ENVIRONMENTAL PROTECTION

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LETTER OF TRANSMITTAL

TO:

Ms. Susan Hugo
Alameda County Health Care Services Agency
Division of Hazardous Materials
1131 Harbor Bay Parkway
Alameda, CA 94501

DATE: September 27, 1995
PROJECT: Connell Oldsmobile/3093 Broadway
SCI JOB NUMBER: 447.055

WE ARE SENDING YOU:

- 1 copies
- ☐ of our final report
- ☐ a draft of our report
- ☐ a Service Agreement
- ☐ a proposed scope of services
- ☐ specifications
- ☐ grading/foundation plans
- ☐ soil samples/groundwater samples
- ☐ an executed contract
- ☒ Letter to Jonathan Redding, Fitzgerald, Abbott & Beardsley

- ☐ if you have any questions, please call
- ☐ for your review and comment
- ☐ please return an executed copy
- ☐ for geotechnical services
- ☐ with our comments
- ☐ with Chain of Custody documents
- ☒ for your use
- ☐ _____
- ☐ _____

REMARKS:

COPIES TO:

BY: Jeriann Alexander
Jeriann Alexander

■ Subsurface Consultants, Inc.

171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 510-268-0461 •
(510) 268-0137

R. William Rudolph, Jr., PE
Thomas E. Cundey, PE
Jeriann N. Alexander, PE

Rec'd 9/27/95 during PEH

September 26, 1995
SCI 447.055

DRAFT

Mr. Jonathan Redding
Fitzgerald, Abbott & Beardsley
1221 Broadway, 21st Floor
Oakland, California 94612-1837

Groundwater Monitoring Event
August 1995
Connell Oldsmobile
3093 Broadway
Oakland, California

Dear Mr. Redding:

This letter records the results of the August 1995 groundwater monitoring event performed by Subsurface Consultants, Inc. (SCI) at the Connell Oldsmobile facility in Oakland, California. The facility is situated at the southwest corner of the intersection of Hawthorne Avenue and Broadway, as shown on the Site Plan, Plate 1.

SITE CONDITIONS

The facility is situated on the south side of Hawthorne Avenue, between Broadway and Webster Street. It consists of a high one-story building with a slab-on-grade floor. Asphalt and concrete-paved accessways extend along the west and south sides of the structure; sidewalks extend along the north and east sides. Three former tanks were located beneath the sidewalk adjacent to the north side of the facility, as shown on Plate 1.

The site was developed by cutting into the eastern flank of a minor structural uplift on the Oakland alluvial plain commonly known as "Pill Hill". The ground surface in the area slopes moderately down toward the east and southeast. The ground surface continues to slope downward across Broadway and toward Glen Echo Creek, which drains in a southerly direction to Lake Merritt.

Geologic mapping by Radbruch (1957) indicates that the site is underlain by the Temescal formation, an extensive Quaternary-age alluvial fan deposit composed of interbedded lenses of silt, sand, clay and gravel. Because of the random nature of alluvial fan deposition, the heterogeneous layers of the Temescal formation are irregular in thickness and laterally discontinuous. As encountered during past

investigations, soils underlying the site range from silty clays to sandy gravels. The sand and gravel deposits typically occur as lenses interfingered with the more prevalent silts and clays. Analysis of subsurface profiles provides little correlation between layers encountered within the various borings and CPT probes.

BACKGROUND

On December 18, 1989, three underground fuel storage tanks which previously contained gasoline, diesel and waste oil were removed from the site. Elevated levels of oil and grease, diesel, gasoline, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were encountered in soil samples from beneath the tanks. The excavation was backfilled with imported material. Tank removal activities were summarized in a letter dated March 22, 1990.

SCI has performed a Preliminary Contamination Assessment and Phase II and III Hydrocarbon Contamination Assessments at the site. The results of the investigations were presented in reports dated December 7, 1990, June 3, 1991, and January 13, 1994. Well and boring locations are shown on Plate 1. Summaries of the historic analytical test results are presented in Tables 1 and 2. These studies indicated that soil and groundwater had been impacted by releases of gasoline and diesel. Soil contamination was found near the former tanks and near the groundwater surface downgradient of the former tanks. Free product was found floating on the groundwater surface in areas up to 200 feet downgradient of the tank area. 1,2-Dichloroethane (1,2-DCA), believed to be a gasoline additive, was detected in groundwater within the fuel release area. Free gasoline product and significantly elevated concentrations of total volatile hydrocarbons (TVH), total extractable hydrocarbons (TEH), BTEX, and 1,2-DCA have been detected in groundwater samples from wells MW-1, MW-4, MW-6, MW-9 and MW-10. The TEH appeared to represent heavier fractions of gasoline rather than a separate significant release of diesel fuel, and the 1,2-DCA appeared to be associated with its common use as a gasoline additive. The TEH chromatograms indicated the presence of diesel or motor oil weight hydrocarbons in the sample from well MW-13. However, gasoline-weight hydrocarbons were not detected. The groundwater monitoring data from March 1991 to November 1993 indicate that the free product and dissolved product plumes had not migrated measurably. Well MW-11 appeared to be impacted by an upgradient source.

Free product recovery has been performed on an intermittent basis at the site since December 1991, using a portable pump and by hand bailing. Product recovery data are presented in Table 4. Monthly free product removal was modified to quarterly removal in August 1992, due to poor recovery rates and lack of client funding. Quarterly free product removal and groundwater monitoring continued through November 1993. As of November 1993 approximately 78.5 gallons of product had been removed from wells MW-1, MW-4 and MW-6. On February 3, 1994, SCI submitted a letter

petitioning the ACHCSA to revise the monitoring program, since studies indicated that the plume appeared to be well defined. Monitoring and free product removal were not conducted from November 1993 to August 1995, due to a lack of client authorization associated with no written agency response to the February 1994 letter and funding problems.

Groundwater levels have been measured periodically in the on-site wells beginning in 1990. The direction of groundwater flow is generally towards the east. Where coarse-grained soil deposits are coincident with the groundwater level, pathways of preferential groundwater flow are developed due to the higher hydraulic conductivity of these soils. The effect may account for the variable nature of the direction and gradient across the site. Historic water level readings are summarized in Table 3.

Pumping test results, described in the report dated January 13, 1994, indicated that preferential flow exists within coarse-grained deposits. The effect of pumping from well MW-10, which has a well-graded sandy gravel present at the groundwater surface, was observed up to 200 feet away in well MW-2 in which coarse-grained soils were also present at the groundwater surface. However, well MW-6, situated about 90 feet away from well MW-10, which also has coarse-grained soils at the groundwater surface was unaffected by pumping. Pumping from well MW-8, which penetrates predominately fine grained soils, did not effect water levels in adjacent wells.

MONITORING EVENT RESULTS

Groundwater Monitoring

On August 29 and 30, 1995 depth-to-water and free product thickness were measured in wells MW-1 through MW-11, and MW-13 and the data are summarized in Table 3. Our interpretation of the flow direction and gradient for the August 1995 event are presented on Plate 2.

The wells were purged by removing water with new disposable bailers (2-inch-diameter wells) or with a pre-cleaned submersible pump (6-inch-diameter wells). The wells were purged until measurements of pH, temperature, and conductivity had stabilized. After the wells recharged to within 80 percent of their initial level they were sampled with new disposable bailers. Purge water was placed in a depression created on top of the existing soil stockpile and allowed to evaporate, or was placed in 55-gallon drums.

Samples were retained in pre-cleaned containers supplied by the analytical laboratory, and were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-custody records accompanied the samples to the laboratory.

It is our opinion that the apparent increase in free product thickness in MW-4 and MW-6 may not represent actual product thickness in the area. Industry experience is that in many cases product accumulates within the wells and mounds in the surrounding formation, distorting product thickness assessments. Data gathered at the site suggest that significant lateral stratigraphic discontinuities, localized perched groundwater zones, and preferential groundwater flow paths exist within the underlying formation which could account for product accumulation. These data include the boring and CPT logs, the contaminant distribution, the apparent gradient and the pump test data.

Since the apparent free product source, i.e. the tanks and piping, have been removed, there is no indication that additional free product is impacting the site. The increases in free product thickness are, in our opinion, related to the downgradient redistribution of free product along preferential flow paths. Free product accumulation rates in various wells and migration of free product on the site is likely highly dependent on groundwater levels. The groundwater levels control whether the free product layer is in hydraulic contact with locally more permeable zones where migration occurs. As a result, we conclude that the current free product thickness likely represent a short term, intermittent condition related to the past winters heavy rains.

Dissolved Product Plume

The distribution of the dissolved product plume of both petroleum hydrocarbons (i.e. TVH, TEH and BTEX) and 1,2-DCA remains essentially the same as during previous monitoring events. Very low levels of oil and grease and semivolatile organic compounds were detected in MW-1, possibly suggesting limited impacts to groundwater from the previous waste oil tank. MW-11 no longer suggests contribution from an upgradient source.

Samples from MW-8, situated at the downgradient property boundary, continues to contain relatively low concentrations of petroleum hydrocarbons. However, concentrations are somewhat higher than previous events. Samples from MW-13, the farthest downgradient well, also contained very low concentrations of the contaminants of concern i.e. benzene, TEH and 1,2-DCA.

Remediation

It is our opinion that, at a minimum, remedial measures are necessary to remove free product. Our opinion remains that significant quantities of free product are likely not recoverable from the site over the long term by bailing or skimming. However, in the short term we recommend that free product removal be reinitiated in wells MW-1, MW-4 and MW-6 on monthly basis until other remedial measured can be implemented or yields substantially decrease. In the long term, free product removal

can most appropriately be accomplished by soil vapor extraction and treatment. We initially recommend soil vapor extraction in MW-6.

To design a remedial system, we recommend the following:

- conduct a soil vapor extraction pilot test in MW-6, i.e. the furthest downgradient well containing free product using a portable system which is permitted by the Bay Area Quality Management District
- conduct free product bail-down tests in MW-1, MW-4 and MW-6

Based on the test results, a system can be designed and its efficiency estimated. SCI would be pleased to prepare a work plan for the recommended pilot test and system design.

Future Monitoring

We recommend that groundwater monitoring be continued prior to and during remediation. The over 5 years of monitoring data suggest that several trends exist in many of the wells. As a result, costly quarterly monitoring of all the wells is not technically warranted. In general, the upgradient and side gradient wells have not detected significant impacts. In addition, the impacted wells within the body of the plume provide little useful data other than that significant impacts exist. The most important wells are the downgradient wells which are useful for detecting the downgradient migration of the plume. Taking these factors into consideration, we recommend the following monitoring program.

Well No.	Location	Current Impact	Analytes	Sampling Frequency
1	Source Area	Yes	TVH, TEH, O&G BTEX, 1,2-DCA, SVOC	SA
2	Upgradient/Side Gradient	No	TVH, BTEX, 1,2-DCA	A
3	Side Gradient	No	TVH, BTEX, 1,2-DCA	A
4	Mid Plume	Yes	TVH, BTEX, 1,2-DCA	SA
5	Side Gradient	No	TVH, BTEX, 1,2-DCA	A
6	Mid Plume	Yes	TVH, BTEX, 1,2-DCA	SA
7	Side/Down Gradient	No	TVH, BTEX, 1,2-DCA	Q
8	Down Gradient	Yes	TVH, BTEX, 1,2-DCA	Q
9	Mid Plume	Yes	TVH, BTEX, 1,2-DCA	SA
10	Mid Plume	Yes	TVH, BTEX, 1,2-DCA	A
11	Upgradient	No	TVH, BTEX, 1,2-DCA	A
12	Not a Well			
13	Down Gradient	Yes	TVH, BTEX, 1,2-DCA	Q

A - Annually
SA - Semi Annually
Q - Quarterly

Groundwater levels and free product measurement and removal should be conducted in all wells on a quarterly basis. A groundwater contour map should be produced quarterly.

SCHEDULE

The exact scope and scheduling of subsequent testing, design and remedial implementation tasks is difficult to predict due to a number of factors including:

- Client funding
- State UST Fund authorization and bidding requirements
- ACHCSA requirements and approval

SCI proposes the following tentative schedule assuming no significant delays:

September 1995	Submit August 1995 monitoring report.
December 1995	Conduct semiannual/quarterly groundwater monitoring. Conduct soil vapor extraction pilot tests and design interim remedial system.
January 1995	Submit December groundwater monitoring report.
March 1996	Submit interim remedial action plan.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

R. William Rudolph
Geotechnical Engineer 741(expires 12/31/96)

Jeriann N. Alexander
Civil Engineer 40469 (expires 3/31/99)

RWR:JNA:sld

Attachments:

Table 1 - Summary of Contaminant Concentrations in Wells
Table 2 - Summary of Contaminant Concentrations in CPT Holes
Table 3 - Free Product Recovery
Table 4 - Groundwater Elevation Data
Plate 1 - Site Plan
Plate 2 - Groundwater Surface Elevation Contours, 8/29-30/95
Field forms
Analytical test reports
Chain-of-custody documents

15 copies submitted

Table 1.
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS

Well	Event Date	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l	Oil & Grease mg/l	Semi-volatile Compounds ug/l
MW-1	Oct-90	620,000	<500	33,000	50,000	7,900	41,000	2,900	ND	--	--
	Oct-92	490,000	--	51,000	59,000	5,000	27,000	1,300	--	--	--
	Nov-92	320,000	4,600	35,000	43,000	4,200	22,000	1,600	ND	--	--
	Apr-93	270,000	25,000	50,000	58,000	4,600	25,000	1,800	ND	--	--
	Jul-93	FP	--	--	--	--	--	--	--	--	--
	Nov-93	FP	--	--	--	--	--	--	--	--	--
	Aug-95	FP	--	--	--	--	--	--	--	10	2,4-dichlorophenol (1,700) napthalene (1,200) 2-methylnapthalene (630) bis (2-ethylhexyl) phthalate (240)
MW-2	Mar-91	<50	<50	<0.5	<0.5	<0.5	<0.5	ND	ND	--	--
	Nov-92	<50	<50	<0.5	1.1	<0.5	1.5	<1	ND	--	--
	Apr-93	<50	870	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Jul-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Nov-93	<50	240	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Aug-95	<50	150*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--

Table 1.
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS

Well	Event Date	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l	Oil & Grease mg/l	Semi-volatile Compounds ug/l
MW-3	Mar-91	<50	<50	<50	0.6	<0.5	<0.5	ND	ND	--	--
	Nov-92	50	160	<0.5	0.9	<0.5	2	<1	ND	--	--
	Apr-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Jul-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Nov-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Aug-95	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
MW-4	Mar-91	150,000	<500	20,000	38,000	2,800	14,000	610	ND	--	--
	Oct-92	230,000	--	15,000	32,000	2,500	14,000	430	--	--	--
	Nov-92	210,000	1,600	14,000	31,000	2,500	14,000	500	ND	--	--
	Apr-93	FP	--	--	--	--	--	--	--	--	--
	Jul-93	FP	--	--	--	--	--	--	--	--	--
	Nov-93	FP	--	--	--	--	--	--	--	--	--
	Aug-95	FP	--	--	--	--	--	--	--	--	--
MW-5	Mar-91	<50	<50	<0.5	<0.5	<0.5	<0.5	ND	ND	--	--
	Nov-92	<50	50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Apr-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Jul-93	<50	190	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Nov-93	<50	170	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Aug-95	<50	180*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--

Table 1.
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS

Well	Event Date	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l	Oil & Grease mg/l	Semi-volatile Compounds ug/l
MW-6	Mar-91	80,000	<50	12,000	13,000	1,100	5,400	1,400	Dibromochloro-methane (160)	--	--
	Oct-92	19,000	--	3,200	1,400	200	560	840	--	--	--
	Dec-92	FP	--	--	--	--	--	--	--	--	--
	Apr-93	FP	--	--	--	--	--	--	--	--	--
	Jul-93	FP	--	--	--	--	--	--	--	--	--
	Nov-93	FP	--	--	--	--	--	--	--	--	--
MW-7	Mar-91	<50	<50	<0.5	<0.5	<0.5	<0.5	ND	ND	--	--
	Nov-92	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Apr-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Jul-93	<50	150	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Nov-93	<50	200	<0.5	1	<0.5	1.7	<1	ND	--	--
	Aug-95	<50	170*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--
MW-8	Oct-92	70	--	20	1	1	3	210	--	--	--
	Nov-92	<50	170	<0.5	<0.5	<0.5	<0.5	200	ND	--	--
	Apr-93	490	100	15	45	5.1	73	210	ND	--	--
	Jul-93	180	90	2.5	3	<0.5	1.9	350	ND	--	--
	Nov-93	310	170	23	<0.5	<0.5	<0.5	240	ND	--	--
	Aug-95	660	240*	360	6.8	13	2.8	130	--	--	--

Table 1.
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS

Well	Event Date	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l	Oil & Grease mg/l	Semi-volatile Compounds ug/l
MW-9	Nov-92	19,000	320	180	590	23	2000	340	Chloroform (15)	--	--
	Apr-93	2,300	920	48	4	0.6	13	600	Chloroform (2)	--	--
	Jul-93	2,300	450	170	8.1	15	<0.5	1100	ND	--	--
	Nov-93	4,400	450	69	7.3	21	9.7	900	ND	--	--
	Aug-95	3,200	680	3,900	49	80	22.8	960	--	--	--
MW-10	Oct-92	28,000	--	2,700	3,800	210	1,300	150	--	--	--
	Nov-92	130,000	1,300	9,700	19,000	1,400	8,400	370	ND	--	--
	Apr-93	63,000	5,000	6,300	14,000	1,100	7,500	70	ND	--	--
	Jul-93	140,000	20,000	16,000	31,000	2,200	13,000	700	ND	--	--
	Aug-95	92,000	5,900	13,000	24,000	1,800	9,100	300	--	--	--
MW-11	Nov-92	<50	220	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Dec-92	<50	140	<0.1	<0.1	<0.1	<0.1	--	--	--	--
	Dec-92	<50	120	<0.5	<0.5	<0.5	<0.5	--	--	--	--
	Apr-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Jul-93	160	150	<0.5	1.8	<0.5	<0.5	<1	ND	--	--
	Nov-93	80	60	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Aug-95	<50	240*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--

Table 1.
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS

Well	Event Date	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l	Oil & Grease mg/l	Semi-volatile Compounds ug/l
MW-13	Nov-92	<50	3,600	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Dec-92	<50	210	<0.1	<0.1	<0.1	<0.1	--	--	--	--
	Dec-92	<50	100	<0.5	<0.5	<0.5	<0.5	--	--	--	--
	Apr-93	<50	<50	<0.5	0.9	<0.5	<0.5	<1	ND	--	--
	Jul-93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Nov-93	<50	160	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--
	Aug-95	<50	~~<50~~	49	<0.5	<0.5	<0.5	3.6	--	--	--

ug/l = micrograms per liter = parts per billion = ppb
MW-1 was initially referred to as Sample 5
ND = None detected, chemicals not present at concentrations above detection limits reported on laboratory test reports
TVH = Total Volatile Hydrocarbons
TEH = Total Extractable Hydrocarbons
BTEX = Benzene, Toulene, Ethylbenzene, Xylenes
* = Suspect laboratory contamination contributing to test result.
1,2-DCA = 1,2-Dichloroethane
<0.5 = Chemical not present at a concentration in excess of detection limit shown
-- = Test not requested
FP = Free product encountered in well

Table 2.
SUMMARY OF CONTAMINANT CONCENTRATIONS
GRAB GROUNDWATER SAMPLES FROM BORING AND CPT HOLES
OCTOBER 1992

	TVH ug/l	TEH ug/l	B ug/l	T ug/l	E ug/l	X ug/l	1,2-DCA ug/l	Other Purgeable Halocarbons ug/l
B-12 (CPT17)	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND
CPT 1	490	-	20	60	10	60	1	-
CPT 3	50	-	<0.4	<0.4	3	3	<4	-
CPT 4	1,100	-	60	50	80	15	110	-
CPT 5	600,000	-	2,300	53,000	8,000	43,000	730	-
CPT 7	1,700,000	-	40,000	120,000	25,000	120,000	2,900	-
CPT 9	2,100,000	-	49,000	140,000	28,000	145,000	620	-
CPT 10	190,000	-	13,000	16,000	3,900	18,000	1,400	-
CPT 11	2,000	-	200	50	30	70	11	-
CPT 12	130,000	-	4,100	10,000	2,600	10,000	9	-
CPT 13 (MW-10)	28,000	-	2,700	3,800	210	1,300	150	-

ug/l = micrograms per liter = parts per billion = ppb
ND = None detected, chemicals not present at concentrations above detection limits reported on laboratory test reports
TVH = Total Volatile Hydrocarbons
TEH = Total Extractable Hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
1,2-DCA = 1,2-Dichloroethane
<50 = Chemical not present at a concentration in excess of detection limit shown
- = Test not requested
Note: CPT 2, 6, 8, 14, 15 and 16 were not sampled

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-1	94.48	10/3/90	26.40	68.08		
		3/5/91	27.46	67.02		
		3/18/91	26.88	67.60		
		4/12/91	25.49	68.99		
		12/23/91	26.86	67.62	1.15	68.77
		12/26/91	26.08	68.40	0.22	68.63
		1/13/92	26.53	67.95	0.66	68.61
		2/28/92	27.75	66.73	0.42	67.15
		5/18/92	24.75	69.73		
		6/29/92	25.09	69.39	0.04	69.43
		7/29/92	25.46	69.02	0.15	69.17
		8/28/92	25.56	68.92	0.29	69.21
		10/28/92	26.44	68.04		
		11/24/92	26.63	67.85		
		12/22/92	26.37	68.11		
		4/5/93	23.77	70.71		
		7/20/93	24.51	69.97	0.60	70.57
		11/9/93	26.06	68.42	1.17	69.59
		8/30/95	21.73	72.75	0.23	72.98
		9/15/95	21.88	72.61	0.15	72.75
MW-2	94.81	3/5/91	27.86	66.95		
		3/18/91	27.46	67.35		
		4/12/91	26.98	67.83		
		5/18/92	26.50	68.31		
		6/29/92	26.80	68.01		
		7/29/92	27.08	67.73		
		8/28/92	27.33	67.48		
		10/28/92	27.65	67.16		
		11/24/92	27.91	66.90		
		12/22/92	27.74	67.07		
		4/5/93	25.95	68.86		
		7/20/93	25.59	69.22		

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
		11/9/93	26.72	68.09		
		8/30/95	25.75	69.06		
MW-3	90.08	3/6/91	23.17	66.91		
		3/18/91	22.76	67.32		
		4/12/91	22.51	67.57		
		5/12/92	23.17	66.91		
		6/29/92	22.90	67.18		
		7/29/92	22.17	67.91		
		8/28/92	22.28	67.80		
		10/28/92	22.67	67.41		
		11/24/92	23.01	67.07		
		12/22/92	22.91	67.17		
		4/5/93	22.11	67.97		
		7/20/93	23.93	66.15		
		11/9/93	23.14	66.94		
		8/29/95	20.61	69.47		
MW-4	88.84	3/5/91	23.79	65.05		
		3/18/91	22.30	66.54		
		4/12/91	21.85	66.99		
		12/23/91	22.63	66.22	0.98	67.19
		12/26/91	22.52	66.32	0.96	67.28
		1/10/92	22.74	66.10	0.99	67.09
		2/28/92	22.00	66.84	0.67	67.51
		3/11/92	21.71	67.13	0.55	67.68
		3/13/92	21.56	67.28	0.49	67.77
		3/17/92	25.46	63.38	0.44	63.82
		3/18/92	21.38	67.47	0.44	67.90
		3/19/92	21.33	67.51	0.48	67.99
		3/23/92	21.29	67.55	0.42	67.97
		3/24/92	21.31	67.53	0.38	67.90
		3/25/92	21.17	67.67	0.36	68.04

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
		3/26/92	21.08	67.76	0.35	68.11
		3/27/92	20.92	67.92	0.26	68.18
		3/31/92	21.15	67.69	0.44	68.13
		4/1/92	20.90	67.94	0.24	68.18
		4/2/92	20.90	67.94	0.17	68.11
		4/10/92	20.91	67.93	0.33	68.26
		4/13/92	21.04	67.80	0.42	68.22
		4/20/92	20.74	68.10	0.19	68.29
		5/4/92	20.83	68.01	0.33	68.34
		5/18/92	21.33	67.51	0.23	67.74
		5/26/92	20.83	68.01	0.17	68.18
		6/1/92	20.85	67.99	0.19	68.17
		6/29/92	21.38	67.46	0.53	67.99
		7/29/92	21.69	67.15	0.56	67.71
		8/28/92	21.35	67.49	0.63	68.12
		10/28/92	22.48	66.36		
		11/24/92	22.60	66.24		
		12/22/92	22.47	66.37		
		4/3/93	20.11	68.73		
		7/20/93	20.48	68.36	0.52	68.88
		11/9/93	21.71	67.13	0.63	67.76
		8/30/95	19.90	68.94	2.20	71.14
		9/15/95	18.76	70.08	0.57	70.65
MW-5	84.84	3/18/91	26.31	58.53		
		3/12/91	26.41	58.43		
		5/18/92	26.75	58.09		
		6/29/92	26.73	58.11		
		7/29/92	26.66	58.18		
		8/28/92	26.90	57.94		
		10/28/92	26.39	58.45		
		11/24/92	26.83	58.01		
		12/22/92	27.33	57.51		

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
		4/3/93	26.62	58.22		
		7/20/93	26.60	58.24		
		11/9/93	27.24	57.60		
		8/30/95	27.46	57.38		
MW-6	85.62	3/18/91	25.82	59.80		
		4/12/91	27.23	58.39		
		12/23/91	28.40	57.22	3.21	60.44
		12/26/91	27.25	58.37	1.67	60.04
		1/10/92	27.23	58.39	0.90	59.29
		2/4/92	27.71	57.91	2.04	59.95
		2/28/92	27.92	57.70	3.00	60.70
		3/10/92	27.16	58.46	2.06	60.53
		3/12/92	25.96	59.66	0.52	60.18
		3/13/92	25.70	59.92	0.21	60.13
		3/23/92	26.34	59.28	1.09	60.37
		3/30/92	25.73	59.89	0.35	60.25
		4/10/92	25.29	60.33	0.05	60.38
		4/13/92	25.52	60.10	0.21	60.31
		4/20/92	25.38	60.25	0.10	60.35
		5/4/92	25.40	60.22		
		5/18/92	25.50	60.12	0.17	60.29
		5/26/92	25.46	60.16	0.13	60.29
		6/1/92	25.46	60.16	0.09	60.26
		6/29/92	25.59	60.03	0.14	60.17
		7/29/92	26.90	58.72	1.71	60.43
		8/28/92	25.09	60.53	2.62	63.15
		10/28/92	25.02	60.60		
		11/24/92	28.87	56.75		
		7/20/93	26.17	59.45		
		11/9/93	27.51	58.11	3.06	61.17
		8/30/95	28.00	57.62	7.96	65.58
		9/15/95	28.24	57.38	6.14	63.52

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-7	85.41	3/18/91	21.63	63.78		
		4/12/91	22.13	63.28		
		5/18/92	21.67	63.74		
		6/29/92	20.75	64.66		
		7/29/92	21.07	64.34		
		8/28/92	21.35	64.06		
		10/28/92	21.81	63.60		
		11/24/92	21.52	63.89		
		12/22/92	obstructed	-		
		4/3/93	20.08	65.33		
		7/20/93	19.59	65.82		
		11/9/93	20.65	64.76		
		8/30/95	18.78	66.63		
MW-8	85.50	10/28/92	27.70	57.80		
		11/24/92	27.62	57.88		
		12/22/92	27.40	58.10		
		4/3/93	26.64	58.86		
		7/20/93	26.60	58.90		
		11/9/93	27.18	58.32		
		8/30/95	26.35	59.15		
MW-9	90.37	10/28/92	23.37	67.00		
		11/24/92	23.51	66.86		
		12/22/92	23.31	67.06		
		4/3/93	21.14	69.23		
		7/20/93	21.54	68.83		
		11/9/93	27.53	62.84		
		8/30/95	19.59	70.78		
MW-10	88.60	10/28/92	21.55	67.05		
		11/24/92	21.86	66.74		

Table 3
GROUNDWATER AND FREE PRODUCT ELEVATION DATA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
		12/22/92	21.68	66.92		
		4/3/93	19.14	69.46		
		7/20/93	19.79	68.81		
		11/9/93	20.83	67.77		
		8/30/95	17.99	70.61		
MW-11	102.06	11/24/92	33.65	68.41		
		12/22/92	33.37	68.69		
		4/5/93	31.03	71.03		
		7/20/93	31.90	70.16		
		11/9/93	32.60	69.46		
		8/29/95	28.92	73.14		
MW-13	84.06	11/24/92	26.05	58.01		
		12/22/92	25.08	58.98		
		4/5/93	24.64	59.42		
		7/20/93	24.29	59.77		
		11/9/93	24.23	59.83		
		8/29/95	23.30	60.76		

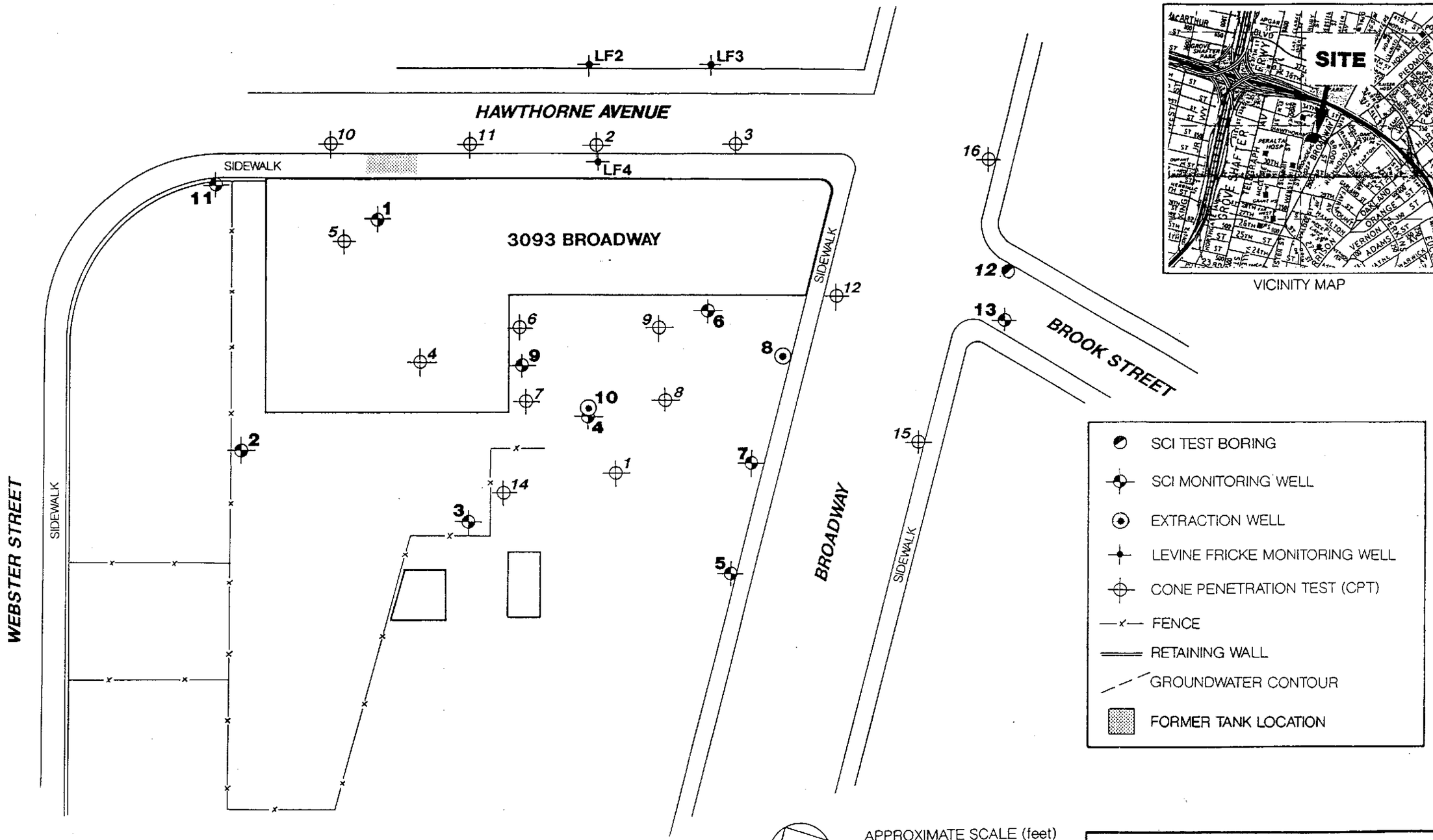
Reference datum: arbitrary benchmark established by Levine Fricke.
TOC = Top of casing
Groundwater depths are measured below TOC.

Table 4
FREE PRODUCT RECOVERY

Well	Pumping Date	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-1	12/23/91	2.0	2.0
	12/26/91	0.5	2.5
	1/13/92	1.0	3.5
	2/28/92	2.0	5.5
	11/9/93	0.5	6.0
MW-4	12/23/91	2.5	2.5
	12/26/91	6.0	8.5
	1/10/92	5.0	13.5
	2/28/92	4.0	17.5
	3/11/92	3.5	21.0
	3/13/92	3.5	24.5
	3/17/92	2.25	26.75
	3/18/92	2.5	29.25
	3/19/92	1.5	30.75
	3/23/92	4.0	34.75
	3/24/92	1.5	36.25
	3/25/92	1.0	37.25
	3/26/92	1.0	38.25
	3/27/92	0.5	38.75
	3/31/92	0.5	39.25
	4/1/92	0.25	39.50
	4/2/92	0.13	39.63
	4/6/92	0.13	39.76
	4/10/92	0.25	40.01
	4/13/92	0.25	40.26
	4/20/92	0.13	40.39
	5/4/92	0.13	40.52
	5/18/92	0.13	40.65
	5/26/92	0.13	40.78
	6/1/92	0.06	40.84
	6/29/92	0.25	41.09
	7/29/92	1.11	42.20
	8/28/92	1.68	43.88
	4/3/93	0.13	44.01
	11/9/93	0.03	44.04
	8/30/95	1.75	45.79

Table 4
FREE PRODUCT RECOVERY

Well	Pumping Date	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-6	12/23/91	7.5	7.5
	12/26/91	2.0	9.5
	1/10/92	1.0	10.5
	2/4/92	2.0	12.5
	2/28/92	3.0	15.5
	3/10/92	2.75	18.25
	3/12/92	2.0	20.25
	3/23/92	1.0	21.25
	3/30/92	0.5	21.75
	4/10/92	0.25	22.00
	4/13/92	0.13	22.13
	4/20/92	0.13	22.26
	5/4/92	0.13	22.39
	5/8/92	0.06	22.45
	5/26/92	0.13	22.58
	6/1/92	0.06	22.64
	6/29/92	0.19	22.83
	7/29/92	0.6	23.43
	8/28/92	2.4	25.83
	12/2/92	(obstruction in well)	
	4/3/93	1.75	27.58
	11/9/93	0.83	28.41
	8/30/95	4.5	32.91



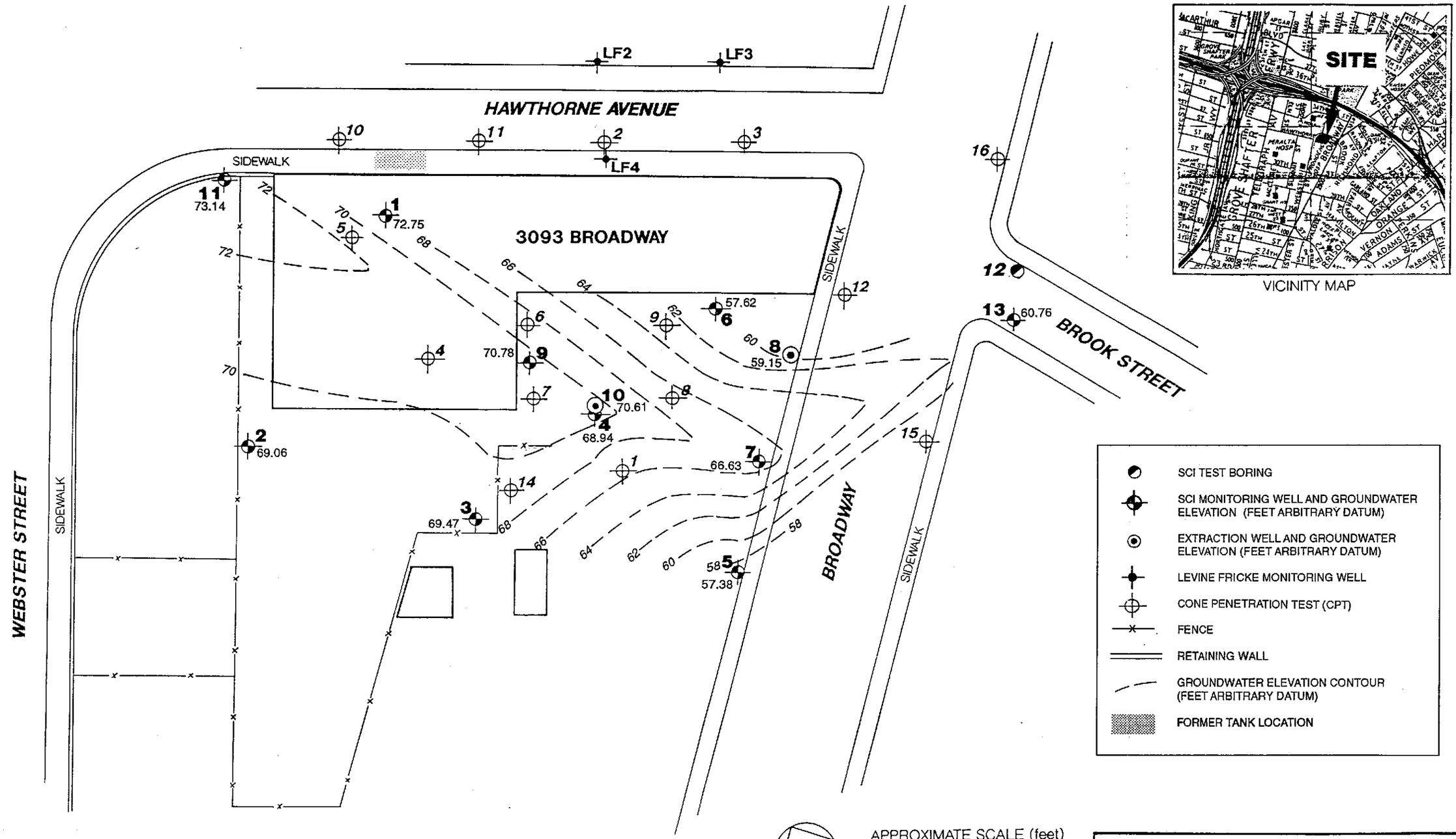
SITE PLAN

Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.055	9/14/95	

PLATE 1



VICINITY MAP

- SCI TEST BORING
- SCI MONITORING WELL AND GROUNDWATER ELEVATION (FEET ARBITRARY DATUM)
- EXTRACTION WELL AND GROUNDWATER ELEVATION (FEET ARBITRARY DATUM)
- LEVINE FRICKE MONITORING WELL
- CONE PENETRATION TEST (CPT)
- FENCE
- RETAINING WALL
- GROUNDWATER ELEVATION CONTOUR (FEET ARBITRARY DATUM)
- FORMER TANK LOCATION

NOTE: GROUNDWATER DATA ELEVATIONS FOR MW-1, MW-4 ANDMW-6 WERE NOT USED IN ESTIMATING GROUNDWATER SURFACE DUE TO THE PRESENCE OF FLOATING PRODUCT IN THE WELLS.

APPROXIMATE SCALE (feet)
0 60 120

GROUNDWATER SURFACE ELEVATION CONTOURS AUGUST 29-30, 1995

Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER 447.055 | DATE 9/14/95 | APPROVED

PLATE 2

GROUNDWATER DEPTHS

Project Name: Connell Olds

Job No.: 447.055

Measured by: DWA

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	8/~~29~~30/95	0900	21' 8¾"	21'6" to top of product (2¾" of product)
MW-2	8/29	12:40	25.75	no product
MW-3	8/29	12:25	20.61	no product
MW-4	8/30	0815	19' 10¾"	17'8⅜" to top of product (2' 2⅜" product) 1¾ gals bailed
MW-5	8/30	0740	27.46	no product
MW-6	8/30	0930	28.00	22' ½" to top of product (7' 11½" product) 4½ gals bailed
MW-7	8/30	0730	18.78	no product
MW-8	8/30	0750	26.35	no product
MW-9	8/30	0845	19.59	no product
MW-10	8/30	0830	17.99	no product
MW-11	8/29	12:55	28.92	no product
MW-13	8/29	13:25	23.30	no product

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-1
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/30/95
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 35.00 feet
Depth to Groundwater (below TOC) 21.87 feet
Feet of Water in Well 13.13 feet
Depth to Groundwater When 80% Recovered 24.50' feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.1 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder Other
Free Product product observed (2 3/4") no visible when bailed
Purge Method disposable bailer

moderate recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	7.99	71.2	1350		murky / product odor
4	7.57	68.1	1330		semi-clear
6	7.28	67.2	1270		↓
8	6.96	67.1	1310		clear

Total Gallons Purged 8 gallons
Depth to Groundwater Before Sampling (below TOC) ~~24.50'~~ 22.90 feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) 3 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

WELL SAMPLING FORM

Project Name: Connell olds
Well Number: MW-2
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/30/95
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 39.50 feet
Depth to Groundwater (below TOC) 25.75 feet
Feet of Water in Well 13.75 feet
Depth to Groundwater When 80% Recovered 28.50 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.24 gallons
Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

fast recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	8.09	77.7	650		semi-clear/no odor
3	7.96	74.6	510		murky
5	7.76	73.2	535		
7	7.65	73.0	495		

Total Gallons Purged 7 gallons
Depth to Groundwater Before Sampling (below TOC) 28.50' feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-3
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/31/95
TOC Elevation:
Weather: foggy/sunny

Depth to Casing Bottom (below TOC) 34.00 feet
Depth to Groundwater (below TOC) 20.61 feet
Feet of Water in Well 13.39 feet
Depth to Groundwater When 80% Recovered 23.29 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.19 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

moderate recharge

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.61	65.6	700		murky/no odor
3	7.47	66.4	745		semi-clear
5	7.41	66.0	720		
7	7.31	66.3	770		

Total Gallons Purged 7 gallons
Depth to Groundwater Before Sampling (below TOC) 23.29' feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-5
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/31/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 34.00 feet
Depth to Groundwater (below TOC) 27.46 feet
Feet of Water in Well 6.54 feet
Depth to Groundwater When 80% Recovered 28.77 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.1 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

immediate recharge

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.66	64.3	640		semi-clear/no odor
2	7.57	65.4	630		↓
3	7.45	65.2	640		murky
4	7.33	65.9	665		↓

Total Gallons Purged 4 gallons
Depth to Groundwater Before Sampling (below TOC) 27.46 feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-7
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/31/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 30.00 feet
Depth to Groundwater (below TOC) 18.78 feet
Feet of Water in Well 11.22 feet
Depth to Groundwater When 80% Recovered 21.02 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.8 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer
fast Recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	6.87	63.0	365		clear/no odor
2	7.84	63.5	520		murky
4	7.57	64.2	710		
6	7.47	64.3	670		

Total Gallons Purged 6 gallons
Depth to Groundwater Before Sampling (below TOC) 21.00' feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-8
Job No.: 447.055
Well Casing Diameter: 6 inch
Sampled By: DWA
Date: 9/1/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 39.50 feet
Depth to Groundwater (below TOC) 26.35 feet
Feet of Water in Well 13.15 feet
Depth to Groundwater When 80% Recovered 28.98 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 19.3 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method pump

moderate recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
10	8.35	65.7	850		clear/strong odor
20	8.10	66.4	850		
30	7.77	66.4	850		murky decreasing odor
40	7.74	65.8	900		DRY@35 gals. let recharge
50	7.58	66.5	900		

Total Gallons Purged 60 gallons
Depth to Groundwater Before Sampling (below TOC) 28.98 feet
Sampling Method ~~pump~~ disposable bailer
Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: ~~MW-9~~ MW-9

Job No.: 447.055
Well Casing Diameter: 2 inch

Sampled By: DWA
Date: 8/31/95

TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 30.50 feet

Depth to Groundwater (below TOC) 19.59 feet

Feet of Water in Well 10.91 feet

Depth to Groundwater When 80% Recovered 21.77 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.8 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

moderate/slow recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	7.95	71.4	720		clear/slight odor
2	7.48	73.0	820		murky/increasing odor
4	7.23	72.7	670		dry @ 4 gals
6	7.58	72.9	730		

Total Gallons Purged 6 gallons

Depth to Groundwater Before Sampling (below TOC) 21.77' feet

Sampling Method disposable bailer

Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Oils | Well Number: MW-10

Job No.: 447.056 | Well Casing Diameter: 6 inch

Sampled By: DWA | Date: 9/1/95

TOC Elevation: | Weather: foggy

Depth to Casing Bottom (below TOC) 34.50 feet

Depth to Groundwater (below TOC) 17.99 feet

Feet of Water in Well 16.51 feet

Depth to Groundwater When 80% Recovered 21.29 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 24.3 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product none

Purge Method ~~disposable bailer~~ pump

fast recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
15	7.69	66.8	660		murky/strong odor @ first; semi-clear/moderate odor
30	7.48	66.9	710		clear
45	7.40	67.1	800		
60	7.34	66.5	820		
75	7.69	67.1	800		

Total Gallons Purged 75 gallons

Depth to Groundwater Before Sampling (below TOC) 17.99 feet

Sampling Method pump

Containers Used 4 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Conwell Olds | Well Number: MW-11

Job No.: 447.055 | Well Casing Diameter: 2 inch

Sampled By: DWA | Date: 8/30/95

TOC Elevation: | Weather: Sunny

Depth to Casing Bottom (below TOC) 37.00 feet

Depth to Groundwater (below TOC) 28.92 feet

Feet of Water in Well 8.08 feet

Depth to Groundwater When 80% Recovered 30.54 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.3 gallons

Depth Measurement Method (Tape & Paste) (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

fast recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.61	75.1	1240		murky/no odor
2	7.66	70.9	1140		
3	7.50	70.0	1160		
4	7.49	70.2	1190		

Total Gallons Purged 4 gallons

Depth to Groundwater Before Sampling (below TOC) 29.00 feet

Sampling Method disposable bailer

Containers Used 4 (40 ml) | 1 (liter) | (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-13
Job No.: 447.055
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 8/30/95
TOC Elevation:
Weather: ~~Sunny~~ foggy

Depth to Casing Bottom (below TOC) 40.00 feet
Depth to Groundwater (below TOC) 23.30 feet
Feet of Water in Well 16.70 feet
Depth to Groundwater When 80% Recovered 26.64 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.73 gallons
Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer fast Recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	8.04	61.8	575		clear/no odor
4	7.78	63.0	595		↓
6	7.64	62.9	575		murky
8	7.52	63.5	570		↓

Total Gallons Purged 8 gallons
Depth to Groundwater Before Sampling (below TOC) 26.60 feet
Sampling Method disposable bailer
Containers Used 4 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 122458
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 08/30/95
DATE RECEIVED: 09/01/95
DATE ANALYZED: 09/02-03/95
DATE REPORTED: 09/16/95
BATCH NO: 23047

ANALYSIS: HALOGENATED VOLATILE ORGANICS-(1,2-DICHLOROETHANE)
ANALYSIS METHOD: EPA 8010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
122458-002	MW-2	ND	ug/L	1.0
122458-003	MW-3	ND	ug/L	1.0
122458-004	MW-5	ND	ug/L	1.0
122458-005	MW-7	ND	ug/L	1.0
122458-009	MW-11	ND	ug/L	1.0
METHOD BLANK	N/A	ND	ug/L	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	1
RECOVERY, %	119

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 122458
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 08/30/95
DATE RECEIVED: 09/01/95
DATE ANALYZED: 09/05/95
DATE REPORTED: 09/16/95
BATCH NO: 23060

ANALYSIS: HALOGENATED VOLATILE ORGANICS-(1,2-DICHLOROETHANE)
ANALYSIS METHOD: EPA 8010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
122458-006	MW-8	130	ug/L	2.0
122458-007	MW-9	960	ug/L	14
122458-008	MW-10	300	ug/L	5.0
METHOD BLANK	N/A	ND	ug/L	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	<1
RECOVERY, %	114

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 122458
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 08/30/95
DATE RECEIVED: 09/01/95
DATE ANALYZED: 09/08/95
DATE REPORTED: 09/16/95
BATCH NO: 23147

ANALYSIS: HALOGENATED VOLATILE ORGANICS-(1,2-DICHLOROETHANE)
ANALYSIS METHOD: EPA 8010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
122458-010	MW-13	3.6	ug/L	1.0
METHOD BLANK	N/A	ND	ug/L	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: BS/BSD

RPD, %	1
RECOVERY, %	115

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 122458

Project Name: Connell Olds
Project Number: 447.055

Report Date: 16 September 95

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD:** SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
122458-001	MW-1	Water	30-AUG-95	01-SEP-95	05-SEP-95	10.	mg/L	5	TR	23087

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: Connell Olds
Project Number: 447.055

Laboratory Login Number: 122458
Report Date: 16 September 95

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 23087**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	85%	SMWW 17:5520BF	05-SEP-95
BSD	83%	SMWW 17:5520BF	05-SEP-95

		Control Limits
Average Spike Recovery	84%	80% - 120%
Relative Percent Difference	2.6%	< 20%

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-002	MW-2	23123	08/30/95	09/07/95	09/07/95	
122458-003	MW-3	23123	08/31/95	09/07/95	09/07/95	
122458-004	MW-5	23123	08/31/95	09/07/95	09/07/95	
122458-005	MW-7	23123	08/31/95	09/07/95	09/07/95	

Analyte Diln Fac:	Units	122458-002 1	122458-003 1	122458-004 1	122458-005 1
Gasoline C4-C12	ug/L	<50	<50	<50	<50
Surrogate					
Trifluorotoluene	%REC	92	93	91	91
Bromobenzene	%REC	90	94	91	89

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-006	MW-8	23123	09/01/95	09/07/95	09/07/95	
122458-007	MW-9	23123	08/31/95	09/07/95	09/07/95	
122458-008	MW-10	23130	09/01/95	09/07/95	09/07/95	
122458-009	MW-11	23130	08/30/95	09/07/95	09/07/95	

Analyte Diln Fac:	Units	122458-006 1	122458-007 1	122458-008 25	122458-009 1
Gasoline C4-C12	ug/L	660	3200	92000	<50
Surrogate					
Trifluorotoluene	%REC	92	92	114	112
Bromobenzene	%REC	94	119	108	96

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-010	MW-13	23198	08/31/95	09/12/95	09/12/95	

Analyte	Units	122458-010
Diln Fac:		1
Gasoline C4-C12	ug/L	<50
Surrogate		
Trifluorotoluene	%REC	98
Bromobenzene	%REC	95

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

METHOD BLANK

Matrix: Water
Batch#: 23123
Units: ug/L
Diln Fac: 1

Prep Date: 09/07/95
Analysis Date: 09/07/95

MB Lab ID: QC03492

Analyte	Result
Gasoline C4-C12	<50

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	92	65-135
Bromobenzene	88	65-135

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	CA LUFT (EPA 8015M)
Project#:	447.055	Prep Method:	EPA 5030
Location:	Connell Olds		

METHOD BLANK

Matrix:	Water	Prep Date:	09/07/95
Batch#:	23130	Analysis Date:	09/07/95
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC03527

Analyte	Result	
Gasoline C4-C12	<50	
Surrogate	**%Rec**	**Recovery Limits**
Trifluorotoluene	113	65-135
Bromobenzene	97	65-135

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

METHOD BLANK

Matrix: Water
Batch#: 23198
Units: ug/L
Diln Fac: 1

Prep Date: 09/12/95
Analysis Date: 09/12/95

MB Lab ID: QC03822

Analyte	Result	
Gasoline C4-C12	<50	
Surrogate	**%Rec**	**Recovery Limits**
Trifluorotoluene	92	65-135
Bromobenzene	88	65-135

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT Page 1 of 1

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ
Lab ID: 122442-001
Matrix: Water
Batch#: 23123
Units: ug/L
Diln Fac: 1

Sample Date: 08/29/95
Received Date: 08/31/95
Prep Date: 09/07/95
Analysis Date: 09/07/95

MS Lab ID: QC03493

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C4-C12	2006	<50.00	1982	99	75-125

Surrogate	%Rec	Limits
Trifluorotoluene	103	65-135
Bromobenzene	106	65-135

MSD Lab ID: QC03494

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C4-C12	2006	1952	97	75-125	2	<35

Surrogate	%Rec	Limits
Trifluorotoluene	102	65-135
Bromobenzene	102	65-135

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

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 23130
Units: ug/L dry weight
Diln Fac: 1

Prep Date: 09/07/95
Analysis Date: 09/07/95
Moisture: 0%

BS Lab ID: QC03528

Analyte	Spike Added	BS	%Rec	#	Limits
Gasoline C4-C12	2006	1859	93		75-125

Surrogate	%Rec	Limits
Trifluorotoluene	105	65-135
Bromobenzene	104	65-135

BSD Lab ID: QC03529

Analyte	Spike Added	BSD	%Rec	#	Limits	RPD	#	Limit
Gasoline C4-C12	2006	1910	95		75-125	0		<35

Surrogate	%Rec	Limits
Trifluorotoluene	105	65-135
Bromobenzene	104	65-135

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

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

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

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ
Lab ID: 122555-001
Matrix: Water
Batch#: 23198
Units: ug/L
Diln Fac: 1

Sample Date: 09/08/95
Received Date: 09/11/95
Prep Date: 09/12/95
Analysis Date: 09/12/95

MS Lab ID: QC03823

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C4-C12	2006	<50.00	2098	105	75-125
Surrogate	**%Rec**	**Limits**			
Trifluorotoluene	96	65-135			
Bromobenzene	95	65-135			

MSD Lab ID: QC03824

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C4-C12	2006	2083	104	75-125	1	<35
Surrogate	**%Rec**	**Limits**				
Trifluorotoluene	99	65-135				
Bromobenzene	97	65-135				

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

Curtis & Tompkins, Ltd.

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-002	MW-2	23123	08/30/95	09/07/95	09/07/95	
122458-003	MW-3	23123	08/31/95	09/07/95	09/07/95	
122458-004	MW-5	23123	08/31/95	09/07/95	09/07/95	
122458-005	MW-7	23123	08/31/95	09/07/95	09/07/95	

Analyte Diln Fac:	Units	122458-002 1	122458-003 1	122458-004 1	122458-005 1
Benzene	ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	94	95	93	92
Bromobenzene	%REC	98	101	98	94

Curtis & Tompkins, Ltd.

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-006	MW-8	23130	09/01/95	09/07/95	09/07/95	
122458-007	MW-9	23130	08/31/95	09/07/95	09/07/95	
122458-008	MW-10	23130	09/01/95	09/07/95	09/07/95	
122458-009	MW-11	23130	08/30/95	09/07/95	09/07/95	

Analyte	Units	122458-006	122458-007	122458-008	122458-009
Diln Fac:		1	1	250	1
Benzene	ug/L	360	3900	13000	<0.5
Toluene	ug/L	6.8	49	24000	<0.5
Ethylbenzene	ug/L	13	80	1800	<0.5
m,p-Xylenes	ug/L	1.9	9.8	6300	<0.5
o-Xylene	ug/L	0.9	13	2800	<0.5
Surrogate					
Trifluorotoluene	%REC	107	108	109	107
Bromobenzene	%REC	108	110	110	108

Curtis & Tompkins, Ltd.

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
122458-010	MW-13	23198	08/31/95	09/12/95	09/12/95	

Analyte	Units	122458-010
Diln Fac:		1
Benzene	ug/L	49
Toluene	ug/L	<0.5
Ethylbenzene	ug/L	<0.5
m,p-Xylenes	ug/L	<0.5
o-Xylene	ug/L	<0.5
Surrogate		
Trifluorotoluene	%REC	102
Bromobenzene	%REC	104

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 23123
Units: ug/L
Diln Fac: 1

Prep Date: 09/07/95
Analysis Date: 09/07/95

MB Lab ID: QC03492

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	94	75-125
Bromobenzene	95	75-125

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 23130
Units: ug/L
Diln Fac: 1

Prep Date: 09/07/95
Analysis Date: 09/07/95

MB Lab ID: QC03527

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	107	75-125
Bromobenzene	109	75-125

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 23198
Units: ug/L
Diln Fac: 1

Prep Date: 09/12/95
Analysis Date: 09/12/95

MB Lab ID: QC03822

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	94	75-125
Bromobenzene	96	75-125

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 23123
Units: ug/L
Diln Fac: 1

Prep Date: 09/07/95
Analysis Date: 09/07/95

LCS Lab ID: QC03491

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	20.3	20	102	85-115
Toluene	19.9	20	100	85-115
Ethylbenzene	20.1	20	101	85-115
m,p-Xylenes	21	20	105	85-115
o-Xylene	19.1	20	96	85-115

Surrogate	%Rec	Limits
Trifluorotoluene	94	75-125
Bromobenzene	94	75-125

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

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 23130
Units: ug/L
Diln Fac: 1

Prep Date: 09/08/95
Analysis Date: 09/08/95

LCS Lab ID: QC03526

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	22.4	20	112	85-115
Toluene	22.5	20	113	85-115
Ethylbenzene	22.2	20	111	85-115
m,p-Xylenes	22.8	20	114	85-115
o-Xylene	21.9	20	110	85-115

Surrogate	%Rec	Limits
Trifluorotoluene	108	75-125
Bromobenzene	110	75-125

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

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: BTXE
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 23198
Units: ug/L
Diln Fac: 1

Prep Date: 09/12/95
Analysis Date: 09/12/95

LCS Lab ID: QC03821

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	18.8	20	94	65-135
Toluene	18.8	20	94	65-135
Ethylbenzene	19.2	20	96	65-135
m,p-Xylenes	19.9	20	100	65-135
o-Xylene	18.2	20	91	65-135

Surrogate	%Rec	Limits
Trifluorotoluene	72	65-135
Bromobenzene	71	65-135

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

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: MW-1
Lab ID: 122458-001
Matrix: Water
Batch#: 23089
Units: ug/L
Diln Fac: 25

Sampled: 08/30/95
Received: 09/01/95
Extracted: 09/05/95
Analyzed: 09/12/95

Analyte	Result	Reporting Limit
Phenol	ND	240
2-Chlorophenol	ND	240
Benzyl alcohol	ND	240
2-Methylphenol	ND	240
4-Methylphenol	ND	240
2-Nitrophenol	ND	1200
2,4-Dimethylphenol	ND	240
Benzoic acid	ND	1200
2,4-Dichlorophenol	1700	240
4-Chloro-3-methylphenol	ND	240
2,4,6-Trichlorophenol	ND	240
2,4,5-Trichlorophenol	ND	1200
2,4-Dinitrophenol	ND	1200
4-Nitrophenol	ND	1200
4,6-Dinitro-2-methylphenol	ND	1200
Pentachlorophenol	ND	1200
N-Nitrosodimethylamine	ND	240
Aniline	ND	240
bis(2-Chloroethyl)ether	ND	240
1,3-Dichlorobenzene	ND	240
1,4-Dichlorobenzene	ND	240
1,2-Dichlorobenzene	ND	240
bis(2-Chloroisopropyl) ether	ND	240
N-Nitroso-di-n-propylamine	ND	240
Hexachloroethane	ND	240
Nitrobenzene	ND	240
Isophorone	ND	240
bis(2-Chloroethoxy)methane	ND	240
1,2,4-Trichlorobenzene	ND	240
Naphthalene	1200	240
4-Chloroaniline	ND	240
Hexachlorobutadiene	ND	240
2-Methylnaphthalene	630	240
Hexachlorocyclopentadiene	ND	240
2-Chloronaphthalene	ND	240
2-Nitroaniline	ND	1200
Dimethylphthalate	ND	240
Acenaphthylene	ND	240

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Field ID:	MW-1	Sampled:	08/30/95
Lab ID:	122458-001	Received:	09/01/95
Matrix:	Water	Extracted:	09/05/95
Batch#:	23089	Analyzed:	09/12/95
Units:	ug/L		
Diln Fac:	25		

Analyte	Result	Reporting Limit
2,6-Dinitrotoluene	ND	240
3-Nitroaniline	ND	1200
Acenaphthene	ND	240
Dibenzofuran	ND	240
2,4-Dinitrotoluene	ND	240
Diethylphthalate	ND	240
4-Chlorophenyl-phenylether	ND	240
Fluorene	ND	240
4-Nitroaniline	ND	1200
N-Nitrosodiphenylamine	ND	240
Azobenzene	ND	240
4-Bromophenyl-phenylether	ND	240
Hexachlorobenzene	ND	240
Phenanthrene	ND	240
Anthracene	ND	240
Di-n-butylphthalate	ND	240
Fluoranthene	ND	240
Pyrene	ND	240
Butylbenzylphthalate	ND	240
3,3'-Dichlorobenzidine	ND	1200
Benzo(a)anthracene	ND	240
Chrysene	ND	240
bis(2-Ethylhexyl)phthalate	240	240
Di-n-octylphthalate	ND	240
Benzo(b)fluoranthene	ND	240
Benzo(k)fluoranthene	ND	240
Benzo(a)pyrene	ND	240
Indeno(1,2,3-cd)pyrene	ND	240
Dibenz(a,h)anthracene	ND	240
Benzo(g,h,i)perylene	ND	240

Surrogate	%Recovery	Recovery Limits
2-Fluorophenol	100	21-110
Phenol-d5	41	10-110
2,4,6-Tribromophenol	95	10-123
Nitrobenzene-d5	90	35-114
2-Fluorobiphenyl	65	43-116
Terphenyl-d14	0	33-141

Curtis & Tompkins, Ltd.

Lab #: 122458 BATCH QC REPORT

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 23089
Units: ug/L
Diln Fac: 1

Prep Date: 09/05/95
Analysis Date: 09/07/95

MB Lab ID: QC03346

Analyte	Result	Reporting Limit
Phenol	ND	10
2-Chlorophenol	ND	10
Benzyl alcohol	ND	10
2-Methylphenol	ND	10
4-Methylphenol	ND	10
2-Nitrophenol	ND	50
2,4-Dimethylphenol	ND	10
Benzoic acid	ND	50
2,4-Dichlorophenol	ND	10
4-Chloro-3-methylphenol	ND	10
2,4,6-Trichlorophenol	ND	10
2,4,5-Trichlorophenol	ND	50
2,4-Dinitrophenol	ND	50
4-Nitrophenol	ND	50
4,6-Dinitro-2-methylphenol	ND	50
Pentachlorophenol	ND	50
N-Nitrosodimethylamine	ND	10
Aniline	ND	10
bis(2-Chloroethyl)ether	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10
bis(2-Chloroisopropyl) ether	ND	10
N-Nitroso-di-n-propylamine	ND	10
Hexachloroethane	ND	10
Nitrobenzene	ND	10
Isophorone	ND	10
bis(2-Chloroethoxy)methane	ND	10
1,2,4-Trichlorobenzene	ND	10
Naphthalene	ND	10
4-Chloroaniline	ND	10
Hexachlorobutadiene	ND	10
2-Methylnaphthalene	ND	10
Hexachlorocyclopentadiene	ND	10
2-Chloronaphthalene	ND	10
2-Nitroaniline	ND	50
Dimethylphthalate	ND	10
Acenaphthylene	ND	10
2,6-Dinitrotoluene	ND	10
3-Nitroaniline	ND	50

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 23089
Units: ug/L
Diln Fac: 1

Prep Date: 09/05/95
Analysis Date: 09/07/95

MB Lab ID: QC03346

Analyte	Result	Reporting Limit
Acenaphthene	ND	10
Dibenzofuran	ND	10
2,4-Dinitrotoluene	ND	10
Diethylphthalate	ND	10
4-Chlorophenyl-phenylether	ND	10
Fluorene	ND	10
4-Nitroaniline	ND	50
N-Nitrosodiphenylamine	ND	10
Azobenzene	ND	10
4-Bromophenyl-phenylether	ND	10
Hexachlorobenzene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Di-n-butylphthalate	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Butylbenzylphthalate	ND	10
3,3'-Dichlorobenzidine	ND	50
Benzo(a)anthracene	ND	10
Chrysene	ND	10
bis(2-Ethylhexyl)phthalate	ND	10
Di-n-octylphthalate	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Rec	Recovery Limits
2-Fluorophenol	18	21-110
Phenol-d5	41	10-110
2,4,6-Tribromophenol	63	10-123
Nitrobenzene-d5	49	35-114
2-Fluorobiphenyl	53	43-116
Terphenyl-d14	66	33-141

Curtis & Tompkins, Ltd.

Lab #: 122458

BATCH QC REPORT

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 23089
Units: ug/L
Diln Fac: 1

Prep Date: 09/05/95
Analysis Date: 09/07/95

BS Lab ID: QC03347

Analyte	Spike Added	BS	%Rec	#	Limits
Phenol	100	34.16	34		12-110
2-Chlorophenol	100	40.43	40		27-123
4-Chloro-3-methylphenol	100	46.77	47		23-97
4-Nitrophenol	100	59.02	59		10-80
Pentachlorophenol	100	45.9	46		9-103
1,4-Dichlorobenzene	50	20.8	42		36-97
N-Nitroso-di-n-propylamine	50	32.25	64		41-116
1,2,4-Trichlorobenzene	50	21.38	42		39-98
Acenaphthene	50	25.49	50		46-118
2,4-Dinitrotoluene	50	28.7	58		24-96
Pyrene	50	23.99	48		26-127

Surrogate	%Rec	Limits
2-Fluorophenol	15	21-110
Phenol-d5	38	10-110
2,4,6-Tribromophenol	61	10-123
Nitrobenzene-d5	49	35-114
2-Fluorobiphenyl	52	43-116
Terphenyl-d14	60	33-141

BSD Lab ID: QC03348

Analyte	Spike Added	BSD	%Rec	#	Limits	RPD	#	Limit
Phenol	100	31.99	32		12-110	6		<42
2-Chlorophenol	100	38.94	39		27-123	3		<40
4-Chloro-3-methylphenol	100	45.69	46		23-97	2		<42
4-Nitrophenol	100	63.03	63		10-80	7		<50
Pentachlorophenol	100	48.89	49		9-103	6		<50
1,4-Dichlorobenzene	50	20.53	42		36-97	0		<28
N-Nitroso-di-n-propylamine	50	33.32	66		41-116	3		<38
1,2,4-Trichlorobenzene	50	20.67	42		39-98	0		<28
Acenaphthene	50	25.53	52		46-118	4		<31
2,4-Dinitrotoluene	50	29.6	60		24-96	3		<38
Pyrene	50	25	50		26-127	4		<31

Surrogate	%Rec	Limits
2-Fluorophenol	13	21-110
Phenol-d5	35	10-110
2,4,6-Tribromophenol	63	10-123
Nitrobenzene-d5	48	35-114
2-Fluorobiphenyl	51	43-116
Terphenyl-d14	64	33-141

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

CHAIN OF CUSTODY FORM

122458

PROJECT NAME: Connell Olds

JOB NUMBER: 447.055

PROJECT CONTACT: Jeri Alexander

SAMPLED BY: Dennis Alexander

LAB: Curtis & Tompkins

TURNAROUND: Normal

REQUESTED BY: Jeri Alexander

PAGE OF

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR			CONTAINERS: VOA	LITER	PINT	TUBE			METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TEH	TVH/BTXE	DCA	04-G	Semi-Volatiles
-1	MW-1	X							2					X			X		08	30	95	1230						
-2	MW-2	X						4	1					X			X		08	30	95	1445		X	X	X		
-3	MW-3	X						4	1					X			X		08	31	95	1000		X	X	X		
-4	MW-5	X						4	1					X			X		08	31	95	0915		X	X	X		
-5	MW-7	X						4	1					X			X		08	31	95	0830		X	X	X		
-6	MW-8	X						4	1					X			X		09	01	95	1045		X	X	X		
-7	MW-9	X						4	1					X			X		08	31	95	1130		X	X	X		
-8	MW-10	X						4	1					X			X		09	01	95	1215		X	X	X		
-9	MW-11	X						4	1					X			X		08	30	95	1330		X	X	X		
-10	MW-13	X						4	1					X			X		08	31	95	0800		X	X	X		

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Dennis Alexander	9/1/95 2:20 p.m.	Dennis Mone	9/1/95 2:25
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

COMMENTS & NOTES:

Subsurface Consultants, Inc.
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
(510) 268-0461 • FAX: 510-268-0137