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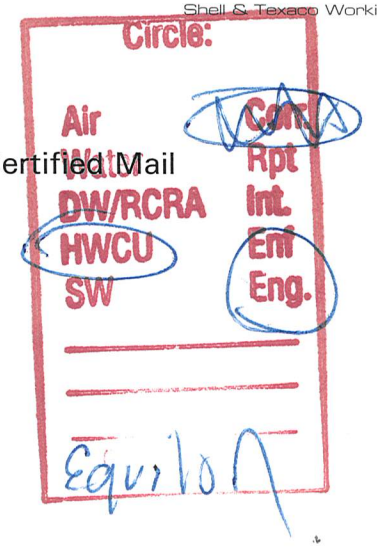

June 29, 1999

By: Certified Mail

Paul Skyllingstad
Washington Department of Ecology
Industrial Section
P.O. Box 47600
Olympia WA 98504-7600

Dear Mr. Skyllingstad,

Please find attached, two copies of a report entitled "**Final Closure Report and Details of the Completion of Consent Decree Requirements Associated with the February 22, 1991 Crude Oil Spill at Texaco Puget Sound Plant**". This report is being submitted in fulfillment of the requirements outlined in Consent Decree No. 93-2-00913-8 between the Washington State Department of Ecology and Texaco Puget Sound Plant. Equilon Puget Sound Refining Company has since taken ownership of the facility and believes that all requirements of the consent decree have now been completed and we hereby request final closure of the consent decree and removal of the site from the Model Toxics Control Act (MTCA) Site Register by the Department of Ecology.

Questions or comments regarding this report should be directed to Mr. Brian Rhodes at telephone # (360) 293-1761. Thank you for your assistance with this matter.

Sincerely,

Brian D. Rhodes
Staff Engineer

BDR/br

cc: Kim Wigfield (WDOE address as above)

Enclosure

Consent decree Final Closure 0699

Puget Sound Refining Company
a Division of
Equilon Enterprises LLC
P.O. Box 622
Anacortes, WA 98221-0622

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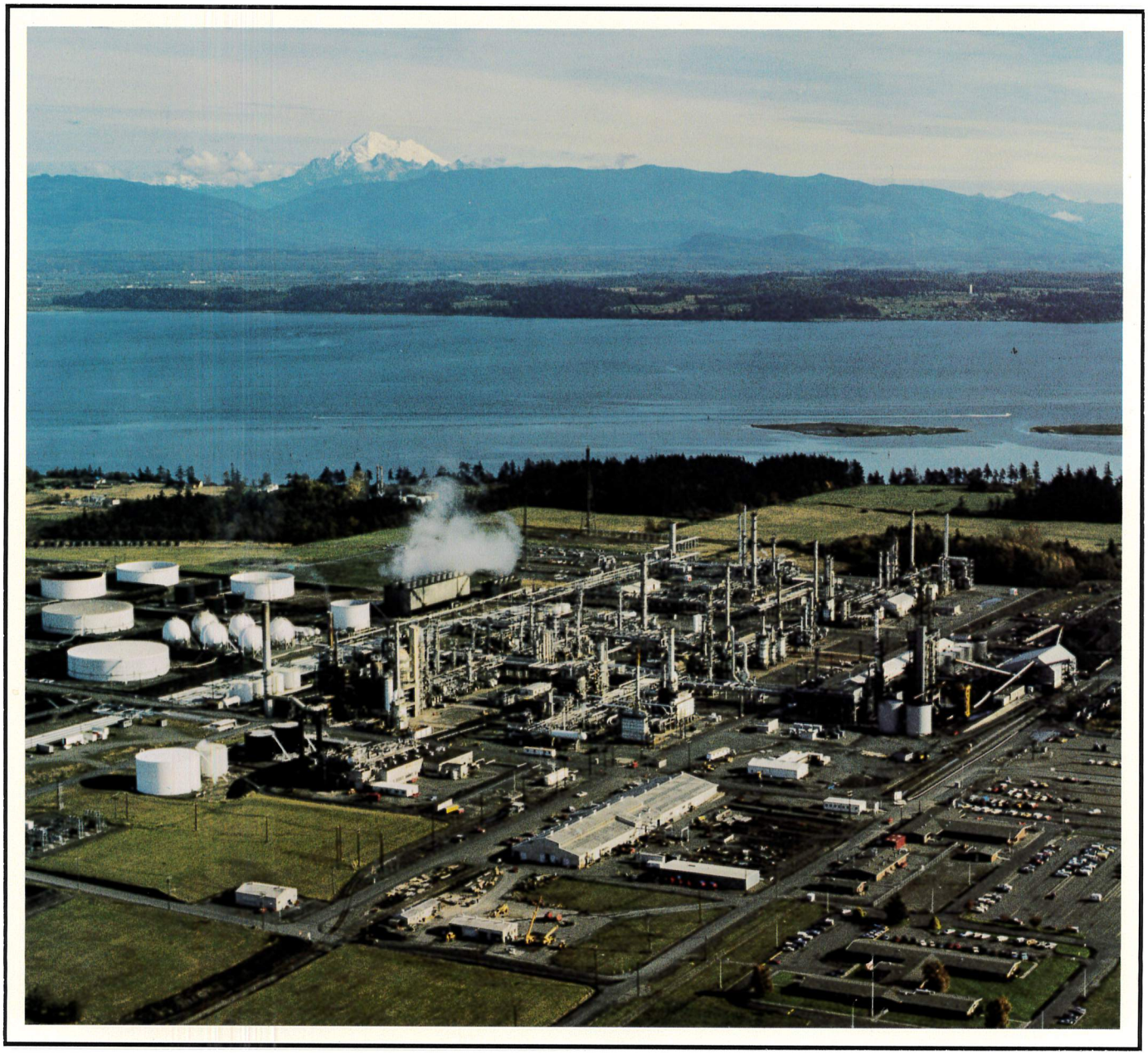

PUGET SOUND REFINING COMPANY

FINAL CLOSURE REPORT AND DETAILS OF THE COMPLETION OF CONSENT DECREE REQUIREMENTS ASSOCIATED WITH THE FEBRUARY 22, 1991 OIL SPILL AT TEXACO PUGET SOUND PLANT

EQUILON
ENTERPRISES LLC
Shell & Texaco Working Together

June 29, 1999

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Puget Sound Refining Company
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REPORT TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY

FINAL CLOSURE REPORT AND DETAILS OF THE COMPLETION OF CONSENT DECREE REQUIREMENTS ASSOCIATED WITH THE FEBRUARY 22, 1991 CRUDE OIL SPILL AT TEXACO PUGET SOUND PLANT

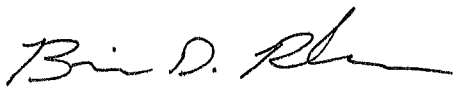
(Consent Decree No. 93-2-00913-8)

Submitted by

Equilon Puget Sound Refining Company
8505 S. Texas Road
Anacortes, Washington 98221

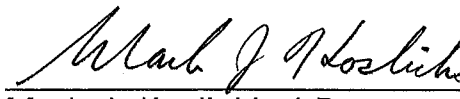
JUNE 1999

Prepared By:



Brian D. Rhodes, R.G.
Staff Engineer

Reviewed By:



Mark J. Koslicki, J.D.
Manager - SHE Department

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1.0 BACKGROUND

1.1 Introduction

On February 22, 1991, approximately 5,000 barrels of crude oil were released at Texaco Puget Sound Plant as a result of a catastrophic failure of a crude oil booster pump. Massive emergency clean-up activities were conducted in response to the spill and were reported to the Department of Ecology in a report submitted on February 22, 1992 entitled "Report on the Interim Action Cleanup Activities and Remedial Investigation/Feasibility Studies Related to the February 22, 1991 Crude Oil Spill at the Texaco Puget Sound Plant".

On August 18, 1993, a consent decree (No. 93-2-00913-8) between the State of Washington Department of Ecology and Texaco Refining and Marketing Incorporated was filed in Skagit County, Washington. The consent decree provides details of additional activities that were to be completed in association with the crude spill. The report, which follows, provides details in support of the final fulfillment and completion of all remedial activities detailed in the subject consent decree.

1.2 Site Location

Puget Sound Plant is located approximately 75 miles north of Seattle near the City of Anacortes on Fidalgo Island (Figure 1). The February 1991 oil spill site is located in the northwest corner of Puget Sound Plant, approximately 200 feet east of Fidalgo Bay (Figure 2).

1.3 Site History

On the evening of February 22, 1991, Texaco Puget Sound Plant was transferring a load of Alaskan North Slope crude oil from an oil tanker into plant tankage. During the transfer, a crude oil booster pump suffered a catastrophic structural failure, which allowed approximately 5000 barrels of crude oil to be released to soils and surface waters adjacent to the Texaco facility. During the spill, crude oil ran from the broken pump westward across a transfer pipeway and railroad right of way to drainage ditches located on Mr. Leonard Munk's property to the west. Following emergency clean-up actions at the site, a remedial investigation and feasibility study was conducted by

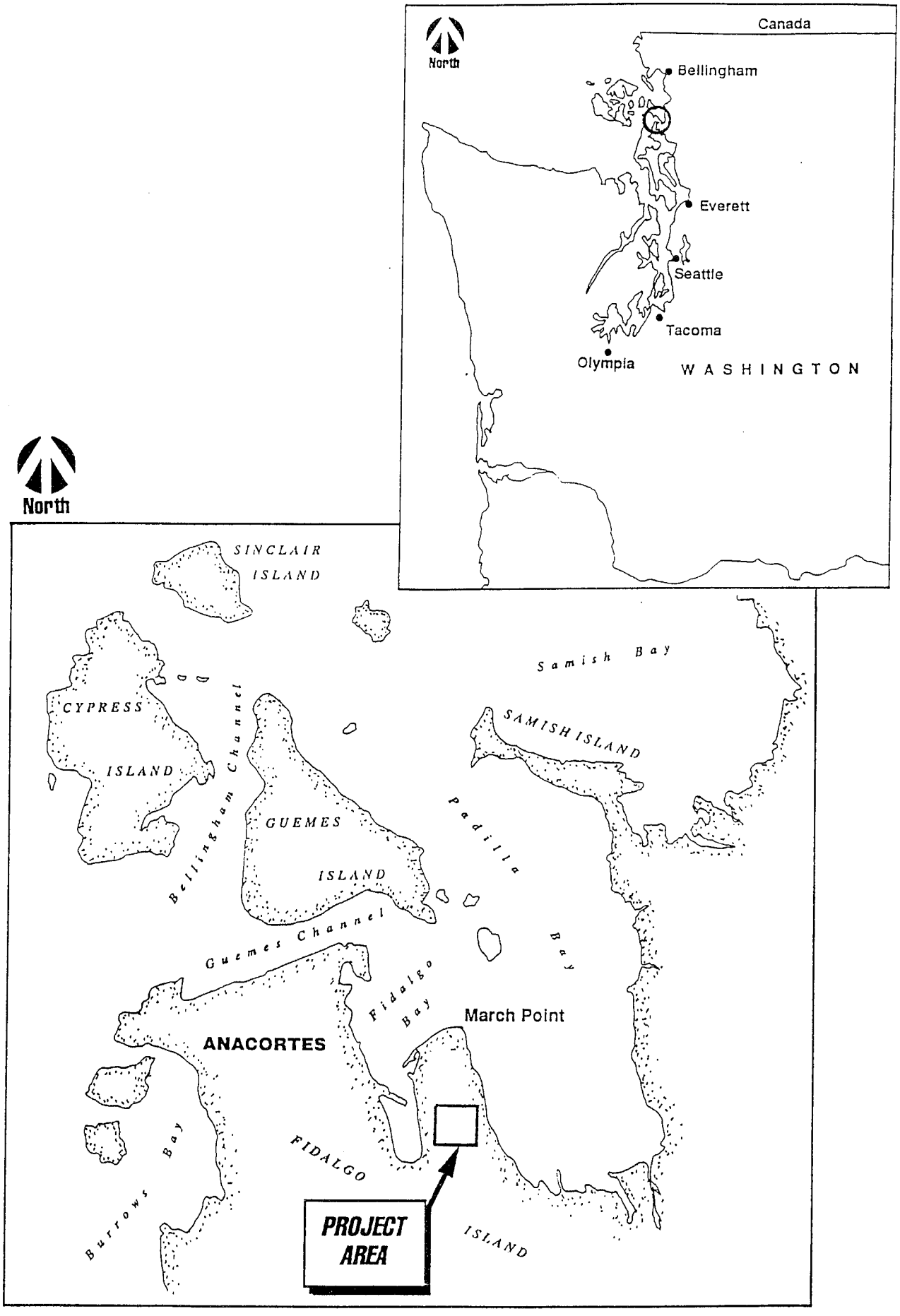
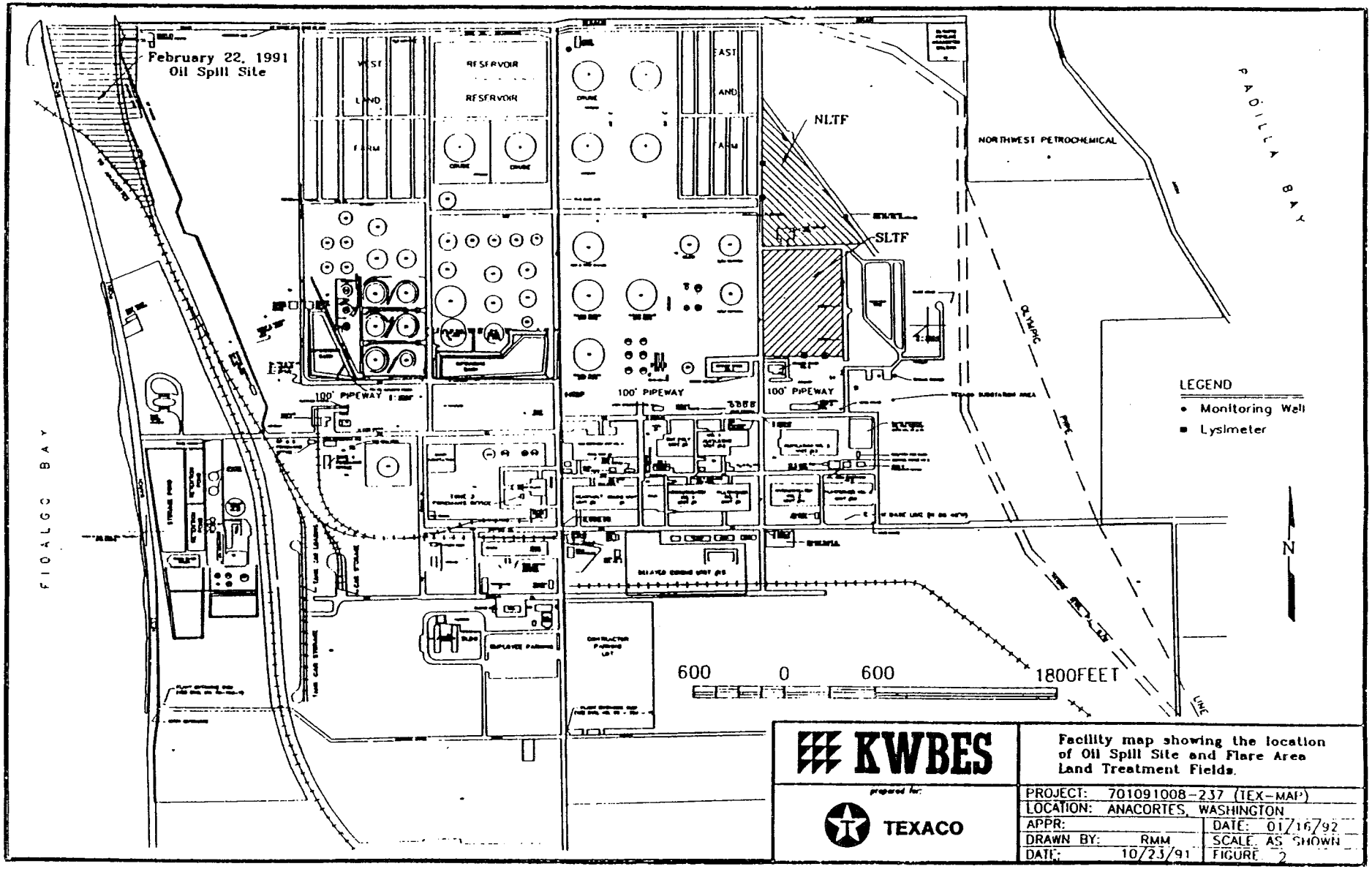


Figure 1. Vicinity map of Equilon Enterprises Puget Sound Refining Company



KWBES

prepared for:

TEXACO

Facility map showing the location of Oil Spill Site and Flare Area Land Treatment Fields.

PROJECT: 701091008-237 (TEX-MAP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 01/16/92
DRAWN BY: RMM	SCALE: AS SHOWN
DATE: 10/23/91	FIGURE 2

K.W. Brown and Associates (Appendix A - Cleanup Action Plan - May 25, 1993). Based on the findings of the assessment and observations of the Washington State Department of Ecology (WDOE), Texaco Puget Sound Plant and WDOE entered into Consent Decree No. 93-2-00913-8 which was recorded in Skagit County, Washington. The consent Decree required Texaco to conduct the following remedial activities:

1) Continue ongoing in situ bioremediation of the Munks farm west pasture and, if necessary, excavate any remaining "hotspots".

2) Bioremediate or, if necessary, excavate contaminated soils in the Blackberry Ditch.

3) Excavate, to the extent feasible, all visibly contaminated soils in the vicinity of the booster pumps and install one groundwater monitoring well down-gradient of the pump area. File a restrictive covenant with the Skagit County Auditors office if soils are left in place above clean-up standards (Appendix D).

4) Delineate the extent of contamination in the catchment basin through a sampling program and, if necessary, conduct in situ remediation of soils that exceed the clean-up standards.

5) Treat excavated soils in the Flare Area Land Treatment Facility and conduct a monitoring program of treated soils.

Additional details, protocols and procedures for completion of the above activities are specified in the subject consent decree (Appendix B - Remedial Action Plan).

In December of 1993, Texaco submitted a report (Appendix C) entitled "Report on the Completion of Remedial Activities Associated with the Feb 22, 1991 Crude Oil Spill at Texaco Puget Sound Plant." The report detailed the active completion of all remedial activities associated with the site including those listed above. In response to the December 1993 report, Mr. Paul Skyllingstad of the Department of Ecology sent a letter to Texaco stating that "The Department has reviewed the Report and finds that the remedial action requirements of the Decree have been met. The project will now start a compliance monitoring phase as stated in Exhibit D of the Consent Decree."

The monitoring phase of Exhibit D of the Consent Decree has now been completed. This report documents final completion of compliance monitoring activities associated with consent decree No.93-2-00913-8 for the Flare Land Treatment Facility soils as well as a risk based closure proposal for soils left in-place near the crude booster pump piping. The consent decree also allows Texaco (Equilon) to seek permission from Ecology to remove the restrictive covenent on the crude booster area upon demonstration that MTCA clean-up standards have been met. A risk assessment for the crude booster pump has been submitted with this report demonstrating the site is now in compliance with MTCA standards. With the completion of these activities, Equilon Enterprises LLC believes that all requirements of the consent decree have been met and that the site is ready for final closure and removal from the Model Toxics Control Act site register. Equilon also requests Ecology's formal approval and documentation such that an instrument removing the restrictive covenant of the crude booster pump area may be filed with Skagit County.

2.0 FINAL CLOSURE MONITORING ACTIVITIES

2.1 Crude Booster Pump Groundwater Monitoring

The consent decree required the installation of a groundwater monitoring well down-gradient from the crude booster pump if hydrocarbon concentrations above clean-up standards were left in place. On September 1, 1993 well MW-123 was installed downgradient of the crude booster pump. On November 4, 1993, well MW-123 was purged and a groundwater sample collected for analysis for Total Petroleum Hydrocarbons and BTEX. Additional monitoring of the well was completed as specified in Exhibit B of the consent decree. In accordance with the consent decree, the crude booster pump site entered the compliance monitoring phase in 1994. The consent decree required quarterly monitoring and sampling for two years (through year-end 1995) followed by annual sampling for the next three years thereafter. The sampling as required by the consent decree has been completed and no further sampling is planned.

2.1.1 Crude Booster Pump Well Analytical Results

Analytical results from the five years of sampling at the crude booster pump are shown in Table 1. No hydrocarbons were detected in the initial groundwater analyses or any additional analyses conducted since well MW-123 was installed. Lab date and chain-of-custody documentation is included in Appendix F.

Table 1
Analytic Result Summary – Crude Booster Pump Well MW-123 (ug/l)

Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes	TPH
12/16/98	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND
01/13/98	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<5.0)	ND (<500)
12/11/96	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<5.0)	ND (<50)
12/26/95	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<5.0)	ND (<50)
09/27/95	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<100)
06/20/95	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<5.0)	ND (<50)
03/21/95	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<1.0)	ND (<50)
12/15/94	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<1.0)	ND (<50)
09/14/94	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<100)
06/09/94	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1000)
03/09/94	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1000)

In summary, no benzene, toluene, ethylbenzene, xylenes or total petroleum hydrocarbons were ever detected in groundwater at the crude booster pump well MW-123. Equilon Puget Sound Refining Company has met the monitoring requirements for groundwater at the site and has no plans to complete additional groundwater monitoring at the site.

2.2 Crude Booster Pump Soil Risk Assessment

Task 1 from the Pump Area section of the consent decree requires that "All Visibly-oiled soils that can feasibly be removed shall be excavated from this area". An excavator was used to remove all accessible visibly stained soils, which were found in the vicinity the Crude Booster Pump and associated, piping. As the excavation progressed it became apparent that some visibly stained soils did extend beneath the piping system and appurtenances in the area where they could not be reasonably removed.

2.2.1 Restrictive Covenant

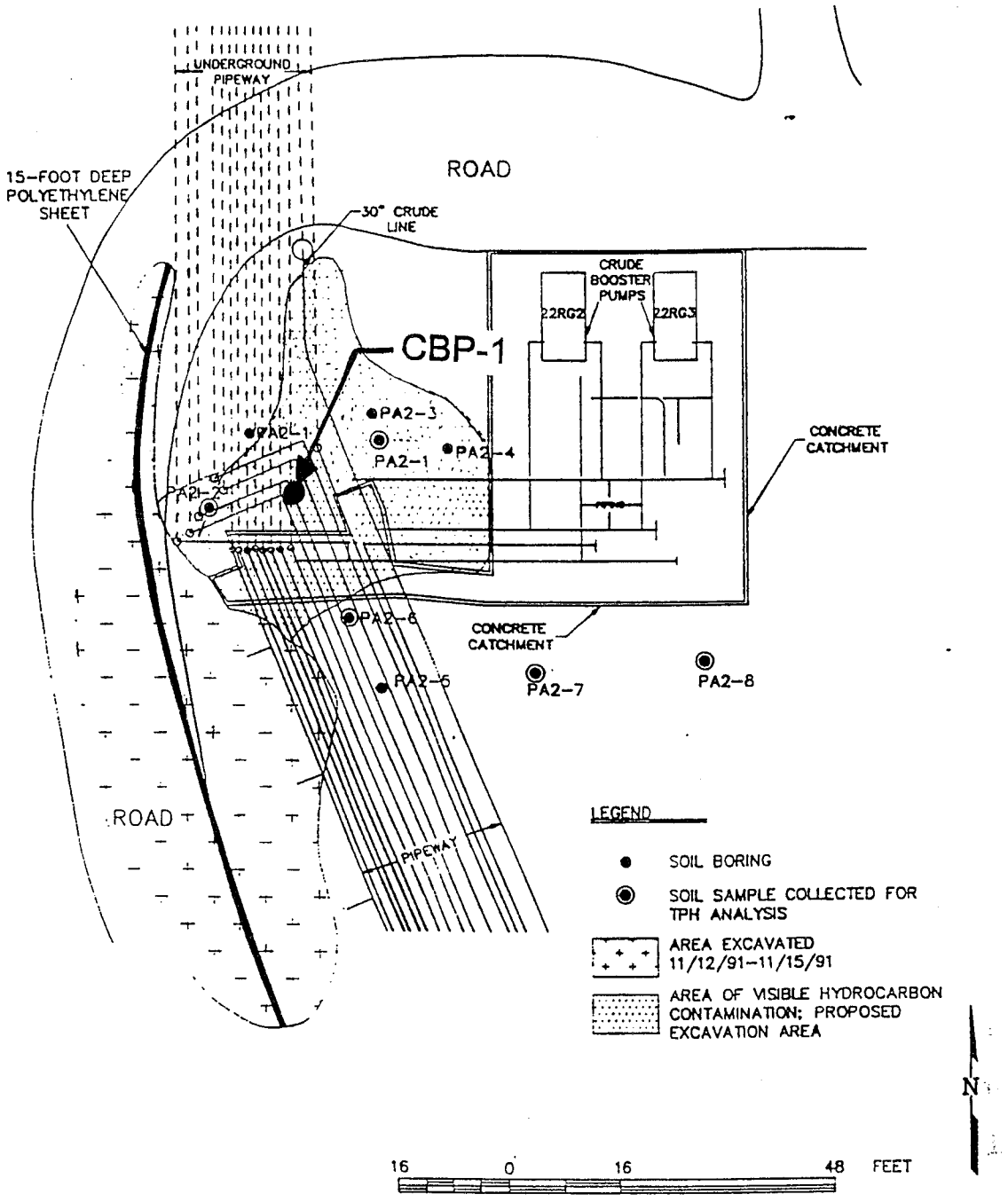
The consent decree required that a restrictive covenant be filed with Skagit County if Texaco determined that any soil sample exceeds the clean-up standard in the Crude Booster Pump area. Appendix D contains a signed-recorded copy of a restrictive covenant for the Crude Booster Pump area. The consent decree allowed for the removal of the restrictive covenant once demonstration was made that the site met MTCA standards. Following is a risked-based analysis demonstrating that MTCA standards have been met for crude booster pump soils.

2.2.2 Sampling and Analysis

On May 19, 1999 soil in the crude booster pump area was screened both visually and with a photoionization detector (PID). Samples were collected using a hand auger from approximately 6 to 12 inches below ground surface (bgs) at four locations. At one location, the soil had a slight odor and a low-level PID reading of 4 ppm. None of the other locations indicated the presence of contamination based on the PID readings.

The soil with the slight odor was considered to represent a worst-case sample and was submitted for laboratory analysis. The soil sample (CBP-1) was collected from approximately 25 feet west of the concrete catchment where the crude booster pumps are attached and near where the pipelines emerge aboveground south of North Texas Road. The location was 3 feet west of the 30-inch diameter crude pipe and 3 feet north of the western extension of the concrete catchment (see Figure 3).

The soil sample was placed into a cooler, chilled and transported under chain-of-custody control to North Creek Analytical in Bothell, Washington. The sample was analyzed for Polynuclear Aromatic Hydrocarbons (PAHs) EPA Method 8270-SIM (selective ion monitoring) and for (benzene, toluene, ethylbenzene, xylens) BTEX and the Ecology Interim TPH Policy Method (VPH/EPH fractionation method). These methods are described in detail in *Analytical Methods for Petroleum Hydrocarbons* (Ecology, 1997). Laboratory data and chain-of-custody data are provided in Appendix F.



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PUGET SOUND REFINING COMPANY 7-2350-520			SAMPLE LOCATION CRUDE BOOSTER PUMP AREA
DATE:	DRWN:	FILE:	FIGURE 3

2.2.3 TPH Risk Assessment - Pathways of Concern

Potential pathways through which a receptor could contact TPH-impacted soils include direct contact with soils and ingestion of groundwater impacted by contaminated soils. This section briefly describes each potential pathway of concern, as well as site-specific considerations pertinent to each pathway.

2.2.3.1 Direct Contact with Soils

According to MTCA (WAC 173-340-740), the direct contact pathway assumes that chemical intake results from exposure to soil via incidental ingestion. Method B residential and Method C commercial scenarios assume exposure to a child as a conservative estimation of risk. Method C industrial assumes exposure to an adult. In this evaluation, residential direct contact with soil is considered based on the requirements in the Consent Decree.

2.2.3.2 Leaching to Groundwater

Leaching of constituents from impacted soils into infiltrating water may result in contamination of underlying groundwater. Subsequent ingestion of this groundwater is one of the exposure pathways that is generally evaluated. No drinking water wells are located in the vicinity of this site, so exposure via drinking impacted groundwater is not anticipated. However, as a conservative measure, protection of groundwater is used in this analysis.

2.2.4 Soil Analytical Results

Sample results for BTEX and PAH analyses are summarized on Table 2. Carcinogenic compounds are present at concentrations less than residential criteria. Results of the soil analyses, including fractionation data, are presented in Table 3. The soil sample from the crude booster pump area contained middle to heavy end (>C12) aromatics and middle to heavy end (C10-C36) aliphatics. BTEX was not detected in any of the samples. Several PAH compounds were detected.

Table 2
Analytical Results and Applicable Criteria

Constituent	Sample Result CBP-1 (mg/kg)	MTCA Method A (mg/kg)	MTCA Method B Leach to GW (mg/kg)	MTCA Method B Direct Contact (mg/kg)
Benzene*	<0.1	0.5	0.02	34.5
Ethyl Benzene	<0.1	20	5.53	8000
MTBE	<1.0			
Naphthalene (VPH)	<0.1		39.88	3200
Toluene	<0.1	40	0.26	16000
Xylenes	<0.3	20	83.66	160000
2-Methylnaphthalene	<0.0200			
Acenaphthene	<0.0200		97.38	4800
Acenaphthylene	<0.0200			
Anthracene	<0.0200		2272.00	24000
Benzo(a)anthracene*	0.0234		0.09	0.137
Benzo(a)pyrene*	0.0201		3.88	0.137
Benzo(b)fluoranthene*	0.0318		0.21	0.137
Benzo(ghi)perylene	0.0435			
Benzo(k)fluoranthene*	<0.0200		0.49	0.137
Chrysene*	<0.0200		0.10	0.137
Dibenz(ah)anthracene*	<0.0200			0.137
Fluoranthene	0.0268		630.65	3200
Fluorene	<0.0200		104.12	3200
Indeno(123-cd)pyrene*	0.0201			0.137
Naphthalene (EPH)	<0.0200		39.88	3200
Phenanthrene	<0.0200			
Pyrene	0.0385		654.39	2400

Notes:
* = carcinogenic compound
Method B leaching to groundwater (GW) calculated using the fixed parameter three-phase partitioning model.

	CBP-1 mg/kg
EC 5-6 Aliphatics	<5
EC >6-8 Aliphatics	<5
EC >8-10 Aliphatics	<5
EC >10-12 Aliphatics	5.1
EC >12-16 Aliphatics	91.9
EC >16-21 Aliphatics	157
EC >21-35 Aliphatics	398
EC 5-7 Aromatics (Benzene)	<0.1
EC >7-8 Aromatics (Toluene)	<0.1
EC >8-10 Aromatics	<5
EC >10-12 Aromatics	<5
EC >12-16 Aromatics	13.9
EC >16-21 Aromatics	104
EC >21-35 Aromatics	463

TOTAL[1]	1,246

Constituent	RfD-oral
Aliphatics	0.06
Aromatics	0.03
Toluene	0.20
Ethylbenzene	0.10
Total Xylenes	2.00

Scenario	Factor
Residential	1.25E-05
Commercial	3.13E-06
Industrial	2.86E-07

Total Aliphatics (C5-C35)	660
Total Aromatics (Benz + C8-C35)	586
Benzene	<0.1
Toluene	<0.1
Ethylbenzene	<0.1
Total Xylenes	<0.3

HAZARD INDEX[2]	
Residential[3]	0.38
Commercial	0.10
Industrial	0.01

NOTES:

[1] Non-detect values were set equal to one-half the detection limit for calculation of totals.

[2] Hazard Index = the summation of ***(Soil Concentration - mg/kg) (Factor [Res, Com, or Ind]) / Oral-RfD*** for each compound or group of compounds (e.g., C5 - C35 aliphatics).

[3] For example, the ***Residential Hazard Index*** for sample is as follows:

	Soil Conc. (mg/kg)		Factor $_{Res}$		RfD $_{Oral}$		Hazard Quotient (HQ)
Total Aliphatics (C5-C35)	660	×	1.25E-05	÷	0.06	=	0.14
Total Aromatics (Benz + C8-C35)	586	×	1.25E-05	÷	0.03	=	0.24
Toluene	<0.1	×	1.25E-05	÷	0.2	=	3.13E-06
Ethylbenzene	<0.1	×	1.25E-05	÷	0.1	=	6.25E-06
Total Xylenes	<0.3	×	1.25E-05	÷	2	=	9.38E-07

2.2.5 TPH Risk Assessment Procedures

To assess carcinogenic risk associated with the TPH in the soil, concentrations of benzene and carcinogenic PAHs were compared to MTCA Method A and B criteria. If the MTCA Method B residential values for individual carcinogens were exceeded, then carcinogenic compounds would be assumed to drive the cleanup.

Non-carcinogenic risk associated with TPH is assessed using the Interim TPH Policy methods. This method is based on a "surrogate" approach to evaluating TPH risk using MTCA Method B procedures. In the Washington State fractionation method, TPH is split into 14 different fractions based on carbon range and chemical group (i.e. aromatic or aliphatic). The analytical method is a two-step procedure: 1) volatile petroleum hydrocarbons (VPH) are measured by purge and trap followed by gas chromatography; and 2) extractable petroleum hydrocarbons (EPH) are measured by a solvent extraction and solid-phase extraction/fractionation followed by gas chromatography with a single detector. The fractionation between aliphatics and aromatics occurs in the EPH extraction step. Individual compounds like BTEX and PAHs are also analyzed.

Non-carcinogenic risk associated with the direct contact pathway is evaluated by calculating a hazard index. To calculate a hazard index (HI), surrogates are used to estimate oral reference doses (RfD) for use in the MTCA Method B equations. The Interim TPH Policy specifies that *n*-hexane is used as the surrogate for the aliphatic group, and pyrene is used or the surrogate for the aromatics group. The RfDs previously established in MTCA are used for toluene, ethylbenzene, and total xylenes. A HI of 1 is the acceptable level of non-carcinogenic risk.

Non-carcinogenic risks associated with the soil-to-groundwater pathway are addressed by calculating each fraction's contribution to the total TPH on a molar basis and multiplying this percentage by the solubility of each fraction to determine the maximum pore water concentration of each fraction. These concentrations are summed and divided by a dilution/attenuation factor of 20 to account for pore water mixing with groundwater. The resultant concentration is the expected TPH concentration in groundwater due to leaching from soils. For this pathway, the cleanup level is determined as the concentration of TPH in soil that does not exceed the MTCA Method A criteria of 1 mg/L TPH in groundwater.

2.2.6 Results of the TPH Assessment

Carcinogenic compounds do not present a risk at the site. Concentrations of the potentially carcinogenic compounds are presented on Table 2. Benzene and four of the carcinogenic PAH were not detected. The remaining three carcinogenic PAH, benzo(a)anthracene, benzo(a)pyrene, and indeno(123-cd)pyrene, were detected at a level slightly above the detection limit at concentrations of 0.0234 mg/kg, 0.0201 mg/kg and 0.0201 mg/kg, respectively. These concentrations are below the applicable Method A and B criteria.

Tables 3 and 4 provide the results for non-carcinogenic risk assessment for TPH. These results indicate that the non-carcinogenic risk associated with TPH in soil within the crude booster pump area does not exceed the acceptable risk level of 1.0 for the hazard index. For the direct contact pathway, a hazard index of 0.38 was calculated for the residential use scenario. For the leaching to groundwater pathway, the estimated TPH concentration in groundwater was 0.05 mg/L. This concentration is well below the drinking water criteria of 1 mg/L for TPH and therefore, this pathway also does not present a risk. Based on this risk analysis, Equilon believes that the MTCA standards for soils at the crude booster pump have been met.

2.3 Flare Area Land Treatment Facility

Non-hazardous hydrocarbon contaminated soils from remedial activities associated with the February 22, 1991 oil spill were treated at Texaco's Flare Land Treatment Facility. The landfarming of soils from the spill and associated groundwater monitoring was completed as specified in the consent decree exhibits C and D as listed below.

2.3.1 Land Treatment Facility Soil Monitoring Requirements

Following are the consent decree requirements for soil sampling, monitoring and final demonstration that the site meets the closure standard.

Table 4
Fractionation Results and Leaching Worksheet

MW (mg/mmol)	Fraction	CBP-1 mg/kg
81	EC 5-6 Aliphatics	<5
100	EC >6-8 Aliphatics	<5
130	EC >8-10 Aliphatics	<5
160	EC >10-12 Aliphatics	5.1
200	EC >12-16 Aliphatics	91.9
270	EC >16-21 Aliphatics	157
312	EC >21-35 Aliphatics [1]	398
78	EC 5-7 Aromatics (Benzene)	<0.1
92	EC >7-8 Aromatics (Toluene)	<0.1
120	EC >8-10 Aromatics	<5
130	EC >10-12 Aromatics	<5
150	EC >12-16 Aromatics	13.9
190	EC >16-21 Aromatics	104
240	EC >21-35 Aromatics	463
	TOTAL [2]	1,246

Fraction	Fraction Concentration/MW (mmol/kg)
EC 5-6 Aliphatics	0.0309
EC >6-8 Aliphatics	0.0250
EC >8-10 Aliphatics	0.0192
EC >10-12 Aliphatics	0.0319
EC >12-16 Aliphatics	0.4595
EC >16-21 Aliphatics	0.5815
EC >21-35 Aliphatics	1.2756
EC 5-7 Aromatics (Benzene)	0.0006
EC >7-8 Aromatics (Toluene)	0.0005
EC >8-10 Aromatics	0.0208
EC >10-12 Aromatics	0.0192
EC >12-16 Aromatics	0.0927
EC >16-21 Aromatics	0.5474
EC >21-35 Aromatics	1.9292
TOTAL	**5.03**

Fraction Solubility (mg/L)	Fraction	Concentration in Well (mg/L)[3] CBP-1	
28	EC 5-6 Aliphatics	8.58E-03	
4.2	EC >6-8 Aliphatics	1.04E-03	
0.33	EC >8-10 Aliphatics	6.30E-05	
0.026	EC >10-12 Aliphatics	8.23E-06	
0.00059	EC >12-16 Aliphatics	2.69E-06	
0.000001	EC >16-21 Aliphatics	5.78E-09	
0.000001	EC >21-35 Aliphatics	1.27E-08	
1780	EC 5-7 Aromatics (Benzene)	1.13E-02	
520	EC >7-8 Aromatics (Toluene)	2.81E-03	
65	EC >8-10 Aromatics	1.35E-02	
25	EC >10-12 Aromatics	4.78E-03	
5.8	EC >12-16 Aromatics	5.34E-03	
0.51	EC >16-21 Aromatics	2.77E-03	
0.01	EC >21-35 Aromatics	1.92E-04	
	TOTAL (mg/L)	**0.05**	**Estimated Groundwater Concentration**

NOTES: [1] Molecular weight for EC > C21-35 aliphatic fraction is set equal to MW of C22 *n*-alkane (312 mg/mmol)
Fraction solubility for EC > C21-35 aliphatic fraction is set equal to solubility of EC > 16-21 aliphatic fraction
[2] Non-detect values were set equal to one-half the detection limit for calculation of totals.
[3] Concentration in well = (Mole Fraction) X (Fraction Solubility) / (Dilution Factor of 20)
Mole Fraction = $(mmol/kg_{Fraction}) / (mmol/kg_{Total})$

2.3.1.1 Land Treatment Facility Surface Soil Samples

The consent decree required that oil spill related soils applied to the Flare Land treatment Facility be treated to MTCA Soil Clean-up Standards for TPH. During the November, 1996 sampling round, no petroleum hydrocarbons were detected in the surface soil composite samples from either the North (S-20) or the South (S-19) flare landfarms. Since the landfarm surface soils met the TPH standard, then final closure monitoring for groundwater wells, lysimeters and soil cores was started as required in the consent decree. Analytical results and chain of custody from the November 1996 sampling round is included in appendix F.

2.3.1.2 Land Treatment Soil Core Final Closure Demonstration

Semi-annual landfarm soil core sampling was required during the compliance monitoring phase of the consent decree. Once landfarm soils complied with the MTCA clean-up standard of 200 mg/kg TPH, the consent decree required the collection of confirmational soil cores from each of the two plots. The soil cores for final closure demonstration were collected within one foot below the treatment zone as required in the consent decree. Following closure demonstration for surface soils at the site, four soil core samples were collected from each landfarm over a two-year period. Each sample was then analyzed for BTEX and TPH. As outlined in Exhibit C of the Consent Decree, the cleanup standard for flare landfarm core samples is 0.5 mg/kg for benzene, 40.0 mg/kg for toluene, 20.0 mg/kg for ethylbenzene, and 20.0 mg/kg for xylenes.

Analytical results from the closure soil core sampling event are included in Table 5 below. In addition, historic core sample results for semi-annual sampling events from 1996 to 1998 are presented in Table 6. All results for the Below Treatment Zone (BTZ) samples were non-detect at detection levels at, or below, MTCA and consent decree clean-up standards for soils. As indicated by the results, the final closure standard for soil core samples has been met and no further soil cores will be collected at the site.

Closure Soil Sampling Results
Flare Land Treatment Facilities
Equilon - Puget Sound Refinery
Anacortes, Washington

Table 5

Landfarm Location	ZONE						
	Grab	Surface composite	Subsurface	BTZ	BTZ	BTZ	BTZ
South Flare Landfarm							
Benzene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.024	< 0.05	< 0.05
Toluene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.024	< 0.05	< 0.05
Ethylbenzene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.024	< 0.05	< 0.05
Xylenes	< 0.25	< 0.25	< 0.25	< 0.05	< 0.024	< 0.05	< 0.05
TPH-D	< 25	< 25	< 25	< 0.10	< 0.024	< 0.10	< 0.10
TPH-heavy	120	110	110	< 11	< 100	< 100	< 100
North Flare Landfarm							
Benzene	NS	NS	NS	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	NS	NS	NS	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	NS	NS	NS	< 0.05	< 0.05	< 0.05	< 0.05
Xylenes	NS	NS	NS	< 0.05	< 0.05	< 0.05	< 0.05
TPH - Method 418.1	14	26	14	12	20	27	17

Notes: Results presented in mg/kg
NS- Not Sampled
Surface Composite - 10 sampling locations composited from 0-6 inches soil depth
Subsurface - 10 sampling locations composited from 6-12 inches soil depth
BTZ (Below Treatment Zone) - Soil core sample from 5-6 feet below original landfarm surface.
SFLF samples for grab, suface and subsurface were collected on October 20, 1998. BTZ samples collected from semiannual cores over the last two years (March 1997 - November 1998)
NFLF samples for grab, suface and subsurce were collected on March 1996. BTZ samples collected in April 1996.

Soil Core Sampling Results
Flare Land Treatment Facilities
Equilon - Puget Sound Refinery
Anacortes, Washington

Table 6

Landfarm Location	Zone	Apr-96	Oct-96	Mar-97	Oct-97	Mar-98	Nov-98
South Flare Landfarm	BTZ						
Benzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Toluene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Ethylbenzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Xylenes		< 0.05	< 0.05	< 1.0	< 0.024	< 1.0	< 1.0
TPH		< 11	< 100	< 11	< 100	< 100	< 100
North Flare Landfarm	**BTZ**						
Benzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Toluene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Ethylbenzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Xylenes		< 0.05	< 0.05	< 1.0	< 0.024	< 1.0	< 1.0
TPH		< 12	< 100	< 12	< 100	< 100	< 100
Flare Landfarm Composite	**MTZ**						
Benzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Toluene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Ethylbenzene		< 0.05	< 0.05	< 0.05	< 0.024	< 0.05	< 0.05
Xylenes		< 0.05	< 0.05	< 1.0	< 0.024	< 1.0	< 1.0
TPH		< 11	< 100	< 11	< 100	< 100	< 100

Notes:
Results are presented in mg/kg
BTZ - Below Treatment Zone
MTZ - Middle Treatment Zone

2.3.2 Land Treatment Facility Groundwater Monitoring Requirements

Groundwater sampling and monitoring requirements and clean-up standards are specified in the consent decree. Following is a description of the requirements and activities conducted.

2.3.2.1 Land Treatment Facility Groundwater Wells

Appendix D of the consent decree required groundwater monitoring of flare landfarm downgradient Wells MW-112 and MW-113 semi-annually for BTEX and TPH until soils at the Flare Land Treatment site met MTCA soil clean-up standard of 200 mg/kg TPH. Once the soil clean-up standard was met, an additional two years of semi-annual groundwater monitoring was required to demonstrate compliance with the MTCA groundwater clean-up standard (WAC 173-340-720 (2)(a)(i). Per Appendix D of the consent decree, the method A (WAC 173-340-720 (2)(a)(i)) groundwater standards of 1.0 mg/l of TPH and BTEX standards of 5.0 ug/l benzene, 30.0 ug/l ethylbenzene, 40.0 ug/l toluene, and 20.0 ug/l xylenes were applied to groundwater wells at the landfarm site.

Analytical results from the historic semi-annual groundwater sampling events are included in Table 7. As indicated by the results, no BTEX or TPH was detected above consent decree cleanup standards in any samples at the site. Based on the groundwater well results, Equilon believes that the final closure demonstration clean-up standard has been met and no further groundwater sampling is proposed at the site in association with the flare land treatment facilities.

2.3.2.2 Land Treatment Facility Lysimeters

Appendix D of the consent decree requires that flare landfarm lysimeters be sampled semi-annually for BTEX and TPH until soils at the site meet MTCA soil clean-up standard of 200 mg/kg TPH. Once the soil clean-up standard was met, an additional two years of semi-annual lysimeter water sampling was required to demonstrate compliance with the MTCA groundwater clean-up standard (WAC 173-340-720 (2)(a)(i).

Groundwater Sampling Results Table 7

Flare Land Treatment Facilities

Equilon - Puget Sound Refinery

Anacortes, Washington

Date	Benzene	Toluene	Ethylbenzene	Xylenes	TPH
W-112					
Mar-99	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Aug-98	NS	NS	NS	NS	NS
Jun-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Mar-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Dec-96	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-96	< 2.0	< 2.0	< 2.0	< 5.0	NS
W-113					
Mar-99	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Aug-98	NS	NS	NS	NS	< 250
Jun-98	< 0.5	< 0.5	< 0.5	< 1.0	318
Mar-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Dec-96	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-96	< 2.0	< 2.0	< 2.0	< 5.0	NS
W-127					
Mar-99	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Aug-98	NS	NS	NS	NS	NS
Jun-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Mar-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50

Note: Results are presented in ug/L.
NS - Not Sampled

Per Appendix D of the consent decree, the method A (WAC 173-340-720 (2)(a)(i)) groundwater standards of 1.0 mg/l of TPH and BTEX standards of 5.0 ug/l benzene, 30.0 ug/l ethylbenzene, 40.0 ug/l toluene, and 20.0 ug/l xylenes were applied to groundwater lysimeter samples at the landfarm site.

Analytical results from the historic semi-annual lysimeter sampling events are included in Table 8. Lysimeter L90-20NW was not sampled after June of 1996 as this area received final closure from Ecology in preparation for the construction of our new biosolids landfarm. During 1996, lysimeter L90-20SW was replaced by piezometer P-22 under agreement with the Department of Ecology and was used to demonstrate compliance for the L90-20SW area (Appendix E). As indicated by the results, no BTEX or TPH was detected above the MTCA and consent decree clean-up standards for any of the lysimeters tested during the two year compliance monitoring phase. Based on the lysimeter results, the final closure demonstration clean-up standard has been met and no further lysimeter sampling is proposed at the site in association with the flare land treatment facilities.

3.0 RECOMMENDATIONS AND CONCLUSIONS

This report has been submitted in fulfillment of the requirements outlined in Consent Decree No. 93-2-00913-8 between Texaco Puget Sound Plant and the Washington State Department of Ecology as recorded in Skagit County on August 18, 1993. With this report, Equilon Enterprises LLC believes that it has fulfilled all requirements from the consent decree and requests that the Department of Ecology proceed to formally close the site and remove the site from the Model Toxics Control Act Site Register. In addition, Equilon requests written approval from the Dept. of Ecology that allows for removal of the restrictive covenant from the crude booster pump site.

Lysimeter Sampling Results
Flare Land Treatment Facilities
Equilon Puget Sound Refinery
Anacortes, Washington

Table 8

	South Flare Land Treatment Facility									
	Lysimeter: L90-19SE					Lysimeter: L90-19SW				
Date	Benzene	Toluene	Ethylbenzene	Xylenes	TPH	Benzene	Toluene	Ethylbenzene	Xylenes	TPH
Mar-99	< 0.5	< 0.5	< 0.5	< 1.0	309	< 0.5	< 0.5	< 0.5	< 1.0	496
Dec-98	< 0.5	< 0.5	< 0.5	< 1.0	321	< 0.5	< 0.5	< 0.5	< 1.0	265
Sep-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Aug-98	NS	NS	NS	NS	NS	NS	NS	NS	NS	284
Jun-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250	< 0.5	< 0.5	< 0.5	< 1.0	360
Mar-98	< 0.5	< 0.5	< 0.5	< 1.0	< 250	< 0.5	< 0.5	< 0.5	< 1.0	374
Dec-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Mar-97	< 2.0	< 2.0	< 2.0	< 5.0	< 50	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Dec-96	< 2.0	< 2.0	< 2.0	< 5.0	< 50	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jun-96	< 2.0	< 2.0	< 2.0	< 5.0	NS	< 2.0	< 2.0	< 2.0	< 5.0	NS

	North Flare Land Treatment Facility									
	Lysimeter: L90-20NW					Lysimeter: L90-20SW/P-22				
Date	Benzene	Toluene	Ethylbenzene	Xylenes	TPH	Benzene	Toluene	Ethylbenzene	Xylenes	TPH
Mar-99	NS	NS	NS	NS	NS	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-98	NS	NS	NS	NS	NS	< 0.5	< 0.5	< 0.5	< 1.0	265
Sep-98	NS	NS	NS	NS	NS	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Jun-98	NS	NS	NS	NS	NS	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Mar-98	NS	NS	NS	NS	NS	< 0.5	< 0.5	< 0.5	< 1.0	< 250
Dec-97	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Sep-97	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Jun-97	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Mar-97	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	< 50
Dec-96	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	NS
Sep-96	NS	NS	NS	NS	NS	< 2.0	< 2.0	< 2.0	< 5.0	NS
Jun-96	< 2.0	< 2.0	< 2.0	< 5.0	NS	< 2.0	< 2.0	< 2.0	< 5.0	NS

Notes:
Results presented in ug/L.
NS- Not Sampled
L90-20NW not sampled after 1995, due to construction of a lined Biosolids Facility at the North Flare Landfarm
After June 1996 L90-20SW was damaged, all data from September 1996 to present is from piezometer P-22

APPENDIX A

CLEAN-UP ACTION PLAN
AS SUBMITTED 5/25/93

CLEANUP ACTION PLAN

Texaco February 22, 1991 Oil Spill
Anacortes, Washington

by

Washington Department of Ecology

May 25, 1993

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DRAFT CLEANUP ACTION PLAN
TEXACO FEBRUARY 22, 1991 OIL SPILL
TEXACO PUGET SOUND PLANT
ANACORTES, WASHINGTON
May 25, 1993

INTRODUCTION

1.1 PURPOSE

This document presents the Cleanup Action Plan for the Texaco February 22, 1991 oil spill on-land site. The Cleanup Action Plan documents the site-specific factors and analysis that led to the selection of the cleanup remedy for the site. The upland site is located on March Point at the Texaco refinery approximately three miles east of the city of Anacortes, Washington. The oil spill site resulted from the failure of a booster pump located in the northwest corner of the refinery. The pump failed during the offloading of Alaska North Slope crude oil from an offshore oil tanker. An estimated 210,000 gallons of crude oil were released at the site. Soils were impacted on Texaco property as well as adjacent property owned by Leonard Munks family, and Shell Oil Company. The southern portion of Fidalgo Bay was also affected by the spill. The cleanup decisions in this Cleanup Action Plan are based on data presented in remedial investigation and feasibility studies and interim action studies conducted by K. W. Brown Environmental Services and initial investigations carried out by Texaco Environmental Services. Much of the cleanup was completed as either an emergency action or interim action under an Agreed Order signed by Texaco and the Department of Ecology in July of 1991. Figure one shows areas of the site which still are impacted by the spill.

1.2 APPLICABILITY

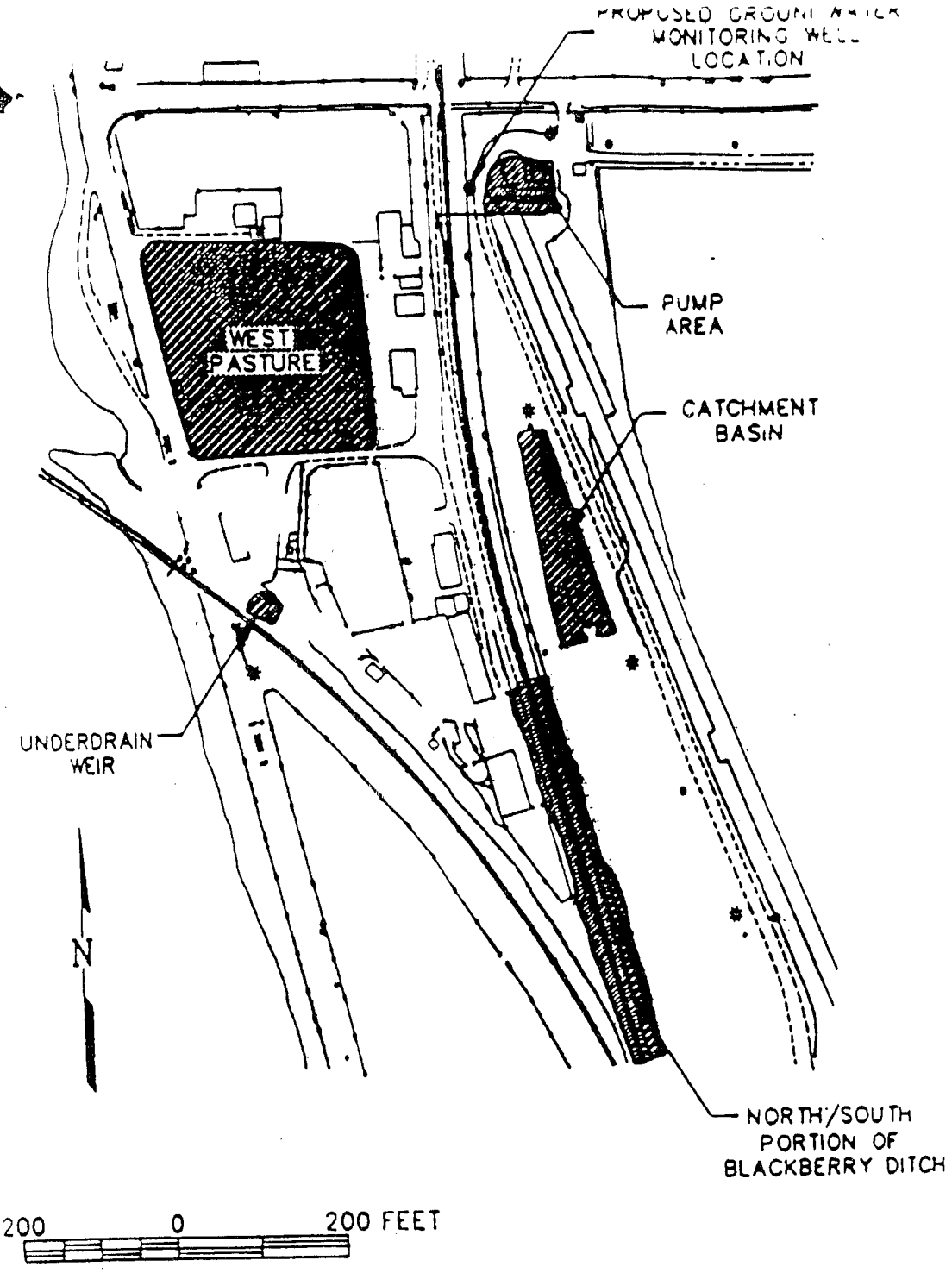
This Cleanup Action Plan is applicable only to the Texaco February 22, 1991 on-land site. The cleanup levels and cleanup actions presented in this document have been developed as a result of a remediation process conducted with Department of Ecology oversight. The cleanup levels are site specific. The cleanup actions should not be considered as setting precedent for other similar sites.

Potentiality Liable Persons (PLP's) cleaning up sites independently, without Ecology oversight, may not cite numerical values of cleanup levels specified in this draft document as justification for cleanup levels in other unrelated sites. PLP's that are cleaning up sites under Ecology oversight must base cleanup levels on site specific regulatory considerations and not the numerical values presented in this CAP.

1.3 DECLARATION

The selected remedy will be protective of human health and the environment. Ecology gives preference to permanent solutions to the maximum extent where

DRAFT



KWBES

prepared for:

Oil spill areas of concern.

PROJECT: 701092005-237 (PSPSAMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 06/24/92
DRAWN BY: RMO	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 1

practical. In this cleanup, treatment was examined and used as the primary cleanup technology proposed. Permanent treatment off site of contaminated soils was judged practicable at this site. Institutional controls along with method B cleanup standards are proposed for one small portion of the site. A summary of all cleanup alternatives which were examined during the investigative phase of the feasibility study is given in the cleanup alternative section of this CAP.

SITE DESCRIPTION AND HISTORY

2.1 SITE LOCATION

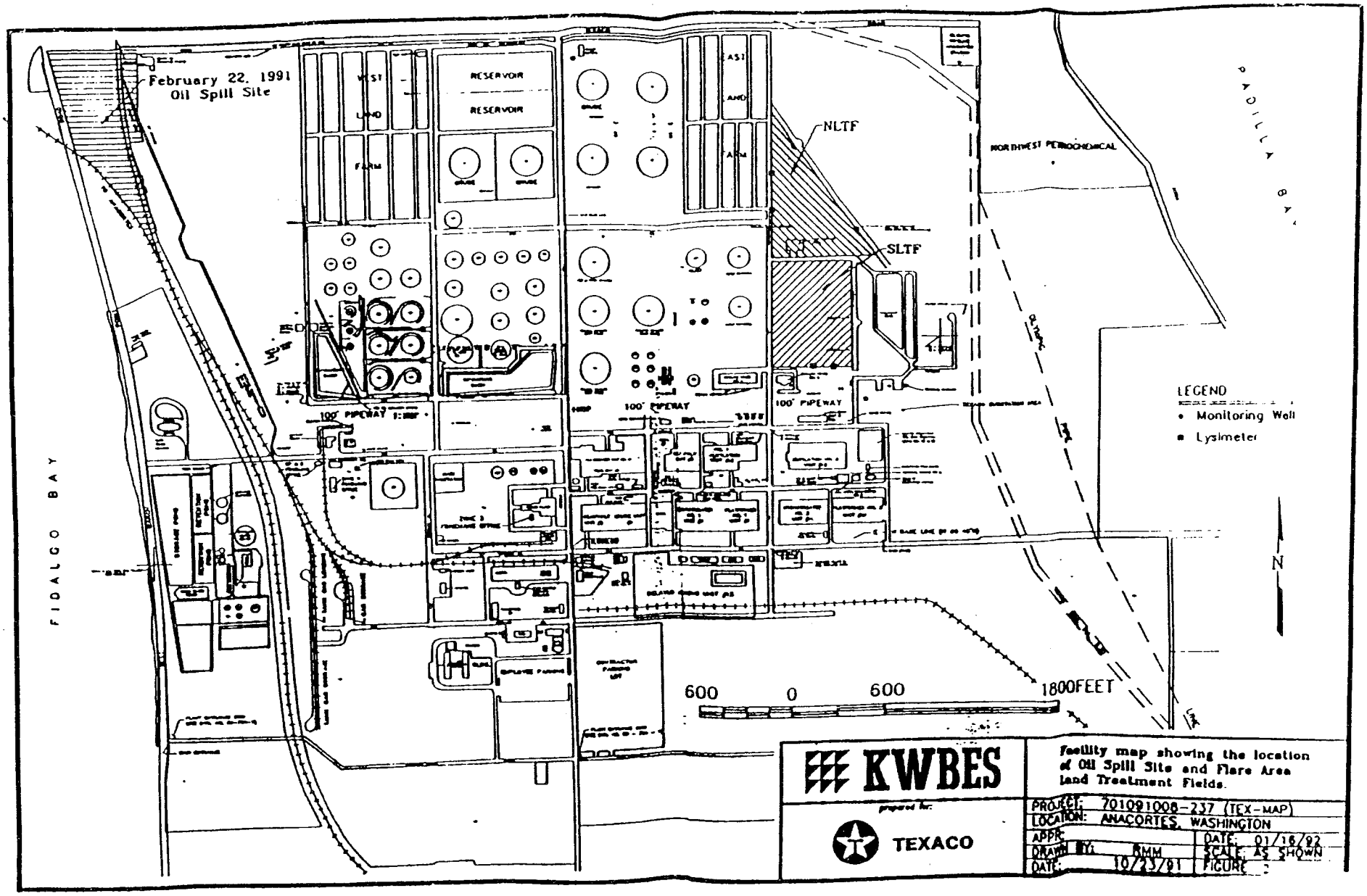
The Texaco February 22, 1991 oil spill site is located in the northwest corner of the Texaco refinery situated on March Point near Anacortes, Washington. The site is approximately 100 to 200 feet from Fidalgo Bay. The area is industrial with two large refineries, Texaco and Shell located along March Point. Figure 2 shows the site location.

2.2 SITE HISTORY

The Texaco refinery began operation in the fall of 1958. The plant operates 24 hours per day and produces a variety of marketable petroleum products. The refinery production capacity is approximately 115,000 barrels of crude oil per day. The oil spill occurred in the evening of February 22, 1991 while Alaskan North Slope crude oil was being off loaded from a tanker in Fidalgo Bay. The spill was a result of a catastrophic failure of a large crude oil litering pump. After pump failure, approximately 210,000 gallons (5000 barrels) of crude oil were released on to the environment. Soils and surface water were impacted on Texaco property as well as adjacent property owned by Mr. Leonard Munks and the Shell Oil Company. Surface drainage pathways transect the site and run directly into Fidalgo Bay. During the spill, crude oil ran from the broken pump westward across the pipeway and railroad right of way to drainage ditches located on the Munks property. The crude oil entered the Fidalgo Bay via two surface water drainage outfalls. The crude oil affected the southern portion of bay. A massive cleanup effort on Fidalgo Bay and the upland pump area was initiated immediately following the release.

Several emergency actions on the site occurred immediately following the spill. Intercepter trenches were excavated in strategic locations on the site to control hydrocarbon migration. Vacuum trucks were utilized to remove free crude oil from the trenches and other low areas on the site. An underdrain weir system was constructed in the drainage ditches surrounding the site to control the movement of crude oil into Fidalgo Bay. Visibly oiled materials from the Munks property, pump area, and service road were removed and stockpiled in a holding area in the refinery. The area was initially investigated by Texaco Environmental Services. Texaco Environmental Services completed a report documenting the impacts of the spill complete with a work plan for the investigation of the site.

In July of 1991, the Washington Department of Ecology and Texaco signed an Agreed Order that directed Texaco to prepare a remedial investigation and feasibility


February 22, 1991
Oil Spill Site
RESERVOIR
RESERVOIR
NLTF
SLTF
NORTHWEST PETROCHEMICAL
PADILLA BAY
FIDALGO BAY
100' PIPEWAY
LEGEND
Monitoring Well
Lysimeter
N
600 0 600 1800FEET
KWBES
prepared for:
TEXACO
Facility map showing the location of Oil Spill Site and Flare Area land Treatment Fields.
PROJECT: 701091008-237 (TEX-MAP)
LOCATION: ANACORTES, WASHINGTON
APPR:
DRAWN BY: RMH
DATE: 10/23/91
DATE: 01/16/92
SCALE: AS SHOWN
FIGURE:

study on the site and complete the rapid cleanup of the oily soils on the private property of Mr. Munks. Texaco personnel and individuals from K. W. Brown and Associates completed the work directed by the Order. The Order consisted of three parts. The first section was an interim cleanup action which allowed for the rapid cleanup of the Munks residence, the second portion of the Order dealt with the bioremediation of the stockpiled nonhazardous oily soil that was placed in the refinery during the emergency action, and the third section of the Order involved the implementation of a work plan to complete the site assessment of the oil spill area and conduct an RI/FS (remedial action/feasibility study) on the affected areas of the site not remediated under the emergency and interim actions. The RI/FS Order was amended to include the cleanup of the oiled railroad right of way in October of 1991.

2.3 CURRENT STATUS AND FUTURE USE

The site is currently bordered on the east by two refineries and on the west by Fidalgo Bay. Mr. L. Munks owns a private residence on the western portion of the site. Future use of the site is unknown at this time. Mr. Munks does not plan to move his residence.

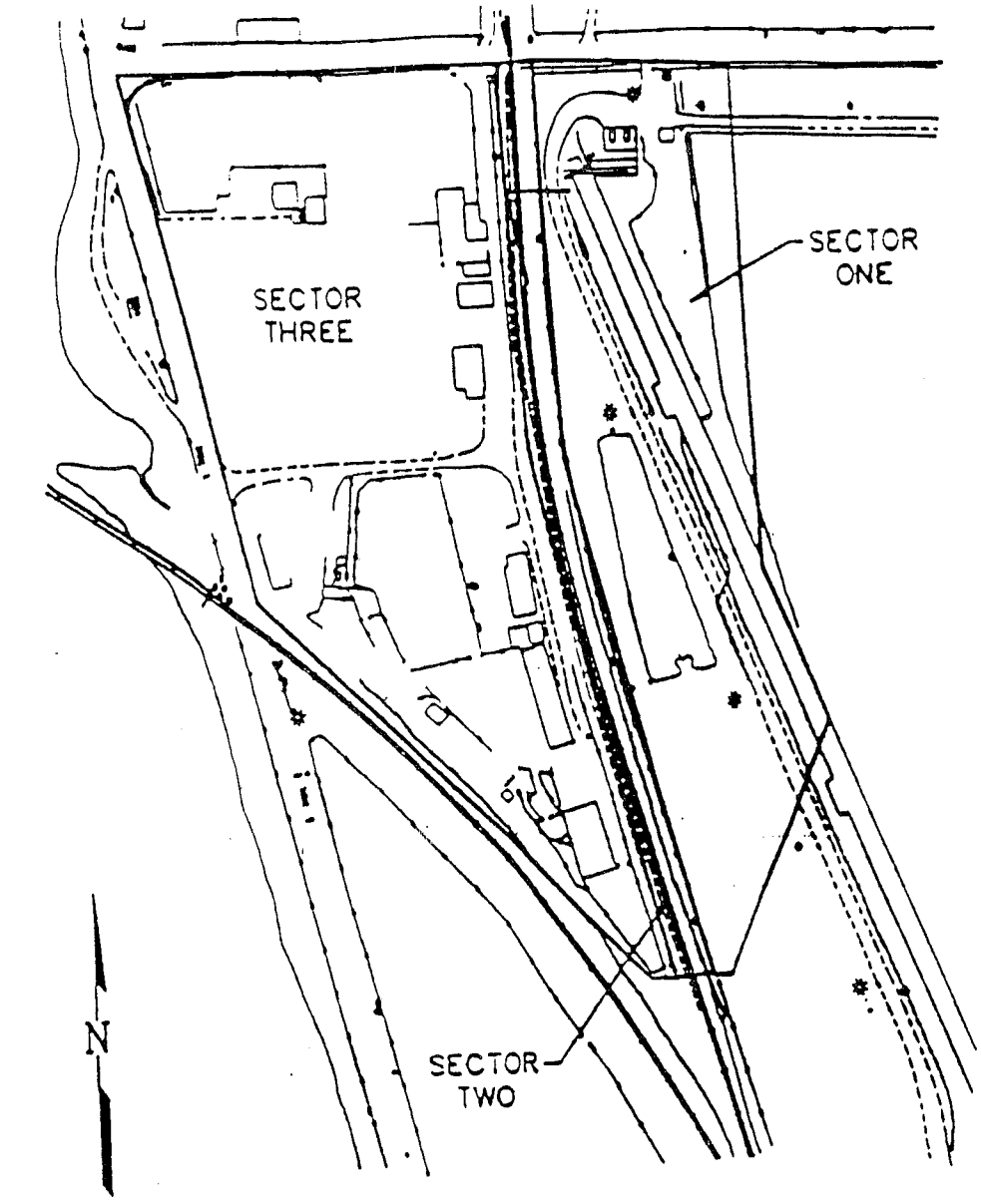
RESULTS OF ENVIRONMENTAL STUDIES AND EMERGENCY/INTERIM ACTIONS

3.1 SITE CHARACTERIZATION

3.1.1 Site Description.

The oil spill site is located on the western flank of March Point approximately 3 miles from Anacortes, Washington. The site is bounded on the north by North Texas Road, a north-south trending Texaco pipeway to the east, West March Point Road to the west, and a railroad spur running northwest-southeast that crosses Fidalgo Bay to the south (Figure 3). For the purpose of cleanup activities, the site was divided into three areas (sectors): Munks property (sector 3), Shell railroad right of way (sector 2), and Texaco property (sector 1). During the interim action the Munks property (sector 3), was divided into six principal areas (Figure 4).

- North Pasture
- South Pasture
- West Pasture
- Area adjacent to Munks north residence
- South house area
- The blackberry ditch - a drainage ditch that parallels the railroad spur



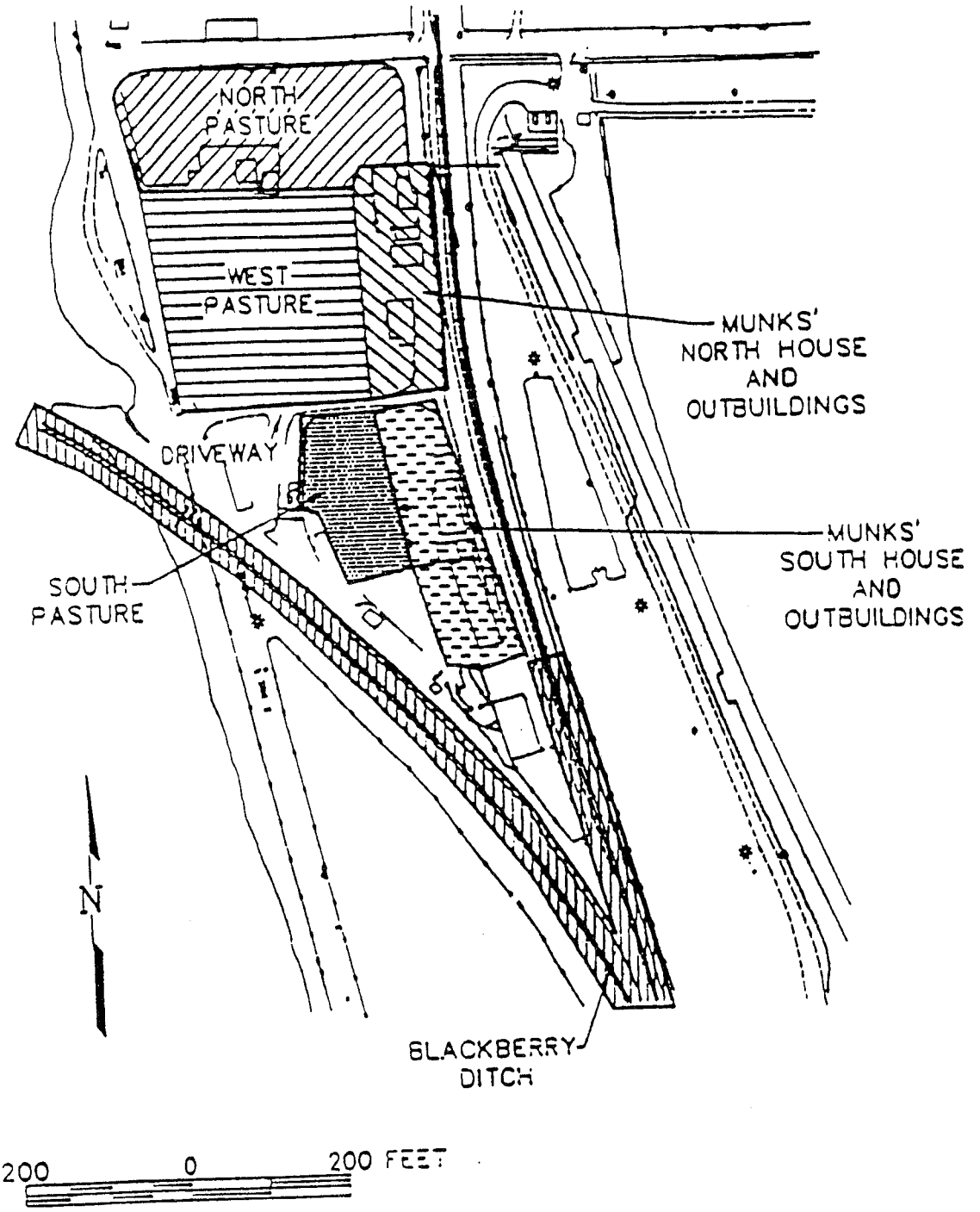
KWBES

prepared for

TEXACO

Sectors in the RI/FS site characterization.

PROJECT:	701091OCE-237 (PSPSAMP)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 11/16/92
DRAWN BY:	RMO SCALE: AS SHOWN
DATE:	05/21/91 FIGURE: 3



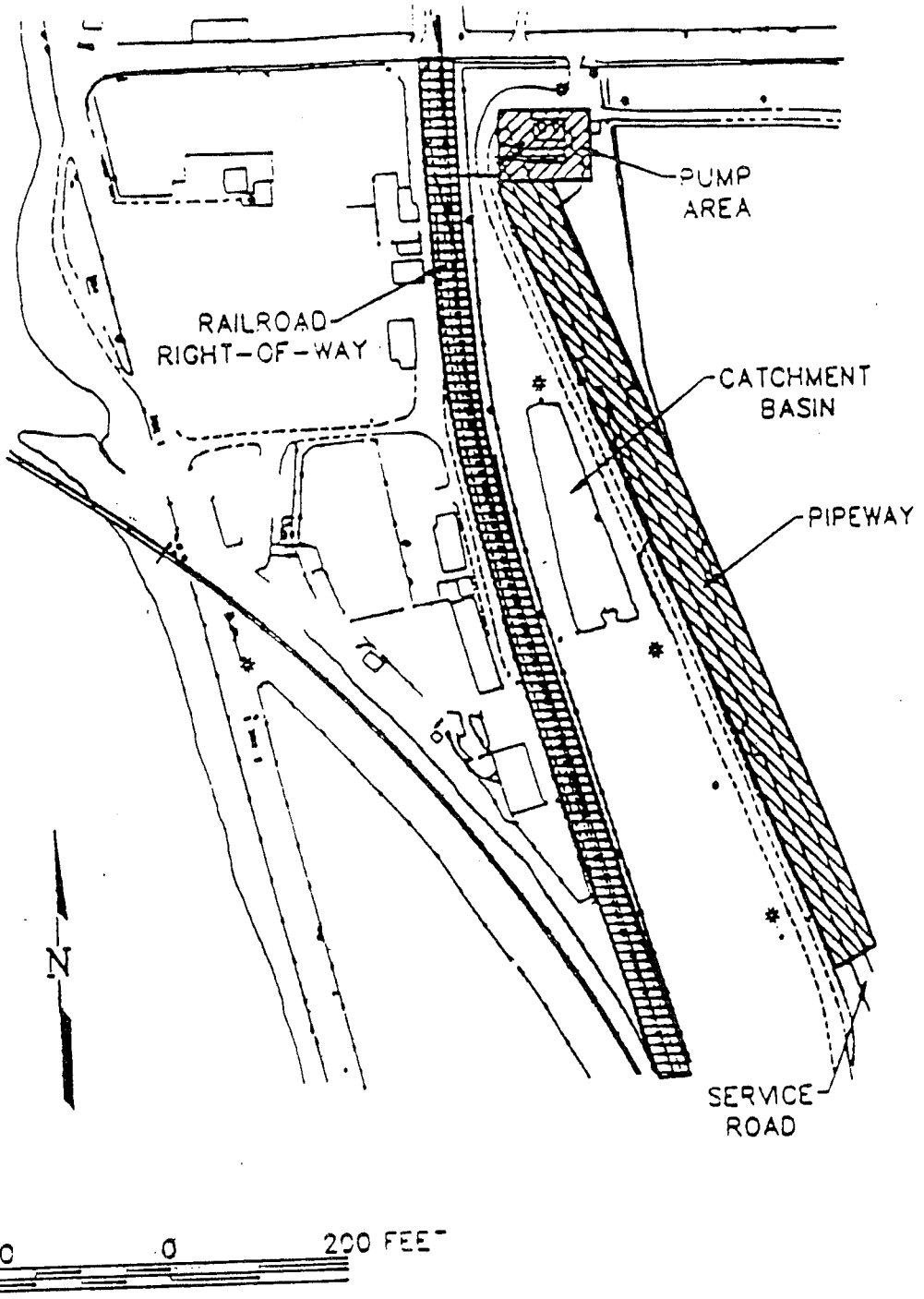
KWBES

prepared for:

TEXACO

Primary areas within Munks' property.

PROJECT:	70:09:008-237 (PSPSAMP)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 01/16/92
DRAWN BY: RMO	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 4



KWBES

prepared for:

TEXACO

Primary areas within the Texaco property and Shell Oil right-of-way.

PROJECT:	70109CCE-237 (PSPSAMP)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 01/16/92
DRAWN BY: RMC	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 5

The Shell railroad spur is the second area (sector 2) and the Texaco property is the third area (sector 1). Sector one, the Texaco property is divided into four areas (Figure 5).

- Pump area
- Catchment basin
- Pipeway
- Surface road that parallels the pipeway

3.1.2 Site Geology and Hydrogeology

The geology of the spill site was investigated during the remedial investigation. Geologic descriptions in the remedial investigation were derived from three borings and surface field investigations. The borings were located in Munks' north pasture, west of the pump station, and east of the pump station area. The three drill holes penetrated two units to a total depth of 50 feet.

The two major stratigraphic units are found throughout the three sectors of the site. The first unit is a brown to gray, mottled, fractured silty clay to clayey silt. The unit is continuous throughout the site and ranges from 10 to 15 feet in thickness. The hydraulic conductivity of the unit is 4.1×10^{-8} cm/sec. The unit is covered with fill consisting of rock ballast beneath the railroad right of way and silt and clay beneath the pipeway. The unit comprised the bulk of the contaminated soil removed from the site.

The second unit is a gray, slightly moist to dry silt that grades into interbedded a gray silt with clay and sand lenses. The top portion of the unit is continuous throughout the site and ranges from 15 to 20 feet in thickness. The gray silt has a hydraulic conductivity of 2.9×10^{-7} cm/sec. The lower portion of the unit, which is interbedded with fine sand and clay, was detected in the lower 15 to 20 feet of each bore hole.

The two geologic units in the site form a barrier over the regional aquifer in the area. One water well is found near the site. This well is located approximately 15 feet north of North Texas Road and west of the railroad crossing. It is owned by the Munks family. The depth of the well is 79 feet as measured from the top of the well casing. No records of well construction details are available for this well. The well produces water throughout the summer months and is assumed to be screened in a confined aquifer found deeper than 50 feet. Monitoring wells drilled south of the spill site at the Texaco effluent plant show similar artesian conditions.

Shallow ground water forms a perched water table on the site and is found on top of unit one during the winter and spring wet seasons. The fluid migration within the unit is vertical by fracture flow. Based on oily fractures found in the remedial investigation, it was concluded that the predominant flow direction was downward in the dry season. No analysis of ground water flow direction on Munks property or the railroad right of way has been completed for wet season flow.

The flow direction of the perched water table beneath the pump station is to the west.

3.1.3 Soil and Ground Water investigations

Sector One Sector one consists of oil spill affected portions of the Texaco property located east of the rail road right of way (Figure 5). The area contains the pipeline area, drainage ditch east of the railroad right of way, pump area, and catchment basin. Portions of the sector were cleaned up during the interim actions described in Section 3.2 and have not been characterized.

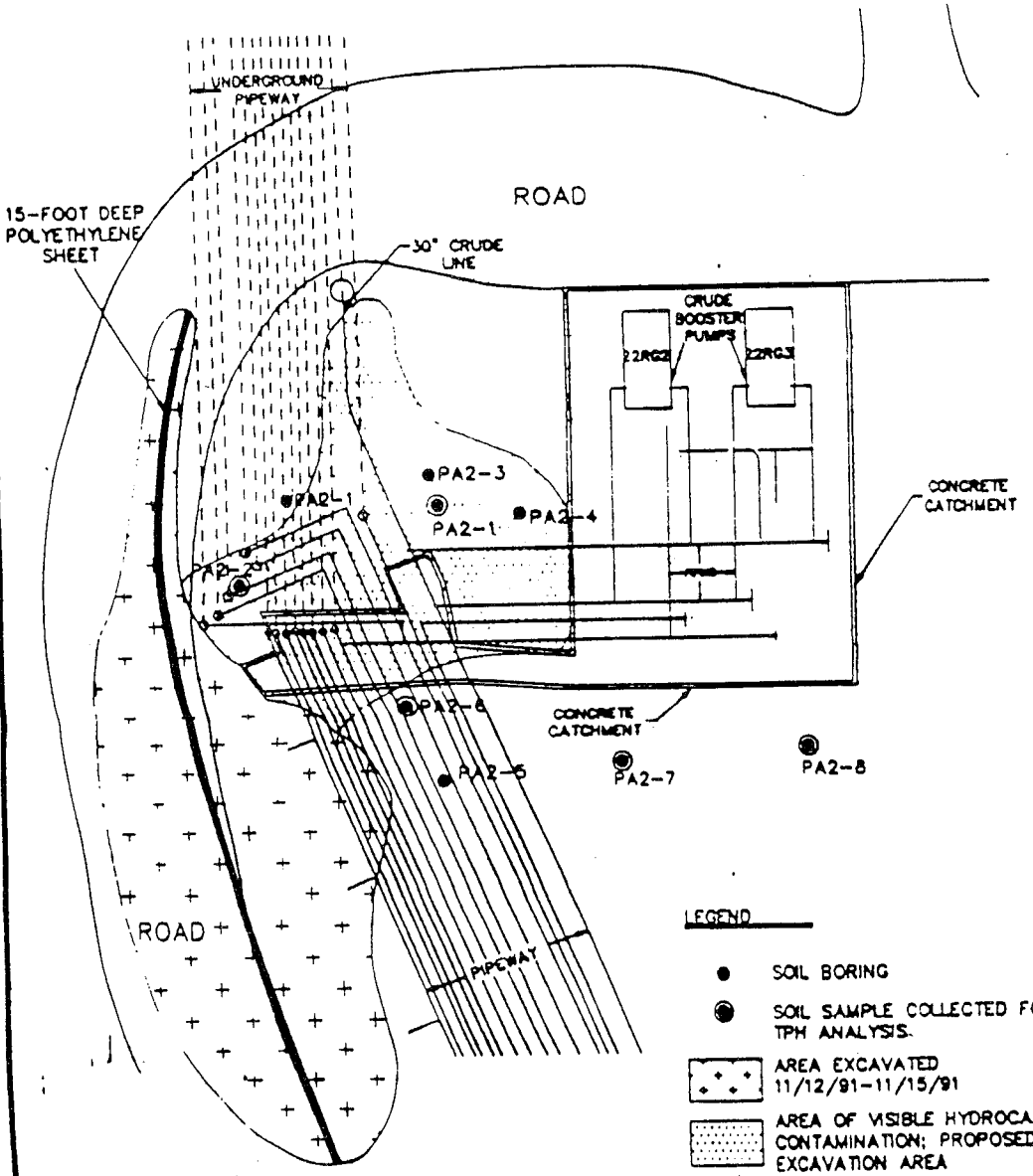
The pipeline area is located south of the pump station. Crude oil ran along the pipeline for approximately 200 feet during the spill. The area was sampled during the emergency action. The surface sample (0-10 inches) collected from a trench containing oil and water showed evidence of oil contamination (16,000 mg/kg). The subsurface sample (10-20 inches) showed less than 5 mg/kg. Samples collected during the RI/FS were below the TPH method detection limit. A portion of the region was excavated during the installation of the impermeable barrier between the pump and service road. No further work is planned along the southern pipeline area.

The ditch east of the railroad right of way was sampled during the RI/FS. The samples yielded TPH results that were below the cleanup standard of 200 mg/kg. Major portions of the ditch were excavated during the replacement of the oiled railroad right of way. No further work is planned in the ditch.

The pump area was heavily oiled during the spill. The oily piping and support structures were pressure washed during the emergency action. The upper 6 inches of oily soil, or approximately 925 cubic yards, were removed near the station and land farmed at the Texaco refinery. Soil removal was not attempted below the pipeway west of the pump station. During the interim action Texaco placed a 120 foot HDPE sheet pile west of the pipeway. The plastic barrier was designed to prevent oil present under the pipeway and buried pipeline from migrating west into the clean railroad ballast bed. Based on analytical results and field observations of soils in the pump area, there appears to still be hydrocarbon contamination in soils directly west of the pump station (Figure 6).

During the oil spill crude oil ran into the containment basin. The majority of the oil was removed by vacuum truck and returned to the refinery. The areas most heavily oiled during the spill are located on the side walls of the basin because the catchment basin contained storm water runoff at the time of the spill. Three soil samples were taken during the RI/FS. One of the samples collected on the side walls of the basin was above MTCA cleanup levels (RP-2 2,139 mg/kg TPH). No sediment was taken from the catchment basin during either the emergency action or interim action.

Sector Two Sector two consists of the Shell Oil railroad right of way. The right of way was heavily oiled during the spill event. Prior to the interim cleanup, the roadbed contained areas of free crude oil and oily ballast. During the interim action, the area along the right of way was cleaned up to MTCA standardsand new clean ballast was placed in the roadbed. The roadbed was



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prepared for: TEXACO

Soil boring locations, proposed and completed excavations at crude booster pump area.

PROJECT: 701091008-237 (BOOSTPMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 2/12/92
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cleaned up due to the threat of further oil migration from the pump and pipeway areas through the ballast and onto the Munks property. No further action is planned in sector two.

Sector Three Sector three consists of Munks private property located east of the railroad right of way. Munks west pasture, north residence and a portion of the north pasture received the bulk of the crude oil from the spill. Interim actions removed oily soils from the north residence, north pasture and west pasture. Oil remained above MTCA 200 ppm TPH limits in the west pasture after the soils excavation. The west pasture was landfarmed throughout late 1991 and 1992. In the fall of 1992, hydrocarbon levels had dropped, but the area was still considered contaminated. In late 1992 Texaco removed soil around two hots spots. After the removal of contaminated soil, verification sampling showed no areas in the west pasture out of complience. All areas in sector three are at or below the TPH soil cleanup standard.

3.1.4 Surface and Ground Water Analysis

Surface water in sector three (Munks property) and two (railroad right of way) is collected in ditches and travels through two culverts to Fidalgo Bay (Figure 7). Subsurface drainage from Munks house area is collected from a north south trending drainfield located along the eastern edge of Munks northern house. The drainfield collects water from under the railroad right of way and a portion of the pump station. The drainfield flow is directed into a sump located in the southwest corner of the west pasture. Surface water flow from the pump station is directed into the catchment basin located south of the pump station structure. The surface water is periodically pumped to a ballast line that runs to the Texaco waste water treatment plant.

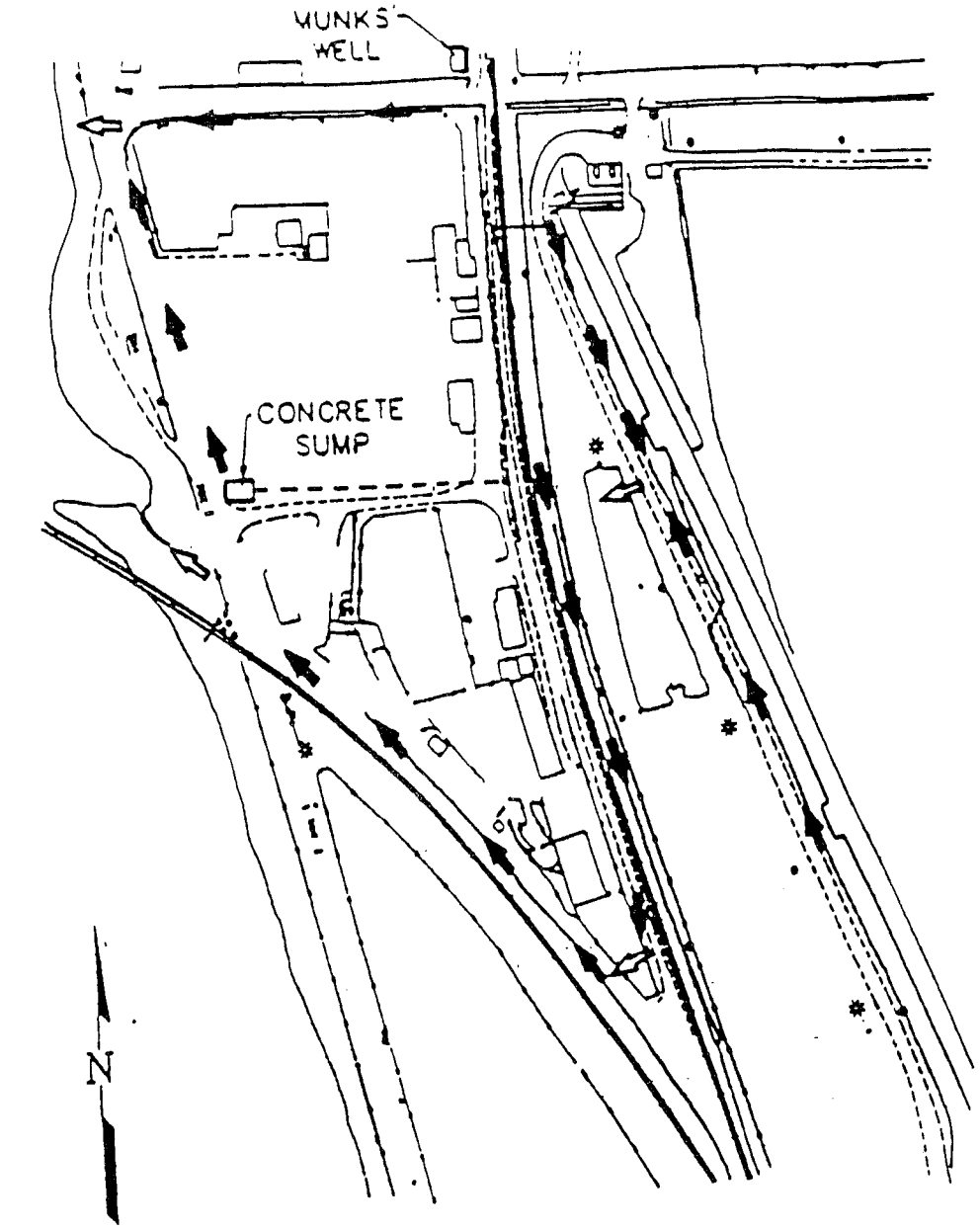
Surface water and water from the perched water table and aquifer has been tested for hydrocarbons and metals. The water from the Munks north house drain field has been tested for metals and hydrocarbons. No detectable hydrocarbons were noted in the samples. Minor amounts of zinc (0.02 mg/kg), nickel (0.01 mg/kg) and copper(0.04 mg/kg) were detected. These levels are below the Method B groundwater cleanup standards. The copper is thought to have originated from the sample pump.

Ground water from the Munks family well was analyzed for TPH, benzene, toluene, ethyl benzene and total xylene. Results of the laboratory testing indicate that no hydrocarbons are present in the water.

During the interim action an intercepter drain was placed west of the pump station. This drain empties into the trench system that ultimately drains to the catchment basin. The catchment basin is pumped into the refinery waste water treatment plant. The water from the drain has not been analyzed.

3.2 EMERGENCY AND INTERIM ACTIONS

Texaco began emergency actions on the on-land portion of the oil spill immediately after the event. These actions continued until July of 1991. In



KWBES	Surface water flow directions and location of Munks' drainfield and well.
prepared for: TEXACO	PROJECT: 701091008-237 (PSPSAMP) LOCATION: ANACORTES, WASHINGTON APPR: DATE: 01/16/92 DRAWN BY: RMO SCALE: AS SHOWN DATE: 05/21/91 FIGURE: 7

July, Texaco and the Department of Ecology signed an agreed order that directed Texaco to continue the cleanup of the private residence owned by the Munks family, complete a site assessment of the spill area and prepare an remedial investigation and feasibility study on the affected areas of the spill not remediated under the interim cleanup efforts. The following remedial actions have been completed on the site.

3.2.1 Munks Residence

3.2.1.1 Munks North Pasture.

A preliminary sample (location 7 - Figure 8) indicated hydrocarbon contamination in the center of the pasture (Figure 8). During the remedial investigation three trenches were excavated in the vicinity of the high sample. No oil was observed or measured using photoionization detectors (PID) during the investigation. Total petroleum hydrocarbon (TPH) and benzene analysis did not repeat the high sample results. The analytes were not present above method detection limits.

A buried water line that extends across the north pasture was examined during the remedial investigation. The water line was exposed in one of the emergency intercepter trenches. The soils exposed near the water line were excavated and screened with a PID. No visible hydrocarbons and no organic vapors were detected by the PID.

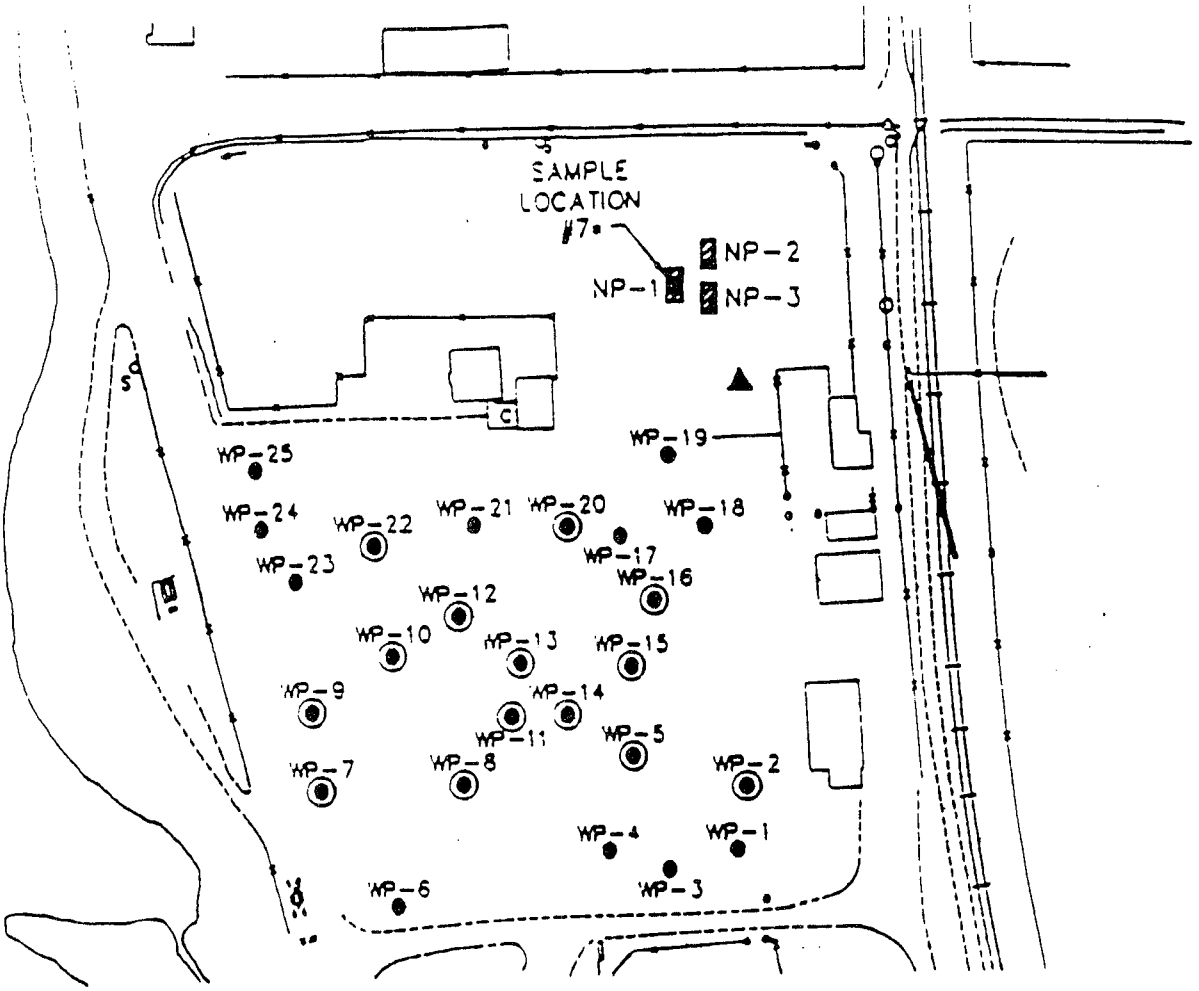
No further work in the north pasture was recommended by the RI/FS. Investigations of the original preliminary high samples did not indicate the presence of hydrocarbons.

3.2.1.2 Munks West Pasture.

Munks west pasture was heavily oiled during the spill. Approximately six inches of topsoil was removed from the pasture in the days immediately following the spill. Soil sampling immediately after the removal of the top soil indicated localized residual hydrocarbon remained in the pasture. A drain tile runs from the Munks house into the west pasture (Figure 8,9).

A second round of sampling was conducted in the pasture in August 1991. The second round of samples consisted of 0 to 10 inch composite samples collected from 25 random sites (Figure 8). Each composite sample was screened using a PID. Eleven samples showed PID responses. Each of these samples, along with three random samples taken from the samples that did not yield any detectable organic vapors, were analyzed for TPH and benzene. Of the 14 samples analyzed for TPH and benzene, five samples contained TPH concentrations in excess of 200 kg/mg.

Texaco began an in situ land farming program on Munks west pasture in the fall of 1991. A third sampling event occurred in October of 1991 (Figure 9). Once again TPH concentrations in the west pasture were above the 200 mg/kg cleanup standard. Texaco continued to landfarm the material throughout the winter and spring season. The area was re-sampled in August of 1992. The results of the 1992 sampling indicated that two samples were above the 200 mg/kg MTCA standard and that the oil concentrations in all cases were continuing to degrade. In September of 1992, Texaco choose to re-sample around the two high samples and



LEGEND

- SOIL BORING
- SOIL SAMPLE COLLECTED FOR TPH, BENZENE ANALYSES
- TRENCH LOCATION, SOIL SAMPLE COLLECTED FOR TPH, BENZENE ANALYSES
- PORTION OF BURIED WATER LINE EXPOSED IN INTERCEPTOR TRENCH. (FOR LOCATION OF INTERCEPTOR TRENCH SEE FIGURE 2)
- From Phase II Preliminary Site Assessment and Remedial Action Review Workplan (Texaco, 1991b)

100 0 100 FEET

N

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prepared for:

TEXACO

Soil sampling locations at the north and and west pastures (WP and NP sampling events).

PROJECT:	701091008-237 (PSPSAMP2)
LOCATION:	ANACORTES, WASHINGTON
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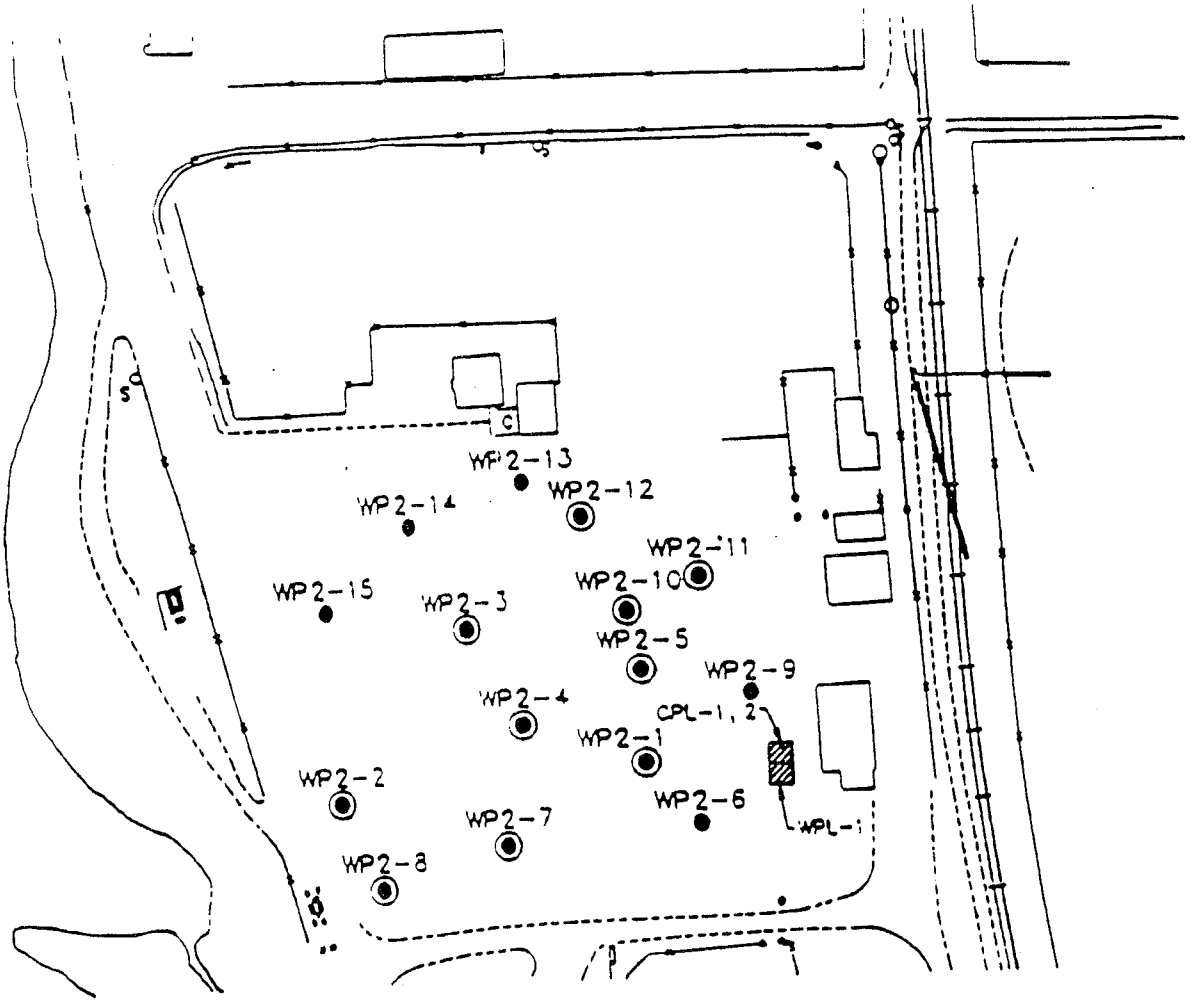
DATE: 10/23/91	FIGURE: 8



LEGEND

- ● SOIL BORING
- ◉ SOIL SAMPLE COLLECTED FOR TPH ANALYSIS
- ▨ TRENCH LOCATION, SOIL SAMPLES COLLECTED FOR TPH, BENZENE ANALYSES

100 0 100 FEET

N

NOTE: WP3 SERIES SAMPLING LOCATIONS SAME AS WP2 LOCATIONS.

KWBES

prepared for:

TEXACO

West pasture soil sampling locations (WP2, WP3, sampling events).

PROJECT: 70109:CCB-237 (PSPSAMP2)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 10/23/91
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DATE: 10/23/91	FIGURE: 9

remove soils above the MTCA cleanup standard. Texaco removed soils around the two hot spots using techniques described in Exhibit A of the consent decree. The west pasture was covered with new clean top soil in October of 1992.The area around the drain tile was removed and landfarmed on the refinery site.

3.2.1.3 Munks North House.

Two interim remedial actions for the Munks residences were outlined in the agreed order. One action called for the cleaning of the Munks residences and in situ bioremediating of contaminated soils, while the other action called for the destruction of the buildings and removal of contaminated soils. Test pits dug next to the residence indicated that in situ cleaning of the building would not be feasible. The decision was made by Texaco, in agreement with the Munks family, to demolish the house, garage, workshop, and barn located in the area. This would facilitate the excavation of the contaminated soil found beneath the structures.

Approximately 11,000 cubic yards of contaminated soil was removed from the area and landfarmed in the Texaco flare landfarms. The deepest contamination was observed beneath the Munks barn where crude oil had pooled under the flooring. This resulted in hydrocarbon contamination to depths of 15 feet in the fractured clay. Soil analysis was completed in the bottom of the pit after removal of contaminated soils. None of the samples from the North house area yielded results above the 200 mg/kg cleanup standard (Figure 10).

The north house area excavation was filled with clean fill and a new residential structure was constructed. The property was restored to the original pre-excavation grade.

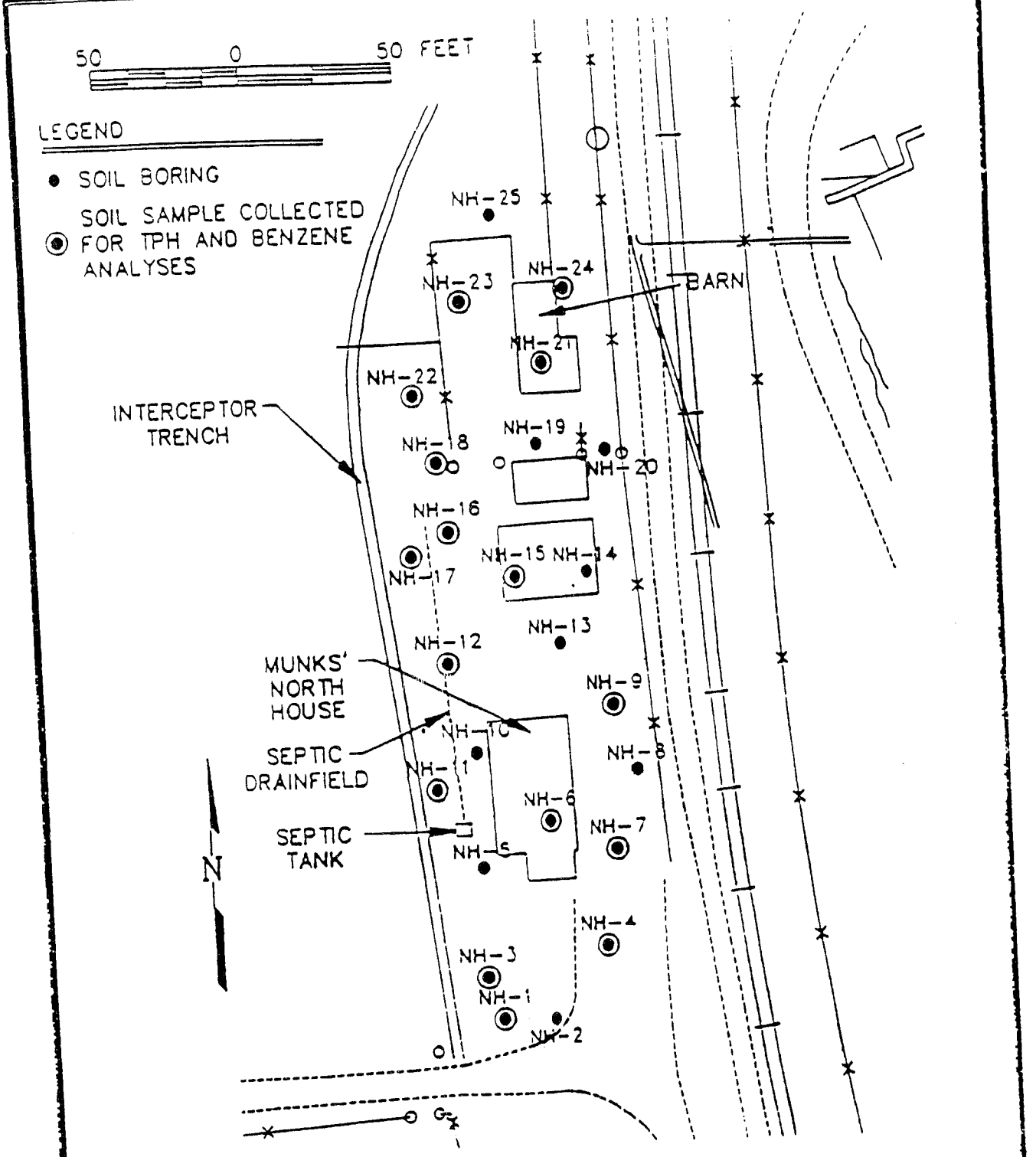
3.2.1.4 Munks South House and Pasture

The soils beneath driveway next to Munks southern house were investigated during the RI/FS. Five borings were completed east of the south house to determine if hydrocarbons migrated from the oiled railroad spur. Samples from the borings were tested with the PID and analyzed for hydrocarbons. The results of the analysis indicated that no samples contained TPH concentrations in excess of the method detection limits (Figure 11).

A northeast-southwest trending drainfield in the southern pasture was investigated as a possible hydrocarbon migration route during the RI/FS. The outfall end of the drain pipe was examined and no hydrocarbons were identified. The drain field was exposed on the eastern edge of the south pasture using an excavator. Soils were screened using a PID. The hole was deepened to six feet where ground water was encountered. No evidence of hydrocarbons was detected in the investigations.

A single boring was completed in the vicinity of the drainfield that serves the Munks' south house septic system. The soil from the hole was screened with a PID. No visible or detectable hydrocarbons were encountered.

Eight random soil samples were collected in the south pasture (Figure 11). The



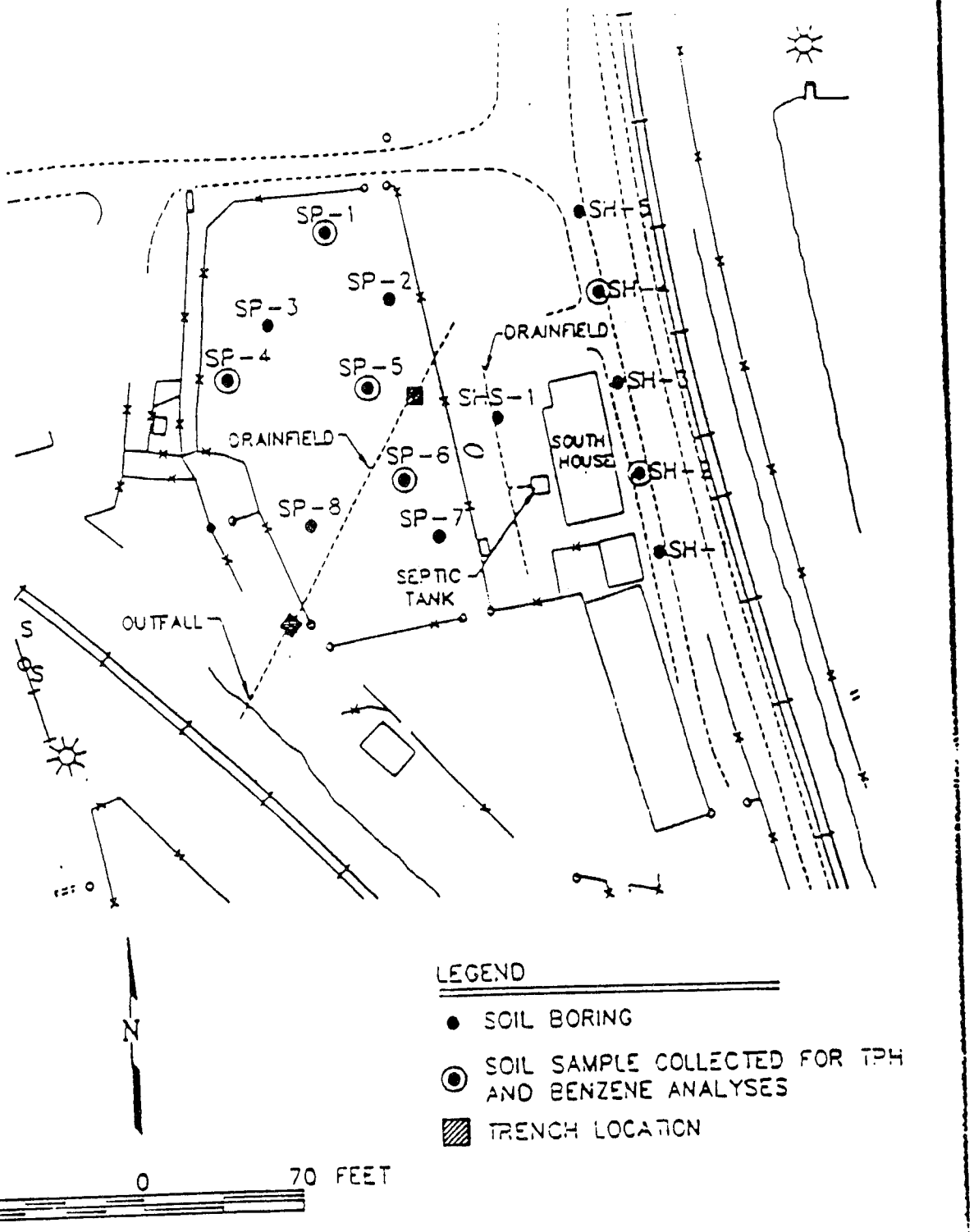
KWBES

prepared for:

TEXACO

Munks' north house and outbuildings soil sampling locations (NH sampling event).

PROJECT:	701091008-237 (PSPSAMPS)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 01/21/92
DRAWN BY: RMC	SCALE: AS SHOWN
DATE: 01/21/92	FIGURE: 10



KWBES

prepared for:

TEXACO

Munks' south house and pasture soil sampling locations.

PROJECT:	70109008-237 (PSPSAMP3)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 10/23/91
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DATE:	10/23/91 FIGURE: 11

samples were screened with a PID. No samples yielded detectable organic vapors. Four of the eight samples were randomly chosen to be analyzed for TPH and benzene. Results of the analysis indicated only one sample with detectable hydrocarbons at the 10 mg/kg level. Visual observations and the sample analysis indicates that no significant release of hydrocarbons occurred in the south pasture.

3.2.1.5 Blackberry Ditch

In the blackberry ditch south of Munks property, and the drainage ditch east of the railroad spur three composite soil samples were collected and analyzed for TPH. Soil TPH analysis indicates that two of the three areas are contaminated with hydrocarbon above MTCA cleanup levels. Visual inspection of the ditch indicated that the contaminated areas are sporadic.

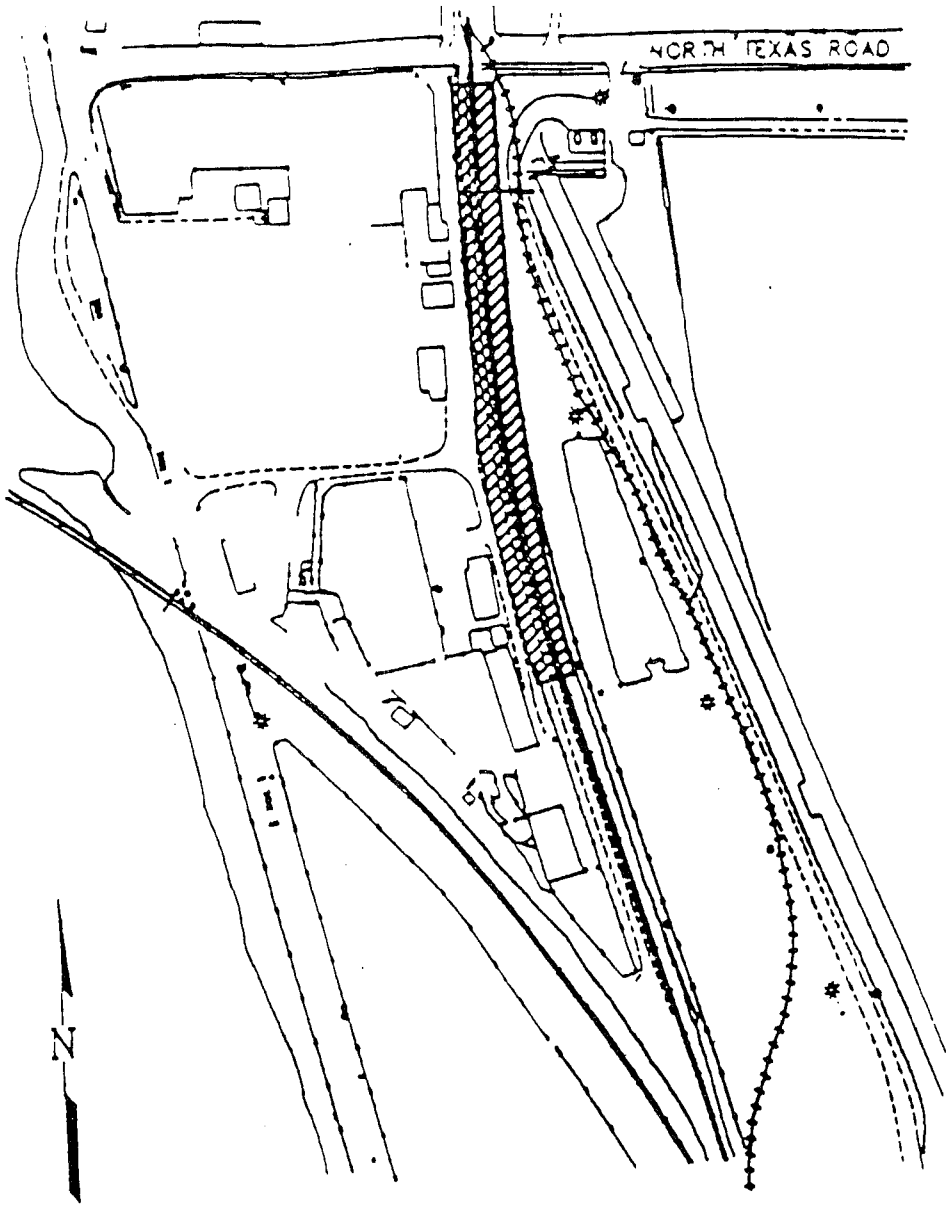
An expanded soil grid in the ditch supports the hypothesis that the oily soils are sporadic in distribution. Only one of the six locations sampled in the second round of sampling yielded TPH concentrations above the 200 mg/kg standard.

3.2.2 Railroad Easement and Temporary Railroad Spur

The July 1991 Agreed Order was amended to include the investigation and cleanup of the railroad spur easement in September 1991 (Figure 12,13). The initial agreed order directed Texaco to conduct the cleanup of the spur under the cleanup consent decree. The agreed order was amended to include the spur cleanup because of the potential of contaminating the clean fill that had been placed down gradient on the Munks property. The railroad spur roadbed contained free crude oil from the spill.

A temporary railroad spur was constructed through the spill site east of the original railroad right of way. The construction of the temporary spur resulted in the excavation of soils and the backfilling of the excavation with ballast to provide a firm roadbed and achieve proper grade. During the excavation the soils in the trench were examined for evidence of hydrocarbon contamination. South of the catchment basin no contaminated soils were observed. Oil was observed north of the basin in the road bed ballast that was found beneath the service road that runs between the catchment basin and pipeline (Figure 13). All oily soils and ballast were removed to the Texaco refinery staging areas. The depth of excavation was directed by visual observation and with the aid of a PID. The nine confirmational samples after the excavation indicated TPH concentrations below the method detection limits (Figure 13). Oily soils were left in place next to the pump area. A 12 foot high, 100 foot long HDPE barrier was placed next to the oily soils found near the pump station (Figure 14). The barrier will prevent oil from moving west through the new fill and into the Munks property.

The excavation of oily materials from the original railroad bed began in the fall of 1991. Approximately 980 cubic yards of ballast was removed and placed in a staging area on Texaco property. Free oil was observed in the ballast and in fractures of the silty clay and sand found beneath the ballast. The deepest hydrocarbon penetration was found immediately west of the pump station. Small



200 0 200 FEET

LEGEND

Excavated portion of railroad roadbed

Temporary railroad spur

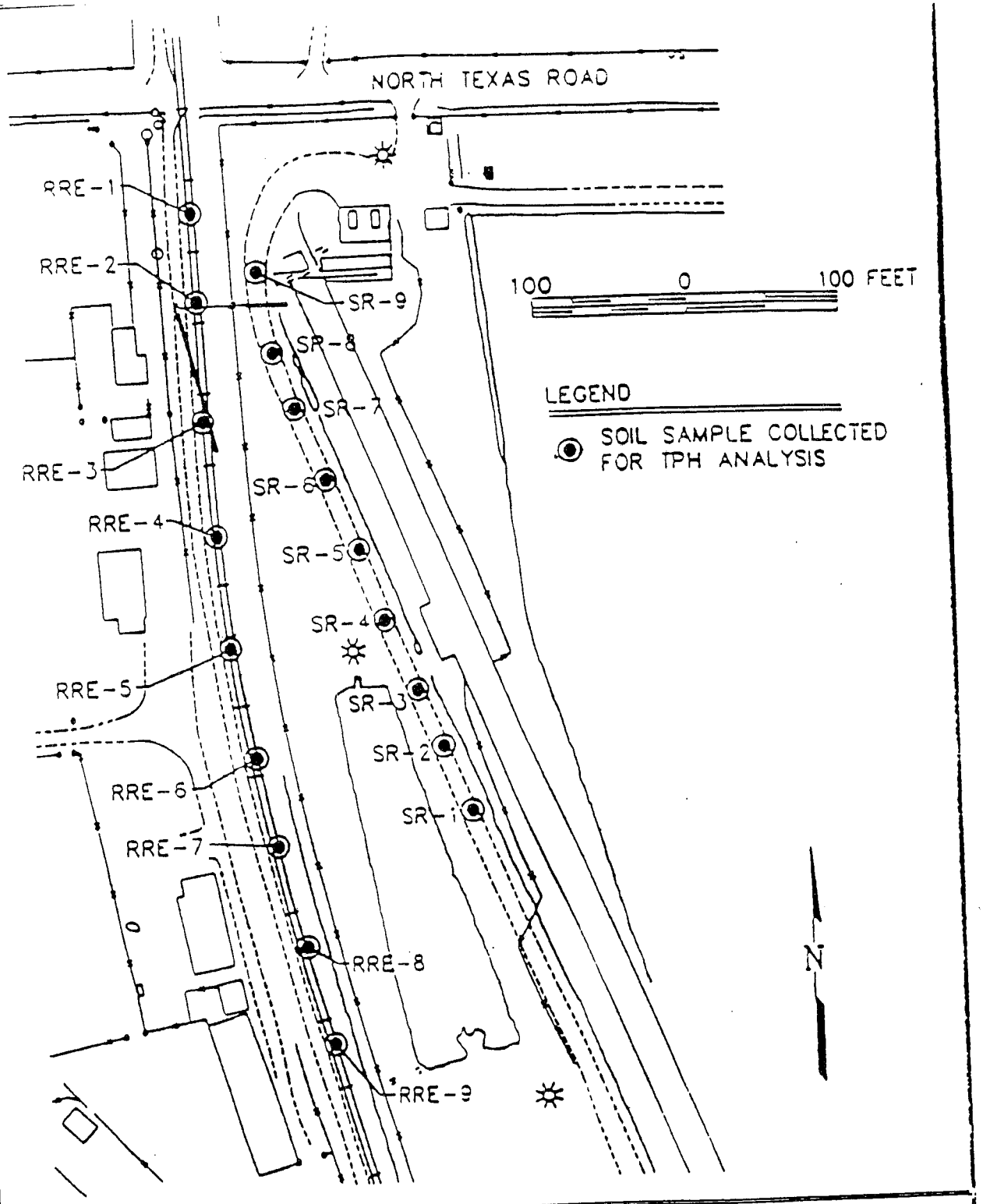
KWBES

prepared for:

TEXACO

Location of temporary railroad spur and excavated portion of railroad roadbed.

PROJECT:	701091008-237 (PSPSAMP)		
LOCATION:	ANACORTES, WASHINGTON		
APPR:		DATE:	01/16/92
DRAWN BY:	RMC	SCALE:	AS SHOWN
DATE:	05/21/91	FIGURE:	12



KWBES

Railroad excavation soil sampling locations

Prepared for:

TEXACO

PROJECT:	701091CC8-237 (PSPSAMP4)
LOCATION:	ANACORTES, WASHINGTON
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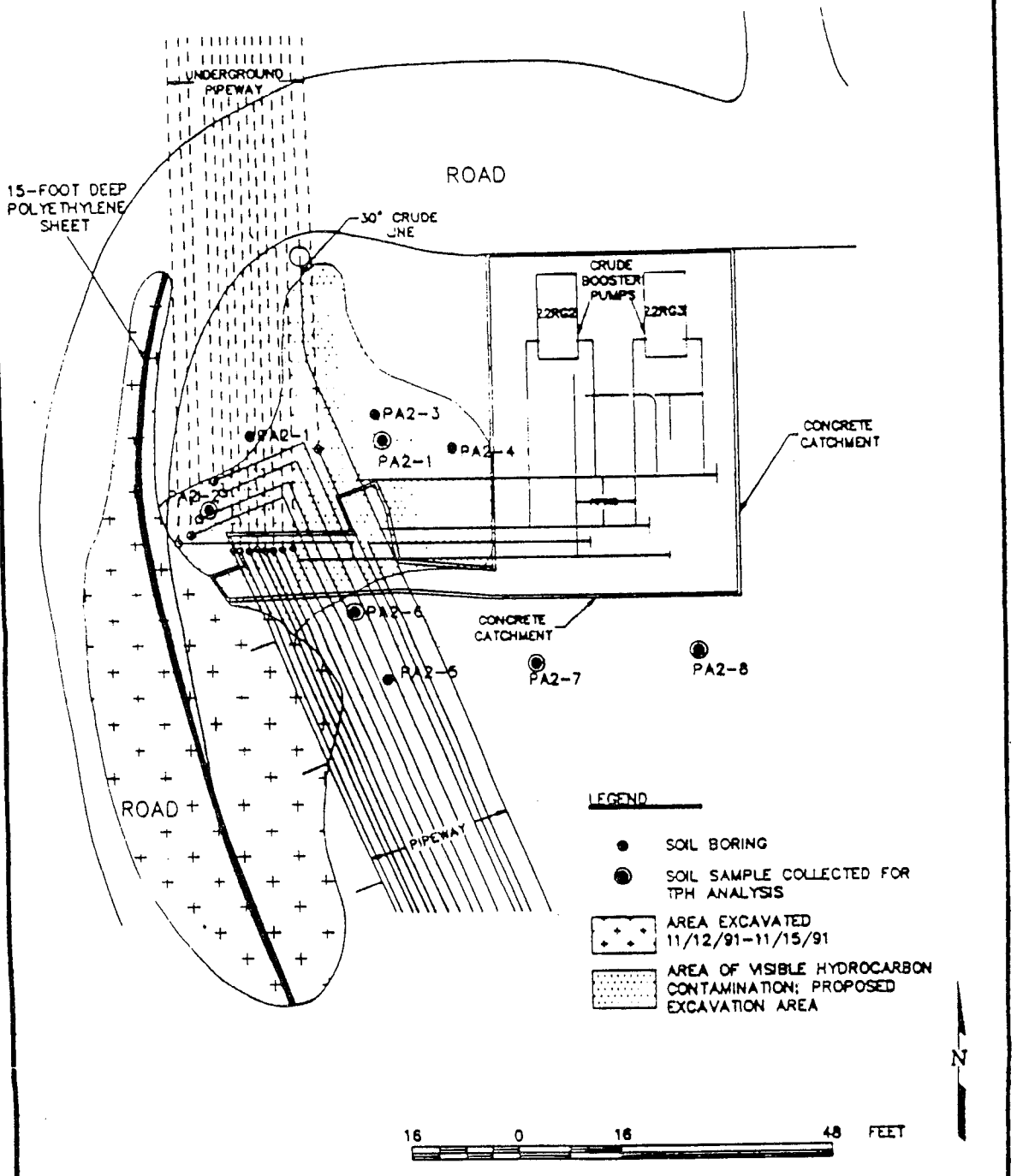
DATE:	10/23/91 FIGURE: 13



KWBES

prepared for: TEXACO

Soil boring locations, proposed and completed excavations at crude booster pump area.

PROJECT: 701091008-237 (BOOSTPMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 2/12/92
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pockets of oil were found in the ballast at this location. A total of 7,100 cubic yards of soil were removed from the 700 feet of railroad bed that was remediated. Confirmational samples were taken at a depth interval of 0-10 inches, every 75 feet linear feet along the excavation. The analytical results indicated that the TPH concentrations were below method detection limits in all nine samples collected (Figure 13). Backfilling of the area began immediately following the receipt of the analytical results. Clean fill materials were moved by truck from offsite. The railroad bed was reconstructed using clean materials.

3.2.3 Summary of Interim Actions

The following areas in the spill site have been cleaned to below the 200 mg/kg MTCA method A soil cleanup level during the interim/emergency actions or no oil was found during the remedial investigation. The areas are considered clean (Figure 4,5).

- Munks north pasture. Eastern edge of pasture excavated.
- Munks house and outbuildings. Excavated and back filled.
- Munks west pasture. Excavated and land farmed.
- Munks south house and outbuildings. No oil found above MTCA cleanup level.
- Munks south pasture. No oil found in RI/FS sampling
- Shell oil railroad right of way. Excavated and back filled.

The following areas contain contamination from the oil spill and will be addressed in the consent decree (Figure 1).

- Blackberry ditch.
- Texaco catchment basin.
- Pump station area east of the service road.

3.3 MEDIA CLEANUP LEVELS

3.3.1 Selection of Method for Establishing Cleanup Levels

The Model Toxics Control Act Cleanup Regulation provides three methods for determining cleanup levels at a contaminated site. The methods are known as Method A, Method B, and Method C. Method A applies to relatively straight forward sites that involve only a few hazardous substances. The method defines cleanup levels for 25 of the most common hazardous substances. The method also requires that the cleanup meet promulgated federal and state regulations such as

the maximum contaminant levels established by the clean water act. Method B is a standard method that can be used at all sites. The clean up levels are set using a site risk assessment which focuses on site characteristics or concentrations of individual hazardous substances established under applicable state and federal laws. Method C is similar to Method B. The main difference in the two methods is that the life time cancer risk is set at a lower number. The method can be only used when either Method A or Method B are technically impossible, the site is defined as an industrial site, or where attainment of Method A or Method B cleanup levels has the potential for creating a significantly greater overall threat to human health and the environment. In addition, Method C also requires that the person undertaking the action comply with all applicable state and federal laws.

The Texaco site is considered a routine petroleum spill site where Method A can be used. The contaminant of concern is petroleum hydrocarbon. Method C can not be used on the site because the site is not defined as a MTCA industrial site, Method B levels are not technically impossible to achieve on the site, and achieving Method B levels will not cause greater environmental harm than not achieving them. The majority of the site is being cleaned up using Method A soil and water cleanup levels, Method B may be used at the pump station area of the site if contaminated soils are left in place. Cleanup levels are discussed below.

3.3.2 Ground-Water Cleanup Levels

No groundwater at the site has been discovered contaminated. One near surface monitoring well is proposed down gradient of the pump station area contamination. The Method A cleanup standard (WAC 173-340-720) for groundwater will be used at the site. The standard for total petroleum hydrocarbons is 1000 ug/liter. The site cleanup standards (Method A) for individual BTEX chemicals are: benzene 5.0 ug/liter, toluene 40.0 ug/liter, ethylbenezene 30.0 ug/liter, and xylenes 20.0 ug/liter.

3.3.3 Soil Cleanup Levels

The Method A soil cleanup standard (WAC 173-340-740(2)) will be used for the blackberry ditch and catchment basin areas of the cleanup. In these areas site soil standard will be 200 mg/kg total petroleum hydrocarbons.

The pump station area will use the Method A standard for total petroleum hydrocarbons (WAC 173-340-740(2)). If the total petroleum hydrocarbon criterion cannot be met at the pump area, a health based assessment of individual hazardous petroleum constituents can be conducted based on a "worst case" TPH sample. Soil cleanup levels shall be determined using the Method B equations outlined in WAC 173-340-740(3)(iii). The protocol for determining individual hazardous petroleum constituents is being developed by the Department of Ecology. When the protocol for the demonstration as outlined in WAC 173-340-740(3) is developed, a worst case sample may be collected from the location exhibiting the highest TPH concentrations. If the area is found to be below the health based standard, then it will be considered clean.

SUMMARY OF ALTERNATIVE CLEANUP ACTIONS

4.1 INTRODUCTION - FEASIBLITY STUDIES

Texaco has completed extensive emergency and interim remedial actions at the site. These cleanup activities have been described in section 3.2 of this report. The activities concentrated on removal of oiled soils and free crude oil through excavation and treatment through landfarming off site. The results of the remedial investigation indicate that hydrocarbon contamination above the MTCA Method A standard is present in selected areas where complete excavation was not possible. The feasibility study portion of the RI/FS was limited to these contaminated areas: the blackberry ditch, the catchment basin, the pump station, and Munks west pasture (Figure 1).

4.2 SECTOR ONE

4.2.1 Sector One - Catchment Basin

Four cleanup alternatives were examined for cleanup of the catchment basin. The alternatives were: no action, additional sampling using Method B analysis and cleanup levels to limit cleanup areas to hot spots along with additional remedial actions in the highly contaminated areas, *in situ* bioremediation, and excavation with off site bioremediation. Each of the alternatives is discussed below.

No Action. The alternative would allow natural bioremediation to occur. Due to the analytical results of the RI/FS sampling and the location of the basin hydraulically up gradient of the Munks property this alternative was not considered a viable cleanup option.

Additional Soil Sampling. Initial emergency action and RI/FS sampling of the basin indicated that the contamination was sporadic in nature and found in the basin bottom and along the walls. Little visible hydrocarbon staining has been observed on the basin walls. This can be explained by the fact that the basin was partially full of water during the spill and the crude oil release floated on the top of the water filled containment. Further sampling would further define hot spot locations. Along with further expanded sampling, Method B standards would be used to determine areas that need further remediation. Further remediation would consist of treatment (bioremediation) either on site *in situ* or off site at one of the refinery landfarms.

In Situ Bioremediation. *In situ* bioremediation of the basin and side wall sediments is feasible during the warmer months of the year. A program of tillage and nutrient application similar to that used at the refinery landfarms would be used to promote microbial degradation of the hydrocarbon in the soils. This alternative would depend on rainfall in the region since the basin is currently used for storm water control and periodically fills with storm water. The bioremediation program may only be possible during the dry summer months.

Excavation of Soils. Contaminated soils would be removed from the side walls and the basin bottom and treated in the refinery landfarms. Soils would be treated in the flare landfarms on Texaco refinery property. The removal of one foot of soil from the basin floor and side walls would generate 600 cubic yards of material that would require treatment.

The preferred action for the Catchment Basin is *in situ* bioremediation. This alternative requires no removal of material from the basin. The basin is periodically filled with storm water. The bottom of the basin contains saturated sediments that are hard to remove and bioremediate.

4.1.2 Sector One - Pump Station Area.

Five alternatives were examined for the cleanup of the pump station area. The pump station area has a shallow perched water table with visible floating hydrocarbon. During the emergency action and the RI/FS, excavation near the pump station was limited due to the existence of buried crude oil pipes. The results of expanded sampling during the RI/FS limit the contamination to a circular area of less than 60 square yards (Figure 14).

No Further Action. Soils in the vicinity of the pump station have not yielded TPH concentrations that are above the MTCA standard. Free floating product has been observed in soils near the station. The no action alternative is not protective of human health and the environment and is not considered an alternative.

No Action With Additional Sampling. This alternative is no action with the collection of further worst case samples. These samples will be used to determine potential threats posed to human health and the environment. Method B analysis of the dangerous constituents of crude oil would be used to determine cleanup levels rather than the general total petroleum hydrocarbon standard. The contaminated area is located up gradient of the impermeable barrier and drain system placed near the pump station during the interim action. This drain system will likely impede shallow groundwater migration of the floating hydrocarbons. The alternative will require deed restrictions if contaminated soils are left in place.

Additional Excavation of Soil. Excavation of contaminated soils in the vicinity of the pump station. Contaminated soils are in the area of the underground portion of the pipeway. The underground portion of the pipeway is located approximately three feet below grade. Texaco proposes to excavate soils down to the buried pipeway and landfarm the contaminated soils in the refinery. If soils in the area are above the MTCA TPH standard of 200 mg/kg Texaco can elect to use a risk based standard using individual petroleum constituents and the standard described in WAC 173-340-740(3). If contaminated soil is left in place a deed restriction will be placed on that portion of the site.

Hydrocarbon Recovery Wells. This alternative uses a pump and treat system to remove hydrocarbon from the shallow aquifer. This alternative was not considered because of the near surface location of the floating product layer and the complexity of the sedimentary column beneath the pump station. The pump

station is built on several different layers of fill. In the vicinity of the p station the hydraulic conductivity of the different fill units varies itly and several buried structures such as the pipeway disturb the flow paths the perched water table. The fill is also locally compacted. Each of these factors makes the alternative not feasible in this location.

Interceptor Trenches. This alternative uses an intercepter trench located next to the barrier wall. Floating free product is collected in a sump located at the end of the intercepter trench. Flow from the intercepter trench is directed to the Texaco treatment plant via the crude oil ballast line that runs past the pump station. The selection of a passive or active free product collection system will be undertaken following the evolution of the intercepter ditch.

The preferred alternative in the pump station area is further excavation in the vicinity of the contamination. If contaminated soils remain after the excavation, then a Method B cleanup standards can be used in the area. If the soil remains above the Method B standard then a deed restriction will be placed on the pump station area and a ground water monitoring program will be initiated at the site. The monitoring well will be located downgradient from the pump station contamination. The well would also be located on the downgradient side of the barrier wall found on the western side of the pump station contamination.

4.3 SECTOR TWO.

All hydrocarbon contaminated soils were completely excavated from sector two ng the interim action. This sector consists of the railroad right of way. right of way was remediated by excavation of contaminated soils to the Texaco flare landfarm and replacement of soils with clean fill. No additional work is proposed for Sector two.

4.4 SECTOR THREE.

4.4.1 Sector Three - Munks West Pasture

Four cleanup alternatives were examined for the cleanup of the west pasture. These alternatives were: no action, no action with additional sampling and re-evaluation using Method B cleanup standards, continuation of *in situ* bioremediation, and excavation of hot spots after *in situ* bioremediation. In the fall of 1992 the excavation alternative was completed.

Remedial activities in Munks west pasture were begun during the emergency action in 1991. The top six to twelve inches of top soil were removed from the pasture and landfarmed in the flare landfarms. The remaining petroleum contamination was landfarmed *in situ* during 1991 and 1992. The pasture was resampled in the fall of 1991 and still showed isolated hot spots of petroleum contamination. The pasture was resampled in the fall of 1992 and showed two hot spots. In the fall of 1992 using protocol from the draft consent decree, Texaco removed six inches of top soil from the hot spot areas. This soil was landfarmed at the flare landfarms on refinery property. After removal, confirmation sampling showed that

and the physical conditions (saturated sediments located in a narrow ditch) of the ditch make cleanup of the area difficult to achieve. The cleanup will consist of the excavation of a "hot spot" located in the north-south portion of the ditch east of the railroad tracks. If it appears that *in situ* bioremediation of ditch sediments is practical, then excavation will be terminated and bioremediation will be used as the cleanup technology. A temporary underdrain weir will be installed downstream of the black berry ditch contamination. The weir will protect Fidalgo Bay from any contamination that results from remediation. The weir will be removed at the end of the remediation.

SELECTED CLEANUP ACTION

5.1 INTRODUCTION

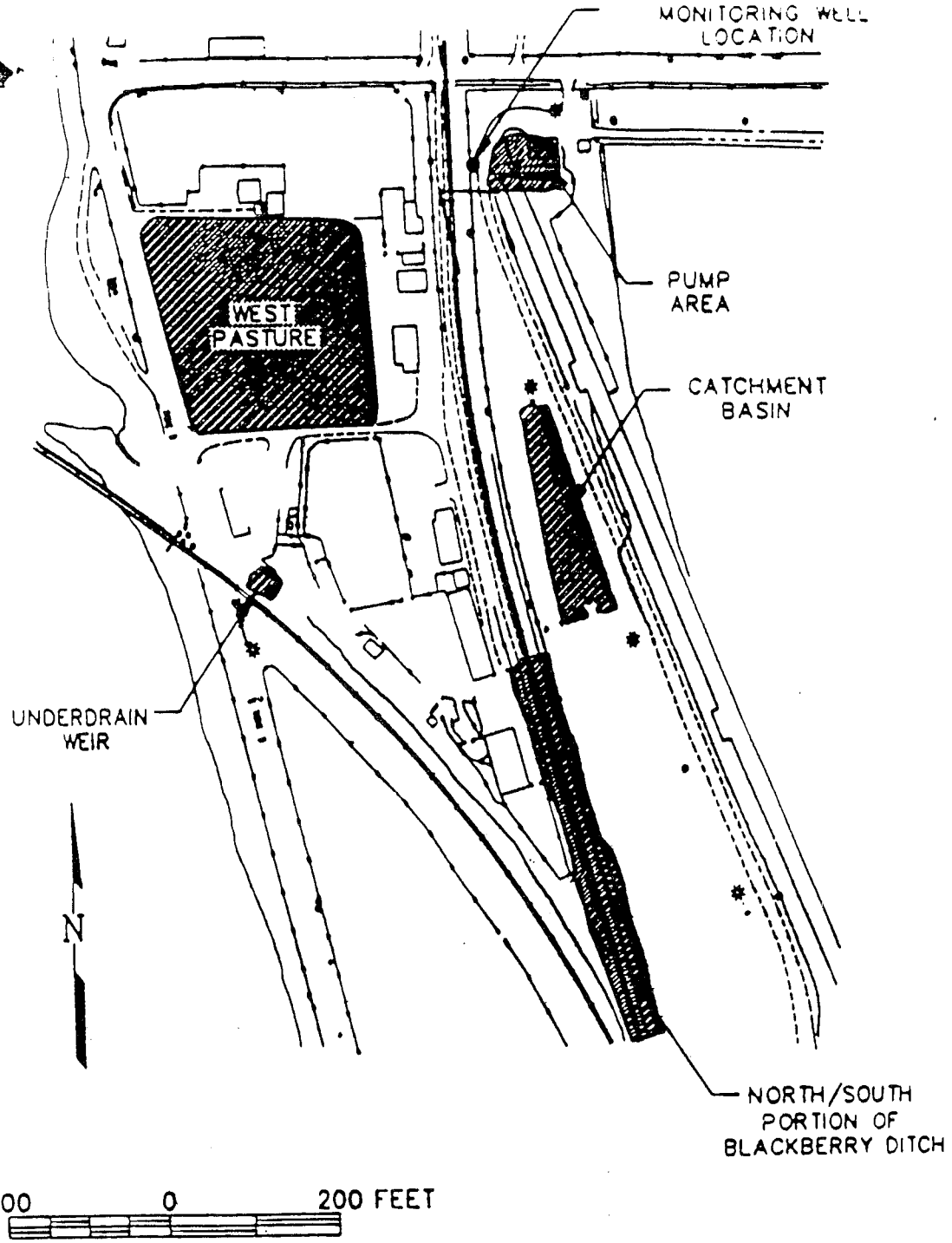
The cleanup strategy proposed by Ecology is to combine treatment of petroleum contaminated soils with containment, monitoring and institutional controls to provide for the protection of human health and the environment. This strategy assumes that the area in the site where contaminated soils are left in place will be used for industrial or commercial purposes for the foreseeable future. The majority of the contamination associated with the February 1991 spill was excavated and treated off site at the Texaco refinery. The proposed cleanup alternatives that were selected for the contamination that remains on site are described in more detail below.

5.2 SELECTED CLEANUP ACTION

The proposed cleanup actions consist of *in situ* bioremediation and/or excavation and off site bioremediation (Figure 15). Specifically:

- Sector Three - Blackberry Ditch. Install temporary underdrain weir, excavate or bioremediate "hot spots", verify sampling, and remove temporary underdrain weir.
- Sector Three - Monks West Pasture. Excavation of hot spots complete. Re-vegetation and replacement of top soils was complete in late fall of 1992.
- Sector Two - Railroad Right of Way. Complete. Excavated during interim action and bioremediated at refinery landfarm.
- Sector One - Catchment Basin. *In situ* bioremediation of contaminated side wall and bottom sediments.
- Sector One - Pump Station Area Excavation of contamined soils with bioremediation off site at the Texaco refinery. Use of Method B cleanup levels if contaminated soils are found above the Method A total petroleum hydrocarbon standard. Ground water monitoring and

DRAFT



KWBES

Oil spill areas of concern.

prepared for:

PROJECT:	701092005-237 (PSPSAMP)		
LOCATION:	ANACORTES, WASHINGTON		
APPR:		DATE:	06/24/92
DRAWN BY:	RMO	SCALE:	AS SHOWN
DATE:	05/21/91	FIGURE.	15

deed restriction if contaminated soils are left in place after excavation. Continuation of pump station surface water treatment in Texaco waste water treatment plant.

5.3 GROUNDWATER MONITORING

Under one cleanup scenario contaminated soil will be left in place at the pump station site. A confirmational monitoring program for TPH and BTEX will be implemented as part of the cleanup. The proposed monitoring plan consists of quarterly monitoring for the first two years and annual monitoring for the next three years. At the end of the five year period Ecology and Texaco will exchange proposals to amend the consent decree with regard to whether continuation of the monitoring program is necessary and, if so, what constitutes an appropriate schedule. The proposed monitoring program will be evaluated at the end of each five year period until the site is no longer a danger to human health and the environment.

5.4 INSTITUTIONAL CONTROLS

If petroleum hydrocarbons are left in place above Method A or B cleanup standards then Texaco will record a restrictive land use covenant in the property deed of the site to ensure that no ground water is removed for domestic purposes from the area near the pump station and that there is no interference with the cleanup action. The form of this covenant is specified in the Consent Decree. Texaco may remove the covenant when contaminant concentrations in soils fall below either Method A or Method B cleanup levels as specified in this Cleanup Action Plan, and after receiving Ecology's consent.

5.5 SCHEDULE

The proposed cleanup is scheduled to occur in 1993. If approved, the cleanup actions will occur in the winter, spring and summer of 1993. Bioremediation will occur during the 1993 dry season. Groundwater monitoring will begin in 1993 after the completion of the remedial action and will continue for five years. At the end of the five year period Ecology and Texaco will exchange proposals for continued monitoring.

APPENDIX B

REMEDIAL ACTION PLAN
FROM CONSENT DECREE

CONSENT DECREE
EXHIBIT A

REMEDIAL ACTION PLAN

Texaco shall perform the following remedial action tasks at the site (Figure A-1):

Munks West Pasture

Task 1. Delineate "hotspots".
It appears that total petroleum hydrocarbon (TPH) concentrations in the west pasture soils near samples WP2-4 and WP2-8 cannot be degraded to levels below the cleanup standard during the 1992 field season. Additional samples shall be collected to further delineate the extent of contamination. A twenty-foot by twenty-foot square grid shall be centered on each sample location where TPH concentrations exceed the cleanup standard. Soil samples shall be collected from each of the four corners of each grid square at a depth of 0-10 inches and analyzed for TPH. If the TPH concentration in any sample exceed 200 mg/kg, a similar grid shall be established around the sample location and soil samples shall be collected from each grid square corner not previously sampled. Previously collected samples analyzed by EPA method 418.1 modified can be used as data points in the grid. This procedure shall be repeated until the extent of TPH contamination is fully delineated.

Task 2. Excavate "hotspots".
The topsoil found within the grid locations where TPH concentrations exceed 200 ppm shall be excavated to the depth of the contact with the underlying sand or eight inches in depth. The topsoil in the west pasture is presently 4 - 8 in. thick.

Task 3. Verification sampling.
After the excavation, five soil samples shall be collected from locations randomly-selected within each excavated area. The samples shall be analyzed for TPH. If the TPH concentration in any sample exceeds the cleanup standard, an additional 6 in. of soil shall be excavated from the grid square surrounding the sample location. Following the additional excavation, another soil sample shall be collected from the each of the five locations and analyzed for TPH. This procedure shall be repeated until all soil samples comply with the cleanup standard given in Exhibit C.

Task 4. Grade restoration.
The west pasture shall be backfilled with clean topsoil to the pre-spill grade to the satisfaction of Mr. Munks following the demonstration of compliance with the soil cleanup standard. The source of clean topsoil shall be approved by Mr. Munks prior to backfilling.

Blackberry Ditch

Task 1. Install an underdrain weir upstream of the culvert that crosses West March Point Road.
An underdrain weir shall be installed upstream of the culvert that crosses beneath West March Point road from the Blackberry Ditch. The weir shall prevent the discharge of floating immiscible fluids to Fidalgo Bay following sediment disturbances in the ditch resulting from remediation activities. The weir shall be constructed similarly to that illustrated in Figure 3; Exhibit F.

Task 2. Excavate soil/sediment from the north-south portion of the ditch located east of the railroad tracks.
Contamination of sediments in excess of the cleanup standard appears to be limited to the north-south portion of the blackberry ditch east of the Shell railroad spur. Texaco shall conduct further excavation of the upper ditch sediment in the vicinity of sample location BD-9 (Figure 10; Exhibit F). Any other locations where hydrocarbons are observed within this segment of the ditch shall also be excavated. The extent and depth of excavation shall depend on field observations of all hydrocarbon-impacted sediment.

Task 3. Verification sampling.
Three soil samples shall be collected for TPH analysis from the north-south segment of the blackberry ditch following the completion of excavation activities. The samples shall be collected where the oil impacted sediments were previously observed. Each sample shall consist of a composite of a 0 - 6 in. ditch-bottom and 0 - 6 in. sidewall sample. If any sample exceeds the cleanup standard, additional excavation shall be undertaken in the vicinity of the sample location.

Task 4. Bioremediate as necessary.
If during the course of the excavation, it appears that *in situ* bioremediation of the ditch sediments is practical, excavation activities shall be terminated. This decision shall be based on the nature of contamination and the physical properties of the ditch sediment. The bioremediation activities shall consist of tilling the sediments using a hand-operated power tiller. The necessity for nutrient application shall be assessed following the analysis of a composite soil sample for soil fertility parameters and trace metals (total organic carbon, total and available phosphorus, total and available potassium, total Kjeldahl nitrogen, total boron, total copper, total manganese, total zinc, and total iron). If deemed necessary, nutrients shall be applied.

To assess the effectiveness of the remedial operation, a composite sample consisting of five randomly-selected locations within the north-south trending section of the blackberry ditch, shall be collected quarterly and analyzed for TPH. Additionally, a "worst case" sample shall be collected quarterly from the vicinity of sample location BD-9, and analyzed for TPH.

The bioremediation program shall be terminated when TPH concentrations in both samples are below the cleanup standard given in Exhibit C. No additional verification samples shall be collected following this demonstration.

Task 5. Remove underdrain weir.
Due to concerns regarding the effect of ponded water on the stability of the West March Point Road and railroad beds, the underdrain weir shall be removed from the blackberry ditch following the demonstration of compliance with the cleanup standard for soils.

Pump Area

Task 1. Excavate soil from the area between the booster pumps and service road.
Oily soil shall be excavated from the area between the booster pumps and service road. Due to the high density of buried piping in the vicinity, it will not be feasible to remove soils below approximately 3 ft in depth. The visible soil contamination in this area appears to be limited to the immediate vicinity of sample location BP-1. (Figure 15; Exhibit F) All visibly-oiled soils that can feasibly be removed shall be excavated from this area.

Task 2. Verification sampling.
Three soil samples shall be collected from 0 - 1 ft in depth from the excavated area and analyzed for TPH. Soil sampling locations shall be randomly-selected based on a grid. If any sample exceeds the cleanup standard (Exhibit C) for TPH, a health based risk assessment can be conducted to determine an alternative cleanup standard. The protocol for determining what analytes constitute the potentially hazardous substances associated with petroleum is currently being developed by the Department of Ecology. When the protocol for the demonstration as outlined in WAC 173-340-740(3) is developed, a "worst case" sample shall be collected from the location exhibiting the highest TPH concentrations. The sample shall be analyzed for the hazardous substances associated with petroleum using Methods outlined in the protocol. A health-based risk assessment shall be conducted based on detections of any of these analytes as outlined in WAC 173-340-740(3). If the area is found to be below the risk based standard (Exhibit C) for each of the hazardous substances associated with petroleum, then the area will be considered clean.

Task 3. Installation of a groundwater monitoring well and maintenance of the pump station shallow drain.
If soil with concentrations of TPH exceeding 200 ppm is left in place after the excavation and Ecology's protocol for determining the potentially hazardous substances associated with petroleum has not yet been developed, or if Ecology's protocol has been developed and a "worst case" sample collected in accordance with Task 2 contains concentrations of petroleum constituents that exceed Method B levels of such substances, then a groundwater monitoring well shall be installed

hydraulically downgradient (west) of the pump area on the Texaco property (Figures A-1 and A-2). The well shall be installed in the uppermost zone of saturation with the well screen positioned across the water table if possible. The well shall not be installed until Ecology has approved its location. Groundwater shall be monitored according to methods described in Exhibit D.

The shallow drain system located west of the pump station shall be inspected periodically and maintained to insure proper operation. The drainage water shall be removed and treated in the Texaco effluent treatment plant.

Task 4. File restrictive covenant.
If Texaco determines that any soil sample exceeds the cleanup standard of 200 ppm TPH, and Ecology's protocol for determining the potentially hazardous substances associated with petroleum has not been developed, or if Ecology's protocol has been developed and a "worst case" sample collected in accordance with Task 2 contains concentrations of petroleum constituents that exceed Method B levels for such substances, then Texaco shall within 30 days of receipt of laboratory analysis results file with the office of the Skagit County Auditor the restrictive covenant set forth in Exhibit G. Texaco may thereafter seek Ecology's permission to record an instrument providing that this restrictive covenant no longer limit uses of the site or is of any further force or effect. Ecology may grant this permission only in accordance with the terms of the restrictive covenant, and only if Texaco demonstrates that soils in the Pump Area meet the cleanup standard established in this Decree.

Catchment Basin

Task 1. Delineation sampling.
The extent of TPH contamination in the catchment basin shall be further delineated through additional soil sampling of the 0 - 6 in. interval of the basin bottom and sidewalls. Five soil samples shall be collected from this interval. The sample distribution shall consist of one sample collected from each of three of the four basin sidewalls. Each sidewall sample shall be collected from a randomly-selected location within the stain line resulting from impounded oil following the spill. Two samples shall additionally be collected from randomly-selected locations within the basin floor.

If the TPH concentration in any sample exceeds the cleanup standard, an additional sample shall be collected from the 6 - 12 in. interval at that location. This procedure shall be repeated in 6 in. increments until the depth and areal extent of TPH contamination in excess of the cleanup standard has been delineated.

If all samples comply with the TPH cleanup standard, the remedial activities at the catchment basin will be considered completed.

Task 2. In situ bioremediation of soils.

If the TPH concentration in any sample exceeds the cleanup standard, a bioremediation program shall be undertaken. Soils shall be tilled within the basin bottom and sidewalls using typical agricultural equipment. Nutrients shall be added as necessary under the criteria listed in Blackberry Ditch, Task 4, to facilitate the degradation of hydrocarbons in the soils. One discrete sample and one composite sample of five randomly-selected locations shall be collected quarterly to assess the effectiveness of the remedial program.

If the preliminary soil sampling exercise indicates that the TPH concentrations exceed the cleanup standards below 1 ft in depth, "treat and strip" methodology shall be used. Once the upper foot of material has been successfully remediated, the layer shall be stripped and piled in a portion of the basin where further remediation shall not be necessary. The next foot of material shall then undergo treatment as outlined above. This process shall be repeated until the TPH concentrations meet the cleanup standard of 200 ppm.

Task 3. Verification sampling.
When sampling completed in Task 2 indicates that the TPH levels are below the cleanup standards, a confirmational soil sampling exercise shall be conducted. Five discrete soil samples shall be collected from randomly-selected locations within the treated area of the basin and analyzed for TPH. The samples shall collected over the depth interval of the treated soil layer(s). If the TPH concentration in any sample exceeds the cleanup standard, additional remediation shall be conducted in the vicinity of the sample. The location shall be resampled quarterly until the TPH levels comply with the cleanup standard.

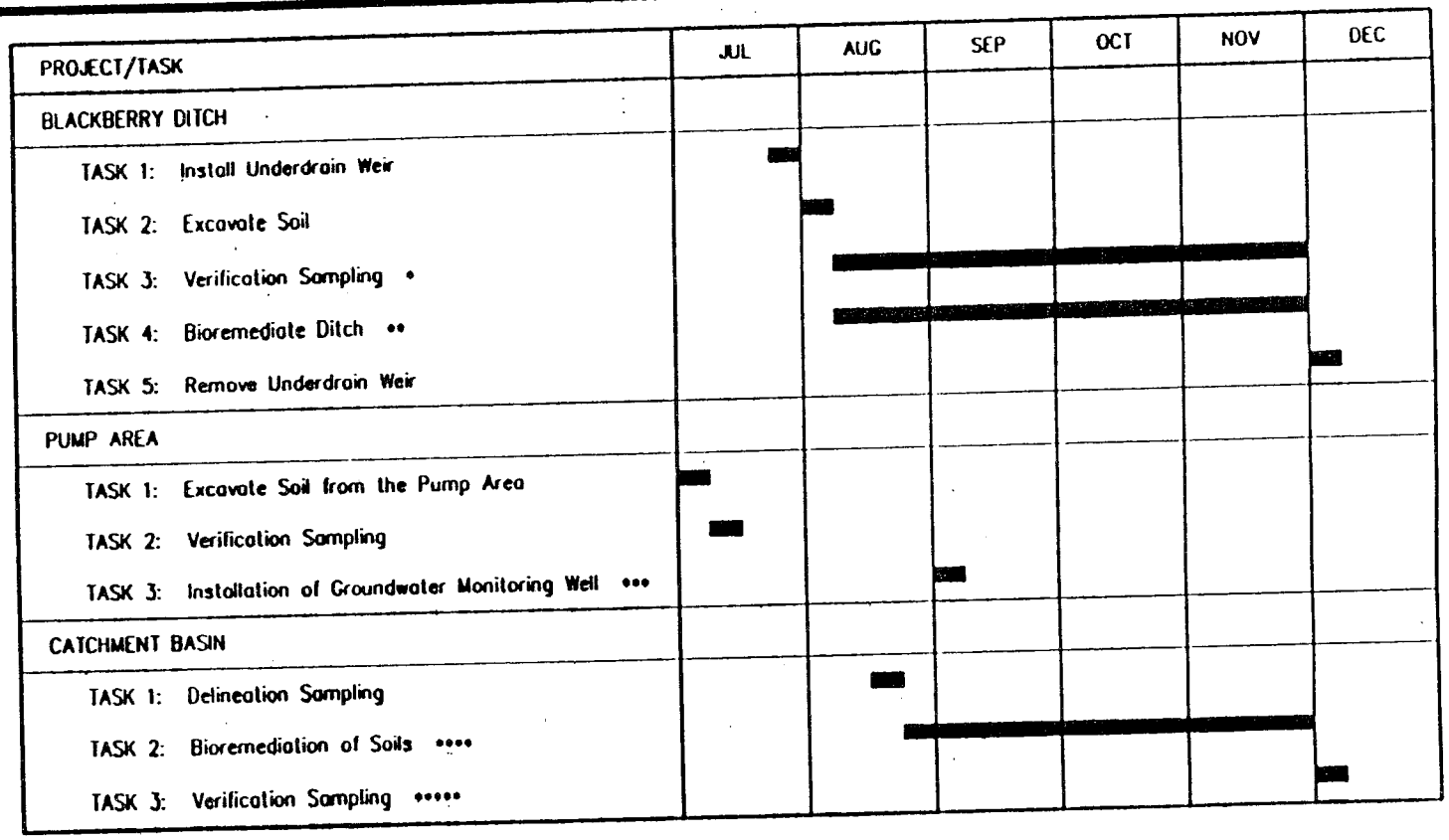
Flare Area Land Treatment Facility

The remediation of soils excavated from the spill site shall be continued at the temporary Flare Area Land Treatment Facility (FLTF) until all spill-related soils comply with the cleanup standard. The plots shall be tilled at a minimum of once a week throughout the field season. Nutrients shall be applied as needed based on the results of periodic soil fertility analyses. The plots shall be irrigated, if necessary, to facilitate the hydrocarbon degradation process.

The degradation of hydrocarbons in the plots shall be tracked through the collection of soil samples for TPH analysis at least semi-annually. One discrete "hot spot" sample and one composite sample shall be collected from each of the two plots. The composite sample shall consist of a minimum of 10 individual samples collected randomly throughout each plot after tilling. Soils shall be applied in six inch lifts when TPH concentrations are below 200 mg/kg in both samples at an individual plot. The compliance monitoring program for the FLTFs is outlined in Exhibit D.

EXHIBIT B

SCHEDULE OF REMEDIAL ACTIVITIES



- • Timing may be dependent on implementation of Task 4
- •• Implementation dependent on field observations during Task 2
- ••• Installation dependent upon results of Tasks 1 & 2
- •••• Necessity dependent upon results on Task 1
- ••••• Timing dependent on results of Task 2

KWBES

prepared for:

TEXACO

Schedule of remedial activities.

PROJECT:	701092005-237 (ACTSCH)
LOCATION:	ANACORTES, WASHINGTON
APPR:	DATE: 04/07/93
DRAWN BY: RMO	SCALE: NONE
DATE: 01/13/93	FIGURE: B-1

EXHIBIT C

SOIL AND GROUNDWATER CLEANUP STANDARD

EXHIBIT C

SOIL AND GROUNDWATER CLEANUP STANDARD

1.0 Soil Cleanup Standard

1.1 MTCA Methodology and Standard

The Method A (WAC 173-340-740 (2)(a)(i)) soil cleanup standard of 200 mg/kg TPH shall apply to the Munks' west pasture, blackberry ditch along the Shell Oil spur, and the catchment basin and pump area on the Texaco property. WDOE Method WTPH 418.1 modified shall be used exclusively for the TPH analyses.

Due to the sporadic distribution of hydrocarbon contamination noted in 1991 field activities, no statistical analysis will be conducted on the results of the soils analyses at the site. Therefore, all samples collected for verification of cleanup standard compliance for each area shall contain less than 200 mg/kg TPH before the remediation of the area is considered complete.

If the TPH criterion cannot be met at the pump area Texaco shall apply a deed restriction (Exhibit G) to the area and begin groundwater compliance monitoring (Exhibit D). Then a health-based assessment of individual hazardous petroleum constituents can be conducted based on a "worst case" TPH sample. Soil cleanup levels shall be determined using the Method B equations outlined in WAC 173-340-740(3)(iii). The protocol for determining individual hazardous petroleum constituents is being developed by the Department of Ecology. The protocol shall be used to determine individual hazardous substances associated with petroleum.

The semi-annual soil cores collected during the compliance monitoring (Exhibit D) from the Flare Area Land Treatment Facility shall be analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), in addition to TPH. EPA method 8020 shall be used for the determination of BTEX. The cleanup standard for benzene shall be 0.5 mg/kg, for toluene shall be 40.0 mg/kg, for ethylbenzene shall be 20.0 mg/kg, and for xylenes shall be 20.0 mg/kg (Table 3; WAC 173-340-740(2)(a)(i)).

1.2 Soil Sampling Protocol

Soil samples shall be collected using either a stainless-steel auger or hand trowel. Composite samples shall be thoroughly mixed in a stainless-steel or glass container before being placed into sample containers. Sample containers shall consist of sterilized glass jars with Teflon lids. All sampling equipment shall be decontaminated between the collection of each sample.

Sample locations and descriptions shall be recorded in the field by a qualified geologist or soil scientist. Chain-of-custody forms shall accompany each batch of samples from the time of sample collection to delivery to the contracted analytical laboratory. A minimum of one duplicate sample shall be collected for each 10 samples collected.

2.0 Groundwater Cleanup Standard

2.1 MTCA Methodology and Standard

The Method A (WAC 173-340-720 (2)(a)(i)) groundwater standard of 1.0 mg/liter TPH and BETX standards of 5.0 ug/liter benzene, 30.0 ug/liter ethylbenzene, 40.0 ug/liter toluene, and 20.0 ug/liter xylenes shall apply to the monitoring well located at the pump area on Texaco property.

2.2 Groundwater sampling Protocol

Groundwater samples shall be collected using a dedicated disposable bailer or dedicated sampling pump. The elevation of the groundwater in monitoring wells shall be measured and recorded in a field notebook prior to sampling and purging. Three well volumes of water shall be evacuated or the well shall be bailed dry, before sampling the well. The pH and electrical conductivity of groundwater shall be tested within two hours of sampling the well and the results placed in the field notebook.

EXHIBIT D

COMPLIANCE MONITORING PLAN

EXHIBIT D

COMPLIANCE MONITORING PLAN

Compliance monitoring shall consist of groundwater monitoring at the pump station area of the spill site, if oily soils are left in place, and at the Flare Area Land Treatment Facility (FLTF); and soil-pore water and soil sampling at the FLTF.

1.0 PUMP STATION AREA GROUNDWATER MONITORING

1.1 Groundwater Monitoring

Texaco shall perform groundwater monitoring at the site for five years. Texaco's obligation to perform groundwater monitoring shall commence when it determines that any soil sample taken from the Pump Area, as required under Pump Area, Task 2 of Exhibit A, exceeds the 200 ppm TPH cleanup standard, or when it determines that a "worst case" soil sample collected in accordance with Pump Area, Task 2 of Exhibit A, contains petroleum constituents that are identified in Ecology's protocol and that exceed in concentration the Method B levels for such substances, whichever comes first. A monitoring well shall be installed downgradient of the pump area on the Texaco property at a location approved by Ecology (Figure A-2). Groundwater samples shall be collected quarterly for the first two years and analyzed for BTEX and TPH. After the initial two years of sampling, groundwater samples shall be collected and analyzed for these same constituents annually for an additional three years. At the end of this period Texaco and Ecology shall exchange proposals to amend this Exhibit (pursuant to Section XV AMENDMENT OF CONSENT DECREE) with regard to whether continued groundwater monitoring is necessary to protect human health or the environment, and if so what would constitute an appropriate monitoring regime. Ecology and Texaco shall exchange proposals to amend, in the manner just described, at five year intervals thereafter until levels of TPH, or individual hazardous substances associated with petroleum, as listed in Ecology's protocol, in soil on the site drop below the cleanup standard(s). Texaco may terminate this groundwater monitoring program at any time after receipt of results showing, and concurrence by Ecology, that soils in the Pump Area no longer contain petroleum or petroleum constituents in concentrations that exceed the cleanup standards established in this Decree. For purposes of determining whether Pump Area soils meet these standards, Texaco may use either the 200 TPH standard or the Method B standards for each of the hazardous substances to be identified in Ecology's protocol.

1.2 Groundwater Sampling Protocol

The elevation of groundwater in the well shall be measured and recorded in the field notebook prior to sampling. Three well volumes of water shall be evacuated, or the well shall be bailed dry, before sampling the well. Each well shall be sampled using a dedicated disposable bailer.

The Ph and electrical conductivity of groundwater shall be tested within two hours of sampling the well and the results recorded in the field notebook.

If any petroleum constituent is detected above the Method A cleanup standards for groundwater listed in Table 1 WAC 173-340-720(2)(a)(i), the well shall be resampled and the sample split for concurrent analyses at independent laboratories for verification. Texaco shall report the results of the verification sample to the WDOE within 30 days of receipt. Within 60 days of the notification, Texaco shall submit a plan for addressing the contamination. This plan shall ensure that the groundwater cleanup standard is met. Texaco and Ecology shall then enter into negotiations to amend this Decree to require remediation of the groundwater contamination.

2.0 FLARE AREA LAND TREATMENT FACILITY

2.1.1 Groundwater Monitoring

The groundwater monitoring wells installed east of the FLTF plots (W-112 and W-113; Figure D-1) shall be monitored semi-annually for BTEX and TPH. Groundwater monitoring shall continue for two years following the final demonstration that treated oil spill soils comply with the cleanup standard for soil.

2.1.2 Groundwater Sampling Protocol

The elevation of groundwater in the well shall be measured and recorded in the field notebook prior to sampling. Three well volumes of water shall be evacuated, or the well shall be bailed dry, before sampling the well. Each well shall be sampled using a dedicated disposable bailer. The pH and electrical conductivity of groundwater shall be tested within two hours of sampling the well and the results recorded in the field notebook.

If any petroleum constituent is detected above the Method A cleanup standards for groundwater listed in Table 1 WAC 173-340-720(2)(a)(i), the well shall be resampled and the sample split for concurrent analyses at independent laboratories for verification.

If the results of the analyses of the split samples confirm the presence of one or more constituents above the Method A cleanup levels, Texaco shall notify WDOE within 30 days of the confirmation. Within 60 days of the notification, Texaco shall submit a plan for groundwater quality assessment.

The groundwater quality assessment plan shall be implemented in such a manner as to determine, at a minimum, the following:

- The rate and extent of migration of the hazardous constituents in the groundwater; and
- The concentrations of hazardous constituents in the groundwater

At the conclusion of the groundwater quality assessment exercise, Texaco shall submit to WDOE a written report containing an assessment of the groundwater quality. If Texaco finds that no hazardous constituents have entered the groundwater from the FLTF, and Ecology concurs in this finding, the confirmatory groundwater monitoring program shall be reinstated. The groundwater quality assessment report shall contain a statement that indicates Texaco's intention to resume normal monitoring.

If the groundwater quality assessment confirms contaminated subsurface waters, Texaco shall continue the groundwater investigation and consult with WDOE on the most appropriate method of addressing the contamination.

2.2 Lysimeter Sampling

The lysimeters installed at the FLTF plots shall be sampled semi-annually for BTEX and TPH. Soil-pore water monitoring shall continue for two years following the demonstration that treated oil spill soils comply with the cleanup standard. If BTEX or TPH is detected above the Method A cleanup standards for groundwater listed in Table 1 WAC 173-340-720(2)(a)(i), the lysimeter shall be resampled and the sample split for concurrent analyses at independent laboratories for verification.

If the results of the analyses of the split samples indicates the presence of one or more of the TPH or BTEX constituents above the Method A cleanup levels, Texaco shall notify WDOE within 30 days of the confirmation. No additional soils shall be applied to the affected plot until an assessment of contaminant mobility is undertaken and approved by Ecology.

3.1 Soil Core Sampling

Soil cores shall be collected within one foot below the treatment zone at the FLTFs following the final demonstration that treated oil spill soils comply with the cleanup standard. Four soil cores shall be collected from each of the two plots and analyzed for BTEX and TPH. The sample locations shall be randomly-selected based on a grid. Samples shall be collected using a drilling rig with split-spoon sampler. The sampling protocol for soils outlined in Exhibit C shall be followed.

If BTEX or TPH is detected above the Method A cleanup standards for soils listed in Table 3 WAC 173-340-740(2)(a)(i), the location shall be resampled and the sample split for concurrent analyses at independent laboratories for verification.

If the results of the analyses of the split samples indicates the presence of one or more of the constituents above the Method A cleanup levels, Texaco shall notify WDOE within 30 days of the confirmation. No additional soils shall be applied to the affected plot after confirmation of soil contamination below the treatment zone. Texaco

shall consult with WDOE regarding remedial action alternatives following the confirmational sampling.

APPENDIX C

TEXACO 1993 REPORT ON THE COMPLETION OF REMEDIAL ACTIVITIES

REPORT TO THE WASHINGTON STATE
DEPARTMENT OF ECOLOGY

REPORT ON THE COMPLETION OF REMEDIAL ACTIVITIES ASSOCIATED WITH THE FEBRUARY 22, 1991 CRUDE OIL SPILL AT TEXACO PUGET SOUND PLANT

(Consent Decree No. 93-2-00913-8)

Submitted by

Texaco, Puget Sound Plant
600 S. Texas Road
Anacortes, Washington 98221

DECEMBER 1993

Prepared By:

Brian D. Rhodes, R.G.
Project Engineer

Reviewed By:

Larry E. Padgett, P.E.
Supervisor - EHS Department

STATE OF WASHINGTON
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Mr. Glenn A. Weiss
Texaco Refining and Marketing Inc.
P.O. Box 622
Anacortes, WA 98221-0622

Dear Mr. Weiss:

Thank you very much for the January 10, 1994 report entitled "Report on the Completion of Remedial Activities Associated with the February 22, 1991 Crude Oil Spill at Texaco Puget Sound Plant". The report was submitted to document the completion of requirements outlined in Consent Decree No. 93-2-00913-8 between Texaco and the Department of Ecology. The Department has reviewed the report and finds that the remedial action requirements of the Decree have been met. The project will now start a compliance monitoring phase. As stated in Exhibit D of the Consent Decree, Texaco shall continue ground water monitoring at the pump station for the next five years. Texaco and Ecology will exchange monitoring proposals after the five year monitoring period to determine if future monitoring is necessary.

I have already changed the status of the cleanup on the Department data base from remedial action in progress to construction complete. The hazardous sites list reflects this change. The next hazardous sites list will indicate that the site is in monitoring phase.

Please thank Joe Haley and Larry Padgett for their assistance during the spill and the three year cleanup effort. Mr. Haley had a refreshing "can-do" attitude during the cleanup. If you have any questions concerning the cleanup please contact me in Olympia at 206 (407-6949).

Sincerely,

Paul Skyllingstad
Industrial Section

PES:

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1.0 BACKGROUND

1.1 Introduction

On February 22, 1991, approximately 5,000 barrels of crude oil were released at Texaco Puget Sound Plant as a result of a catastrophic failure of a crude oil booster pump. Massive emergency clean-up activities were conducted in response to the spill and were reported to the Department of Ecology in a report submitted in February 22, 1992 entitled "Report on the Interim Action Cleanup Activities and Remedial Investigation/Feasibility Studies Related to the February 22, 1991 Crude Oil Spill at the Texaco Puget Sound Plant".

On August 18, 1993, a consent decree (No. 93-2-00913-8) between the State of Washington Department of Ecology and Texaco Refining and Marketing Incorporated was filed in Skagit County, Washington. The consent decree provides details of additional activities which were to be completed in association with the crude spill. The report which follows provides details in support of the fulfillment and completion of remedial activities detailed in the subject consent decree.

1.2 Site Location

Puget Sound Plant is located approximately 75 miles north of Seattle near the City of Anacortes on Fidalgo Island (Figure 1). The February 1991 oil spill site is located in the northwest corner of Puget Sound Plant, approximately 200 feet east of Fidalgo Bay (Figure 2).

1.3 Site History

On the evening of February 22, 1991, Texaco Puget Sound Plant was transferring a load of Alaskan North Slope crude oil from an oil tanker into plant tankage. During the transfer, a crude oil booster pump suffered a catastrophic structural failure which allowed approximately 5000 barrels of crude oil to be released to soils and surface waters adjacent to the Texaco facility. During the spill, crude oil ran from the broken pump westward across a transfer pipeway and railroad right of way to drainage ditches located on Mr. Leonard Munk's property to the west. Following emergency clean-up actions at the site, a remedial investigation and feasibility study was conducted by K.W. Brown and Associates (Appendix A - Cleanup

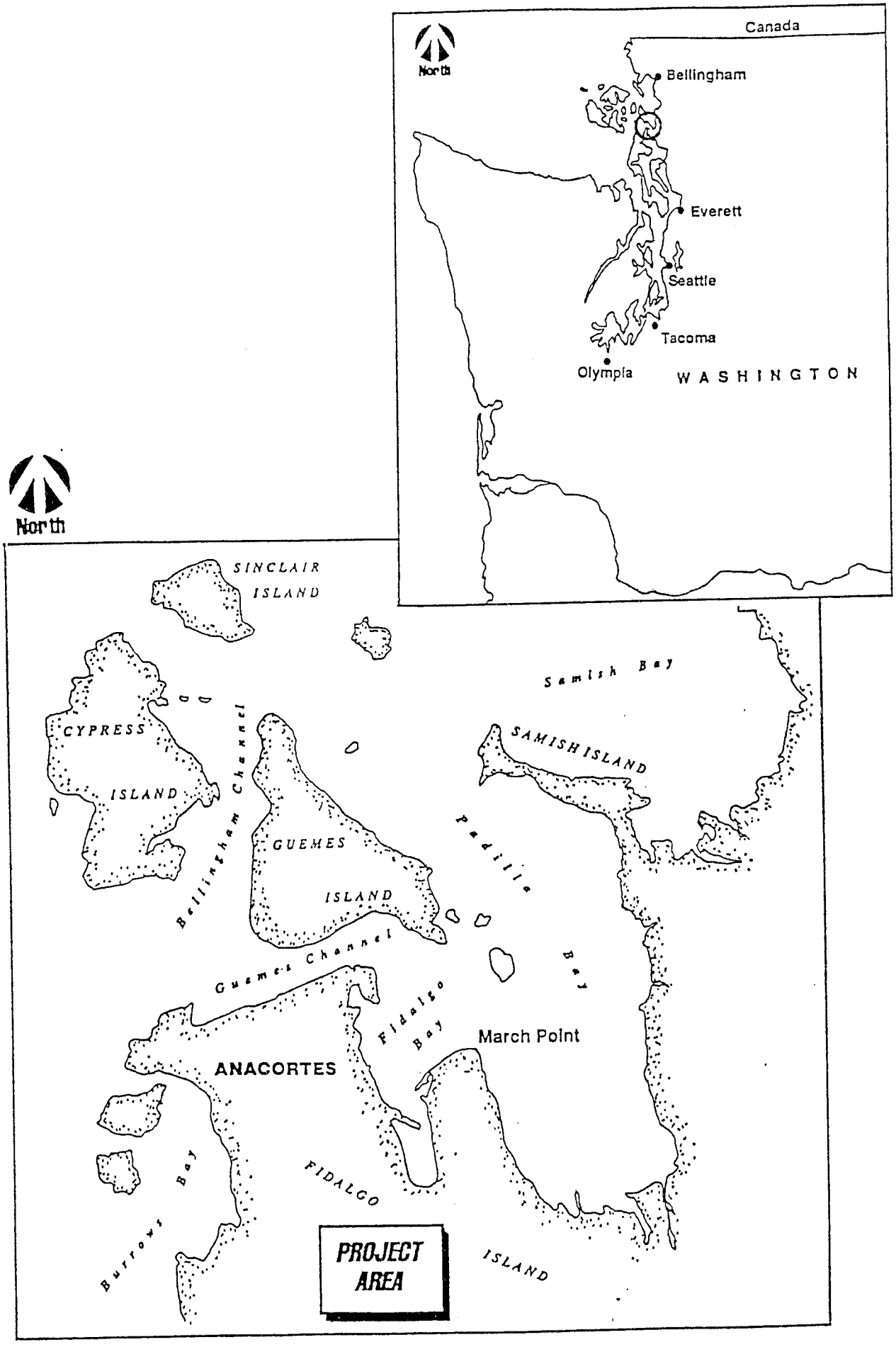
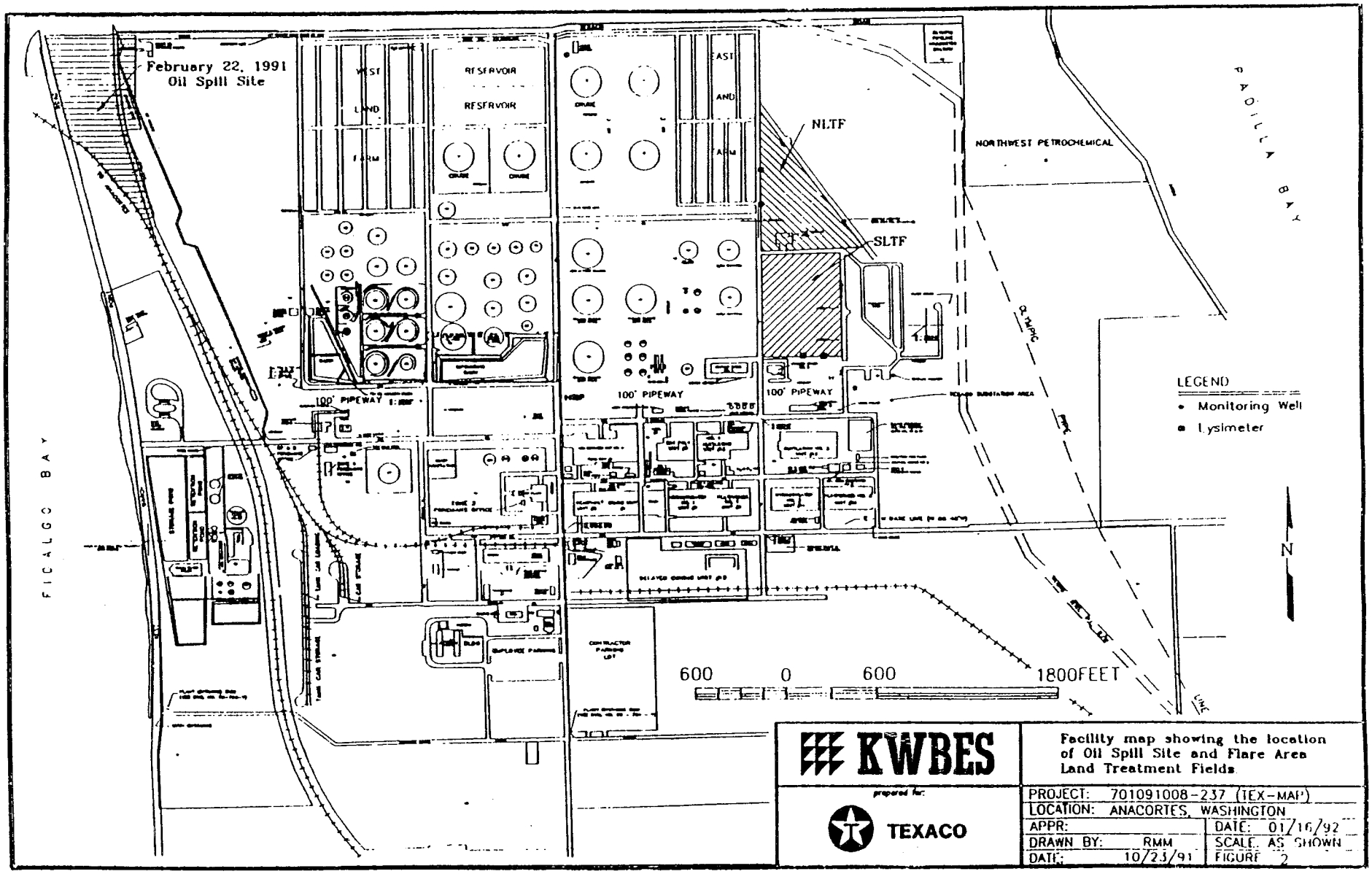


Figure 1. Vicinity map of Texaco Puget Sound Plant


February 22, 1991
Oil Spill Site
WEST LAND FARM
RESERVOIR
RESERVOIR
EAST AND FARM
NLTF
SLTF
NORTHWEST PETROCHEMICAL
PADILLA BAY
FICALGO BAY
100' PIPEWAY
100' PIPEWAY
100' PIPEWAY
OLYMPIC
LEGEND
Monitoring Well
Lysimeter
N
600 0 600 1800FEET
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prepared for:
TEXACO
Facility map showing the location of Oil Spill Site and Flare Area Land Treatment Fields
PROJECT: 701091008-237 (TEX-MAP)
LOCATION: ANACORTES, WASHINGTON
APPR:
DATE: 01/16/92
DRAWN BY: RMM
SCALE: AS SHOWN
DATE: 10/23/91
FIGURE 2

Action Plan - May 25, 1993). Based on the findings of the assessment and observations of the Washington State Department of Ecology (WDOE), Texaco Puget Sound Plant and WDOE entered into Consent Decree No. 93-2-00913-8 which was recorded in Skagit County, Washington. The consent Decree required Texaco to conduct the following activities:

1) Continue ongoing in situ bioremediation of the Munks farm west pasture and, if necessary, excavate any remaining "hotspots".

2) Bioremediate or, if necessary, excavate contaminated soils in the Blackberry Ditch.

3) Excavate, to the extent feasible, all visibly contaminated soils in the vicinity of the booster pumps and install one groundwater monitoring well down-gradient of the pump area.

4) Delineate the extent of contamination in the catchment basin through a sampling program and, if necessary, conduct in situ remediation of soils which exceed the clean-up standards.

5) Treat excavated soils in the Flare Area Land Treatment Facility and conduct a monitoring program of treated soils.

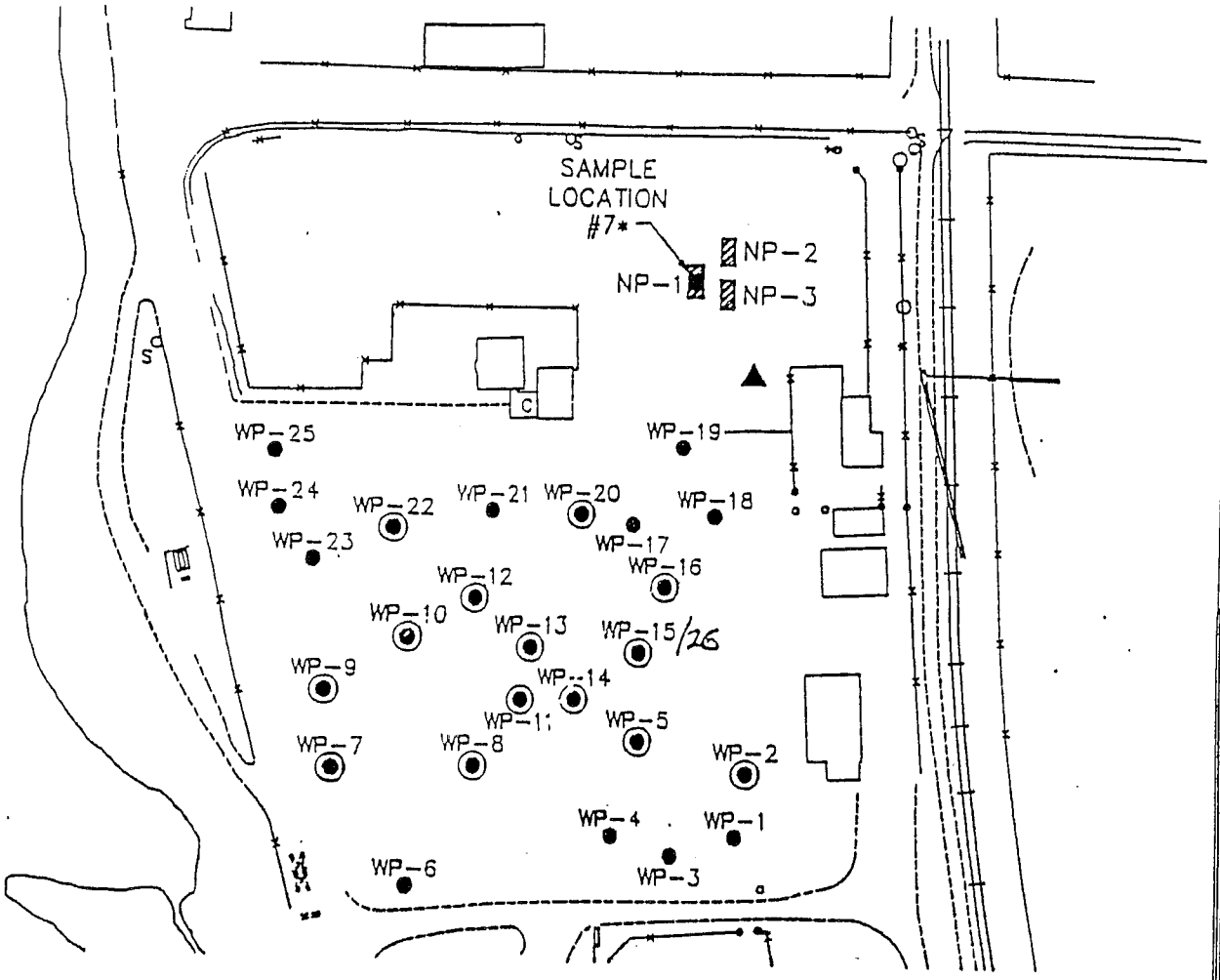
Additional details, protocols and procedures for completion of the above activities are specified in the subject consent decree (Appendix B - Remedial Action Plan). This report addresses actions taken to complete each of the five action items listed above.

2.0 REMEDIAL ACTION ACTIVITIES

2.1 Munk's West Pasture

During emergency response measures, surface soils at Munk's West Pasture were removed and properly disposed of at permitted landfarm facilities at Puget Sound Plant. This report details the ongoing treatment of remaining soils and ultimate closure of the West Pasture.

The original sampling event at the site involved the collection of 25 randomly-selected samples from the west pasture on August 7, 1991 (Figure 3; sampling event WP & NP). Paul Skyllingstad of WDOE accompanied Paul



LEGEND

- SOIL BORING
- SOIL SAMPLE COLLECTED FOR TPH, BENZENE ANALYSES
- TRENCH LOCATION, SOIL SAMPLE COLLECTED FOR TPH, BENZENE ANALYSES
- PORTION OF BURIED WATER LINE EXPOSED IN INTERCEPTOR TRENCH. (FOR LOCATION OF INTERCEPTOR TRENCH SEE FIGURE 2)

* From Phase II Preliminary Site Assessment and Remedial Action Review Workplan (Texaco, 1991b)

100 0 100 FEET

N

KWBES

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Soil sampling locations at the north and and west pastures (WP and NP sampling events).

PROJECT: 701091008-237 (PSPSAMP2)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 10/23/91
DRAWN BY: RMM	SCALE: AS SHOWN
DATE: 10/23/91	FIGURE: 3

Grabau of KW Brown during the event and split samples for analysis at an independent laboratory. All samples were screened with a photo-ionization detector (PID) for the presence of volatile organic compounds (VOC's). All samples yielding VOC detection were analyzed for TPH in addition to several randomly-selected samples for a total of 14 samples which were analyzed for TPH using method 418.1. Of the 14 samples, five yielded TPH concentrations above the 200 ppm level (Table 1).

2.1.1 "Hotspot" Delineation

Based on the initial sampling event, a soil sampling strategy was developed which involved the collection of samples from "hotspots" which were identified during previous sampling events. The "hotspots" consist of sampling locations where total petroleum hydrocarbon (TPH) concentrations exceed the MTCA cleanup standard of 200 ppm. Soil samples were taken from the 0 - 10 in. depth interval. Three sampling rounds were completed using this technique on Oct. 8, 1991, May 29, 1992, and August 4, 1992 as shown in Figure 4. The analytical results for the three sampling rounds are summarized in Table 2. Note that the table includes two columns for data from the Oct. 8, 1991 sampling round. This represents the results from a split (duplicate) of the original sample.

During the sampling of the west pasture, the ability of TPH method 418.1 to differentiate between petroleum hydrocarbon and background organics was brought into question by laboratory personnel since the technique uses IR energy to measure all carbon-hydrogen bonds regardless of their origin. For this reason, both method 8015 modified (GC) and 418.1 were run on the Aug 4, 1992 samples. Based on method 8015, only a single sample, WP2-8 at 310 ppm, showed detectable hydrocarbons during the Aug 4 sampling round. By method 418.1, two samples, WP2-4 (270 ppm) and WP2-8 (560 ppm), had detectable hydrocarbons. Ultimately, it was decided that Texaco would continue to use method 418.1 for consistency and to comply with the Washington Department of Ecology (WDOE) consent decree requirements.

2.1.2 "Hotspot" Excavation

Four samples were collected around each remaining 'hot spot' at WP2-

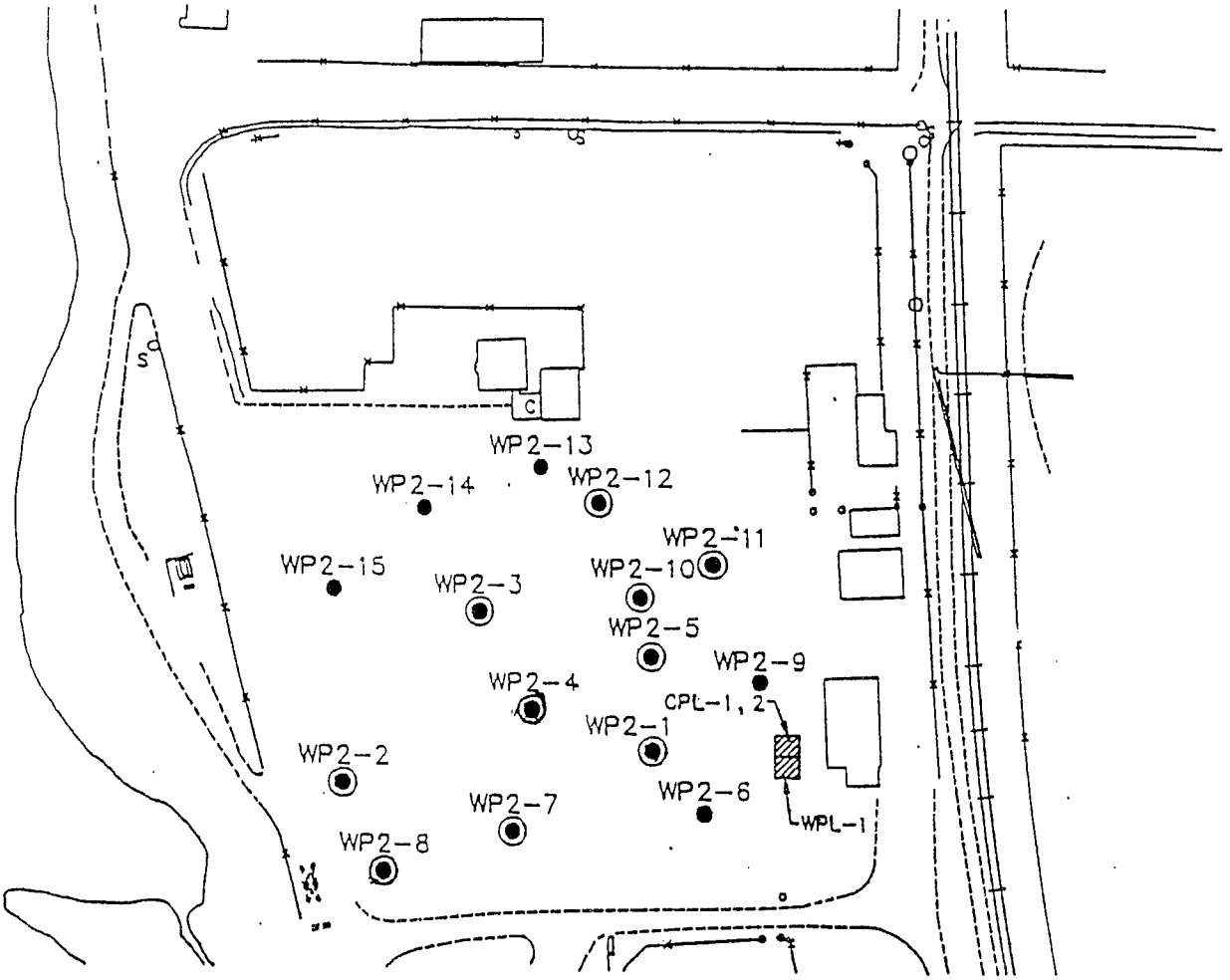
TEXACO PUGET SOUND PLANT - TABLE 1

MUNKS' WEST PASTURE - INITIAL SAMPLING RESULTS

08/07/91 SAMPLING ROUND (SEE MAP 1)

SAMPLE LOCATION	TPH - mg/kg by 418.1
WP-1	NA
WP-2	147
WP-3	NA
WP-4	NA
WP-5	729
WP-6	NA
WP-7	1977
WP-8	31
WP-9	ND
WP-10	77
WP-11	4301
WP-12	1148
WP-13	16
WP-14	110
WP-15	162
WP-16	168
WP-17	NA
WP-18	NA
WP-19	NA
WP-20	50
WP-21	NA
WP-22	ND
WP-23	NA
WP-24	NA
WP-25	NA
WP-26*	767

*WP-26 is a duplicate (split) of WP-15



LEGEND

- ● SOIL BORING
- ◉ SOIL SAMPLE COLLECTED FOR TPH ANALYSIS
- ▨ TRENCH LOCATION, SOIL SAMPLES COLLECTED FOR TPH, BENZENE ANALYSES

100 0 100 FEET

N

NOTE: WP3 SERIES SAMPLING LOCATIONS SAME AS WP2 LOCATIONS.

Also WP4, WP5

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West pasture soil sampling locations (WP2, WP3, sampling events).

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PROJECT:	701091008-237 (PSPSAMP2)	
LOCATION:	ANACORTES, WASHINGTON	
APPR:		DATE: 10/23/91
DRAWN BY:	RMM	SCALE: AS SHOWN
DATE:	10/23/91	FIGURE: 4

TEXACO PUGET SOUND PLANT - TABLE 2		(SEE MAP 2)
MUNKS' WEST PASTURE SOIL SAMPLING HISTORICAL SUMMARY		

SAMPLE	DATE SAMPLED				
LOCATION	10/8/91	10/8/91	5/29/92	8/4/1992	
	(TPH (mg/kg) by 418.1 IN SOIL)			BY 8015M	BY 418.1
WP2-1	439	271	168	NS	NS
WP2-2	2354	770	141	NS	NS
WP2-3	392	173	584	ND	ND
WP2-4	1678	1098	764	ND	270
WP2-5	91	36	NS	NS	NS
WP2-6	NA	NA	NS	NS	NS
WP2-7	161	102	NS	NS	NS
WP2-8	850	258	706	310	560
WP2-9	NA	NA	NS	NS	NS
WP2-10	76	42	NS	NS	NS
WP2-11	183	42	NS	NS	NS
WP2-12	456	240	841	ND	ND
WP2-13	NA	NS	NS	NS	NS
WP2-14	NA	NS	NS	NS	NS
WP2-15	NA	NS	NS	NS	NS
*WP2-16a	1768	1012	1083	**ND	**270

**Sample 16a is a duplicate (split) of sample 4 in each case*

***No split for this round - see WP2-4 result*

NS = Not sampled

ND = Analyte not detected at stated detection limit

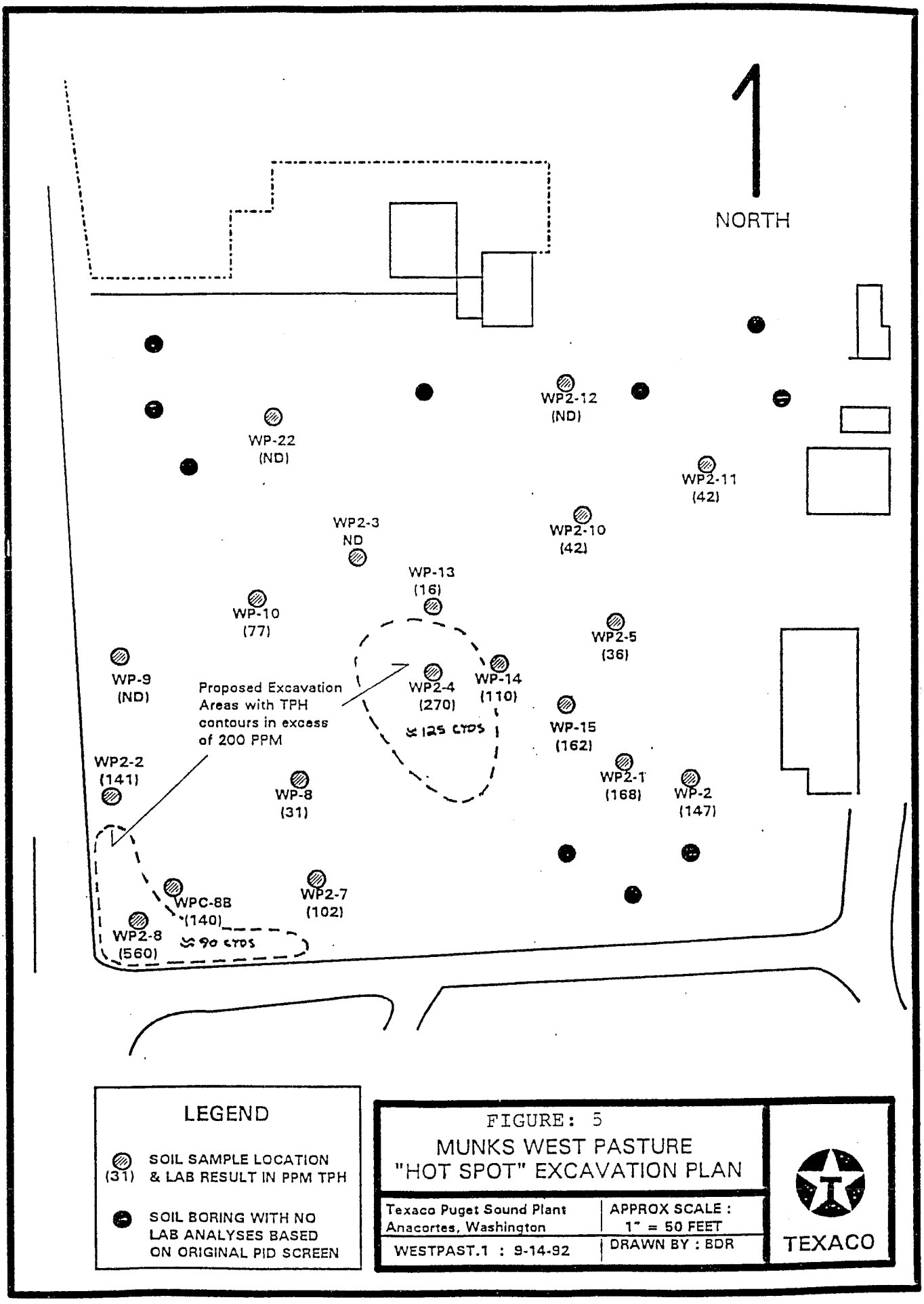
NA = Not analyzed for stated constituent

4 and WP2-8 to confirm the extent of the remaining hydrocarbons. The samples were collected in a square with 20 ft sides around each 'hot spot'. Analytical lab results from the samples ranged from 140 ppm TPH (WPC-8B) to 510 ppm TPH (WPC-8D). Only a single sample, WPC-8B, was below the regulatory level of 200 ppm. Based on the sampling results, a contour map was then developed which delineated a proposed excavation zone around the remaining 'hot spots' (Figure 5). The excavation plan was submitted to Mr. Paul Skyllingstad of the WDOE for review and approval. Once WDOE approval was received, approximately 12" to 24" of soil were excavated as shown on figure 5 and photos 1 - 2 (below). The depth of the excavation was determined by the depth to a light green clay layer on the site. Once the clay layer was reached, the excavation was terminated.

Photo No. 1 - Munk's Pasture

2.1.3 Confirmation Sampling

Upon completion of the excavation, ten confirmation samples (WPE-1 through WPE-10), five from each excavation, were collected and submitted for analytical analysis as required by the WDOE consent decree. The locations where confirmation samples were collected are



LEGEND

(31) SOIL SAMPLE LOCATION & LAB RESULT IN PPM TPH

SOIL BORING WITH NO LAB ANALYSES BASED ON ORIGINAL PID SCREEN

FIGURE: 5

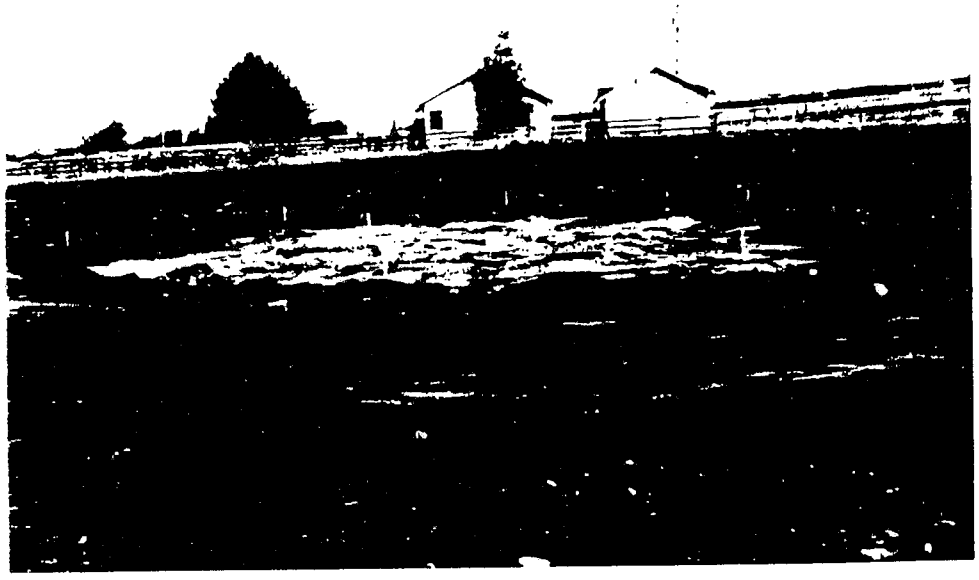
MUNKS WEST PASTURE "HOT SPOT" EXCAVATION PLAN

Texaco Puget Sound Plant Anacortes, Washington	APPROX SCALE : 1" = 50 FEET
WESTPAST.1 : 9-14-92	DRAWN BY : BDR

TEXACO

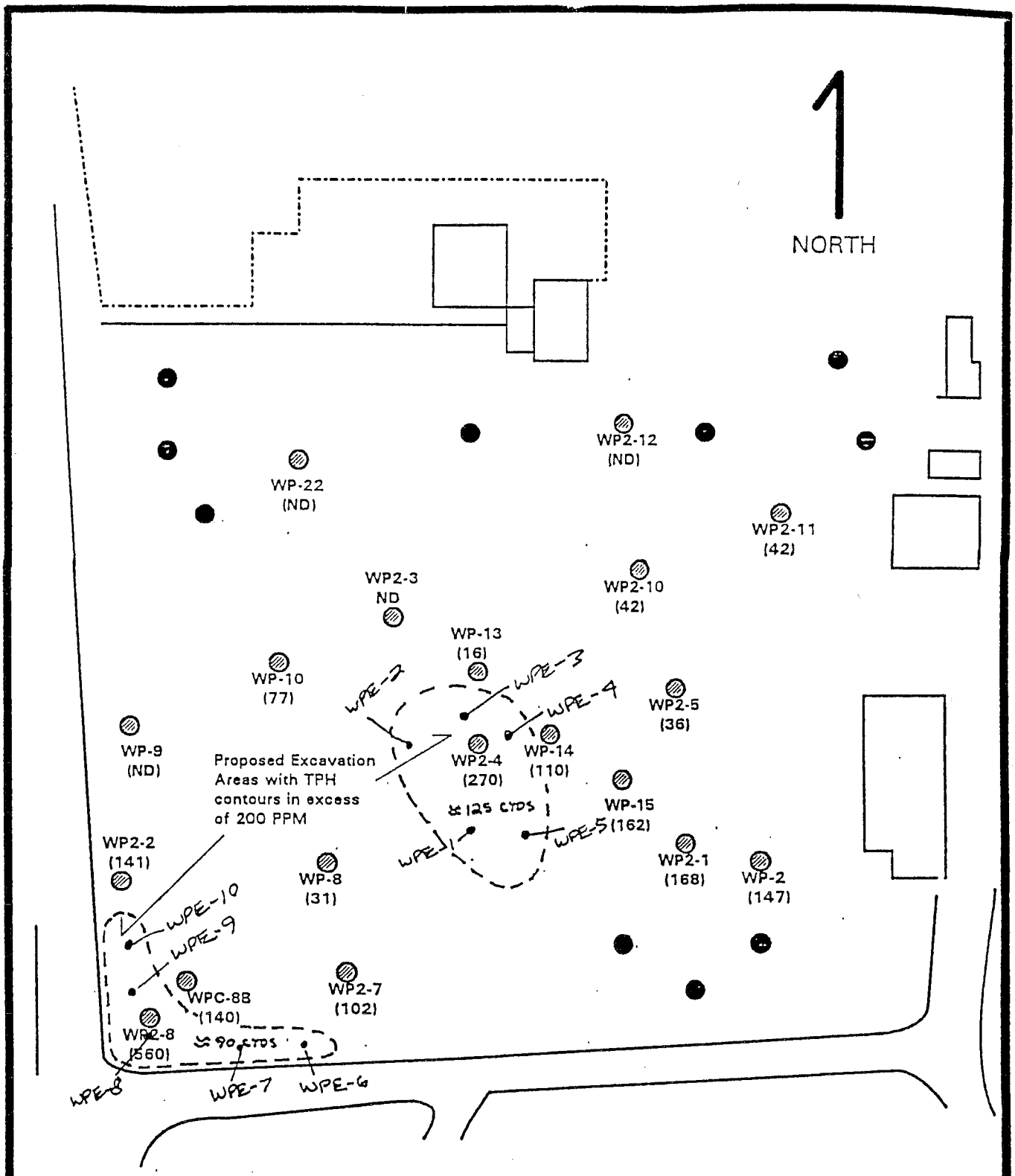
shown in Figure 6. Results from the lab analyses indicated that only a single sample (WPE-8 @260 ppm) was above the regulatory limit of 200 ppm TPH (Table 3). A final excavation was completed around WPE-8, the remaining 'hot spot' and two confirmation samples (WPE-8A @ WPE-8B) were collected to confirm if the 'hot spot' had been removed (Figure 7). The small size of the final excavation did not warrant the collection of five confirmation samples as mentioned in the consent decree. Both Samples WPE-8A @ 19 ppm TPH and WPE-8B @ 18 ppm were below regulatory levels (Table 3). Laboratory analytical results are attached in Appendix C. Based on the lab data and remediation efforts at the site, no soils with TPH levels above regulatory limits of 200 ppm were detected during final screening effort in each area of the pasture.

Photo No. 2 - Munk's Pasture



2.1.4 Grade Restoration

Following a satisfactory demonstration that clean-up standards had been met, the west pasture was back-filled with clean top-soil to the pre-spill grade as directed by Mr. Munk's. Texaco anticipates that no further action will be required at the site.



LEGEND

(31) SOIL SAMPLE LOCATION & LAB RESULT IN PPM TPH

SOIL BORING WITH NO LAB ANALYSES BASED ON ORIGINAL PID SCREEN

FIGURE: 6

MUNKS WEST PASTURE
"HOT SPOT" EXCAVATION PLAN

Texaco Puget Sound Plant Anacortes, Washington	APPROX SCALE : 1" = 50 FEET
WESTPAST.1 : 9-14-92	DRAWN BY : BDR

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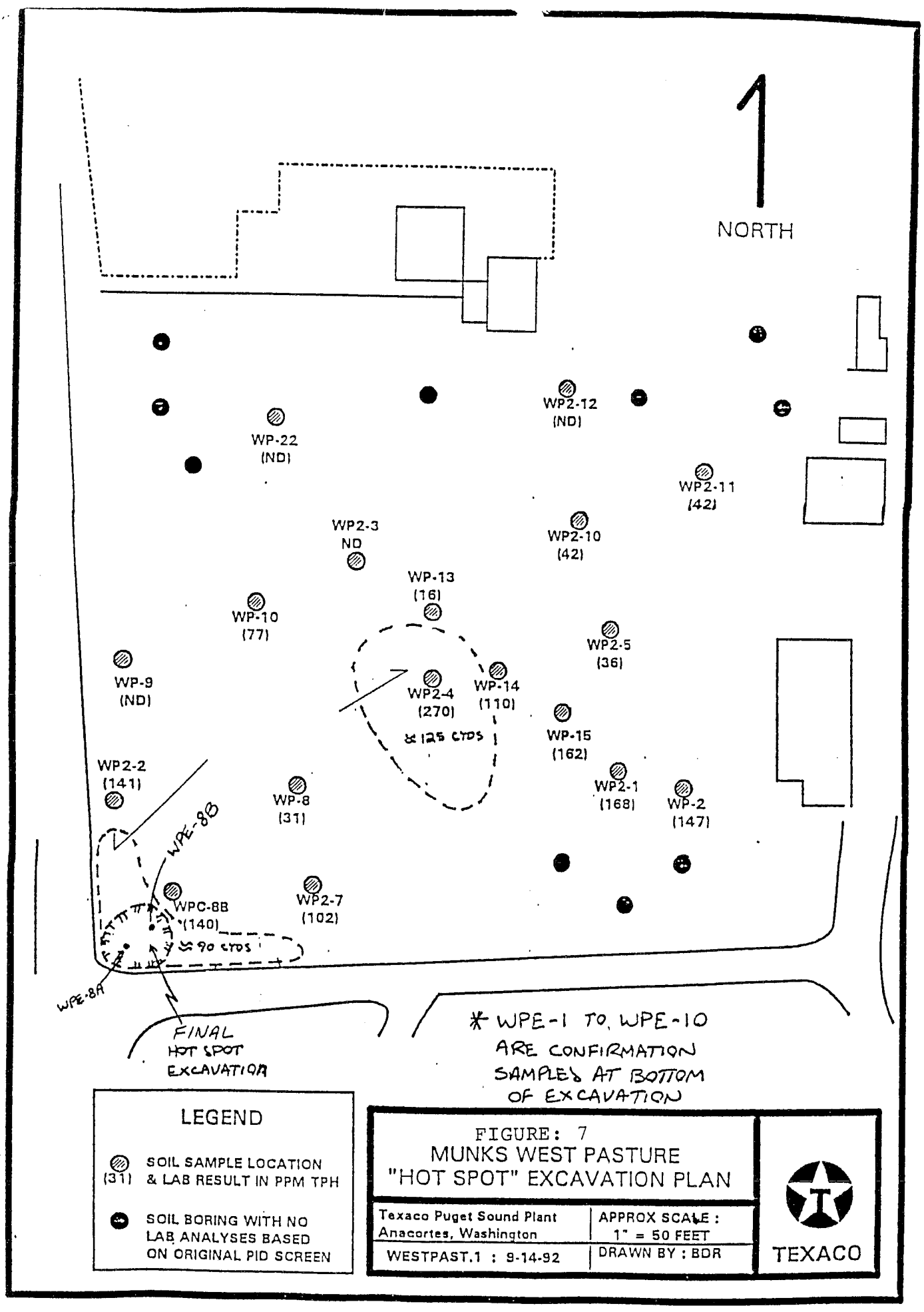


LEGEND

(31) SOIL SAMPLE LOCATION & LAB RESULT IN PPM TPH

SOIL BORING WITH NO LAB ANALYSES BASED ON ORIGINAL PID SCREEN

FIGURE: 7
MUNKS WEST PASTURE
"HOT SPOT" EXCAVATION PLAN

Texaco Puget Sound Plant Anacortes, Washington	APPROX SCALE : 1" = 50 FEET
WESTPAST.1 : 9-14-92	DRAWN BY : BDR

TEXACO

TEXACO PUGET SOUND PLANT - TABLE 3

MUNKS' WEST PASTURE SOIL SAMPLING HISTORICAL SUMMARY

SAMPLE LOCATION	DATE SAMPLED 9/18/92 PPM TPH BY 418.1	DATE SAMPLED 10/30/92 PPM TPH BY 418.1
WPE-1	54	N/S
WPE-2	29	N/S
WPE-3	68	N/S
WPE-4	<10	N/S
WPE-5	39	N/S
WPE-6	41	N/S
WPE-7	63	N/S
WPE-8	260	N/S
WPE-9	37	N/S
WPE-10	16	N/S
WPE-8A	N/S	19
WPE-8B	N/S	18

NS = Not sampled

ND = Analyte not detected at stated detection limit

NA = Not analyzed for stated constituent

2.2 Blackberry Ditch

The Blackberry Ditch area consists of North-South trending drainage ditch immediately east of the railroad tracks which eventually extend to the Shell Oil Refinery to the North. The subject consent decree requires additional excavation and/or bioremediation as necessary to remove/treat remaining soils with hydrocarbon concentrations above regulatory limits in the vicinity of samples BD-3, BD-7 and BD-9 (Figure 8).

2.2.1 Hydrocarbon Delineation Sampling

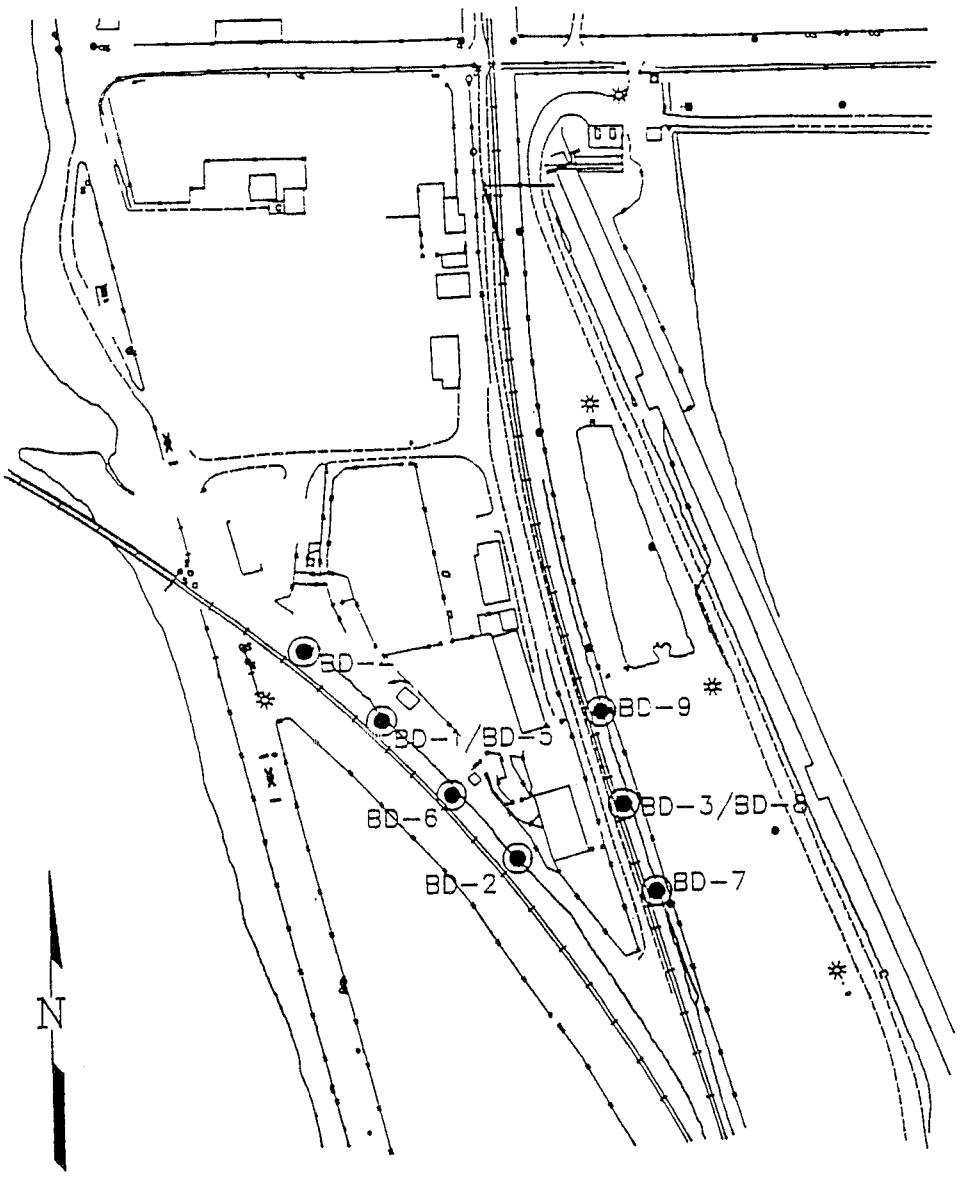
On September 2, 1993, three soil samples were collected in the north-south portion of the Blackberry Ditch to determine the progress of bioremediation in the area and to determine to need for additional excavation. The three samples were labelled BD93-3, BD93-7 and BD93-9 which correspond geographically to sample locations BD-3, BD-7 and BD-9, respectively, which are mentioned in the consent decree and shown in Figure 8. Each sample consisted of a composite collected from 0 - 6 inches deep on ditch sidewall and 0 - 6 inches deep on the ditch bottom. Each sample was analyzed for total petroleum hydrocarbons (TPH) at a state certified laboratory using method 418.1. The laboratory analyses reported TPH concentrations of <25 parts per million (ppm) for samples BD93-3 and BD93-9. Only in sample BD93-7 (323 ppm TPH) were hydrocarbons detected above the clean-up standard of 200 ppm TPH.

2.2.2 Excavation Activities

Based on the findings of the confirmation sampling, an additional 6 - 8 inch layer of soils was excavated along the ditch in the vicinity of sample location BD93-7 as depicted in figure 9. Soils removed from the Blackberry Ditch were properly disposed of at a permitted landfarm facility at Puget Sound Plant. Photo No. 3 depicts remedial activities in progress on November 23, 1993

2.2.3 Confirmation Sampling

A composite sample consisting of soils from five randomly-selected locations within the newly excavated section of the Blackberry Ditch



200 0 200 FEET

LEGEND

◉ SOIL SAMPLE COLLECTED FOR TPH ANALYSIS

KWBES

Blackberry ditch soil sampling locations.

prepared for:

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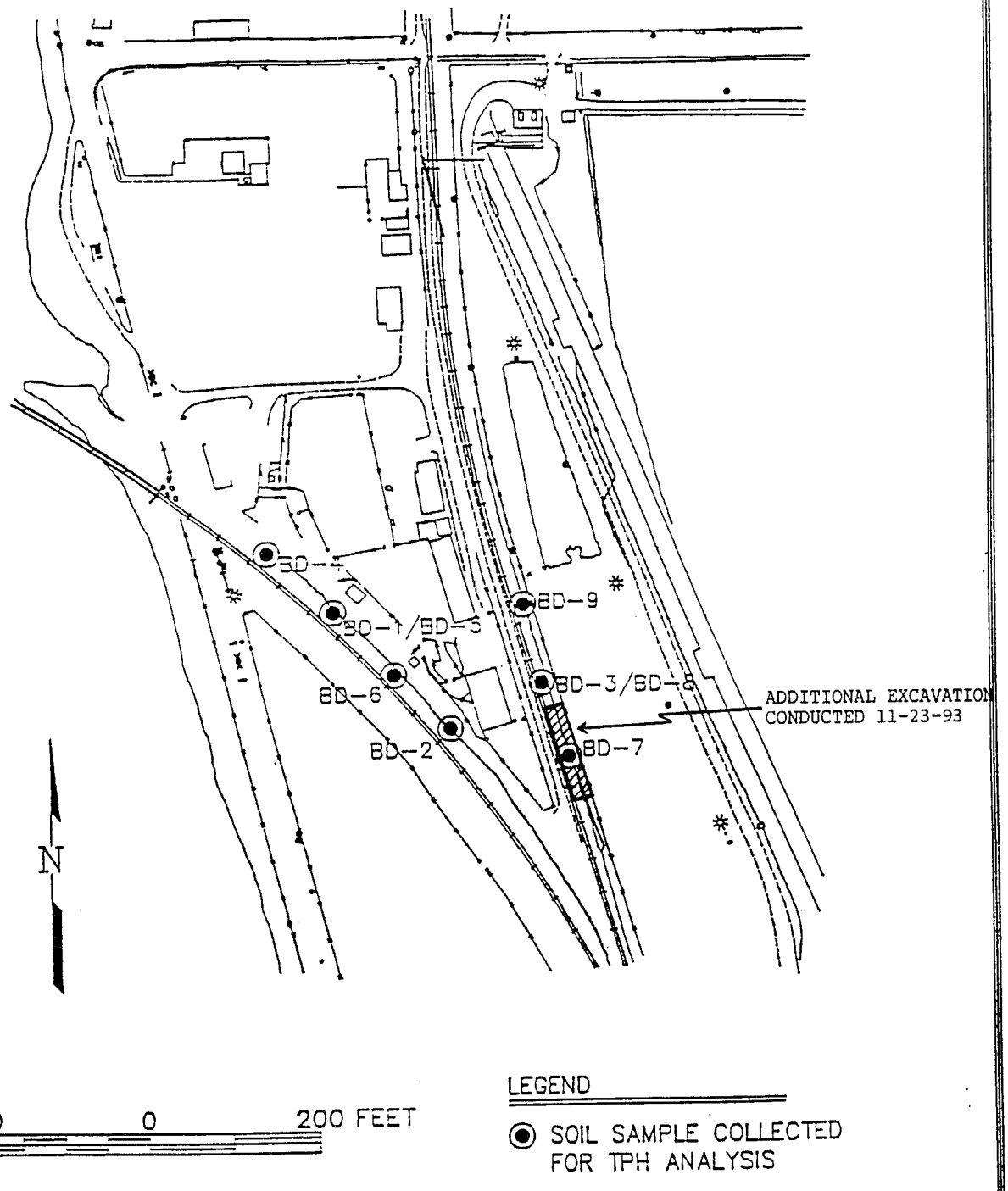
PROJECT: 701091008-237 (PSPSAMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 01/16/92
DRAWN BY: RMO	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 8



KWBES

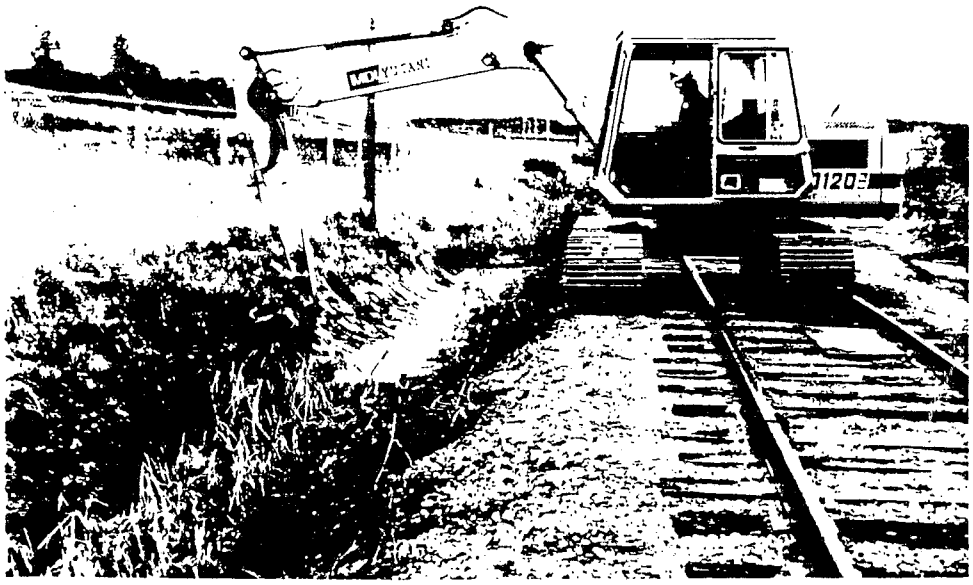
Blackberry ditch soil sampling locations.

prepared for:

TEXACO

PROJECT: 701091008-237 (PSPSAMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 01/16/92
DRAWN BY: RMO	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 9

Photo No. 3 - Blackberry Ditch



was collected to assess the effectiveness of the remedial effort. The sample was collected in accordance with Task 4 from the Blackberry Ditch section of the subject consent decree. The sample was identified as BDC-1 and was analyzed for total petroleum hydrocarbons (TPH) by method 418.1 for soils. The laboratory reported hydrocarbon concentrations of 194 ppm TPH which is below MTCA clean-up standards. Lab reports and chain of custody information is included in Appendix D. No additional remedial action is planned for the Blackberry ditch.

2.3 Crude Booster Pump

Task 1 from the Pump Area section of the consent decree requires that "All visibly-oiled soils that can feasibly be removed shall be excavated from this area". Figure 10 shows the approximate extent of residual hydrocarbons which were estimated to remain in the vicinity of the Crude Booster Pump based on the findings of K.W. Brown and Associates.

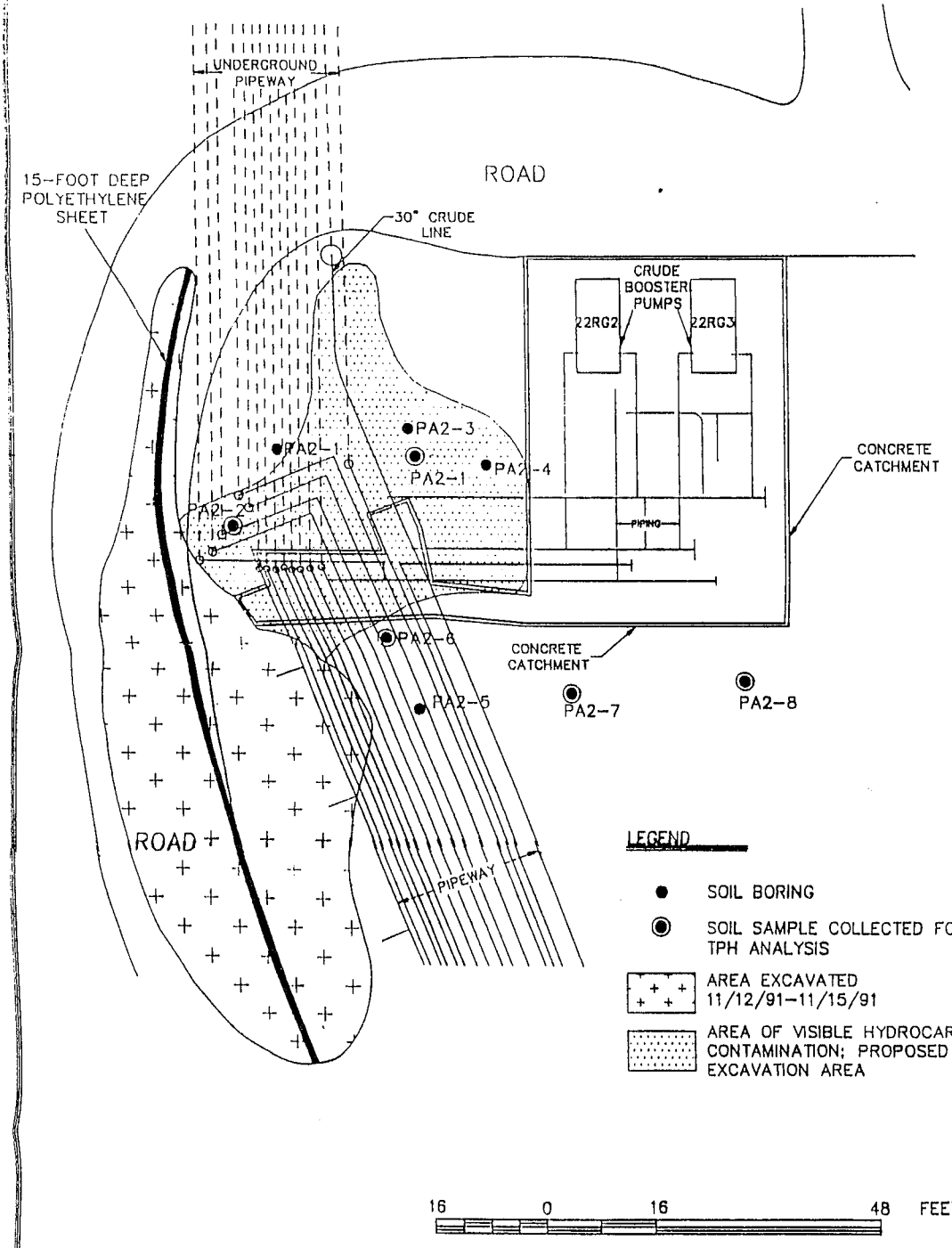
2.3.1 Soils Excavation

An excavator was used to remove all accessible visibly stained soils which were found in the vicinity the Crude Booster Pump and associated piping. An oil laden layer consisting of angular fragments of shale was uncovered during the excavation. As this layer was removed, large quantities of clear water gushed into the excavation for several minutes. The excavation was drained using a vacuum truck. Water from the vacuum truck was deposited into the facility effluent treatment system. The ultimate extent of the excavation is depicted in figure 11. During the drafting of the consent decree, it was thought that hydrocarbons were likely to extend beneath immovable high density piping in the area. As the excavation progressed it became apparent that some visibly stained soils did extend beneath the piping system and appurtenances in the area (Photo No. 4).

Photo No. 4 - Crude Booster

2.3.2 Restrictive Covenant

The consent decree requires that a restrictive covenant be filed with Skagit County if Texaco determines that any soil sample exceeds the



KWBES

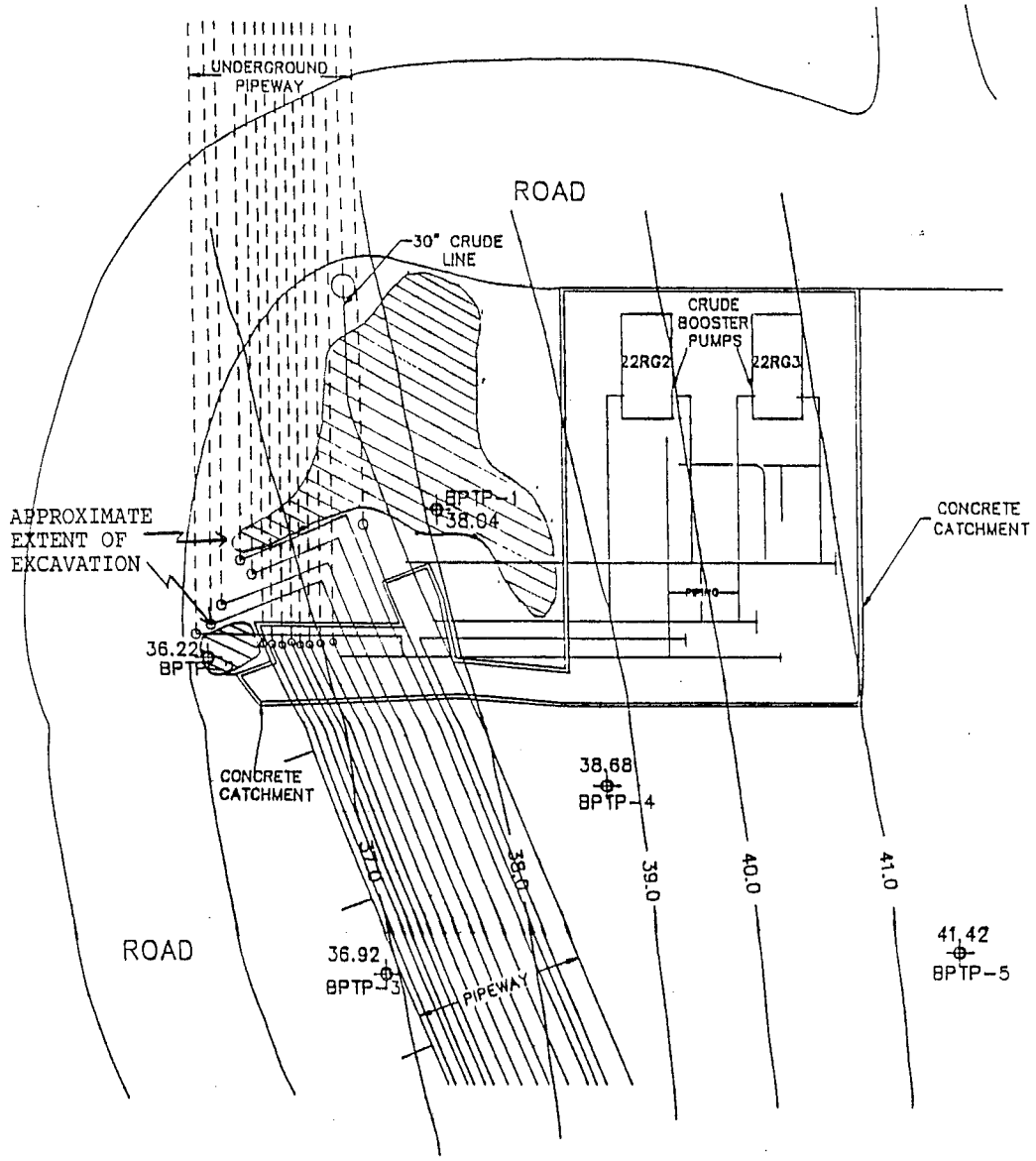
prepared for:

TEXACO

Soil boring locations, proposed and completed excavations at crude booster pump area.

PROJECT:	701091008-237 (BOOSTPMP)		
LOCATION:	ANACORTES, WASHINGTON		
APPR:		DATE:	2/12/92
DRAWN BY:	SSA	SCALE:	AS SHOWN
DATE:	1/28/92	FIGURE:	10

X1st Copy of Drawing



KWBES	Location of piezometer installations, contours of perched water table elevation at crude booster pump area (1/15/92).
prepared for: TEXACO	PROJECT: 701091008-237 (BOOSTPMP)
	LOCATION: ANACORTES, WASHINGTON
	APPR: DATE: 2/12/92
	DRAWN BY: SSA SCALE: AS SHOWN
	DATE: 1/28/92 FIGURE: 11

clean-up standard in the Crude Booster Pump area. Appendix C contains a signed recorded copy of a restrictive covenant for the Crude Booster Pump area.

2.3.3 Confirmation Sampling

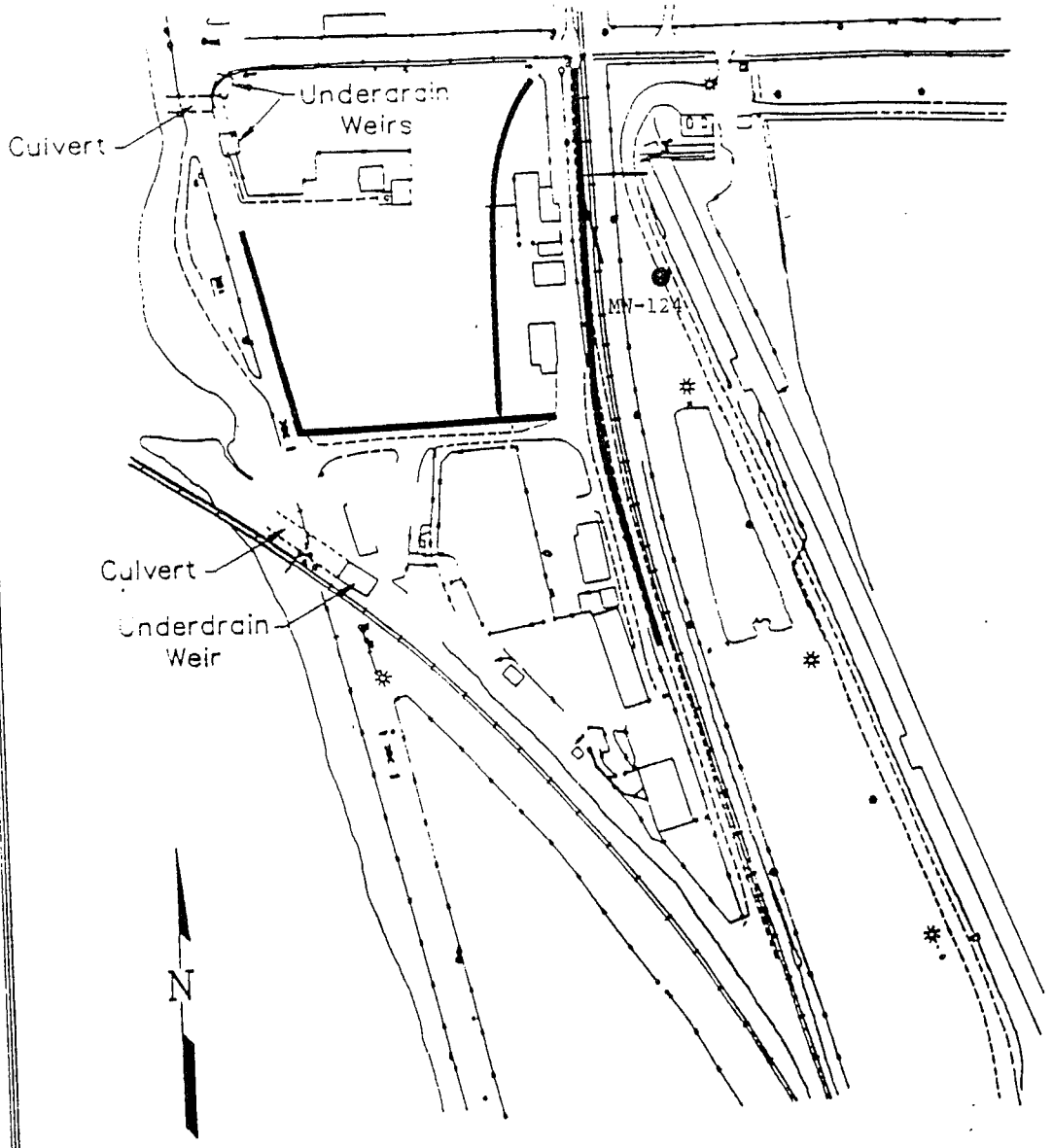
No verification sampling was conducted for the final round of the excavation since visibly stained soils had to be left in place. It was assumed that these inaccessible stained soils were above clean-up standards such that a restrictive covenant would be required.

2.3.4 Groundwater Monitoring Well

The consent decree requires the installation of groundwater monitoring well down-gradient from the crude booster pump if hydrocarbon concentrations above clean-up standards are left in place. On September 1, 1993 well MW-124 was installed at the location depicted on Figure 12. The well was drilled and completed in accordance with all appropriate well installation regulations and ordinances. A drilling start card was obtained prior to drilling of the well. The well was completed to a total depth of 20 feet and screened from 10.4 feet to 19.9 feet. The screened interval was placed to coincide with the apparent depth of the first significant water interval. Figure 13 is the well completion diagram for MW-124. The well was developed on September 3, 1993. The depth to water was measured at 10.33 feet below top of casing. On November 4, 1993, well MW-124 was purged and a groundwater sample collected for analysis for Total Petroleum Hydrocarbons as gasoline and BTEX. No hydrocarbons were detected in the groundwater analyses. Additional monitoring of the well will be conducted as specified in Exhibit B of the consent decree. Laboratory results are included in Appendix D.

2.4 Catchment Basin

The Catchment Basin is located southwest of the Crude Booster Pump area and received much of the flow of crude oil during the initial release. Task 1 of the consent decree for this area required the sampling and delineation of residual hydrocarbon contaminated soils in the basin



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prepared for:

TEXACO

GROUNDWATER MONITORING WELL
LOCATION MAP

PROJECT: 701091008-237 (PSPSAMP)	
LOCATION: ANACORTES, WASHINGTON	
APPR:	DATE: 01/16/92
DRAWN BY: RMO	SCALE: AS SHOWN
DATE: 05/21/91	FIGURE: 12

Blow Count	Samp. Log	PID (ppm)	Depth (Feet)	Geologic Description
			1	
			2	0–3.0' NO RECOVERY
9			3	3.0–4.5' SILTY SANDY CLAY, brown, abundant orange mottling, moderate pebbles, moderate organics, slightly plastic, slightly moist, (fill).
9			4	
10			5	
			6	4.5–8.0' NO RECOVERY
			7	8.0–9.5' SILTY CLAY, light brown, gray coloration along vertical fractures, minor pebbles, firm, dry to slightly moist, (Unit B).
28			8	
12			9	
16			10	9.5–13.0' NO RECOVERY
			11	13.0–14.5' SILTY CLAY, light brown to tan, minor pebbles, slightly plastic, moist to wet, (Unit B).
			12	
8			13	
16			14	14.5–18.0' NO RECOVERY
9			15	18.0–19.5' SILTY CLAY, olive gray grading downward to gray, slightly plastic, moist to wet.
			16	
			17	19.5–20.0' NO RECOVERY
26			18	TD = 20.0'
31			19	
41			20	

Sample Method Symbols

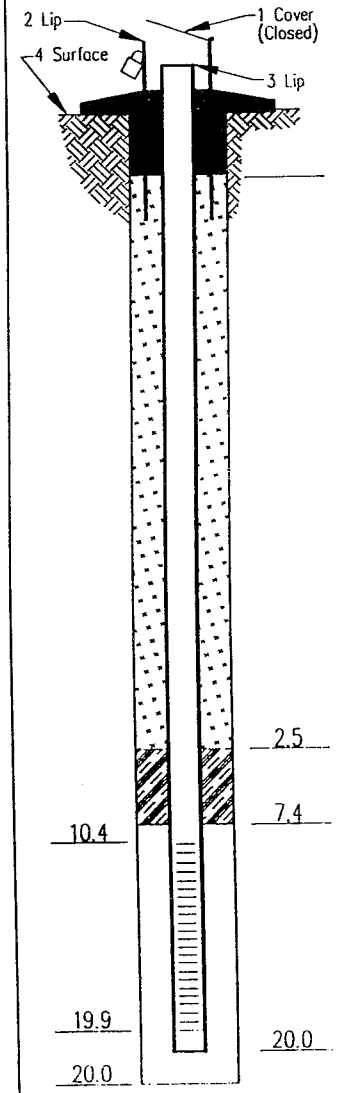
RB=Recovery Barrel ☒ 5' ☐ ____

ST=Shelby Tube | ☒ SS=Split Spoon | C=Cutting

Monitoring Well X

Piezometer

Protective Casing



Depths in Feet from Ground Surface (Not to Scale)

LOG-1

Design Specifications

Elevations: 1 _____ 2 _____

(feet MSL) 3 _____ 4 _____

Coordinates: X _____ Y _____

Bore Hole Diameter: 8"

Type of Casing: ☒ PVC Sched. 40 Flush Thread

☐ Stainless Steel ☐ _____

Casing Diameter: ☒ 2" ☐ 4" ☐ 6" ☐ _____

Screen Slot: ☐ 0.008 ☒ 0.010 ☐ _____

Screen Style: ☒ Machine Slot ☐ Wire Wrap ☐ _____

Sand Pack: Colorado 10/20

Bentonite Seal: ☐ 1/4" Pellets ☐ 1/2" Pellets

☐ 1/2" Chips ☒ Hole Plug ☐ 3/8"

Grout Type: _____ Weight: _____

Drill Rig: ☒ Hollow Stem ☐ Rotary ☐ _____

Drilled By: Hayes Drilling Inc. Lic. #: _____

Logged By: HJC

Completion Date: 9/1/93

Depth First Encountered Water: 13.0'

Date	D-T-W	D-T-P	Prod Thick	Field pH	Field EC
9/3/93	10.33	-	0.0	7.9	822

Comments: Bentonite chip added through auger and hydrated with drill rig water.

FIGURE 13

KWBES

TEXACO | MW-124

Project: 701093006-003 (BOOST124)

Location: Booster Pump

2.4.1 Delineation Sampling

As specified in the consent decree, five discrete soil samples were collected from the basin and tested for total petroleum hydrocarbons using method 418.1 for soils. Two samples were collected from the basin floor and three samples were collected from three of the four basin sidewalls. The locations of each sample and the analytical results are summarized in Table 4.

TABLE 4 - Hydrocarbon Concentrations in Soils - Sept. 2, 1993

Sample No.	Sample Location	TPH Conc. (ppm)
CBSE-1	East Sidewall	<25
CBSS-2	South Sidewall	1074
CBSW-3	West Sidewall	<25
CBFN-4	North Floor	29
CBFS-5	South Floor	<25

2.4.2 Soils Excavation

Based on the findings of the September 2nd sampling round, Texaco decided to excavate an additional 6 - 8 inches of soil from the entire south sidewall (Photo No. 5). No visible signs of residual hydrocarbon contamination were observed during the delineation sampling or the excavation of additional soils.

2.4.3 Confirmation Sampling

Following the excavation of the south sidewall of the catchment basin, five additional discrete soil samples were collected to verify that soils with hydrocarbon concentrations exceeding regulatory limits had been removed. Three of the five samples were collected along the former stain line in the basin and two samples were collected approximately 18 inches above the basin bottom on the sidewall. Table 5 below summarizes the analytical findings of the confirmation sampling round.

Photo No. 5 - Catchment Basin

Table 5 - Confirmation Sampling Results - Catchment Basin		
Sample No.	**Sample Location**	**TPH Conc. (ppm)**
CBSS-CF1S	SW Upper Sidewall	55
CBSS-CF1N	SW Lower Sidewall	278/364 Duplicate
CBSS-CF2N	SE Lower Sidewall	121
CBSS-2S	SE Upper Sidewall	122
CBSS-CF3	South Upper Sidewall	118

All samples except CBSS-CF1N were below the clean-up standard of 200 ppm TPH. CBSS-CF1N tested with TPH concentrations of 278 ppm on the original run and 364 ppm on a duplicate test. Lab reports and chain of custody are included in Appendix D. On November 29, 1993, Mr. Paul Skyllingstad of the Washington State Department of Ecology (WDOE) visited Puget Sound Plant to conduct a RCRA well inspection and to discuss the progress of activities specified in the

subject consent decree. Mr. Skyllingstad notified Texaco that the WDOE was preparing to adjust the clean-up standards for heavier hydrocarbons (ie: Crude Oil) in soils at industrial facilities to 400 ppm TPH from the current standard of 200 ppm TPH. On this basis, Texaco requests that the WDOE accept that sample CBSS-CF1N as meeting Model Toxics Control Act clean-up standards for the State of Washington. Unless otherwise requested, Texaco does not intend to conduct further remedial activities at the Catchment Basin.

2.5 Flare Land Treatment Facility

Non-hazardous hydrocarbon contaminated soils from remedial activities associated with the February 22, 1991 oil spill are being treated at Texaco's Flare Land Treatment Facility. The landfarming of soils from the spill continue as specified in the consent decree. Compliance monitoring and testing is being conducted as outlined in exhibit D of the consent decree.

3.0 RECOMMENDATIONS AND CONCLUSIONS

This report has been submitted in fulfillment of the requirements outlined in Consent Decree No. 93-2-00913-8 between Texaco Puget Sound Plant and the Washington State Department of Ecology as recorded in Skagit County on August 18, 1993. With the exception of ongoing activities (ie: landfarming, groundwater monitoring) specified in the consent decree, Texaco Puget Sound Plant has no plans, at this time, to conduct additional remedial actions in association with the subject consent decree.

APPENDIX D

RESTRICTIVE COVENANT
CRUDE BOOSTER PUMP AREA

12
12-

JERRY McINTURFF
SKAGIT COUNTY AUDITOR

'94 JAN -7 P 4:02

RECORDED ___ FILED ___
REQUEST OF Texaco
PO Box 62
Anacortes

9401070139

RESTRICTIVE COVENANT

This property that is the subject of this Restrictive Covenant has been the subject of remedial action under Chapter 70.105D RCW. The work done to clean up the property (hereafter the "Cleanup Action") is described in the Consent Decree entered in State of Washington Department of Ecology v. Texaco Refining and Marketing Incorporated, Skagit County Superior Court No. 93-2 00913 8, and in attachments to the Decree and in documents referenced in the Decree. This Restrictive Covenant is required by Ecology under Ecology's rule WAC 173-340-440 (1991 ed.) because the Cleanup Action on the Site resulted in residual concentrations of petroleum contaminants which exceed Ecology's Method A or Method B cleanup levels for soils established under WAC 173-340-740(2) or (3).

The undersigned, Texaco Refining and Marketing Incorporated, is the fee owner of real property in the County of Skagit, State of Washington (legal description attached), hereafter referred to as the "Pump Station Area of the Site". The pump station area of the site refers to two crude oil booster pumps and pipeways west of the pump station and the subsurface areas impacted by the petroleum contamination. More specifically, the Pump Station Area of the Site is an area bounded on the north by North Texas Road, on the west by Shell Oil railroad right of way, on the south by a line 150 feet south of North Texas Road and on the east by the western crude oil booster pump. Texaco Refining and Marketing Incorporated makes the following declaration as to limitations, restrictions, and uses to which the Pump Station Area of the Site

9401070139

may be put, and specifies that such declarations shall constitute covenants to run with the land, as provided by law, and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Pump Station Area of the Site.

Section 1. No groundwater may be taken for domestic purposes from any well at the Pump Station Area of the Site.

Section 2. Any activity on the Pump Station Area of the Site that may interfere with the Cleanup Action is prohibited. Any activity on the Pump Station Area of the Site that may result in the release of a hazardous substance that was contained as part of the Cleanup or Interim Cleanup Action(s) is prohibited. The foregoing prohibitions notwithstanding, the owner may engage in activity in the Pump Station Area of the Site that is reasonable and necessary for the conduct of owner's petroleum refining business, including but not limited to excavation, inspection, repair or replacement of the crude oil transfer pipelines, booster pumps, or associated equipment. Owner shall give the Department of Ecology, or a successor agency, prior notice of any such activity, when a reasonable person would anticipate that the activity may result in a release of a hazardous substance that has remained on the site following completion of the Cleanup or Interim Action(s).

Section 3. The owner of the Pump Station Area of the Site must give written notice to the Department of Ecology, or to a successor agency, of the owner's intent to convey any interest in the Pump Station Area of the Site. No conveyance of title, easement, lease or other interest in the Pump Station Area of the Site shall be consummated by the owner without adequate and complete provision for the continued operation, maintenance and monitoring of the Cleanup Action.

Section 4. The owner must notify and obtain approval from the Department of Ecology, or from a successor agency, prior to any use of the Pump Station Area of the Site that is inconsistent with the terms of this Restrictive Covenant. The Department of Ecology or its successor agency may approve such a use only after public notice and comment.

Section 5. The owner shall allow authorized representatives of the Department of Ecology, or of a successor agency, the right to enter the Pump Station Area of the Site at reasonable times for the purpose of evaluating compliance with the Cleanup Action Plan and the Consent Decree, to take samples, to inspect Cleanup Actions conducted at the Pump Station Area of the Site, and to inspect records that are related to the Cleanup Action.

Section 6. The owner of the Pump Station Area of the Site and the owner's assigns and successors in interest reserve the right under WAC 173-340-740 and WAC 173-340-440

(1991 ed.) to record an instrument which provides that this Restrictive Covenant shall no longer limit the use of the Pump Station Area of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of the Department of Ecology, or successor agency. The Department of Ecology, or a successor agency may consent to the recording of such an instrument only after public notice and comment.

Signed: _____
Name:

Title: ASST. PLANT MGR.
of Texaco Refining and Marketing Inc.

Date: 01-07-94

Leonard, Boudinot & Skodje Inc.
PROFESSIONAL ENGINEERS & LAND SURVEYORS

JOHN E. LEONARD JR. P.E. & P.L.S.
ROBERT C. BOUDINOT JR. P.E.
JEFFREY A. SKODJE P.L.S.

January 4, 1994 Job No. 93282

LEGAL DESCRIPTION FOR: Texaco Refining and Marketing Incorporated

Restrictive Covenant Legal Description

That portion of Government Lot 7 in Section 32, Township 35 North, Range 2 East, W.M., that is described as follows:

Commencing at the East One Quarter Corner of said Section 32; **thence** North 0°49' 00" East, along the East line of said Section 32, a distance of 625.80 feet to the South margin of the existing 40.00 feet wide county road known as North Texas Road; **thence** North 89°19' 19" West, along said South margin, a distance of 69.72 feet to the **TRUE POINT OF BEGINNING; thence** continuing North 89°19' 19" West, a distance of 79.85 feet to the East margin of a 50.00 foot wide railroad right-of-way, which said East margin is 25.00 feet distant from and perpendicular to the centerline of the existing track; **thence** South 0°40' 10" East, along said East margin, a distance of 150.04 feet; **thence** South 89°19' 19" East, parallel to said North Texas Road a distance of 76.44 feet; **thence** North 0°37' 47" East a distance of 150.00 feet to the **TRUE POINT OF BEGINNING.**

f:\docs\legal\93232.teb

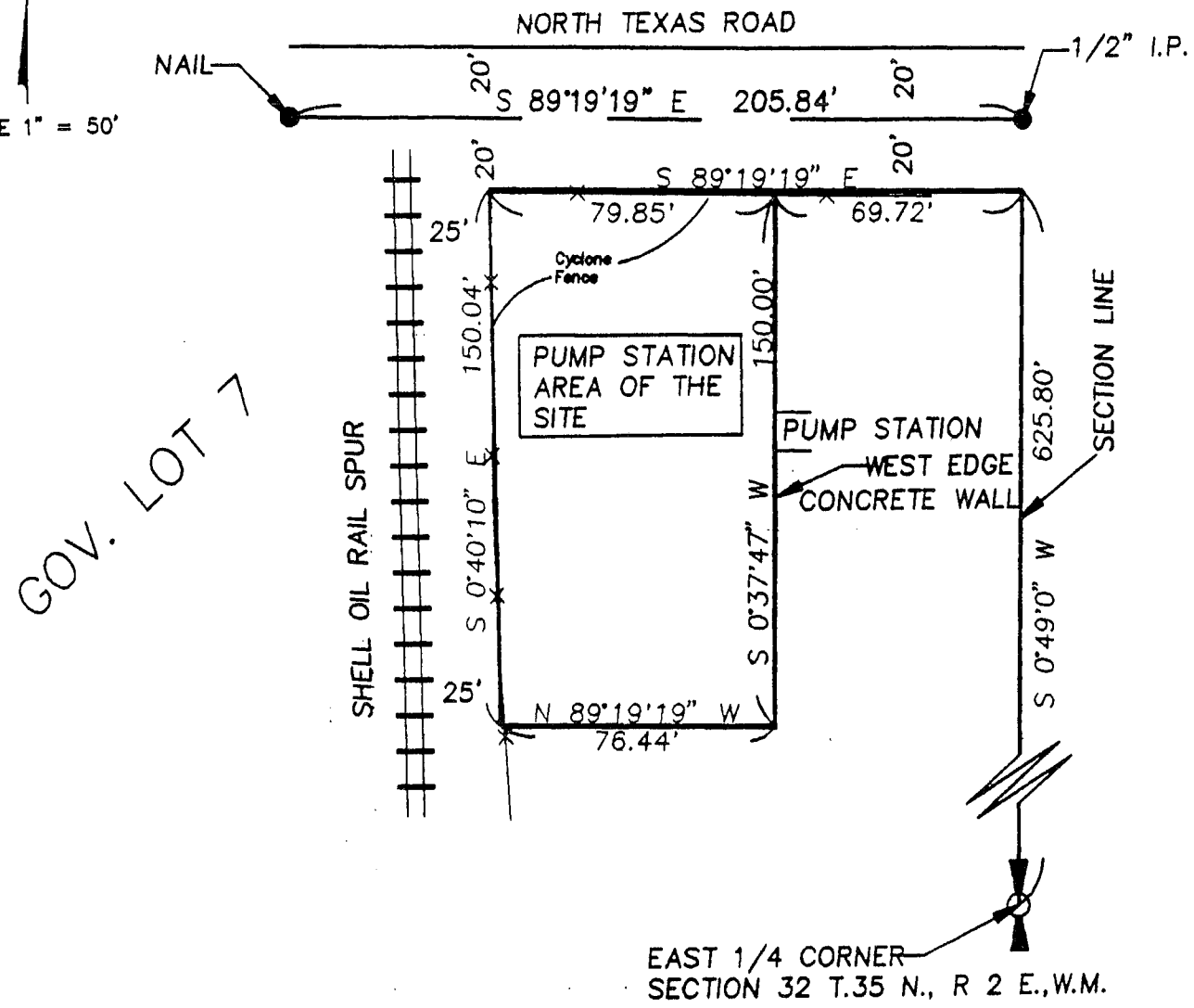
9401070138

Mount Vernon Office: 603 South First Street, Mount Vernon, WA 98273, (206) 336-5751 FAX (206) 336-3981
Anacortes Office: 606 Commercial Avenue, Anacortes, WA 98221, (206) 293-4508
Mailing Address: P.O. Box 1228, Mount Vernon, WA 98273

EXHIBIT "A"

RESTRICTIVE COVENANT
for
TEXACO REFINING AND MARKETING INCORPORATED
in
GOV. LOT 7, SEC.32, T. 35 N., R. 2 E., W.M.

SCALE 1" = 50'



9401070139

LEONARD, BOUDINOT AND SKODJE INC.
CIVIL ENGINEERS AND LAND SURVEYORS
603 SOUTH FIRST ST., MOUNT VERNON, WA 98273

DATE: 1-2-94
BY: T.E.B.

FIELD BOOK: 50/463

JOB NO.: 93282

APPENDIX E

ECOLOGY LETTER APPROVING REPLACEMENT OF FLARE LANDFARM LYSIMETER L90-20SW

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

November 7, 1996

Mr. C. A. Flagg
Refinery Manager
Texaco Refining & Marketing
P.O. Box 622
Anacortes, WA 98221-0622

Dear Mr. Flagg:

I am writing in reference to your letter of July 11, 1996 and my letter of May 21, 1996 concerning the replacement of lysimeter L90-20SW in the North Flare Landfarm. In May, I approved the replacement of lysimeter L90-20SW with a piezometer. The new piezometer will be sampled quarterly for BTEX constituents using EPA method 8020 and TPH using WTPH-D extended. The piezometer shall be sampled for two years. If no contamination is found above the MTCA cleanup standards for BTEX constituents and TPH then the area around the lysimeter shall be considered clean. If the new piezometer shows contamination, Texaco shall prepare a remediation plan for the area.

Your letter of July 11, 1996 submitted "as built" plans for the new piezometer. The installation is approved. If you have any other questions concerning the closure requirements of the North Flare Land Treatment Facility please call me (360 407-6949).

Sincerely,

Paul Skyllingstad
Industrial Section.

PES:

cc: J. Mussen - Texaco

APPENDIX F

LAB REPORTS AND CHAIN OF CUSTODY

Landfarm Surface Soil Lab Data
11-26-96

SOUND ANALYTICAL SERVICES, INC.

Texaco - Puget Sound
Project: Landfarm Surface Soil Samples
Report No. 60832
November 26, 1996

Lab Sample No. 60832-24 Client ID: S-19

General Chemistry

Parameter	Method	Result	PQL
pH	EPA 9045	7.86	N/A
Solids, percent	EPA 160.3	75.82	N/A
Total Organic Carbon, mg/kg	PSEP	19,000	100
Total Kjeldahl Nitrogen, mg/kg	EPA 351.3	1,800	55
Total Phosphorus, mg/kg	EPA 365.1	510	100
Oil and Grease, mg/kg	EPA 413.1M	ND	320

N/A - Not Applicable
ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Texaco - Puget Sound
Project: Landfarm Surface Soil Samples
Report No. 60832
November 26, 1996

Lab Sample No. 60832-25 Client ID: S-20

General Chemistry

Parameter	Method	Result	PQL
pH	EPA 9045	7.82	N/A
Solids, percent	EPA 160.3	81.35	N/A
Total Organic Carbon, mg/kg	PSEP	11,000	100
Total Kjeldahl Nitrogen, mg/kg	EPA 351.3	840	55
Total Phosphorus, mg/kg	EPA 365.1	450	100
Oil and Grease, mg/kg	EPA 413.1M	ND	290

N/A - Not Applicable
ND - Not Detected
PQL - Practical Quantitation Limit

TEXACO - PUGET SOUND PLANT

600 S. TEXAS ROAD
ANACORTES, WA 98221
TEL: (360) 293-0800
FAX: (360) 293-1584

CHAIN OF CUSTODY RECORD

PROJECT NAME:	LANDFARM SURFACE SOIL SAMPLES
SITE CONTACT:	JEFF MUSSEN
Sampler:	Adrian Kooiman
Signature:	
TELEPHONE	(360) 293-0865

LABORATORY:
SOUND ANALYTICAL SERVICES, INC.
4813 PACIFIC HIGHWAY, EAST
TACOMA, WA 98424 (206) 922-2310

SAMPLE ID.	LAB ID.	DATE/TIME	# CONTAINERS	MATRIX	PRESERVATIVE	ANALYSIS	COMMENTS
(6083) 23 S-18		11/ 6 /1996	1	SOIL	NONE	pH, Solids, TOC, TKN, Total Phosphorus, and Oil/Grease (413.1)	
24 S-19[redacted]		"	1	"	"	"	
25 [redacted] 520		"	1	"	"	"	
26 TK 1		"	1	"	"	"	
27 BG-SE		"	1	"	"	"	

RELINQUISHED BY : (Signature) TEXACO ( ) LAB ( ) Adrian Kooiman	DATE 11-7-96
RECEIVED BY: (Signature) TEXACO ( ) LAB Mary Custer	DATE 11/8/96 10:00
RELINQUISHED BY : (Signature) TEXACO ( ) LAB ( )	DATE
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	DATE

COMMENTS:

INVOICE # 96037582

CHAIN OF CUSTODY MUST BE SIGNED AND RETURNED TO TEXACO - PUGET SOUND PLANT

Crude Booster Pump Groundwater
Well MW-123 Lab Data

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Texaco Puget Sound Date: March 23, 1994

Report On: Analysis of Water & Soil Lab No.: 38643

IDENTIFICATION:
Samples received on 03-10-94
P. O. No. PSP24669

ANALYSIS:

Lab Sample No. 38643-1 Client ID: 123
Matrix: Water

BTEX by EPA Method 8020
Date Analyzed: 3-10-94
Units: mg/L

Parameter	Result	PQL	Flag
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethyl Benzene	ND	0.001	
Xylenes	ND	0.001	

SURROGATE RECOVERY, %

Trifluorotoluene	109

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Texaco Puget Sound
Lab No. 38643
March 23, 1994

Lab Sample No. 38643 1 Client ID: 123
Matrix: Water

TPH Per EPA Method 8015 Modified
Date Extracted: 3-18-94
Date Analyzed: 3-21-94
Units: mg/L

Parameter	Result	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	1.0	
SURROGATE RECOVERY, %			
1-Chlorooctane	100		
o-terphenyl	88		

ND - Not Detected
PQL - Practical Quantitation Limit

TEXACO - PUGET SOUND PLANT

600 S. TEXAS ROAD
ANACORTES, WA 98221
TEL: (206) 293-0800
FAX: (206) 293-1584

CHAIN OF CUSTODY RECORD

PROJECT NAME:	
SAMPLED BY: Brian D. Rhodes TEL: (206) 293-1761	SIGNATURE: Brian Rhodes

LABORATORY:
SOUND ANALYTICAL
4813 Pacific Hwy East
Tacoma, WA 98424 TEL: (206) 922-2310

SAMPLE No's.	QUANTITY	DATE	SAMPLE TYPE	PRESERVATIVES	SAMPLE LOCATION	ANALYSES REQUIRED
123B – 126B	4	3/9/94	1L - WATER -	H_2SO_4	BOOSTER / HTU #2	TPH BY 8015
123A1/A2 - 126A1/A2	8	"	40ml VIAL	NO	"	BTEX BY 8020
API - 1	1	"	125 ml BOTTLE	NO	API	TCLP - BTEX
HTU CAT - SP1	1	3/8/94	1L BOTTLE	NO	HTU #1	TCLP - SKINNER METALS, TCLP - BTEX, TOTAL - BTEX, SULFIDE 9031

RELINQUISHED BY : (Signature)	DATE
TEXACO (✓) LAB ( ) Brian Rhodes	3/9/94
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	DATE
RELINQUISHED BY : (Signature) TEXACO ( ) LAB ( )	DATE
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	DATE

COMMENTS:

INVOICE P.O. # PSP24669

* HTU CAT - SP1 RUSH BASIS - NEED BY 3/16/94

CHAIN OF CUSTODY MUST BE SIGNED AND RETURNED TO TEXACO - PUGET SOUND PLANT

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Texaco - Puget Sound Date: July 1, 1994

Report On: Analysis of Water & Soil Lab No.: 40927

IDENTIFICATION:
Samples received on 06-10-94
P. O. No. 25444

ANALYSIS:

Lab Sample No. 40927-1 Client ID: MW-123
Matrix: Water

BTEX by EPA Method 8020
Date Analyzed: 6-15-94
Units: mg/L

Parameter	Result	PQL	Flag
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethyl Benzene	ND	0.001	
Xylenes	ND	0.001	

SURROGATE RECOVERY, %

Trifluorotoluene	95

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Texaco - Puget Sound
Lab No. 40927
July 1, 1994

Lab Sample No. 40927-1 Client ID: MW-123
Matrix: Water

TPH Per EPA Method 8015 Modified
Date Extracted: 6-14-94
Date Analyzed: 6-14-94
Units: mg/L

Parameter	Result	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	1.0	
SURROGATE RECOVERY, %			
1-chlorooctane	93		
o-terphenyl	120		

ND - Not Detected
PQL - Practical Quantitation Limit

CHAIN OF CUSTODY RECORD

TEXACO - PUGET SOUND PLANT

600 S. TEXAS ROAD
ANACORTES, WA 98221
TEL: (206) 293-0800
FAX: (206) 293-1584

PROJECT NAME:

SAMPLED BY:
Brian D. Rhodes
TEL: (206) 293-1761

SIGNATURE: Brian Rhodes

LABORATORY:
SOUND ANALYTICAL
4813 Pacific Hwy East
Tacoma, WA 98424 TEL: (206) 922-2310

SAMPLE No's.	QUANTITY	DATE	SAMPLE TYPE	PRESERVATIVES	SAMPLE LOCATION	ANALYSES REQUIRED
MW-123	2-40ml	6/9/94	WATER	HCl	CRUDE BOOSTER	8020 BTEX
MW-123	1-1L	"	"	NO	"	8015 TPH
SEE BELOW	17	6/9/94	SOILS	NO	LANDFARMS	ANALYTE LIST *2 (ATTACHED)

	DATE
RELINQUISHED BY : (Signature) TEXACO ( ) LAB ( ) Brian Rhodes	6/9/94
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	DATE
RELINQUISHED BY : (Signature) TEXACO ( ) LAB ( )	DATE
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	DATE

COMMENTS:
INVOICE PO #25494

SAMPLE NOS: BKGRN-WA-MT2, ELTF-2-BT2, ELTF-4-BT2, ELTF-5-BT2, ELTF-6E-BT2, ELTF-6EC-BT2, ELTF-6WC-BT2, ELTF-MT2-COMP, WLTF-MTR-COMP, FLAKE-MT2-COMP, WLTF-8-BT2, WLTF-7-BT2, WLTF-10W-BT2, WLTF-12-BT2, SFLT-19-BT2, SFLT-20-BT2, WA-BT2
*2 ICE CHART IN SHIPMENT

CHAIN OF CUSTODY MUST BE SIGNED AND RETURNED TO TEXACO - PUGET SOUND PLANT

MTC *Analytical/Environmental Serv*

Materials Testing & Consulting, Inc
WSDOE Laboratory #C057
WSDOH Laboratory #046

P.O. Box 309
Mount Vernon, WA 98273
(206)757-1400 - FAX (206)757-1

81

Client: Texaco, P.S.P., Anacortes
600 S. Texas Rd.
Anacortes, WA 98221

Attn: Mr Brian Rhodes

Report Date: 9/26/94
Reference: 94-1714
Date Analyzed: 9/16/94

Project: P O # 25989
Date Sampled: 9/14/94

Data Report

Page: 1 of 1

Lab Number	Sample Description	ppm	ppb				Surroga
		TPH	Benzene	Toluene	Ebenzene	Xylenes	% Recov
81-94-03847.0W	MW-123	nd	nd	nd	nd	nd	99
81-94-03848.0W	TF-NESHAPS	7.62-G	1,650	2,210	3,165	14,840	102
QC-Gas	Fortified Blank - 0.4ppm	105%					101
QC-BETX	Fortified Blank - 4ppb ea.		99%	96%	99%	93%	101
	Methods:						Methc
	WSDOE: WTPH-G/WTPH-D						Accepta
	G- Gasoline A-Aged D-Diesel	Soil/Water	Soil/Water	Soil/Water	Soil/Water	Soil/Water	Limits
	Method Reporting Limit (MRL)**	10.0/0.10	100/1.0	100/1.0	100/1.0	100/1.0	Soil: 50-
	Maximum Contamination Levels	100/1	500/5	40000/40	20000/30	20000/20	H20: 50-

Comments: * - indicates heavier hydrocarbons
** - A value of "<n" indicates elevated detection limits due to dilution or chromatographic interference
MS - Matrix Spike at 200 ppm Gasoline\Diesel

CO

QC Review:

600 S. TEXAS ROAD
ANACORTES, WA 98221
TEL: (206) 293-0800
FAX: (206) 293-1584

PROJECT NAME:

SAMPLED BY: B.D. RHODES

SIGNATURE: [signature]

TEL: (206) 2931761

LABORATORY:
MATERIALS TESTING & CONSULTING
BURLINGTON, WA 98273

SAMPLE No's.	QUANTITY	DATE	SAMPLE TYPE	PRESERVATIVES	SAMPLE LOCATION	ANALYSES REQUIRED
MW-123	2-40ml	9-14-99	WATER	HCl	CRUDE BOOSTER	8020 BTEX
MW-123	1L	"	"	NONE	"	8015 TPH
TF-NESHAPS	2-40ml	"	"	HCl	TRICKLING FILTER	8020 BTEX

	DATE
RELINQUISHED BY: (Signature) TEXACO (✓) LAB ( ) [signature]	9-14-99
RECEIVED BY: (Signature) TEXACO ( ) LAB (✓) [signature]	9/14/99
RELINQUISHED BY: (Signature) TEXACO ( ) LAB ( )	
RECEIVED BY: (Signature) TEXACO ( ) LAB ( )	

COMMENTS:
INVOICE P.O. #25989

CHAIN OF CUSTODY MUST BE SIGNED AND RETURNED TO TEXACO - PUGET SOUND PLANT

9U. 1714 3447 3448

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: MW-123
Lab ID: 079420-0017-SA
Matrix: AQUEOUS
Authorized: 19 DEC 94

Sampled: 15 DEC 94
Prepared: NA

Received: 16 DEC 94
Analyzed: 27 DEC 94

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	1.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Ann Marie Carroll

Approved By: Min Qin Yu

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Extractable Hydrocarbons by GC/FID

Method TEH-Diesel

Client Name: Texaco Refining
Client ID: MW-123
Lab ID: 079420-0017-SA
Matrix: AQUEOUS
Authorized: 19 DEC 94

Sampled: 15 DEC 94
Prepared: 22 DEC 94

Received: 16 DEC 94
Analyzed: 11 JAN 95

Parameter	Result	Units	Reporting Limit
Total Extractable Hydrocarbons (n-C10 to n-C24)	ND	ug/L	50

ND = Not detected
NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Linda Ellithorpe

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

METHOD BLANK REPORT
Hydrocarbon Work Cell

Analyte	Result	Units	Reporting Limit
Test: TEH-D-A			
Matrix: AQUEOUS			
QC Lot: 16 DEC 94-36A QC Run: 22 DEC 94-36A			
Total Extractable Hydrocarbons (n-C10 to n-C24)	ND	ug/L	50

Quanterra
Environmental
Services

DUPLICATE CONTROL SAMPLE REPORT
Hydrocarbon Work Cell

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisic (RPD) DCS	Lim
Category: TEH-D-A Matrix: AQUEOUS QC Lot: 16 DEC 94-36A Concentration Units: ug/L								
Diesel Fuel	300	306	320	313	104	67-122	4.5	26

Calculations are performed before rounding to avoid round-off errors in calculated results

CHAIN OF CUSTODY RECORD

ENS-1145-A

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DATE
LAB NUMBER

CHAIN OF CUSTODY NUMBER 15771

Page 2 of 2

CLIENT: TEXACO PUGET SOUND PLANT
PROJECT MANAGER: DOUG BAKER
ADDRESS: 600 S. TEXAS RD.
TELEPHONE NUMBER (AREA CODE):
CITY: ANACORTES | STATE: WA | ZIP CODE: 98221
SITE CONTACT: BRIAN RHODES
PROJECT NAME: GLASS BRICK LYSIMETERS / CRUDE BOOSTER NESHAPS
TELEPHONE NUMBER (AREA CODE): 206-293-7601
CONTRACT/PURCHASE ORDER/QUOTE NO.: PO # 37089

ANALYSES

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ.	AIR	SOLID	NO. OF CONTAINERS	* BTEX 8020	NAPHTHALENE 1-METHYLNAPHTHALENE	METALS (CD, CR, PB, V ONLY)	TPH - DIESEL			Sample Condition/ REMARKS
* NE DITCH	12/15	11:45 AM		X			5	X	X	X				LOW OR NO
** SE DITCH							5	X	X	X				
L-90-20NW							5	X	X	X				
BLANK							5	X	X	X				
TRIP BLANK							3	X	X					Cancel if as per client
*** NESHAP-DEC							2	X						BTEX IN 1PPM RANGE
MW-123							3	X			X			LOW LEVEL
*Containers say NE Ditch														
*Containers say SE Ditch											1,3,DB			4 AM
**Containers NESHAP-DEC PO PL Dupl						X	Containers				MW-123E			MW-123 PL

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)		RELINQUISHED BY (SIGNATURE)	DATE 12/15/94	TIME 11:55AM
RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY BY	DATE RECEIVED	TIME	TIME ACCEPTED	DATE	TIME

METHOD OF SHIPMENT

SPECIAL INSTRUCTIONS
* IF ANY BTEX B1 SAMPLE "HITS" (EXCEPT BLANK, TRIP BLANK OR NESHAPS) THEN RUN B2 BTEX FOR CONFIRMATION. OTHERWISE ONLY RUN B1

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for thirty (30) days without additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: WHITE - With Report; CANARY - To ENSECO; PINK - To Courier; GOLDENROD - To Sample Control

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: BOOSTER PUMP
Lab ID: 081011-0003-SA
Matrix: AQUEOUS
Authorized: 22 MAR 95

Sampled: 21 MAR 95
Prepared: NA

Received: 22 MAR 95
Analyzed: 28 MAR 95

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	0.50
Toluene	ND	ug/L	0.50
Ethylbenzene	ND	ug/L	0.50
Xylenes (total)	ND	ug/L	1.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	94	%	

ND = Not detected
NA = Not applicable

Reported By: Lisa Stafford

Approved By: Harlan Loui

The cover letter is an integral part of this report.
Rev 230787

Total Extractable Hydrocarbons by GC/FID - Method TEH Diesel

Quanterra
Environmental Services

Total Extractable Hydrocarbons by GC/FID

Method TEH-Diesel

Client Name: Texaco Refining
Client ID: BOOSTER PUMP
Lab ID: 081011-0003-SA
Matrix: AQUEOUS
Authorized: 22 MAR 95

Sampled: 21 MAR 95
Prepared: 28 MAR 95

Received: 22 MAR 95
Analyzed: 28 MAR 95

Parameter	Result	Units	Reporting Limit
Total Extractable Hydrocarbons (n-C10 to n-C24)	ND	ug/L	50

ND = Not detected
NA = Not applicable

Reported By: Linda Ellithorpe

Approved By: Lisa Stafford

The cover letter is an integral part of this report.
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CHAIN OF CUSTODY RECORD ENS-1145-A

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☐ Mobile Labs, 1 (800) ENSECO-8

DATE: 3/21/95
CHAIN OF CUSTODY NUMBER: 20394
LAB NUMBER: 808101 1
Page 1 of 1

CLIENT: Texaco
ADDRESS: 600 S. Texas Rd
CITY: Anacortes | STATE: WA | ZIP CODE: 98221
PROJECT NAME: Various
CONTRACT/PURCHASE ORDER/QUOTE NO.: 95100166

PROJECT MANAGER: John Gilderslede
TELEPHONE NUMBER (AREA CODE): (916) 374-4381
SITE CONTACT: Brian Rhodes
TELEPHONE NUMBER (AREA CODE): (360) 293-1761

ANALYSES

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ	AIR	SOLID	NO. OF CONTAINERS	BTEX 8020	BTEX (TCLP)	TPH 8015M	TCLP for Skinner Metals				Sample Condition/ REMARKS
MAR 95 - NESHAPS	3/21	8 am		X			3	X							good
TANK 55 SCALE	3/20	12:30 pm				X	1		X		X				
BOOSTER PUMP	3/21	8 am		X			RSS 4	X		X					

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME
Rich Stoyko	Rich Stoyko		3/21/95	9:00 am
RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY BY	RECEIVED	DATE 3-22-95	TIME 10:30	ACCEPTED	DATE	TIME
METHOD OF SHIPMENT						

SPECIAL INSTRUCTIONS

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for thirty (30) days without additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: BOOSTER PUMP
Lab ID: 082575-0006-SA
Matrix: AQUEOUS
Authorized: 23 JUN 95

Sampled: 20 JUN 95
Prepared: NA

Received: 23 JUN 95
Analyzed: 27 JUN 95

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	95	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin Yu

Approved By: Patricia Trinidad

The cover letter is an integral part of this report.
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Quanterra
Environmental
Services

Total Petroleum Hydrocarbons (Triregional)
Method 8015 Modified

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: BOOSTER PUMP
Lab ID: 082575-0006-SA
Matrix: AQUEOUS
Authorized: 23 JUN 95

Sampled: 20 JUN 95
Prepared: 26 JUN 95

Received: 23 JUN 95
Analyzed: 27 JUN 95

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Unknown hydrocarbon	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	73	%	

ND = Not detected
NA = Not applicable

Reported By: Linda Ellithorpe

Approved By: Eric Bayless

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LAB NUMBER

Page 1 of 1

CLIENT: TEXACO Puget Sound PLANT
PROJECT MANAGER: Doug Baker JON GILDERSLEEVE
ADDRESS: 600 S. TEXAS Rd
TELEPHONE NUMBER (AREA CODE):
CITY: ANACORTES | STATE: WA | ZIP CODE: 98221
SITE CONTACT: Brian Rhodes
PROJECT NAME: Effluent PLANT RCRA Wells
TELEPHONE NUMBER (AREA CODE): ~~206~~ (360) 293-1761
CONTRACT/PURCHASE ORDER/QUOTE NO.: INVOICE P.O. # 95110992

ANALYSES

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ.	AIR	SOLID	NO. OF CONTAINERS	BTEX	Skinner 8020	Skinner VOA's 8240	Skinner S. Vol. 8270	NO3, Cl, SO4, N/A	TPH (8015)	METALS (Cr, Ni, V) NAPHTHALENE + METHYL NAPH ONLY (8270)	Sample Condition/ REMARKS
RCRA-W71	6/19/95	PM		X			6		X	X	X	X			* SEE ATTACHED TABLE 3 FOR SKINNER ANALYTES
" -W82	6/19/95						6		X	X	X	X			
" -W87	6/19/95						6		X	X	X	X			
" -W117	6/19/95						6		X	X	X	X			
" -W89	6/19/95						3		~~NO~~	X	X	X			
									X	X	X	X			
BOOSTER PUMP	6/20/95	AM		X			3	X					X		
FLARE LF 112							6	X						X	
FLARE LF 113							6	X						X	

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME
[signature]	[signature]				6-22-95	
RECEIVED BY (SIGNATURE)		DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY BY	RECEIVED	DATE 6-23-95	TIME 1100	ACCEPTED	DATE	TIME
METHOD OF SHIPMENT [signature]						

SPECIAL INSTRUCTIONS
* PLEASE USE EPA APP IX REPORTING LIMITS AS FOLLOWS: BTE ⇒ 2 ug/l, xylene 5 ug/l
8270 ⇒ 10 ug/l, 8240 ⇒ 5 ug/l

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for thirty (30) days without additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: WHITE - With Report; CANARY - To **ENSECO**; PINK - To Courier; GOLDENROD - To Sample Control

EDGE ANALYTICAL

Environmental/Analytical Chemistry
1151 Knudson Rd. Burlington, WA 98233
(360) 757-1400 - (360) 757-1402FAX
Toll Free (800) 755-9295
WSDOE Laboratory C057

81

Client: Texaco, P.S.P., Anacortes
600 S. Texas Rd.
Anacortes, WA 98221

Attn: Mr Brian Rhodes

Report Date: 10/6/95
Reference: 95-1770
Date Analyzed: 10/3/95

Project: PO#95123355/Booster 3rd D
Date Sampled: 9/27/95

Data Report

Lab Number	Sample Description	ppm TPH	ppm Benzene	ppm Toluene	ppm Ebenzene	ppm Xylenes	Surrogate % Recovery
81-95-03423.0W	Booster - 9/95	nd	nd	nd	nd	nd	90
	Methods: WSDOE: WTPH-G/WTPH-D G- Gasoline A-Aged D-Diesel	Soil/Water	Soil/Water	Soil/Water	Soil/Water	Soil/Water	Method Acceptance Limits
	Method Reporting Limit (MRL)**	20.0/0.10	0.1/0.001	0.1/0.001	0.1/0.001	0.1/0.001	Soil: 50-150
	Maximum Contamination Levels	100/1	0.5/0.005	40/0.040	20/0.030	20/0.020	H20: 50-150

Comments: * - indicates heavier hydrocarbons
** - A value of "<n" indicates elevated detection limits due to dilution or chromatographic interference

kwl

QC Review:

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DATE	CHAIN OF CUSTODY NUMBER
	23383
LAB NUMBER	Page 1 of 1

CLIENT: TEXACO
PROJECT MANAGER: BRIAN RHODES
ADDRESS: 600 S. TEXAS. RD.
TELEPHONE NUMBER (AREA CODE): 360-4241669
CITY: MONACORTIS | STATE: WA | ZIP CODE: 98221
SITE CONTACT:
PROJECT NAME: BOOSTER / 3rd DAF
TELEPHONE NUMBER (AREA CODE):
CONTRACT/PURCHASE ORDER/QUOTE NO.

ANALYSES

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ.	AIR	SOLID	NO. OF CONTAINERS	WTPH-HCID (TPH/BTEX)	TSS	OIL & GREASE 413.1					Sample Condition/ REMARKS
BOOSTER - 9/95	9/27	8:50 AM		X			3	X							
API - 9/27	"	11:30 AM		X			2		X	X					
DAF 3 - 9/27	"	"		X			2		X	X					

THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)		RELINQUISHED BY (SIGNATURE)	DATE	TIME
ED RH	E.D. RHODES			9/27/95	1:10 PM
RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY BY: JANUARY	RECEIVED	DATE 9/28/95	TIME 9:10 AM	ACCEPTED	DATE	TIME

METHOD OF SHIPMENT:

SPECIAL INSTRUCTIONS: TRIVOLI P.O. # ~~[illegible]~~ 95123355

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for thirty (30) days without additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: WHITE - With Report; CANARY - To **ENSECO**; PINK - To Courier; GOLDENROD - To Sample Control

Quanterra
Environmental
Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: WELL 123
Lab ID: 085627-0011-SA
Matrix: AQUEOUS
Authorized: 28 DEC 95

Sampled: 26 DEC 95
Prepared: NA

Received: 28 DEC 95
Analyzed: 02 JAN 96

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	92	%	

ND = Not detected
NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Patricia Trinidad

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID - Method TPH-D-TRIREGIONAL

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: WELL 123
Lab ID: 085627-0011-SA
Matrix: AQUEOUS
Authorized: 28 DEC 95

Sampled: 26 DEC 95
Prepared: 29 DEC 95

Received: 28 DEC 95
Analyzed: 07 JAN 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Unknown hydrocarbon	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	126	%	

ND = Not detected
NA = Not applicable

Reported By: Chris Jenkins

Approved By: Eric Bayless

The cover letter is an integral part of this report.
Rev 230787

CHAIN OF CUSTODY RECORD ENS-1145-A

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DATE:
LAB NUMBER:
CHAIN OF CUSTODY NUMBER: 23382
Page 1 of 1

CLIENT: TEXACO PUGET SOUND PLANT
ADDRESS: 600 S. TEXAS RD
CITY: ANACORTES | STATE: WA | ZIP CODE: 98221
PROJECT NAME: EP RCRA/HTU2/BOOSTER
CONTRACT/PURCHASE ORDER/QUOTE NO.: 95132296

PROJECT MANAGER: ~~BRIAN RHODES~~ → JON GILDERSLEEVE
TELEPHONE NUMBER (AREA CODE): 916-374-4381
SITE CONTACT: BRIAN RHODES
TELEPHONE NUMBER (AREA CODE): 360-293-1761

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ.	AIR	SOLID	NO. OF CONTAINERS	ANALYSES: BTEX BY 8020	BTEX + TPH	SKINNER * 8240	SKINNER * 8270	1-METHYNAPHTHALENE + NAPHTHALENE BY 8270	SKINNER * METALS + FE & MN	METALS (Cr, Ni, V ONLY)	CHLORIDE, SO4, SODIUM, NITRATE	Sample Condition/ REMARKS
WELL 82	12-26	3:09 PM		X			5			X	X		X		X	
WELL 87				X			5			X	X		X		X	
WELL 89				X			4			X	X		X			
WELL 71				X			5			X	X		X		X	
WELL 112				X			4	X				X		X		
WELL 113				X			4	X				X		X		
WELL 117				X			5			X	X		X		X	
WELL 124				X			3		X							
WELL 125				X			3		X							
WELL 126				X			3		X							
WELL 123				X			3		X							

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME
ADRIAN LOOIMAN			12/27/95	1:30PM
RECEIVED BY (SIGNATURE)	DATE / TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY BY	RECEIVED DATE / TIME	ACCEPTED	DATE	TIME

METHOD OF SHIPMENT:

SPECIAL INSTRUCTIONS:
* SKINNER LIST PER ATTACHED TABLE 3. REPORTING LIMITS: BTEX = 5ug/l

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for ~~thirty (30) days without~~ additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

WHITE - With Report; CANARY - To ENSECO; PINK - To Originator; GOLDENROD - To Sample Control

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

Quanterra Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: MW-123
Lab ID: 091012-0001-SA
Matrix: AQUEOUS
Authorized: 12 DEC 96

Sampled: 11 DEC 96
Prepared: NA

Received: 12 DEC 96
Analyzed: 16 DEC 96

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	97	%	

ND = Not detected
NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Harlan Loui

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons by GC/FID (Triregional) - Method TPH-D-TRIREGIONAL

Quanterra Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: MW-123
Lab ID: 091012-0001-SA
Matrix: AQUEOUS
Authorized: 12 DEC 96

Sampled: 11 DEC 96
Prepared: 13 DEC 96

Received: 12 DEC 96
Analyzed: 16 DEC 96

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Unknown hydrocarbon	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	102	%	

ND = Not detected
NA = Not applicable

Reported By: Marcia Reed

Approved By: Emily Uebelhoer

The cover letter is an integral part of this report.
Rev 230787

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A Corning Company

CHAIN OF CUSTODY RECORD ENS-1145-A

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DATE: 12/11/96
CHAIN OF CUSTODY NUMBER: 23386
LAB NUMBER:
Page 1 of 1

CLIENT: TEXACO PUGET SOUND PLANT
PROJECT MANAGER: JON GILDERSLEEVE
ADDRESS: 600 S. TEXAS RD.
TELEPHONE NUMBER (AREA CODE):
CITY: ANACORTES | STATE: WA | ZIP CODE: 98221
SITE CONTACT: BRIAN RHODES
PROJECT NAME: RCRA-EP & CRUDE BOOSTER
TELEPHONE NUMBER (AREA CODE): (360) 2931761
CONTRACT/PURCHASE ORDER/QUOTE NO.: PO 96042530

SAMPLE NO./IDENTIFICATION	DATE	TIME	LAB/SAMPLE NUMBER	SAMPLE TYPE: LIQ.	AIR	SOLID	NO. OF CONTAINERS	ANALYSES: TPH-d & 8020 BTEX	*SKINNER LIST VOA's 8240	*SKINNER SEMI-VOA's 8270	*SKINNER METALS + FE/MN	NITRATE, CHLORIDE, SULFATE, SODIUM			Sample Condition/ REMARKS
MW-123	12/11			X			3	X							
71	12/11			X			5		X	X	X	X			
82	12/11			X			5		X	X	X	X			
87	12/11			X			5		X	X	X	X			
89	12/11			X			4		X	X	X				
117	12/11			X			5		X	X	X	X			

DO THE SAMPLE(S) POSE ANY POTENTIAL HAZARD(S)? IF YES, PLEASE EXPLAIN
NO

* SEE ATTACHED SKINNER LIST.

SAMPLERS (SIGNATURE)	RELINQUISHED BY (SIGNATURE)		RELINQUISHED BY (SIGNATURE)		DATE	TIME
RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)		DATE	TIME
RECEIVED FOR LABORATORY BY	RECEIVED DATE	TIME	ACCEPTED		DATE	TIME

METHOD OF SHIPMENT:

SPECIAL INSTRUCTIONS: 1 ice chest in shipment

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the **Enseco** Terms and Conditions, unless a contract or purchase order has been executed and is sited above.

SAMPLE DESPOSITION:
1. Storage time requested: _____ days (Samples will be stored for thirty (30) days without additional charge; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: ☐ Yes ☐ No (**Enseco** will dispose of unreturned samples for a charge of $15.00. Disposal will be by incineration wherever possible; otherwise, as

Quanterra
Environmental
Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) - Method 8020

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: 123
Lab ID: 097031-0006-SA
Matrix: AQUEOUS
Authorized: 14 JAN 98

Sampled: 13 JAN 98
Prepared: NA

Received: 14 JAN 98
Analyzed: 20 JAN 98

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Chris Jenkins

Approved By: Kris Rogers

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental
Services

Total Petroleum Hydrocarbons (Gasoline) - Method P/T-GAS

Quanterra
Environmental Services

Total Petroleum Hydrocarbons (Gasoline)

Method P/T-GAS

Client Name: Texaco Refining
Client ID: 123
Lab ID: 097031-0006-SA
Matrix: AQUEOUS
Authorized: 14 JAN 98

Sampled: 13 JAN 98
Prepared: NA

Received: 14 JAN 98
Analyzed: 16 JAN 98

Parameter	Result	Units	Reporting Limit
Gasoline	ND	ug/L	500
Unknown hydrocarbon	ND	ug/L	500
Surrogate	**Recovery**		
4-Bromofluorobenzene	111	%	

ND = Not detected
NA = Not applicable

Reported By: Karen Mason

Approved By: Leticia Sangalang

The cover letter is an integral part of this report.
Rev 230787

Chain of Custody Record

Quanterra

QUA-4124

PER ATTACHED TABLE 3

Client: TEXACO	Project Manager: BRIAN RHODES / JON GILDERSLEEVE	Date: 01-13-98	Chain Of Custody Number: 21311
Address: 600 S. TEXAS RD.	Telephone Number (Area Code)/Fax Number: 360-2931761	Lab Number	Page 1 of 1
City: ANACORTES / State: WA / Zip Code: 98221	Site Contact		
Project Name: RCRA EP/HTU #2/BOOSTER	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.: PO # 97038390			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: SKINNER VOAs	SKINNER SEMI-VOAs	SKINNER METALS	SO4, NA, NO3, Cl	TPH-9	BTEX	TPH (TOTAL)
71	1-13-98		WATER		MISC	5	AS LABELED		X	X	X	X			
82									X	X	X	X			
87									X	X	X	X			
89										X					
117															
123	1-13-98		WATER		MISC	3							X	X	
124	1-13-98		WATER		MISC	3							X	X	
125						3							X	X	
126						3									
119	1-13-98		WATER		MISC	3								X	X
120														X	X
121															

Special Instructions: SEE ATTACHED LIST TABLE 3 FOR SKINNER LIST RQMTS

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time
1. Relinquished By: B	1/13/98	1:45
2. Relinquished By		
3. Relinquished By		

	Date	Time
1. Received By: Mark D. Ellen	01/14/98	14:00
2. Received By		
3. Received By		

Comments: 2 ICE CHESTS IN THIS SHIPMENT — Samples rec'd in good condition 01/14/98

Texaco - Refining and Marketing	Project:	Texaco Puget Sound Refining Co.	Sampled: 12/16/98
600 South Texas Road	Project Number:	98035308	Received: 12/18/98
Anacortes, WA 98221	Project Manager:	Brian Rhodes	Reported: 12/29/98 11:53

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Note
			B812396-04				Water	
MW-123	1280628	12/22/98	12/22/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		93.3	%	
Surrogate: 4-BFB (PID)								

Volatile Organics Fuel Fingerprint by EPA Method 8015 Modified
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Note

The sample does not appear to contain measurable amounts of gasoline range organic products.

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number:
Project Manager: ~~Jeff Huesen~~ BRIAN Rhodes
Texaco Job #: 98035308
Puget Sound Refining Company
Site Address: 8505 S. Texas Road
City, State, Zip: Anacortes, WA 98221

CONSULTANT INFORMATION

Name: Project#
Address:
Phone: Fax:
Project Manager:
Sample Collection by: WRS

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☑ 5 Business Days
- ☐ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS Semi Vols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	TPH Fuel Scan	BTEX					NCA SAMPLE NUMBER
1. MW-124	12-16-98	W	3		X														X					
2. MW-125	↓	↓	↓		X														X					
3. MW-126					X														X					
4.																								
5.																								
6. MW-123	12-16-98	W	3															X	X					
7.																								
8.																								
9.																								
10.																								

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1 Allison Kenyon	WRS	12-17-98 2pm			
2					

Additional Comments:
1 Ghost - Crude Booster
HTH #2

Crude Booster Pump Soils
Lab Data

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Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

ThermoRetec Corp.	Project: Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager: Dean Kinney	Reported: 5/26/99 11:48

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
CBP-1	B905360-01	Soil	5/19/99

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle. WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

BTEX, MTBE and Naphthalene by WDOE Interim TPH Policy Method using GC/MS
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
			B905360-01				Soil	
CBP-1								
Methyl tert-butyl ether	0590540	5/20/99	5/20/99		1.00	ND	mg/kg dry	
Benzene	"	"	"		0.100	ND	"	
Toluene	"	"	"		0.100	ND	"	
Ethylbenzene	"	"	"		0.100	ND	"	
m,p-Xylene	"	"	"		0.200	ND	"	
o-Xylene	"	"	"		0.100	ND	"	
Naphthalene	"	"	"		0.100	ND	"	
Surrogate: 2-Bromopropene	"	"	"	*70.0-130*		*92.8*	*%*	
Surrogate: 1,2-DCA-d4	"	"	"	*70.0-130*		*99.2*	"	
Surrogate: Toluene-d8	"	"	"	*70.0-130*		*94.0*	"	
Surrogate: 4-BFB	"	"	"	*70.0-130*		*87.3*	"	

*Refer to end of report for text of notes and definitions

North Creek Analytical - Bothell

Matthew Essig, Project Manager

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
CBP-1			B905360-01				Soil	
C8-C10 Aliphatics	0590526	5/20/99	5/21/99		5.00	ND	mg/kg dry	
C10-C12 Aliphatics	"	"	"		5.00	**5.10**	"	
C12-C16 Aliphatics	"	"	"		5.00	**91.9**	"	
C16-C21 Aliphatics	"	"	"		5.00	**157**	"	
C21-C34 Aliphatics	"	"	"		5.00	**398**	"	
C10-C12 Aromatics	"	"	5/24/99		5.00	ND	"	
C12-C16 Aromatics	"	"	"		5.00	**13.9**	"	
C16-C21 Aromatics	"	"	"		5.00	**104**	"	
C21-C34 Aromatics	"	"	"		5.00	**463**	"	
Extractable Petroleum Hydrocarbons	"	"	"			**1230**	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*96.0*	*%*	
Surrogate: Octacosane	"	"	*5/21/99*	*50.0-150*		*105*	"	
Surrogate: Undecane	"	"	"	*30.0-150*		*55.3*	"	

**Refer to end of report for text of notes and definition.*

North Creek Analytical - Bothell

Matthew Essig, Project Manager

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Polynuclear Aromatic Hydrocarbons by GC/MS-SIM
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
CBP-1			**B905360-01**				**Soil**	
Acenaphthene	0590526	5/20/99	5/24/99		0.0200	ND	mg/kg dry	
Acenaphthylene	"	"	"		0.0200	ND	"	
Anthracene	"	"	"		0.0200	ND	"	
Benzo (a) anthracene	"	"	"		0.0200	**0.0234**	"	
Benzo (a) pyrene	"	"	"		0.0200	**0.0201**	"	
Benzo (b) fluoranthene	"	"	"		0.0200	**0.0318**	"	
Benzo (ghi) perylene	"	"	"		0.0200	**0.0435**	"	
Benzo (k) fluoranthene	"	"	"		0.0200	ND	"	
Chrysene	"	"	"		0.0200	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.0200	ND	"	
Fluoranthene	"	"	"		0.0200	**0.0268**	"	
Fluorene	"	"	"		0.0200	ND	"	
ndeno (1,2,3-cd) pyrene	"	"	"		0.0200	**0.0201**	"	
2-Methylnaphthalene	"	"	"		0.0200	ND	"	
Naphthalene	"	"	"		0.0200	ND	"	
Phenanthrene	"	"	"		0.0200	ND	"	
Pyrene	"	"	"		0.0200	**0.0385**	"	
Surrogate: p-Terphenyl-d14	"	"	"	*30.0-150*		*114*	*%*	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions*

Matthew Essig, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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ThermoRetec Corp.	Project: Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager: Dean Kinney	Reported: 5/26/99 11:48

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
CBP-1	B905360-01	Soil	79.7	%

Matthew Essig, Project Manager

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Volatile Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
CBP-1			**B905360-01**				**Soil**	
C5-C6 Aliphatics	0590417	5/20/99	5/24/99		5.00	ND	mg/kg dry	
C6-C8 Aliphatics	"	"	"		5.00	ND	"	
C8-C10 Aliphatics	"	"	"		5.00	ND	"	
C10-C12 Aliphatics	"	"	"		5.00	ND	"	
C8-C10 Aromatics	"	"	"		5.00	ND	"	
C10-C12 Aromatics	"	"	"		5.00	ND	"	
C12-C13 Aromatics	"	"	"		5.00	**11.4**	"	
Surrogate: 4-BFB (FID)	"	"	"	*60.0-140*		*83.1*	%	
Surrogate: 4-BFB (PID)	"	"	"	*60.0-140*		*89.2*	"	

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541.383.9310 fax 541.382.7588

ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle. WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Volatile Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590417	**Date Prepared: 5/17/99**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0590417-BLK1**									
C5-C6 Aliphatics	5/20/99			**ND**	mg/kg dry	**5.00**				
C6-C8 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aliphatics	"			**ND**	"	**5.00**				
C10-C12 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aromatics	"			**ND**	"	**5.00**				
C10-C12 Aromatics	"			**ND**	"	**5.00**				
C12-C13 Aromatics	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*3.97*	"	*60.0-140*	*99.3*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.06*	"	*60.0-140*	*101*			
Blank	**0590417-BLK2**									
C5-C6 Aliphatics	5/22/99			**ND**	mg/kg dry	**5.00**				
C6-C8 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aliphatics	"			**ND**	"	**5.00**				
C10-C12 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aromatics	"			**ND**	"	**5.00**				
C10-C12 Aromatics	"			**ND**	"	**5.00**				
C12-C13 Aromatics	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*3.75*	"	*60.0-140*	*93.8*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.23*	"	*60.0-140*	*106*			
LCS	**0590417-BS1**									
C5-C6 Aliphatics	5/20/99	2.00		1.32	mg/kg dry	70.0-130	66.0			
C6-C8 Aliphatics	"	1.00		1.08	"	70.0-130	108			
C8-C10 Aliphatics	"	1.00		1.16	"	70.0-130	116			
C10-C12 Aliphatics	"	1.00		1.22	"	70.0-130	122			
C8-C10 Aromatics	"	4.00		4.10	"	70.0-130	102			
C10-C12 Aromatics	"	1.00		1.10	"	70.0-130	110			
C12-C13 Aromatics	"	2.00		2.30	"	70.0-130	115			
Surrogate: 4-BFB (FID)	"	*4.00*		*4.15*	"	*60.0-140*	*104*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.12*	"	*60.0-140*	*103*			
Duplicate	**0590417-DUP1**	**B905211-01**								
C5-C6 Aliphatics	5/21/99		ND	ND	mg/kg dry			25.0		
C6-C8 Aliphatics	"		ND	ND	"			25.0		
C8-C10 Aliphatics	"		ND	ND	"			25.0		
C10-C12 Aliphatics	"		856	911	"			25.0	**6.23**	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definition.*

Matthew Essig, Project Manager

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503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite B-8, Bend, OR 97701-5883
541.383.9310 fax 541.382.7588

ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Volatile Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Duplicate (continued)	**0590417-DUP1**		**B905211-01**							
C8-C10 Aromatics	5/21/99		ND	ND	mg/kg dry			25.0		
C10-C12 Aromatics	"		649	651	"			25.0	**0.308**	
C12-C13 Aromatics	"		1500	1350	"			25.0	**10.5**	
Surrogate: 4-BFB (FID)	"	*4.28*		*ND*	"	*60.0-140*	*NR*			
Surrogate: 4-BFB (PID)	"	*4.28*		*21.1*	"	*60.0-140*	*NR*			
Duplicate	**0590417-DUP2**		**B905273-03**							
C5-C6 Aliphatics	5/24/99		ND	ND	mg/kg dry			25.0		
C6-C8 Aliphatics	"		ND	ND	"			25.0		
C8-C10 Aliphatics	"		ND	ND	"			25.0		
C10-C12 Aliphatics	"		ND	ND	"			25.0		
C8-C10 Aromatics	"		ND	ND	"			25.0		
C10-C12 Aromatics	"		ND	ND	"			25.0		
C12-C13 Aromatics	"		5.45	7.42	"			25.0	**30.6**	
Surrogate: 4-BFB (FID)	"	*5.13*		*4.22*	"	*60.0-140*	*82.3*			
Surrogate: 4-BFB (PID)	"	*5.13*		*4.44*	"	*60.0-140*	*86.5*			

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

BTEX, MTBE and Naphthalene by WDOE Interim TPH Policy Method using GC/MS/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590540	**Date Prepared: 5/20/99**					**Extraction Method: EPA 5030B [MeOH]**				
Blank	**0590540-BLK1**									
Methyl tert-butyl ether	5/20/99			**ND**	mg/kg dry	**1.00**				
Benzene	"			**ND**	"	**0.100**				
Toluene	"			**ND**	"	**0.100**				
Ethylbenzene	"			**ND**	"	**0.100**				
m,p-Xylene	"			**ND**	"	**0.200**				
o-Xylene	"			**ND**	"	**0.100**				
Naphthalene	"			**ND**	"	**0.100**				
Surrogate: 2-Bromopropene	"	*2.00*		*2.02*	"	*70.0-130*	*101*			
Surrogate: 1,2-DCA-d4	"	*2.00*		*1.84*	"	*70.0-130*	*92.0*			
Surrogate: Toluene-d8	"	*2.00*		*1.73*	"	*70.0-130*	*86.5*			
Surrogate: 4-BFB	"	*2.00*		*1.68*	"	*70.0-130*	*84.0*			
LCS	**0590540-BS1**									
Benzene	5/20/99	1.00		0.986	mg/kg dry	70.0-130	98.6			
Toluene	"	1.00		0.873	"	70.0-130	87.3			
Surrogate: 2-Bromopropene	"	*2.00*		*2.18*	"	*70.0-130*	*109*			
Surrogate: 1,2-DCA-d4	"	*2.00*		*1.98*	"	*70.0-130*	*99.0*			
Surrogate: Toluene-d8	"	*2.00*		*1.79*	"	*70.0-130*	*89.5*			
Surrogate: 4-BFB	"	*2.00*		*1.76*	"	*70.0-130*	*88.0*			
Matrix Spike	**0590540-MS1**		**B905273-13**							
Benzene	5/21/99	1.07	ND	0.940	mg/kg dry	70.0-130	**87.9**			
Toluene	"	1.07	ND	0.951	"	70.0-130	**88.9**			
Surrogate: 2-Bromopropene	"	*2.14*		*1.69*	"	*70.0-130*	*79.0*			
Surrogate: 1,2-DCA-d4	"	*2.14*		*2.36*	"	*70.0-130*	*110*			
Surrogate: Toluene-d8	"	*2.14*		*2.02*	"	*70.0-130*	*94.4*			
Surrogate: 4-BFB	"	*2.14*		*2.05*	"	*70.0-130*	*95.8*			
Matrix Spike Dup	**0590540-MSD1**		**B905273-13**							
Benzene	5/21/99	1.07	ND	0.974	mg/kg dry	70.0-130	**91.0**	20.0	**3.47**	
Toluene	"	1.07	ND	0.968	"	70.0-130	**90.5**	20.0	**1.78**	
Surrogate: 2-Bromopropene	"	*2.14*		*1.71*	"	*70.0-130*	*79.9*			
Surrogate: 1,2-DCA-d4	"	*2.14*		*2.43*	"	*70.0-130*	*114*			
Surrogate: Toluene-d8	"	*2.14*		*2.05*	"	*70.0-130*	*95.8*			
Surrogate: 4-BFB	"	*2.14*		*2.10*	"	*70.0-130*	*98.1*			

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions*

Matthew Essig, Project Manager

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590526	**Date Prepared: 5/20/99**					**Extraction Method: EPA 3550B**				
Blank	**0590526-BLK1**									
C8-C10 Aliphatics	5/21/99			**ND**	mg/kg dry	**5.00**				
C10-C12 Aliphatics	"			**ND**	"	**5.00**				
C12-C16 Aliphatics	"			**ND**	"	**5.00**				
C16-C21 Aliphatics	"			**ND**	"	**5.00**				
C21-C34 Aliphatics	"			**ND**	"	**5.00**				
C10-C12 Aromatics	"			**ND**	"	**5.00**				
C12-C16 Aromatics	"			**ND**	"	**5.00**				
C16-C21 Aromatics	"			**ND**	"	**5.00**				
C21-C34 Aromatics	"			**ND**	"	**5.00**				
Extractable Petroleum Hydrocarbons	"			**ND**	"					
Surrogate: 2-FBP	"	*12.0*		*10.8*	"	*50.0-150*	*90.0*			
Surrogate: Octacosane	"	*12.3*		*12.6*	"	*50.0-150*	*102*			
Surrogate: Undecane	"	*13.3*		*11.0*	"	*30.0-150*	*82.7*			
Blank	**0590526-BLK2**									
C8-C10 Aliphatics	5/21/99			**ND**	mg/kg dry	**5.00**				
C10-C12 Aliphatics	"			**ND**	"	**5.00**				
C12-C16 Aliphatics	"			**ND**	"	**5.00**				
C16-C21 Aliphatics	"			**ND**	"	**5.00**				
C21-C34 Aliphatics	"			**ND**	"	**5.00**				
C10-C12 Aromatics	"			**ND**	"	**5.00**				
C12-C16 Aromatics	"			**ND**	"	**5.00**				
C16-C21 Aromatics	"			**ND**	"	**5.00**				
C21-C34 Aromatics	"			**ND**	"	**5.00**				
Extractable Petroleum Hydrocarbons	"			**ND**	"					
Surrogate: 2-FBP	"	*12.0*		*11.4*	"	*50.0-150*	*95.0*			
Surrogate: Octacosane	"	*12.3*		*12.0*	"	*50.0-150*	*97.6*			
Surrogate: Undecane	"	*13.3*		*10.6*	"	*30.0-150*	*79.7*			
LCS	**0590526-BS1**									
Extractable Petroleum Hydrocarbons	5/21/99	167		141	mg/kg dry	30.0-120	84.4			
Surrogate: 2-FBP	"	*12.0*		*11.4*	"	*50.0-150*	*95.0*			
Surrogate: Octacosane	"	*12.3*		*12.1*	"	*50.0-150*	*98.4*			
Surrogate: Undecane	"	*13.3*		*10.3*	"	*30.0-150*	*77.4*			
LCS Dup	**0590526-BSD1**									
Extractable Petroleum Hydrocarbons	5/21/99	167		135	mg/kg dry	30.0-120	80.8	40.0	4.36	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions*

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
LCS Dup (continued)	**0590526-BSD1**									
Surrogate: 2-FBP	*5/21/99*	*12.0*		*9.86*	*mg/kg dry*	*50.0-150*	*82.2*			
Surrogate: Octacosane	*"*	*12.3*		*11.6*	*"*	*50.0-150*	*94.3*			
Surrogate: Undecane	*"*	*13.3*		*10.3*	*"*	*30.0-150*	*77.4*			
Matrix Spike	**0590526-MS1**		**B905211-01**							
Extractable Petroleum Hydrocarbons	5/21/99	178	7360	1810	mg/kg dry	30.0-120	**NR**			
Surrogate: 2-FBP	*"*	*12.9*		*31.3*	*"*	*50.0-150*	*NR*			
Surrogate: Octacosane	*"*	*13.2*		*14.5*	*"*	*50.0-150*	*110*			
Surrogate: Undecane	*"*	*14.2*		*ND*	*"*	*30.0-150*	*NR*			

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ThermoRetec Corp.	Project:	Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 5/26/99 11:48

Polynuclear Aromatic Hydrocarbons by GC/MS-SIM/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590526	**Date Prepared: 5/20/99**					**Extraction Method: EPA 3550B**				
Blank	**0590526-BLK1**									
Acenaphthene	5/23/99			**ND**	mg/kg dry	**0.0100**				
Acenaphthylene	"			**ND**	"	**0.0100**				
Anthracene	"			**ND**	"	**0.0100**				
Benzo (a) anthracene	"			**ND**	"	**0.0100**				
Benzo (a) pyrene	"			**ND**	"	**0.0100**				
Benzo (b) fluoranthene	"			**ND**	"	**0.0100**				
Benzo (ghi) perylene	"			**ND**	"	**0.0100**				
Benzo (k) fluoranthene	"			**ND**	"	**0.0100**				
Chrysene	"			**ND**	"	**0.0100**				
Dibenz (a,h) anthracene	"			**ND**	"	**0.0100**				
Fluoranthene	"			**ND**	"	**0.0100**				
Fluorene	"			**ND**	"	**0.0100**				
Indeno (1,2,3-cd) pyrene	"			**ND**	"	**0.0100**				
2-Methylnaphthalene	"			**ND**	"	**0.0100**				
Naphthalene	"			**ND**	"	**0.0100**				
Phenanthrene	"			**ND**	"	**0.0100**				
Pyrene	"			**ND**	"	**0.0100**				
Surrogate: p-Terphenyl-d14	"	*0.267*		*0.269*	"	*30.0-150*	*101*			
LCS	**0590526-BS1**									
Chrysene	5/23/99	0.333		0.310	mg/kg dry	10.0-125	93.1			
Fluorene	"	0.333		0.248	"	11.0-116	74.5			
Indeno (1,2,3-cd) pyrene	"	0.333		0.285	"	10.0-147	85.6			
Surrogate: p-Terphenyl-d14	"	*0.267*		*0.286*	"	*30.0-150*	*107*			
LCS Dup	**0590526-BSD1**									
Chrysene	5/23/99	0.333		0.316	mg/kg dry	10.0-125	94.9	28.0	1.91	
Fluorene	"	0.333		0.187	"	11.0-116	56.2	32.0	28.0	
Indeno (1,2,3-cd) pyrene	"	0.333		0.278	"	10.0-147	83.5	34.0	2.48	
Surrogate: p-Terphenyl-d14	"	*0.267*		*0.279*	"	*30.0-150*	*104*			
Matrix Spike	**0590526-MS1**		**B905211-01**							
Chrysene	5/23/99	0.357	0.485	0.770	mg/kg dry	10.0-125	**79.8**			
Fluorene	"	0.357	2.45	2.43	"	10.0-154	**NR**			
Indeno (1,2,3-cd) pyrene	"	0.357	ND	ND	"	10.0-144	**NR**			
Surrogate: p-Terphenyl-d14	"	*0.285*		*0.285*	"	*30.0-150*	*100*			

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions*

Matthew Essig, Project Manager

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ThermoRetec Corp.	Project: Equilon-UST	Sampled: 5/19/99
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-520	Received: 5/19/99
Seattle, WA 98134	Project Manager: Dean Kinney	Reported: 5/26/99 11:48

Notes and Definitions

#	Note
1	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
2	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
3	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
4	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
5	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
7	The percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Bothell

Matthew Essig, Project Manager

8764

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	SEND RESULTS TO:
7-2350-520	Equilon	Dr. King
SAMPLERS: D. Kinney		1990S100
RECEIVING LABORATORY: NCA		

LAB I.D. NO.	DATE	TIME	SAMPLE NO.	NO. OF CONTAINERS	ETPH (Inorganic Extraction)	PAH's					REMARKS
B905310	5/19/99	1300	CBP-1	2	X	X					Please direct bill Equilon Enterprises.
											Call Brian Rhodes of Equilon for PO # (360) 293-1901
											* need 1 ppm detection limit on PAH's

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	5/19/99 / 16:05	[signature]			

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time
			5.19.99 / 1609

Shipper Information w/o 17.8

REMEDIATION TECHNOLOGIES INC

REMEDIATION TECHNOLOGIES
1011 S.W. Klickitat Way
Suite 207
Seattle, WA 98134
(206) 624-9349

CHAIN OF CUSTODY RECORD

8764

PROJ. NO.	PROJECT NAME
7-2350-520	Equilon

SAMPLERS: D. Kinney

RECEIVING LABORATORY: NCA

SEND RESULTS TO: Dean Kinney

LAB I.D. NO.	DATE	TIME	SAMPLE NO.	NO. OF CONTAINERS	ETPH (Extractable TPH)	PAH's	REMARKS
	5/19/99	13:00	CBP-1	2	X	X	Please direct bill Equilon Enterprises Call Brian Rhodes of Equilon for PO # (360) 293-1761 * need 1 ppm detection limit on PAH's

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	5/19/99 16:05	
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)
		5.19.99 1609

Shipper Information

Relinquished by: (Signature) | Date / Time | Received by: (Signature)

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Suite 207
Seattle, WA 98134
(206) 624-9349

Flare Land Treatment Facility
Surface Soil Lab Data
11-26-96

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ThermoRetec Corp.	Project:	Equilon #1999016839	Sampled: 3/29/99 to 3/30/99
1011 SW Klickitat Way, Ste 207	Project Number:	3-4205-100	Received: 3/31/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 4/29/99 13:35

Heavy Oil Range Hydrocarbons by WTPH-418.1
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Not
SFLF-BTZ			B903702-01				Soil	
Petroleum Oil Hydrocarbons	0490008	4/6/99	4/7/99	WTPH-418.1	100	ND	mg/kg dry	
NFLF-BTZ			B903702-02				Soil	
Petroleum Oil Hydrocarbons	0490008	4/6/99	4/7/99	WTPH-418.1	100	ND	mg/kg dry	
Flare MTZ Comp			B903702-03				Soil	
Petroleum Oil Hydrocarbons	0490008	4/6/99	4/7/99	WTPH-418.1	100	ND	mg/kg dry	

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ThermoRetec Corp.	Project:	Equilon #1999016839	Sampled: 3/29/99 to 3/30/99
1011 SW Klickitat Way, Ste 207	Project Number:	3-4205-100	Received: 3/31/99
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 4/29/99 13:35

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Note
SFLF-BTZ			**B903702-01**				**Soil**	
Benzene	0490107	4/5/99	4/6/99		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*99.8*	%	
NFLF-BTZ			**B903702-02**				**Soil**	
Benzene	0490107	4/5/99	4/6/99		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*90.0*	%	
Flare MTZ Comp			**B903702-03**				**Soil**	
Benzene	0490107	4/5/99	4/7/99		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*88.9*	%	

8760

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3-4205-100	Equilon

SAMPLERS: D. Kinney

RECEIVING LABORATORY: NCA

SEND RESULTS TO: Jeff Musser, Equilon

LAB I.D. NO.	DATE	TIME	SAMPLE NO.	NO. OF CONTAINERS	Chromium, Nickel & Vanadium	TOC	Total Solids	PAH's – see list	Oil & Grease (Method 413.1)	BTEX (Method 8020)	WTPH (Method 418.1)	REMARKS
	3/29/99	1050	SFLF-BTZ	1					X	X		Please: direct bill –
		1135	NFLF-BTZ	1					X	X		Equilon
		1125	Flare MTZ Comp	1					X	X		Equilon Job # 1999016839
		1235	ELTF-1-BTZ	1	X	X	X	X				PAH's – report only:
		1310	ELTF-2-BTZ	1	X	X	X	X				
		1345	ELTF-3-BTZ	1	X	X	X	X				Naphthalene, 1-Methylnaphthalene
		1415	ELTF-5-BTZ	1	X	X	X	X				Benz(a)anthracene
		1450	ELTF-6WC-BTZ	1	X	X	X	X				Benzo(a)pyrene
		1510	ELTF-6W-BTZ	1	X	X	X	X				Benzo(b)fluoranthene
		1405	ELTF SOUTH MTZ-COMP	1	X	X	X	X				Fluoranthene, phenanthrene
	↓	1510	ELTF NORTH MTZ-COMP	1	X	X	X	X				Pyrene & chrysene
	3/30/99	0840	WLTF-7-BTZ	1	X	X	X	X				
		1040	WLTF 9-BTZ	1	X	X	X	X				
		1120	WLTF-10E-BTZ	1	X	X	X	X				
		1205	WLTF-11-BTZ	1	X	X	X	X				
		1225	WLTF-12-BTZ	1	X	X	X	X				
	↓	1220	WLTF MTZ-COMP	1	X	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	3/31/99 12:10				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time
		Rolan Reed NCAB	3/31/99 1210

Shipper Information:

RETEC
REMEDIATION TECHNOLOGIES INC
REMEDIATION TECHNOLOGIES
1011 S.W. Klickitat Way
Suite 207
Seattle, WA 98134
(206) 624-9349

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 481-9200 ▪ FAX 485-2992
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

RETEC	Project: Texaco-PSP	Sampled: 3/16/98
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-245	Received: 3/17/98
Seattle, WA 98134	Project Manager: June Coover	Reported: 4/2/98 11:52

Heavy Oil Range Hydrocarbons by WTPH-418.1
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Note
SFLF-BTZ			**B803387-01**				**Soil**	
Petroleum Oil Hydrocarbons	0380540	3/20/98	3/23/98	WTPH-418.1	100	ND	mg/kg dry	
NFLF-BTZ			**B803387-02**				**Soil**	
Petroleum Oil Hydrocarbons	0380540	3/20/98	3/23/98	WTPH-418.1	100	ND	mg/kg dry	
FLARE-MTZ COMPOSITE			**B803387-03**				**Soil**	
Petroleum Oil Hydrocarbons	0380540	3/20/98	3/23/98	WTPH-418.1	100	ND	mg/kg dry	

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 906-9200 ■ FAX 906-9210

RETEC	Project: Texaco-PSP	Sampled: 3/16/98
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-245	Received: 3/17/98
Seattle, WA 98134	Project Manager: June Coover	Reported: 4/2/98 11:52

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Note
SFLF-BTZ			**B803387-01**				**Soil**	
Benzene	0380532	3/20/98	3/20/98		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*95.3*	%	
NFLF-BTZ			**B803387-02**				**Soil**	
Benzene	0380532	3/20/98	3/20/98		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*94.6*	%	
FLARE-MTZ COMPOSITE			**B803387-03**				**Soil**	
Benzene	0380532	3/20/98	3/20/98		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*93.9*	%	

**Refer to end of report for text of notes and definiti*

North Creek Analytical, Inc.

Matthew Essig, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776

NOR CREEK ANALYTICAL
Environmental Laboratory Services

120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 481-9200 FAX 4
East 11115 Montgomery, Suite B, Spokane, WA 98206-4779 (509) 924-9200 FAX 924-
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT B803387

Laboratory Turnaround Time
- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☒ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

TEXACO INFORMATION
- Facility Number: Puget Sound Plant
- Project Manager: Jeff Mussen
- Texaco Job #: 98008482
- Site Address: P.O. Box 622
- City, State, Zip: Anacortes, WA 98221-0622

CONSULTANT INFORMATION
- Name: RETEC Project#: 7-2350-245
- Address: 1011 SW Klickitat Way Ste 207, Seattle, WA 98134
- Phone: (206) 624-9349 Fax:
- Project Manager: J. Coover
- Sample Collection by: D. Kinney

☐ AK ☐ OR ☒ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	Oil & Grease (Method 413.1)	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS Semi Vols. EPA 8270 (See Comments)	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	WTPH (Method 418.1)	BTEX (Method 8020)	TOC, Total Solids	Cr, Ni, V	Skinner List (see Table Attached)	NCA SAMPLE NUMBER
1. SELF-BTZ	3/16/98 1105	S	1					X	X					X	X			X	X	X	X		B803387-01
2. NFLF-BTZ	1200		1															X	X	X	X		-02
3. FLARE MTZ COMPOSITE	1140		1					X	X					X	X			X	X	X	X		-03
4. ELTF-2-BTZ	1435		1					X	X					X	X					X	X		-04
5. ELTF-5-BTZ	1530		1					X	X					X	X					X	X	X	-05
6. ELTF SOUTH MTZ COMP	1520		2					X	X					X	X					X	X		-06
7. ELTF-6WC-BTZ	1640		1					X	X					X	X					X	X		-07
8. ELTF-6EC-BTZ	3/17/98 0800		1					X	X					X	X					X	X		-08
9. ELTF-6EN-BTZ	0900		1					X	X					X	X					X	X		-09
10. ELTF-6ES-BTZ	0935		1					X	X					X	X					X	X		-10

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. Dan J Kinney	RETEC	3/17/98 16:40	Lisa Kinsley	NCA	3/17/98 1640
2.					
3.					

Additional Comments:
PAH's – Naphthalene, 1-Methylnaphthalene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b) Fluoranthene, Fluoranthene, Phenanthrene, Pyrene, Chrysene

14° C

RETEC	Project:	Texaco-PSP	Sampled: 11/2/98 to 11/3/98
1011 SW Klickitat Way, Ste 207	Project Number:	7-2350-245	Received: 11/3/98
Seattle, WA 98134	Project Manager:	Dean Kinney	Reported: 11/25/98 08:55

Heavy Oil Range Hydrocarbons by WTPH-418.1
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
			B811073-01				**Soil**	
SFLF-BZ Petroleum Oil Hydrocarbons	1180263	11/9/98	11/11/98	WTPH-418.1	100	ND	mg/kg dry	
			B811073-02				**Soil**	
NFLF-BZ Petroleum Oil Hydrocarbons	1180263	11/9/98	11/11/98	WTPH-418.1	100	ND	mg/kg dry	
			B811073-03				**Soil**	
FLARE NTZ COMP Petroleum Oil Hydrocarbons	1180263	11/9/98	11/11/98	WTPH-418.1	100	ND	mg/kg dry	

Refer to end of report for text of notes and definitions.

North Creek Analytical - Bothell

Matthew Essig, Project Manager

RETEC	Project: Texaco-PSP	Sampled: 11/2/98 to 11/3/98
1011 SW Klickitat Way, Ste 207	Project Number: 7-2350-245	Received: 11/3/98
Seattle, WA 98134	Project Manager: Dean Kinney	Reported: 11/25/98 08:55

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
			B811073-01				**Soil**	
SFLF-BZ	1180305	11/9/98	11/10/98		0.0500	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.100	ND	"	
Xylenes (total)	"	"	"	*50.0-150*		*118*	%	
Surrogate: 4-BFB (PID)								
			B811073-02				**Soil**	
NFLF-BZ	1180305	11/9/98	11/10/98		0.0500	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.100	ND	"	
Xylenes (total)	"	"	"	*50.0-150*		*126*	%	
Surrogate: 4-BFB (PID)								
			B811073-03				**Soil**	
FLARE NTZ COMP	1180305	11/9/98	11/10/98		0.0500	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.100	ND	"	
Xylenes (total)	"	"	"	*50.0-150*		*125*	%	
Surrogate: 4-BFB (PID)								

*Refer to end of report for text of notes and definitio

North Creek Analytical - Bothell

Matthew Essig, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 481-9200 F 2992
East 11115 Montgomery, Suite B, Spokane, WA 98206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number:
Project Manager: JEFF MUSSEN
Texaco Job #: 98029275
Site Address: PUGET SOUND REFINING COMPANY 600 SOUTH TEXAS ROAD
City, State, Zip: ANACORTES, WA 98221

CONSULTANT INFORMATION

Name: RETEC Project# 7-2350
Address: 1011 SW Klickitat Way Ste. 207 Seattle, WA 98134
Phone: (206) 624-9349 Fax: (206) 624-2839
Project Manager: Dean Kinney
Sample Collection by: Dean Kinney

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☒ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☒ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8020 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS Semi Vols. EPA 8270 or 8270 SIM	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	Cr, Ni & V	TDC	Total Solids	WTPH (Method 418.1 Mod.)	NCA SAMPLE NUMBER
1. SELF-BTZ	11/2/98/1205	S	1			X															X	
2. NELF-BTZ	/1240		1			X															X	
3. FLARE MTR COMP	/1230		1			X																
4. WLTF-8-BTZ	/1330		1											X				X	X	X		
5. WLTF-7-BTZ	/1400		1											X				X	X	X		
6. WLTF-10E-BTZ	/1930		1											X				X	X	X		
7. WLTF-11-BTZ	/1515		1											X				X	X	X		
8. WLTF-12-BTZ	/1550		1											X				X	X	X		
9. WLTF MTR COMP	/1540		1											X				X	X	X		
10. ELTF-2-BTZ	/1645		1											X				X	X	X		

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1.	RETEC	11/3/98 17:15	Wideen	NCA	11/3/98 1715
2.					
3.					

Additional Comments: ☒ Need only naphthalene, 1-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene benzo(b) fluoranthene, fluoranthene, phenanthrene, pyrene & chrysene

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (253)922-2310 - FAX (253)922-5047

Report To: Texaco - Puget Sound

Date: November 7, 1997

Report On: Analysis of Solid

Report No.: 68386

IDENTIFICATION:
Samples received on 10-27-97
Project: 7-2350-270 Texaco-PSP

ANALYSIS:

Lab Sample No. 68386-1

Client ID: SFLF-BTZ

WTPH-418.1 Modified
Date Extracted: 10-30-97
Date Analyzed: 10-30-97
Units: mg/kg

Parameter	Result
Total Petroleum Hydrocarbons	< 100

Lab Sample No. 68386-2

Client ID: NFLF-BTZ

WTPH-418.1 Modified
Date Extracted: 10-30-97
Date Analyzed: 10-30-97
Units: mg/kg

Parameter	Result
Total Petroleum Hydrocarbons	< 100

Lab Sample No. 68386-3

Client ID: FLARE MTZ COMPOSITE

WTPH-418.1 Modified
Date Extracted: 10-30-97
Date Analyzed: 10-30-97
Units: mg/kg

Parameter	Result
Total Petroleum Hydrocarbons	< 100

SOUND ANALYTICAL SERVICES, INC.

Client Name	Texaco - Puget Sound
Client ID:	SFLF-BTZ
Lab ID:	68386-01
Date Received:	10/27/97
Date Prepared:	11/4/97
Date Analyzed:	11/5/97
% Solids	81.73

BTEX Compounds by USEPA Method 8020 Modified

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Trifluorotoluene	99		37	125

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Benzene	ND	0.024	
Toluene	ND	0.024	
Ethylbenzene	ND	0.024	
m,p-Xylene	ND	0.049	
o-Xylene	ND	0.024	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Texaco - Puget Sound
Client ID:	NFLF-BTZ
Lab ID:	68386-02
Date Received:	10/27/97
Date Prepared:	11/4/97
Date Analyzed:	11/5/97
% Solids	81.84

BTEX Compounds by USEPA Method 8020 Modified

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Trifluorotoluene	97		37	125

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Benzene	ND	0.024	
Toluene	ND	0.024	
Ethylbenzene	ND	0.024	
m,p-Xylene	ND	0.048	
o-Xylene	ND	0.024	

SOUND ANALYTICAL SERVICES, INC.

Client Name	Texaco - Puget Sound
Client ID:	FLARE MTZ COMPOSITE
Lab ID:	68386-03
Date Received:	10/27/97
Date Prepared:	11/4/97
Date Analyzed:	11/5/97
% Solids	84.52

BTEX Compounds by USEPA Method 8020 Modified

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Trifluorotoluene	98		37	125

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Benzene	ND	0.024	
Toluene	ND	0.024	
Ethylbenzene	ND	0.024	
m,p-Xylene	ND	0.047	
o-Xylene	ND	0.024	

8677

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
7-2350-270	Texaco-PSP

SAMPLERS: D. Kinney

RECEIVING LABORATORY: Sound Analytical

SEND RESULTS TO:
Jeff Milsen
Texaco-PSP
600 S. Tenus Rd
(P.O. Box 622)
Anacortes, WA 98221

LAB I.D. NO.	DATE	TIME	SAMPLE NO.	NO. OF CONTAINERS	SVOC (Method 8270 & see list)	Total Metals- Chromium, Nickel & Vanadium	TOTAL ORGANIC CARBON (TOC)	BTEX (Method 8020)	NWTPH (Method 418.1)			REMARKS
68286	10/22/97	1030	SELF-BTZ	1				X	X			Please report only:
2		1135	NFLF-BTZ	1				X	X			Naphthalene
3		1130	FLARE MTZ COMPOSITE	1				X	X			1-Methylnaphthalene
4		1215	ELTF-2-BTZ	1	X	X	X		X			Benz(a)anthracene
5		1240	ELTF-5-BTZ	1	X	X	X		X			Benzo(b)Fluoranthene
6		1375	ELTF-6WN-BTZ	1	X	X	X		X			Benzo(a)pyrene
7		1355	ELTF-6WS-BTZ	1	X	X	X		X			Fluoranthene
8		1420	ELTF-6WC-BTZ	1	X	X	X		X			Phenanthrene
9		1455	ELTF-6EC-BTZ	1	X	X	X		X			Pyrene & Chrysene
10		1545	WLTF-7N-BTZ	1	X	X	X		X			
		1240	ELTF SOUTH MTZ COMP	1	X	X	X		X			
12		1445	ELTF NORTH MTZ COMP	1	X	X	X		X			
13	10/23/97	0825	WLTF-7S-BTZ	1	X	X	X		X			
14		0855	WLTF-10WS-BTZ	1	X	X	X		X			
15		0870	WLTF-10WN-BTZ	1	X	X	X		X			
16		1000	WLTF-12-BTZ	1	X	X	X		X			
17		0950	WLTF MTZ COMP	1	X	X	X		X			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
D. Kinney	10/24/97 1005				
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time		
			10/24/97 1:05		

Shipper Information

REMEDIATION TECHNOLOGIES
1011 S.W. Klickitat Way
Suite 207
Seattle, WA 98134
(206) 624-9349

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Texaco - Puget Sound Date: March 31, 1997

Report On: Analysis of Solid Report No.: 63509

IDENTIFICATION:
Samples received on 03-21-97
Project: 3-2350-243 Texaco PSP

ANALYSIS:

Lab Sample No. 63509-1 Client ID: SFLF-BTZ

TPH Per EPA Method 418.1
Date Extracted: 3-26-97
Date Analyzed: 3-26-97
Units: mg/kg

Parameter	Result	PQL	Flag
Total Petroleum Hydrocarbons	ND	11	

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Texaco Puget Sound
Project: 3-2350-243
Report No. 63509
March 31, 1997

Lab Sample No. 63509-9 Client ID: NFLF-BTZ

TPH Per EPA Method 418.1
Date Extracted: 3-26-97
Date Analyzed: 3-26-97
Units: mg/kg

Parameter	Result	PQL	Flag
Total Petroleum Hydrocarbons	ND	12	

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Texaco Puget Sound
Project: 3-2350-243
Report No. 63509
March 31, 1997

Lab Sample No. 63509-10 Client ID: FLARE MTZ COMP

TPH Per EPA Method 418.1
Date Extracted: 3-26-97
Date Analyzed: 3-26-97
Units: mg/kg

Parameter	Result	PQL	Flag
Total Petroleum Hydrocarbons	ND	11	

ND - Not Detected
PQL - Practical Quantitation Limit

8449

8°C

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3-2350-243	Texaco - PSP

SAMPLERS: D. Kinney

RECEIVING LABORATORY: Sound Analytical

SEND RESULTS TO:
Jeff Mussen
Texaco
Puget Sound Plant
P.O. Box 622
Anacortes, WA 98221-0622

LAB I.D. NO.	DATE	TIME	SAMPLE NO.	NO. OF CONTAINERS	PAHs (Method 8270) *	Chromium, Nickel & Vanadium	TOC	Oil & Grease (Method 413.1)	BTEX (Method 8020)	WTPH (Method 418.1 mod.)	REMARKS
03509-1	3/17/97	1055	SFLF-BTZ	1					X	X	* PAH's: Naphthalene
2		1255	ELTF-3-BTZ	1	X	X	X	X			1-Methylnaphthal-
3		1330	ELTF-4-BTZ	1	X	X	X	X			Benzo(a)anthracene
4		1420	ELTF-5-BTZ	1	X	X	X	X			Benzo(a)pyrene
5		1405	ELTF SOUTH MTZ COMP	1	X	X	X	X			Benzo(b)fluoranthene
6		1505	ELTF-6W-BTZ	1	X	X	X	X			Fluoranthene
7		1555	ELTF-6WC-BTZ	1	X	X	X	X			Phenanthrene
8	3/18/97	0805	ELTF-6E-BTZ	1	X	X	X	X			Pyrene & Chrysene
9		0945	NFLF-BTZ	1					X	X	
10		0935	FLARE MTZ COMP	1					X	X	
11		1115	WLTF-7-BTZ	1	X	X	X	X			
12		1215	WLTF-9-BTZ	1	X	X	X	X			
13		1255	WLTF-10E-BTZ	1	X	X	X	X			Please direct bill
14		1450	WLTF-11-BTZ	1	X	X	X	X			Texaco
15		1530	WLTF-12-BTZ	1	X	X	X	X			
16		1525	WLTF MTZ COMP	1	X	X	X	X			
17	3/18/97	0800	ELTF North MTZ Comp	1	X	X	X	X			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	3/21/97 1330	[signature]			

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time
		[signature]	3/21/97 12:35

Shipper Information

REMEDIATION TECHNOLOGIES INC
REMEDIATION TECHNOLOGIES
1011 S.W. Klickitat Way
Suite 207
Seattle, WA 98134
(206) 624-9349

Flare Land Treatment Facility
Lysimeter Data

www.ncalabs.com

Seattle 18339 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97701-8883
541.383.9310 fax 541.382.7588

Equilon Enterprises, LLC - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 3/17/99
600 South Texas Road	Project Number:	1999012264	Received: 3/19/99
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 4/1/99 15:34

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
P22			**B903411-14**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*79.7*	%	
L19SE-90			**B903411-15**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	**0.309**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*91.6*	%	
L19SW-90			**B903411-16**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	**0.496**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*81.0*	%	
W-47			**B903411-17**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*67.5*	%	
W-112			**B903411-18**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*65.6*	%	
W-113			**B903411-19**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*93.9*	%	
W-127			**B903411-20**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*82.3*	%	
Duplicate			**B903411-21**				**Water**	
Diesel Range Hydrocarbons	0390577	3/22/99	3/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*76.8*	%	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitio*

Matthew Essig, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

www.ncalabs.com

Seattle 11720 120th Avenue N.E. Suite 07, Bothell, WA 98011-8508
425.420.9200 fax 425.420.9210
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509.924.9200 fax 509.924.9290
Portland 6543 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20251 Empire Avenue, Suite E-9, Bend, OR 97701-1883
541.383.9310 fax 541.382.7588

Equilon Enterprises. LLC - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 3/17/99
600 South Texas Road	Project Number:	1999012264	Received: 3/19/99
Anacortes. WA 98221	Project Manager:	Jeff Mussen	Reported: 4/1/99 15:34

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
BG-SE-88			**B903411-12**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	2.67	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*85.4*	%	
BG-TK1-88			**B903411-13**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	0.639	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*86.0*	%	
P22			**B903411-14**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*84.4*	%	
L19SE-90			**B903411-15**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*85.4*	%	
L19SW-90			**B903411-16**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*86.0*	%	
W-47			**B903411-17**				**Water**	
Benzene	0390760	3/29/99	3/29/99		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitio*

Matthew Essig, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

39 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 481-9200 FAX
East 11115 Montgomery, Suite B, Spokane, WA 98206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906 2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number:
Project Manager: Jeff Mussen
Texaco Job #: 199901226 4
Site Address: Equilon 8505 S. Texas Rd
City, State, Zip: Box 622 Anacortes, WA 98221-0622

CONSULTANT INFORMATION

Name: Project# Texas Cup Lps.
Address:
Phone: Fax:
Project Manager:
Sample Collection by: KOOIMAN / WRS

Laboratory Turnaround Time
- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☐ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	Metals - Cr, Pb, Cd, Ag, Ni only (6010)	BTEX 8020	Naphthalene & 1 methyl/Naphthalene extended	TPH(WTPH-D)	NCA SAMPLE NUMBER
1. L11-88	3-17-99	W	4															X	X	X		
2. BG-SE-88			4															X	X	X		
3. LG-TK1-88			4															X	X	X		
4. P22			3																X		X	
5. L195E-90			3																X		X	
6. L195W-90			3																X		X	
7. W-47			4															X	X		X	
8. W-112			4															X	X		X	
9. W113			4															X	X		X	
10. W-127			4															X	X		X	

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. Adrien Kooiman	WRS	3/18/99, 2pm			
2.					
3.					

Additional Comments:
4 chests

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ▪ (425) 420-9200 ▪ FAX 420-9210
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Equilon Enterprises, LLC - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 12/10/98
600 South Texas Road	Project Number:	98009508	Received: 12/11/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 12/23/98 10:07

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
LBG-TK1-88			**B812262-12**				**Water**	
Benzene	1280494	12/17/98	12/17/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*97.7*	*%*	
P22			**B812262-13**				**Water**	
Benzene	1280494	12/17/98	12/17/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*99.2*	*%*	
L19SE-90			**B812262-14**				**Water**	
Benzene	1280494	12/17/98	12/18/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*98.5*	*%*	
L19SW-90			**B812262-15**				**Water**	
Benzene	1280494	12/17/98	12/18/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*96.0*	*%*	
L13-90			**B812262-16**				**Water**	
Benzene	1280494	12/17/98	12/18/98		0.500	**0.918**	ug/l	
Toluene	"	"	"		0.500	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*100*	*%*	
L16E-90			**B812262-17**				**Water**	
Benzene	1280494	12/17/98	12/18/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*105*	*%*	

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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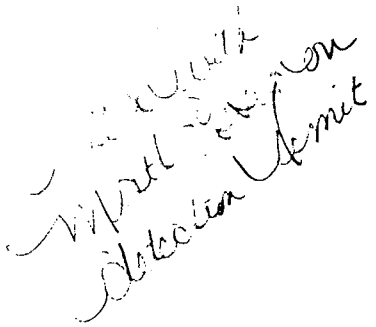
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Equilon Enterprises, LLC - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 12/10/98
600 South Texas Road	Project Number:	98009508	Received: 12/11/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 12/23/98 10:07

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
P22			**B812262-13**				**Water**	
Diesel Range Hydrocarbons	1280408	12/15/98	12/16/98		0.250	**0.264**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*60.3*	%	
L19SE-90			**B812262-14**				**Water**	
Diesel Range Hydrocarbons	1280408	12/15/98	12/16/98		0.250	**0.321**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*61.8*	%	
L19SW-90			**B812262-15**				**Water**	
Diesel Range Hydrocarbons	1280408	12/15/98	12/16/98		0.250	**0.544**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*69.3*	%	



Matthew Essig, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

NORTH CREEK ANALYTICAL
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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number:
Project Manager: Jeff Mussen
Texaco Job #: 98035344
Puget Sound Refining Company
Site Address: 8505 S. Texas Road
City, State, Zip: Anacortes, WA 98221

CONSULTANT INFORMATION

Name: Project#
Address:
Phone: Fax:
Project Manager:
Sample Collection by:

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☑ 5 Business Days
- ☐ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONTAINERS	NCA SAMPLE NUMBER
1. BG-SE-88	12-10-98	W	4	98-12-11
2. BG-TH-88	12-10-98		4	12
3. P22			3	13
4. L19SE-90			3	14
5. L19SW-90			3	15
6. L13-90			4	16
7. L16E-90			4	17
8. BLANK			4	18
9.				
10.				

TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	Metals (Cr, Ni)	BTEX 8020	NAPH & MeNAPH	TPH(WTPH-DX)	Benzene & Toluene	NAPH
														X	X	X			
														X	X	X			
															X		X		
															X		X		
															X		X		
														X				X	X
														X				X	X
														X	X	X			

Relinquished by: Andrew Kooiman **Firm:** WRS **Date & Time** 12/10/98
Received by: Cathy Nichols NCA **Firm:** **Date & Time** 12/12/98 7:30

Additional Comments: 2 of 2 : 3 ohms TS

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Equilon Enterprises, LLC - Puget Sound Plant	Project:	Texaco #98027092	Sampled: 9/22/98
600 South Texas Road	Project Number:	not provided	Received: 9/24/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 10/12/98 09:40

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
W-47			**B809650-13**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*97.7*	%	
W-112			**B809650-14**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*97.1*	%	
W-113			**B809650-15**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*81.8*	%	
Bio Solids(W)			**B809650-16**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*92.3*	%	
P22			**B809650-17**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*93.9*	%	
L19SE-90			**B809650-18**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/29/98		0.250	**0.281**	mg/l	✓ < 1 mg/l
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*84.2*	%	
L19SW-90			**B809650-19**				**Water**	
Diesel Range Hydrocarbons	0980908	9/28/98	9/30/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*90.7*	%	
Blank			**B809650-20**				**Water**	
Diesel Range Hydrocarbons	0980900	9/28/98	9/30/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*92.0*	%	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definition*

Matthew Essig, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Equilon Enterprises, LLC - Puget Sound Plant	Project:	Texaco #98027092	Sampled: 9/22/98
600 South Texas Road	Project Number:	not provided	Received: 9/24/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 10/12/98 09:40

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Not
BG-TK1-88			**B809650-12**				**Water**	
Benzene	1080064	10/2/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	**0.878**	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*102*	%	
W-47			**B809650-13**				**Water**	
Benzene	1080064	10/2/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*103*	%	
W-112			**B809650-14**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*107*	%	
W-113			**B809650-15**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*105*	%	
Bio Solids(W)			**B809650-16**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	**0.769**	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*105*	%	
P22			**B809650-17**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	

NORTH CREEK ANALYTICAL
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Equilon Enterprises, LLC - Puget Sound Plant	Project:	Texaco #98027092	Sampled: 9/22/98
600 South Texas Road	Project Number:	not provided	Received: 9/24/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 10/12/98 09:40

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
P22 (continued)			**B809650-17**				**Water**	
Xylenes (total)	1080089	10/3/98	10/3/98		1.00	ND	ug/l	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*106*	%	
L19SE-90			**B809650-18**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*107*	%	
L19SW-90			**B809650-19**				**Water**	
Benzene	1080089	10/3/98	10/3/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*104*	%	

NORTH CREEK ANALYTICAL
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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number:
Project Manager: Jeff Mussen
Texaco Job #: 98027092
Site Address: Equilon Enterprizes, LLC 6005 Texas Rd
City, State, Zip: Anacortes, WA 98221

CONSULTANT INFORMATION

Name: Project#
Address:
Phone: Fax:
Project Manager:
Sample Collection by: Adrian Kooiman/WRS

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☒ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	BETX 8020	MeTALS V	TPH WTPH-D Extended			NCA SAMPLE NUMBER
1. BG-SE-88	9-22-98	W	3															2	1				11
2. BG-TK1-88			3															2	1				
3. W-47			4															2	1	1			
4. W-112			4															2	1	1			
5. W-113			4															2	1	1			
6. Bio Solids(W)			4															2	1	1			
7. P22			3															2		1			
8. L19SE-90			3															2		1			
9. L19SW-90			3															2		1			
10.																		[redacted]					

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. Adrian Kooiman	WRS	9-24-98 2pm	[signature]	NCA	9/24/98 1700
2.					
3.					

Additional Comments: 2-chests
12.9°C
13.7 w/c

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Texaco Refining and Marketing - Puget Sound Plant	Project: Texaco PSP. #98019221	Sampled:	6/29/98
600 South Texas Road	Project Number: Glass Brick Lysimeters	Received:	7/2/98
Anacortes, WA 98221	Project Manager: Jeff Mussen	Reported:	7/21/98 09:42

Diesel Hydrocarbons (C12-C24) by WTPH-D
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
P22			**B807071-14**				**Water**	
Diesel Range Hydrocarbons	0780128	7/6/98	7/9/98		0.250	ND	mg/l	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*70.5*	%	
L19SE-90			**B807071-15**				**Water**	
Diesel Range Hydrocarbons	0780128	7/6/98	7/9/98		0.250	ND	mg/l	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*77.3*	%	
L19SW-90			**B807071-16**				**Water**	
Diesel Range Hydrocarbons	0780128	7/6/98	7/9/98		0.250	**0.360**	mg/l	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*76.4*	%	

OK less than NCA method limit [illegible]

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitio*

Matthew Essig, Project Manager

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PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Texaco Refining and Marketing - Puget Sound Plant	Project:	Texaco PSP. #98019221	Sampled: 6/29/98
600 South Texas Road	Project Number:	Glass Brick Lysimeters	Received: 7/2/98
Anacortes. WA 98221	Project Manager:	Jeff Mussen	Reported: 7/21/98 09:42

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
L8-97S (continued)			**B807071-08**				**Water**	
Xylenes (total)	0780134	7/6/98	7/6/98		1.00	ND	ug/l	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*117*	%	
L9-88			**B807071-09**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	**1.93**	ug/l	
Toluene	"	"	"		0.500	**0.710**	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*117*	%	1
L10W-90			**B807071-10**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*115*	%	
BG-SE-88			**B807071-12**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*114*	%	
BG-TK1-88			**B807071-13**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*115*	%	
P22			**B807071-14**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*114*	%	

*Refer to end of report for text of notes and definition.

North Creek Analytical, Inc.

Matthew Essig, Project Manager

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Texaco Refining and Marketing - Puget Sound Plant	Project:	Texaco PSP. #98019221	Sampled: 6/29/98
600 South Texas Road	Project Number:	Glass Brick Lysimeters	Received: 7/2/98
Anacortes. WA 98221	Project Manager:	Jeff Mussen	Reported: 7/21/98 09:42

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes
L19SE-90			**B807071-15**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*118*	%	
L19SW-90			**B807071-16**				**Water**	
Benzene	0780134	7/6/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*118*	%	
DUPLICATE			**B807071-17**				**Water**	
Benzene	0780134	7/7/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*110*	%	*1*
BLANK			**B807071-18**				**Water**	
Benzene	0780134	7/7/98	7/7/98		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*116*	%	

North Creek Analytical. Inc.

**Refer to end of report for text of notes and definitio*

Matthew Essig, Project Manager

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TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number: Texaco PSP
Project Manager: Jeff Masson
Texaco Job #: 98019221
Site Address: Texaco PSP 6005 Texas Rd
City, State, Zip: Anacortes, WA 98221

CONSULTANT INFORMATION

Name: Matt Essig Project#: Glass Brick Lysimeters
Address: 18939 120th Ave NE Suite 101
Bothell, WA 98011-9505
Phone: (425) 481-9200 Fax: (425) 485-2992
Project Manager: Jeff Masson
Sample Collection by: Adrian Koorman/Matt Essig

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☐ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	BTEX (8020)	Naphthalene 1-methylnaphthalene (8270)	Cr, Ni, V (6010)	TPH (w/TPH-D)	X Volatiles (Skinner List)	X Semi-Volatiles (Skinner List)	X Metals (Skinner List)	NCA SAMPLE NUMBER
1. L11-98	6-29-98	WATER	4															X	X	X		X	X	B807071-11
2. BG-SE-98	6/30/98		4															X	X	X				-12
3. BG-7K1-98			4															X	X	X	X			-13
4. P22			3															X			X			-14
5. L19SE-90			3															X			X			-15
6. L19SW-90			3															X			X			-16
7. Duplicate			4															X	X	X				-17
8. BLANK	↓	↓	4															X	X	X				-18
9.																								
10.																								

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. Adrian Koorman	WRS	7-2-98 1230	Kent	NCA	7/2/98 1630
2.					
3.					

Additional Comments:

3 chests

NORTH CREEK ANALYTICAL
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Texaco Refining and Marketing - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 3/25/98
600 South Texas Road	Project Number:	98009508	Received: 3/30/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 4/13/98 16:02

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
P22			**B803635-14**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*69.7*	%	
L19-SE-90			**B803635-15**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*68.1*	%	
L19SW-90			**B803635-16**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	**0.374**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*80.3*	%	
W-47			**B803635-17**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*80.3*	%	
W-112			**B803635-18**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*81.8*	%	
W-113			**B803635-19**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*75.4*	%	
W-BIOSOLIDS (127)			**B803635-20**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*77.6*	%	
Dup (Bio Solids)			**B803635-24**				**Water**	
Diesel Range Hydrocarbons	0380796	3/31/98	4/1/98		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*77.5*	%	

*Refer to end of report for text of notes and definitions

North Creek Analytical, Inc.

Matthew Essig, Project Manager

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Texaco Refining and Marketing - Puget Sound Plant	Project:	LYSIMETERS P.CUP	Sampled: 3/25/98
600 South Texas Road	Project Number:	98009508	Received: 3/30/98
Anacortes, WA 98221	Project Manager:	Jeff Mussen	Reported: 4/13/98 16:02

BTEX by EPA Method 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
			B803635-12				Water	
BG-SE-88	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	**2.81**	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		97.5	%	
Surrogate: 4-BFB (PID)								
			B803635-13				Water	
BG-TK1-88	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	**0.827**	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		97.7	%	
Surrogate: 4-BFB (PID)								
			B803635-14				Water	
22	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		96.9	%	
Surrogate: 4-BFB (PID)								
			B803635-15				Water	
L19-SE-90	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		99.0	%	
Surrogate: 4-BFB (PID)								
			B803635-16				Water	
L19SW-90	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Xylenes (total)	"	"	"	50.0-150		100	%	
Surrogate: 4-BFB (PID)								
			B803635-17				Water	
W-47	0480117	4/5/98	4/5/98		0.500	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene								

*Refer to end of report for text of notes and definition.

North Creek Analytical, Inc.

Matthew Essig, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 481-9200 FAX 992
East 11115 Montgomery, Suite B, Spokane, WA 98206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-2202

TEXACO CHAIN OF CUSTODY REPORT

TEXACO INFORMATION

Facility Number: TEXACO A.S.P.
Project Manager: JEFF MUSSEN
Texaco Job #: 9800 9508
Site Address: TEXACO A.S.P. 600 S. TEXAS RD.
City, State, Zip: ANACORTES WA 98221

CONSULTANT INFORMATION

Name: MATT ESSIG Project# LYSIMETERS, PCUP
Address: 18939 120TH AVE NE STE 101 BOTHELL WA. 98011-9508
Phone: 481 9200 (425) Fax: 485 - 2992 (425)
Project Manager: JEFF MUSSEN
Sample Collection by:

Laboratory Turnaround Time

- ☐ 1 Business Day
- ☐ 3 Business Days
- ☐ 5 Business Days
- ☑ 10 Business Days
- ☐ 3 Day Air Samples (Please Select One)

☐ AK ☐ OR ☑ WA ☐ NW Series

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only:	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	PAH - MODIFIED EXTENDED					NCA SAMPLE NUMBER
1. L11-88	3/25	W	4			X											X	X					-11
2. BG-SE-88	3/25	W	4			X											X	X					-12
3. BG-TK1-88	3/25	W	4			X											X	X					-13
4. P22	3/25	W	3			X													X				-14
5. L19SE-90	3/25	W	3			X													X				-15
6. L19SW-90	3/25	W	3			X													X				-16
7. W-47	3/25	W	4			X												X	X				-17
8. W-112	3/25	W	4			X												X	X				-18
9. W-113	3/25	W	4			X												X	X				-19
10. W-BIO SOLIDS (127)	3/25	W	4			X												X	X				-20

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. JAY JOHNSON	TEXACO	3/26/98	Dana H	NCAB	3/30/98 10:00
2.					
3.					

Additional Comments:

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: P-22
Lab ID: 096630-0013-SA
Matrix: AQUEOUS Sampled: 11 DEC 97 Received: 15 DEC 97
Authorized: 15 DEC 97 Prepared: 17 DEC 97 Analyzed: 19 DEC 97

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Unknown hydrocarbon	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	92	%	

ND = Not detected
NA = Not applicable

Reported By: Joe Scarpa Approved By: Marcia Reed

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: L19SE-90
Lab ID: 096630-0014-SA
Matrix: AQUEOUS
Authorized: 15 DEC 97

Sampled: 11 DEC 97
Prepared: 17 DEC 97

Received: 15 DEC 97
Analyzed: 19 DEC 97

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	65	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	94	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C25. Quantitation is based on a diesel reference between n-C10 and n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Joe Scarpa

Approved By: Marcia Reed

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: L19SW-90
Lab ID: 096630-0015-SA
Matrix: AQUEOUS
Authorized: 15 DEC 97

Sampled: 11 DEC 97
Prepared: 17 DEC 97

Received: 15 DEC 97
Analyzed: 19 DEC 97

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	210	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	101	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C12 to n-C28. Quantitation is based on a diesel reference between n-C10 and n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Joe Scarpa

Approved By: Marcia Reed

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: P-22
Lab ID: 096630-0013-SA
Matrix: AQUEOUS
Authorized: 15 DEC 97

Sampled: 11 DEC 97
Prepared: NA

Received: 15 DEC 97
Analyzed: 21 DEC 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Patricia Trinidad
Approved By: Leticia Sangalang

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: L19SE-90
Lab ID: 096630-0014-SA
Matrix: AQUEOUS Sampled: 11 DEC 97 Received: 15 DEC 97
Authorized: 15 DEC 97 Prepared: NA Analyzed: 21 DEC 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	100	%	

ND = Not detected
NA = Not applicable

Reported By: Patricia Trinidad Approved By: Leticia Sangalang

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: L19SW-90
Lab ID: 096630-0015-SA
Matrix: AQUEOUS
Authorized: 15 DEC 97

Sampled: 11 DEC 97
Prepared: NA

Received: 15 DEC 97
Analyzed: 21 DEC 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	99	%	

ND = Not detected
NA = Not applicable

Reported By: Patricia Trinidad

Approved By: Leticia Sangalang

The cover letter is an integral part of this report.
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Chain of Custody Record

Quanterra

QUA-4124

Client: TEXACO PUGET SOUND PLANT
Address: 600 S TEXAS RD
City: ANACORTES State: WA Zip Code: 98221
Project Name: RCRA WELLS
Contract/Purchase Order/Quote No.: 9703 ~~350~~ 5085

Project Manager: JON GILDERSLEEVE
Telephone Number (Area Code)/Fax Number: (916) 374-4381
Site Contact: JAY JOHNSON
Carrier/Waybill Number:

Date: 12-12-97
Lab Number:

Chain Of Custody Number: [illegible]
Page 1 of 2

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Metals 6010	BTEX 8020	Naph + m-Naph 8270	WTPH-D Ext.	Benzene Toluene	Naph 8270
L1-88	12-11-97		WATER			4			X	X	X			
L3-88	↓		↓			4			X	X	X			
L4-88	↓		↓			4			X	X	X			
L6E-88	↓		↓			4			X	X	X			
L6EC-88	↓		↓			4			X	X	X			
L7-97N	↓		↓			4			X	X	X			
L8-97N	↓		↓			3			X	X				
L8-97S	↓		↓			3			X	X				
L10W-90	↓		↓			4			X	X	X			
L11-88	↓		↓			4			X	X	X			
BG-SE-88	↓		↓			4			X	X	X			
BG-TK1-88	↓		↓			4			X	X	X			
P-22	↓		↓			3				X		X		
L19SE-90	↓		↓			3				X		X		
L19SW-90	↓		↓			3				X		X		
L13-90	↓		↓			4			X				X	X

Special Instructions

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☐ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By: Adrien Kooiman/WRS	12-12-97		1. Received By: [signature]	121597	13:30
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: * Received one broken VOA
** 1 of 2 VOA has pea-size air bubble. MJG

DISTRIBUTION: WHITE - Stays with Sample; CANARY - ... PINK - Field Copy

Quanterra Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)
Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: Porus Cup P22
LAB ID: 095232-0014-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: 27 SEP 97

Received: 26 SEP 97
Analyzed: 30 SEP 97

Dilution Factor: 1.0

Parameter	Result	Units	Reporting Limit	Qualifier
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	ND	ug/L	50	

Surrogate	Recovery	Acceptable Range
o-Terphenyl	102 %	50 - 150

ND = Not Detected

Reported By: Marcia Reed

Approved By: Lisa Stafford

The cover letter is an integral part of this report.
Rev 230787

Quanterra Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)
Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: Porus Cup L19SE-90
LAB ID: 095232-0015-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: 27 SEP 97

Received: 26 SEP 97
Analyzed: 30 SEP 97

Dilution Factor: 1.0

Parameter	Result	Units	Reporting Limit	Qualifier
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	77	ug/L	50	1

Surrogate	Recovery	Acceptable Range
o-Terphenyl	108 %	50 - 150

Note 1 = The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C10 to n-C24. Quantitation is based upon a diesel fuel reference between n-C10 and n-C24.
ND = Not Detected

Reported By: Marcia Reed
Approved By: Lisa Stafford

The cover letter is an integral part of this report.
Rev 230787

Quanterra Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)
Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: Porus Cup L19SW-90
LAB ID: 095232-0016-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: 27 SEP 97

Received: 26 SEP 97
Analyzed: 30 SEP 97

Dilution Factor: 1.0

Parameter	Result	Units	Reporting Limit	Qualifier
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	180	ug/L	50	1

Surrogate	Recovery	Acceptable Range
o-Terphenyl	115 %	50 - 150

Note 1 = The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C12 to n-C28. Quantitation is based upon a diesel fuel reference between n-C10 and n-C24.
ND = Not Detected

Reported By: Marcia Reed

Approved By: Lisa Stafford

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: Porus Cup P22
Lab ID: 095232-0014-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: NA

Received: 26 SEP 97
Analyzed: 30 SEP 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	93	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin

Approved By: Patricia Trinidad

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: Porus Cup L19SE-90
Lab ID: 095232-0015-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: NA

Received: 26 SEP 97
Analyzed: 30 SEP 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	95	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin

Approved By: Patricia Trinidad

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: Porus Cup L19SW-90
Lab ID: 095232-0016-SA
Matrix: AQUEOUS
Authorized: 26 SEP 97

Sampled: 23 SEP 97
Prepared: NA

Received: 26 SEP 97
Analyzed: 30 SEP 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	86	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin

Approved By: Patricia Trinidad

The cover letter is an integral part of this report.
Rev 230787

Chain of Custody Record

Quanterra Environmental Services

QUA-4124-1

Client: Texaco PSP

Address: 600 S. Texas Rd

City: Anacortes | State: WA | Zip Code: 98221

Project Name: Porus Cup Lysimeters

Contract/Purchase Order/Quote No.: PO 97027378

Project Manager: Jon Gildersl[illegible]ve

Telephone Number (Area Code)/Fa[illegible]umber: (916) 374-[illegible]31

Site Contact: Jeff Musser

Lab Contact:

Carrier/Waybill Number:

Date: 9/25/97

Lab Number:

Chain Of Custody Number: 70757

Page 2 of 2

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Matrix: Sed.	Matrix: Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: 8270 (Naphth./Methyl naphth.)	Metals (Cr, Ni only)	BTEX 8020	TPH
Porus Cup B6-TK-1-88	9/23/97		X			1		1	2			X	X	X	
P22						1									X
L19SE-90						1									
L19SW-90						1									
W47						1		1					X		
W112						1		1							
W113						1		1							
W-New Bio Solids						1		1	2						
Blank						1		1	2			X			

Special Instructions/ Conditions of Receipt

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For ___ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: [ ] 24 Hours [ ] 48 Hours [ ] 7 Days [X] 14 Days [ ] 21 Days [ ] Other

QC Requirements (Specify):

		Date	Time
1. Relinquished By	Rich Stoyke	9/25/97	1115
2. Relinquished By			
3. Relinquished By			
1. Received By		092697	1145
2. Received By			
3. Received By			

Comments: Received in good condition. MCD 092697

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: P-22
Lab ID: 093606-0014-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97

Sampled: 09 JUN 97
Prepared: 16 JUN 97

Received: 12 JUN 97
Analyzed: 18 JUN 97

Parameter	Result	Units	Reporting Limit
Diesel Fuel	ND	ug/L	50
Unknown hydrocarbon	ND	ug/L	50
Surrogate	**Recovery**		
o-Terphenyl	100	%	

ND = Not detected
NA = Not applicable

Reported By: Lisa Stafford

Approved By: Emily Uebelhoer

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: L19SE-90
Lab ID: 093606-0015-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97

Sampled: 09 JUN 97
Prepared: 16 JUN 97

Received: 12 JUN 97
Analyzed: 18 JUN 97

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	72	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	93	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C09 to n-C30. Quantitation is based on a diesel reference between n-C10 and n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Lisa Stafford

Approved By: Emily Uebelhoer

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Total Petroleum Hydrocarbons by GC/FID (Triregional)

Method TPH-D-TRIREGIONAL

Client Name: Texaco Refining
Client ID: L19SW-90
Lab ID: 093606-0016-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97

Sampled: 09 JUN 97
Prepared: 16 JUN 97

Received: 12 JUN 97
Analyzed: 18 JUN 97

Parameter	Result	Units	Reporting Limit	
Diesel Fuel	ND	ug/L	50	
Unknown hydrocarbon	150	ug/L	50	1
Surrogate	**Recovery**			
o-Terphenyl	106	%		

Note 1 : The hydrocarbon pattern present in this sample represents an unknown mixture atypical of diesel fuel in the range of n-C09 to n-C30. Quantitation is based on a diesel reference between n-C10 and n-C24 only.

ND = Not detected
NA = Not applicable

Reported By: Lisa Stafford

Approved By: Emily Uebelhoer

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: P-22
Lab ID: 093606-0014-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97

Sampled: 09 JUN 97
Prepared: NA

Received: 12 JUN 97
Analyzed: 13 JUN 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	101	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin

Approved By: Jennifer Bavetta

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: L19SE-90
Lab ID: 093606-0015-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97

Sampled: 09 JUN 97
Prepared: NA

Received: 12 JUN 97
Analyzed: 13 JUN 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	98	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin

Approved By: Jennifer Bavetta

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)

Method 8020

Client Name: Texaco Refining
Client ID: L19SW-90
Lab ID: 093606-0016-SA
Matrix: AQUEOUS
Authorized: 12 JUN 97
Sampled: 09 JUN 97
Prepared: NA
Received: 12 JUN 97
Analyzed: 13 JUN 97

Parameter	Result	Units	Reporting Limit
Benzene	ND	ug/L	2.0
Toluene	ND	ug/L	2.0
Ethylbenzene	ND	ug/L	2.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	**Recovery**		
a,a,a-Trifluorotoluene	94	%	

ND = Not detected
NA = Not applicable

Reported By: Min Qin
Approved By: Jennifer Bavetta

The cover letter is an integral part of this report.
Rev 230787

Contract/Purch[illegible]rder/Quote No.

97016407

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH		8270 - N	BTEx BC	Metc.	TPH -			
BG - SE - 88			X				1		1	3				X	X	X				
BG - TK1 - 88			↓				↓		↓	↓				X	↓	X				
P-22			↓				↓		X	↓					↓		X			
L19SE-90			↓				↓		X	↓					↓		X			
L19SW - 90			↓				↓		X	↓					↓		X			
Blank			↓				↓		↓	↓				X	↓	X				
Duplicate [redacted]			↓				↓		↓	↓				X	↓	X				
							7		4	21										

Possible Hazard Identification

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time	
1. Relinquished By: Adrian Kaasman/WRS	6-11-97	PM	1. Received By:
2. Relinquished By			2. Received By
3. Relinquished By			3. Received By

Comments

Run Duplicate for any sample that show BTEX hits

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy