# 3R - <u>83</u>

# REPORTS

# DATE: 11/6/1996

ON SITE DENGER DEN ZOVISIO

November 6, 1996

Conoco, Inc., Mid-Continent Region Attn.: Mr. John Coy 3314 Bloomfield Hwy. Farmington, NM 87401

RE: Conoco Location Farmington B Com 1 Investigation

Project 4-1325

Dear Mr. Coy:

The following interim report is intended to document events and activities with regards to a suspected hydrocarbon release at the above location and to inform interested parties of the current status of the investigation.

### FIELD INVESTIGATIONS

On October 31, 1996, Ms. Cynthia Sluyter-Gray of On Site Technologies was contacted by Mr. John Coy of Conoco, Inc. to arrange sampling of groundwater through a vent pipe from the cathodic groundbed at the Farmington B Com 1 in response to complaints from area residents of hydrocarbon odors in the vicinity. Ms. Grav and Mr. Coy met at the location, opened the 1" vent pipe and attempted to bail the cathodic well and obtain a water sample. However, an obstruction in the pipe only allowed the use of 1/4" Teflon tubing to attempt sampling. Seven (7) feet of tubing were introduced into the vent pipe. The liquid recovered was identified by appearance and odor as a hydrocarbon product. Several additional attempts were made but no evidence of water was found. Mr. Coy had previous notified Mr. Denny Foust of New Mexico Oil Conservation Division, Aztec office. Mr. Foust arrived at the location and was informed of the status. A cursory soil vapor survey was performed in the general area near the cathodic grounding well vent pipe with positive results (20 to 25 units) within five feet of the vent and negative results elsewhere. A small flowing water ditch was noted adjacent to the site, located upgradient and down an embankment. A small surface water pond is also located nearby between the site and the ditch (see Site Sketch). Two water samples were taken from the pond to rule out migration of free product into the pond and the ditch. Samples were taken to the laboratory for analysis for Benzene, Toluene, Ethyl-Benzene, and Xylene (BTEX) by EPA Method 8020.

Ms. Gray and Mr. Michael Lane returned to the site later in the day with more 1/4" tubing and a water-finding paste to attempt to locate groundwater in the cathodic well. No color change was noted in the water-finding paste applied to seventeen (17) feet of tubing inserted in the vent pipe. Free product began at approximately two (2 feet) below the top of the vent pipe valve. A free product recovery attempt was scheduled for the next morning using an air driven intrinsically-safe pump and 1/4" Teflon tubing through the vent pipe. A backhoe was also scheduled for later in the morning for exploratory excavation in the area of the cathodic well. Mr. Coy notified New Mexico

PO Box 2606 Farmington, NM 505-325-5667 FAX: 505-327-1496 Conoco, Inc. Farmington B Com 1 Investigation

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November 6, 1996 Project 4-1325

OneCall to mark utilities, lines, and pipelines in the area on an emergency basis. Mr. Foust was also apprised of the plan.

As scheduled, on November 1, 1996, Ms. Gray and Mr. Lane set up the air-powered free product recovery system with 1/4" Teflon tubing in the vent pipe and ultimately recovered approximately five (5) gallons of product and one to two gallons of water. Further efforts at recovery through the vent pipe were unsuccessful.

Line spotters for Public Service Co., City of Farmington Water and Sewer, and Farmington Electric Utility arrived on site and confirmed locations of lines and pipelines with none noted as on location. A crew from L & R Oilfield Service arrived with a backhoe as scheduled by Mr. Coy. A brief safety meeting was held by Mr. Coy. The cathodic protection line and the power line to the location equipment were located and marked. The power to the rectifier and the location were then locked out and tagged out by Mr. Coy. Two initial test pits were excavated with one (TP1) immediately adjacent to the cathodic well and the other (TP2) to the site south of the rectifier and power pole.

In TP1, stained soils were encountered at approximately three to four feet below surface grade with groundwater at approximately six feet below grade. The excavation was continued to an approximate depth of eight feet. Free product was noted seeping into the excavation from the sidewall next to the cathodic well. Several unsuccessful attempts were made to recover the product collecting in the excavation. A ten (10) foot long piece of five (5) inch diameter PVC pipe with cut slots was then placed in the excavation during backfilling to serve as a product recovery well should sufficient product be collected.

A second test pit (TP2) was excavated at a lower surface elevation approximately five (5) feet south of the rectifier and power pole. Stained soils were encountered at approximately two to three feet below surface with groundwater at approximately three to four feet. No free product was seen but a sheen was noted on the water collecting in the test pit prior to backfilling.

In consultation with Mr. Coy, Mr. Foust, and On Site personnel, it was agreed that the soil plume should be delineated with a direct-punch Geoprobe sampling unit and basic groundwater data obtained prior to initiating any further cleanup efforts. The probe was scheduled for Monday, November 4. Laboratory results were also received indicating that the pond water samples taken the previous day were below detection limits for all BTEX constituents (see attached laboratory reports).

On November 4, using the Geoprobe, seven test holes were advanced as noted on the attached Site Sketch and apparent Contamination Map. Temporary water sampling points (MW1, MW2, and MW3) were placed in Test Holes 1, 2, and 6 respectively. Soil samples were taken from each Test Hole within a two-foot interval encompassing the level at which groundwater was encountered. Soil samples were submitted to the laboratory for analysis by methods 8015 Modified (Total Petroleum Hydrocarbons) and 8020 (Benzene, Toluene, Ethyl-benzene, and Xylene) as required for closure under NMOCD regulations. Water levels were measured in the temporary water sampling



Conoco, Inc. Farmington B Com 1 Investigation

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November 6, 1996 Project 4-1325

points. Groundwater samples were taken from MW1, MW2, and MW3 after well development to temperature stabilization. Samples were preserved with Hydrochloric Acid and transported to the laboratory for analysis by method 8020 (BTEX) with the primary constituent of concern being Benzene. Analytical results are noted by Test Hole (TH) and water sampling point (MW) on the Contamination Map attached. The detailed laboratory reports are also attached.

#### PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Based upon an engineering plane survey conducted on November 6, depth to groundwater measurements taken November 5, and visual observations, a Site Sketch has been constructed noting locations of test holes, water sampling points, significant site features, and an estimated groundwater slope. Using that information and factoring in the results of laboratory analyses, a sketch indicating the estimated extent of significant soil contamination as well as an approximated free product plume has also been developed.

In view of limited records of an historic spill in 1992, it appears that the free product present may be residual from that spill which has been trapped in the area of the cathodic well by the clayey soils in the area. During sampling, even the cobbles at or near the water table were noted to be contained in a clay to sandy clay matrix which tends to limit the migration of hydrocarbons. Furthermore, where hydrocarbons were found in the soil and water samples, it is evident that the more volatile compounds have either degraded or evaporated, indicating that the remaining product is aged and not a recent spill.

While there is an evident impact to groundwater in the area of the cathodic well, the limited and preliminary groundwater sampling and analyses do not indicate a significant or widespread groundwater impact outside the immediate area at this time.

Due to the proximity of the site to a residential area, surface water ditches, and shallow depth to groundwater, we recommend that the operator carefully excavate contaminated soils immediately surrounding the cathodic well and south and west toward Test Hole 6 (MW 3) until closure levels of <100 parts per million TPH, < 50 ppm BTEX, and <10 ppm Benzene are reached in the soils. Care should be taken to disturb the soils at groundwater as little as possible to avoid mixing and spreading hydrocarbons into the water. Where free product is present, it should be removed either by skimming or by the application of an absorbent such as dehydrated peat moss. Excavated contaminated material should be stockpiled in a plastic-lined bermed area until off-site disposal can be arranged.

In conclusion, further investigation and monitoring of other areas of the location may be appropriate due to the site history. However, the remediation and mitigation of the immediate problem regarding the contamination in the area of the cathodic well should be addressed first.

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Conoco, Inc. **T** Farmington B Com 1 Investigation



immediate problem regarding the contamination in the area of the cathodic well should be addressed first.

If there are any questions regarding this status report, please contact either Cindy Gray or Myke Lane at On Site Technologies, (505) 325-5667.

Respectfully submitted,

Cynthia A. Sluyter-Gray Project Manager, On Site Technologies, Ltd.

attachments: Site Sketch Estimated Contamination Map Laboratory Analytical Results

CC:

Mr. Neil Goates, Conoco, Inc. Mr. Roger Anderson, NMOCD Mr. Denny Foust, NMOCD

file: 41325-2doc





ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-5667

LAB: (505) 325-1556

## **AROMATIC VOLATILE ORGANICS**

Attn:	John Co	у			Date:	1-Nov-96	
Company:	Сопосо,	Inc. cc: Cindy Gray			COC No.:	6164	
Address:	3315 Blo	oomfield Hwy.			Sample No.	12722	
City, State:	Farming	ton, NM 87401			Job No.	2-1000	
Project Nam		Pond Adjacent to	Conoco Farming	ton B Com 1			
Project Loca	ation:	4-1303-В					
Sampled by	<b>/:</b>	CG	Date:	31-Oct-96	Time:	10:50	
Analyzed by	y:	DC	Date:	1-Nov-96			
Sample Mat	trix:	Liquid					

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene		<0.2	ug/L	0.2	ug/L
Toluene		<0.2	ug/L	0.2	ug/L
Ethylbenzene		<0.2	ug/L	0.2	ug/L
m,p-Xylene		<0.2	ug/L	0.2	ug/L
o-Xylene		<0.2	ug/L	0.2	ug/L
	TOTAL	< 0.2	ug/L		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 11/1/96

#### P.O. BOX 2606 • FARMINGTON, NM 87499

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LAB: (505) 325-1556

## AROMATIC VOLATILE ORGANICS

Attn: John Co Company: Conoco, Address: 3315 Bl City, State: Farming	Inc. cc: Cindy Gray		Date: COC No.: Sample No Job No.	1-Nov-96 6164 0. 12721 2-1000
Project Name: Project Location: Sampled by: Analyzed by: Sample Matrix:	<i>Pond Adjacent to 4-1303-A</i> CG DC <i>Liquid</i>	<i>Conoco Farming</i> Date: Date:	<i>ton B Com 1</i> 31-Oct-96 Time: 1-Nov-96	10:45

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene		<0.2	ug/L	0.2	ug/L
Toluene		<0.2	ug/L	0.2	ug/L
Ethylbenzene		<0.2	ug/L	0.2	ug/L
m,p-Xylene		<0.2	ug/L	0.2	ug/L
o-Xylene		<0.2	ug/L	0.2	ug/L
	TOTAL	< 0.2	ug/L		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 11/1/96

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## QUALITY ASSURANCE REPORT for EPA Method 8020

Date Analyzed: 1-Nov-96

OFF: (505) 325-5667

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Internal QC No.:	0515-QC
Surrogate QC No.:	0516-QC
Reference Standard QC No.:	0417-QC

Method Blank Unit of Result Measure Parameter < 0.2 Average Amount of All Analytes In Blank ppb

#### **Calibration Check**

	Unit of	True	Analyzed		
Parameter	Measure	Value	Value	% Diff	Limit
Benzene	ppb	20.0	19.7	2	15%
Toluene	ppb	20.0	19.8	1	15%
Ethylbenzene	ppb	20.0	19.9	0	15%
m,p-Xylene	ppb	40.0	39.4	2	15%
o-Xylene	ppb	20.0	19.8	1	15%

#### Matrix Spike

	1- Percent	2 - Percent			
Parameter	Recovered	Recovered	Limit	%RSD	Limit
Benzene	92	101	(39-150)	6	20%
Toluene	92	101	(46-148)	6	20%
Ethylbenzene	95	105	(32-160)	7	20%
m,p-Xylene	88	98	(35-145)	7	20%
o-Xylene	92	102	(35-145)	7	20%

#### Surrogate Recoveries

	S1	S2		S1	S2
	Percent	Percent		Percent	Percent
Laboratory Identification	Recovered	Recovered	Leboratory Identification	Recovered	Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
12721-6164	97			+	
12722-6164	97				
		<u> </u>			
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S1: Flourobenzene

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Date/Time			Received by:	B		Date/Time		Relinquished by:
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		City, State, Zip	RES	RE				Address
		Mailing Address	ULT	PO		Dept.		0
cc: Cindy Gray	0		S T Company	RT				Name Canoca
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				, <b>99</b>	on NM 874 15-6256	<ul> <li>Farmingt</li> <li>AX: (505) 32</li> </ul>	). Box 2606 5-5667 • F/	657 W. Maple • P. O. Box 2606 • Farmington NM 87499           LAB: (505) 325-5667 • FAX: (505) 325-6256
Pageof		1-96	10-31-	Date:/	Ē			ON SITE
6164		ECORD		STOL	: CU	N OF	CHAIN OF CUSTODY R	

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LAB: (505) 325-1556

### TPH - Gasoline / Diesel Range Organics

Company: Con Address: 331	n Coy oco, Inc. cc: Cindy Gray 5 Bloomfield Hwy. nington, NM 87401	Ý	Date: COC No.: Sample No. Job No.	5-Nov-96 6172 12741 4-1325
Project Name: Project Location Sampled by: Analyzed by: Sample Matrix:	Conoco - Farmir : Test Hole #1; 7 CG DC/HR Soil		4-Nov-96 Time: 5-Nov-96	8:20

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		< 5.0	mg/kg	5.0	mg/kg
Diesel Range Organics (C10 - C28)		<5.0	mg/kg	5.0	mg/kg
	TOTAL	< 5.0	mg/kg		

Quality Assurance Report

 GRO QC No.:
 0493-STD

 DRO QC No.:
 0489-STD

**Calibration Check** Method Unit of True Analyzed Parameter Blank Value Value % Diff Measure Limit 1,350 1,410 Gasoline Range (C5 - C9) <50 15% ppb 4.5 Diesel Range (C10 - C28) 100 97 <5.0 2.8 15% ppm

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: Date: 1\$/5/96

\_\_\_\_<u>- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT</u>



OFF: (505) 325-5667

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# AROMATIC VOLATILE ORGANICS

Attn: John Coy			Date:	6-Nov-96	
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address: 3315 Bloomfield Hwy.				Sample No.	12741
City, State: Farmington, NM 87401				Job No.	4-1325
Project Name: Conoco - Farmington B Com 1					
Project Loc	ation:	Test Hole #	#1; 7'-9' bsg		
Sampled by	y:	CG	Date:	4-Nov-96 Time:	8:20
Analyzed b	y:	DC	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		<0.2	ug/kg	0.2	ug/kg
Toluene		3.0	ug/kg	0.2	ug/kg
Ethylbenzene		<0.2	ug/kg	0.2	ug/kg
m,p-Xylene		1.8	ug/kg	0.2	ug/kg
o-Xylene		<0.2	ug/kg	0.2	ug/kg
	TOTAL	4.8	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Decc Date: 11/6/96

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ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-5667

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## TPH - Gasoline / Diesel Range Organics

Attn: John Coy				Date:	5-Nov-96
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address:	3315 Blo	oomfield Hwy.	Sample No.	12742	
City, State: Farmington, NM 87401				Job No.	4-1325
Project Nar	ne:	Conoco - Farm	ington B Com 1		
Project Loc	ation:	Test Hole #2;	8'-10' bsg		
Sampled by	y:	CG	Date:	4-Nov-96 Time:	8:50
Analyzed b	iy:	DC/HR	Date:	5-Nov-96	
Sample Ma	itrix:	Soil			

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/kg
Diesel Range Organics (C10 - C28)		<5.0	mg/kg	5.0	mg/kg
	TOTAL	<5.0	mg/kg		

Quality Assurance Report

GRO QC No.: 0493-STD DRO QC No.: 0489-STD

**Calibration Check** True Method Unit of Analyzed Parameter Blank Measure Value Value % Diff Limit Gasoline Range (C5 - C9) 1,350 1,410 4.5 <50 15% ppb Diesel Range (C10 - C28) <5.0 100 97 2.8 15% ррт

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: 11/5/96 Date:

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT

LAB: (505) 325-1556



## AROMATIC VOLATILE ORGANICS

Attn: John Coy					Date:	6-Nov-96
Company: Conoco, Inc. cc: Cindy Gray					COC No.:	6172
Address: 3315 Bloomfield Hwy.					Sample No.	12742
City, State:	Farmington	, NM 87401		4-1325		
Project Name: Conoco - Farmington B Com 1						
Project Loca	ation:	Test Hole #2;	8'-10' bsg			,
Sampled by	:	CG	Date:	4-Nov-96	Time:	8:50
Analyzed by	/:	DC	Date:	5-Nov-96		
Sample Mat	rix:	Soil				

Laboratory Analysis

Parameter		ameter Result		Detection Limit	Units of Measur <del>e</del>
Benzene		0.4	ug/kg	0.2	ug/kg
Toluene		0.7	ug/kg	0.2	ug/kg
Ethylbenzene		1.6	ug/kg	0.2	ug/kg
m,p-Xylene		1.4	ug/kg	0.2	ug/kg
o-Xylene		2.3	ug/kg	0.2	ug/kg
	TOTAL	6.3	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 11/6

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OFF: (505) 325-5667

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LAB: (505) 325-1556

## TPH - Gasoline / Diesel Range Organics

Attn: John Coy			Date:	5-Nov-96	
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address: 3315 Bloomfield Hwy.				Sample No	o. 12743
City, State: Farmington, NM 87401				Job No.	4-1325
Project Nan	ne:	Conoco - Fari	mington B Com 1		
Project Loc	ation:	Test Hole #3;	6'-7.5' bsg		
Sampled by	/:	CG	Date:	4-Nov-96 Time:	9:20
Analyzed b	y:	DC/HR	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/ <b>kg</b>
Diesel Range Organics (C10 - C28)		66.3	mg/kg	5.0	mg/kg
	TOTAL	66.3	mg/kg		

Quality Assurance Report

 GRO QC No.:
 0493-STD

 DRO QC No.:
 0489-STD

Calibration Check							
Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit	
Gasoline Range (C5 - C9)	<50	ppb	1,350	1,410	4.5	15%	
Diesel Range (C10 - C28)	< 5.0	maa	100	97	2.8	15%	

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: Date: 11/5/96

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT.



OFF: (505) 325-5667

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# AROMATIC VOLATILE ORGANICS

Attn: John Coy				Date:	6-Nov-96
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address: 3315 Bloomfield Hwy.				Sample No.	12743
City, State:	Farmingt	on, NM 87401	Job No.	4-1325	
Project Nam	ne:	Conoco - Fa	armington B Com 1		
Project Loca	ation:	Test Hole #	t3; 6'-7.5' bsg		
Sampled by	:	CG	Date:	4-Nov-96 Time:	9:20
Analyzed by	/:	DC	Date:	5-Nov-96	
Sample Mat	rix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		<0.2	ug/kg	0.2	ug/kg
Toluene		1.4	ug/kg	0.2	ug/kg
Ethylbenzene		1.5	ug/kg	0.2	ug/kg
m,p-Xylene		3.3	ug/kg	0.2	ug/kg
o-Xylene		4.6	ug/kg	0.2	ug/kg
	TOTAL	10.8	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: 11/6 Date:

P.O. BOX 2606 • FARMINGTON, NM 87499

ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-5667

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## TPH - Gasoline / Diesel Range Organics

Attn: John Coy			Date:	5-Nov-96	
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address:	3315 Blo	oomfield Hwy.	Sample No.	12744	
City, State:	: Farmingt	on, NM 87401	Job No.	4-1325	
Project Name: Conoco - Farmington B Com 1					
Project Loc	ation:	Test Hole #4;	3'-5' bsg		
Sampled by	y:	CG	Date:	4-Nov-96 Time:	9:40
Analyzed by: DC/HR		Date:	5-Nov-96		
Sample Matrix: Soil		Soil			

#### Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/kg
Diesel Range Organics (C10 - C28)		<5.0	mg/kg	5.0	mg/kg
	TOTAL	<5.0	mg/kg		

Quality Assurance Report

GRO QC No.: 0493-STD

DRO QC No.: 0489-STD

Calibration C	heck					
Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Gasoline Range (C5 - C9)	<50	ppb	1,350	1,410	4.5	15%
Diesel Range (C10 - C28)	<5.0	ppm	100	97	2.8	15%

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: 11/5/96 Date:

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT

LAB: (505) 325-1556



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LAB: (505) 325-1556

# AROMATIC VOLATILE ORGANICS

Attn:	John Coy	/		Date:	6-Nov-96
Company: Conoco, Inc. cc: Cindy Gray			COC No.:	6172	
Address: 3315 Bloomfield Hwy.				Sample No.	12744
City, State:	Farmingto	on, NM 87401	Job No.	4-1325	
Project Nar	ne:	Conoco - F	armington B Com 1		
Project Loc	ation:	Test Hole #	#4; 3'-5' bsg		
Sampled by	/:	CG	Date:	4-Nov-96 Time:	9:40
Analyzed b	y:	DC	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		<0.2	ug/kg	0.2	ug/kg
Toluene		3.3	ug/kg	0.2	ug/kg
Ethylbenzene		<0.2	ug/kg	0.2	ug/kg
m,p-Xylene		1.2	ug/kg	0.2	ug/kg
o-Xylene		1.4	ug/kg	0.2	ug/kg
	TOTAL	5.9	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: \_\_\_\_\_ Date: 11/0/24

P.O. BOX 2606 • FARMINGTON, NM 87499 - Technology Biending Industry with the Environment -



## TPH - Gasoline / Diesel Range Organics

Attn:	John Co	/		Date:	5-Nov-96
Company: Conoco, Inc. cc: Cindy Gray			COC No.:	6172	
Address: 3315 Bloomfield Hwy.			Sample No.	12745	
City, State:	: Farmingt	on, NM 87401	Job No.	4-1325	
Project Nar	ne:	Conoco - Farm	ington B Com 1		
Project Loc	ation:	Test Hole #5;	3'-5' bsg		
Sampled by	y:	CG	Date:	4-Nov-96 Time:	10:10
Analyzed b	iy:	DC/HR	Date:	5-Nov-96	
Sample Ma	itrix:	Soil			

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/kg
Diesel Range Organics (C10 - C28)		<5.0	mg/kg	5.0	mg/kg
	TOTAL	<5.0	mg/kg		

Quality Assurance Report

GRO QC No.: 0493-STD DRO QC No.: 0489-STD

Calibration C	heck						
Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit	
Gasoline Range (C5 - C9)	< 50	ppb	1,350	1,410	4.5	15%	
Diesel Range (C10 - C28)	<5.0	ppm	100	97	2.8	15%	

Matrix Spike

OFF: (505) 325-5667

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: 11/5/92 Date:

P.O. BOX 2606 • FARMINGTON, NM 87499 - Technology Blending Industry with the Environment -



## AROMATIC VOLATILE ORGANICS

Attn: John Coy			Date:	6-Nov-96	
Company: Conoco, Inc. cc: Cindy Gray				COC No.:	6172
Address:	3315 Blo	oomfield Hwy.	Sample No.	12745	
City, State:	: Farmingt	on, NM 87401	Job No.	4-1325	
Project Name: Conoco - Farmington B Com 1			armington B Com 1		
Project Loc	ation:	Test Hole #	\$5; 3'-5' bsg		
Sampled by	/:	CG	Date:	4-Nov-96 Time:	10:10
Analyzed b	y:	DC	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		0.5	ug/kg	0.2	ug/kg
Toluene		0.9	ug/kg	0.2	ug/kg
Ethylbenzene		0.6	ug/kg	0.2	ug/kg
m,p-Xylene		1.8	ug/kg	0.2	ug/kg
o-Xylene		1.3	ug/kg	0.2	ug/kg
	TOTAL	5.1	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 796

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667

2

SITE TECHNOLOGIES, LTD.

OFF: (505) 325-5667

## TPH - Gasoline / Diesel Range Organics

Attn: J	lohn Coy	Date:	5-Nov-96
Company: (	Conoco, Inc. cc: Cindy Gray	COC No.:	6172
Address: 3	3315 Bloomfield Hwy.	Sample No.	12746
City, State: F	Farmington, NM 87401	Job No.	4-1325
Project Name	Conoco - Farmington B Com 1		
Project Locat	ion: Test Hole #6; 3'-5' bsg		
Sampled by:	CG Date:	4-Nov-96 Time:	10:50
Analyzed by:	DC/HR Date:	5-Nov-96	
Sample Matri	x: Soil		

#### Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/kg
Diesel Range Organics (C10 - C28)		453.3	mg/kg	5.0	mg/kg
	TOTAL	453.3	mg/kg		

Quality Assurance Report

GRO QC No.: 0493-STD

DRO QC No.:

0489-STD

Calibration C	heck			· · ·		
Parameter	Method Biank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Gasoline Range (C5 - C9)	<50	ррь	1,350	1,410	4.5	15%
Diesel Range (C10 - C28)	<5.0	ppm	100	97	2.8	15%

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: Date: 11/5/86

P.O. BOX 2606 • FARMINGTON, NM 87499

TECHNOLOGY REENDING INDUSTRY WITH THE ENVIRONMENT -

LAB: (505) 325-1556



LAB: (505) 325-1556

## AROMATIC VOLATILE ORGANICS

Attn:	John Coy	1		Date:	6-Nov-96
Company: Conoco, Inc. cc: Cindy Gray			COC No.	: 6172	
Address: 3315 Bloomfield Hwy.			Sample N	lo. 12746	
City, State:	Farmingt	on, NM 87401		Job No.	4-1325
Project Name: Conoco - Farmington B Com 1					
Project Loca	ation:	Test Hole #	6; 3'-5' bsg		
Sampled by	<i>r</i> :	CG	Date:	4-Nov-96 Time:	10:50
Analyzed by	y:	DC	Date:	5-Nov-96	
Sample Mar	trix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		1.6	ug/kg	0.2	ug/kg
Toluene		4.2	ug/kg	0.2	ug/kg
Ethylbenzene		3.4	ug/kg	0.2	ug/kg
m,p-Xylene		19.6	ug/kg	0.2	ug/kg
o-Xylene		14.8	ug/kg	0.2	ug/kg
	TOTAL	43.6	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 11/6/16

P.O. BOX 2606 • FARMINGTON, NM 87499 - Technology Blending Industry with the Environment - ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-5667

## TPH - Gasoline / Diesel Range Organics

Attn: John Coy			Date:	5-Nov-96	
Company: Conoco, Inc. cc: Cindy Gray			COC No.:	6172	
Address: 3315 Bloomfield Hwy.			Sample No.	12747	
City, State:	: Farmingt	on, NM 87401		Job No.	4-1325
Project Nar	ne:	Conoco - Farm			
Project Loc	ation:	Test Hole #7;	5'-7' bsg		
Sampled by	y:	CG	Date:	4-Nov-96 Time:	11:30
Analyzed b	y:	DC/HR	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Gasoline Range Organics (C5 - C9)		<5.0	mg/kg	5.0	mg/kg_
Diesel Range Organics (C10 - C28)		<5.0	mg/kg	5.0	mg/kg
	TOTAL	<5.0	mg/kg		

Quality Assurance Report

GRO QC No.: 0493-STD

DRO QC No.: 0489-STD

Calibration C						
Parameter	Method Biank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Gasoline Range (C5 - C9)	<50	ppb	1,350	1,410	4.5	15%
Diesel Range (C10 - C28)	<5.0	ppm	100	97	2.8	15%

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Gasoline Range (C5-C9)	111	92	(70-130)	13	20%
Diesel Range (C10-C28)	90	95	(70-130)	4	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by: 11/5/86 Date:

/

LAB: (505) 325-1556

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BIENDING INDUSTRY WITH THE ENVIRONMENT -



LAB: (505) 325-1556

## AROMATIC VOLATILE ORGANICS

Attn:	Attn: John Coy			Date:	6-Nov-96
Company: Conoco, Inc. cc: Cindy Gray			COC No.:	6172	
Address: 3315 Bloomfield Hwy.			Sample No.	12747	
City, State:	Farmingt	on, NM 87401		Job No.	4-1325
Project Name: Conoco - Farmington B Com 1					
Project Loc	ation:	Test Hole #	7; 5'-7' bsg		
Sampled by	/:	CG	Date:	4-Nov-96 Time:	11:30
Analyzed b	y:	DC	Date:	5-Nov-96	
Sample Ma	trix:	Soil			

Laboratory Analysis

Parameter		Result	Units of Measure	Detection Limit	Units of Measure
Benzene		<0.2	ug/kg	0.2	ug/kg
Toluene		1.6	ug/kg	0.2	ug/kg
Ethylbenzene		<0.2	ug/kg	0.2	ug/kg
m,p-Xylene		0.6	ug/kg	0.2	ug/kg
o-Xylene		0.4	ug/kg	0.2	ug/kg
	TOTAL	2.6	ug/kg		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: )\_\_\_\_ Date: 11/6 786

P.O. BOX 2606 • FARMINGTON, NM 87499 - TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -



OFF: (505) 325-5667

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# QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 5-Nov-96

Internal QC No.: 0515-QC Surrogate QC No.: 0516-QC Reference Standard QC No.: 0417-QC

Method Blank

		Units of
Analyte	Result	Measure
Average Amount of All Analytes In Blank	< 0.2	ppb

#### **Calibration Check**

Analyte	Units of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	19.9	0	15%
Toluene	ppb	20.0	20.9	.4	15%
Ethylbenzene	ppb	20.0	21.0	5	15%
m,p-Xylene	ppb	40.0	41.3	3	15%
o-Xylene	ppb	20.0	20.8	4	15%

Matrix Spike

Analyte	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	100	102	(39-150)	1	20%
Toluene	100	108	(46-148)	5	20%
Ethylbenzene	102	103	(32-160)	1	20%
m,p-Xylene	102	103	(35-145)	1	20%
o-Xylene	108	102	(35-145)	4	20%

#### Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovery	(70-130)		Limit Percent Recovery	(70-130)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
S1: Flourobenzene			S1: Flourobenzene		
12741-6172	94				
12742-6172	91				
12743-6172	94				
12744-6172	95			-	
12745-6172	95				
12746-6172	84				
12747-6172	95				

#### P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOCY BLENDING INDUSTRY WITH THE ENVIRONMENT -

6172 しき ノー 140 LAB ID よいと Date/Time 11/4//1 CHELI Checi ットたい )HtU Jitel H-tu カたい Special Instructions: Date/Time Date/Time ž Telefax No. Page. ANALYSIS REQUESTED Title J 10 Working Days 20 200 25 24-48 Hours Goldenrod – Client CHAIN OF CUSTODY RECORD 0203 4 51000 **Mailing Address** Q City, State, Zip Telephone No. Date: 11-4-96 Company Name Date/Time 11/4/b/L 13 40 Received by: Pink – Sampler Received by: Received by: Rush RESULTS TO Containers , тяочая Number of MATRIX PRES. Distribution: White – On Site Yellow – LAB Gul t : 2 ÷ 4 657 W. Maple • P. O. Box 2606 • Farmington NM 87499 LAB: (505) 325-5667 • FAX: (505) 325-6256 S: I Date 11/4/9 1 : \_\* -: : 0850 0220 0490 0830 0/01 1050 1130 TIME Date/Time Date/Time 2 2 7 1325 Dep 18 SAMPLE DATE : : 2 : <u>a</u> : 4-22 (Client Signature Must Accompany Request) Job No. **bsy** <del>2sg</del> 254 **bsq** 659 254 Farnington B Com A A SAMPLE IDENTIFICATION - /0 Sampler: C. A Surter - Grey 7'-9' C с і **ÔN SITE** 5-20-00 60 'n M 6 m<sup>-</sup> TECHNOLOGIES, LTD. City, State, Zip #6 # オメ F 0 ¥ S # 44 Purchase Order No.: Method of Shipment: Company Sampling Location: Address Authorized by: 6 Name Relinquished by: Relinquished by: Relinquished by: HJ/cH <u>.</u> : -: Test . ٤ : **ONBS** 

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M. C.     Date/Time N/4/b, 13 40     Received by:     Date/Time 11/1/// / / /       M. C.     Date/Time N/4/b, 13 40     Received by:     Date/Time 11/1/// / / /       M. C.     Date/Time N/4/b, 13 40     Received by:     Date/Time 11/1/// / / /       M. C.     Date/Time N/4/b, 13 40     Received by:     Date/Time 11/1/// / / /       M. C.     Date/Time N/4/b, 13 40     Received by:     Date/Time 11/1// / / /	"#9 S'-9'				7			A CHELI
M. V.     Date/Time     M/H/L     13 40     Received by:     Date/Time     Date/Time       Date/Time     Date/Time     Bate/Time     Date/Time     Date/Time     Date/Time       M. V.     Date/Time     Bate/Time     Bate/Time     Date/Time     Date/Time       Date/Time     Date/Time     Bate/Time     Date/Time     Date/Time       Date/Time     Date/Time     Received by:     Date/Time     Date/Time       M. V.     Date/Time     Rush     24-48 Hours     10 Working Days     Special Instructions:								
M     Date/Time     I/M/b     I3 40     Received by:     Date/Time     Date/Time       Date/Time     Date/Time     Bate/Time     Bate/Time     Date/Time       Date/Time     Date/Time     Received by:     Date/Time       Date/Time     Bate/Time     Received by:     Date/Time       Date/Time     Bate/Time     Received by:     Date/Time       Date/Time     Bate/Time     Received by:     Date/Time       Date/Time     Rush     24-48 Hours     10 Working Days								
Matrix     Date/Time     Date/Time     Date/Time       Date/Time     Beceived by:     Date/Time       Date/Time     Beceived by:     Date/Time       Date/Time     Bate/Time     Date/Time       Date/Time     Bate/Time     Date/Time			77					114/11-4
Date/Time     Received by:       Rush     24-48 Hours     10 Working Days	Relinduished by:	Date/Time	721		sived by:			Date/Time
M. 24-48 Hours 10 Working Days	Relinquished by:	Date/Time		Rec	sived by:			Date/Time
ALCA. Date 11/41	Method of Shipment:			Rus	ء			scial Instructions:
	ALCA.	Date <u>//</u>	-3	_				

Distribution: White - On Site Yellow - LAB Pink - Sampler Goldenrod - Client



## **AROMATIC VOLATILE ORGANICS**

Attn:	John Coy	/		Date:	6-Nov-96
Company:	Conoco,	Inc. cc: Cindy G	ray	COC No.:	6173
Address:	3315 Blo	omfield Hwy.		Sample No.	12751
City, State:	Farmingt	on, NM 87401		Job No.	4-1325
Project Nam	ne:	Conoco - Far	mington B Com 1		
Project Loca	ation:	Monitor Well	#1		
Sampled by	:	CG	Date:	4-Nov-96 Time:	15:40
Analyzed by	/:	DC	Date:	5-Nov-96	
Sample Mat	trix:	Liquid			

Laboratory Analysis

N N G

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OFF: (505) 325-5667

Parameter		Result	Unit of Measur <del>e</del>	Detection Limit	Unit of Measure
Benzene		<0.2	ug/L	0.2	ug/L
Toluene		<0.2	ug/L	0.2	ug/L
Ethylbenzene		< 0.2	ug/L	0.2	ug/L
m,p-Xylene		<0.2	ug/L	0.2	ug/L
o-Xylene		<0.2	ug/L	0.2	ug/L
	TOTAL	<0.2	ug/L		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: De C Date: 11/6/96

P.O. BOX 2606 • FARMINGTON, NM 87499 - Technology Blending Industry with the Environment -



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LAB: (505) 325-1556

## **AROMATIC VOLATILE ORGANICS**

Attn:	John Co	y		Date:	6-Nov-96
Company:	Conoco,	Inc. cc: Cindy Gr	ау	COC No.:	6173
Address:	3315 Blo	oomfield Hwy.		Sample No.	12752
City, State:	Farmingt	on, NM 87401		Job No.	4-1325
Project Nan	ne:	Conoco - Farn	nington B Com 1		
Project Loc	ation:	Monitor Well	#2		
Sampled by	/:	CG	Date:	4-Nov-96 Time:	15:55
Analyzed b	y:	DC	Date:	5-Nov-96	
Sample Ma	trix:	Líguid			

Laboratory Analysis

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene		<0.2	ug/L	0.2	ug/L
Toluene		< 0.2	ug/L	0.2	ug/L
Ethylbenzene		<0.2	ug/L	0.2	ug/L
m,p-Xylene		< 0.2	ug/L	0.2	ug/L
o-Xylene		<0.2	ug/L	0.2	ug/L
	TOTAL	<0.2	ug/L		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date: 11/6/56

P.O. BOX 2606 • FARMINGTON, NM 87499 - TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -



## AROMATIC VOLATILE ORGANICS

Attn:	John Co	Y		Date:	6-Nov-96
Company:	Conoco,	Inc. cc: Cindy Gr	ау	COC No.:	6173
Address:	3315 Blo	oomfield Hwy.		Sample No.	12753
City, State:	Farmingt	on, NM 87401		Job No.	4-1325
Project Nam	ne:	Conoco - Farr	nington B Com 1		
Project Loca	ation:	Monitor Well	#3		
Sampled by	<i>r</i> :	CG	Date:	4-Nov-96 Time:	16:10
Analyzed by	y:	DC	Date:	5-Nov-96	
Sample Mat	trix:	Liquid			

Laboratory Analysis

TYX: -

5

OFF: (505) 325-5667

:

Parameter		Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene		0.2	ug/L	0.2	ug/L
Toluene		1.5	ug/L	0.2	ug/L
Ethylbenzene		< 0.2	ug/L	0.2	ug/L
m,p-Xylene		0.9	ug/L	0.2	ug/L
o-Xylene		0.4	ug/L	0.2	ug/L
	TOTAL	3.0	ug/L		

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: Date:

P.O. BOX 2606 • FARMINGTON, NM 87499 - TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -



# QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 5-Nov-96

OFF: (505) 325-5667

Internal QC No.: 0515-QC Surrogate QC No.: 0516-QC Reference Standard QC No.: 0417-QC

Method Blank

		Unit of
Parameter	Result	Measure
Average Amount of All Analytes In Blank	<0.2	ррb

#### **Calibration Check**

	Unit of	True	Analyzed		
Parameter	Measure	Value	Value	% Diff	Limit
Benzene	ррь	20.0	19.9	0	15%
Toluene	ррь	20.0	20.9	.4	15%
Ethylbenzene	ppb	20.0	21.0	5	15%
m,p-Xylene	ррь	40.0	41.3	3	15%
o-Xylene	ppb	20.0	20.8	4	15%

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	100	102	(39-150)	1	20%
Toluene	100	108	(46-148)	5	20%
Ethylbenzene	102	103	(32-160)	1	20%
m,p-Xylene	102	103	(35-145)	1	20%
o-Xylene	108	102	(35-145)	4	20%

#### Surrogate Recoveries

S1	S2		S1	S2
1				Percent
Recovered	Recovered	Laboratory Identification	Recovered	Recovered
(70-130)		Limit Percent Recovered	(70-130)	
			i	
96				
96				
93				
	Percent Recovered (70-130) 96 96	PercentPercentRecoveredRecovered(70-130)	Percent RecoveredPercent RecoveredLaboratory Identification(70-130)Limit Percent Recovered96969696	Percent RecoveredPercent Laboratory IdentificationPercent Recovered(70-130)Limit Percent Recovered(70-130)969696

S1: Flourobenzene

### P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

	CHAIN OF CUST	[OD]	CUSTODY RECORD		6173
TECHNOLOGIES, LTD. V 657 W. Maple • P. O. Bo	Cate: . 657 W. Maple • P. O. Box 2606 • Farmington NM 87499 LAB: (505) 325-5667 • FAX: (505) 325-6256		7/ - 1/		Page / of /
Purchase Order No.: Job No.	4- 1325		Name (1, 1 4 )	. KN T	Title
Name		TR DT S	Company		
	Dept.		Mailing Address		
SEI Address		IS31 38	City, State, Zip		
			Telephone No.	1	Telefax No.
Sampling Location:				ANALYSIS REQUESTED	STED
FAPININ IN B-CUNH	년 / 년				
Sampler:		edmu Jimbe Jistric			
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SAMPLE IDENTIFICATION	DATE TIME MATRIX PRES.	Ś			
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	TECHNOLOGIES, LTD. V 657 W. Maple • P. O. Box 2606 • Farmington NM 87499 LAB: (505) 325-5667 • FAX: (505) 325-6256	57499		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		
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Alan II