REPORT OF QUARTERLY ACTIVITIES

FOR

VORELCO PROPERTY NO. 4286
BROADWAY VOLKSWAGEN
2740 BROADWAY
OAKLAND, CALIFORNIA

Prepared For:

Alameda County Department of Environmental Health
Hazardous Materials Program
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Oakland, California 94621

and

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Prepared By:

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Project No. 6-91-5165
December 3, 1992

ESE
A CILCORP Company

This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of Vorelco, Inc. as it pertains to their site located at 2740 Broadway, Oakland, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made as to the professional advice in this report.

REPORT PREPARED BY:

Bart S. Miller
Senior Staff Geologist

DECEMBER 7, 1992
Date

UNDER THE PROFESSIONAL REVIEW AND SUPERVISION OF:

Susan S. Wickham
Senior Geologist
California Registered Geologist No. 3851

Dec 4, 1992
Date

Project No. 6-91-5165

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1.0 INTRODUCTION

1.1 Objective

On October 27, 1992 Environmental Science & Engineering, Inc. (ESE) monitored and sampled ground water at five monitoring wells located at Vorelco Property No. 4286 (Broadway Volkswagen), 2740 Broadway Avenue, Alameda County, Oakland, California (Figure 1 - Vicinity Map). The purpose of this fieldwork was to monitor and define the extent of petroleum hydrocarbons and volatile organic compounds (VOC's) in ground water at the site. This report documents procedures used during and the findings of the recent ground water monitoring activities and provides recommendations for future work.

1.2 Environmental Background

During August, 1988 four underground storage tanks (UST), referred to as UST's A, B, C, and D, were removed by SEMCO, Inc. of Modesto, California from three areas at Vorelco Property No. 4286 (Broadway Volkswagen), 2740 Broadway Avenue, Alameda County, Oakland, California (Figure 2 - Site Plan). The Vorelco property is located at a commercially zoned area and is surrounded by numerous automobile maintenance facilities.

UST's C and D (one 500-gallon waste oil tank and one 3,000-gallon gasoline tank, respectively) were formerly located adjacent to each other at the northeast side of the property along 28th Avenue. Soil samples collected from the excavation during removal of the UST's were noted to contain detectable concentrations of Total Petroleum Hydrocarbons as Gasoline (TPH-G) and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX). Two soil borings, SB-3 and SB-4, were drilled under the supervision of ESE during May, 1991 at the UST C and D area. Three soil samples collected from boring SB-3 (5, 10, and 15-foot depth) were observed to contain detectable TPH-G and BTEX. Boring SB-4 intersected gravel fill in the former UST excavation and one soil sample collected at the base of the fill (15-feet below ground surface) was noted to contain detectable TPH-G and BTEX.

To date, ESE has installed five ground water monitoring wells around the former UST C and D area. Detectable concentrations of TPH-G, BTEX, and VOC's have been found in ground water samples collected from those wells since May 13, 1991 (ESE Report of Quarterly Activities for Vorelco Property No. 4286, July 1991; ESE Report of Quarterly Activities for Vorelco Property No. 4286, November 1991). Background research by ESE indicates that several sites surrounding the Vorelco property do handle petroleum hydrocarbons and solvents containing VOC's and that numerous unauthorized releases from other properties have been reported to the Alameda County Health Care Services Agency (ACHCSA).

2.0 SAMPLING METHODOLOGY

During this ground water monitoring event ESE performed all activities consistent with guidelines established by the ACHCSA and the San Francisco Bay, Regional Water Quality Control Board (SFBRWQCB). ESE first gauged the depth to water in five monitoring wells (MW-1, MW-3, MW-4, MW-5, and MW-6) at the Vorelco property and then collected ground water samples from each (Figure 2 - Site Plan). Depth to water measurements were taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well casing. Depth to water measurements were recorded within an accuracy of 0.01-foot. The electric tape was washed with an Alconox® detergent and tap water solution and then rinsed with tap water between uses at the different wells.

Ground water samples were collected from the wells subsequent to purging a minimum of three to four well casing volumes of ground water from each. If a well bailed dry prior to the removal of the required minimum volume, the samples were collected upon the recovery of ground water in that well to 80% of its initial static level. Ground water was purged from the wells using a variable-flow submersible pump constructed of stainless steel and Teflon®. The submersible pump was cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. All observations of water clarity, sediment content, purge volume measurements, and pumping rates were documented by an ESE geologist on an ESE Ground-Water Sampling Data Form.

Ground water samples were collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer was retrieved, emptied, then filled again. The ground water from the bailer was decanted into appropriate laboratory supplied glassware and each was filled carefully so that no headspace was present to avoid volatilization of the sample. The filled sample containers were then

labeled and placed in a cooler with ice for transport under Chain of Custody documentation to Sequoia Analytical of Concord, California (a California State-Certified Laboratory). Each sample was analyzed for TPH-G, BTEX, and Halogenated Volatile Organic Compounds (HVOC's) by EPA Methods 8015, 8020, and 8010, respectively. For Quality Assurance/Quality Control (QA/QC) purposes, ESE transported a trip (travel) blank sample to the site and from the site with the collected ground water samples to the laboratory. The trip blank was supplied by the laboratory and was analyzed using EPA Methods 8015 and 8020. Trip blanks consist of deionized water and act as a check on ESE sample handling and transport procedures.

All purged ground water and equipment rinseates are temporarily being stored on site in four Department of Transportation (DOT) rated 55-gallon steel drums.

3.0 RESULTS OF INVESTIGATION

3.1 Site Hydrology

The site is situated at an alluviated highland portion of Oakland and is topographically characterized by a gentle southeasterly slope toward Lake Merritt (Figure 1 - Vicinity Map). Depth to ground water was observed to range between 9 to 12 feet bgs in ground water monitoring wells MW-1, MW-3, MW-4, MW-5, and MW-6 on October 27, 1992 (Appendix A - Well Sampling Field Logs). Measured ground water elevations, corrected to an arbitrary datum, are presented in Table 1 - Relative Ground Water Elevations.

TABLE 1. RELATIVE GROUND WATER ELEVATIONS

Well Number	Relative Well El. (feet)	Relative Ground Water Elevation (feet)					
		1/21/89	2/06/89	3/13/89	5/13/91	10/18/91	10/27/92
MW-1	29.22	21.72	20.22	20.72	16.62	19.11	19.59
MW-3	30.00	18.30	19.00	19.30	19.44	19.79	19.19
MW-4	29.70	NA	NA	NA	18.50	20.15	20.49
MW-5	30.50	NA	NA	NA	NA	19.23	19.26
MW-6	29.19	NA	NA	NA	NA	18.98	19.41

NOTE : El. = Elevation.
NA = Not Applicable (wells constructed after date indicated).
- *All elevations relative to mean sea level.*
- *Reference survey point is notched at top of each well riser.*

Below Surface
9.63'
10.81'
9.21'
10.24'
9.78'

Ground water flow direction at the site is noted to deviate locally from the regional southeasterly ground water flow direction (Figure 3 - Relative Ground Water Elevations). Similar localized ground water flow direction was also observed by ESE during the October 1991 monitoring event. The local ground water flow appears to be complicated by both a semi-perched, water-saturated sand unit in the clay sediments beneath the Vorelco site and an upward hydraulic gradient in the deeper water-saturated sandy clay. A rising ground water head of approximately 12-14 feet was measured by ESE during installation and development of monitoring wells MW-4, MW-5, and MW-6 at the site.

3.2 Analytical Results for Ground Water Samples

Detectable concentrations of TPH-G were noted in ground water samples collected from monitoring wells MW-3, MW-4, MW-5, and MW-6 (Table 2- Ground Water TPH-G Analytical Results). A ground water sample collected from well MW-3 contained the highest concentration of TPH-G of any monitored. MW-3 has always contained the highest TPH-G concentrations in ground water (Figure 4 - Iso-Concentration Map of TPH-G in Ground Water).

TABLE 2. GROUND WATER TPH-G ANALYTICAL RESULTS

Well Number	Total Petroleum Hydrocarbons as Gasoline (TPH-G) Concentration			
	1/21/89	4 /13/91	10/18/91	10/27/92
MW-1	ND	130	ND	ND
MW-3	32,000	81,000	73,000	37,000
MW-4	NA	13,000	ND	180
MW-5	NA	NA	16,000	87
MW-6	NA	NA	28,000	1,300

NOTE : NA = Not Applicable (wells constructed after date indicated).
ND = Not Detected Using Analytical Method EPA 8015.
• all results reported in micrograms per Liter (µg/L).

Detectable concentrations of BTEX compounds, known to be associated with gasoline, were identified in ground water samples collected from monitoring wells MW-3, MW-4, and MW-6 (Table 3 - Ground Water BTEX Analytical Results). Ground water samples collected from well MW-3 during this monitoring event and past monitoring events have been noted to contain the highest BTEX concentrations.

Detectable concentrations of HVOC's: trichloroethylene (TCE); and 1,2 dichloroethane (DCA), were observed in ground water samples collected during this quarter from monitoring wells MW-1, MW-3, MW-4, MW-5, and MW-6 (Table 4 - Ground Water TCE and DCA Analytical Results). A significantly high concentration of TCE was noted to occur in a ground water sample collected at monitoring well MW-6 located offsite to the north

(Figure 5 - Iso-Concentration Map of TCE in Ground Water). During this quarter the only detectable concentration of DCA was reported to occur in a ground water sample collected from MW-3.

TABLE 3. GROUND WATER BTEX ANALYTICAL RESULTS

Well No.	Compound	Concentrations			
		1/21/89	5/13/91	10/18/91	10/27/92
MW-1	B	53	ND	ND	ND
	T	13	ND	ND	ND
	E	1.4	ND	ND	ND
	X	8.2	1.1	ND	ND
MW-3	B	9,600	7,800	9,400	7,100
	T	8,200	12,000	8,600	4,900
	E	1,800	1,200	750	970
	X	6,200	4,000	3,300	3,500
MW-4	B	NA	160	11.0	6.4
	T	NA	690	11.0	2.8
	E	NA	250	ND	1.2
	X	NA	1,100	15.0	6.2
MW-5	B	NA	NA	3,500	ND
	T	NA	NA	530	ND
	E	NA	NA	670	ND
	X	NA	NA	1,100	ND
MW-6	B	NA	NA	640	48
	T	NA	NA	2,700	130
	E	NA	NA	1,100	55
	X	NA	NA	4,500	230

NOTE : NA = Not Applicable (wells constructed after date indicated).
ND = Not Detected Using Analytical Methods EPA 8010, 8020 or 8240.
B = Benzene, T = Toluene, E = Ethylbenzene, X = Xylenes.
- *all results reported in micrograms per Liter (µg/L).*

TABLE 4. GROUND WATER TCE AND DCA ANALYTICAL RESULTS				
Well Number	Compound	Concentration		
		5/13/91	10/18/91	10/27/92
MW-1	TCE	58	120	11
	DCA	ND	ND	ND
MW-3	TCE	14	14	ND
	DCA	380	8.3	170
MW-4	TCE	490	450	520
	DCA	ND	3.9	ND
MW-5	TCE	NA	120	410
	DCA	NA	32	ND
MW-6	TCE	NA	230	2,000
	DCA	NA	60	ND

NOTE : *TCE = Trichloroethylene.*
DCA = 1,2 Dichloroethane.
ND = Not Detected Using Analytical Methods EPA 8010 or 8240.
NA = Not Applicable (wells constructed after date indicated).
- *all results reported in micrograms per Liter (μg/L).*

4.0 DISCUSSION AND CONCLUSIONS

The localized, semi-perched, water-bearing sand unit was identified by ESE in soil borings surrounding the former UST C and D area at a depth ranging between 11 to 17 feet below ground surface (ESE Report of Quarterly Activities, November 1991). It is probable that the bottom of the former UST C and D excavation was located at approximately the same depth as the sand unit. Soil boring observations indicate that the sand unit is approximately two feet in thickness, dips toward the west, and occurs locally as an interbed bounded both above and below by a dry, "tight" clay unit. A deeper, water-saturated, semi-confined, sandy clay unit was identified by ESE at a depth of 22 to 23 feet below ground surface when installing monitoring wells MW-4, MW-5, and MW-6. ESE suspects that the sand unit may come into contact with the deeper, water-saturated sandy clay at an offsite location and ground water from both units can freely intermix. Further, ground water flow is presumed to be affected beneath the site by the presence of the semi-perched sand unit, in combination with, the upward hydraulic gradient observed in the deeper, water-bearing, sandy clay unit.

During the installation of monitoring wells MW-5 and MW-6 in October, 1991 ESE noted a faint fuel odor in the sand unit but, however, did not notice a fuel odor in samples of clay collected inches above and below the sand unit or in soil samples collected immediately above the deeper water-saturated clay.

Selective screening of ground water monitoring wells at the site has allowed ESE to sample ground water infiltrating from the sand unit alone and ground water infiltrating from a combination of the sand unit and the deeper sandy clay unit (Table 5 - TPH-G and TCE Concentration in Ground Water Samples Collected From Wells Intersecting Different Water-Bearing Zones).

TABLE 5. TPH-G AND TCE CONCENTRATION IN GROUND WATER COLLECTED FROM WELLS INTERSECTING DIFFERENT WATER-BEARING ZONES				
Well No.	Well Screen Interval (feet)	Water Saturated Zone	TPH-G and TCE Concentration in Ground Water Samples (10/27/92)	
			TPH-G	TCE
MW-1	5-20	CL	ND	11
MW-3	5-20	SP	37,000	ND
MW-4	5-25	SP & CL	180	520
MW-5	9-30	SP & CL	87	410
MW-6	6.5-26.5	SP & CL	1,300	2,000

NOTE : SP = Semi-Perched Poorly Sorted Sand Lens.
CL = Confined Sandy Clay.
NA = Not Applicable (wells constructed after date indicated).
ND = Not Detected Using EPA Method 8010 or 8240.
• *all results reported in micrograms per Liter (µg/L).*

ESE suspects that petroleum hydrocarbon migration may be facilitated by the sand layer. The highest concentrations of TPH-G and BTEX compounds occur in ground water collected from monitoring well MW-3 located approximately 50 feet west of the former UST location and selectively screened over the sand unit (Figure 4). Historically, the concentration of gasoline constituents has always been highest at well MW-3 (Table 2 and Table 3). Ground water samples collected by ESE from well MW-3 during past and present monitoring events also contained detectable concentrations of DCA, a common additive to gasoline.

Monitoring well MW-1, located to the east of the former UST C and D location, is also selectively screened over the semi-perched sand unit but ground water samples have not contained detectable concentrations of TPH-G and BTEX. Because of the observed westerly dip of the sand unit, ESE suspects that MW-1 is screened over that portion of the sand unit which is above water saturation and that slow ground water recharge is occurring through seepage from the surrounding clay sediments.

Detectable concentrations of TPH-G in ground water samples collected from monitoring wells MW-4, MW-5, and MW-6 are observed to be much less than that observed in ground water from well MW-3. Because the gasoline plume has not been defined to the west, ESE suspects that the plume may be potentially derived from an offsite source with a possible contribution from the Vorelco property.

Detectable concentrations of TCE were noted in ground water samples collected from MW-1, MW-4, MW-5, and MW-6. A significantly high concentration of 2,000 µg/L was detected in ground water collected from the off-site well, MW-6. Contours of TCE concentration in ground water samples shows a concentration gradient opposite in direction than that of TPH-G (Figure 5 - Iso-Concentration Map of TCE in Ground Water). Data collected by ESE to date indicates that the TCE concentrations are highest in wells which penetrate the semi-confined, water-bearing, sandy clay zone occurring below a 25-foot depth and lowest in wells which only penetrate the shallower semi-perched sand unit (Table 5).

Based on the field data collected to date and the high density of automobile service facilities surrounding the Vorelco property, ESE concludes that the potential sources for gasoline constituents observed in ground water samples collected include offsite UST or surface releases and/or a past onsite UST release. Potential sources for TCE constituents observed in ground water include documented or undocumented offsite releases, and/or seepage from ruptured sewers or storm drains in the vicinity.

5.0 RECOMMENDATIONS

Based upon the conclusions derived from field investigations and monitoring activities conducted at Vorelco Property #4286 to date, ESE recommends the following:

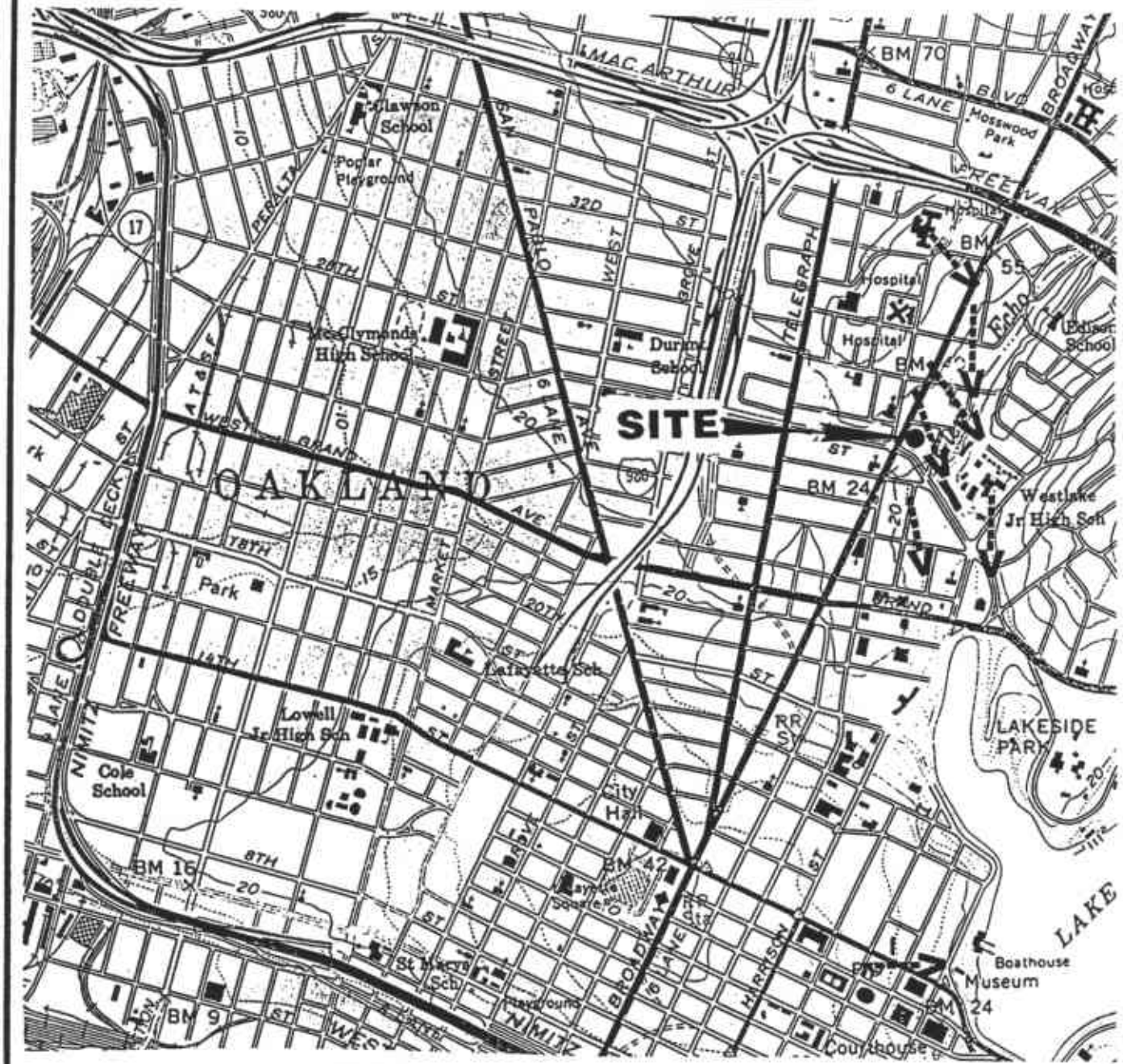
1. Arrange a meeting with Alameda County Health Care Services Agency (ACHCSA). The purpose of this meeting should be to determine future site activities required to correct any possible petroleum hydrocarbon impact related to former Vorelco UST's C and D given the prevailing TCE contamination of unknown origin.

2. Pending results of the abovementioned meeting, preparation of a risk assessment to identify a cleanup level and determine health risks related to the known contamination.

6.0 REFERENCES

ESE, Report of Quarterly Activities for Vorelco Property No. 4286, July 1991.

ESE, Report of Quarterly Activities for Vorelco Property No. 4286, November 1991.



SCALE

0 1/2 MILE 1 mile

LEGEND

REPORTED GROUND WATER FLOW DIRECTION

N

SOURCE:
USGS Oakland East and Oakland West Quadrangles

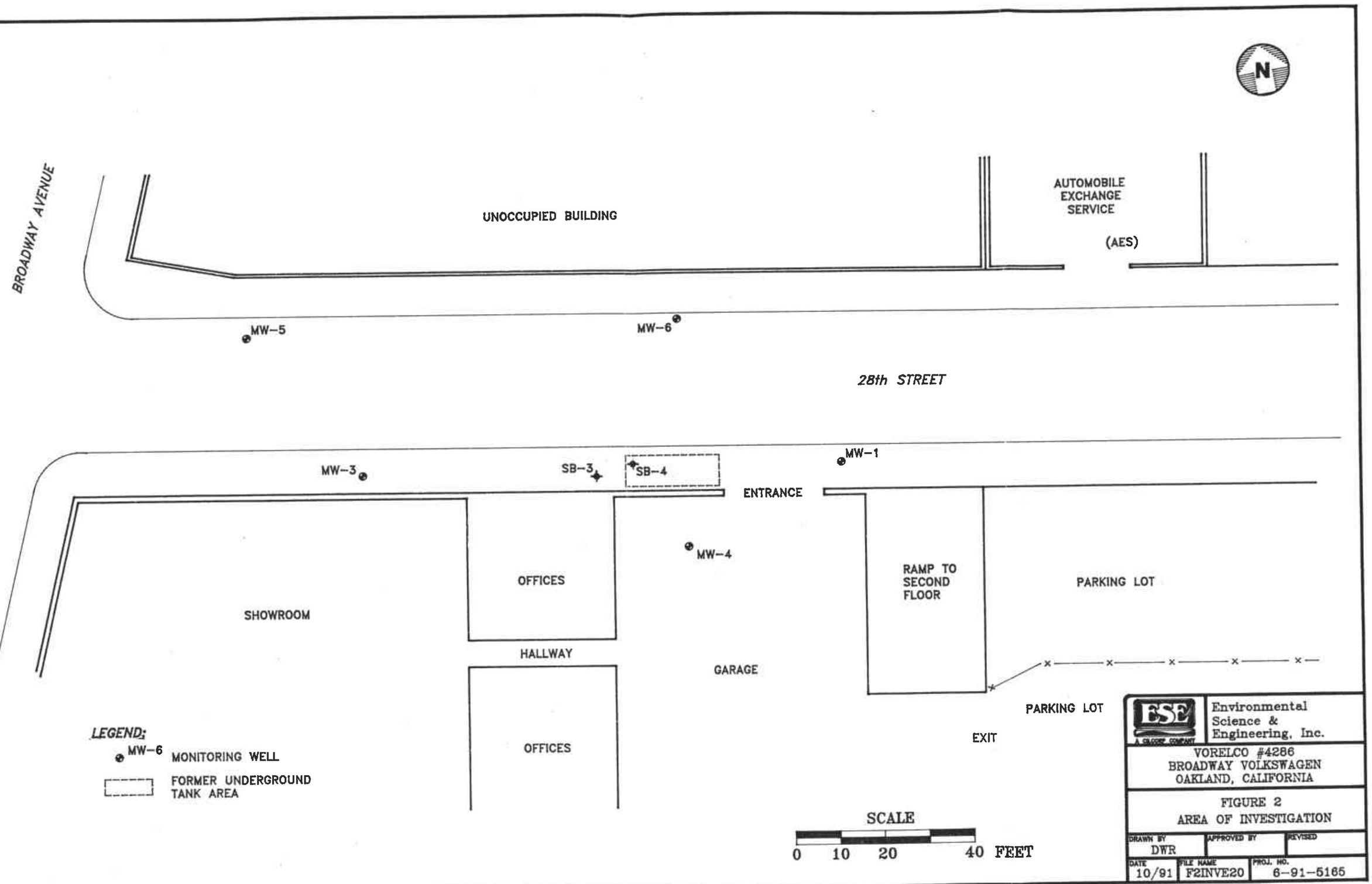
ESE A GROUP COMPANY
Environmental Science & Engineering, Inc.

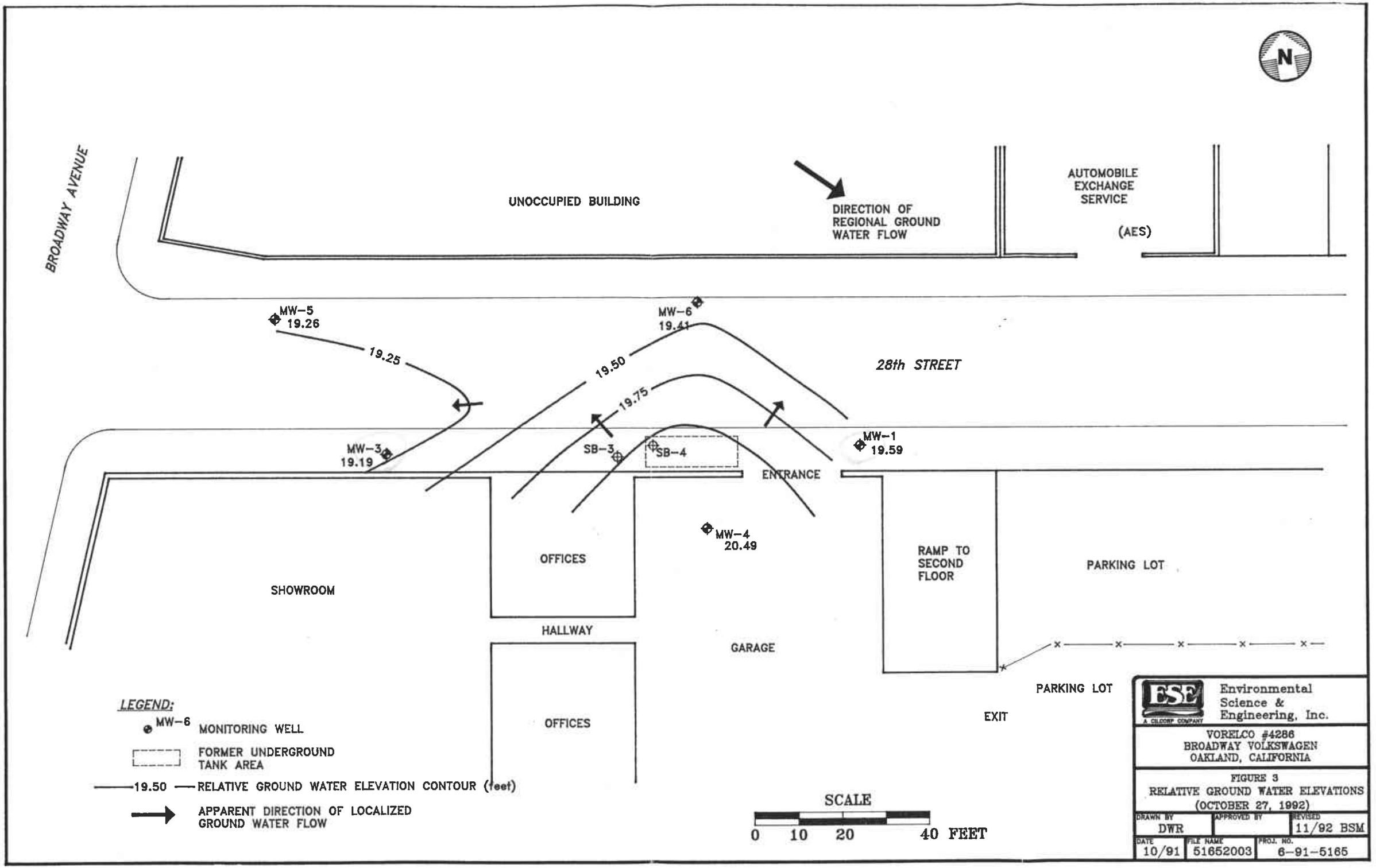
VORELCO #4286
BROADWAY/VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 1
VICINITY MAP

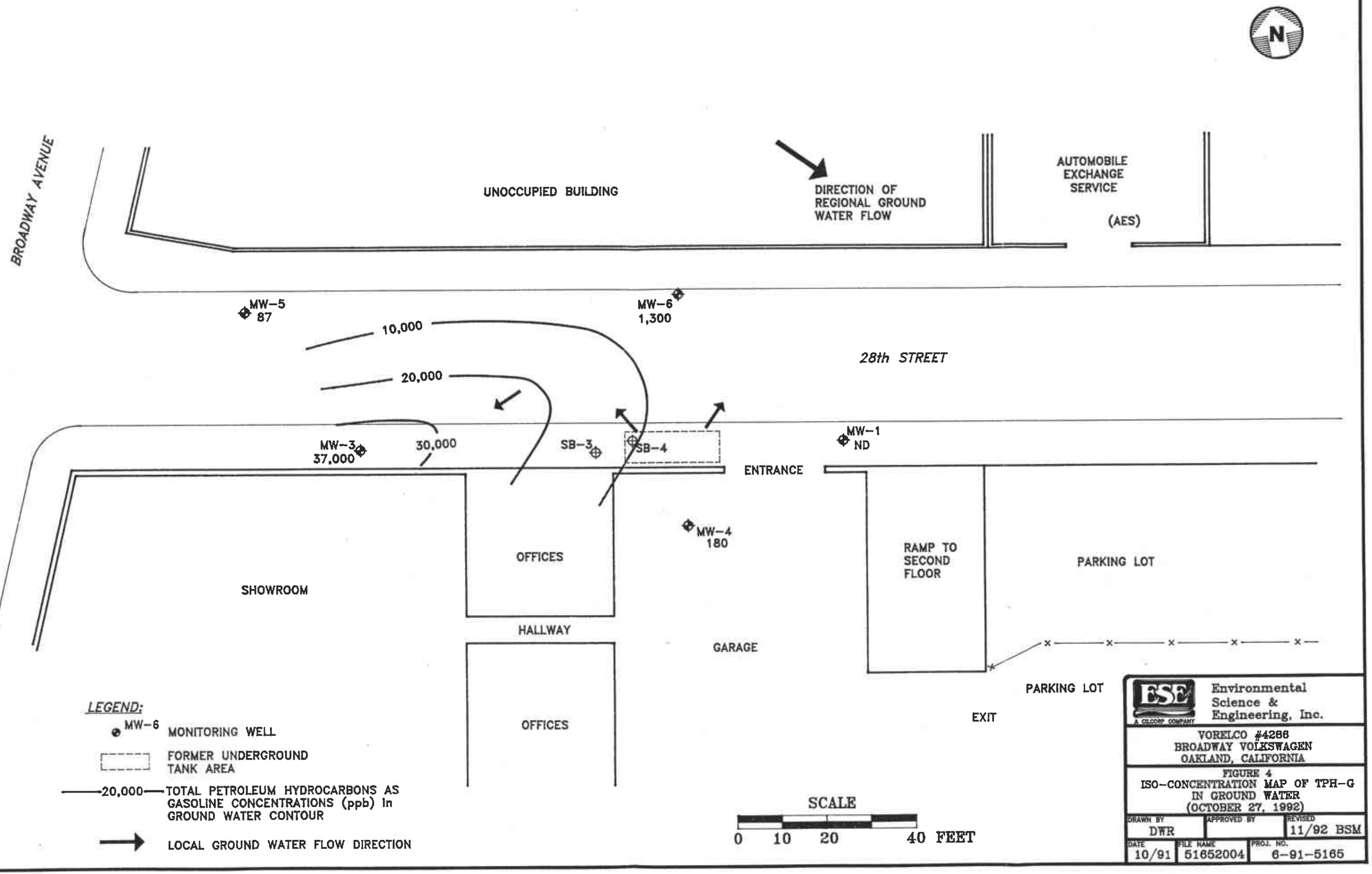
DRAWN BY	APPROVED BY	REVISED
DWR	DWR	CVS 6/91

DATE	FILE NAME	PROJ. NO.
3/91	F1VM30	6-91-5165


N
BROADWAY AVENUE
UNOCCUPIED BUILDING
AUTOMOBILE EXCHANGE SERVICE
(AES)
MW-5
MW-6
28th STREET
MW-3
SB-3
SB-4
MW-1
ENTRANCE
MW-4
OFFICES
RAMP TO SECOND FLOOR
PARKING LOT
SHOWROOM
HALLWAY
GARAGE
OFFICES
PARKING LOT
EXIT
LEGEND:
MW-6 MONITORING WELL
FORMER UNDERGROUND TANK AREA
SCALE
0 10 20 40 FEET
ESE A CH2M HILL COMPANY
Environmental Science & Engineering, Inc.
VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA
FIGURE 2
AREA OF INVESTIGATION
DRAWN BY DWR
APPROVED BY
REVISED
DATE 10/91
FILE NAME F2INVE20
PROJ. NO. 6-91-5165


N
BROADWAY AVENUE
UNOCCUPIED BUILDING
DIRECTION OF REGIONAL GROUND WATER FLOW
AUTOMOBILE EXCHANGE SERVICE
(AES)
MW-5
19.26
MW-6
19.41
19.25
19.50
19.75
28th STREET
MW-3
19.19
SB-3
SB-4
MW-1
19.59
ENTRANCE
MW-4
20.49
OFFICES
RAMP TO SECOND FLOOR
PARKING LOT
SHOWROOM
HALLWAY
GARAGE
OFFICES
PARKING LOT
EXIT
LEGEND:
MW-6 MONITORING WELL
FORMER UNDERGROUND TANK AREA
19.50 RELATIVE GROUND WATER ELEVATION CONTOUR (feet)
APPARENT DIRECTION OF LOCALIZED GROUND WATER FLOW
SCALE
0 10 20 40 FEET
ESE A CILCORP COMPANY
Environmental Science & Engineering, Inc.
VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA
FIGURE 3
RELATIVE GROUND WATER ELEVATIONS
(OCTOBER 27, 1992)
DRAWN BY DWR
APPROVED BY
REVISED 11/92 BSM
DATE 10/91
FILE NAME 51652003
PROJ. NO. 6-91-5165

want to abandone
MW 5, 6, 4 as sources
from deeper aquifer of TCE
contamination from off-site



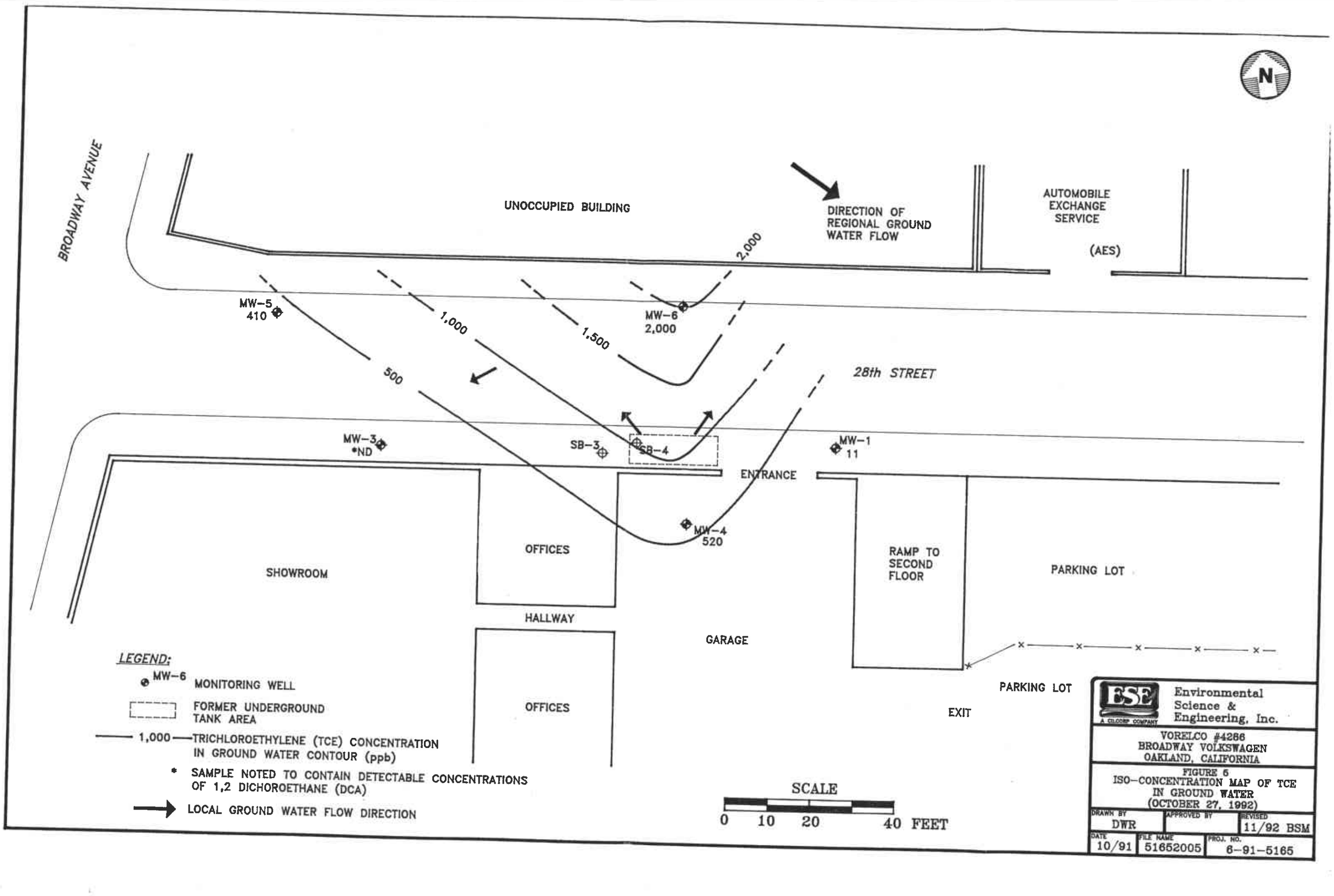
ESE A CLECORP COMPANY
Environmental Science & Engineering, Inc.

VORELCO #4266
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 4
ISO-CONCENTRATION MAP OF TPH-G IN GROUND WATER
(OCTOBER 27, 1992)

DRAWN BY	APPROVED BY	REVISED
DWR		11/92 BSM

DATE	FILE NAME	PROJ. NO.
10/91	51652004	6-91-5165


N
BROADWAY AVENUE
UNOCCUPIED BUILDING
DIRECTION OF REGIONAL GROUND WATER FLOW
AUTOMOBILE EXCHANGE SERVICE
(AES)
2,000
MW-5
410
1,000
1,500
MW-6
2,000
500
28th STREET
MW-3
*ND
SB-3
SB-4
MW-1
11
ENTRANCE
MW-4
520
OFFICES
SHOWROOM
HALLWAY
RAMP TO SECOND FLOOR
PARKING LOT
GARAGE
OFFICES
PARKING LOT
EXIT
LEGEND:
MW-6 MONITORING WELL
FORMER UNDERGROUND TANK AREA
1,000 TRICHLOROETHYLENE (TCE) CONCENTRATION IN GROUND WATER CONTOUR (ppb)
* SAMPLE NOTED TO CONTAIN DETECTABLE CONCENTRATIONS OF 1,2 DICHOROETHANE (DCA)
LOCAL GROUND WATER FLOW DIRECTION
SCALE
0 10 20 40 FEET
ESE A CILCORP COMPANY
Environmental Science & Engineering, Inc.
VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA
FIGURE 6
ISO-CONCENTRATION MAP OF TCE IN GROUND WATER
(OCTOBER 27, 1992)
DRAWN BY DWR
APPROVED BY
REVISED 11/92 BSM
DATE 10/91
FILE NAME 51652005
PROJ. NO. 6-91-5165

APPENDIX A

Well Sampling Field Logs

WELL SAMPLING FIELD LOG

PROJECT NAME: BROADWAY VOLKSWAGEN
PROJECT MANAGER: BART M.
SAMPLER: BART M.
GROUNDWATER: _____ OTHER: _____

DATE: 10/27/92
CLIENT: VORELCO, INC.
SAMPLE LOCATION I.D. MW-1
START TIME: 11:52

CASING ELEVATION (FT): 29.22 DATUM: _____ CASING DIAMETER: 2"__ 4"__ OTHER__

DEPTH TO WATER (FT): 9.63 DEPTH OF WELL (FT): 19.17 DIFFERENCE (FT): 9.54

WATER ELEVATION (FT): 19.59 CALCULATED WELL VOLUME (GAL): 1.56

ACTUAL PURGE VOLUME (GAL): _____ MINIMUM PURGE VOLUME (3/4 x WV): 6.2 gallons

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
11:57	5	* Purged dry			Translucent, clear	No odor
12:02	9	* Purged dry			Translucent, clear	No odor

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) ✓Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
✓Bailer (Disposable) __Other

WELL INTEGRITY: _____

REMARKS: WELL PURGED DRY TWICE AT 2.0 GALLON/MINUTE PUMPING RATE

SIGNATURE: _____ CHECKED BY: SAW

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3046
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: BROADWAY VOLKSWAGEN
PROJECT MANAGER: BART M.
SAMPLER: BART M.
GROUNDWATER: _____ OTHER: _____

DATE: 10/27/92
CLIENT: VORELCO, INC.
SAMPLE LOCATION I.D. MW-3
START TIME: 13:28

CASING ELEVATION (FT): 30 DATUM: _____ CASING DIAMETER: 2" ✓ 4" __ OTHER __

DEPTH TO WATER (FT): 10.81 DEPTH OF WELL (FT): 19.18 DIFFERENCE (FT): 8.37

WATER ELEVATION (FT): 19.19 CALCULATED WELL VOLUME (GAL): 1.37

ACTUAL PURGE VOLUME (GAL): 6 MINIMUM PURGE VOLUME ($\frac{3}{4}$ x WV): 5.5 gallons

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
13:32	3	* PURGED DRY			Transparent, clear	Fuel odor
13:40	6	* PURGED DRY			Transparent, clear	Fuel odor

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) ✓Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
✓Bailer (Disposable) __Other

WELL INTEGRITY: _____

REMARKS: WELL PURGED DRY TWICE AT 2.0 GALLON / MINUTE PUMPING RATE

SIGNATURE: _____ CHECKED BY: SW

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: BROADWAY VOLKSWAGEN
PROJECT MANAGER: BART M.
SAMPLER: BART M.
GROUNDWATER: _____ OTHER: _____

DATE: 10/27/92
CLIENT: VORELLO, INC.
SAMPLE LOCATION I.D. MW-4
START TIME: 12:53

CASING ELEVATION (FT): 29.70 DATUM: _____ CASING DIAMETER: 2" ✓ 4" __ OTHER __

DEPTH TO WATER (FT): 9.21 DEPTH OF WELL (FT): 24.20 DIFFERENCE (FT): 14.99

WATER ELEVATION (FT): 20.49 CALCULATED WELL VOLUME (GAL): 2.45

ACTUAL PURGE VOLUME (GAL): 15 MINIMUM PURGE VOLUME (3/4 x WV): 9.8 gallons

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
12:57	7	* PURGED DRY			Brown, opaque	No odor
13:07	15	* PURGED DRY			Brown, translucent	No odor

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) ✓Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
✓Bailer (Disposable) __Other

WELL INTEGRITY: _____

REMARKS: WELL PURGED DRY TWICE AT 2.0 GALLON / MINUTE PUMPING RATE

SIGNATURE: _____ CHECKED BY: _____

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: BROADWAY VOLKSWAGEN
PROJECT MANAGER: BART M.
SAMPLER: BART M.
GROUNDWATER: _____ OTHER: _____

DATE: 10/27/92
CLIENT: VORELLO, INC.
SAMPLE LOCATION I.D. MW-5
START TIME: 14:05

CASING ELEVATION (FT): 30.50 DATUM: _____ CASING DIAMETER: 2"__ 4"✓ OTHER__

DEPTH TO WATER (FT): 11.24 DEPTH OF WELL (FT): 29.13 DIFFERENCE (FT): 17.89

WATER ELEVATION (FT): 19.26 CALCULATED WELL VOLUME (GAL): 11.68

ACTUAL PURGE VOLUME (GAL): 50 MINIMUM PURGE VOLUME (3 x WV): 46.7 gallons

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
14:20	50				Translucent	Slight Fuel Odor

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) ✓Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
✓Bailer (Disposable) __Other

WELL INTEGRITY: _____

REMARKS: WELL DID NOT PURGE DRY AT 2.5 GALLON/MINUTE PUMPING RATE

SIGNATURE: _____ CHECKED BY: SMW

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: BROADWAY VOLKSWAGEN DATE: 10/27/92
PROJECT MANAGER: BART M. CLIENT: VORELCO, INC.
SAMPLER: BART M. SAMPLE LOCATION I.D. MW-6
GROUNDWATER: OTHER: START TIME: 11:00

CASING ELEVATION (FT): 29.19 DATUM: CASING DIAMETER: 2" 4" ✓ OTHER

DEPTH TO WATER (FT): 9.78 DEPTH OF WELL (FT): 26.43 DIFFERENCE (FT): 16.65

WATER ELEVATION (FT): 19.41 CALCULATED WELL VOLUME (GAL): 10.87

ACTUAL PURGE VOLUME (GAL): 30 MINIMUM PURGE VOLUME (3/4 x WV): 43.5

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
11:09	20	* PURGED DRY			Clear, Transparent	No odor
11:14	24	* PURGED DRY			Cloudy white	No odor
11:20	30	* PURGED DRY			Cloudy white	No odor

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) ✓Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
✓Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS: WELL PUMPED DRY THREE TIMES AT 2.0 GALLON/MINUTE PUMPING RATE

SIGNATURE: [signature] CHECKED BY: SMW

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

APPENDIX B

Analytical Results and Chain of Custody Documentation

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Matrix:	Water	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Nov 9, 1992
Attention: Bart Miller	First Sample #:	210-0922		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 210-0922 MW-1	Sample I.D. 210-0923 MW-3	Sample I.D. 210-0924 MW-4	Sample I.D. 210-0925 MW-5	Sample I.D. 210-0926 MW-6	Sample I.D. 210-0927 Trip
Purgeable Hydrocarbons	50	N.D.	37,000	180	87	1,300	N.D.
Benzene	0.5	N.D.	7,100	6.4	N.D.	48	N.D.
Toluene	0.5	N.D.	4,900	2.8	N.D.	130	N.D.
Ethyl Benzene	0.5	N.D.	970	1.2	N.D.	55	N.D.
Total Xylenes	0.5	N.D.	3,500	6.2	N.D.	230	N.D.
Chromatogram Pattern:		--	Gasoline	Gasoline	Discrete Peaks	Gasoline	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	100	1.0	1.0	1.0	1.0
Date Analyzed:	10/29/92	10/29/92	10/29/92	10/29/92	10/29/92	10/29/92
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	103	102	112	112	104	99

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

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Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Descript:	Water, MW-1	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 3, 1992
Attention: Bart Miller	Lab Number:	210-0922	Reported:	Nov 9, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	**0.50**	**11**
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

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Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Descript:	Water, MW-3	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 3, 1992
Attention: Bart Miller	Lab Number:	210-0923	Reported:	Nov 9, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	170
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

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Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Descript:	Water, MW-4	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	11/3&11/5/92
Attention: Bart Miller	Lab Number:	210-0924	Reported:	Nov 9, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	520
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
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Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Descript:	Water, MW-5	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	11/3&11/5/92
Attention: Bart Miller	Lab Number:	210-0925	Reported:	Nov 9, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	410
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
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Environmental Science & Engineering	Client Project ID:	#6-91-5165 / Vorelco, Oakland	Sampled:	Oct 27, 1992
4090 Nelson Ave., Suite J	Sample Descript:	Water, MW-6	Received:	Oct 28, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	11/3&11/5/92
Attention: Bart Miller	Lab Number:	210-0926	Reported:	Nov 9, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	100	N.D.
Carbon tetrachloride	50	N.D.
Chlorobenzene	50	N.D.
Chloroethane	100	N.D.
2-Chloroethylvinyl ether	100	N.D.
Chloroform	50	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	50	N.D.
1,3-Dichlorobenzene	50	N.D.
1,4-Dichlorobenzene	50	N.D.
1,2-Dichlorobenzene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
cis-1,2-Dichloroethene	50	N.D.
trans-1,2-Dichloroethene	50	N.D.
1,2-Dichloropropane	50	N.D.
cis-1,3-Dichloropropene	50	N.D.
trans-1,3-Dichloropropene	50	N.D.
Methylene chloride	500	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
1,1,2-Trichloroethane	50	N.D.
Trichloroethene	50	2,000
Trichlorofluoromethane	50	N.D.
Vinyl chloride	100	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering
4090 Nelson Ave., Suite J
Concord, CA 94520
Attention: Bart Miller

Client Project ID: #6-91-5165 / Vorelco, Oakland

QC Sample Group: 2100922-927

Reported: Nov 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	J.F.	J.F.	J.F.	J.F.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 29, 1992	Oct 29, 1992	Oct 29, 1992	Oct 29, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	20	20	20	66
Matrix Spike % Recovery:	100	100	100	110
Conc. Matrix Spike Dup.:	20	20	20	65
Matrix Spike Duplicate % Recovery:	100	100	100	108
Relative % Difference:	0.0	0.0	0.0	1.5

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering
4090 Nelson Ave., Suite J
Concord, CA 94520
Attention: Bart Miller

Client Project ID: #6-91-5165 / Vorelco, Oakland

QC Sample Group: 2100922-927

Reported: Nov 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	K.Nill	K.Nill	K.Nill
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Nov 3, 1992	Nov 3, 1992	Nov 3, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10
Conc. Matrix Spike:	9.7	10	9.0
Matrix Spike % Recovery:	97	100	90
Conc. Matrix Spike Dup.:	8.3	9.3	8.2
Matrix Spike Duplicate % Recovery:	83	93	82
Relative % Difference:	16	7.3	7.1

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

CHAIN OF CUSTODY RECORD

DATE 10/27/92 PAGE 1 OF 1

PROJECT NAME VORELCO

ADDRESS BROADWAY VOLKSWAGEN
BROADWAY AVE., OAKLAND

PROJECT NO. 6-91-5165

SAMPLED BY [signature] BART MILLER

LAB NAME SEQUOIA ANALYTICAL

ESE Environmental Science & Engineering, Inc.
4090 Nelson Avenue
Suite J
Concord, CA 94520
(415) 685-4053
Fax (415) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TPH-g/BTEX 8015-/8020	ANALYSES TO BE PERFORMED: 8010 (HVO's)	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW1	10/27/92	13:55		✓	✓	WATER	4	2100922AD
MW-3	10/27/92	14:00		✓	✓	"	4	923AD
MW-4	10/27/92	14:05		✓	✓	"	4	924AD
MW-5	10/27/92	14:10		✓	✓	"	4	925AD
MW-6	10/27/92	14:15		✓	✓	"	4	926AD
TRIP				✓		"	2	927AB

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. [signature]	[signature]	10/27/92	17:53
2.			
3.			
4.			
5.			

22 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: BART MILLER

SPECIAL SHIPMENT REQUIREMENTS: COLD TRANSPORT

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
NORMAL T.A.T.

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	