

**GROUNDWATER
TECHNOLOGY®**

Groundwater Technology, Inc.

19033 W. Valley Highway, Suite D-104, Kent, WA 98032 USA

**GROUNDWATER MONITORING REPORT
SR 522 and NE 180th Street
RIVERSIDE PROPERTY
BOTHELL, WASHINGTON**


GTI Project 020605033

October 5, 1994

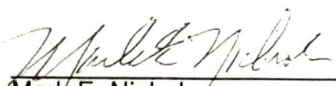
Prepared for:

Mr. Tony Palagyi
Texaco Environmental Services
3400 188th Street Southwest, Suite 630
Lynnwood, WA 98037

Groundwater Technology, Inc.
Submitted by:


Stan Haskins, RG
Lead Geologist

Groundwater Technology, Inc.
Approved by:


Mark E. Nichols
Senior Project Manager/Hydrogeologist

52
4/24/95
CM

DEPARTMENT OF ECOLOGY NWRO/TCP TANK UNIT	
INC # 2241	
INTERIM CLEANUP REPORT	<input type="checkbox"/>
SITE CHARACTERIZATION	<input type="checkbox"/>
FINAL CLEANUP REPORT	<input checked="" type="checkbox"/>
OTHER <u>GW monitoring</u>	<input checked="" type="checkbox"/>
AFFECTED MEDIA: SOIL	<input checked="" type="checkbox"/>
OTHER _____ GW	<input checked="" type="checkbox"/>
INSPECTOR (INIT.) <u>BN</u>	DATE <u>3/24/95</u>



Texaco Refining
and Marketing Inc

3400 188th Street SW
Suite 630
Lynnwood WA 98037

October 10, 1994

RECEIVED
OCT 12 1994
ECOTOLOGY

ENV - THIRD PARTY

Report Transmittal

City of Bothell - Riverside Property

Texaco Location # 63-802-1003

Mr. Roger Nye

Washington Department of Ecology Northwest Region - Toxics Cleanup Program

Mail Stop NB-81

3190-160th Street Avenue SE

Bellevue, WA 98008-5452

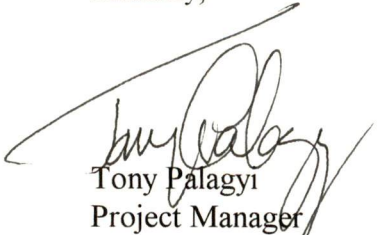
Dear Mr. Nye:

Attached please find a copy of the Groundwater Monitoring Report for the above-captioned location. The report was prepared by Groundwater Technology Inc., Texaco's contractor for this project. The report documents the monitoring and sampling of three groundwater monitoring wells in August 1994. Three additional wells were not sampled due to insufficient amounts of water present in the wells.

Results of the sampling event indicate that concentrations of total petroleum hydrocarbons, btex, and dissolved lead were not encountered above state clean-up goals and in most cases the analytes were not detected. This sampling event was the fourth conducted since July, 1992. The ground water analytical results have remained consistent over the four events. This data suggests that ground water beneath this location has not been impacted by petroleum hydrocarbons above MTCA clean-up goals.

Based on the results of the monitoring events Texaco concurs with GTI's conclusion that "No Further Action" is warranted. Texaco intends to permanently abandon the wells in the near future.

Sincerely,



Tony Palagyi

Project Manager

Texaco Environmental Services

AJP:ajp

P:\ajp\washing\rivermon.doc

Attachment

cc: William Joyce, Esq. - Ogden, Murphy, Wallace

DVWatson-JAWenker-File-UCPFile-PNWRRead

PR: fvs

EXECUTIVE SUMMARY

Groundwater Technology, Inc. conducted groundwater monitoring and sampling at the property located near the intersection of State Route 522 and NE 180th Street in Bothell, Washington, known as the Riverside Property. The work was performed to assess the current groundwater conditions underlying the site with respect to substances regulated under the Washington Department of Ecology (WDOE) Model Toxics Control Act (MTCA). Groundwater Technology personnel gauged the depth to water in six groundwater monitoring wells and collected water samples from three (MW-1, MW-2 and MW-3). The water samples were analyzed for benzene, toluene, ethylbenzene, xylenes, total petroleum hydrocarbons-as-gasoline (TPH-G), TPH, volatile organics, total lead, dissolved lead, and turbidity.

- The apparent groundwater flow direction was toward the west at a gradient of approximately 0.01.
- Analytes tested were not detected above the MTCA Method A Compliance Cleanup Levels.

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1. Location Map
2. Site Plan
3. Groundwater Potentiometric Surface Map

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1. Groundwater Monitoring Data
2. Summary Of Laboratory Results - Groundwater

Appendices

- A. Standard Operating Procedures
- B. Laboratory Analytical Results

1.0 INTRODUCTION

Presented in this report are the worksteps and results associated with groundwater monitoring and sampling conducted for Texaco Refining and Marketing Inc. at the Riverside Property located near the intersection of State Route 522 and NE 180th Street, Bothell, Washington (See Figure 1, Site Location Map). The work was performed to assess the current groundwater conditions with respect to substances regulated under the Washington Department of Ecology (WDOE) Model Toxics Control Act¹ (MTCA). The site is owned by the City of Bothell.

2.0 SCOPE OF WORK

The following outline summarizes the specific worksteps involved:

- Gauged the depth to water in each of the six site groundwater monitoring wells;
- Purged and sampled three (MW-1, MW-2 and MW-3) of the six groundwater monitoring wells;
- Analyzed one water sample from monitoring wells MW-1, MW-2, and MW-3 for benzene, toluene, ethylbenzene, xylenes (BTEX), total petroleum hydrocarbons-as-gasoline (TPH-G), TPH, volatile organics, total lead, dissolved lead, and turbidity;
- Prepared this report summarizing the data and results of analysis.

3.0 WELL MONITORING AND SAMPLING

On August 26, 1994 water levels were measured in groundwater monitoring wells MW-1, MW-1A, MW-2, MW-2A, MW-3, and MW-3A to evaluate groundwater flow direction and gradient. The gradient was approximately 0.01 to the west. Relative groundwater elevations are shown and contoured in Figure 3. Table 1 shows the top of casing relative elevations and relative groundwater elevations in the monitoring wells.

Following groundwater monitoring on October 12, 1993, wells MW-1, MW-2 and MW-3, which are completed in a shallow, apparently confined water-bearing zone, were purged of approximately three well volumes and sampled. The samples were collected in accordance with the Standard Operating Procedures in Appendix A and EPA guidelines. Samples collected were sent to GTEL with a Chain-of-Custody. Wells MW-1A, MW-2A, and MW-3A, which are completed above the site aquitard, were not sampled, due to an insufficient amount of water in the wells. Purged water was treated through two 55-gallon carbon canisters connected in series prior to disposal to the ground.

¹ Washington Department of Ecology (WAC 173-340)

4.0 LABORATORY ANALYSIS

Groundwater samples collected were analyzed at GTEL Environmental Laboratories in Concord, California. Water samples from MW-1, MW-2, and MW-3 were analyzed for BTEX and TPH-G by EPA Methods 8020 and Washington Method WTPH-G, volatile organics by EPA Method 8010, TPH by Washington Method WTPH 418.1, total and dissolved lead by EPA Method 7421, and turbidity by EPA Method 180.1. Due to turbidity, water samples collected for lead analysis were passed through a 0.45 micron filter prior to analysis. This procedure is allowed under WAC 173-340-720 (8)(a)(i). Water analyses results from this and previous sampling events are summarized in Table 2. Complete laboratory results are contained in Appendix B. The only detected analyte was benzene in the sample from MW-2. The reported concentration, 0.5 microgram/liter ($\mu\text{g/L}$), is below the MTCA Method A Compliance Cleanup Level (CCL) of 5 $\mu\text{g/L}$.

Table 1 Groundwater Monitoring Data						
Well Number	MW-1	MW-1A	MW-2	MW-2A	MW-3	MW-3A
Well-Head Elevation (Feet)	101.82	101.74	101.57	101.47	100.22	100.34
Date: July 15, 1992						
DTW	8.57	7.63*	9.16	7.70*	10.02	5.63
Elevation (Feet)	93.25	94.11	94.41	93.77	90.22	94.71
Date: August 24, 1992						
DTW	9.08	7.89*	9.64	7.69*	10.29	NM
Relative Elev. (Ft)	92.74	93.85	91.93	93.78	89.93	--
Date: August 31, 1992						
DTW	9.18	7.88*	9.75	7.70*	10.32	6.59
Relative Elev. (Ft)	92.64	93.86	91.85	93.77	89.90	93.75
Date: February 25, 1993						
DTW	7.87	6.99	9.45	7.74*	9.56	4.45
Relative Elev. (Ft)	93.95	94.75	92.12	93.73	90.66	95.89
Date: October 12, 1993						
DTW	7.29	7.91*	9.72	7.19*	10.12	6.88*
Relative Elev. (Ft.)	94.53	93.83	91.85	94.28	90.10	93.46
Date: August 26, 1994						
DTW	9.49	DRY	10.01	DRY	10.24	DRY
Relative Elev. (Ft.)	92.33	--	91.56	--	89.98	--

DTW = Depth to Water

NM = Not Measured (inaccessible)

Note: Elevations are relative based on an arbitrary common datum of 100 feet.

* Not a representative groundwater elevation and insufficient water column to sample.

TABLE 2 Analytical results BTEX, TPH-G, TPH, Lead EPA Methods 8020, modified 8015, 418.1, 7421 and 8240 or 8010 Results in micrograms per liter (µg/L)										
Well Number	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH-G	TPH	Total Lead	Dissolved Lead	TCE
MW-1	07/15/92	<0.3	<0.3	<0.3	<0.5	<10	1,000	<5	NS	<5
	02/25/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	<5	NS	<5
	10/12/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	NS	<5	<0.5
	08/26/94	<0.3	<0.3	<0.3	<0.5	<10	<1,000	<5	<5	<0.5
MW-1A	07/15/92	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/25/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	56	NS	<5
	10/12/93	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/26/94	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	07/15/92	<0.3	0.3	<0.3	3	200	<1,000	6	NS	<5
	02/25/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	<5	NS	<5
	10/12/93	1	<0.3	<0.3	<0.5	<10	<1,000	NS	<5	<0.5
	08/26/94	0.5	<0.3	<0.3	<0.5	<10	<1,000	<5	<5	<0.5
MW-2A	07/15/92	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/25/93	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/12/93	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/26/94	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3	07/15/92	<0.3	<0.3	<0.3	<0.5	<10	<1,000	40	NS	<5
	02/25/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	<5	NS	<5
	10/12/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	NS	<5	<0.5
	08/26/94	<0.3	<0.3	<0.3	<0.5	<10	<1,000	19	<5	<0.5
MW-3A	07/15/92	<0.3	<0.3	<0.3	<0.5	<10	<1,000	240	NS	110
	02/25/93	<0.3	<0.3	<0.3	<0.5	<10	<1,000	53	NS	<5
	10/12/93	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/26/94	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCL		5	40	30	20	1,000	1,000		250	5

MDL = Method Detection Limit

CCL = WAC-340, Model Toxics Act, Method A Compliance Cleanup Levels - Groundwater

TCE = Trichloroethene

NS = Not sampled

< = Method reporting limit

5.0 SUMMARY AND CONCLUSIONS

Groundwater monitoring and sampling were completed at the Riverside Property, Bothell, Washington on August 26, 1994. BTEX, TPH-G, TPH, volatile organics, total lead, and dissolved lead concentrations were either not-detected at the respective method detection limits or were below groundwater CCLs in samples collected from monitoring wells MW-1, MW-2, and MW-3. The apparent groundwater gradient is approximately 0.01 to the west.

Two previous groundwater sampling events were conducted at the site in July, 1992 and February, 1993. Groundwater concentrations above CCLs were reported in July, 1992 in samples collected from monitoring wells MW-1 (TPH), MW-2 (lead), MW-3 (lead) and MW-3A (lead and trichloroethene (TCE)). The February, 1993 sampling event reported only lead concentrations above CCLs in monitoring wells MW-1A and MW-3A.

In the last two sampling events BTEX, TPH-G, TPH, lead or TCE levels have not been detected in concentrations above Method A CCLs in the apparently confined water-bearing zone. Also the wells completed in the upper zone have been dry in each monitoring event since October, 1993. Based on the results of periodic groundwater monitoring and sampling, it is Groundwater Technology opinion that petitioning the WDOE for a "No Further Action" status is warranted.

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MW-3	07/15/92	<0.3	<0.3	<0.3	<0.5	<10	<1,000	40	NS	<5
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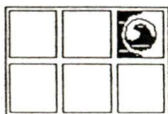
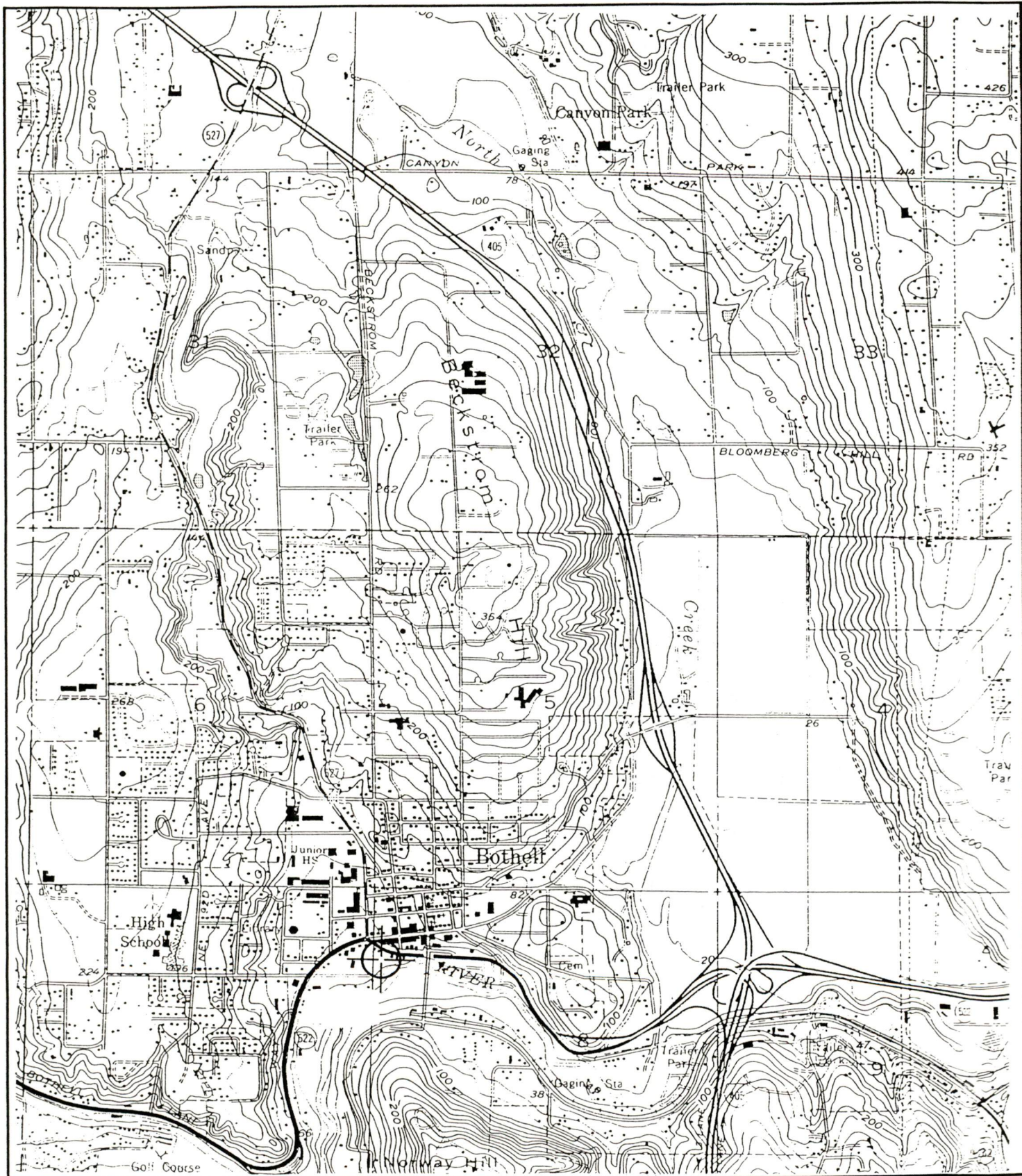
5.0 SUMMARY AND CONCLUSIONS

Groundwater monitoring and sampling were completed at the Riverside Property, Bothell, Washington on August 26, 1994. BTEX, TPH-G, TPH, volatile organics, total lead, and dissolved lead concentrations were either not-detected at the respective method detection limits or were below groundwater CCLs in samples collected from monitoring wells MW-1, MW-2, and MW-3. The apparent groundwater gradient is approximately 0.01 to the west.

Two previous groundwater sampling events were conducted at the site in July, 1992 and February, 1993. Groundwater concentrations above CCLs were reported in July, 1992 in samples collected from monitoring wells MW-1 (TPH), MW-2 (lead), MW-3 (lead) and MW-3A (lead and trichloroethene (TCE)). The February, 1993 sampling event reported only lead concentrations above CCLs in monitoring wells MW-1A and MW-3A.

In the last two sampling events BTEX, TPH-G, TPH, lead or TCE levels have not been detected in concentrations above Method A CCLs in the apparently confined water-bearing zone. Also the wells completed in the upper zone have been dry in each monitoring event since October, 1993. Based on the results of periodic groundwater monitoring and sampling, it is Groundwater Technology opinion that petitioning the WDOE for a "No Further Action" status is warranted.

FIGURES



**GROUNDWATER
TECHNOLOGY**

19033 W VALLEY HWY, D-104
KENT, WA
(206) 251-5441



SCALE:

0 FEET 2000

SITE LOCATION MAP

CLIENT:

TEXACO
ENVIRONMENTAL SERVICES

DATE:

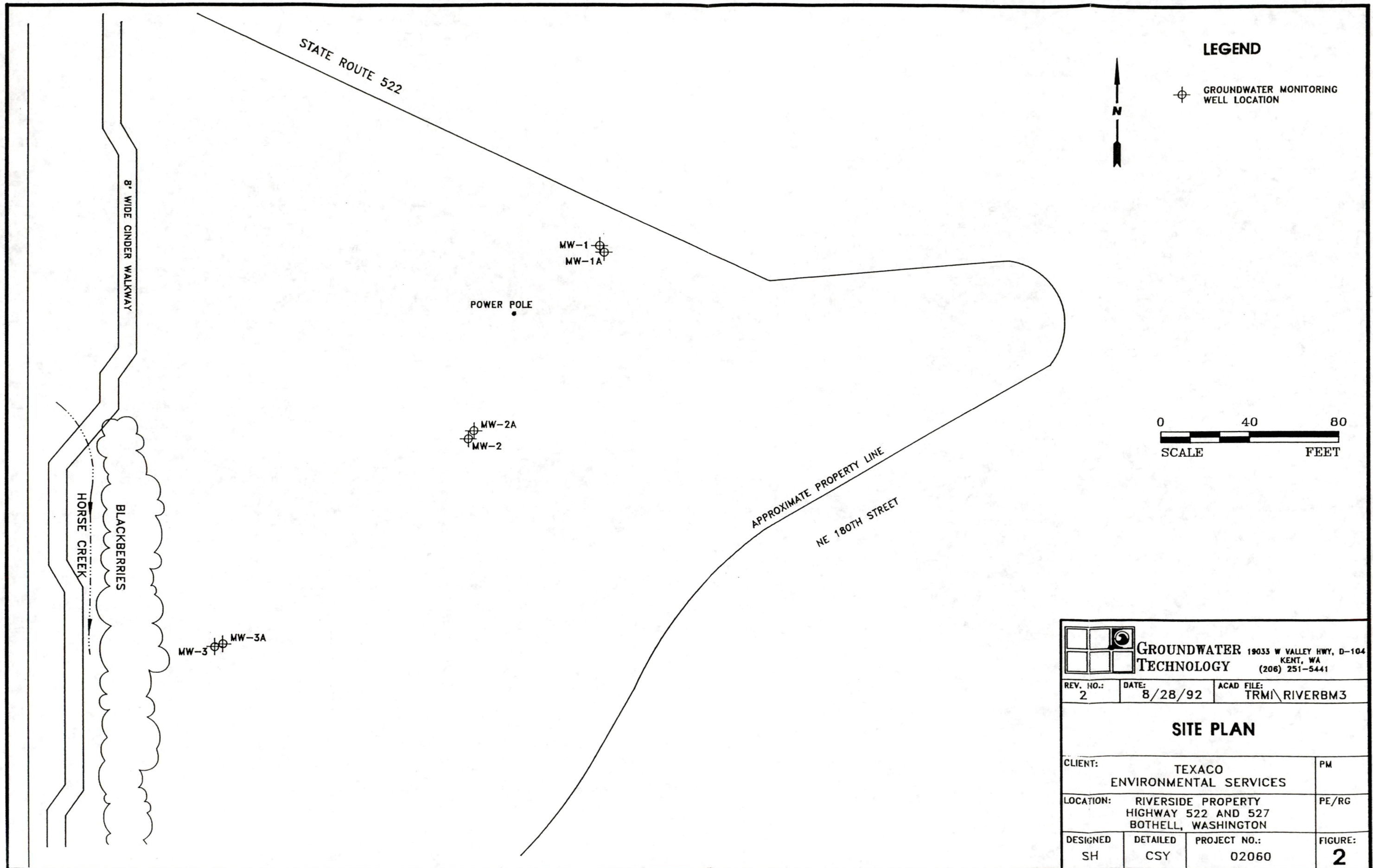
5/21/92

LOCATION:

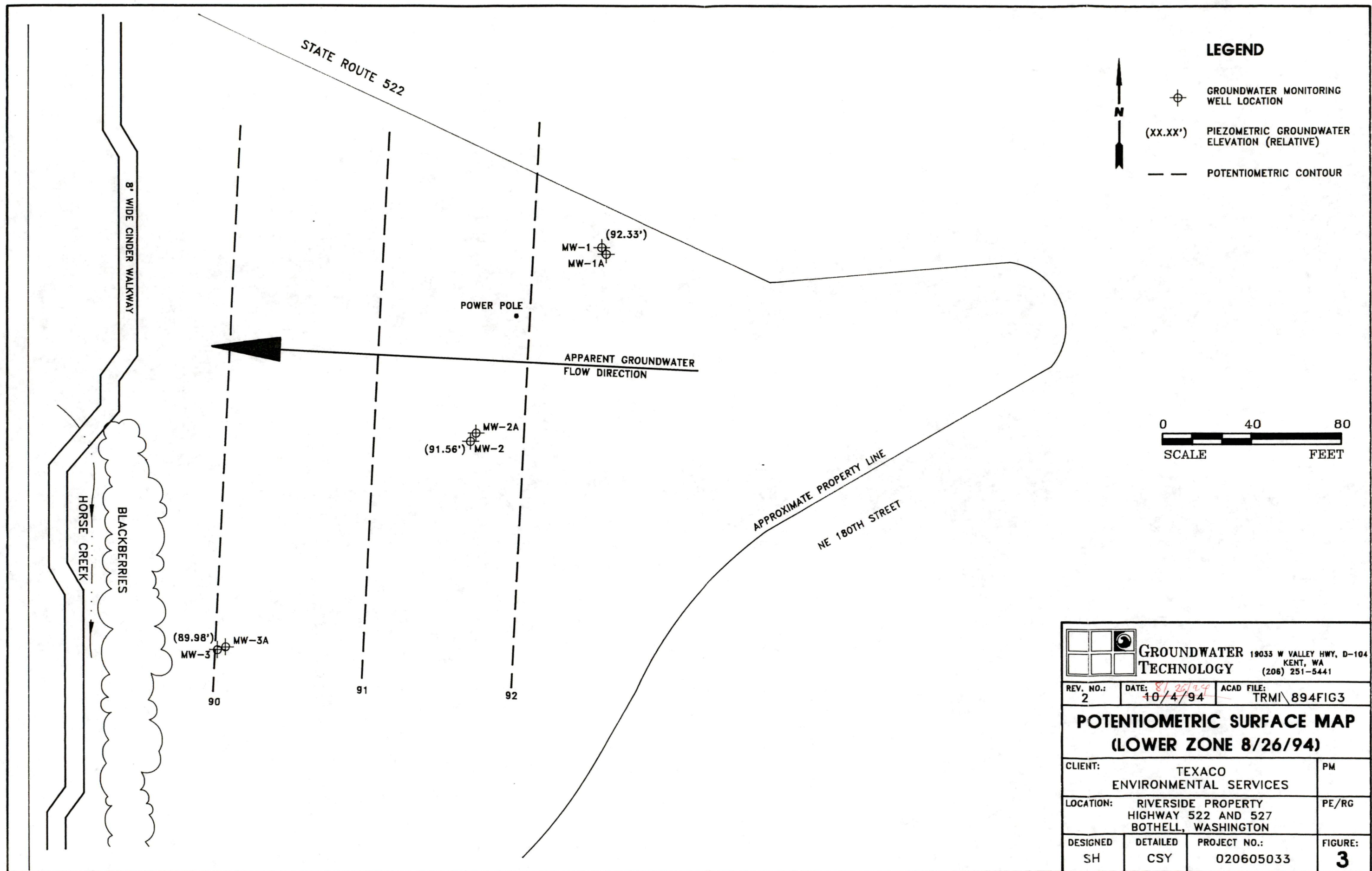
RIVERSIDE/SR 522 & SR 527
BOTHELL, WA


FIGURE:

1



		GROUNDWATER TECHNOLOGY 19033 W VALLEY HWY, D-104 KENT, WA (206) 251-5441	
REV. NO.: 2	DATE: 8/28/92	ACAD FILE: TRM1\ RIVERBM3	
SITE PLAN			
CLIENT: TEXACO ENVIRONMENTAL SERVICES		PM	
LOCATION: RIVERSIDE PROPERTY HIGHWAY 522 AND 527 BOTHELL, WASHINGTON		PE/RG	
DESIGNED SH	DETAILED CSY	PROJECT NO.: 02060	FIGURE: 2



 GROUNDWATER TECHNOLOGY 19033 W VALLEY HWY, D-104 KENT, WA (206) 251-5441			
REV. NO.: 2	DATE: 10/4/94	ACAD FILE: TRM\894FIG3	
POTENTIOMETRIC SURFACE MAP (LOWER ZONE 8/26/94)			
CLIENT: TEXACO ENVIRONMENTAL SERVICES			PM
LOCATION: RIVERSIDE PROPERTY HIGHWAY 522 AND 527 BOTHELL, WASHINGTON			PE/RG
DESIGNED SH	DETAILED CSY	PROJECT NO.: 020605033	FIGURE: 3

APPENDIX A
STANDARD OPERATING PROCEDURES

3.0 WATER QUALITY SAMPLING

- 3.1 Water samples should not be taken from the stagnant water in the well.
- 3.2 Water samples should be taken in triplicate.
- 3.3 Remove 3 to 5 volumes of water in the well prior to sampling. The water may be removed by bailing, submersible pump, or purge system. Wells with a slow recovery period should be bailed dry and then sampled within 1 hour or when recovered to 80%. Monitor pH, temperature and specific conductivity with each well volume to insure water quality stabilization has occurred. However, this is not necessary at every well or in all circumstances.
- 3.4 Use only Teflon, stainless steel, or glass bailers to obtain the sample. Use Teflon only for sampling water containing chlorinated compounds and also for bacteriological samples. PVC bailers can be used for one-time sampling for other than EPA 624 analysis. Using a bailer for a one-time sampling reduces the possibility for cross-contamination.
- 3.5 When sampling, avoid stirring up any sediments in the well and agitating the water to reduce volatilization of any dissolved compounds that may be present.
- 3.6 All sampling equipment must be cleaned following the appropriate procedure to avoid cross contamination from site to site and sample to sample. The sampling equipment should be cleaned before each well sampling, between each sampling, and at the end of each sampling round.
- 3.7 Monitoring wells should be gauged prior to sampling.
- 3.8 If possible, the monitoring wells should be sampled starting with the cleanest well and ending with the most contaminated well.
- 3.9 Wells containing free-phase contaminants should not be sampled.
- 3.10 When filling out the chain of custody form:
 - enter the samples in the order in which they were collected;
 - make a note as to the cleaning fluid used to clean the sampling equipment;
 - attempt to identify which samples are the most contaminated;
 - complete all other requested information.
- 3.11 The laboratory sample identification label should be filled out with a waterproof pen and firmly affixed to each sample container. Typically, identification labels require that the following information be supplied:
 - job name
 - job number
 - sampler's name
 - sample identification
 - date sampled and time
 - analysis requested

- 3.12 Acidification is required for samples that will be analyzed by the EPA 624 method. (see Acidification Procedure in this section)
- 3.13 Acidification is recommended for EPA method 601 and 602 samples to preserve them and increase their holding life. (see Acidification Procedure in this section)
- 3.14 Field blanks should be taken as part of each sampling round. A field blank consists of a sample of distilled water which has been collected by putting the distilled water into a sampling bailer after the bailer has been cleaned following the procedure used to clean that bailer during the sampling round. The field blank is stored with the samples. It is not analyzed unless requested by the Project Manager. The field blank should not be identified as such to the laboratory.
- 3.15 Handling of decontaminated equipment:
- Always use "pristine" gloves (latex, solvex, etc.).
 - Place decontaminated bailers on clean surface (plastic).
 - Do not wipe down bailer with paper towels or cloth. Follow decontamination procedure.
- 3.16 Sample accuracy can be adversely affected by the entrainment of sediment in wells which have not been properly developed. Contaminants adhering to the sediments can be released when samples are acidified for preservation. Therefore, if sediments are present, field filtering of the samples is recommended.
- 3.17 Chemical changes can take place because the sample was oxidized during sampling. It is critical to avoid oxidation of samples when sampling for volatile organic compounds (VOC). Therefore, take care to insure minimal agitation occurs during sampling.
- 3.18 All samples should be properly and promptly preserved.
- 3.19 All samples should be analyzed quickly; arrangements should be made with the testing laboratory to insure prompt analysis is performed within the allowable times for the specific analyses to be done.
- 3.20 Bailer strings that have contacted water or contaminants should be replaced between each well to avoid contamination from a bailer string which has absorbed contamination. A good practice is to replace the string between wells. Caution: some bailer strings are treated with a fungicide which may be detected in priority pollutant analysis.
- 3.21 Notify laboratory that samples are being shipped in advance of sampling to insure proper delivery and turnaround.
- 3.22 On the chain of custody, note what type of decontamination or preservation fluids, chemicals were used.

4.0 ACIDIFICATION PROCEDURE (EPA Methods 601,602, and 624)

- 4.1 At the start of each sampling round, the amount of acid required to lower a sampling container of water to be sampled to a pH of less than 2 should be determined.
- 4.2 After removing 3 to 5 well volumes from the first well to be sampled, put 5-10 drops of 50% HCL into a 40 ml sample vial (larger sampling container will require more acid) and fill the vial with water from the well; determine the pH of water in the vial with pH paper; if the pH is too high, repeat the procedure using 15-20 drops of acid in the vial; repeat until the pH of the water in the sample vial is a pH of less than 2 on the pH paper. Note the amount of acid required to lower the pH of the volume of water in the sampling vial. (pH paper should not be placed into sampling container. Pour sample onto pH paper to check for proper pH.)
- 4.3 Discard the practice acidified sample.
- 4.4 Once the amount of acid required to reach a pH of <2 is known, the acid can be routinely added to each sample container directly; the water to be analyzed is added to vial or container containing the appropriate amount of acid.
- 4.5 Note that the amount of acid required is site specific and should be noted on the Chain of Custody form.
- 4.6 The procedure should be repeated for each site at the start of each sampling round.
- 4.7 Equipment
 - Bailer or other means to remove 3 to 5 well volumes
 - Sampling bailer
 - Polyethylene squirt bottle of 50% hydrochloric (HCL) acid
 - Narrow range pH paper (1.0 - 2.5 pH range)
 - Paper towels
 - Waterproof pen
 - Laboratory sample identification labels
 - Cooler with ice
 - Chain of custody forms
 - Sample containers (usually 40 ml glass vials with teflon faced septums)
 - Alconox solution and/or methanol
 - Distilled water
 - Safety equipment (gloves, etc.)
 - Dissolved oxygen meter (sometimes used in limited biorec projects in conjunction with bacteriological testing)

APPENDIX B
LABORATORY ANALYTICAL RESULTS

RECEIVED SEP 07 1994



Client Number: 020600032
Project ID: TX Riverside
Bothell, WA
Work Order Number: C4-08-0442

Northwest Region

4080 Pike Lane
Suite C
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
FAX (510) 825-0720

September 6, 1994

Mark Nichols
Groundwater Technology, Inc.
19033 West Valley Hwy., #D-104
Kent, WA 98032

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 08/27/94, under chain of custody record 28945.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certification number E1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

GTEL is also certified by the Washington Department of Ecology under Laboratory I.D. number C054 to perform analyses for wastewater.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

William S. Shah
for

Rashmi Shah
Laboratory Director

Client Number: 020600032
Project ID: TX Riverside
Bothell, WA
Work Order Number: C4-08-0442

ANALYTICAL RESULTS

Lead in Water by Graphite Furnace AA

EPA Methods 7421¹/3005²

GTEL Sample Number		01	02	03	083194 MET
Client Identification		MW1	MW2	MW3	METHOD BLANK
Date Sampled		08/26/94	08/26/94	08/26/94	--
Date Prepared		08/31/94	08/31/94	08/31/94	08/31/94
Date Analyzed		08/31/94	08/31/94	08/31/94	08/31/94
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Lead, total	5	<5	<5	19	<5
Detection Limit Multiplier		1	1	1	1

1. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, November 1986.
2. Sample preparation by Modified EPA Method 3005. Acid concentration have been adjusted to allow analysis by GFAAS.

Client Number: 020600032
Project ID: TX Riverside
Bothell, WA
Work Order Number: C4-08-0442

ANALYTICAL RESULTS

Dissolved Lead in Water by Graphite Furnace AA

EPA Methods 7421¹

GTEL Sample Number		01	02	03	082994 MET
Client Identification		MW1	MW2	MW3	METHOD BLANK
Date Sampled		08/26/94	08/26/94	08/26/94	--
Date Prepared ²		08/29/94	08/29/94	08/29/94	08/29/94
Date Analyzed		08/29/94	08/29/94	08/29/94	08/29/94
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Lead, Dissolved	5	<5	<5	<5	<5
Detection Limit Multiplier		1	1	1	1

1. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, November 1986.
2. Unpreserved water sample was passed through a 0.45 micron filter and analyzed as a dissolved metal. Sample was lab filtered on 08/29/94.

Client Number: 020600032
Project ID: TX Riverside
Bothell, WA
Work Order Number: C4-08-0442

ANALYTICAL RESULTS

Total Petroleum Hydrocarbons in Water by Infrared Spectrometry

EPA Method 418.1¹(SM 5520 FC²)

1. Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-202, Revised March 1983, U.S. Environmental Protection Agency.
2. Standard Methods for the Examination of Water and Wastewater, 17th ed., 1989, American Public Health Association.

GTEL Sample Number		01	02	03	083094 TPH
Client Identification		MW1	MW2	MW3	METHOD BLANK
Date Sampled		08/26/94	08/26/94	08/26/94	--
Date Prepared		08/31/94	08/31/94	08/31/94	08/31/94
Date Analyzed		08/31/94	08/31/94	08/31/94	08/31/94
Analyte	Detection Limit, mg/L	Concentration, mg/L			
Total Petroleum Hydrocarbons	1	<1	<1	<1	<1
Detection Limit Multiplier		1	1	1	1

Client Number: 020600032
Project ID: TX Riverside
Bothell, WA
Work Order Number: C4-08-0442

ANALYTICAL RESULTS
Matrix: Water

Sample Number					01	02	03	090194 TUR
Sample Identification					MW1	MW2	MW3	METHOD BLANK
Date Sampled					08/26/94	08/26/94	08/26/94	--
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Turbidity	NTU	0.2	EPA 180.1	09/02/94	22	92	73	<0.2

Note: Test Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, March, 1983.

GTEL Client ID: 020600032
 Login Number: C4080442
 Project ID (number): 020600032
 Project ID (name): TX-Riverside/Bothell, WA

ANALYTICAL RESULTS

Volatile Organics
 Method: EPA 8020
 Matrix: Aqueous

GTEL Sample Number	C4080442-01	C4080442-02	C4080442-03	--
Client ID	MW 1	MW 2	MW 3	--
Date Sampled	08/26/94	08/26/94	08/26/94	--
Date Analyzed	09/01/94	09/01/94	09/03/94	--
Dilution Factor	1.00	1.00	1.00	--

Analyte	Reporting		Concentration:			
	Limit	Units				
Benzene	0.3	ug/L	< 0.3	0.5	< 0.3	--
Toluene	0.3	ug/L	< 0.3	< 0.3	< 0.3	--
Ethylbenzene	0.3	ug/L	< 0.3	< 0.3	< 0.3	--
Xylenes (total)	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
TPH as GAS	10.	ug/L	< 10.	< 10.	< 10.	--
BFB (Surrogate)	--	%	93.7	96.2	81.1	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8020:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846", Third Edition, Revision 1, US EPA November 1986. Bromofluorobenzene surrogate recovery acceptability limits are 62-129%. TPH as gasoline quantitated as per the state of Washington Department of Ecology, Appendix L, April, 1992.

GTEL Concord, CA
 C4080442:1

GTEL Client ID: 020600032
Login Number: C4080442
Project ID (number): 020600032
Project ID (name): TX-Riverside/Bothell, WA

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8020
Matrix: Aqueous

Method Blank Results

QC Batch No: M083194-4
Date Analyzed: 31-AUG-94

Analyte	Method: EPA 8020	Concentration: ug/L
Benzene	< 0.30	
Toluene	< 0.30	
Ethylbenzene	< 0.30	
Xylenes (Total)	< 0.50	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
TPH as Gasoline	< 10.	

Notes:

GTEL Client ID: 020600032
 Login Number: C4080442
 Project ID (number): 020600032
 Project ID (name): TX-Riverside/Bothell, WA

ANALYTICAL RESULTS

Volatile Organics
 Method: EPA 8010A
 Matrix: Aqueous

GTEL Sample Number	C4080442-01	C4080442-02	C4080442-03	--
Client ID	MW 1	MW 2	MW 3	--
Date Sampled	08/26/94	08/26/94	08/26/94	--
Date Analyzed	08/31/94	09/01/94	09/01/94	--
Dilution Factor	1.00	1.00	1.00	--

Analyte	Reporting		Concentration:			
	Limit	Units				
Dichlorodifluoromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Chloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Vinyl chloride	1.0	ug/L	< 1.0	< 1.0	< 1.0	--
Bromomethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Chloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Trichlorofluoromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,1-Dichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Methylene chloride	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,2-Dichloroethene (total)	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,1-Dichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Chloroform	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,1,1-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Carbon tetrachloride	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,2-Dichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Trichloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,2-Dichloropropane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Bromodichloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
2-Chloroethyl vinyl ether	1.0	ug/L	< 1.0	< 1.0	< 1.0	--
cis-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
trans-1,3-Dichloropropene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,1,2-Trichloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Tetrachloroethene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Dibromochloromethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Chlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
Bromoform	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,1,2,2-Tetrachloroethane	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,3-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,4-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
1,2-Dichlorobenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	--
BFB (surrogate)	--	%	98.9	88.0	78.9	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8010A:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846", Third Edition, Revision 1, US EPA July 1992. 1,2-Dichlorobenzene (total) is the sum of cis-and trans 1,2-Dichloroethene BFB surrogate recovery acceptability limits are 65 - 130%.

GTEL Concord, CA
 C4080442:1

GTEL Client ID: 020600032
Login Number: C4080442
Project ID (number): 020600032
Project ID (name): TX-Riverside/Bothell, WA

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8010A
Matrix: Aqueous

Method Blank Results

QC Batch No: C083194-1
Date Analyzed: 31-AUG-94

Analyte	Method: EPA 8010A	Concentration: ug/L
Dichlorodifluoromethane	< 0.5	
Chloromethane	< 0.5	
Vinyl chloride	< 1.	
Bromomethane	< 0.5	
Chloroethane	< 0.5	
Trichlorofluoromethane	< 0.5	
1,1-Dichloroethene	< 0.5	
Methylene chloride	< 0.5	
1,2-Dichloroethene (total)	< 0.5	
1,1-Dichloroethane	< 0.5	
Chloroform	< 0.5	
1,1,1-Trichloroethane	< 0.5	
Carbon tetrachloride	< 0.5	
1,2-Dichloroethane	< 0.5	
Trichloroethene	< 0.5	
1,2-Dichloropropane	< 0.5	
Bromodichloromethane	< 0.5	
2-Chloroethyl vinyl ether	< 1.	
cis-1,3-Dichloropropene	< 0.5	
trans-1,3-Dichloropropene	< 0.5	
1,1,2-Trichloroethane	< 0.5	
Tetrachloroethene	< 0.5	
Dibromochloromethane	< 0.5	
Chlorobenzene	< 0.5	
Bromoform	< 0.5	
1,1,2,2-Tetrachloroethane	< 0.5	
1,3-Dichlorobenzene	< 0.5	
1,4-Dichlorobenzene	< 0.5	
1,2-Dichlorobenzene	< 0.5	
Benzene	< 0.5	
Toluene	< 0.5	
Ethylbenzene	< 0.5	
Xylenes (Total)	< 0.5	

Notes:

