



March 31, 1993

Ms. Eva Chu
Alameda County Health Agency
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Dear Ms. Chu:

This letter serves as a letter of transmittal for McLaren/Hart "December 1992 Quarterly Groundwater Monitoring and Interim Remediation Report, Former Alameda Service Station A-558, 7608 Amador Valley Blvd., Dublin California." This document was prepared at the request of the Alameda County Health Agency.

As requested, a copy of the Bill of Lading for transporting purged groundwater at the site to an oil recycler is also enclosed. If you have any questions please give us a call at (510) 521-5200.

Sincerely,

A handwritten signature in black ink that reads 'Campbell McLeod'.

Campbell McLeod
Supervising Geoscientist

A handwritten signature in black ink that reads 'Clifton Davenport'.

Clifton Davenport, CEG #1455
Principal Geoscientist

Enclosures

1123AMD1

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

March 31, 1993

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ENVIRONMENTAL ENGINEERING CORPORATION

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

INTRODUCTION

This report presents the December 1992 quarterly groundwater monitoring results at the former Alameda Service Station A-578, 7608 Amador Valley Boulevard in Dublin, California. This report was prepared in accordance with McLaren/Hart's sampling plan entitled "Proposal to Conduct Quarterly Groundwater Sampling and Interim Remediation at the Target Store T-328 Dublin, California" dated September 10, 1992. This sample plan follows recommendations in the "June 1992 Quarterly Monitoring and Interim Recommendation Report" for the site. Recommendations included a schedule of six episodes of interim remediation and four sampling events between September 1992 and June 1993. This work was verbally approved by Ms. Eva Chu of the Alameda County Health Care Services Agency, Department of Environmental Health, Hazardous Materials division.

Based on McLaren/Hart's recommendations for revising the quarterly monitoring program and Ms. Eva Chu's written approval of December 18, 1992, monitoring wells MW-1 and MW-3 were not sampled. Water elevations were collected in all wells.

OBJECTIVES AND SCOPE OF WORK

A site location map is presented as Figure 1 and a site map showing monitoring well locations is included as Figure 2. Quarterly monitoring of site wells is being conducted to monitor the lateral extent of petroleum hydrocarbons in the shallow groundwater beneath the site, while groundwater removal from MW-6 serves as interim remediation of impacted groundwater in the area of the former underground fuel tanks.

The work associated with the December quarterly monitoring event included sampling four monitoring wells (MW-2, MW-4, MW-5, MW-6) for petroleum-related hydrocarbons, collecting water elevations from six monitoring wells (MW-1 through MW-6), and extracting 400 gallons of impacted groundwater from monitoring well MW-6. In addition, 200 gallons of groundwater were removed from MW-6 in October and in November 1992 as part of interim remediation.

Groundwater Elevations

Groundwater surface elevations were measured prior to sampling and pumping activities on December 29, 1992 (Table 1). This data was used to construct the December 1992 groundwater contour map (Figure 2). The inferred groundwater flow direction is generally toward the east and is apparently influenced by the presence of permeable materials in the excavation area. This flow direction is generally consistent with the observed groundwater flow direction in September 1992. Based on the observed contour pattern, MW-2 and MW-4 appear to be downgradient of the former excavation area.

The static depth to groundwater ranges from 4.89 to 6.59 feet below ground surface or 334.31 to 335.52 feet above mean sea level. The average hydraulic gradient is approximately 0.012 feet/foot. The December water level measurements indicate that groundwater levels have increased in all of the six wells since September 1992, ranging from 0.03 to 0.35 feet, with an average increase of 0.24 feet. Historic groundwater elevation data are presented in Table 2.

Interim Remediation

Eight interim remediation episodes have occurred at MW-6, five in conjunction with quarterly sampling. The first remediation event occurred on October 17 and 18, 1991, shortly after MW-6 was constructed. The next four episodes took place on December 30 and 31, 1991, March 26 and 27, 1992, June 23 and 24, 1992, and September 24 and 25, 1992. Three interim remediation episodes took place between September and December 1992. On each of October 29, 1992 and November 30, 1992, 200 gallons of groundwater were extracted from MW-6 at an average pumping rate of 0.65 gpm, as part of a monthly interim remediation schedule. Four hundred gallons of groundwater were extracted during December 1992 quarterly interim remediation, at an average pumping rate of approximately 0.65 gpm.

Depth to groundwater was measured at the six wells during each day of the eight interim remediation episodes, once before pumping started then again just before pumping stopped for the day. As shown on Table 3, the extraction of groundwater from MW-6 typically reduces the water level in each of the six wells. However, apparently due to extensive rainfall during the October and December 1992 interim remediation events, extraction of groundwater from MW-6 did not always decrease water levels at the neighboring monitoring wells.

Water level measurements collected during December 1992 interim remediation (Table 3) show that water levels in MW-2, MW-4 and MW-5 responded to the first day of pumping (decreases of 0.05, 0.12 and 0.05 feet, respectively). Measurements collected after the first day of pumping showed the effect of the rainfall which occurred after the first day and throughout the second day of pumping. The water levels at MW-1 through MW-5 increased overnight, as a result. However, water levels at MW-1 through MW-5 did show an average decrease of 0.10 feet between the morning and afternoon measurements during the second day of pumping with MW-4 showing the largest decrease of 0.21 feet.

Monitoring Well Sampling Protocol

Groundwater samples were collected at MW-2 and MW-5 on December 29, and at MW-4 and MW-6 on December 30, 1992. Prior to sampling MW-2, MW-4 and 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 5 NTU's, sampling was performed using a disposable bailer. At MW-6, in conjunction with the interim remediation, 65 casing volumes were removed prior to sample collection and parameters were collected during the last four of these casing volumes. Sampling event data sheets are enclosed as Attachment I.

Groundwater samples were stored in a container filled with ice and delivered to McLaren 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 Services (DHS) LUFT Manual Method for Total Petroleum Hydrocarbons as gasoline (TPH/G), and for benzene, toluene, ethyl benzene, and xylenes (BTEX) analyses by EPA Method 8020. 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 December 1992 sampling event. Water samples collected at monitoring well MW-5 did not contain concentrations of either TPH/G or BTEX at or above the reporting limit. With the exception of benzene and toluene, the highest concentrations of petroleum constituents were detected in the sample from MW-6, which contained 250 ppb TPH/G, 16 ppb benzene, <0.3 ppb toluene, 33 ppb ethyl benzene and 16.4 ppb total xylenes. The highest detected levels of benzene (35 ppb) and toluene (0.81 ppb) were in groundwater samples from MW-2. Also detected at MW-2 were 150 ppb of TPH/G, 4.0 ppb of ethyl benzene and 3.2 ppb of total xylenes. Concentrations of benzene at 0.92 ppb were detected in the groundwater sample from MW-4.

Analysis

Concentrations of petroleum chemicals in groundwater near MW-6 continue to decrease. As shown on Table 4, the December 1992 analytical results represents the third consecutive monitoring episode with decreasing concentrations at MW-6. With the exception of 0.92 ppb of benzene, this is the third consecutive sampling event in which petroleum constituents were not reported at MW-4. Therefore, interim remediation effort appears to be effective in decreasing the concentration of petroleum constituents in the groundwater near MW-4 and MW-6.

The December 1992 sampling results at MW-2 represent the highest reported concentrations for TPH/G, benzene and ethyl benzene for this well. As shown on Table 4, during the previous four sampling episodes TPH/G, benzene and ethyl benzene concentrations at MW-2 were <50, <9.5, and <0.5 ppb, respectively.

The trip blank sample did not contain TPH/G or BTEX compounds 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; 680 ppb ethyl benzene; and 1,750 ppb total xylenes. The Federal MCL for toluene is 1,000 ppb. There is no state action level for TPH/G. Benzene is present in monitoring wells MW-6 and MW-2 in concentrations in excess of its MCL. However,

groundwater beneath the site is reportedly 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 data collected to date:

- No free-floating petroleum product was observed in any of the wells.
- With the exception of 0.92 ppb of benzene, this sampling round is the third consecutive time in eight sampling events that petroleum constituents were not reported at MW-4, installed adjacent to the former tank excavation.
- The analytical results from water samples collected at MW-6 were the lowest reported concentrations at this well to date. Based on the analytical data from the last three sampling events, concentrations in the well appear to be decreasing overall, implying that the interim remediation at the well is having some effect.
- The concentrations of benzene (35 ppb) and TPH/G (150 ppb) detected at MW-2 during this sampling event is the highest recorded to date for this well.
- As shown on Figure 2, the apparent groundwater flow direction at the site is generally to the east, consistent with historic flow directions.
- Groundwater elevations in all six wells increased an average of 0.24 feet since September 1992.
- Based on historical analytical results from downgradient wells MW-2 and MW-5, chemicals of concern do not appear to be migrating towards MW-5. However, petroleum constituents are present in groundwater at MW-2.
- The interim groundwater remediation at MW-6 has removed a total of 2,520 gallons of groundwater and appears to be capable of lowering water levels at other wells on-site.

Future work currently planned at the site includes:

- The interim remediation program schedule will include quarterly extraction of 400 gallons of groundwater from MW-6 in March and in June 1993.
- In accordance of the agreement with the Alameda County, Department of Environmental Health, the revised quarterly sampling plan includes measuring the depth to groundwater at MW-1 and MW-3 but not collecting a groundwater sample during future sampling events at MW-1 and only annually at MW-3. In addition, during March 1993 quarterly sampling, a water sample will be collected at MW-6 and analyzed for diesel.
- The March 1993 analytical results for MW-2 will be evaluated to determine the significance of the December 1992 sampling results for MW-2.

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

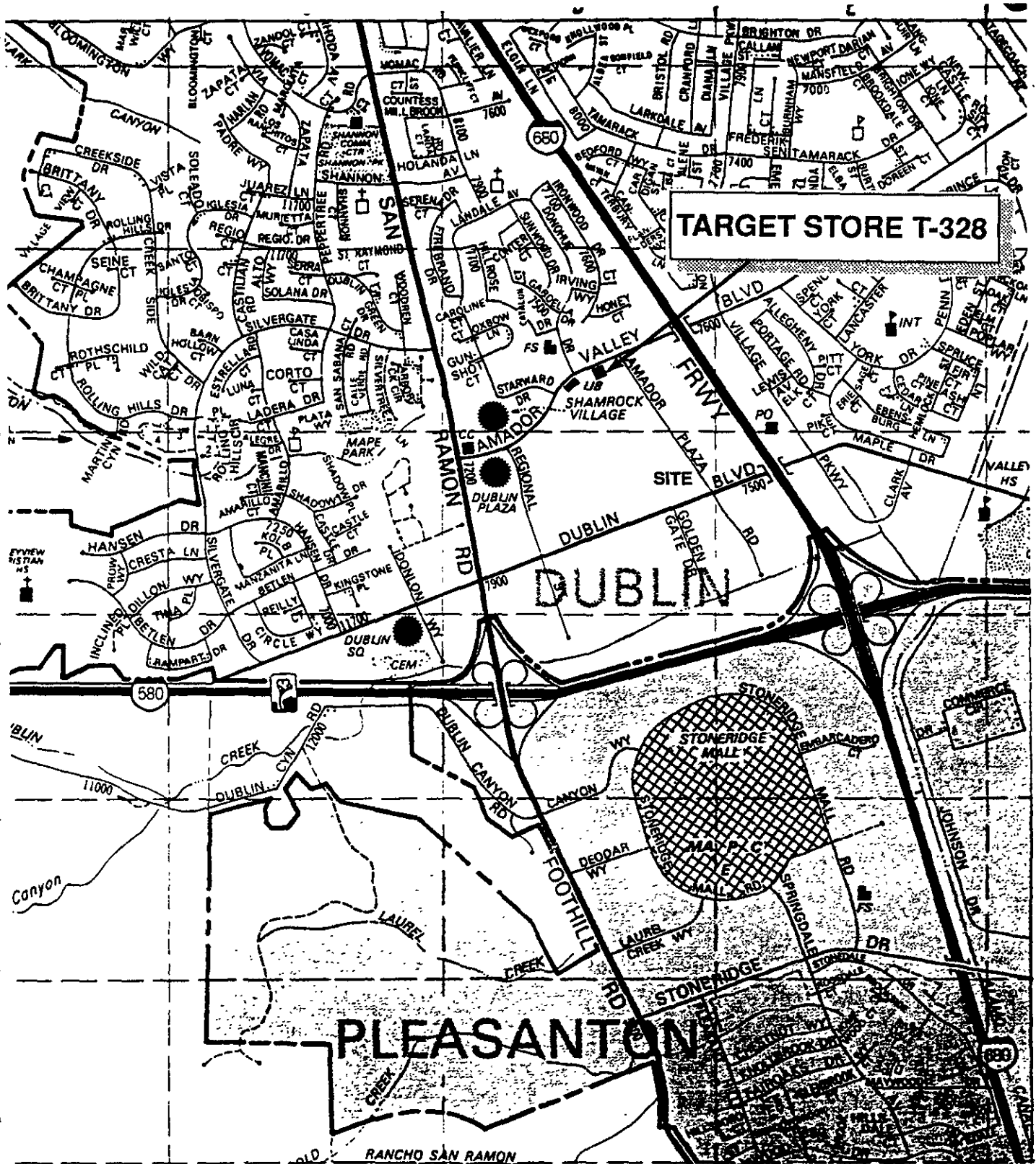
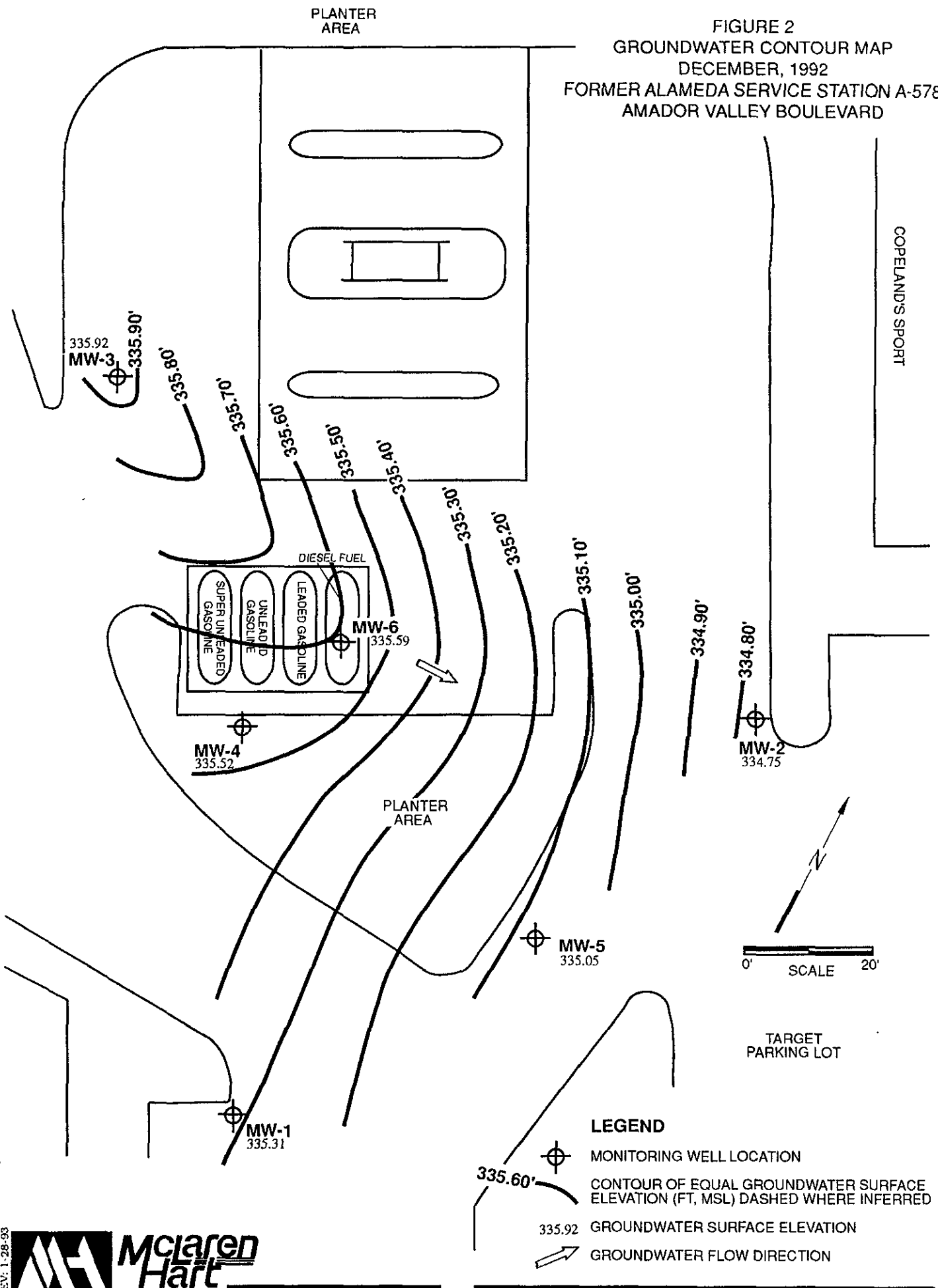


FIGURE 2
 GROUNDWATER CONTOUR MAP
 DECEMBER, 1992
 FORMER ALAMEDA SERVICE STATION A-578
 AMADOR VALLEY BOULEVARD



Target Dublin
 Groundwater Contour Map December
 REV: 1-28-93







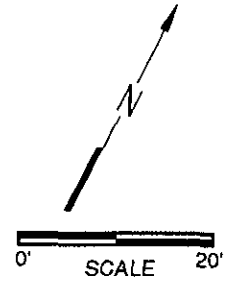
- LEGEND**
-  MONITORING WELL LOCATION
 -  CONTOUR OF EQUAL GROUNDWATER SURFACE ELEVATION (FT, MSL) DASHED WHERE INFERRED
 -  335.92 GROUNDWATER SURFACE ELEVATION
 -  GROUNDWATER FLOW DIRECTION

FIGURE 3
GROUNDWATER MONITORING WELL
CHEMICAL CONCENTRATIONS
DECEMBER, 1992

FORMER ALAMEDA SERVICE STATION A-578
AMADOR VALLEY BOULEVARD

PLANTER AREA

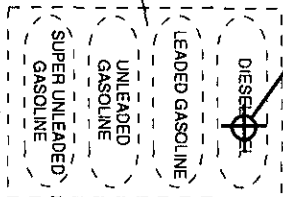
COPELAND'S SPORT



MW-3

MW-6	ppb
TPH/G	250
Benzene	16
Toluene	ND
Ethylbenzene	33
Xylenes	16.4

FORMER
TANK
EXCAVATION



MW-6

MW-2	ppb
TPH/G	150
Benzene	35
Toluene	0.81
Ethylbenzene	4.0
Xylenes	3.2

MW-2

MW-4	ppb
TPH/G	ND
Benzene	0.92
Toluene	ND
Ethylbenzene	ND
Xylenes	ND

MW-4

PLANTER AREA

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

MW-5

TARGET
PARKING LOT

MW-1

LEGEND


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

TABLE 1

WELL CONSTRUCTION DETAILS AND GROUNDWATER SURFACE ELEVATIONS
FORMER 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 12/29/92 (feet below grade)	GROUNDWATER ELEVATION 12/29/92 (MSL)
MW-1	5-20	340.30	335.30 - 320.30	340.20	4.89	335.31
MW-2	5-20	340.52	335.52 - 320.52	340.27	5.52	334.75
MW-3	5-20	341.67	336.67 - 321.67	341.00	5.08	335.92
MW-4	5-20	342.31	337.31 - 322.31	342.11	6.59	335.52
MW-5	5-20	340.52	335.52 - 320.52	340.09	5.04	335.05
MW-6	4.5-14.5	341.13	336.63-326.63	340.81	5.22	335.59

* Feet above mean sea level

TABLE 2

**SUMMARY OF GROUNDWATER ELEVATION DATA
FORMER 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
		6/23/92	4.92	335.28	-0.27
		9/24/92	5.10	335.10	-0.18
		12/29/92	4.89	335.31	0.21
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
		6/23/92	5.69	334.58	-0.34
		9/24/92	5.70	334.57	-0.01
		12/29/92	5.52	334.75	0.18
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
		6/23/92	5.27	335.73	-0.69
		9/24/92	5.47	335.53	-0.20
		12/29/92	5.08	335.92	0.39
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
		6/23/92	6.70	335.41	-0.26
		9/24/92	6.84	335.27	-0.14
		12/29/92	6.59	335.52	0.25
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
		6/23/92	5.23	334.86	-0.43
		9/24/92	5.07	335.02	0.16
		12/29/92	5.04	335.05	0.03
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
		6/23/92	5.38	335.43	-0.35
		9/24/92	5.57	335.24	-0.19
		12/29/92	5.22	335.59	0.35

* MSL = Mean Sea Level

TABLE 3

CHANGE IN GROUNDWATER ELEVATION AT MONITORING WELLS
 DURING INTERIM REMEDIATION AT MW-6
 FORMER 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
6/23/92	0930	4.92	---	5.69	---	5.27	---	6.70	---	5.23	---	5.38	---
	1830	5.04	-0.12	5.82	-0.13	5.38	-0.11	6.95	-0.25	5.39	-0.16	13.70	-8.32
6/24/92	0900	5.04	-0.12	5.76	-0.07	5.33	-0.06	6.84	-0.14	5.34	-0.11	5.48	-0.10
	1130	5.09	-0.17	5.79	-0.10	5.38	-0.11	6.95	-0.25	5.39	-0.16	9.77	-4.39
9/24/92	0845	5.10	---	5.70	---	5.47	---	6.84	---	5.07	---	5.57	---
	1530	5.33	-0.23	5.91	-0.21	5.68	-0.21	7.16	-0.32	5.50	-0.43	13.50	-7.93

TABLE 3

CHANGE IN GROUNDWATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-6
FORMER 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
9/25/92	0705	5.35	-0.25	5.98	-0.28	5.69	-0.22	7.14	-0.30	5.53	-0.46	5.79	-0.22
	1005	5.42	-0.32	6.07	-0.37	5.76	-0.29	7.64	-0.80	5.66	-0.59	13.50	-7.93
10/29/92	1030	5.95	--	6.77	--	6.46	--	8.00	--	6.34	--	6.65	--
	1556	6.03	-0.08	6.64	0.13	6.47	-0.01	7.94	-0.06	6.21	0.13	13.16	-6.51
11/20/92	0820	6.06	--	6.85	--	6.47	--	8.04	--	6.42	--	6.73	--
	1325	6.22	-0.16	6.88	-0.03	6.67	-0.20	8.12	-0.08	6.48	-0.06	13.85	-7.12
12/29/92	1150	4.89	--	5.52	--	5.08	--	6.59	--	5.04	--	5.22	--
	1605	4.89	0.00	5.57	-0.05	5.08	0.00	6.71	-0.12	5.09	-0.05	12.25	-7.03
12/30/92	0935	4.66	0.23	5.26	0.26	4.82	0.26	6.33	0.26	4.83	0.21	4.81	0.41
	1420	4.72	0.17	5.31	0.21	4.92	0.16	6.54	0.05	4.93	0.11	13.90	-8.68

*NOTE: Changes in water elevation are measured from the initial depth to groundwater on 10/17/91, 12/30/91, 3/26/92, 6/23/92, 9/24/92, 10/29/92, 11/20/92 and 12/29/92. Groundwater was pumped from MW-6 at approximately 0.65 GPM during December 1992.

TABLE 4

ANALYTICAL RESULTS OF GROUNDWATER SAMPLES (ppb)
FORMER 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
	6/92	<50	---	<0.3	<0.3	<0.3	<0.3
	9/92	<50	---	<0.3	<0.3	<0.3	<0.3
	12/92	---	---	---	---	---	---
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
	6/92	<50	---	9.5	<0.3	<0.3	<0.3
	9/92	<50	---	1.3	<0.3	<0.3	<0.3
	12/92	150	---	35 ^b	0.81	4.0	3.2
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
	6/92	<50	---	<0.3	<0.3	<0.3	<0.3
	9/92	<50	---	<0.3	<0.3	<0.3	<0.3
	12/92	---	---	---	---	---	---
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
	6/92	<50	---	<0.3	<0.3	<0.3	<0.3
	9/92	<50	---	<0.3	<0.3	<0.3	<0.3
	12/92	<50	---	0.92	<0.3	<0.3	<0.3
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
	6/92	<50	---	<0.3	<0.3	<0.3	<0.3
	9/92	<50	---	<0.3	<0.3	<0.3	<0.3
	12/92	<50	---	<0.3	<0.3	<0.32	<0.3

TABLE 4
(Continued)

ANALYTICAL RESULTS OF GROUNDWATER SAMPLES (ppb)
FORMER 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-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 ^a	260	<50 ^a
	3/92	2,600	<0.5	400	<50 ^a	280	<50 ^a
	6/92	1,500	---	220	<3 ^b	190	<3 ^b
	9/92	<480 ^b	---	28	<3 ^b	120	<3 ^b
	12/92	250	---	16 ^b	<0.3	33 ^b	16.4

- a = The analysis was run at a 1:100 dilution to bring target analytes within linear working range of the GC.
b = The analysis was run at a 1:10 dilutions to bring target analytes within linear working range of the GC.
--- = Not analyzed.

ATTACHMENT 1

OCTOBER, NOVEMBER AND DECEMBER 1992 EVENTS



PROJECT: TARGET Dublin EVENT: MW-6 EXTRACTING SAMPLER: D. WATTS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	10	29	92	10	30	5.95	SWL	SOUNDINGS TAKEN
2	MW-3				10	32	6.46		prior to pumping
3	MW-5				10	34	6.34		
4	MW-2				10	40	6.77		
5	MW-4				10	43	8.00		
6	MW-6	∇	∇	∇	10	45	6.65	∇	
7									
8	MW-1	10	29	92	15	51	6.03	SWL	SOUNDINGS TAKEN
9	MW-3				15	53	6.47		WHILE PUMPING
10	MW-5				15	56	6.21		
11	MW-2				15	57	6.64		
12	MW-4				15	58	7.94		
13	MW-6	∇	∇	∇	16	01	13.16	∇	
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)



McLaren

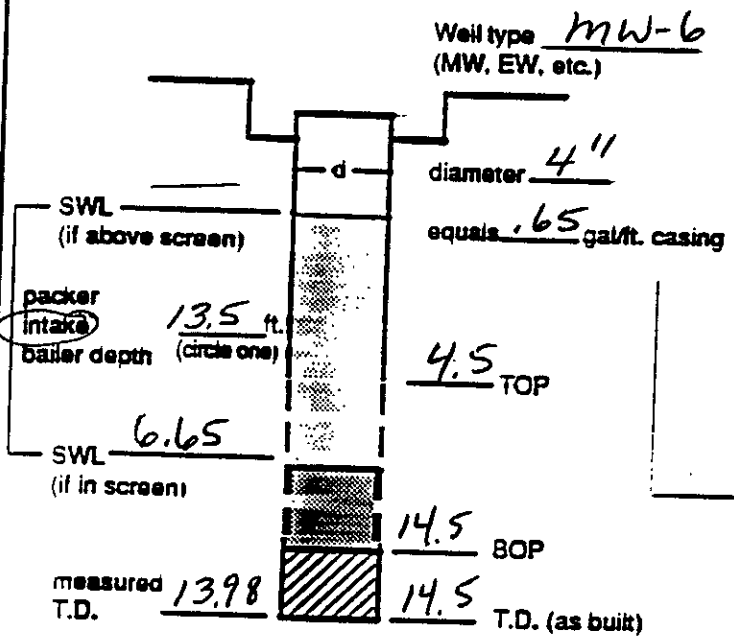
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-6

PROJECT TARGET DUBLIN EVENT EXTRACTING SAMPER D. WATTS DATE 10/29/92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1100	.62 gpm	
Stop	1625		
Sampled (Final IWL)			

Purge calculation
 $.65 \text{ gal/ft.} \cdot 7.33 \text{ ft.} = 4.77 \text{ gals} \times 3 = 14.31 \text{ gals.}$

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

Actual gallons purged 200 +
 Actual volumes purged 41.9 +
 Well yield (see below) \oplus MY

COC #	Sample I.D.	Analysis	Lab

Additional comments:

MODERATE PETROLEUM ODOUR

Gallons purged *	TEMP °C/°F (circle one)	EC (µs/cm)	PH	TURBIDITY (NTU)		
1.						
2.						
3.						
4.						
5.						

* 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.

PROJECT: TARGET DUBLIN EVENT: MW-6 EXTRACTING SAMPLER: D. WATTS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	11	20	92	08	10	6.06	SWL	SOUNDINGS TAKEN / 0.0 PPM
2	MW-3				08	16	6.47		PRIOR to Pumping / 0.0
3	MW-5				08	20	6.42		0.0
4	MW-2				08	25	6.85		293
5	MW-4				08	29	8.04		0.0
6	MW-6				08	34	6.73		254
7	MW-1				13	20	6.22		SOUNDINGS TAKEN / 0.0
8	MW-3				13	22	6.67		WHILE Pumping / 0.0
9	MW-5				13	25	6.48		0.0
10	MW-2				13	27	6.88		284
11	MW-4				13	29	8.12		0.0
12	MW-6	↓	↓	↓	13	30	13.85	↓	0.0 ↓
13									
14									
15									
16									
17									
18									
19									OVM CALIB: 99.4 PPM m 203
20									Watts 11/20/92

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)



McLaren

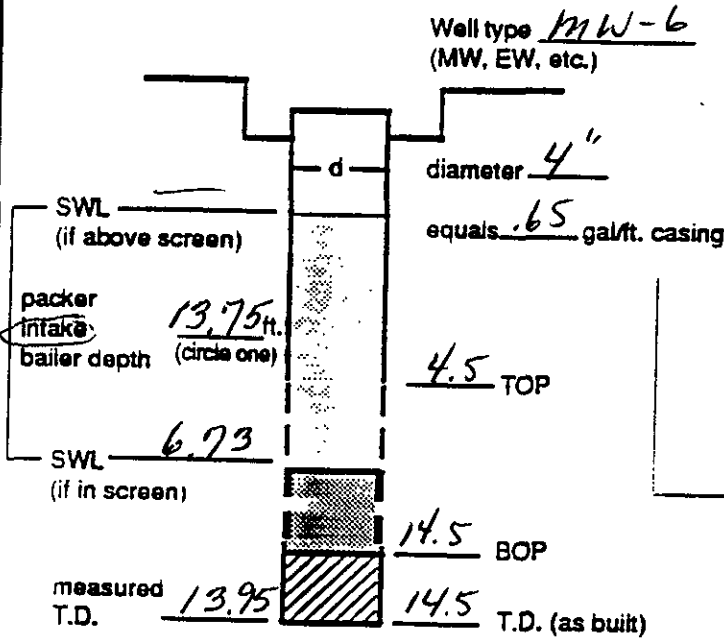
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-6

PROJECT TARGET DUBLIN EVENT EXTRACTING SAMPLER D. WATK DATE 11/20/92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	<u>0850</u>	<u>.69 GPM</u>	
Stop	<u>1340</u>	↓	
Sampled (Final IWL)			

Purge calculation
.65 gal/ft. * 7.22 ft. = 4.69 gals x 3 = 14.07 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

Actual gallons purged 200+
 Actual volumes purged 42.6+
 Well yield (see below) ⊕ MY

COC #	Sample I.D.	Analysis	Lab

Additional comments:

MODERATE PETROLEUM ODOR

Gallons purged *	TEMP °C/°F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1.						
2.						
3.						
4.						
5.						

* 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.



PROJECT: <u>TARGET DUBLIN</u> EVENT: <u>Quarterly</u> SAMPLER: <u>D. WATTS</u>								
NO.	WELL OR LOCATION	DATE		TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR			
1	MW - 1	12	30	92	09	35	4.66	SWL
2	MW - 3				09	36	4.82	
3	MW - 5				09	37	4.83	
4	MW - 2				09	38	5.26	
5	MW - 4				09	39	6.33	
6	MW - 6				09	40	4.81	
7	MW - 1				14	15	4.72	
8	MW - 3				14	17	4.92	
9	MW - 5				14	19	4.93	
10	MW - 2				14	21	5.31	
11	MW - 4				14	23	6.54	
12	MW - 6	▼	▼	▼	14	25	13.90	▼ PURGING
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: TARGET DUBLIN EVENT: Quarterly SAMPLER: D. WATTS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	12	29	92	11	45	4.89	SWL	VAULT BOX FLOODED
2	MW-3				11	47	5.08		
3	MW-5				11	49	5.04		↓
4	MW-2				11	51	5.52		SLIGHT PETROLEUM ODOR
5	MW-4				11	52	6.59		
6	MW-6				11	55	5.22		MODERATE PETROLEUM ODOR
7	MW-1				16	00	4.89		
8	MW-3				16	01	5.08		
9	MW-5				16	02	5.09		
10	MW-2				16	03	5.57		
11	MW-4				16	04	6.71		
12	MW-6	↓	↓	↓	16	05	12.25	↓	PURGING
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)



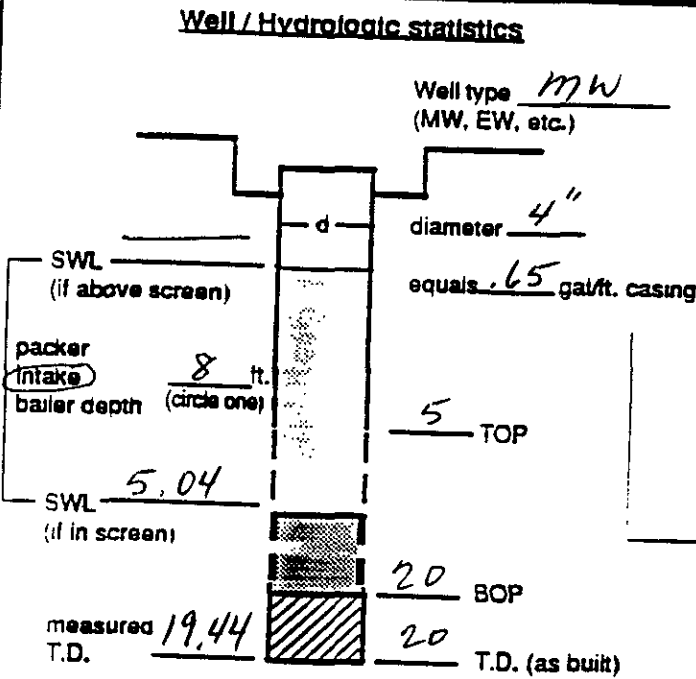
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SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-5

PROJECT TARGET DUBLIN EVENT Quarterly SAMPLER D. WATTS DATE 12/29/92



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1315	1 GPM	
	1325	1 GPM	7.11
	1335	1 GPM	7.23
	1345	1 GPM	7.30
	1355	1 GPM	7.37
Stop	1356	↓	7.37
Sampled	1400		
(Final IWL)	1410		5.18
Purge calculation			
<u>.65</u> gal/ft. * <u>14.96</u> ft. = <u>9.75</u> gals 28 = <u>39</u> 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:
CENT. Pump @ DISPOSABLE BAILER
USED DESIGN T.D. FOR PURGE CALCULATION.
TEMP. ELEVATED DUE TO CENT. PUMP OPERATION.

Actual gallons purged	<u>40 +</u>	
Actual volumes purged	<u>4 +</u>	
Well yield (see below)	<u>HY</u>	
COC #	<u>32634</u>	
Sample I.D.	Analysis	Lab
<u>238401-04</u>	<u>TPH-G/LUFT</u> <u>BTX-G/LUFT</u>	<u>MAL (TR)</u> <u>BLK</u>
<u>238405-08</u>	↓	<u>MAL</u>

Additional comments:
50% RECOVERY: 12.52
80% RECOVERY: 8.03 SAMPLE TURBIDITY: 0.86

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
1. <u>10</u>	<u>62.8</u>	<u>1780</u>	<u>6.70</u>	<u>4.54</u>
2. <u>20</u>	<u>65.2</u>	<u>1790</u>	<u>6.71</u>	<u>4.44</u>
3. <u>30</u>	<u>66.0</u>	<u>1830</u>	<u>6.73</u>	<u>1.80</u>
4. <u>40</u>	<u>66.5</u>	<u>1830</u>	<u>6.69</u>	<u>1.36</u>
5.				

* 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.



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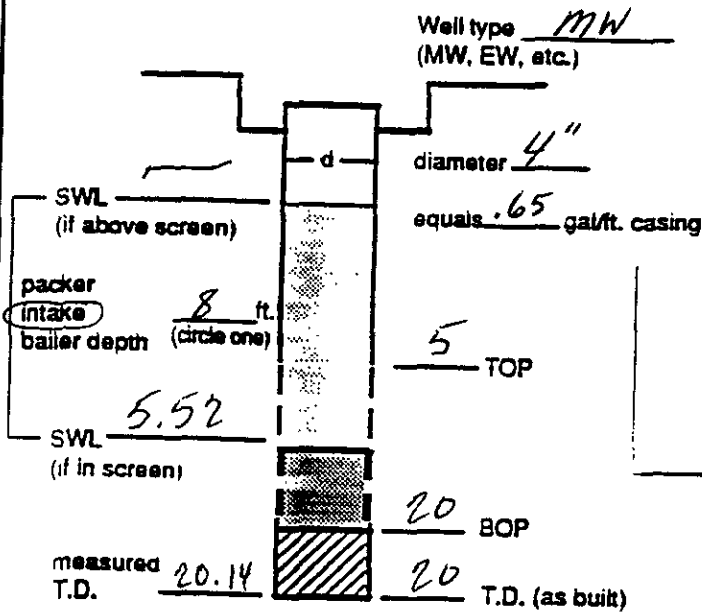
SAMPLING EVENT DATA SHEET

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WELL OR LOCATION MW-2

PROJECT TARGET Dublin EVENT Quarterly SAMPLER D. WATTS DATE 12/29/92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1440	1 GPM	
	1450	1 GPM	7.20
	1500	1 GPM	7.38
	1510	1 GPM	7.41
	1520	1 GPM	7.44
Stop	1522		7.44
Sampled	1530		
(Final IWL)	1540		5.83

Purge calculation

.65 gal/ft. * 14.62 ft. = 9.6 gals ~~22~~ = 39 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:

CENT. Pump @ Disp. BAILER
USED MEASURED T.D. FOR PURGE CALCULATION.

Actual gallons purged 40 +

Actual volumes purged 4 +

Well yield ⊕ HY
(see below)

COC # 32634

Sample I.D.	Analysis	Lab
<u>238409-12</u>	<u>TPH-6/LuKT + STX/LuKT</u>	<u>MAL</u>

Additional comments: SLIGHT PETROLEUM ODOR

50% RECOVERY: 12.83

80% RECOVERY: 8.44 SAMPLE TURBIDITY: 1.71

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
1. <u>10</u>	<u>63.0</u>	<u>1720</u>	<u>7.05</u>	<u>4.22</u>
2. <u>20</u>	<u>65.9</u>	<u>1760</u>	<u>7.01</u>	<u>2.35</u>
3. <u>30</u>	<u>66.6</u>	<u>1770</u>	<u>7.03</u>	<u>2.84</u>
4. <u>40</u>	<u>67.2</u>	<u>1780</u>	<u>7.14</u>	<u>2.02</u>
5.				

* 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.



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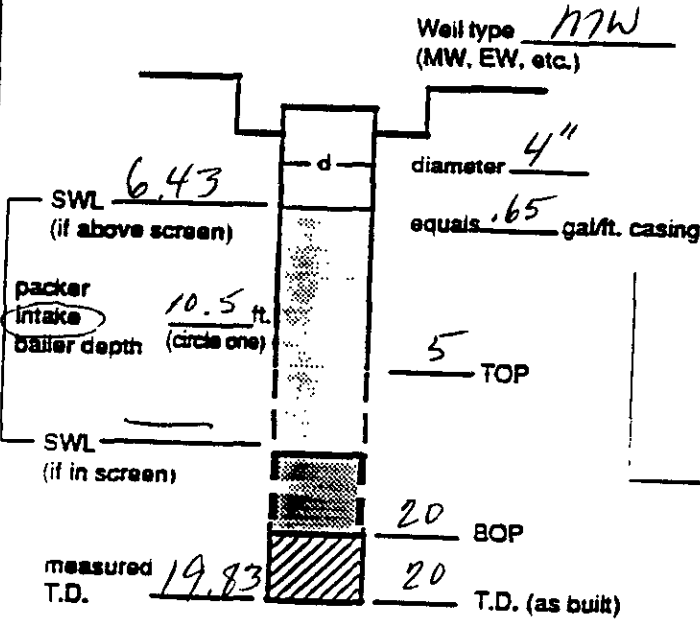
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-4

PROJECT TARGET Dublin EVENT Quarterly SAMPLER D. WATTS DATE 12/30/92

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1040	1 GPM	
	1049	1 GPM	9.75
	1058	1 GPM	9.81
	1107	1 GPM	9.85
	1116	1 GPM	9.91
Stop	1117		9.91
Sampled	1130		7.30
(Final IWL)	1135		6.63

Purge calculation
.65 gal/ft. * 13.57 ft. = 9 gals * 4 = 36 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:
CENT. Pump (w Disp. BAILER)
USED DESIGN T.D. FOR PURGE CALCULATION.

Actual gallons purged	<u>36 +</u>
Actual volumes purged	<u>4 +</u>
Well yield (see below)	<u>MY</u>

COC #	<u>32634</u>
Sample I.D.	<u>238413-16</u>
Analysis	<u>TH-6/10/92</u>
Lab	<u>MAL</u>

Additional comments:

50% RECOVERY: 13.21

80% RECOVERY: 9.14

SAMPLE TURBIDITY: 0.68

Gallons purged *	TEMP °C/F (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)
1. <u>9</u>	<u>70.1</u>	<u>1750</u>	<u>7.35</u>	<u>3.51</u>
2. <u>18</u>	<u>74.2</u>	<u>1600</u>	<u>7.18</u>	<u>2.20</u>
3. <u>27</u>	<u>73.7</u>	<u>1550</u>	<u>7.07</u>	<u>2.20</u>
4. <u>36</u>	<u>72.9</u>	<u>1570</u>	<u>7.01</u>	<u>1.18</u>
5.				

* 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.

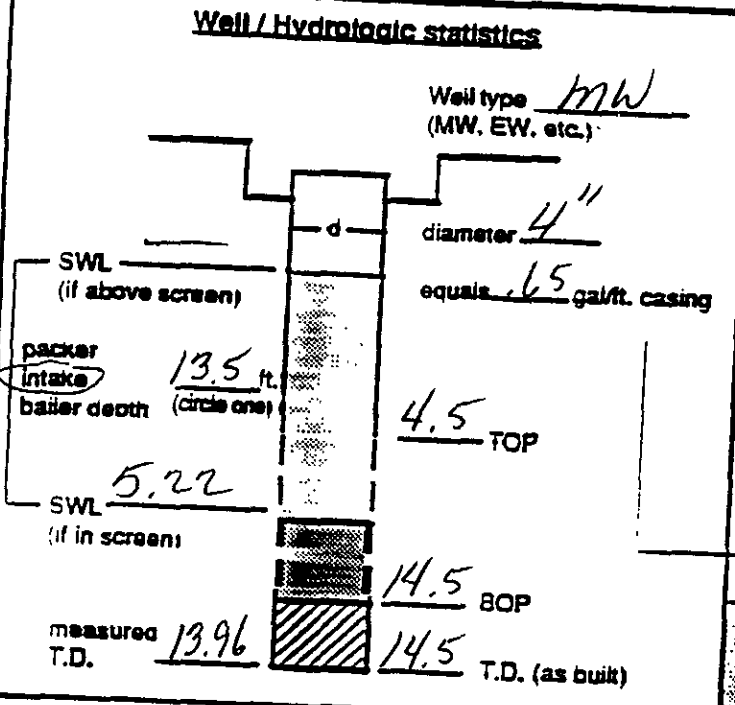


SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-6

PROJECT TARGET Ditch EVENT Quarterly SAMPLER D. WATT DATE 12/30/92



Action	Time	Pump rate	IWL (low vit)
Start pump / Begin	1210		
(12/29/92) STOP	1605	.85 GPM	12.2'
(12/30/92) RE-START	0950	.70 GPM	4.8'
Stop	1435		13.9'
Sampled	1450		6.7'
(Final IWL)	1515		5.0'

Purge calculation
.65 gal/ft. * 9.28 ft. = 6.04 gals * 4 = 24.16 gals

SWL to BOP or packer to BOP one volume
 SWL to BOP or packer to BOP three volumes

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

packer to SWL _____

Equipment Used / Sampling Method / Description of Event:

CENT. Pump (w) Disp. BAILER
USED DESIGN T.D. FOR PURGE CALCULATION

Actual gallons purged 400+
 Actual volumes purged 66+
 Well yield (see below) \oplus MY

COC # 32634
 Sample I.D. 238417-20 Analysis TPH-G/WAT + BTEX/LWET Lab MAL

Additional comments: MODERATE PETROLEUM DOOR

50% RECOVERY: 9.86

80% RECOVERY: 7.07

SAMPLE TURBIDITY: 3.89

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
1. 360	67.7	1610	6.78	1.63
2. 380	67.8	1650	6.77	1.28
3. 390	67.8	1660	6.78	1.38
4. 400	67.8	1620	6.76	1.39
5.				

* 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.



DIRECT READING REPORT

Sheet 1 of 1

Client Name and Site: TARGET Dublin Project Manager: M^cLEOD Task Number: 04.0122619.000 Date: 12/29/92

Employee: D. WATTS Title: ASST. ENV. SCI. Weather Conditions/ Observations: WINDY/ RAINY
 Wind Speed: BRISK Wind Direction: NE Temperature: 55 F

Direct Reading Data

Location:	Task Description (Drilling, Sampling, etc.)	Time	Instrument Type (E. Lamp size if applicable)	Substance/ Agent	Concentration	Source: S Breathing Zone: B
MW - 1	Sampling	1130	HNu / 11.7	VOC	0 / 0	S/B
MW - 3		1132			0 / 0	
MW - 5		1134			0 / 0	
MW - 2		1136			190 / 0	
MW - 4		1138			0 / 0	
MW - 6		1140			150 / 0	
MW - 1		1550			0 / 0	
MW - 3		1551			0 / 0	
MW - 5		1552			0 / 0	
MW - 2		1553			150 / 0	
MW - 4		1554			0 / 0	
MW - 6		1555			30 / 0	
* MW - 1	Sampling	0915	HNu / 11.7	VOC	0 / 0	S/B
MW - 3		0917			0 / 0	
MW - 5		0919			0 / 0	
MW - 2		0920			180 / 0	
MW - 4		0921			0 / 0	
MW - 6		0922			20 / 0	
MW - 1					0 / 0	
MW - 3					0 / 0	
MW - 5					0 / 0	
MW - 2					110 / 0	
MW - 4					0 / 0	
MW - 6	(Purgings)				10 / 0	

Comments: * 12/30/92 READING?

NOTE: Return to REHSC Upon Completion of Site Work. Use Additional Forms if Necessary.

ATTACHMENT II
ANALYTICAL DATA SHEETS
AND
CHAIN-OF-CUSTODY



Date: January 11, 1993
LP #: 6963

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

Dear Mr. McLeod:

Enclosed are the laboratory results for the five samples submitted by you to the McLaren Analytical Laboratory on December 31, 1992, for the project *Target Dublin*.

The analyses you requested are:

EPA 8020 (BTEX) and TPH/G (5 - Water)

The report consists of the following sections:

1. A copy of the Chain-of-Custody
2. Quality Control Definitions and Report
3. Abbreviations and Comments
4. Analytical results

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,

A handwritten signature in black ink, appearing to read 'Shakoora Azimi', written over a horizontal line.

Shakoora Azimi
Laboratory Director, Principal Scientist

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.

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.

Control limits for accuracy and precision are different for different methods and may 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 - CN6963)

QUALITY CONTROL REPORT

METHOD BLANK

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

Date Analyzed: 01/06/93

<u>Analyte</u>	<u>Reporting Limit</u>	<u>Concentration</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: 01/07/93

<u>Analyte</u>	<u>Reporting Limit</u>	<u>Concentration</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

**Laboratory Control Sample/Laboratory Control Sample Duplicate
Method 8020**

LP#: 6963

Analyst: TL

Spike Sample ID: LCS/LCSD W-27

Date Of Analysis: 01/06/93

Spike ID Code: W-1-667

Column: DB-WAX

Surrogate ID Code: W-1-674

Instrument #: 6

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	3.8	95	4.0	100	5	80 - 120	≤20
8020	Benzene	0	4.0	3.6	90	4.1	102	13	80 - 120	≤20
8020	Ethyl Benzene	0	4.0	3.6	90	3.9	98	8	80 - 120	≤20

$$\text{Spike Recovery} = d = ((c-a)/b) \times 100$$

$$\text{Spike Duplicate Recovery} = f = ((e-a)/b) \times 100$$

$$\text{Relative Percent Difference} = g = (|c-e|)/((c+e) \times .5) \times 100$$

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	3.0	75 ^a	3.1	78 ^a	80 - 120	

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

$$\text{Surrogate Dup \% Recovery} = l = (k/h) \times 100$$



ENVIRONMENTAL ENGINEERING CORPORATION

QUALITY CONTROL REPORT

**Laboratory Control Sample/Laboratory Control Sample Duplicate
Total Petroleum Hydrocarbons/TPH-Gasoline**

Analyst: TL

LP#: 6963

Date of Analysis: 01/06/93

Spike Sample ID: LCS/LCSD W-22

Column: DB 624

Spike ID Code: W-1-676

Instrument #: 6

Surrogate ID Code: W-1-674

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.	100.	100	110.	110	10	80 - 120	≤20

$$\text{Spike Recovery} = d = ((c-a)/b) \times 100$$

$$\text{Spike Duplicate Recovery} = f = ((e-a)/b) \times 100$$

$$\text{Relative Percent Difference} = g = (|c-e|)/((c+e) \times .5) \times 100$$

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	% REC.
a,a,a-Trifluorotoluene	4.0	4.7	118	80 - 120

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

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.

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

The reporting limits for BTEX meet those specified in the California LUFT Manual.

(DC2-CN6963)

VOLATILE AROMATIC COMPOUNDS

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

Project Name:	<u>Target Dublin</u>	Project Number:	<u>04.0122617.000</u>
Sample Description:	<u>Trip Blank</u>	Lab Project-ID Number:	<u>6963-001</u>
Sample Number:	<u>238401</u>	Date Sampled:	<u>12/29/92</u>
Date Received:	<u>12/31/92</u>	Date Analyzed:	<u>01/06/93</u>

<u>ANALYTE</u>	<u>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)	75 {a}	80 - 120
a,a,a-Trifluorotoluene (FID)	110	80 - 120

Comments: {a} Sample surrogate recovery is beyond acceptance limits.
All other quality control is acceptable.

Approved By: UM Date: 1-11-93
Nancy McDonald, Quality Control Chemist

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

080492btxtphgw

VOLATILE AROMATIC COMPOUNDS

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

Project Name: <u>Target Dublin</u>	Project Number: <u>04.0122617.000</u>
Sample Description: <u>MW-2</u>	Lab Project-ID Number: <u>6963-003</u>
Sample Number: <u>238409</u>	Date Sampled: <u>12/29/92</u>
Date Received: <u>12/31/92</u>	Date Analyzed: <u>01/06/93</u>

<u>ANALYTE</u>	<u>CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	35 (a)	3.0
Toluene	0.81	0.30
Ethyl Benzene	4.0	0.30
1,2-Xylene	1.0	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	2.2	0.30
Total Petroleum Hydrocarbons - Gasoline	150	50

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	75 (b)	80 - 120
a,a,a-Trifluorotoluene (FID)	112	80 - 120

Comments: (a) The data was reported from a different analytical run on 01/07/93 at a 10 fold dilution to obtain a result within linear range.

(b) Sample surrogate recovery is beyond acceptance limits. All other quality control is acceptable.

Approved By: UM Date: 1-16-93
Nancy McDonald, Quality Control Chemist

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

080492btxtphgw

VOLATILE AROMATIC COMPOUNDS

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

Project Name: <u>Target Dublin</u>	Project Number: <u>04.0122617.000</u>
Sample Description: <u>MW-4</u>	Lab Project-ID Number: <u>6963-004</u>
Sample Number: <u>238414</u>	Date Sampled: <u>12/30/92</u>
Date Received: <u>12/31/92</u>	Date Analyzed: <u>01/06/93</u>

<u>ANALYTE</u>	<u>CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	0.92	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)	78 {a}	80 - 120
a,a,a-Trifluorotoluene (FID)	135 {a}	80 - 120

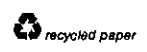
Comments: {a} Sample surrogate recovery is beyond acceptance limits.
 All other quality control is acceptable.

Non-target analytes are present on the chromatograph.

Approved By: UM Date: 1-11-93
 Nancy McDonald, Quality Control Chemist

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

080492btxtphgw



VOLATILE AROMATIC COMPOUNDS

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

Project Name: <u>Target Dublin</u>	Project Number: <u>04.0122617.000</u>
Sample Description: <u>MW-5</u>	Lab Project- ID Number: <u>6963-002</u>
Sample Number: <u>238405</u>	Date Sampled: <u>12/29/92</u>
Date Received: <u>12/31/92</u>	Date Analyzed: <u>01/06/93</u>

<u>ANALYTE</u>	<u>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)	75 (a)	80 - 120
a,a,a-Trifluorotoluene (FID)	112	80 - 120

Comments: (a) Sample surrogate recovery is beyond acceptance limits.
 All other quality control is acceptable.

Approved By: UM Date: 1/1/93
 Nancy McDonald, Quality Control Chemist

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

080492btxtphgw



VOLATILE AROMATIC COMPOUNDS

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

Project Name: <u>Target Dublin</u>	Project Number: <u>04.0122617.000</u>
Sample Description: <u>MW-6</u>	Lab Project-ID Number: <u>6963-005</u>
Sample Number: <u>238418</u>	Date Sampled: <u>12/30/92</u>
Date Received: <u>12/31/92</u>	Date Analyzed: <u>01/06/93</u>

<u>ANALYTE</u>	<u>CONCENTRATION</u> ug/L (ppb)	<u>REPORTING LIMIT</u> ug/L (ppb)
Benzene	16 {a}	3.0
Toluene	BRL	0.30
Ethyl Benzene	33	3.0
1,2-Xylene	BRL	0.30
1,3-Xylene	8.9	0.30
1,4-Xylene	7.5	0.30
Total Petroleum Hydrocarbons - Gasoline	250	50

<u>Surrogates</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	75 {b}	80 - 120
a,a,a-Trifluorotoluene (FID)	95	80 - 120

Comments: (a) The data was reported from a different analytical run on 01/07/93 at a 10 fold dilution to obtain a result within linear range.

(b) Sample surrogate recovery is beyond acceptance limits. All other quality control is acceptable.

Approved By: UM Date: 1-1-93
Nancy McDonald, Quality Control Chemist

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

080492btxtphgw

Ship To: McClaren LAB
 Address: 3083 GOLD CANAL DR
RANCHO CORDOVA, CA
95670

Project Name: TARGET DUBLIN
 Project Number: 04.0122617.000
 Project Location: (State) CA

FOR LABORATORY USE ONLY
 Laboratory Project #: _____
 Storage Refrigerator ID: _____
 Storage Freezer ID: _____

Sampler Name: D. WATTS Signature: [Signature] PPE Worn in Field: D
 Relinquished By: [Signature] Date/Time: 12/30/92 1600 Received By or Method of Shipment/shipment I.D.: FEDERAL EXPRESS Date/Time: 12/30/92 1600
 Relinquished By: _____ Date/Time: _____ Received By or Method of Shipment/shipment I.D.: _____ Date/Time: _____
 Relinquished By: _____ Date/Time: _____ Received By or Method of Shipment/shipment I.D.: _____ Date/Time: _____

- Common Analytical Methods
- 413.1
 - 413.2
 - 418.1
 - 418.1 Short Method
 - 420.1
 - 502.2
 - 503E
 - 524.2
 - 601
 - 602
 - 604
 - 608
 - 610
 - 624
 - 625
 - 8010
 - 8015
 - 8015 Mod.
 - 8020
 - 8021
 - 8040
 - 8080
 - 8100
 - 8240
 - 8270
 - 8310
 - Alkalinity
 - BTEX
 - Chloride
 - CLP (see Side 2)
 - COD
 - Color
 - Conductivity
 - Cyanide
 - Flashpoint
 - Fluoride
 - General Mineral
 - Hex. Chromium
 - Ion Balance
 - Metals (write specific metal & method #)*
 - Metals 6010*
 - Metals PP*
 - Metals Title 22:
 - TTLC Level
 - STLC Level (see Side 2)
 - Nitrate
 - Nitrite
 - Org. Lead
 - Org. Mercury
 - Percent Moisture
 - Percent Solid
 - Perchlorate
 - pH
 - Phosphates
 - Phosphorus
 - Sulfate
 - Sulfides
 - TCLP:
 - VOA
 - Semivolatile
 - Metals
 - Pesticide
 - TDS
 - Total Hardness
 - Total Solids
 - TPH/D
 - TPH/G
 - TSS
 - Turbidity
- * Specify Total or Dissolved

Sample Disposal (check one)
 Laboratory Standard
 Other

Level of QC (see Side 2)
 1 2 3 4
 5 6 7

Write in Analysis Method →

ANALYSES REQUESTED

SAMPLE INFORMATION

FOR LABORATORY USE ONLY Lab ID	Sample ID Number	Date	Time	Description		Container(s)		Matrix Type	Pres. Type	TAT	ANALYSES REQUESTED	
				Locator	Depth	#	Type				TPH-G (u.g./L)	BTEX (u.g./L)
1	238401-04	12/29/92	1230	TRIP BLANK	NA	4	V	H ₂ O	HCl	4	X	X
2	238405-08	↓	1400	MW-5	↓	↓	↓	↓	↓	↓	X	X
3	238409-12	↓	1530	MW-2	↓	↓	↓	↓	↓	↓	X	X
4	238413-16	12/29/92	1130	MW-4	↓	↓	↓	↓	↓	↓	X	X
5	238417-20	↓	1450	MW-6	↓	↓	↓	↓	↓	↓	X	X
6												
7												
8												
9												
10												

Special Instructions/Comments: _____

Container Types: A=1 Liter Amber TAT (Analytical Turn Around Time)
 B=Brass Tube C=Cassette 1 = 24 hours 2 = 48 hours
 G=Glass Jar P=Polyethylene 3 = 1 week 4 = 2 weeks
 O=Other V=Voa Vial 0 = Other

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: _____

SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: C. McLEOD / ALAMEDA
 Client Name: _____
 Company: _____
 Address: _____
 Phone: _____ FAX: _____