

THIRD QUARTER 1999
GROUNDWATER MONITORING RESULTS
B&C Gas Mini Mart
Livermore, California

Prepared by
CONOR PACIFIC/EFW
2650 East Bayshore Road
Palo Alto, California 94303
November 1999

Project BNC103

November 18, 1999
Project No. BNC103

Mr. Balaji Angle
Angle Enterprises
5131 Shattuck Avenue
Oakland, California 94609

Re: Third Quarter 1999 Groundwater Monitoring Results, B&C Gas Mini
Mart, 2008 First Street, Livermore, California (Station ID 1689)

Dear Mr. Angle:

Conor Pacific/EFW has compiled third quarter 1999 groundwater monitoring results for B&C Gas Mini Mart (B&C), 2008 First Street, Livermore, California (Figure 1). This report includes third quarter 1999 groundwater elevation data, groundwater sampling methods, and results of groundwater chemical analyses.

This third quarter 1999 groundwater monitoring is the initial sampling period incorporating the new downgradient monitoring wells into the quarterly monitoring program, and reducing the monitoring of existing site wells.¹ Under this new monitoring program, site wells MW-1, MW-3, MW-4, and MW-6 will be sampled annually, in the first quarter, when groundwater levels are generally the highest. Site wells MW-2 and MW-5, typically the wells with the highest concentrations, are sampled quarterly. All wells installed during the downgradient investigation will be sampled quarterly, with the exception of cross-gradient well MW-9, which will be monitored annually. Well (MS)MW-1 will be monitored quarterly for free-phase hydrocarbon and sampled if free-phase hydrocarbon is not present. This monitoring program will be re-evaluated following one year, with changes proposed based on the monitoring results.

SITE INFORMATION

Site Name & Contact

Mr. Balaji Angle
B&C Gas Mini Mart
2008 First Street
Livermore, California 94550
(510) 654-3461

¹ Conor Pacific/EFW. Report of Downgradient Investigation, B&C Gas Mini Mart, Livermore, California. November 1999.

Site Description

The B&C property is located on the northeast corner of First and South L Streets in Livermore, California, and currently serves as a gasoline station and mini market and is called Valley Gas. From at least 1988 until 1994, Desert Petroleum (DP) owned and operated the site. In January 1994, DP sold the site to the current owner, Mr. Balaji Angle. The following site description has been compiled from reports on file with Alameda County Environmental Health Services (ACEHS) and information provided by the site owner.

The site is located in the Livermore Valley groundwater basin, an area of sedimentary deposition containing braided channel systems with complex interfingering. Subsurface investigations conducted to the west of the B&C site have found an upper unconfined water-bearing zone consisting primarily of gravels with sand and clay. A low-permeability clayey unit is found at depths of approximately 75 to 110 feet below ground surface (bgs). Below the clayey unit, the top of a lower, semi-confined aquifer is found at depths ranging from 110 to 145 feet bgs.²

Subsurface work conducted in the B&C area has found predominantly sandy clay, silty sand, silty gravel, and sandy gravel. Over the last eleven years, static water levels have ranged from 68.7 feet bgs (January 1992) to 17.0 feet bgs (February 1997). The groundwater flow generally ranges from west of north during the summer and fall months, to north of west during the winter and spring months. Table 1 presents historical site groundwater elevations.³ Table 2 summarizes all B&C monitoring well constructions.

Previous Work Performed at Site

A preliminary site assessment was conducted in September 1988. Three soil borings were completed; one of which was converted to a monitoring well (MW-1). In March 1994, a 280-gallon waste oil underground storage tank (UST) and 25 cubic yards of soil were removed as part of closing the auto repair shop at the station. Three months later in June, wells MW-2, MW-3, and MW-4 were installed (Figure 2).⁴

In August 1994, free product was encountered in well MW-2, and product removal commenced twice a month. By the end of January 1995, no measurable thickness of product remained, only sheen could be detected.⁵ In March 1995, a release was reported

² H*GCL, Inc. Deep Groundwater Conduit Study, Livermore Arcade Shopping Center, First Street and South P Street, Livermore, California. December 6, 1993.

³ Groundwater elevation and flow direction data from Remediation Service Int'l quarterly reports.

⁴ Remediation Service Int'l. Soil & Groundwater Investigation Report for 2008 First Street, Livermore, California. July 22, 1994.

⁵ Product thickness information from Remediation Service, Int'l field records, "Free Product Removal Logs."

to have occurred from the union between a tank subpump and product line. The quantity of the release is unknown.

One gasoline UST at the B&C site failed an integrity test in September 1995. The tank was immediately taken out of commission and ACEHS was notified. In July 1996, further source removal was conducted. Two more gasoline USTs were removed, and new double-walled fiberglass USTs and fiberglass piping with automated leak detection were installed. Other remedial activities included the removal of two hydraulic lifts and approximately 700 cubic yards of impacted soil. Also, one 1,000-gallon UST discovered during excavation activities was closed in place with approval from ACEHS and the Livermore Fire Department by grouting with a cement sand slurry. In October 1995, two additional monitoring wells (off-site well MW-5 and well MW-6) were installed for the B&C site (Figure 2).

Nine new downgradient wells (MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, D-1, and D-2) were installed during June and July 1999 to define the lateral extent of the plume and provide long-term monitoring locations (Figure 2).⁶ Two of the wells, D-1 and D-2, are installed in the semi-confined aquifer below the aquitard. The other wells are installed in the upper water-bearing zone.

The primary constituents of concern are total petroleum hydrocarbons as gasoline (TPH-G); the aromatic compounds benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX); and methyl tertiary-butyl ether (MTBE). Since 1994, concentrations of TPH-G in groundwater have generally decreased.

Interim Remedial Action at Well MW-5

Floating product was first observed in well MW-5 on July 30, 1998 (Table 1). The well is screened from 15 feet to 40 feet, bgs, and the depth to groundwater has historically ranged from 18 to 33 feet, well within the screened interval of the well. Due to the presence of floating free product in well MW-5, interim remedial actions were taken to remove the floating product from the well. A passive bailer or absorbent sock was selected to remove product from well MW-5 based on well access, the thickness of the product, and the rate at which the product enters the well as it is removed.

Over the time period monitored, the absorbent socks have removed sufficient product to reduce the free product thickness to a sheen or less. In April 1999, the absorbent sock was raised above the water table; floating product has not re-entered the well.

⁶ Einarson, Fowler & Watson, November 5, 1999, Report of Downgradient Investigation, B&C Gas Mini Mart, 2008 First Street, Livermore, California.

GROUNDWATER SAMPLING AND ANALYSIS

Third quarter activities are reviewed below. Groundwater sampling methods and results are presented and a discussion of historical analytical trends for site monitoring wells is included.

Free Product

During the third quarter 1999 sampling event, EFW checked for free product in all site wells. Wells MW-2, MW-5, and MW-6, which previously have been reported to contain free product, did not contain a measurable thickness of product this quarter. Off-site well (MS)MW-1, located approximately 800 feet downgradient from the B&C site on the Mill Springs Park property (MSP), was also checked for product (Figure 1). (MS)MW-1 did not contain a measurable thickness of product. However, product was observed during purging and thus, a groundwater sample was not collected from this well.

Groundwater Elevations

On September 27, 1999, Conor Pacific/EFW measured the depth to water in all groundwater monitoring wells. Water levels were measured to the nearest 0.01 foot using a float-activated product probe, according to Conor Pacific/EFW's standard measuring protocol,⁷ and were recorded on a water level data sheet (Appendix A). Groundwater elevations are calculated by subtracting depth-to-water measurements from the top of well casing elevations, surveyed to Livermore City datum, mean sea level (MSL).

Table 1 summarizes available groundwater elevations from August 1990 to September 1999. A comparison of well screen elevations (Table 2) and third quarter measurements shows that the water levels were above the well screens in wells MW-3, MW-13, D-1, and D-2. The water levels in all other wells intercepted the well screen intervals at the time of groundwater sampling. A groundwater contour map, based on September 1999 measurements, is shown in Figure 2. Third quarter groundwater elevations are generally three feet lower than the second quarter 1999. Groundwater flow was slightly west of north during third quarter 1999. Based on third quarter measurements, the hydraulic gradient is approximately 0.013 foot per foot. The flow direction and gradient are in accordance with previous results.

Sampling Methods

Conor Pacific/EFW sampled ten monitoring wells (MW-2, MW-5, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, D-1, and D-2) on September 28, 1999, following EFW's standard protocol. Well (MS)MW-1 was not sampled due to the presence of free product in the groundwater during well purging. Wells were purged using either a submersible pump or a polyvinyl chloride (PVC) bailer. Samples were collected from each well using

⁷ Einarson, Fowler & Watson. Third Quarter 1998 Groundwater Monitoring Results, B&C Gas Mini Mart, Livermore, California, Appendix A. September 10, 1998.

a disposable PVC bailer. Field measurements of temperature, pH, dissolved oxygen, turbidity, and electrical conductivity were taken and recorded on water sample field data sheets (Appendix A). All purge water was contained in 55-gallon drums and stored on site pending proper disposal. Purge water with low hydrocarbon concentrations is pumped to the sanitary sewer under City of Livermore Groundwater Discharge Permit # 1514. All samples were properly stored on the day of sampling. Chain-of-custody documentation accompanied the samples through collection and delivery to the analytical laboratory.

Analytical Program

All groundwater analyses were performed by Sequoia Analytical of Petaluma, California, a state-certified laboratory. All groundwater samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) by U.S. Environmental Protection Agency (EPA) Method 8015M and benzene, toluene, ethylbenzene, and xylenes (BTEX) and Methyl tertiary-butyl ether (MTBE) by EPA Method 8020M. Laboratory analyses occurred within specified holding times and within laboratory quality control standards. The certified analytical report is located in Appendix A.

Analytical Results

Over the last five years of monitoring at the site, concentrations of benzene have steadily decreased in all site wells. Analysis of site groundwater samples for MTBE began in June 1995. Since then, concentrations of MTBE have decreased significantly. Table 3 presents a historical summary of groundwater analytical results from the B&C site. Third quarter 1999 analytical results for benzene and MTBE are also presented on Figure 3.

Site Well

Well MW-2 is the only site well sampled quarterly. Hydrocarbon concentrations in well MW-2 were similar to the previous two quarters. In well MW-2, TPH-G was detected at a concentration of 18,000 µg/l. Concentrations of BTEX compounds ranged from 351 to 2,140 µg/l. MTBE was detected at 225 µg/l.

Downgradient Wells

Well MW-5, located 75 feet downgradient of the site, was purged and sampled, with a hydrocarbon sheen observed during purging. Petroleum hydrocarbons were detected at concentrations similar to the previous sampling events.

(MS)MW-1, located approximately 800 feet downgradient from the B&C site, was not sampled during the third quarter event, due to the presence of blebs of free product during well purging. Because there was more than a hydrocarbon sheen present in the groundwater purged from well (MS)MW-1, the well was not sampled.

Well MW-7, located on the Mill Springs Park Apartments property approximately 550 feet downgradient from the site, had hydrocarbon concentrations roughly one-half to one

order of magnitude lower than the previous sampling event in July 1999. Concentrations of benzene and MTBE declined from 31.9 µg/l and 43.6 µg/l to 2.75 µg/l and 14 µg/l, respectively.

Well MW-8, located on Railroad Avenue at the Bank of America building, contained only MTBE. The MTBE concentration was similar to the previous sampling in June 1999.

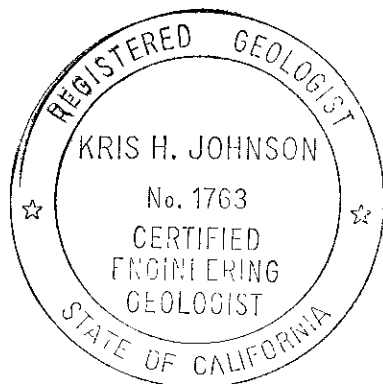
No TPH-G, BTEX, or MTBE were detected in downgradient wells MW-10, MW-11, MW-12, D-1, and D-2. Except for well MW-11, these results are consistent with the previous sampling event for these wells (June 1999). In June 1999, well MW-11 had low concentrations of TPH-G and BTEX, but no MTBE. These low concentrations of hydrocarbons were attributed to the Beacon Gasoline Station located at the intersection of P and First Streets (Conor Pacific/EFW, November 1999).

Well MW-13 had low concentrations of benzene and MTBE lower than the previous sampling event in July 1999.

SUMMARY

The third quarter 1999 groundwater monitoring results are consistent with previous monitoring results. Fourth quarter 1999 groundwater monitoring is currently scheduled for December 1999.

If you have any questions regarding this report, please call us at (650) 843-3828.



Sincerely,
Conor Pacific/EFW

Kris H. Johnson
Kris H. Johnson
Senior Engineering Geologist
C.E.G. 1763

Martha J. Watson
Martha J. Watson
Principal Environmental Engineer

Mr. Balaji Angle
November 18, 1999
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Appendices

Appendix A - Water Sample Field Data Sheets and Certified Analytical Reports

cc: Eva Chu, ACEHS
Mr. Matt Katen, Alameda Co. Flood Control and Water Cons. District Zone 7
Regional Water Quality Control Board, USTCF

Table 1
 Summary of Groundwater Elevations
 B & C Gas Mini Mart
 Livermore, California

Well No.	Top-of-Casing Elevation (feet, MSL)	Date Measured	Depth to Water (feet)	Groundwater Elevation (feet, MSL)	Depth to Free product (feet)	Product Thickness (feet)
MW-1	487.00	09/22/88	60.50	426.50		
		08/02/90	43.10	443.90		
		10/10/91	66.39	420.61		
		01/08/92	68.72	418.28		
		05/11/93	34.76	452.24		
		09/21/93	38.70	448.30		
		05/22/94	33.57	453.43		
	484.07	06/19/94	37.51	446.56		
		08/25/94	43.27	440.80		
		11/22/94	40.58	443.49		
		03/13/95	28.06	456.01		
		06/01/95	21.76	462.31		
		02/29/96	18.86	465.21		
		Feb-97	NM	NM		
		07/30/98	25.90	458.17		
		11/05/98	33.23	450.84		
		03/23/99	25.49	458.58		
06/08/99	27.78	456.29				
09/27/99	30.65	453.42				
MW-2	483.86	06/19/94	38.15	445.71		
		08/25/94	44.13	-	43.47	0.66
		11/22/94	40.96	-	40.92	0.04
		03/09/95	29.28	-	28.47	0.81
		03/13/95	28.71	-	28.29	0.42
		06/01/95	22.61	461.25		
		02/29/96	20.05	463.81		
		Feb-97	18.30	465.56		
		07/30/98	25.75	-	25.74	0.01
		11/05/98	33.31	450.55		
		03/23/99	25.51	458.35		
		06/08/99	27.54	456.32		
		09/27/99	30.73	453.13		
MW-3	484.24	06/19/94	37.15	447.09		
		08/25/94	42.31	441.93		
		11/22/94	40.07	444.17		
		03/13/95	27.94	456.30		
		06/01/95	21.31	462.93		
		02/29/96	18.78	465.46		
		Feb-97	16.97	467.27		
		07/30/98	24.88	459.36		
		11/05/98	32.09	452.15		
		03/23/99	24.49	459.75		
		06/08/99	26.77	457.47		
09/27/99	29.52	454.72				

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B & C Gas Mini Mart
Livermore, California

Well No.	Top-of-Casing Elevation (feet, MSL)	Date Measured	Depth to Water (feet)	Groundwater Elevation (feet, MSL)	Depth to Free product (feet)	Product Thickness (feet)
MW-4	485.04	06/19/94	37.49	447.55		
		08/25/94	42.25	442.79		
		11/22/94	40.59	444.45		
		03/13/95	28.00	457.04		
		06/01/95	21.51	463.53		
		02/29/96	18.42	466.62		
		Feb-97	17.47	467.57		
		07/30/98	25.47	459.57		
		11/05/98	32.67	452.37		
		03/23/99	25.09	459.95		
		06/08/99	27.43	457.61		
		09/27/99	30.16	454.88		
MW-5*	481.97	02/29/96	19.35	462.62		
		Feb-97	18.19	463.78		
		07/30/98	25.25	456.72	25.24	0.01
		11/05/98	32.70	449.27	32.48	0.22
		03/23/99	25.15	456.82		
		06/08/99	27.27	454.70		
		09/27/99	30.00	451.97		
MW-6	483.93	02/29/96	20.32	463.61		
		Feb-97	18.92	465.01		
		07/30/98	25.59	458.34	25.58	0.01
		11/05/98	NA	NA		
		03/23/99	25.43	458.50		
		06/08/99	27.43	456.50		
		09/27/99	NM >28.6	NM		
MW-7	478.14	7/12/1999	28.37	449.77		
		09/27/99	30.2	447.94		
MW-8	473.23	7/12/1999	34.29	438.94		
		09/27/99	37.11	436.12		
MW-9	477.08	7/12/1999	30.71	446.37		
		09/27/99	32.61	444.47		
MW-10	471.42	7/12/1999	34.60	436.82		
		09/27/99	37.62	433.80		
MW-11	464.93	7/12/1999	31.00	433.93		
		09/27/99	33.83	431.10		
MW-12	458.34	7/12/1999	25.50	432.84		
		09/27/99	28.28	430.06		
MW-13	474.79	7/12/1999	30.65	444.14		
		09/27/99	32.74	442.05		
D-1	464.70	7/12/1999	30.67	434.03		
		09/27/99	35.32	429.38		

Table 1
 Summary of Groundwater Elevations
 B & C Gas Mini Mart
 Livermore, California

Well No.	Top-of-Casing Elevation (feet, MSL)	Date Measured	Depth to Water (feet)	Groundwater Elevation (feet, MSL)	Depth to Free product (feet)	Product Thickness (feet)
D-2	457.61	7/12/1999	25.72	431.89		
		09/27/99	28.44	429.17		
(MS)MW-1	477.79	07/30/98	30.37	447.42	30.35	0.02
		11/05/98	38.01	439.78	(1)	
		03/23/99	29.44	448.35	(1)	
		06/08/99	31.70	446.09	(1)	
		09/27/99	34.38	443.41		

Notes: Data prior to 1998 from RSI quarterly reports. February 1997 date unknown.
 MSL = mean sea level
 NM - not measured; NS - not surveyed; NA - well not accessible, blocked at 28 4 feet
 MSP - Mill Springs Park
 (1) - free product visible in purge or sample water

Table 2
Monitoring Well Constructions
B&C Gas Mini Mart
Livermore, California

Well No.	Drilling Method	Date Installed	T.D. Boring (ft.-bgs)	T.D. Well (ft.-bgs)	Borehole Diameter (in.)	Casing Material (PVC)	Casing Diameter (in.)	Screen Size (in.)	Sand Pack Material	Screened Interval (ft.-bgs)	Sand Pack Interval (ft.-bgs)
MW-1	HSA	Sep-88	77	77	8	PVC	2	0.020	#3 sand	27 - 77	25 - 77
MW-2	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-3	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-4	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-5	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-6	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-7	HSA	Jun-99	62	49	8	PVC	2	0.020	#3 sand	29-49	27-51
MW-8	HSA	Jun-99	62	54	8	PVC	2	0.020	#3 sand	34-54	32-54
MW-9	HSA	Jun-99	45	45	8	PVC	2	0.020	#3 sand	25-45	23-45
MW-10	HSA	Jun-99	55	53.5	8	PVC	2	0.020	#3 sand	33.5-53.5	23-55
MW-11	HSA	Jun-99	50	49	8	PVC	2	0.020	#3 sand	29-49	27-49
MW-12	HSA	Jun-99	45	43.5	8	PVC	2	0.020	#3 sand	23.5-43.5	21-45
MW-13	HSA	Jul-99	55	55	8	PVC	2	0.020	#3 sand	35-55	32-55
D-1	HSA	Jun-99	125	125	8	PVC	2	0.020	#3 sand	110-125	104-125
D-2	HSA	Jun-99	115	114	8	PVC	2	0.020	#3 sand	99-114	94-114
(MS)MW-1	HAS	Apr-89	62	60	NA	PVC	2	NS	NS	NS	NA

HSA Hollow-Stem Auger

NA = not available

T.D. Total Depth

ft.-bgs feet below ground surface

Well construction information for wells MW-2 through MW-6 collected from Remediation Service Int'l boring logs.

Table 3
 Historical Groundwater Analytical Results
 B&C Gas Mini Mart
 Livermore, California

Well No.	Sample Date	TPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	MTBE (ug/l)
MW-1	Aug-90	24,000	1,300	1,300	400	2,700	NA
	Oct-91	2,000	430	170	100	290	NA
	Jan-92	1,000	200	120	30	150	NA
	May-93	960	66	8	41	90	NA
	Sep-93	1,900	311	118	34	112	NA
	May-94	10,000	690	1,100	340	1,200	NA
	Aug-94	13,000	290	690	120	670	NA
	Nov-94	19,000	400	770	230	130	NA
	Mar-95	6,000	900	100	980	740	NA
	Jun-95	2,400	210	380	53	280	13,000
	Sep-95	7,800	69	1,300	220	1,200	2,000
	Feb-96	120	4.2	1.4	4.7	5.6	14
	Feb-97	NS*	NS*	NS*	NS*	NS*	NS*
	Jul-98	1,400	26	110	57	243	5
	Nov-98	6,000	230	330	240	1,060	<100
Mar-99	6,600	280	420	240	990	60	
Jun-99	1,630	70.4	51.7	54.6	138	66.8	
MW-2	Jun-94	290,000	18,000	36,000	4,600	26,000	NA
	Aug-94	NS**	NS**	NS**	NS**	NS**	NA
	Nov-94	NS**	NS**	NS**	NS**	NS**	NA
	Mar-95	NS**	NS**	NS**	NS**	NS**	NA
	Jun-95	25,000	2,300	3,400	720	3,100	16,000
	Sep-95	NS**	NS**	NS**	NS**	NS**	NS**
	Feb-96	57,000	2,500	650	3,700	3,100	6,500
	Feb-97	20,000	860	1,500	480	1,000	1,300
	Jul-98	NS**	NS**	NS**	NS**	NS**	NS**
	Nov-98	40,000	2,400	2,500	2,100	7,200	1,200
	Mar-99	22,000	780	880	780	1,730	300
Jun-99	11,200	352	454	540	639	343	
Sep-99	18,000	992	331	901	2,140	225	
MW-3	Jun-94	11,000	640	580	270	790	NA
	Aug-94	41,000	1,600	2,300	330	1,800	NA
	Nov-94	18,000	8,000	10,000	900	5,000	NA
	Mar-95	44,000	1,600	1,300	5,000	6,600	NA
	Jun-95	15,000	600	1,900	490	2,600	4,200
	Sep-95	8,000	710	1,100	180	870	2,700
	Feb-96	13,000	260	200	200	1,100	1,500
	Feb-97	11,000	260	550	170	600	900
	Jul-98	25,000	330	1,200	490	1,860	300
	Nov-98	26,000	400	2,100	820	3,600	300
	Mar-99	6,900	100	160	110	265	220
Jun-99	1,210	5	9	7	4	53	

Table 3
 Historical Groundwater Analytical Results
 B&C Gas Mini Mart
 Livermore, California

Well No.	Sample Date	TPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	MTBE (ug/l)
MW-4	Jun-94	810	12	25	<0.5	22	NA
	Aug-94	850	37	51	9.5	35	NA
	Nov-94	1,700	110	110	5.8	58	NA
	Mar-95	1,300	180	8	52	77	NA
	Jun-95	ND	3	1	ND	1	ND
	Sep-95	<50	0.69	<0.5	<0.5	<0.5	<2.5
	Feb-96	87	<0.5	<0.5	<0.5	<0.5	<0.5
	Feb-97	<50	<0.5	<0.5	<0.5	<0.5	2.9
	Jul-98	<50	<0.4	0.60	<0.3	0.80	<5
	Nov-98	<50	0.7	<0.3	<0.3	<0.8	27
	Mar-99	<50	<0.4	<0.3	<0.3	<0.8	<5
	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
MW-5	Oct-95	120,000	16,000	26,000	3,100	15,000	39,000
	Feb-96	47,000	3,400	4,200	860	4,100	20,000
	Feb-97	28,000	1,300	1,500	480	1,000	2,200
	Jul-98	47,000	1,400	4,000	2,000	8,500	600
	Nov-98	NS**	NS**	NS**	NS**	NS**	NS**
	Mar-99	36,000	1,500	2,400	1,500	5,500	900
	Jun-99	34,500	722	1,980	1,720	7,170	765
	Sep-99	49,100	540	2,500	1,730	8,040	255
MW-6	Oct-95	110,000	9,900	22,000	3,200	17,000	47,000
	Feb-96	23,000	2,000	460	2,900	2,600	6,300
	Feb-97	12,000	450	780	200	590	790
	Jul-98	NS**	NS**	NS**	NS**	NS**	NS**
	Nov-98	NS*	NS*	NS*	NS*	NS*	NS*
	Mar-99	5,700	240	260	120	440	150
	Jun-99	7,610	259	334	283	567	275
MW-7	Jul-99	5,090	31.9	4.8	60	219	43.6
	Sep-99	2,160	2.75	8.16	5.91	27.3	14.0
MW-8	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	88.5
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	52.0
MW-9	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
MW-10	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	<2.5
MW-11	Jun-99	91.3	0.683	2.02	1.07	2.62	<2
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	<2.5
MW-12	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	<2.5
MW-13	Jul-99	214	42.8	<0.5	4.48	<0.5	332
	Sep-99	<100	5.8	<1	<1	<1	160

Table 3
 Historical Groundwater Analytical Results
 B&C Gas Mini Mart
 Livermore, California

Well No.	Sample Date	TPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	MTBE (ug/l)
D-1	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	<2.5
D-2	Jun-99	<50	<0.5	<0.5	<0.5	<0.5	<2
	Sep-99	<50	<0.5	<0.5	<0.5	<0.5	<2.5
(MS)MW-1	Aug-95	11,000	190	260	110	900	210
	Jul-98	NS**	NS**	NS**	NS**	NS**	NS**
	Nov-98	10,000	260	120	500	1,100	200
	Mar-99	NS**	NS**	NS**	NS**	NS**	NS**
	Jun-99	NS**	NS**	NS**	NS**	NS**	NS**

ug/l = micrograms per liter

TPH-G = total petroleum hydrocarbons as gasoline

MTBE = methyl tertiary-butyl ether

MSP = Mill Springs Park

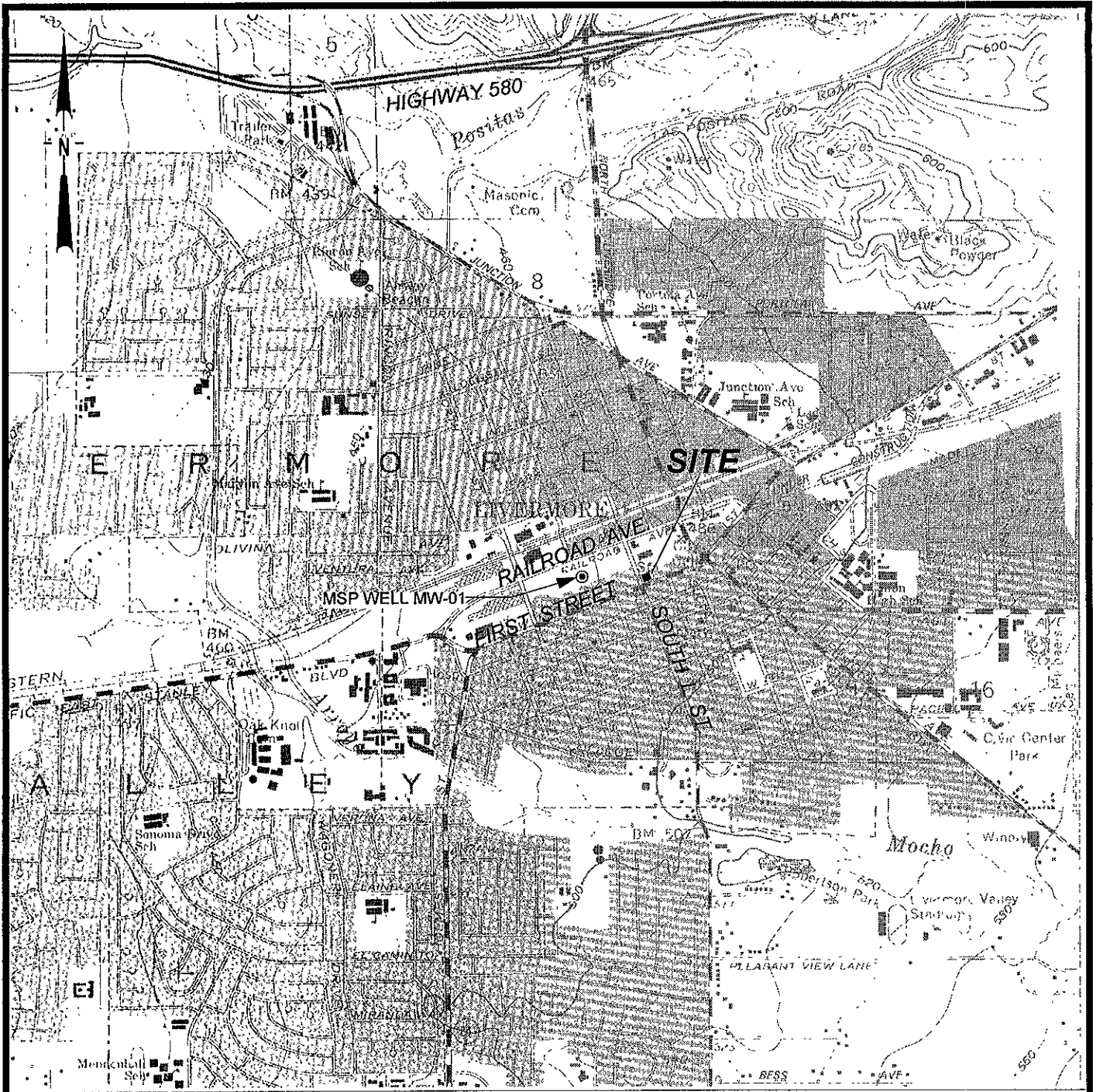
NA= not analyzed

NS= not sampled

* = well inaccessible ** = floating hydrocarbon present

ND = not detected above reporting limit, limit not available

< = less than method reporting limit



Base map: USGS 7.5' topography, Livermore, California (1961, photorevised 1980)

SCALE: 0 2,000 4,000 FEET



VBNC/103/FIGURES/SITELoc.DSF 4/22/99

Conor Pacific



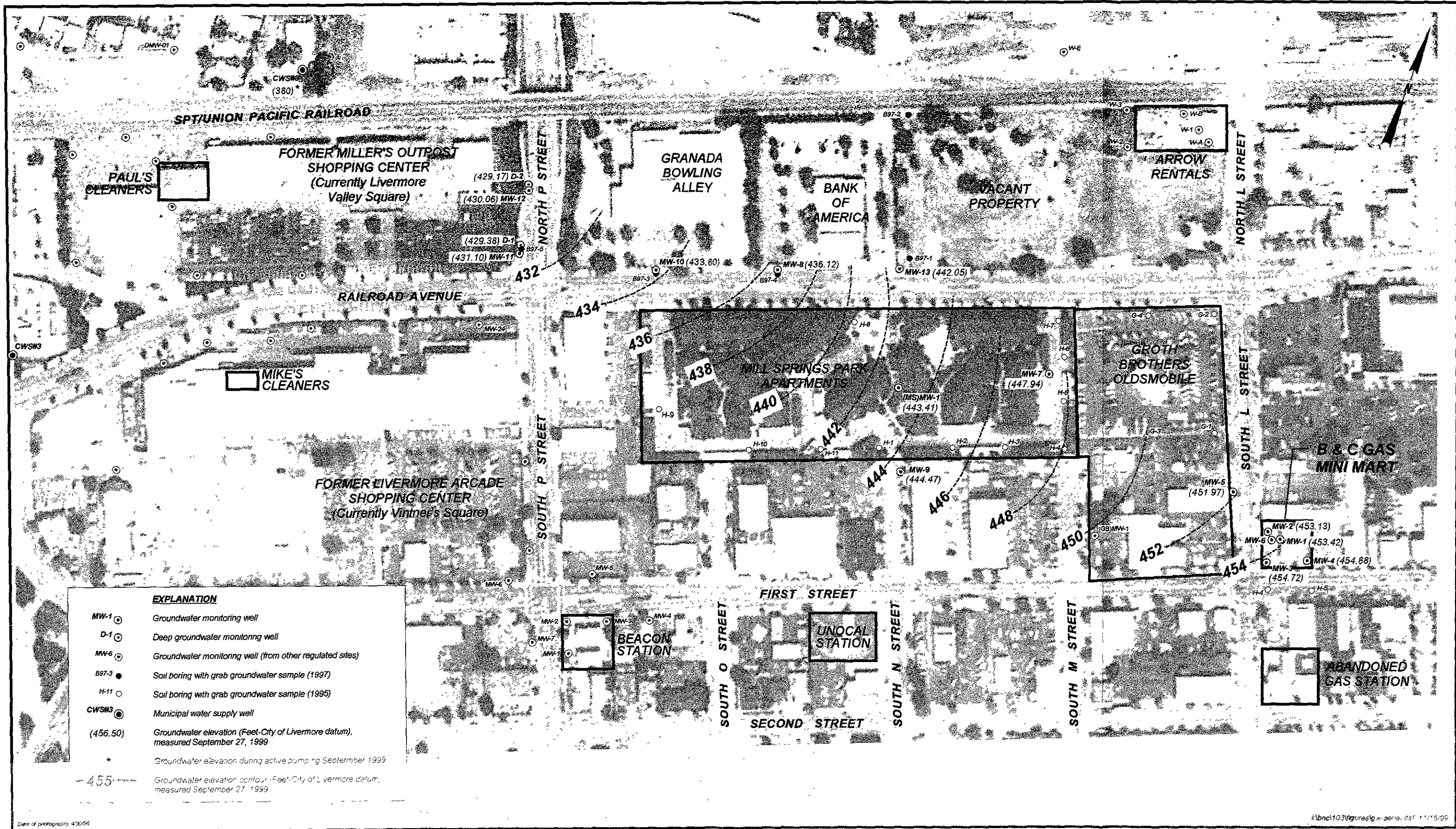
GROUNDWATER MONITORING
B & C GAS MINI MART
LIVERMORE, CALIFORNIA

SITE LOCATION MAP

FIGURE

1

PROJECT NO.
BNC103



EXPLANATION	
MW-1	Groundwater monitoring well
D-1	Deep groundwater monitoring well
MW-6	Groundwater monitoring well (from other regulated sites)
B97-3	Soil boring with grab groundwater sample (1997)
H-11	Soil boring with grab groundwater sample (1995)
CWS#3	Municipal water supply well
(456.50)	Groundwater elevation (Feet-City of Livermore datum), measured September 27, 1999
*	Groundwater elevation during active pumping September 1999
455	Groundwater elevation contour (Feet-City of Livermore datum), measured September 27, 1999

Date of photography 4/30/99

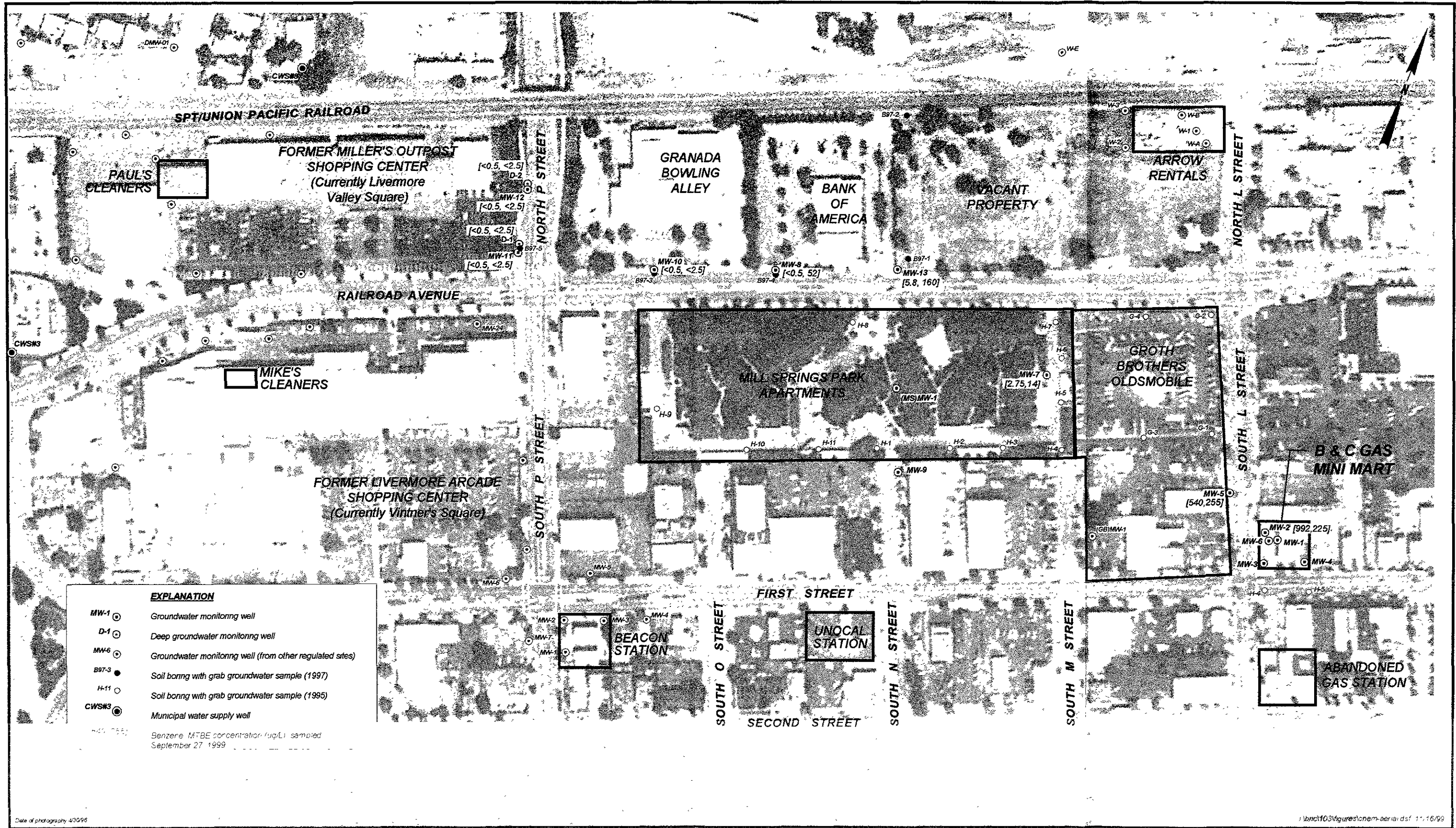
l:\bnc103\figures\g w-aerial.dsf 11/16/99



GROUNDWATER MONITORING
 B & C GAS MINI MART
 LIVERMORE, CALIFORNIA

WELL LOCATIONS AND GROUNDWATER CONTOURS (SEPTEMBER 1999)

FIGURE
2
 PROJECT NO
 BNC103



EXPLANATION

- MW-1 ○ Groundwater monitoring well
- D-1 ○ Deep groundwater monitoring well
- MW-6 ○ Groundwater monitoring well (from other regulated sites)
- B97-3 ● Soil boring with grab groundwater sample (1997)
- H-11 ○ Soil boring with grab groundwater sample (1995)
- CWS#3 ● Municipal water supply well

Benzene MTBE concentration (ug/L) sampled
 September 27, 1999



GROUNDWATER MONITORING
 B & C GAS MINI MART
 LIVERMORE, CALIFORNIA

GROUNDWATER CHEMISTRY (SEPTEMBER 1999)

FIGURE
3
 PROJECT NO
 BNC103

WATER LEVEL DATA SHEET

Conor Pacific/EFW

Project: B&C Gas Mini Mart
 Project No.: BNC103
 Date(s): 9/27/99
 Name: R. PAUL
 Weather: Sunny, hot Sounder #: KECK

Well	Date	DIPP (TOC)	DTW (TOC)	Total Depth	Meas By	Comments
MW-1	9/27/99	N/D	30.65	75.5	PM	
MW-2			30.73	56.0		
MW-3			29.52	57.3		9 1/2"
MW-4			30.16	59.9		
MW-5			30.00	39.7		15 1/2" - Cages suspended at cap
MW-6			NM			Obstructed at 20.0'
MW-7			30.20	49.3		9 1/2"
MW-8			37.11	53.5		
MW-9			32.01	44.0		
MW-10			37.02	54.1		
MW-11			33.83	49.2		
MW-12			28.28	43.4		
MW-13			32.74	54.4		
D-1			35.32	124.2		
D-2			28.44	112.0		
MS MW01			34.38	59.5		
						All locks 09/09



Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342

October 8, 1999

Kris Johnson
Conor Pacific / EFW
2650 East Bayshore Rd.
Palo Alto, CA 94303

RE: B&C Gas Mini Mart/P910039

Dear Kris Johnson

Enclosed are the results of analyses for sample(s) received by the laboratory on September 29, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis
Project Manager

CA ELAP Certificate Number I-2374





Conor Pacific / BFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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ANALYTICAL REPORT FOR P910039

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-2	P910039-01	Water	9/28/99
MW-5	P910039-02	Water	9/28/99
MW-7	P910039-03	Water	9/28/99
MW-8	P910039-04	Water	9/28/99
MW-10	P910039-05	Water	9/28/99
MW-11	P910039-06	Water	9/28/99
MW-12	P910039-07	Water	9/28/99
MW-13	P910039-08	Water	9/28/99
D-1	P910039-09	Water	9/28/99
D-2	P910039-10	Water	9/28/99





Conor Pacific, EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
				<u>P910039-01</u>				
<u>MW-2</u>							<u>Water</u>	
Gasoline	9100033	10/4/99	10/4/99		1000	18000	ug/l	
Benzene	"	"	"		10.0	992	"	
Toluene	"	"	"		10.0	331	"	
Ethylbenzene	"	"	"		10.0	901	"	
Xylenes (total)	"	"	"		10.0	2140	"	
Methyl tert-butyl ether	"	"	"		50.0	225	"	1
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		105	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		96.7	"	
				<u>P910039-02</u>				
<u>MW-5</u>							<u>Water</u>	
Gasoline	9100033	10/4/99	10/4/99		5000	49100	ug/l	
Benzene	"	"	"		50.0	540	"	
Toluene	"	"	"		50.0	2500	"	
Ethylbenzene	"	"	"		50.0	1730	"	
Xylenes (total)	"	"	"		50.0	8040	"	
Methyl tert-butyl ether	"	"	"		250	255	"	1
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		101	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		94.0	"	
				<u>P910039-03</u>				
<u>MW-7</u>							<u>Water</u>	
Gasoline	9100033	10/4/99	10/4/99		250	2160	ug/l	
Benzene	"	"	"		2.50	2.75	"	
Toluene	"	"	"		2.50	8.16	"	1
Ethylbenzene	"	"	"		2.50	5.91	"	
Xylenes (total)	"	"	"		2.50	27.3	"	
Methyl tert-butyl ether	"	"	"		12.5	14.0	"	1
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		99.3	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		93.7	"	
				<u>P910039-04</u>				
<u>MW-8</u>							<u>Water</u>	
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	52.0	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		96.0	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.7	"	
				<u>P910039-05</u>				
<u>MW-10</u>							<u>Water</u>	
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
 Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-10 (continued)			P910039-05			Water		
Benzene	9100033	10/4/99	10/4/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		99.0	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.7	"	
MW-11			P910039-06			Water		
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		99.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		93.0	"	
MW-12			P910039-07			Water		
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		98.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.0	"	
MW-13			P910039-08			Water		
Gasoline	9100033	10/4/99	10/4/99		100	ND	ug/l	
Benzene	"	"	"		1.00	5.78	"	
Toluene	"	"	"		1.00	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Methyl tert-butyl ether	"	"	"		5.00	160	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	65.0-135		97.7	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.0	"	
D-1			P910039-09			Water		
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M
Sequoia Analytical - Petaluma**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
D-1 (continued)			P910039-09				Water	
Toluene	9100033	10/4/99	10/4/99		0.500	ND	ug/l	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene	"	"	"	65.0-135		97.0	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.0	"	
D-2			P910039-10				Water	
Gasoline	9100033	10/4/99	10/4/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene	"	"	"	65.0-135		97.3	%	
Surrogate: 4-Bromofluorobenzene	"	"	"	65.0-135		91.7	"	





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M/Quality Control
 Sequoia Analytical - Petaluma**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 9100033			Date Prepared: 10/4/99			Extraction Method: EPA 5030 waters				
Blank			9100033-BLK1							
Gasoline	10/4/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	0.500				
Methyl tert-butyl ether	"			ND	"	2.50				
Surrogate: a,a,a-Trifluorotoluene	"	300		295	"	65.0-135	98.3			
Surrogate: 4-Bromofluorobenzene	"	300		288	"	65.0-135	96.0			
LCS			9100033-BS1							
Benzene	10/4/99	100		89.3	ug/l	65.0-135	89.3			
Toluene	"	100		91.0	"	65.0-135	91.0			
Ethylbenzene	"	100		88.3	"	65.0-135	88.3			
Xylenes (total)	"	300		282	"	65.0-135	94.0			
Surrogate: a,a,a-Trifluorotoluene	"	300		292	"	65.0-135	97.3			
Matrix Spike			9100033-MS1		P910027-01					
Benzene	10/4/99	100	ND	93.6	ug/l	65.0-135	93.6			
Toluene	"	100	ND	93.1	"	65.0-135	93.1			
Ethylbenzene	"	100	ND	88.9	"	65.0-135	88.9			
Xylenes (total)	"	300	ND	285	"	65.0-135	95.0			
Surrogate: a,a,a-Trifluorotoluene	"	300		298	"	65.0-135	99.3			
Matrix Spike Dup			9100033-MSD1		P910027-01					
Benzene	10/4/99	100	ND	95.0	ug/l	65.0-135	95.0	20.0	1.48	
Toluene	"	100	ND	94.6	"	65.0-135	94.6	20.0	1.60	
Ethylbenzene	"	100	ND	90.4	"	65.0-135	90.4	20.0	1.67	
Xylenes (total)	"	300	ND	288	"	65.0-135	96.0	20.0	1.05	
Surrogate: a,a,a-Trifluorotoluene	"	300		294	"	65.0-135	98.0			





Conor Pacific / EFW 2650 East Bayshore Rd. Palo Alto, CA 94303	Project: B&C Gas Mini Mart Project Number: BNC103, Task Project Manager: Kris Johnson	Sampled: 9/28/99 Received: 9/29/99 Reported: 10/8/99
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Notes and Definitions

#	Note
1	Results between the primary and confirmation columns varied by greater than 40% RPD.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference



PA10001

CONTRACT LABORATORY: *Sequoia-Petaluma*

TURN-AROUND TIME: *Standard*

Project No. <i>BNC103, task</i>		Site Name <i>B 9 C Gas Minimart</i>				Analyses													
Sampler(s): (printed) <i>R. P. Lane</i>		(signature) <i>M. Mamm</i>				<div style="border: 1px solid black; padding: 5px; transform: rotate(-90deg); display: inline-block;"> <i>TPH, GAS, BTEX, METALS</i> </div> <i>Please provide Chromatograms with results</i>													
Sample I.D.	Lab I.D.	Collection Date Time		Matrix	Depth					Container Information Type/Volume Qty Filt Prsv			Remarks						
<i>mw-2</i>	<i>PA10001</i>	<i>9/24/99</i>	<i>1750</i>	<i>water</i>	<i>✓</i>	<i>3</i>	<i>N</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>mw-5</i>	<i>2</i>		<i>11037</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>mw-7</i>	<i>3</i>		<i>11009</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>mw-8</i>	<i>4</i>		<i>1059</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>MW-10</i>	<i>5</i>		<i>1144</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>MW-11</i>	<i>6</i>		<i>1437</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>MW-12</i>	<i>7</i>		<i>1229</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>MW-13</i>	<i>8</i>		<i>1020</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>D-1</i>	<i>9</i>		<i>1409</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>D-2</i>	<i>10</i>		<i>1310</i>			<i>3</i>		<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>msmw01</i>			<i>no sample</i>			<i>✓</i>		<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>

COOLER CUSTODY SEALS INTACT NOT INTACT
 COOLER TEMPERATURE 6 °C

Relinquished by: (signature) <i>M. Mamm</i>	Received by: (signature) <i>K. Coe</i>	Date/Time: <i>9/24/99 1310</i>
Relinquished by: (signature) <i>Noelle Lane</i>	Received by: (signature) <i>[Signature]</i>	Date/Time: <i>10-1 1230</i>
Relinquished by: (signature) <i>[Signature]</i>	Received by: (signature) <i>[Signature]</i>	Date/Time: <i>10-1 1345</i>

Send Results To:
 Attn: *Kris Johnson*
 EINARSON, FOWLER & WATSON
 2650 East Bayshore Road
 Palo Alto, CA 94303
 Phone (650) 843-3828
 Fax (650) 843-3815