Storage Freezer ID

Project Name: Target Dublin Project #: 122601 Sampler: Colette Shelly Colette Shelly
 Relinquished by: (Signature and Printed Name) Colette Shelly Received by: (Signature and Printed Name) Fed Ex Date: 3/27/92 Time: 1700
 Relinquished by: (Signature and Printed Name) Fed Ex Received by: (Signature and Printed Name) [Signature] Date: 3/28/92 Time: 1000
 Relinquished by: (Signature and Printed Name) Received by: (Signature and Printed Name) [Signature] Date: 3/30/92 Time: 1105

SHIP TO:
 McLaren Analytical Laboratory
 1101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: Fed Ex
 Shipment ID:

Circle or Add Analysis(es) Requested

- 60178010 (Halogenated Volatiles-GC)
- 60278020 (Aromatic Volatiles-GC)
- 60478040 (Phenols-GC)
- 60878080 (Pesticides/PCB-GC)
- 61078100 (PNA-GC)
- 62478240 (Volatiles-GC)
- 62578270 (TPHG-Crasioline-GC/MS)
- 418-1 (PF)
- 8015 Modified (GC)
- Metals-Total a
- Fluoride/Soluble a
- Chloride/pH
- TDS/TP Percent Solid
- Specific Conductivity (EC)

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description		Description	Analysis Requested												TAT	Container(s)		FOR LABORATORY USE ONLY		
	Date	Time		60178010	60278020	60478040	60878080	61078100	62478240	62578270	418-1 (PF)	8015 Modified (GC)	Metals-Total a	Fluoride/pH	Chloride/pH		TDS/TP Percent Solid	Specific Conductivity (EC)	#	Type	Lab ID
1	2/29/92	1555	MW-Lp																4	VHU	5781-1003/
2	2/29/92		(spare)																		
3	2/29/92																				
4	2/29/92																				
5	2/29/92	1500	MW-Lp																		
6	2/29/92		(spare)																		
7																					
8																					
9																					
10																					

Special Instructions/Comments: _____
 Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one)
 Project Manager/Office: Campbell McLeod/Alameda
 Client Name: _____
 Company: _____
 Address: _____
 Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES INTACT, TEMP. GOOD - REF
2/29/92 HAS AIR BUBBLE

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS: A method blank (MB) is a laboratory generated sample free of any contamination. The method blank assesses the degree to which the laboratory operations and procedures cause false-positive analytical results for your samples. The method blank results associated with your samples are attached.

LABORATORY CONTROL SPIKES

The LCS Program:

The laboratory control spike is a well characterized matrix (organic pure type II water for water samples and contamination free sand for soil samples) which is spiked with certain target parameters and analyzed in duplicate at approximately 5% of the sample load in order to assure the accuracy and precision of the analytical method. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\% \text{ Recovery of Spike}_{(1)} - \% \text{ Recovery of Spike}_{(2)}}{(\% \text{ Recovery of Spike}_{(1)} + \% \text{ Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also vary with the different sample matrices. They are based on laboratory average historical data and EPA limits which are approved by the Quality Assurance Department.

(DC2-CN5781)



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 03/31/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.50	BRL
Toluene	0.50	BRL
Ethyl Benzene	0.50	BRL
1,2-Xylene	0.50	BRL
1,3-Xylene	0.50	BRL
1,4-Xylene	0.50	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL

(DC2-CN5781)



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/01/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.50	BRL
Toluene	0.50	BRL
Ethyl Benzene	0.50	BRL
1,2-Xylene	0.50	BRL
1,3-Xylene	0.50	BRL
1,4-Xylene	0.50	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL

(DC2 - CN5781)



QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/02/92

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Benzene	0.50	BRL
Toluene	0.50	BRL
Ethyl Benzene	0.50	BRL
1,2-Xylene	0.50	BRL
1,3-Xylene	0.50	BRL
1,4-Xylene	0.50	BRL
Total Petroleum Hydrocarbons - Gasoline	50.	BRL

(DC2 - CN5781)



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Method 8020

LP#: 5781

Analyst: TL

Batch #: NA

Date Of Analysis: 03/31/92

Spike Sample ID: LCS/LCSDW-7

Column: DB Wax

Spike ID Code: W-1-448

Instrument #: 6

Surrogate ID Code: W-1-458

Matrix: Water Units: ug/L

EPA METHOD	COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
		SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC.%	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD%	% REC.	RPD
8020	Chlorobenzene	0	4.0	3.9	98	3.7	92	6	80 - 120	≤20
8020	Benzene	0	4.0	3.9	98	3.7	92	6	80 - 120	≤20
8020	Ethyl Benzene	0	4.0	4.0	100	3.8	95	5	80 - 120	≤20

Spike Recovery = d = ((c-a)/b) x 100
 Spike Duplicate Recovery = f = ((e-a)/b) x 100
 Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

EPA METHOD	SURROGATE COMPOUNDS	DET.	(h)	(i)	(j)	(k)	(l)	ACCEPTANCE LIMITS	
			SUR. SPIKE CONC.	SAMPLE + SUR. SPIKE CONC.	SUR. REC. %	SAMPLE DUP. + SUR.SPIKE CONC.	SUR. DUP. RECOVERY %	% REC.	
8020	a.a.a.-Trifluorotoluene	PID	4.0	3.5	88	3.3	83	80 - 120	

Surrogate % Recovery = j = (i/h) x 100
 Surrogate Dupe % Recovery = l = (k/h) x 100

Comments:



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Total Petroleum Hydrocarbons/TPH-Gasoline

Analyst: TL

LP#: 5781

Date of Analysis: 03/31/92

Spike Sample ID: LCS/LCSD W-7

Column: DB624

Spike ID Code: W-1-447

Instrument #: 6

Surrogate ID Code: W-1-458

Batch #: NA

Matrix: Water Units: ug/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC.	RPD
Gas	0	100.0	100.	100	100.	100	0	80 - 120	≤20

Spike Recovery = d = ((c-a)/b) x 100
 Spike Duplicate Recovery = f = ((e-a)/b) x 100
 Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS % REC.
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	
a,a,a-Trifluorotoluene	4.0	4.5	112	80 - 120

Surrogate % Recovery = j = (i/h) x 100

Comments: _____



McLaren Analytical Laboratory
 Spike/Spike Duplicate Recovery
 Total Petroleum Hydrocarbons/TPH - Diesel

LP#: 5781

Analyst: EB

Batch #: 920331-1901

Date of Analysis: 04/04/92

Spike Sample ID: LCSW/LCSDW #27

Column: DB-1

Spike ID Code: W-2-814

Instrument #: PGC #6

Surrogate ID Code: NA

Matrix: Water Units: mg/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC	RPD
Diesel	0	2.5	2.5	100	2.5	100	0	43 - 152	≤ 25

Spike Recovery = $d = ((c-a)/b) \times 100$
 Spike Duplicate Recovery = $f = ((e-a)/b) \times 100$
 Relative Percent Difference = $g = (|c-e|)/((c+e) \times .5) \times 100$

Comments: _____

5MSDR.W91



(DC2-CN5781)

QUALITY CONTROL REPORT

METHOD BLANK

Method: TPH/D
Units: mg/L (ppm)

Date Analyzed: 04/04/92
Date Extracted: 03/30/92
Batch Number: 920330-1901

<u>Compound</u>	<u>Reporting Limit</u>	<u>Results of the MB</u>
Total Petroleum Hydrocarbons - Diesel	0.50	BRL



(DC2-CN5781)



ABBREVIATIONS USED IN THIS REPORT

BRL	Below Reporting Limit
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
RPD	Relative Percent Difference
NS	Not Specified
NA	Not Applicable

COMMENTS

Test methods may include minor modifications of published EPA methods (e.g., reporting limits or parameter lists). Reporting limits are adjusted to reflect dilution of the sample when appropriate. Solids and waste are analyzed with no correction made for moisture content. Blank results are reported in the Case Narrative.

Values for total petroleum hydrocarbons gasoline were calculated based only on detected peaks.

Values for total petroleum hydrocarbons diesel were calculated based only on detected peaks.

Results are reported on the attached data sheets.

(DC2-CN5781)



VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
 Total Petroleum Hydrocarbons Gasoline by LUFT
 Preparation Method: EPA 5030

Project Name: Target Dublin

Project Number: 122601

Sample Description: Trip Blank

Lab Project-ID Number: 5775-001

Sample Number: 212903

Date Sampled: 03/26/92

Date Received: 03/27/92

Date Analyzed: 04/01/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethyl Benzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	90	80 - 120
a,a,a-Trifluorotoluene (FID)	102	80 - 120

Dilution: None

Comments:

Approved By: Nancy McDonald for CM Date: 4/6/92
 Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

070191



VOLATILE AROMATIC COMPOUNDS

**Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030**

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-1

Lab Project-ID Number: 5775-004

Sample Number: 212909

Date Sampled: 03/26/92

Date Received: 03/27/92

Date Analyzed: 03/31/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethyl Benzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	92	80 - 120
a,a,a-Trifluorotoluene (FID)	105	80 - 120

Dilution: None

Comments:

Approved By: Nancy McDonald for CM Date: 4-6-92
Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

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VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
 Total Petroleum Hydrocarbons Gasoline by LUFT
 Preparation Method: EPA 5030

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-2

Lab Project-ID Number: 5781-001

Sample Number: 212917

Date Sampled: 03/27/92

Date Received: 03/28/92

Date Analyzed: 03/31/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	3.6	0.50
Toluene	BRL	0.50
Ethyl Benzene	BRL	0.50
1,2-Xylene	BRL	0.50
1,3-Xylene	BRL	0.50
1,4-Xylene	BRL	0.50
Total Petroleum Hydrocarbons - Gasoline	BRL	50.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	83	80 ~ 120
a,a,a-Trifluorotoluene (FID)	100	80 ~ 120

Dilution: None

Comments: Non-target analytes are present in the chromatograph.

Approved By: Nancy McDonald for em Date: 4-7-92
 Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

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VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
 Total Petroleum Hydrocarbons Gasoline by LUFT
 Preparation Method: EPA 5030

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-3

Lab Project- ID Number: 5775-002

Sample Number: 212907

Date Sampled: 03/26/92

Date Received: 03/27/92

Date Analyzed: 04/02/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethyl Benzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	115	80 - 120
a,a,a-Trifluorotoluene (FID)	120	80 - 120

Dilution: None

Comments:

Approved By: Nancy McDonald for em Date: 4-6-92
 Cheryl Matterson, Associate Chemist

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VOLATILE AROMATIC COMPOUNDS

**Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030**

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-4

Lab Project-ID Number: 5781-002

Sample Number: 212923

Date Sampled: 03/27/92

Date Received: 03/28/92

Date Analyzed: 04/02/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	120.	50. (a)
Toluene	6.0	5.0
Ethyl Benzene	5.0	5.0
1,2-Xylene	BRL	5.0
1,3-Xylene	BRL	5.0
1,4-Xylene	BRL	5.0
Total Petroleum Hydrocarbons - Gasoline	560.	500.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	83	80 - 120
a,a,a-Trifluorotoluene (FID)	112	80 - 120

Dilution: The sample was diluted 10 fold to bring target analytes within linear working range.

Comments: (a) The data was reported from a different analytical run on 04/02/92 at a 100 fold dilution to obtain result within linear range.

Approved By: Nancy McDonald for CM Date: 4-7-92
Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

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VOLATILE AROMATIC COMPOUNDS

**Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030**

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-5

Lab Project- ID Number: 5775-003

Sample Number: 212913

Date Sampled: 03/26/92

Date Received: 03/27/92

Date Analyzed: 03/31/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethyl Benzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	85	80 - 120
a,a,a-Trifluorotoluene (FID)	98	80 - 120

Dilution: None

Comments: Non-target analytes are present in the chromatograph.

Approved By: Nancy McDonald for CM Date: 4-6-92
Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

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VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT

Preparation Method: EPA 5030

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-6

Lab Project-ID Number: 5781-003

Sample Number: 212927

Date Sampled: 03/27/92

Date Received: 03/28/92

Date Analyzed: 04/01/92

<u>COMPOUND</u>	<u>ANALYTE CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	400.	50.
Toluene	BRL	50.
Ethyl Benzene	280.	50.
1,2-Xylene	BRL	50.
1,3-Xylene	BRL	50.
1,4-Xylene	BRL	50.
Total Petroleum Hydrocarbons - Gasoline	2600. (a)	5000.

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	83	80 - 120
a,a,a-Trifluorotoluene (FID)	110	80 - 120

Dilution: The sample was diluted 100 fold to bring target analytes within linear working range.

Comments: (a) Reported as an estimated concentration below the established reporting limit.

Approved By: Nancy McDonald for CM Date: 4-7-92
Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of this report.

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TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Diesel by LUFT
Preparation Method: Modified LUFT (a)

Project Name: Target Dublin

Project Number: 122601

Sample Description: MW-6

Lab Project- ID Number: 5781-003

Sample Number: 212929

Date Sampled: 03/27/92

Date Received: 03/28/92

Date Extracted: 03/30/92

Date Analyzed: 04/05/92

Batch Number: 920330-1901

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

Total Petroleum Hydrocarbons - Diesel BRL 0.50

Dilution: None

Comments: (a) Methylene chloride rather than carbon disulfide used for extraction.

The sample contains early eluting hydrocarbons in the C7 - C12 boiling point range.

Approved By: Nancy McDonald for CM Date: 4-7-92
Cheryl Matterson, Associate Chemist

The cover letter and attachments are integral parts of the report.

072491

