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ENVIRONMENTAL  
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**Report of Quarterly Ground Water  
Monitoring  
Fourth Quarter 1996**

Prepared for:  
CORE Resource, Inc.  
Property No. 4826  
Broadway Volkswagen

Prepared by:  
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January 1997

ESE Project No. 6595214

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This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of CORE Resource, Inc., as it pertains to their site located at 2740 Broadway Avenue in 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 professional advice in this report.

REPORT PREPARED BY:

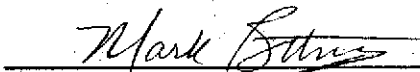


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Date

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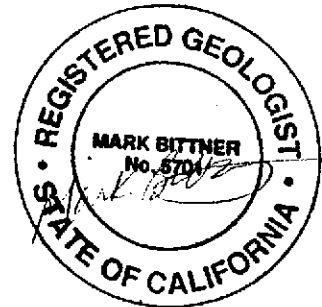


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ESE PROJECT NO. 6595214



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## 1.0 Introduction

This report describes the events and presents the findings of system operation and ground water monitoring for the period October through December 1996 conducted by Environmental Science & Engineering, Inc. (ESE) at CORE Resource, Inc., Broadway Volkswagen, 2740 Broadway, Oakland. The purpose of this work was to conduct quarterly monitoring and to operate and maintain a dual-phase extraction and treatment system operating at the site. The following report presents the procedures and methods used during this monitoring event for ground water monitoring, and the results and conclusions drawn from the monitoring during the months of October through December 1996.

### 1.1 Work Performed

To complete the objectives for this ground water monitoring and system operation and maintenance, ESE performed the following tasks:

- Collected water samples from the treatment system influent, midpoint and effluent;
- Analyzed treatment system samples for benzene, toluene, ethylbenzene and xylenes (BTEX) and total petroleum hydrocarbons as gasoline (TPH-g);
- Monitored system influent, midpoint and effluent concentrations with a photoionization detector (PID);
- Measured ground water levels and collected ground water samples from three monitoring wells;
- Analyzed the ground water samples for TPH-g and BTEX;
- Evaluated all field and analytical data and prepared a report of findings for all monitoring this period.

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## 1.2 Site Description

The site is located on the southeast corner of the intersection of Broadway Avenue and 28th Street in Oakland, California (Figure 1) in a predominantly commercial area. The Broadway Volkswagen automobile dealership currently occupies the site and consists of a three-story steel-reinforced concrete building, multiple service bays and a showroom (Figure 2). Numerous automobile dealerships and maintenance shops are in operation in the immediate area. Numerous underground service utilities are present within the right-of-way of 28th Street immediately adjacent to the site.

The site is at an approximate elevation of approximately 30 feet above mean sea level (amsl) in an area of moderately sloping topography (U.S.G.S., 1980).

## 1.3 Geology/Hydrogeology

The site is situated on an alluviated highland portion of Oakland and is topographically characterized by a gentle southeasterly slope toward Lake Merritt which lies approximately 2,000 feet south of the site. Soil borings drilled to depths of approximately 30 feet below ground surface indicated that the subsurface consists of clay, silty clay, sandy clay, silt, sandy silt and sand. A predominant sand layer, approximately two feet thick is present beneath the site at approximately 11 to 17 feet below ground surface and is sloping in a general northwesterly direction.

Regional ground water appears to flow in a predominantly southeasterly direction. Local ground water flow under the site appears to deviate from the regional ground water flow in a west-northwest direction. Confined ground water beneath the site has been observed at depths of 11 to 17 feet below ground surface, with observed elevations between 16 to 23 feet amsl. Recent measurements of ground water elevations are shown in Table 1.

## 1.4 Project Background

During August 1988, two underground storage tanks (USTs), one 500-gallon waste oil UST and one 3,000-gallon gasoline UST were removed from an area at the northeast side of the site along 28th Street (Figure 2). Soil samples collected during the removal of these USTs were reported to contain detectable concentrations of TPH-g and BTEX

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(SEMCO, 1989). Soil samples collected from soil borings, SB-3 and SB-4, drilled subsequent to the tank removal also contained detectable concentrations of TPH-g and BTEX (ESE, 1991a).

Boring logs for five additional ground water monitoring wells (MW-1, MW-3, MW-4, MW-5, and MW-6) installed by ESE at the site indicate the presence of clay sediments with perched, moist to wet sand beds at depths ranging between 11 to 17 feet below grade (ESE, 1991a; ESE, 1991b). ESE installed wells MW-1 and MW-3 to a depth of approximately 20 feet below grade and screened both over the interval containing the perched sand beds. ESE identified one two-foot thick perched sand bed in wells MW-5 and MW-6 at depths of 17 and 11 feet, respectively (ESE, 1991b). The sand bed was observed to have an apparent dip toward the west. Clay sediments above and immediately below the sand beds were observed to be dry.

Soil samples collected from the sand beds in borings MW-5 and MW-6 were noted to have a fuel odor and detectable volatile organic compound (VOC) concentrations as determined using a PID. However, ESE did not observe a fuel odor or detect VOCs with a PID in samples of clay collected above and below the sand bed in these borings. No detectable concentrations of halogenated VOCs (HVOCs) have been reported to occur in soil samples collected from the sand and clay sediments at the site.

The analytical results of soil samples collected at this site indicate the petroleum hydrocarbon affected soil beneath the site is limited to the immediate area surrounding the former UST locations.

A sandy clay aquifer was intersected beneath the clay unit containing the perched sand beds at a depth of approximately 22 to 23 feet below grade in wells MW-4, MW-5, and MW-6. Monitoring well MW-4 was installed to a depth of 25 feet below grade and wells MW-5 and MW-6 were installed to a depth of 30 feet below grade. Water levels in these wells were observed to rise approximately 12 to 14 feet when the sandy clay aquifer was penetrated suggesting some confining pressures. These three wells were screened over the interval containing the sandy clay aquifer as well as the perched sand beds.

Detectable concentrations of TPH-g, BTEX, and HVOCs including trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,2-Dichloroethane (DCA) have been reported to occur in some ground water samples collected from various site wells since May 13,

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1991 (ESE, 1991a; ESE, 1991b; ESE, 1992; ESE, 1993). Historically, the highest concentrations of TPH-g and BTEX have been reported to occur in ground water samples collected from well MW-3 located west and hydraulically downgradient of the former UST area. Well MW-3 is selectively screened to recharge with water from the perched sand beds. The highest concentrations of HVOCs have been reported to occur in ground water samples collected from wells screened into the deeper, semi-confined aquifer (MW-4, MW-5, and MW-6). Contours of TCE concentration in ground water indicate an offsite source of TCE located to the north of the UST area. ESE concluded that ground water in the semi-confined aquifer containing TCE was cross-contaminating the upper perched sand beds at the site by upwardly migrating through the monitoring wells completed in the shallower sand beds (ESE, 1993).

Background research by ESE (ESE, 1991a) indicates that several sites surrounding the CORE property handled petroleum hydrocarbons and solvents containing HVOCs. In addition, numerous unauthorized releases at other properties have been documented by the ACHCSA and the RWQCB - San Francisco Bay Region (ESE, 1991a).

Wells MW-4, MW-5 and MW-6 were abandoned in March 1994. The ACHCSA recommended that one additional well be installed further west of MW-3 to try and define the TPH-G plume in the downgradient direction (ACHCSA, 1993). Well MW-7 was installed for this purpose (ESE 1994).

ESE performed a soil vapor extraction test in 1994 and aquifer testing in 1995 to determine feasibility for a remediation system. The results of these tests were reported in the Remedial Action Plan (RAP) dated August 25, 1995 (ESE 1995). The RAP was approved by the ACHCSA in September 1995. A dual phase extraction and treatment system was constructed in late 1995 and early 1996. The vapor phase of the system was put into operation in February 1996 and the ground water phase in April 1996.



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## 2.0 Quarterly Ground Water Monitoring Activities

### 2.1 Ground Water Monitoring Procedures

#### 2.1.1 Ground Water Level Measurements

ESE measured the depth to ground water in MW-1, MW-3 and MW-7 during the fourth quarter with respect to the surveyed elevation datum at the top of each well casing. The water level measurements were collected using an electronic water level sounder on December 13, 1996.

#### 2.1.2 Ground Water Monitoring Well Sampling

On December 13, 1996 ESE staff collected ground water samples from MW-1, MW-3 and MW-7. Prior to collection of the ground water samples, a minimum of three well-casing volumes of ground water were purged from each well. During the well purging process the pH, conductivity, and temperature of the ground water were periodically monitored for stabilization to ensure the collection of samples representative of the aquifer surrounding each well.

Ground water samples were obtained from the wells by lowering a new disposable bailer into each well. The ground water was then decanted from the bailers into laboratory supplied 40-milliliter glass vials containing hydrochloric acid (a preservative). Three vials were collected for each well. The sample vials were then sealed with a Teflon-lined cap, labeled, placed on ice in a cooler and transported under chain-of-custody to Curtis and Tompkins Laboratory in Berkeley, California.

### 2.2 Ground Water Monitoring and Sampling Results

#### 2.2.1 Ground Water Levels and Flow

Depth to water ranged from 5.85 feet below ground surface (bgs) in MW-1 to 10.13 ft bgs in MW-7. Depth to water measurements are summarized in Table 1.

#### 2.2.2 Ground Water Monitoring Well Sampling

Samples were taken from MW-1, MW-3 and MW-7 and analyzed for TPH as gasoline by EPA Method 8015M and BTEX by EPA Method 8020. Samples MW-1 and MW-7 were

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both below detection limits for TPH-g and BTEX. In MW-3, benzene was detected at 30  $\mu\text{g/L}$ , toluene was detected at 10  $\mu\text{g/L}$ , ethylbenzene was detected at 1.5  $\mu\text{g/L}$  and xylenes at 7.4  $\mu\text{g/L}$ . MW-3 was below detection limits for TPH-g. BTEX and TPH-g concentrations at each well are shown in Figure 3. These analytical results are presented in Appendix A and summarized in Table 2. The results indicate that ground water hydrocarbon concentrations are being reduced following remediation system startup.

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## 3.0 Treatment System Monitoring and Operation

### 3.1 Ground Water Extraction and Treatment

The ground water extraction and treatment system was put into operation in April 1996, after receiving a permit to discharge from the East Bay Municipal Utility District (EBMUD). A 7-1/2 horsepower positive displacement blower extracts vapors from wells MW-3, VW-1, VW-2 and VW-3. Ground water is extracted by becoming entrained in the air stream flowing from the vapor extraction wells. The entrained ground water passes through the system piping into the moisture knockout pot. The water is pumped by a transfer pump to two 200-pound carbon vessels for treatment. The treated ground water is discharged to the sanitary sewer. Monthly readings were taken from the flow totalizer to determine the volume of water discharged to the sanitary sewer. These readings are presented in Table 3. As of December 13, 1996, 14,217 gallons have been discharged since system operation began.

Influent, midpoint and effluent samples were collected bi-monthly when the system was in operation. The samples were collected from sample ports on the system into laboratory supplied 40-milliliter glass vials containing hydrochloric acid (a preservative). Four vials were collected for each sample location. The sample vials were then sealed with a Teflon-lined cap, labeled, placed on ice in a cooler and transported under chain-of-custody to Curtis and Tompkins Laboratory.

Influent, midpoint and effluent samples were analyzed for TPH-g by EPA Method 8015M and BTEX by EPA Method 8020. In the influent sample, TPH-g was detected at a concentration of 81  $\mu\text{g}/\text{L}$ , benzene at a concentration of 1  $\mu\text{g}/\text{L}$ , toluene at a concentration of 1.2  $\mu\text{g}/\text{L}$  and xylenes at a concentration of 2.2  $\mu\text{g}/\text{L}$ . All midpoint and effluent concentrations of both TPH-g and BTEX were below detection limits. Analytical results are included in Appendix A and summarized in Table 4.

### 3.2 Vapor Extraction and Treatment

The vapor phase extraction and treatment system was put into operation in February 1995 after receiving a permit from the Bay Area Air Quality Management District (BAAQMD). The extracted vapors are routed to two 1,000-pound vapor phase carbon

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vessels for treatment. The influent, midpoint and effluent vapor concentrations were monitored regularly using a PID. PID measurements are summarized in Table 5.

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## 4.0 Summary

- The vapor phase of the dual phase extraction and treatment system was put into operation in February 1996 and the ground water phase in April 1996.
- Fourth quarter ground water sampling and monitoring was conducted on December 13, 1996. ESE staff collected ground water samples from MW-1, MW-3 and MW-7.
- Depth to water ranged from 5.85 ft bgs in MW-1 to 10.13 ft bgs in MW-7.
- Sample results from MW-1 and MW-7 were all below detection limits for both TPH-g and BTEX.
- In MW-3, benzene was detected at 30  $\mu\text{g/L}$ , toluene was detected at 10  $\mu\text{g/L}$ , ethylbenzene was detected at 1.5  $\mu\text{g/L}$  and total xylenes at 7.4  $\mu\text{g/L}$ . TPH-g was not detected.
- Monthly readings were taken from the flow totalizer to determine the volume of water discharged to the sanitary sewer. As of December, 1996, 14,217 gallons have been treated and discharged.
- All ground water treatment system effluent concentrations of both BTEX and TPH-g were below detection limits.

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## 5.0 References

County of Alameda Health Care Services Agency (ACHCSA), 1993. Unpublished Letter Response to Recommendations in August 3, 1993 Environmental Science & Engineering, Inc. Report of Quarterly Activities at Vorelco Property No. 4826, Broadway Volkswagen, 2740 Broadway, Oakland, California; September 23, 1993.

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\_\_\_\_\_, 1995. Report of Findings Soil Vapor Extraction Test, CORE Resource Property No. 4826, Broadway Volkswagen, 2740 Broadway, Oakland, California; January 27, 1995.

SEMCO, Inc., 1989. Unpublished Report of Underground Storage Tank Removal at Vorelco Property No. 4826, Broadway Volkswagen, 2740 Broadway, Oakland, California; February 3, 1989.

State of California Department of Water Resources (DWR), 1981. Water Well Standards: State of California. DWR Bull. 74-81; December, 1981.

**TABLE 1**  
**GROUND WATER ELEVATION DATA**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Well Number	Date	Top of Well Casing Elevation (feet above MSL)	Depth to Ground Water from Top of Casing (feet)	Ground Water Elevation (feet above MSL)
MW-1	1/29/89	29.22	7.50	21.72
	2/6/89		9.00	20.22
	3/13/89		8.50	20.72
	5/13/91		12.60	16.62
	10/18/91		10.11	19.11
	10/27/92		9.63	19.59
	7/13/93		6.26	22.96
	6/27/96		6.25	22.97
	9/19/96		10.46	18.76
	12/13/96		5.85	23.37
MW-3	1/29/89	30.00	11.70	18.30
	2/6/89		11.00	19.00
	3/13/89		10.70	19.30
	5/13/91		10.56	19.44
	10/18/91		10.21	19.79
	10/27/92		10.81	19.19
	7/13/93		9.64	20.36
	6/28/96		NM	NA
	9/19/96		11.22	18.78
	12/13/96		9.55	20.45
MW-4*	1/29/89	29.70	NM	NA
	2/6/89		NM	NA
	3/13/89		NM	NA
	5/13/91		11.20	18.50
	10/18/91		9.55	20.15
	10/27/92		9.21	20.49
	7/13/93		8.32	21.38
MW-5*	1/29/89	30.50	NM	NA
	2/6/89		NM	NA
	3/13/89		NM	NA
	5/13/91		NM	NA
	10/18/91		11.27	19.23
	10/27/92		11.24	19.26
	7/13/93		10.21	20.29
MW-6*	1/29/89	29.19	NM	NA
	2/6/89		NM	NA
	3/13/89		NM	NA
	5/13/91		NM	NA

**TABLE 1**  
**GROUND WATER ELEVATION DATA**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Well Number	Date	Top of Well Casing Elevation (feet above MSL)	Depth to Ground Water from Top of Casing (feet)	Ground Water Elevation (feet above MSL)
	10/18/91		10.21	18.98
	10/27/92		9.78	19.41
	7/13/93		8.50	20.69
MW-7	1/29/89		NM	NA
	2/6/89		NM	NA
	3/13/89		NM	NA
	5/13/91		NM	NA
	10/18/91		NM	NA
	10/27/92		NM	NA
	7/13/93		NM	NA
	6/27/96		9.70	--
	9/19/96		11.92	--
	12/13/96		10.13	--

Notes:

- \* - Well abandoned on 3/16/94
- NM - Not Measured
- NA - Not Applicable



**TABLE 2**  
**Summary of Analytical Results of Ground Water Samples**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Well Number	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-g
		concentrations (ug/L)				
MW-1	1/21/89	53	13	1.4	8.2	ND
	5/16/91	ND	ND	ND	1.1	130
	10/18/91	ND	ND	ND	ND	ND
	10/27/91	ND	ND	ND	ND	ND
	7/13/93	ND	ND	ND	ND	ND
	6/27/96	ND	ND	ND	ND	ND
	9/19/96	ND	ND	ND	ND	ND
	12/13/96	ND	ND	ND	ND	ND
MW-3	1/21/89	9,600	8,200	1,800	6,200	32,000
	5/16/91	7,800	12,000	1,200	4,000	81,000
	10/18/91	9,400	8,600	750	3,300	73,000
	10/27/91	7,100	4,900	970	3,500	37,000
	7/13/93	8,100	6,200	8,100	4,400	41,000
	6/28/96	120	75	6.2	47	370
	9/25/96	6,000	2,700	450	2,180	15,000
	12/13/96	30	10	2	7.4	ND
DUP	12/13/96	21	7	1.1	4.9	ND
MW-4*	1/21/89	NA	NA	NA	NA	NA
	5/16/91	160	690	250	1,100	13,000
	10/18/91	11.0	11.0	ND	15	ND
	10/27/91	6.4	2.8	1.2	6.2	180
	7/13/93	36	4.4	1.8	5.3	320
MW-5*	1/21/89	NA	NA	NA	NA	NA
	5/16/91	NA	NA	NA	NA	NA
	10/18/91	3,500	530	670	1,100	16,000
	10/27/91	ND	ND	ND	ND	87
	7/13/93	ND	ND	ND	ND	90
MW-6*	1/21/89	NA	NA	NA	NA	NA
	5/16/91	NA	NA	NA	NA	NA
	10/18/91	640	2,700	1,100	4,500	28,000
	10/27/91	48	130	55	230	1,300
	7/13/93	5.1	30	30	230	1,100
MW-7	1/21/89	NA	NA	NA	NA	NA
	5/16/91	NA	NA	NA	NA	NA
	10/18/91	NA	NA	NA	NA	NA
	10/27/91	NA	NA	NA	NA	NA
	7/13/93	NA	NA	NA	NA	NA
	6/27/96	ND	ND	ND	ND	ND
	9/19/96	ND	ND	ND	ND	67
	12/13/96	ND	ND	ND	ND	ND

Notes:

TPH-g - Total Petroleum Hydrocarbons as gasoline

BTEX - Benzene, toluene, ethylbenzene and xylenes

\* - Wells abandoned on 3/16/94

ND - Not detected at or above detection limits

NA - Not Analyzed

ug/L - micrograms per liter

**TABLE 3**  
**Ground Water System Flow Totalizer Readings**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Date	Totalizer Reading (gallons)
4/19/96	2800
4/30/96	3494
5/6/96	4080
5/21/96	4433
5/30/96	4493
7/22/96	4790
8/19/96	5780
9/9/96	8070
9/19/96	9810
10/8/96	9854
10/24/96	9894
11/15/96	11,597
12/13/96	14,217

**TABLE 4**  
**Summary of Analytical Results of Ground Water Treatment System**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Sample Point	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-g	MTBE
		concentrations (ug/L)					
Influent	5/30/96	--	--	--	--	390	--
	6/27/95	--	--	--	--	86	--
	9/19/96	--	--	--	--	71	--
	12/13/96	1	1.2	ND	2.2	81	--
Midpoint	5/30/96	--	--	--	--	ND	--
	6/27/96	--	--	--	--	ND	--
	9/19/96	--	--	--	--	61	--
	12/13/96	ND	ND	ND	ND	ND	--
Effluent	5/30/96	ND	ND	ND	ND	--	ND
	6/27/96	ND	ND	ND	ND	--	ND
	9/19/96	ND	ND	ND	ND	--	ND
	12/13/96	ND	ND	ND	ND	ND	--

Notes:

TPH-g - Total Petroleum Hydrocarbons as gasoline

BTEX - Benzene, toluene, ethylbenzene and xylenes

MTBE - Methyl tertiary butyl ether

-- - Not analyzed for this constituent

ND - Not detected at or above the reporting limit

ug/L - micrograms per liter

**TABLE 5**  
**Vapor Concentrations - Vapor Phase Treatment System**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

<b>Date Sampled</b>	<b>Influent (ppm)</b>	<b>Midpoint (ppm)</b>	<b>Effluent (ppm)</b>
2/29/96	54.6	0.0	0.0
3/22/96	23.3	0.0	0.0
4/19/96	126	0.0	0.0
4/30/96	120	0.0	0.0
5/3/96	55.7	0.0	0.0
5/21/96	120	0.0	0.0
5/30/96	118	0.0	0.0
7/22/96	230	0.0	0.0
8/19/96	5	4.0	0.0
9/4/96	120	0.0	0.0
9/9/96	76	0.0	0.0
10/8/96	35.7	1.5	0.0
10/24/96	25.5	0.3	0.0
11/15/96	16.5	4.5	5.6
12/13/96	15.8	3.7	2.8

Notes:

PID - photo ionization detector

ppm - parts per million, vapor-phase total hydrocarbon concentrations measured with a PID

**TABLE 5**  
**Vapor Concentrations - Vapor Phase Treatment System**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

<b>Date Sampled</b>	<b>Influent (ppm)</b>	<b>Midpoint (ppm)</b>	<b>Effluent (ppm)</b>
2/29/96	54.6	0.0	0.0
3/22/96	23.3	0.0	0.0
4/19/96	126	0.0	0.0
4/30/96	120	0.0	0.0
5/3/96	55.7	0.0	0.0
5/21/96	120	0.0	0.0
5/30/96	118	0.0	0.0
7/22/96	230	0.0	0.0
8/19/96	5	4.0	0.0
9/4/96	120	0.0	0.0
9/9/96	76	0.0	0.0
10/8/96	35.7	1.5	0.0
10/24/96	25.5	0.3	0.0
11/15/96	16.5	4.5	5.6
12/13/96	15.8	3.7	2.8

Notes:

PID - photo ionization detector

ppm - parts per million, vapor-phase total hydrocarbon concentrations measured with a PID

**TABLE 6**  
**Summary of Analytical Results of Vapor Samples**  
**CORE Resource, Inc.**  
**2740 Broadway**  
**Oakland, CA**

Sample Point	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-g
		All results reported in milligrams per cubic meter				
Influent	5/30/96	ND	ND	ND	ND	ND
	9/25/96	3.6	8.5	1.6	2	78

Notes:

TPH-g - Total Petroleum Hydrocarbons as gasoline

BTEX - Benzene, toluene, ethylbenzene and xylenes

ND - Not detected at or above the reporting limit



ADAPTED FROM U.S.G.S. OAKLAND WEST 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, 1959, PHOTOREVISED 1980.



**Environmental  
Science &  
Engineering, Inc.**

DATE

8/93

REVISED

5/23/95

CAD FILE

50931001

VICINITY MAP

CORE RESOURCE, INC. PROPERTY #4286  
2740 BROADWAY  
OAKLAND, CALIFORNIA

FIGURE NO.

**1**

PROJ. NO.

6-93-5093

4090 NELSON AVENUE, SUITE J  
CONCORD, CA 94520



BROADWAY AVENUE

AUTOMOBILE INTERIOR SERVICE

AUTOMOBILE EXCHANGE SERVICE (AES)

MW-5

MW-6

28th STREET

VW-1

MW-3

VW-2

SB-3

SB-4 VW-3

MW-1

MW-7

ENTRANCE

MW-4

OFFICES

RAMP TO SECOND FLOOR

PARKING LOT

SHOWROOM

HALLWAY

GARAGE

PARKING LOT

OFFICES

LEGEND:

- MW-7 MONITORING WELL
- SB-3 SOIL BORING
- VW-3 VAPOR EXTRACTION WELL
- FORMER UNDERGROUND TANK AREA



	DATE	10/25/96	SITE MAP	FIGURE NO.
	REVISED	11/1/96		CORE RESOURCES INC. PROP. #4286 2740 BROADWAY OAKLAND, CALIFORNIA
	CAD FILE	65521402	PROJ. NO.	

4090 NELSON AVENUE, SUITE J  
CONCORD, CA 94520

DATE  
10/25/96  
REVISED  
11/1/96  
CAD FILE  
65521402

CORE RESOURCES INC. PROP. #4286  
2740 BROADWAY  
OAKLAND, CALIFORNIA

FIGURE NO.  
2  
PROJ. NO.  
65-95-214





BROADWAY AVENUE

AUTOMOBILE INTERIOR SERVICE

AUTOMOBILE EXCHANGE SERVICE (AES)

MW-5

MW-6

*B	0.03
T	0.01
E	0.0015
X	0.0074
TPH-G	<0.05

B	<0.0005
T	<0.0005
E	<0.0005
X	<0.0005
TPH-G	<0.05

28th STREET

VW-1

MW-3

VW-2

SB-3

SB-4

VW-3

MW-1

ENTRANCE

MW-7

B	<0.0005
T	<0.0005
E	<0.0005
X	<0.0005
TPH-G	<0.05

SHOWROOM

OFFICES

MW-4

RAMP TO SECOND FLOOR

PARKING LOT

HALLWAY

GARAGE

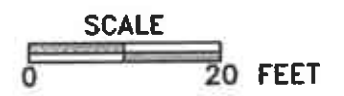
PARKING LOT

OFFICES

**LEGEND:**

- MW-7 MONITORING WELL
- SB-3 SOIL BORING
- VW-3 SOIL BORING
- FORMER UNDERGROUND TANK AREA

- B CONCENTRATION OF BENZENE IN GROUND WATER IN MILLIGRAMS PER LITER (mg/L)
- T CONCENTRATION OF TOLUENE IN GROUND WATER IN MILLIGRAMS PER LITER (mg/L)
- E CONCENTRATION OF ETHYLBENZENE IN GROUND WATER IN MILLIGRAMS PER LITER (mg/L)
- X CONCENTRATION OF XYLENES IN GROUND WATER IN MILLIGRAMS PER LITER (mg/L)
- TPH-G CONCENTRATION OF TPH-G IN GROUND WATER IN MILLIGRAMS PER LITER (mg/L)
- \* MW-3 SAMPLED ON DECEMBER 13, 1996



<b>Environmental Science &amp; Engineering, Inc.</b>	DATE 10/25/96	<b>TPH-G AND BTEX CONCENTRATIONS IN GROUND WATER, DECEMBER 13, 1996</b>	FIGURE NO. <b>3</b>
	REVISED 01/28/97		CORE RESOURCES INC. PROP. #4286 2740 BROADWAY OAKLAND, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520		CAD FILE 65521403	



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710. Phone (510) 486-0900

A N A L Y T I C A L   R E P O R T

Prepared for:

Environmental Science & Engineering  
4090 Nelson Avenue  
Suite J  
Concord, CA 94520

Date: 20-DEC-96  
Lab Job Number: 127748  
Project ID: 65-95-214  
Location: Core Resource, Inc.

Reviewed by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

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TVH-Total Volatile Hydrocarbons

Client: Environmental Science & Engineering  
Project#: 65-95-214  
Location: Core Resource, Inc.

Analysis Method: CA LUFT (EPA 8015M)  
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
127748-001	INFLUENT	31460	12/12/96	12/18/96	12/18/96	
127748-004	MW-1	31460	12/13/96	12/18/96	12/18/96	
127748-005	MW-3	31460	12/13/96	12/18/96	12/18/96	
127748-006	MW-7	31460	12/13/96	12/18/96	12/18/96	

Matrix: Water

Analyte	Units	127748-001	127748-004	127748-005	127748-006
Diln Fac:		1	1	1	1
Gasoline	ug/L	81 Y	<50	<50	<50
Surrogate					
Trifluorotoluene	%REC	103	101	102	97
Bromobenzene	%REC	78	73	74	70

Y: Sample exhibits fuel pattern which does not resemble standard



TVH-Total Volatile Hydrocarbons

Client: Environmental Science & Engineering  
Project#: 65-95-214  
Location: Core Resource, Inc.

Analysis Method: CA LUFT (EPA 8015M)  
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
127748-007 DUP		31461	12/13/96	12/19/96	12/19/96	

Matrix: Water

Analyte	Units	127748-007
Diln Fac:		1
Gasoline	ug/L	<50
Surrogate		
Trifluorotoluene	%REC	105
Bromobenzene	%REC	73



BTXE

Client: Environmental Science & Engineering  
Project#: 65-95-214  
Location: Core Resource, Inc.

Analysis Method: EPA 8020  
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
127748-001	INFLUENT	31460	12/12/96	12/18/96	12/18/96	
127748-002	MIDPOINT	31460	12/12/96	12/18/96	12/18/96	
127748-003	EFFLUENT	31460	12/12/96	12/18/96	12/18/96	
127748-004	MW-1	31460	12/13/96	12/18/96	12/18/96	

Matrix: Water

Analyte	Units	127748-001	127748-002	127748-003	127748-004
Diln Fac:		1	1	1	1
Benzene	ug/L	1 C	<0.5	<0.5	<0.5
Toluene	ug/L	1.2C	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	1.2C	<0.5	<0.5	<0.5
o-Xylene	ug/L	1 C	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	103	103	103	101
Bromobenzene	%REC	101	97	97	94

C: Presence of this compound confirmed by second column,  
however, the confirmation concentration differed from the reported  
result by more than a factor of two



BTXE

Client: Environmental Science & Engineering      Analysis Method: EPA 8020  
Project#: 65-95-214                                      Prep Method:      EPA 5030  
Location: Core Resource, Inc.

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
127748-005	MW-3	31460	12/13/96	12/18/96	12/18/96	
127748-006	MW-7	31460	12/13/96	12/18/96	12/18/96	
127748-007	DUP	31461	12/13/96	12/19/96	12/19/96	
127748-008	TRIP	31460	12/13/96	12/18/96	12/18/96	

Matrix: Water

Analyte	Units	127748-005	127748-006	127748-007	127748-008
Diln Fac:		1	1	1	1
Benzene	ug/L	30	<0.5	21	<0.5
Toluene	ug/L	10	<0.5	6.9	<0.5
Ethylbenzene	ug/L	1.5	<0.5	1.1C	<0.5
m,p-Xylenes	ug/L	4.9	<0.5	3.2	<0.5
o-Xylene	ug/L	2.5	<0.5	1.7	<0.5
Surrogate					
Trifluorotoluene	%REC	102	100	105	103
Bromobenzene	%REC	96	91	94	97

C: Presence of this compound confirmed by second column,  
however, the confirmation concentration differed from the reported  
result by more than a factor of two



Lab #: 127748

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Environmental Science & Engineering	Analysis Method: CA LUFT (EPA 8015M)
Project#: 65-95-214	Prep Method: EPA 5030
Location: Core Resource, Inc.	

METHOD BLANK

Matrix: Water	Prep Date: 12/18/96
Batch#: 31460	Analysis Date: 12/18/96
Units: ug/L	
Diln Fac: 1	

MB Lab ID: QC36618

Analyte	Result	
Gasoline	<50	
Surrogate	%Rec	Recovery Limits
Trifluorotoluene	97	69-120
Bromobenzene	70	70-122



Lab #: 127748

BATCH QC REPORT

BTXE

Client: Environmental Science & Engineering  
Project#: 65-95-214  
Location: Core Resource, Inc.

Analysis Method: EPA 8020  
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water  
Batch#: 31460  
Units: ug/L  
Diln Fac: 1

Prep Date: 12/18/96  
Analysis Date: 12/18/96

MB Lab ID: QC36618

Analyte	Result		
Benzene	<0.5		
Toluene	<0.5		
Ethylbenzene	<0.5		
m,p-Xylenes	<0.5		
o-Xylene	<0.5		
Surrogate	%Rec		Recovery Limits
Trifluorotoluene	97		58-130
Bromobenzene	90		62-131





Lab #: 127748

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons			
Client:	Environmental Science & Engineering	Analysis Method:	CA LUFT (EPA 8015M)
Project#:	65-95-214	Prep Method:	EPA 5030
Location:	Core Resource, Inc.		
METHOD BLANK			
Matrix:	Water	Prep Date:	12/19/96
Batch#:	31461	Analysis Date:	12/19/96
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC36623

Analyte	Result		
Gasoline	<50		
Surrogate	%Rec	Recovery Limits	
Trifluorotoluene	105	69-120	
Bromobenzene	72	70-122	



Lab #: 127748

BATCH QC REPORT

BTXE

Client: Environmental Science & Engineering  
Project#: 65-95-214  
Location: Core Resource, Inc.

Analysis Method: EPA 8020  
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water  
Batch#: 31461  
Units: ug/L  
Diln Fac: 1

Prep Date: 12/19/96  
Analysis Date: 12/19/96

MB Lab ID: QC36623

Analyte	Result		
Benzene	<0.5		
Toluene	<0.5		
Ethylbenzene	<0.5		
m,p-Xylenes	<0.5		
o-Xylene	<0.5		
Surrogate	%Rec		Recovery Limits
Trifluorotoluene	104		58-130
Bromobenzene	93		62-131



Lab #: 127748

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons			
Client:	Environmental Science & Engineering	Analysis Method:	CA LUFT (EPA 8015M)
Project#:	65-95-214	Prep Method:	EPA 5030
Location:	Core Resource, Inc.		
LABORATORY CONTROL SAMPLE			
Matrix:	Water	Prep Date:	12/18/96
Batch#:	31460	Analysis Date:	12/18/96
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC36616

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline	1961	2000	98	80-120
Surrogate	%Rec	Limits		
Trifluorotoluene	95	69-120		
Bromobenzene	93	70-122		

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits  
 Spike Recovery: 0 out of 1 outside limits



Lab #: 127748

BATCH QC REPORT

BTXE

Client: Environmental Science & Engineering      Analysis Method: EPA 8020  
Project#: 65-95-214      Prep Method: EPA 5030  
Location: Core Resource, Inc.

LABORATORY CONTROL SAMPLE

Matrix: Water      Prep Date: 12/18/96  
Batch#: 31460      Analysis Date: 12/18/96  
Units: ug/L  
Diln Fac: 1

LCS Lab ID: QC36617

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	18.2	20	91	80-120
Toluene	18.6	20	93	80-120
Ethylbenzene	18.6	20	93	80-120
m,p-Xylenes	37.8	40	95	80-120
o-Xylene	18.7	20	94	80-120
Surrogate	%Rec	Limits		
Trifluorotoluene	100	58-130		
Bromobenzene	100	62-131		

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits  
Spike Recovery: 0 out of 5 outside limits



Lab #: 127748

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Environmental Science & Engineering      Analysis Method: CA LUFT (EPA 8015M)  
Project#: 65-95-214      Prep Method: EPA 5030  
Location: Core Resource, Inc.

LABORATORY CONTROL SAMPLE

Matrix: Water      Prep Date: 12/19/96  
Batch#: 31461      Analysis Date: 12/19/96  
Units: ug/L  
Diln Fac: 1

LCS Lab ID: QC36621

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline	1800	2000	90	80-120
Surrogate	%Rec	Limits		
Trifluorotoluene	101	69-120		
Bromobenzene	92	70-122		

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits  
Spike Recovery: 0 out of 1 outside limits

Lab #: 127748

BATCH QC REPORT

BTXE

Client: Environmental Science & Engineering	Analysis Method: EPA 8020
Project#: 65-95-214	Prep Method: EPA 5030
Location: Core Resource, Inc.	

LABORATORY CONTROL SAMPLE

Matrix: Water	Prep Date: 12/19/96
Batch#: 31461	Analysis Date: 12/19/96
Units: ug/L	
Diln Fac: 1	

LCS Lab ID: QC36622

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	18.6	20	93	80-120
Toluene	19.3	20	95	80-120
Ethylbenzene	18.7	20	94	80-120
m,p-Xylenes	38.3	40	96	80-120
o-Xylene	18.9	20	95	80-120
Surrogate	%Rec	Limits		
Trifluorotoluene	108	58-130		
Bromobenzene	96	62-131		

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits  
 Spike Recovery: 0 out of 5 outside limits



Lab #: 127748

BATCH QC REPORT

BTXE

Client: Environmental Science & Engineering      Analysis Method: EPA 8020  
Project#: 65-95-214      Prep Method: EPA 5030  
Location: Core Resource, Inc.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ      Sample Date: 12/13/96  
Lab ID: 127751-002      Received Date: 12/13/96  
Matrix: Water      Prep Date: 12/18/96  
Batch#: 31460      Analysis Date: 12/18/96  
Units: ug/L  
Diln Fac: 1

MS Lab ID: QC36619

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Benzene	20	<0.5	19.2	96	75-125
Toluene	20	<0.5	18.7	94	75-125
Ethylbenzene	20	<0.5	18.8	94	75-125
m,p-Xylenes	40	<0.5	37.6	94	75-125
o-Xylene	20	<0.5	19	95	75-125
Surrogate	%Rec	Limits			
Trifluorotoluene	104	58-130			
Bromobenzene	102	62-131			

MSD Lab ID: QC36620

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Benzene	20	19.5	98	75-125	2	20
Toluene	20	19	95	75-125	2	20
Ethylbenzene	20	19.1	96	75-125	2	20
m,p-Xylenes	40	38.2	96	75-125	2	20
o-Xylene	20	19.3	97	75-125	2	20
Surrogate	%Rec	Limits				
Trifluorotoluene	102	58-130				
Bromobenzene	100	62-131				

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits  
RPD: 0 out of 5 outside limits  
Spike Recovery: 0 out of 10 outside limits

Lab #: 127748

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons		
Client: Environmental Science & Engineering	Analysis Method: CA LUFT (EPA 8015M)	
Project#: 65-95-214	Prep Method: EPA 5030	
Location: Core Resource, Inc.		
MATRIX SPIKE/MATRIX SPIKE DUPLICATE		
Field ID: DUP	Sample Date:	12/13/96
Lab ID: 127748-007	Received Date:	12/13/96
Matrix: Water	Prep Date:	12/19/96
Batch#: 31461	Analysis Date:	12/19/96
Units: ug/L		
Diln Fac: 1		

MS Lab ID: QC36624

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline	2000	<50	1954	98	75-125
Surrogate	%Rec	Limits			
Trifluorotoluene	104	69-120			
Bromobenzene	99	70-122			

MSD Lab ID: QC36625

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline	2000	1993	100	75-125	2	35
Surrogate	%Rec	Limits				
Trifluorotoluene	103	69-120				
Bromobenzene	99	70-122				

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits