

**3R - 85**

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# **REPORTS**

**DATE:**

**2/1/1998**

---



February 1, 1998

Conoco, Inc., Mid-Continent Region  
Attn.: Ms. Shirley Ebert, Field SHEAR Specialist  
3314 Bloomfield Hwy.  
Farmington, NM 87401

RECEIVED

FEB 27 1998

Environmental Bureau  
Oil Conservation Division

RE: 1997 Annual Ground Water Report  
Conoco Location: Farmington C Com 1  
Unit L, Sec. 15, T29N, R13W, NMPM, San Juan Co., NM

Dear Ms. Ebert:

The following report summarizes the ground water remediation and monitoring activities conducted by On Site Technologies Limited Partnership and/or others on behalf of Conoco, Inc. at the referenced oil and gas location. This report covered the prior calendar year of 1997, and follows the format outlined in the *Comprehensive Ground Water Remediation and Long-Term Monitoring Plan for Conoco Locations in the San Juan Basin, New Mexico*, submitted to the New Mexico Oil Conservation Division on October 15, 1997.

**SUMMARY OF 1997 ACTIVITIES:**

During April 1997, a Phase II Assessment of soil and ground water was performed to determine the extent of hydrocarbon contamination. Test Holes were drilled using a pickup mounted hydraulic punch and auger. During the assessment, three (3) monitoring wells were installed.

During September 1997, hydrocarbon contamination was excavated from three (3) areas at Farmington C Com #1. The three (3) areas of excavation involved approximately 424 cubic yards of contaminated soil. During excavation, the MW #1, installed during the April 1997 site assessment, was removed. This monitoring well was replaced and an additional well was installed in a down gradient location. Results of the soil excavation efforts and initial ground water sampling were previously documented in the following correspondence:

On Site Technologies, Ltd., April 16, 1997. letter to Mr. W. L. Brignon, Senior Council Conoco, Inc. Midland Division, regarding: *Site Assessment, Conoco Location, Farmington C Com #1, Unit L, Sec. 15, T29N, R13W, NMPM, San Juan Co., NM.*

On Site Technologies, Ltd., November 26, 1997. letter to Mr. Neal Goates, Senior Environmental Specialist, Conoco, Inc. Midland Division, regarding: *Remediation Summary, Conoco Location, Farmington C Com #1, Unit L, Sec. 15, T29N, R13W, NMPM, San Juan Co., NM.*

**SAMPLING:**

Following the approved Conoco plan, during each sampling event, water levels were measured on all monitoring wells prior to purging and sampling. Samples were collected in laboratory supplied containers, preserved as needed, and proper chain-of-custody protocol followed. Laboratory analyses ordered followed the Conoco Ground Water Plan.

Table 1 summarizes the monitoring well data and water levels measured during each sampling event. Table 2 summarizes the laboratory results for BTEX compounds from all water sampling completed at the referenced site, including assessment data. Table 3 summarizes the laboratory results for RCRA metals and API water quality testing, as required by NMOCD.

PO Box 2606  
Farmington, NM  
505-325-5667 FAX: 505-327-1496

Copies of all laboratory reports for the calendar year 1997, along with all laboratory QA/QC documentation and chain-of-custody, are attached with this report.

***SUMMARY AND CONCLUSIONS:***

The following conclusions are based on the 1997 ground water monitoring results and trends associated with a former production pit at the Farmington C Com #1 well location:

1. Except for contamination from BTEX constituents, there appears to have been no significant hydrocarbon impact to ground water above the New Mexico Water Quality Control Commission (NMWQCC) standards. The BTEX contamination appears to be limited to the immediate area of the former pit.
2. API water analysis indicates high TDS (i.e., 2,580 mg/L). This water quality is typical for shallow ground water at similar sites along the Animas River and is not suspected to have been a result of the ongoing oil and gas production at the site.
3. BTEX contamination of ground water has declined for monitoring well #2 and #3. This is the initial sampling of monitoring wells #1 and #4.

***RECOMMENDATIONS:***

1. Ground water monitoring to continue in accordance with Conoco's Comprehensive Ground Water Remediation and Long-Term Monitoring Plan.

***LIMITATIONS AND CLOSURE:***

This annual ground water report documents the results of ground water monitoring for the referenced Conoco well location during the calendar year 1997. This report follows the Conoco Ground Water Plan, dated October 15, 1997.

The scope of On Site Technologies' services consisted of project management, periodic water sampling and measurement of water levels, laboratory testing for ground water quality, and preparation of the annual report. All work has been performed in accordance with generally accepted professional practices in geotechnical, petroleum and environmental engineering, and hydrogeology.

This document has been prepared by On Site Technologies for the exclusive use of Conoco Inc. as it pertains to the referenced well location operated by Conoco.

If there are any questions regarding this status report, please contact either Myke Lane or Larry Trujillo at On Site Technologies, (505) 325-5667. Thank you for your consideration.

Respectfully submitted,



Larry Trujillo  
Project Manager



Michael K. Lane, P.E.  
Senior Engineer

On Site Technologies, Limited Partnership

- Attachments:
- Table 1: Monitoring Well Details and Ground Water Levels Summary
  - Table 2: Ground Water BTEX Analytical Summary
  - Table 3: Other Constituents Analytical Summary
  - Figure 1: Site Sketch
  - Figure 3: Ground Water Potentiometric Map (December, 1997)
  - Boring Logs and Monitoring Well Diagrams
  - Laboratory results, QA/QC, Chain of Custody

Acknowledgment:  
CONOCO, Inc.

 *STEWAM Spec.*  
\_\_\_\_\_  
(Name/Title)

*2/19/98*  
\_\_\_\_\_  
(Date)

MKL/mkl: 41374-97.doc.doc

On Site Technologies, Ltd.:  
 Table 1  
 Groundwater Elevation Summary  
 Farmington C-Com 1  
 Unit L, Sec. 15, T29N, R13W

Well Number	Top of Casing Elevation* (ft)	Total Depth of Well (ft)**	Well Type	Screen Interval (ft) (BGS)***	Sample Date	Depth to Groundwater (ft) (BTOC)***	Relative Groundwater Elevation (ft)
MW#1	99.87	8.87	2" PVC	3.9 to 8.9	12/4/97	6.63	93.24
MW#2	100.25	7.70	2" PVC	2.7 to 7.7	12/5/97	6.48	93.77
MW#3	101.11	8.90	2" PVC	3.87 to 8.87	12/5/97	6.58	94.53
MW#4	99.69	8.51	2" PVC	3.51 to 8.51	12/5/97	6.43	93.26

\* - approximate measurements taken as Below Ground Surface  
 BTOC - Below Top of Casing  
 NM - Not Measured

On Site Technologies  
Table 2

BTEX Analytical Summary  
Farmington C-COM 1  
Unit L, Sec. 15, T29N, R13W

Sample Date	Sample ID#	Monitor Well	Remarks	BTEX per EPA 8020 (ppb)				
				Benzene	Toluene	Ethylbenzene	Total Xylene	Total BTEX
12/4/97	17043	#1	On Site Lab.	109.1	1.0	91.0	77.7	278.8
12/4/97	17044	#2	On Site Lab.	0.4	BDL	BDL	BDL	0.4
12/5/97	17046	#3	On Site Lab.	BDL	0.3	BDL	0.2	0.5
12/5/97	17047	#4	On Site Lab.	0.7	1.5	2.2	3.7	8.1
<b>WQCC ACTION LEVELS</b>				<b>10.0</b>	<b>750.0</b>	<b>750.0</b>	<b>620.0</b>	

BDL Below Detection Levels

On Site Technologies  
 Table 3  
 Other Constituent Analytical Summary  
 Farmington C-COM 1  
 Unit L, Sec. 15, T29N, R13W  
 API Results Monitoring Well #1

CATIONS				ANIONS			
PARAMETER	RESULTS	UNIT OF MEASURE	WQCC Standards	PARAMETER	RESULT TS	UNIT OF MEASURE	WQCC Standards
Sodium	Na	314	mg/L	Chloride	Cl	171	mg/L
Calcium	Ca	332	mg/L	Sulfate	SO <sub>4</sub>	519	mg/L
Magnesium	Mg	74.0	mg/L	Carbonate	CO <sub>3</sub>	<1	mg/L
Potassium	K	13.1	mg/L	Bicarbonate	HCO <sub>3</sub>	1157	mg/L
				Hydroxide	HO	<1	mg/L
				Sulfide	S <sub>2</sub>	NA	
				Iron	Fe	0.26	mg/L
				Total Dissolved Solids		2580	mg/L
				Total Naphthalene		<0.00 <sup>1</sup>	mg/l
				benzo-a-pyrene		<0.00 <sup>2</sup>	mg/L
				pH		7.04	between 6 and 9
				Resistivity		3.8168	ohm-m
				Specific Gravity		1.0012	
				Total hardness of CaCO <sub>3</sub>		1134	mg/L

Sample Date: August 20, 1997

Difference Cation-Anion me/L 2.07

Total Cation-Anion me/L 71.25

Difference Cation-Anion 2.9%

**RCRA Metals**  
 Test Method SW-846

PARAMETER	RESULTS	UNITS	WQCC	UNITS
Mercury by CVAA	<0.0005	mg/L	0.002	mg/L
Arsenic by ICP	<0.15	mg/L	0.1	mg/L
Barium by ICP	0.85	mg/L	1.0	mg/L
Cadmium by ICP	<0.020	mg/L	0.01	mg/L
Chromium by ICP	<0.050	mg/L	0.05	mg/L
Lead by ICP	<0.20	mg/L	0.05	mg/L
Selenium by ICP	<0.35	mg/L	0.05	mg/L
Silver by ICP	<0.030	mg/L	0.05	mg/L

On Site Technologies  
 Table 3  
 Other Constituent Analytical Summary  
 Farmington C-COM 1  
 Unit L, Sec. 15, T29N, R13W  
**API Results Monitoring Well #2**

CATIONS				ANIONS			
PARAMETER	RESULTS	UNIT OF MEASUR E	WQCC Standards	PARAMETER	RESU LTS	UNIT OF MEASUR E	WQCC Standards
Sodium	Na	67	mg/L	Chloride	Cl	51	mg/L
Calcium	Ca	180	mg/L	Sulfate	SO <sub>4</sub>	306	mg/L
Magnesium	Mg	37.0	mg/L	Carbonate	CO <sub>3</sub>	<1	mg/L
Potassium	K	3.67	mg/L	Bicarbonate	HCO <sub>3</sub>	381	mg/L
				Hydroxide	HO	<1	mg/L
				Sulfide	S <sub>2</sub>	NA	
				Iron	Fe	<0.05	mg/L
				Total Dissolved Solids		1025	mg/L
				Total Naphthalene		0.07	mg/L
				benzo-a-pyrene		<0.00	mg/L
						2	
				pH		7.34	between 6 and 9
				Resistivity		9.3545	ohm-m
				Specific Gravity		1.0010	
				Total hardness of CaCO <sub>3</sub>		602	mg/L

**Sample Date:** August 20, 1997

Difference Cation-Anion me/L 0.96

Total Cation-Anion me/L 29.07

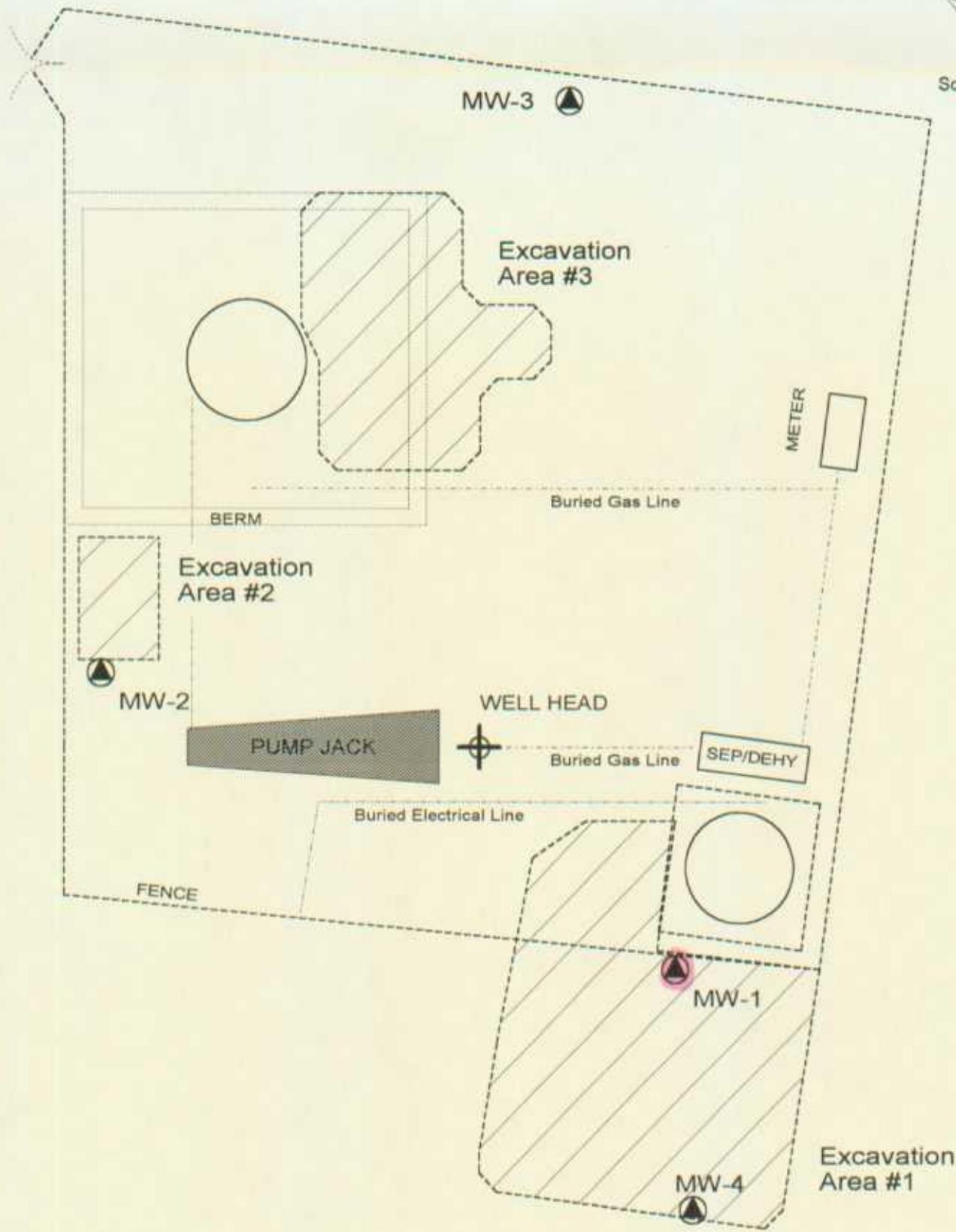
Difference Cation-Anion 3.3%

**RCRA Metals**  
 Test Method SW-846

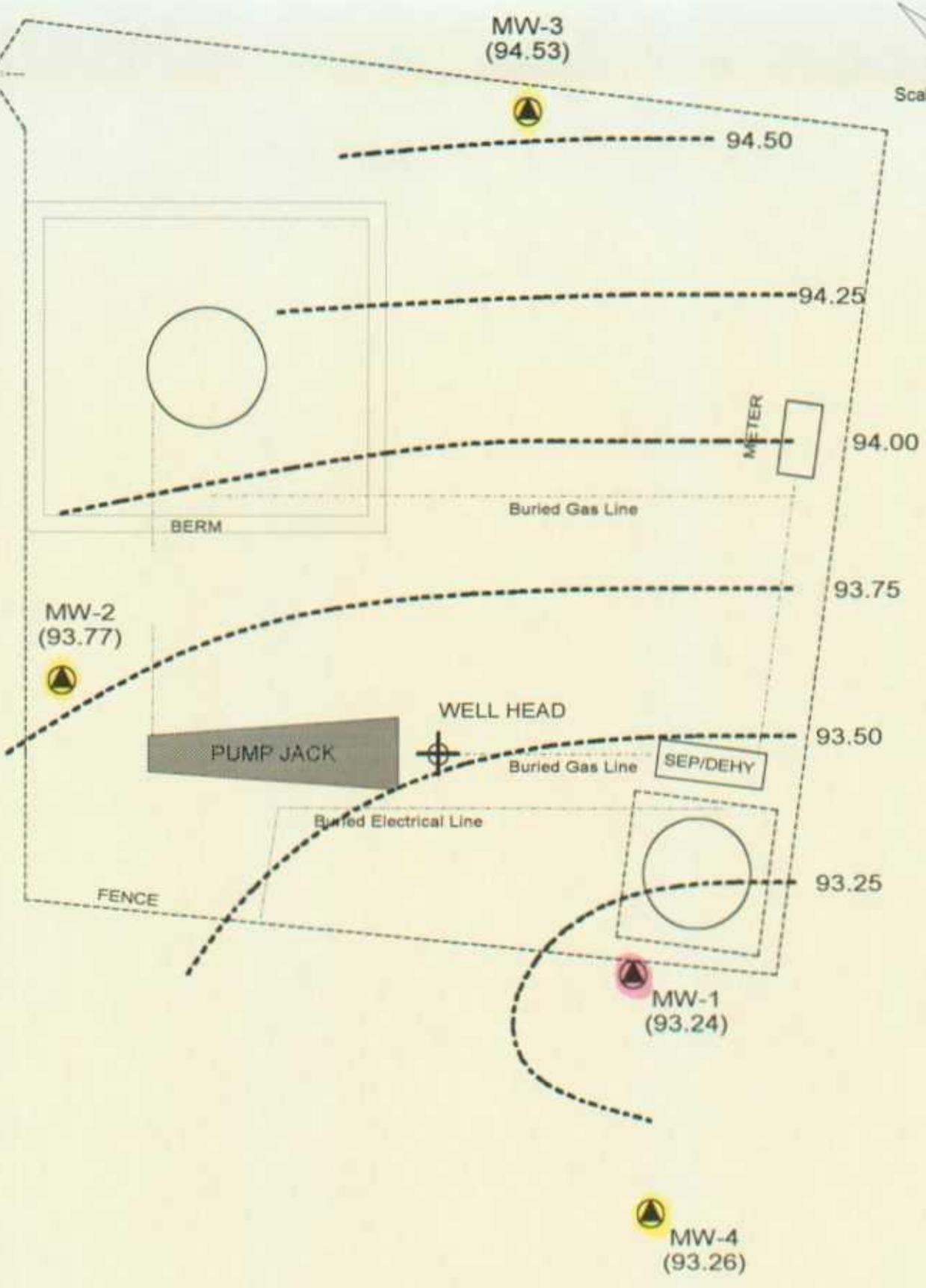
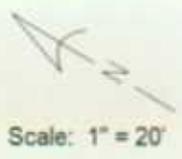
PARAMETER	RESULTS	UNITS	WQCC	UNITS
Mercury by CVAA	<0.0005	mg/L	0.002	mg/L
Arsenic by ICP	<0.15	mg/L	0.1	mg/L
Barium by ICP	0.27	mg/L	1.0	mg/L
Cadmium by ICP	<0.020	mg/L	0.01	mg/L
Chromium by ICP	<0.050	mg/L	0.05	mg/L
Lead by ICP	<0.20	mg/L	0.05	mg/L
Selenium by ICP	<0.35	mg/L	0.05	mg/L
Silver by ICP	<0.030	mg/L	0.05	mg/L



Scale: 1" = 20'



FARMINGTON "C" COM #1 Unit L, S15, T29W, R13W SAN JUAN BASIN, NM		<b>SITE SKETCH</b>		 <b>ON SITE TECHNOLOGIES, LTD.</b> P.O. BOX 2606, FARMINGTON, NM 87499 (505) 325-5667
PROJECT NO: 4-1373		DRWN: 11-03-97		
FIGURE: 1		DRWN BY: MKL		
FILE: 41303S4.CAD	PROJECT: 1997 Ground Water Report			



FARMINGTON "C" COM #1 Unit L, S15, T29W, R13W SAN JUAN BASIN, NM		Ground Water Potentiometric Map December 4, 1997	 <b>ON SITE TECHNOLOGIES, LTD.</b> P.O. BOX 2606, FARMINGTON, NM 87499 (505) 323-5667
PROJECT NO: 4-1373		DRWN: 11-03-97	
FIGURE: 2		DRWN BY: MKL	
FILE: 41373F2.CAD	PROJECT: 1997 Ground Water Report		

On Site Technologies Ltd. Partnership  
P.O. BOX 2606, FARMINGTON, NM 87499  
(505) 327-1072

TEST HOLE LOG & MONITORING WELL DETAIL  
**Monitoring Well: MW-1**

Project: CONOCO: Site Remediation Farmington "C" COM #1  
Project No: 4-1373

Project Location: Farmington "C" COM #1		Logged By: Larry Trujillo	Approved: M K Lane
Drilling Contractor: Consolidated Contractors		Date Started:	Date Completed:
Drilling Equipment: Trackhoe	Driller: NA	TD Exc. (ft): 6.0	Static Water Depth (ft):
Drilling Method: NA	Borehole Dia. (in): 2.5	TOC Elevation:	Ground Elevation:
Sampling Method: NA		Well Casing (Diameter & Type): 2 in. - Sch 40 PVC	
COMMENTS: 'New' monitoring well (MW-1) set by hand auger in backfill material following pit remediation by excavation.		Slot Size (in): 0.010	Filter Material: Silica Sand 10/20
Development Method: Bailer			

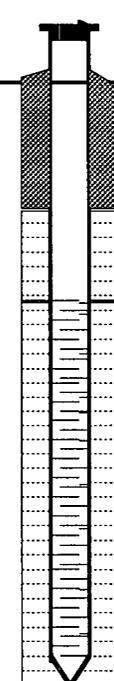
Depth (feet)	Depth to Water During Drilling (ft)	USCS	Lithology	Field Description & Remarks	Sampled Interval	Field PID Reading	Lab TPH: EPA 418.1 (ppm)	Monitoring Well Construction & Remarks
SURFACE								Well secured with 2 in. locking plug.
2.5'		SP/SM		CLEAN IMPORTED FILL: Light Brown SANDY SILT to SILTY SAND, moist to wet, firm, earth odor.				5% Bentonite Cement Grout to surface.
5.0'				Static Water Level: approx. 6 ft.				Top of Filter Pack
7.5'		GW		Lt. Gray SILTY GRAVEL with fine sand, saturated, dense, well rounded and well graded.				Top of Screened Interval
10'				TOTAL DEPTH: 9'-0"				Bottom of Screened Interval: 8.9 ft
25'								Total Depth: 9.0 ft.

BY: MKL  
DATE: 1/23/98  
FILE: 91429B2.CAD

  
**On Site Technologies Ltd. Partnership**  
 P.O. BOX 2606, FARMINGTON, NM 87499  
 (505) 327-1072

**TEST HOLE LOG & MONITORING WELL DETAIL**  
**Monitoring Well: MW-2**  
 Project: CONOCO: Site Remediation Farmington "C" COM #1  
 Project No: 4-1373

Project Location: Farmington "C" COM #1		Logged By: Myke Lane	Approved: M K Lane
Drilling Contractor: Blagg Engineering		Date Started: 3/97	Date Completed: 3/97
Drilling Equipment: Pickup Rig	Driller: J. Blagg	TD (ft): 8.0	Static Water Depth (ft):
Drilling Method: Flight Auger	Borehole Dia. (in): 2.5	TOC Elevation:	Ground Elevation:
Sampling Method: NA		Well Casing (Diameter & Type): 2 in. - Sch 40 PVC	
COMMENTS: Monitoring well (MW-2) set by pickup mounted auger rig for preliminary assessment.		Slot Size (in): 0.010	Filter Material: Silica Sand 10/20
		Development Method: Bailer	

Depth (feet)	Depth to Water During Drilling (ft)	USCS	Lithology	Field Description & Remarks	Sampled Interval	Field PID Reading	Lab TPH: EPA 418.1 (ppm)	Monitoring Well Construction & Remarks
SURFACE								 <p>Well secured with 2 in. locking plug.</p>
2.5'		GM/GW	[Cross-hatched pattern]	Light Gray SILTY GRAVEL to SANDY GRAVEL, moist to wet, dense, well rounded, well sorted.				<p>5% Bentonite Cement Grout to surface.</p> <p>Top of Filter Pack</p> <p>Top of Screened Interval</p>
5.0'	▽			Static Water Level: approx. 6 ft.				<p>Bottom of Screened Interval: 7 ft</p>
7.5'								
10'				TOTAL DEPTH: 8'-0"				
25'								

BY : MKL  
 DATE : 2/11/98  
 FILE : 91373b2.CAD

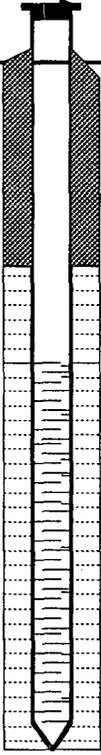
On Site Technologies Ltd. Partnership  
P.O. BOX 2606, FARMINGTON, NM 87499  
(505) 327-1072

TEST HOLE LOG & MONITORING WELL DETAIL  
**Monitoring Well: MW-3**

Project: CONOCO: Site Remediation Farmington "C" COM #1  
Project No: 4-1373

Project Location: Farmington "C" COM #1		Logged By: Myke Lane	Approved: M K Lane
Drilling Contractor: Blagg Engineering		Date Started: 3/97	Date Completed: 3/97
Drilling Equipment: Pickup Rig	Driller: J. Blagg	TD (ft): 9.0	Static Water Depth (ft):
Drilling Method: Flight Auger	Borehole Dia. (in): 2.5	TOC Elevation:	Ground Elevation:
Sampling Method: NA	Well Casing (Diameter & Type): 2 in. - Sch 40 PVC		
COMMENTS: Monitoring well (MW-3) set by pickup mounted auger rig for preliminary assessment.	Slot Size (in): 0.010	Filter Material: Silica Sand 10/20	
	Development Method: Bailer		

Depth (feet)	Depth to Water During Drilling (ft)	USCS	Lithology	Field Description & Remarks	Sampled Interval	Field PID Reading	Lab TPH: EPA 418.1 (ppm)	Monitoring Well Construction & Remarks
0' SURFACE								Well secured with 2 in. locking plug.
2.5'		GM/GW		Light Gray SILTY GRAVEL to SANDY GRAVEL, moist to wet, dense, well rounded, well sorted.				5% Bentonite Cement Grout to surface.
5.0'				Static Water Level: approx. 6 ft.				Top of Filter Pack
7.5'								Top of Screened Interval
10'				TOTAL DEPTH: 9'-0"				Bottom of Screened Interval: 8.8ft
25'								



BY: MKL  
DATE: 2/11/98  
FILE: 9137363.CAD

**On Site Technologies Ltd. Partnership**  
 P.O. BOX 2606, FARMINGTON, NM 87499  
 (505) 327-1072

**TEST HOLE LOG & MONITORING WELL DETAIL**  
**Monitoring Well: MW-4**

Project: CONOCO: Site Remediation Farmington "C" COM #1  
 Project No: 4-1373

Project Location: Farmington "C" COM #1		Logged By: Larry Trujillo	Approved: M K Lane
Drilling Contractor: Consolidated Contractors		Date Started:	Date Completed:
Drilling Equipment: Trackhoe	Driller: NA	TD Exc. (ft): 6.0	Static Water Depth (ft):
Drilling Method: NA	Borehole Dia. (in): 2.5	TOC Elevation:	Ground Elevation:
Sampling Method: NA		Well Casing (Diameter & Type): 2 in. - Sch 40 PVC	
COMMENTS: Monitoring well (MW-4) set by hand auger in backfill material following pit remediation by excavation.		Slot Size (in): 0.010	Filter Material: Silica Sand 10/20
		Development Method: Bailer	

Depth (feet)	Depth to Water During Drilling (ft)	USCS	Lithology	Field Description & Remarks	Sampled Interval	Field PID Reading	Lab TPH: EPA 418.1 (ppm)	Monitoring Well Construction & Remarks
SURFACE								Well secured with 2 in. locking plug.
2.5'		SP/SM		CLEAN IMPORTED FILL: Light Brown SANDY SILT to SILTY SAND, moist to wet, firm, earth odor.				5% Bentonite Cement Grout to surface.
5.0'								Top of Filter Pack
								Top of Screened Interval
7.5'		GW		Lt. Gray SILTY GRAVEL with fine sand, saturated, dense, well rounded and well graded.				Bottom of Screened Interval: 8.5 ft
10'				TOTAL DEPTH: 9'-0"				Total Depth: 9.0 ft.
25'								

BY: MKL  
 DATE: 2/11/98  
 FILE: 91373B4.CAD

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *9-Dec-97*  
 COC No.: *6758*  
 Sample No.: *17046*  
 Job No.: *4-1373*

Project Name: *Conoco, Inc. - Farmington C-Com #1*  
 Project Location: *MW#31*  
 Sampled by: *LT/TY* See      Date: *5-Dec-97*      Time: *8:16*  
 Analyzed by: *DC*      Date: *8-Dec-97*  
 Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	109.1	ug/L	0.2	ug/L
<i>Toluene</i>	1.0	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	91.0	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	77.0	ug/L	0.2	ug/L
<i>o-Xylene</i>	0.7	ug/L	0.2	ug/L
<i>TOTAL</i>	278.8	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*  
 Date: *12/10/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -



HOUSTON LABORATORY  
 8880 INTERCHANGE DRIVE  
 HOUSTON, TEXAS 77054  
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712544-02

On Site Technologies  
 612 East Murray  
 Farmington, NM 87401  
 ATTN: David Cox

P.O.#  
 6757/58  
 12/24/97

PROJECT: PAH Analysis  
 SITE: Farmington C-Com-1  
 SAMPLED BY: On Site Technologies  
 SAMPLE ID: Farmington C-Com-1 MW#1

PROJECT NO: 4-1373  
 MATRIX: WATER  
 DATE SAMPLED: 12/05/97 08:30:00  
 DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.1	ug/L
Acenaphthylene	ND	0.1	ug/L
Acenaphthene	ND	0.3	ug/L
Fluorene	ND	0.3	ug/L
Phenanthrene	ND	0.1	ug/L
Anthracene	ND	0.1	ug/L
Fluoranthene	ND	0.1	ug/L
Pyrene	ND	0.1	ug/L
Chrysene	ND	0.1	ug/L
Benzo (a) anthracene	ND	0.1	ug/L
Benzo (b) fluoranthene	ND	0.1	ug/L
Benzo (k) fluoranthene	ND	0.1	ug/L
Benzo (a) pyrene	ND	0.1	ug/L
Dibenzo (a,h) anthracene	ND	0.1	ug/L
Benzo (g,h,i) perylene	ND	0.1	ug/L
Indeno (1,2,3-cd) pyrene	ND	0.1	ug/L
1-Methylnaphthalene	ND	0.2	ug/L
2-Methylnaphthalene	ND	0.2	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1-Fluoronaphthalene	0.20 ug/L	66	50	150
Phenanthrene d-10	0.20 ug/L	90	50	150

ANALYZED BY: KA DATE/TIME: 12/13/97 01:42:20  
 EXTRACTED BY: PC DATE/TIME: 12/11/97 08:00:00  
 METHOD: 8310 Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Practical Quantitation Limit ND - Not Detected  
 NA - Not Analyzed

COMMENTS: Lab ID: A046-6758

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *11-Dec-97*  
 COC No.: *6758*  
 Sample ID.: *17046*  
 Job No.: *4-1373*

Project Name: **Conoco, Inc. - Farmington C-Com #1**  
 Project Location: **MW #1**  
 Sampled by: **LT/TY**  
 Analyzed by: **HR**

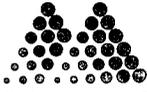
Date: *5-Dec-97* Time: **NR**  
 Date: *10-Dec-97*

**API RP-45 Laboratory Analysis**

Parameter	Result	Unit of Measure	Result	Unit of Measure
<i>Cations</i>				
Sodium Na	314	mg/L	13.66	me/L
Calcium Ca	332	mg/L	16.57	me/L
Magnesium Mg	74.0	mg/L	6.09	me/L
Potassium K	13.1	mg/L	0.33	me/L
<i>Anions</i>				
Chloride Cl	171	mg/L	4.82	me/L
Sulfate SO4	519	mg/L	10.81	me/L
Carbonate CO3	<1	mg/L	<0.01	me/L
Bicarbonate HCO3	1157	mg/L	18.96	me/L
Hydroxide OH	<1	mg/L	<0.01	me/L
Sulfide S2	NA	mg/L	NA	me/L
Iron Fe	0.26	mg/L	<0.01	me/L
Total Dissolved Solids			<i>Cation-Anion Balance</i>	
Calculated, Sum of Cation/Anion	2580	mg/L	2.07 Difference Cation-Anion, me/L	
			71.25 Total Cation-Anion, me/L	
			2.9 % Difference Cation-Anion	
pH	7.04		<i>Comments</i>	
Resistivity	3.8168	ohm-m	NA: Not Analyzed	
Specific Gravity	1.0012			
Total Hardness as CaCO3	1134	mg/L		

Approved by: *[Signature]*  
 Date: *12/11/97*

# Analytical Report



## Mountain States Analytical, Inc.

The Quality Solution

On Site Technologies, Ltd.  
612 E Murray Drive  
Farmington, NM 87401

Attn: Mr. David Cox  
Project: Farmington C-Com #1

Sample ID: 17053-6760

Matrix: Waste Water

Anal # 3

new #1

11/6/98  
11/28/98

MSAI Sample: 72556  
MSAI Group: 18973  
Date Reported: 12/22/97  
Discard Date: 01/21/98  
Date Submitted: 12/10/97  
Date Sampled: 12/05/97  
Collected by: LT  
Purchase Order: 6758  
Project No.: 4-1373

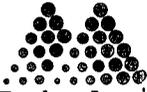
Test Analysis	Results as Received	Units	Limit of Quantitation
0259B Mercury by CVAA, w/ww, 7470 Method: SW-846 7470	ND	mg/l	0.0005
0392I Flame/ICP Prep, w/ww, 3005A Method: SW-846 3005A	Batch. w910		
0392M Mercury Prep CVAA, w/ww, 7470 Method: SW-846 7470	Batch. w914		
7245 Arsenic by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.15
7246 Barium by ICP, w/ww, 6010A Method: SW-846 6010A	0.85	mg/l	0.02
7249 Cadmium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.020
7251 Chromium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.050
7255 Lead by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.20
7264 Selenium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.35
7266 Silver by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.030

10  
Years of  
Quality  
Service

Corporate Office  
1645 West 2200 South, Salt Lake City, Utah 84119  
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278  
e-mail: service@msailabs.com

Southwest States Region  
6223 Bayonne, Spring, Texas 77389  
281-320-2842 • FAX 281-320-0989  
e-mail: gbrewer@msailabs.com





Mountain States Analytical, Inc.  
On Site Technologies, Ltd. *The Quality Solution*

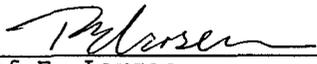
Sample ID: 17053-6760

MSAI Sample: 72556  
MSAI Group: 18973

ND - Not detected at the limit of quantitation

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,  
Reviewed and Approved by:

  
Rolf E. Larsen  
Project Manager

10  
Years of  
Quality  
Service

Corporate Office  
1645 West 2200 South, Salt Lake City, Utah 84119  
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278  
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6223 Bayonne, Spring, Texas 77389  
281-320-2842 • FAX 281-320-0989  
e-mail: [gbrewer@msailabs.com](mailto:gbrewer@msailabs.com)



OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *9-Dec-97*  
 COC No.: *6757*  
 Sample No.: *17044*  
 Job No.: *4-1373*

Project Name: *Conoco, Inc. - Farmington C-Com-1*  
 Project Location: *MW #2*  
 Sampled by: *LT* Date: *4-Dec-97* Time: *NR*  
 Analyzed by: *DC* Date: *5-Dec-97*  
 Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	0.4	ug/L	0.2	ug/L
<i>Toluene</i>	ND	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	ND	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	0.4	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*  
 Date: *12/9/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *11-Dec-97*  
 COC No.: *6757*  
 Sample ID.: *17044*  
 Job No.: *4-1373*

Project Name: **Conoco, Inc. - Farmington C-Com-1**  
 Project Location: **MW #2**  
 Sampled by: **LT** Date: **4-Dec-97** Time: **NR**  
 Analyzed by: **HR** Date: **10-Dec-97**

**API RP-45 Laboratory Analysis**

Parameter	Result	Unit of Measure	Result	Unit of Measure
<u>Cations</u>				
Sodium <i>Na</i>	67	mg/L	2.89	me/L
Calcium <i>Ca</i>	180	mg/L	8.98	me/L
Magnesium <i>Mg</i>	37.0	mg/L	3.04	me/L
Potassium <i>K</i>	3.67	mg/L	0.09	me/L
<u>Anions</u>				
Chloride <i>Cl</i>	51	mg/L	1.44	me/L
Sulfate <i>SO4</i>	306	mg/L	6.37	me/L
Carbonate <i>CO3</i>	< 1	mg/L	< 0.01	me/L
Bicarbonate <i>HCO3</i>	381	mg/L	6.24	me/L
Hydroxide <i>OH</i>	< 1	mg/L	< 0.01	me/L
Sulfide <i>S2</i>	NA	mg/L	NA	me/L
Iron <i>Fe</i>	< 0.05	mg/L	< 0.01	me/L
Total Dissolved Solids Calculated, Sum of Cation/Anion	1025	mg/L	<u>Cation-Anion Balance</u> 0.96 Difference Cation-Anion, me/L 29.07 Total Cation-Anion, me/L 3.3 % Difference Cation-Anion  <u>Comments</u> NA: Not Analyzed	
pH	7.34			
Resistivity	9.3545	ohm-m		
Specific Gravity	1.0010			
Total Hardness as CaCO3	602	mg/L		

Approved by: *[Signature]*  
 Date: *12/11/97*



HOUSTON LABORATORY  
 8880 INTERCHANGE DRIVE  
 HOUSTON, TEXAS 77054  
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712544-01

On Site Technologies  
 612 East Murray  
 Farmington, NM 87401  
 ATTN: David Cox

P.O.#  
 6757/58  
 12/24/97

PROJECT: PAH Analysis  
 SITE: Farmington C-Com-1  
 SAMPLED BY: On Site Technologies  
 SAMPLE ID: Farmington C-Com-1 MW#2

PROJECT NO: 4-1373  
 MATRIX: WATER  
 DATE SAMPLED: 12/04/97 15:01:00  
 DATE RECEIVED: 12/10/97

ANALYTICAL DATA

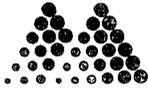
PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	37	11	ug/L
Acenaphthylene	ND	2.00	ug/L
Acenaphthene	ND	6.00	ug/L
Fluorene	ND	6.00	ug/L
Phenanthrene	ND	2.00	ug/L
Anthracene	ND	2.00	ug/L
Fluoranthene	ND	2.00	ug/L
Pyrene	ND	2.00	ug/L
Chrysene	ND	2.00	ug/L
Benzo (a) anthracene	ND	2.00	ug/L
Benzo (b) fluoranthene	ND	2.00	ug/L
Benzo (k) fluoranthene	ND	2.00	ug/L
Benzo (a) pyrene	ND	2.00	ug/L
Dibenzo (a,h) anthracene	ND	2.00	ug/L
Benzo (g,h,i) perylene	ND	2.00	ug/L
Indeno (1,2,3-cd) pyrene	ND	2.00	ug/L
1-Methylnaphthalene	16	11	ug/L
2-Methylnaphthalene	17	11	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1-Fluoronaphthalene	0.20 ug/L	D	50	150
Phenanthrene d-10	0.20 ug/L	D	50	150

ANALYZED BY: KA\_ DATE/TIME: 12/13/97 01:06:20  
 EXTRACTED BY: PC DATE/TIME: 12/11/97 08:00:00  
 METHOD: 8310 Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Practical Quantitation Limit ND - Not Detected  
 NA - Not Analyzed  
 D - Diluted, control limits not applicable.

COMMENTS: Lab ID: A044-6757

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.



## Mountain States Analytical, Inc.

On Site Technologies, Ltd.  
612 E Murray Drive  
Farmington, NM 87401

The Quality Solution

Attn: Mr. David Cox  
Project: Farmington C-Com #1

Sample ID: 17045-6758 *RAW #2*  
Matrix: Waste Water

*me 1/6/98*

MSAI Sample: 72555  
MSAI Group: 18973  
Date Reported: 12/22/97  
Discard Date: 01/21/98  
Date Submitted: 12/10/97  
Date Sampled: 12/05/97  
Collected by: LT  
Purchase Order: 6758  
Project No.: 4-1373

Test Analysis	Results as Received	Units	Limit of Quantitation
259B Mercury by CVAA, w/ww, 7470 Method: SW-846 7470	ND	mg/l	0.0005
392I Flame/ICP Prep, w/ww, 3005A Method: SW-846 3005A	Batch. w910		
0392M Mercury Prep CVAA, w/ww, 7470 Method: SW-846 7470	Batch. w914		
7245 Arsenic by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.15
7246 Barium by ICP, w/ww, 6010A Method: SW-846 6010A	0.27	mg/l	0.02
7249 Cadmium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.020
251 Chromium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.050
255 Lead by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.20
264 Selenium by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.35
266 Silver by ICP, w/ww, 6010A Method: SW-846 6010A	ND	mg/l	0.030



On Site ~~Technologies, Ltd.~~ **Mountain States Analytical, Inc.**

*The Quality Solution*

MSAI Sample: 72555

MSAI Group: 18973

Sample ID: 17045-6758

ND - Not detected at the limit of quantitation

This report consists of the following items: A cover letter, a signed analytical report for each sample specified on the cover letter, and if applicable, an inorganic quality control summary. Organic sample reports contain footnotes which describe any quality control anomalies which may have occurred.

Respectfully Submitted,  
Reviewed and Approved by:

Rolf E. Larsen  
Project Manager

10  
Years of  
Quality  
Service

Corporate Office  
1645 West 2200 South, Salt Lake City, Utah 84119  
801-973-0050 • 1-800-973-6724(MSAI) • FAX 801-972-6278  
e-mail: service@msailabs.com

Southwest States Region  
6223 Bayonne, Spring, Texas 77389  
281-320-2842 • FAX 281-320-0989  
e-mail: gbrewer@msailabs.com



OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *9-Dec-97*  
 COC No.: *6757*  
 Sample No.: *17043*  
 Job No.: *4-1373*

Project Name: *Conoco, Inc. - Farmington C-Com-1*  
 Project Location: *MW #13*  
 Sampled by: *LT* Date: *4-Dec-97* Time: *14:39*  
 Analyzed by: *DC* Date: *5-Dec-97*  
 Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	0.3	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	0.2	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	0.5	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*  
 Date: *12/9/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Larry Trujillo*  
 Company: *On Site Technologies, Ltd. c/o Conoco, Inc.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *9-Dec-97*  
 COC No.: *6758*  
 Sample No.: *17047*  
 Job No.: *4-1373*

Project Name: ***Conoco, Inc. - Farmington C-Com #1***  
 Project Location: ***MW#4***  
 Sampled by: *LT/TY* Date: *5-Dec-97* Time: *8:30*  
 Analyzed by: *DC* Date: *8-Dec-97*  
 Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	0.7	ug/L	0.2	ug/L
<i>Toluene</i>	1.5	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	2.2	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	1.5	ug/L	0.2	ug/L
<i>o-Xylene</i>	2.2	ug/L	0.2	ug/L
<i>TOTAL</i>	8.1	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*  
 Date: *12/10/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
 COC No.: *5055*  
 Sample No.: *13909*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *MW#2*  
 Sampled by: *ML/BC* Date: *17-Mar-97* Time: *15:15*  
 Analyzed by: *DC* Date: *18-Mar-97*  
 Sample Matrix: *Liquid*

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>0.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>9.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>&lt;0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>&lt;0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>10.0</i>	<i>ug/L</i>		

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

Approved By: *[Signature]*  
 Date: *3/19/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
Company: *On Site Technologies, Ltd.*  
Address: *612 E. Murray Drive*  
City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
COC No.: *5055*  
Sample No.: *13910*  
Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
Project Location: *MW#3*  
Sampled by: *ML/BC*  
Analyzed by: *DC*  
Sample Matrix: *Liquid*

Date: *17-Mar-97* Time: *15:10*  
Date: *18-Mar-97*

---

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>1.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>106.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>&lt;0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>0.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>108.3</i>	<i>ug/L</i>		

---

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

Approved By: *[Signature]*  
Date: *3/19/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
 COC No.: *5055*  
 Sample No.: *13911*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *Trip Blank*  
 Sampled by: *ML/BC*  
 Analyzed by: *DC*  
 Sample Matrix: *Liquid*

Date: *17-Mar-97* Time: *14:30*  
 Date: *18-Mar-97*

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

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

Approved By: *[Signature]*  
 Date: *3/19/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

**QUALITY ASSURANCE REPORT**  
for EPA Method 8020

Date Analyzed: 18-Mar-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0529/30-QC

**Method Blank**

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

**Calibration Check**

Parameter	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	19.6	2	15%
Toluene	ppb	20.0	20.2	1	15%
Ethylbenzene	ppb	20.0	20.6	3	15%
m,p-Xylene	ppb	40.0	39.4	1	15%
o-Xylene	ppb	20.0	20.3	1	15%

**Matrix Spike**

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	77	91	(39-150)	4	20%
Toluene	94	100	(46-148)	4	20%
Ethylbenzene	94	86	(32-160)	5	20%
m,p-Xylene	82	94	(35-145)	4	20%
o-Xylene	96	101	(35-145)	4	20%

**Surrogate Recoveries**

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
13908-5055	95				
13909-5055	97				
13910-5055	95				
13911-5055	96				

S1: Fluorobenzene

pe

OFFICE: (505) 327-8786  
FAX: (505) 327-1496



LAB: (505) 325-5667  
FAX: (505) 325-6256

April 16, 1997

Conoco, Inc., Midland Division  
Exploration and Production, North America  
10 Desta Drive, Suite 100W  
Midland, Texas 79705-4500

Attn.: Mr. W.L. Brignon, Senior Counsel

RE: Site Assessment  
Farmington "C" COM #1  
Unit L, Sec. 15, T29N, R13W, NMPM  
San Juan County, NM

Project No: 4-1373

The following summary has been prepared by On Site Technologies Limited Partnership for Conoco. The summary describes the findings of Phase II Assessment of soil and ground water at the referenced oil/gas well location, for hydrocarbon contamination identified during the transfer of operating interest. The assessment consisted of the delineation of soil contamination (i.e. vertical and lateral extent) and installation of three monitor wells to screen water quality and establish the site ground water gradient.

#### ASSESSMENT BRIEF:

On March 11, 1997, 22 test holes were drilled using a pick-up mounted hydraulic punch and auger unit equipped with 2 and 3 inch flight augers. Test holes ranged in depth from 4.5 to 7 feet in depth. Refer to Sheet 1 for approximate test hole locations.

One to two grab soil samples of the augered cuttings were collected from each test hole and field tested for volatile hydrocarbons per the NMOCD Field Heated Headspace Method. Selected split samples were also collected in 4 oz. glass containers with Teflon® closures, labeled, and placed on ice for delivery to the laboratory. Lab samples were tested for Total Petroleum Hydrocarbons (TPH) per EPA Method 8015M and select samples were tested for BTEX per EPA Method 8020 to verify the Headspace results. Table 1 summarizes the soil test results.

Ground water impact from hydrocarbons was suspected. Three monitor wells were installed in selected test holes. One monitor well was located in the area of up gradient, and two were located in areas of suspected contamination (Refer to Sheet 1). Monitor wells were constructed of 2 inch Sch. 40 PVC with 5 feet of 0.010 inch slotted pipe. The annular space was sand packed with 10-20 mesh clean sand. Due to the shallow depth to ground water and anticipated rise in the water table, the top of the screen was located within 12 inches of the surface, and only a thin bentonite seal was placed around each well at the surface. Each well was developed by removing approximately ten well volumes or until dry.

On March 17, 1997, a level survey was completed to establish relative elevations for the monitor well tops of casing. Water levels were then measured from the top of casing for each well, and the water table elevations were calculated. Refer to Sheet 1 for the ground water surface contour. Following the water level measurements, water samples were collected from each well. Prior to sampling, each well

was purged by bailing approximately three well volumes. Water samples were placed in 40 ml VOA glass vials, labeled and placed on ice for delivery to the lab. Samples were analyzed for BTEX per EPA Method 8020. Table 2 summarizes the monitor well data, and Table 3 summarizes the water lab results.

#### RESULTS:

Subsurface soils were typical alluvium consisting of silty clayey sands in the top 2 to 3 feet overlying coarse sand, gravel and cobbles. Ground water was measured at 4 to 5 feet below the ground surface.

TPH and BTEX soil contamination was found from approximately 3 to 6 feet below the surface in three areas: south of the production tank, in west of the tank berm in a surface depression, and under and west of the separator/dehy tank. Soil contamination appears limited outside of the fenced location in the area of the separator tank. Approximate aerial extent of tank, northwest depression and separator tank are: 820 square feet(sf), 150 sf and 1,800 sf, respectively (Refer to Sheet 2). Assuming soil contamination averages four feet thick, approximately 121 cubic yards, 22 cy, and 275 cy of contaminated soil above current NMOCD standards are present.

Ground water, at the time of this assessment and seasonal period, is relatively flat, having a gradient of 0.005 feet/foot to the west-southwest. No BTEX contamination of ground water above the New Mexico Water Quality Control Commission (WQCC) standards. Ground water contamination noted by Merrion Oil during due diligence inquiries in January, 1997 may have been the result of cross contamination, as the samples were taken from backhoe excavated test holes.

No other areas of soil or ground water contamination were found during this assessment effort or earlier efforts by Merrion Oil, the current operator.

#### RECOMMENDATIONS:

The following proposed corrective actions are recommended based on the findings of this assessment, proximity of the site to the Animas River and recent operating interest transfer:

- Removal by excavation of impacted soils with hydrocarbon contamination above current NMOCD maximum contaminant levels for TPH (per EPA Method 8015M) and/or BTEX (per Field Heated Headspace Method and/or EPA Method 8020). Excavated soils to be removed offsite for proper disposal.
- Following the soil removal, abandonment of all monitor wells meeting NMOCD standards.

#### LIMITATIONS AND CLOSURE:

This summary documents visual observations of the site, subsurface conditions encountered during this Phase II Assessment, and analysis of soil and groundwater samples collected during the assessment. This summary does not reflect subsurface variations which may exist between sampling points, or subsurface changes which may occur due to seasonal variations.

The scope of our services consisted of the performance of a Phase II Assessment and included advancement of 22 soil borings to reasonably define the lateral and vertical extent of soil contamination, installation of three monitoring wells to assess the possible extent and magnitude of ground water contamination, field and lab testing of soil and water for hydrocarbon contamination, and preparation of

a summary. All work has been performed in accordance with generally accepted professional practices in geotechnical, petroleum and environmental engineering, and hydrogeology.

This document has been prepared by On Site Technologies for the exclusive use of Conoco Inc. as it pertains to the referenced well location formerly operated by Conoco. At your request, On Site has furnished a copy of this assessment report to Mr. C. John Coy, SHEAR Specialist, in the Conoco Farmington office.

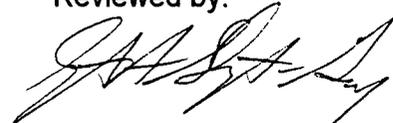
If there are any questions regarding this status report, please contact either Cindy Gray or Myke Lane at On Site Technologies, (505) 325-5667. Thank you for considering On Site to assist you with this matter.

Respectfully submitted,



Michael K. Lane, P.E.  
Senior Engineer

Reviewed by:



Cynthia Sluyter-Gray  
Environmental Services Manager

On Site Technologies Limited Partnership

- Attachments: Table 1: Soil Test Results  
Table 2: Monitor Well Data  
Table 3: Water Lab Results  
Sheet 1: Site Sketch and Ground Water Surface Contour  
Sheet 2: Site Sketch and Estimated Soil Contamination

MKL/mkl: 41373rpt

CONFIDENTIAL

TABLE 1: SUMMARY OF SOIL SAMPLES  
 FARMINGTON C COM #1  
 Unit L, Sec. 15, T29N, R13W, NMPM  
 SAN JUAN COUNTY, NM

SAMPLE LOCATION	DATE	DEPTH <sup>(1)</sup> (ft)	PID <sup>(2)</sup> (units)	Benzene (ppm)	Total BTEX <sup>(3)</sup> (ppm)	TPH <sup>(4)</sup> (ppm)
TH-1	3/11/97	3-4	2.0			
TH-1	3/11/97	5-6	166.9	<0.01	49.7	1300
TH-2	3/11/97	2-3		No	Recovery	
TH-3	3/11/97	4.5-5		No	Recovery	
TH-4	3/11/97	5-6	ND			
TH-5	3/11/97	4-5	0.2			
TH-6	3/11/97	3.5-4.5	ND			
TH-6	3/11/97	5.5-6.5	ND			
TH-7	3/11/97	4.5-5.5	ND			
TH-8	3/11/97	3-4	ND			
TH-8	3/11/97	6.5-7.5	ND			
TH-9	3/11/97	3-4	ND			
TH-9	3/11/97	6.5-7.5	ND			
TH-10	3/11/97	3-4	ND			
TH-10	3/11/97	6.5-7.5	ND			
TH-11	3/11/97	4-5	ND			12.4
TH-12	3/11/97	4-5	ND			
TH-13	3/11/97	4-5	ND			
TH-14	3/11/97	4-5	154	<0.01	14.5	1903.1
TH-15	3/11/97	4-5	ND			
TH-16	3/11/97	4.5-5	ND			< 6
TH-17	3/11/97	4.5-5	ND			
TH-18	3/11/97	4.5-5	ND			
TH-19	3/11/97	4-5	>2500	33.4	126.5	20021
TH-20	3/11/97	4.5-5.5	5.7			
TH-21	3/11/97	4.5-5.5	ND			
TH-22	3/11/97	4.5-5.5	ND			
NMOCD Action Levels	Feb. 1993		100	10	50	100

- Notes:
- (1) Depth below ground surface.
  - (2) PID: Results of field headspace samples measured with an organic vapor meter equipped with a photoionization detector, and Benzene Response Factor of 0.56.
  - (3) BTEX: Benzene, Toluene, Ethyl-benzene, and total Xylenes measured by EPA Method 8020.
  - (4) TPH: Total Petroleum Hydrocarbons as measured by EPA Method 8015 (mod.).
  - (5) ND: Not detected.

CONFIDENTIAL

TABLE 2: MONITOR WELL DATA & WATER ELEVATION DATA  
FARMINGTON "C" COM #1  
Unit L, Sec. 15, T29N, R13W, NMPM  
San Juan County, NM

On Site Technologies, Ltd.  
Project No: 4-1373

March, 1997

MONITOR WELL	Date	Top of Casing Elevation	Total Well Depth (ft)	Top of Screen (bgs)	Depth to Ground Water (ft)	Ground Water Elevation	Change in Water Elevation
MW-1	03/17/97	100.40	9.10	4.00	6.54	93.86	--
MW-2	03/17/97	100.29	8.38	3.38	6.31	93.98	--
MW-3	03/17/97	101.12	8.14	3.10	6.71	94.41	--

Notes: 1) All elevations relative to arbitrary benchmark at well head flange with an elevation of 100.00.

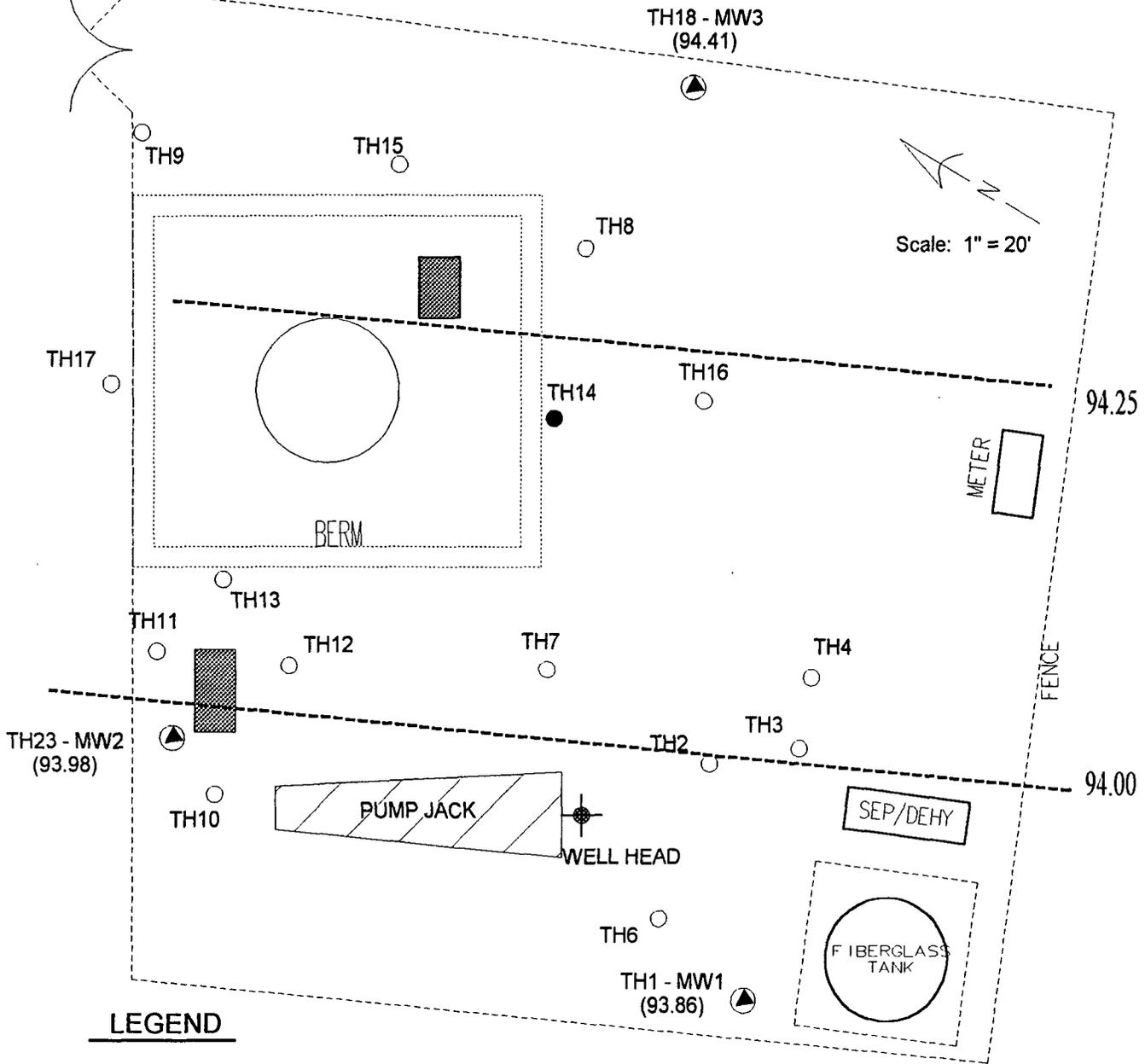
CONFIDENTIAL

TABLE 3: SUMMARY OF WATER SAMPLE RESULTS  
FARMINGTON "C" COM #1  
Unit L, Sec.15, T29N, R13W, NMPM  
San Juan County, NM

(ppb or ug/L)

Sample Location	Date	Water Elevation	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX
MW-1	03/17/97	93.86	<0.2	14.9	2.7	2.1	19.7
MW-2	03/17/97	93.98	0.8	9.0	<0.2	0.2	10.0
MW-3	03/17/97	94.41	1.0	106.5	<0.2	0.7	108.3
Action Levels	11/18/93		10	750	750	620	

- Notes: (1) Water elevations based on site bench mark of 100.00.  
(2) ND: Not detected at or above NMWQCC specified detection limits.



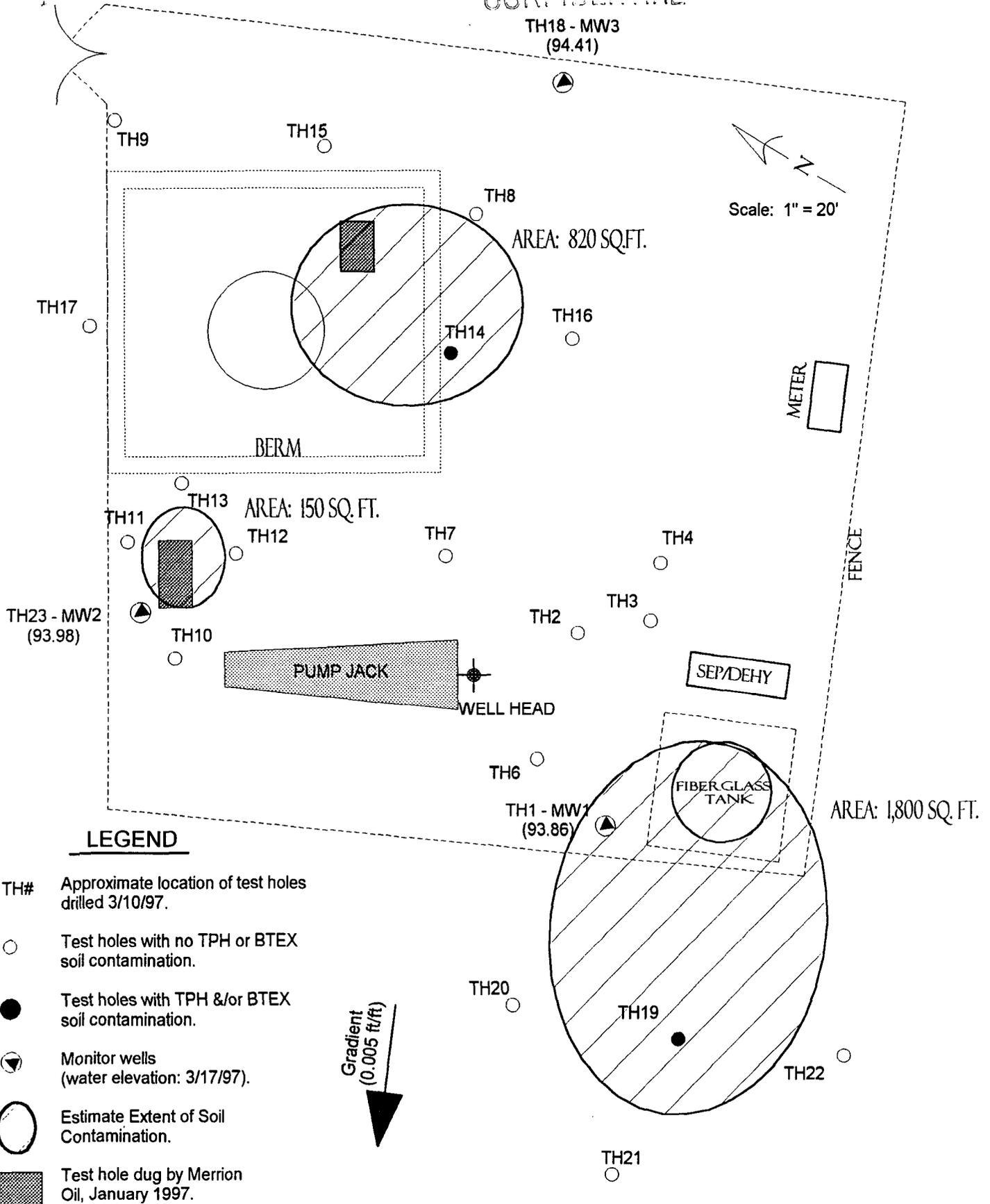
**LEGEND**

- TH# Approximate location of test holes drilled 3/10/97.
- Test holes with no TPH or BTEX soil contamination.
- Test holes with TPH &/or BTEX soil contamination.
- ▲ Monitor wells (water elevation: 3/17/97).
- - - Estimate Ground Water Surface.
- Test holes dug by Merrion Oil in January 1997.



FARMINGTON "C" COM #1 SAN JUAN BASIN, NM		<b>SITE SKETCH</b>			
PROJECT: SITE ASSESSMENT		DRWN: 03-18-97		ON SITE TECHNOLOGIES, LTD.	
PROJECT NO: 4-1373		DRWN BY: MKL		P.O. BOX 2606, FARMINGTON, NM 87499	
SHEET: 1	FILE: 413731.CAD	REVISED: 04-07-97		(505) 325-5667	

TH18 - MW3  
(94.41)



**LEGEND**

- TH# Approximate location of test holes drilled 3/10/97.
- Test holes with no TPH or BTEX soil contamination.
- Test holes with TPH &/or BTEX soil contamination.
- ◐ Monitor wells (water elevation: 3/17/97).
- Estimate Extent of Soil Contamination.
- ▨ Test hole dug by Merrion Oil, January 1997.

FARMINGTON "C" COM #1 SAN JUAN BASIN, NM		<b>SITE SKETCH</b>		 <b>ON SITE TECHNOLOGIES, LTD.</b> P.O. BOX 2606, FARMINGTON, NM 87499 (505) 325-5667
PROJECT: SITE ASSESSMENT	DRWN: 03-18-97			
PROJECT NO: 4-1373	DRWN BY: MKL			
SHEET: 2	FILE: 413731.CAD	REVISED:		

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
Company: *On Site Technologies, Ltd. c/o Conoco*  
Address: *612 E. Murray Drive*  
City, State: *Farmington, NM 87401*

Date: *20-Mar-97*  
COC No.: *5039*  
Sample No.: *13861*  
Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
Project Location: *TC1 @ 5'-6'*  
Sampled by: *MKL* Date: *11-Mar-97* Time: *8:30*  
Analyzed by: *DC/HR* Date: *18-Mar-97*  
Sample Matrix: *Soil*

**Laboratory Analysis**

Parameter	Result	Unit of Measure	Method Detection Limit	Unit of Measure
<i>Gasoline Range Organics (C5 - C9)</i>	<i>99</i>	<i>mg/kg</i>	<i>1.0</i>	<i>mg/kg</i>
<i>Diesel Range Organics (C10 - C28)</i>	<i>1201</i>	<i>mg/kg</i>	<i>5.0</i>	<i>mg/kg</i>

**Quality Assurance Report**

GRO QC No.: *0535-STD*  
DRO QC No.: *0512-STD*

**Continuing Calibration Verification**

Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	RPD	RPD Limit
<i>Gasoline Range (C5 - C9)</i>	<i>&lt;50</i>	<i>ppb</i>	<i>1,351</i>	<i>1,361</i>	<i>0.7</i>	<i>15%</i>
<i>Diesel Range (C10 - C28)</i>	<i>&lt;5.0</i>	<i>ppm</i>	<i>100</i>	<i>115</i>	<i>13.7</i>	<i>15%</i>

**Matrix Spike**

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	RPD Limit
<i>Gasoline Range (C5-C9)</i>	<i>81</i>	<i>83</i>	<i>(70-130)</i>	<i>2</i>	<i>20%</i>
<i>Diesel Range (C10-C28)</i>	<i>101</i>	<i>101</i>	<i>(70-130)</i>	<i>0</i>	<i>20%</i>

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

Approved by: *[Signature]*  
Date: *3/20/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *25-Mar-97*  
 COC No.: *5039*  
 Sample No.: *13861*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*

Project Location: *TC1 @ 5'-6'*

Sampled by: *MKL* Date: *11-Mar-97* Time: *8:30*

Analyzed by: *DC* Date: *21-Mar-97*

Sample Matrix: *Soil*

#### Laboratory Analysis

<i>Parameter</i>	<i>Result</i>	<i>Units of Measure</i>	<i>Detection Limit</i>	<i>Units of Measure</i>
<i>Benzene</i>	<i>1.1</i>	<i>ug/kg</i>	<i>0.2</i>	<i>ug/kg</i>
<i>Toluene</i>	<i>30.2</i>	<i>ug/kg</i>	<i>0.2</i>	<i>ug/kg</i>
<i>Ethylbenzene</i>	<i>1018.9</i>	<i>ug/kg</i>	<i>0.2</i>	<i>ug/kg</i>
<i>m,p-Xylene</i>	<i>1737.6</i>	<i>ug/kg</i>	<i>0.2</i>	<i>ug/kg</i>
<i>o-Xylene</i>	<i>2181.6</i>	<i>ug/kg</i>	<i>0.2</i>	<i>ug/kg</i>
<i>TOTAL</i>	<i>4969.4</i>	<i>ug/kg</i>		

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

Approved by: *[Signature]*  
 Date: *3/25/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd. c/o Conoco*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *20-Mar-97*  
 COC No.: *5039*  
 Sample No.: *13862*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *TC11 @ 4'-5'*  
 Sampled by: *MKL* Date: *11-Mar-97* Time: *10:57*  
 Analyzed by: *DC/HR* Date: *19-Mar-97*  
 Sample Matrix: *Soil*

*Laboratory Analysis*

Parameter	Result	Unit of Measure	Method Detection Limit	Unit of Measure
<i>Gasoline Range Organics (C5 - C9)</i>	<i>&lt;1.0</i>	<i>mg/kg</i>	<i>1.0</i>	<i>mg/kg</i>
<i>Diesel Range Organics (C10 - C28)</i>	<i>12.4</i>	<i>mg/kg</i>	<i>5.0</i>	<i>mg/kg</i>

*Quality Assurance Report*

*GRO QC No.: 0535-STD*  
*DRO QC No.: 0512-STD*

*Continuing Calibration Verification*

Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	RPD	RPD Limit
<i>Gasoline Range (C5 - C9)</i>	<i>&lt;50</i>	<i>ppb</i>	<i>1,351</i>	<i>1,361</i>	<i>0.7</i>	<i>15%</i>
<i>Diesel Range (C10 - C28)</i>	<i>&lt;5.0</i>	<i>ppm</i>	<i>100</i>	<i>115</i>	<i>13.7</i>	<i>15%</i>

*Matrix Spike*

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	RPD Limit
<i>Gasoline Range (C5-C9)</i>	<i>81</i>	<i>83</i>	<i>(70-130)</i>	<i>2</i>	<i>20%</i>
<i>Diesel Range (C10-C28)</i>	<i>101</i>	<i>101</i>	<i>(70-130)</i>	<i>0</i>	<i>20%</i>

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

Approved by: *[Signature]*  
 Date: *3/20/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

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OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd. c/o Conoco*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
 COC No.: *5039*  
 Sample No.: *13863*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *TC14 @ 4'-5'*  
 Sampled by: *MKL* Date: *11-Mar-97* Time: *11:49*  
 Analyzed by: *DC/HR* Date: *19-Mar-97*  
 Sample Matrix: *Soil*

*Laboratory Analysis*

Parameter	Result	Unit of Measure	Method Detection Limit	Unit of Measure
<i>Gasoline Range Organics (C5 - C9)</i>	<i>9.1</i>	<i>mg/kg</i>	<i>1.0</i>	<i>mg/kg</i>
<i>Diesel Range Organics (C10 - C28)</i>	<i>1894</i>	<i>mg/kg</i>	<i>5.0</i>	<i>mg/kg</i>

*Quality Assurance Report*

*GRO QC No.: 0535-STD*  
*DRO QC No.: 0512-STD*

*Continuing Calibration Verification*

Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	RPD	RPD Limit
<i>Gasoline Range (C5 - C9)</i>	<i>&lt; 50</i>	<i>ppb</i>	<i>1,351</i>	<i>1,379</i>	<i>2.0</i>	<i>15%</i>
<i>Diesel Range (C10 - C28)</i>	<i>&lt; 5.0</i>	<i>ppm</i>	<i>100</i>	<i>102</i>	<i>2.0</i>	<i>15%</i>

*Matrix Spike*

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	RPD Limit
<i>Gasoline Range (C5-C9)</i>	<i>116</i>	<i>126</i>	<i>(70-130)</i>	<i>8</i>	<i>20%</i>
<i>Diesel Range (C10-C28)</i>	<i>101</i>	<i>101</i>	<i>(70-130)</i>	<i>0</i>	<i>20%</i>

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

Approved by: *[Signature]*  
 Date: *3/20/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *25-Mar-97*  
 COC No.: *5039*  
 Sample No.: *13863*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *TC14 @ 4'-5'*  
 Sampled by: *MKL* Date: *11-Mar-97* Time: *11:49*  
 Analyzed by: *DC* Date: *21-Mar-97*  
 Sample Matrix: *Soil*

#### Laboratory Analysis

<i>Parameter</i>	<i>Result</i>	<i>Units of Measure</i>	<i>Detection Limit</i>	<i>Units of Measure</i>
<i>Benzene</i>	0.6	ug/kg	0.2	ug/kg
<i>Toluene</i>	87.1	ug/kg	0.2	ug/kg
<i>Ethylbenzene</i>	253.5	ug/kg	0.2	ug/kg
<i>m,p-Xylene</i>	452.5	ug/kg	0.2	ug/kg
<i>o-Xylene</i>	652.0	ug/kg	0.2	ug/kg
	<i>TOTAL</i>	1445.7		ug/kg

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

Approved by: *DC*  
 Date: *3/25/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

**ANALYTICAL REPORT**

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd. c/o Conoco*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *20-Mar-97*  
 COC No.: *5039*  
 Sample No.: *13864*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *TC19 @ 4'-5'*  
 Sampled by: *MKL*  
 Analyzed by: *DC/HR*  
 Sample Matrix: *Soil*

Date: *11-Mar-97* Time: *14:00*  
 Date: *19-Mar-97*

**Laboratory Analysis**

Parameter	Result	Unit of Measure	Method Detection Limit	Unit of Measure
<i>Gasoline Range Organics (C5 - C9)</i>	<i>1681</i>	<i>mg/kg</i>	<i>1.0</i>	<i>mg/kg</i>
<i>Diesel Range Organics (C10 - C28)</i>	<i>18340</i>	<i>mg/kg</i>	<i>5.0</i>	<i>mg/kg</i>

**Quality Assurance Report**

GRO QC No.: *0535-STD*  
 DRO QC No.: *0512-STD*

**Continuing Calibration Verification**

Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	RPD	RPD Limit
<i>Gasoline Range (C5 - C9)</i>	<i>&lt;50</i>	<i>ppb</i>	<i>1,351</i>	<i>1,361</i>	<i>0.7</i>	<i>15%</i>
<i>Diesel Range (C10 - C28)</i>	<i>&lt;5.0</i>	<i>ppm</i>	<i>100</i>	<i>115</i>	<i>13.7</i>	<i>15%</i>

**Matrix Spike**

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	RPD	RPD Limit
<i>Gasoline Range (C5-C9)</i>	<i>81</i>	<i>83</i>	<i>(70-130)</i>	<i>2</i>	<i>20%</i>
<i>Diesel Range (C10-C28)</i>	<i>101</i>	<i>101</i>	<i>(70-130)</i>	<i>0</i>	<i>20%</i>

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

Approved by: *[Signature]*  
 Date: *3/20/97*

P.O. BOX 2606 • FARMINGTON, NM 87499





**QUALITY ASSURANCE REPORT**  
for EPA Method 8020

Date Analyzed: 21-Mar-97

Internal QC No.: 0527-STD  
Surrogate QC No.: 0528-STD  
Reference Standard QC No.: 0529/30-QC

**Method Blank**

Analyte	Result	Units of 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	19.6	2	15%
Toluene	ppb	20.0	20.4	2	15%
Ethylbenzene	ppb	20.0	20.9	4	15%
m,p-Xylene	ppb	40.0	40.0	0	15%
o-Xylene	ppb	20.0	20.9	4	15%

**Matrix Spike**

Analyte	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	107	126	(39-150)	12	20%
Toluene	110	130	(46-148)	11	20%
Ethylbenzene	114	134	(32-160)	11	20%
m,p-Xylene	108	127	(35-145)	11	20%
o-Xylene	103	123	(35-145)	12	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: Flourobenezene			S1: Flourobenezene		
13861-5039	78				
13863-5039	82				
13864-5039	88				

(2)



OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
 COC No.: *5055*  
 Sample No.: *13908*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *MW#1*  
 Sampled by: *ML/BC* Date: *17-Mar-97* Time: *15:20*  
 Analyzed by: *DC* Date: *18-Mar-97*  
 Sample Matrix: *Liquid*

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>&lt;0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>14.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>2.7</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>1.1</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>1.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>19.7</i>	<i>ug/L</i>		

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

Approved By: *Call*  
 Date: *3/19/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

TECHNOLOGY BLENDING INDUSTRY WELFARE FOUNDATION

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
Company: *On Site Technologies, Ltd.*  
Address: *612 E. Murray Drive*  
City, State: *Farmington, NM 87401*

Date: 19-Mar-97  
COC No.: 5055  
Sample No.: 13909  
Job No.: 4-1373

Project Name: *Conoco - Farmington C Com #1*  
Project Location: *MW#2*  
Sampled by: *ML/BC* Date: 17-Mar-97 Time: 15:15  
Analyzed by: *DC* Date: 18-Mar-97  
Sample Matrix: *Liquid*

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<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	0.8	ug/L	0.2	ug/L
<i>Toluene</i>	9.0	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	<0.2	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	0.2	ug/L	0.2	ug/L
<i>o-Xylene</i>	<0.2	ug/L	0.2	ug/L
<i>TOTAL</i>	10.0	ug/L		

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

Approved By: *[Signature]*  
Date: 3/19/97

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### ANALYTICAL REPORT

Attn: *Michael Lane*  
 Company: *On Site Technologies, Ltd.*  
 Address: *612 E. Murray Drive*  
 City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
 COC No.: *5055*  
 Sample No.: *13910*  
 Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
 Project Location: *MW#3*  
 Sampled by: *ML/BC* Date: *17-Mar-97* Time: *15:10*  
 Analyzed by: *DC* Date: *18-Mar-97*  
 Sample Matrix: *Liquid*

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>1.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>106.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>&lt;0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>0.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>108.3</i>	<i>ug/L</i>		

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

Approved By: *[Signature]*  
 Date: *3/19/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

### ANALYTICAL REPORT

Attn: *Michael Lane*  
Company: *On Site Technologies, Ltd.*  
Address: *612 E. Murray Drive*  
City, State: *Farmington, NM 87401*

Date: *19-Mar-97*  
COC No.: *5055*  
Sample No.: *13911*  
Job No.: *4-1373*

Project Name: *Conoco - Farmington C Com #1*  
Project Location: *Trip Blank*  
Sampled by: *ML/BC*  
Analyzed by: *DC*  
Sample Matrix: *Liquid*

Date: *17-Mar-97* Time: *14:30*  
Date: *18-Mar-97*

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

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

Approved By: *[Signature]*  
Date: *3-19-97*

OFF: (505) 325-5667



LAB: (505) 325-1556

**QUALITY ASSURANCE REPORT**  
for EPA Method 8020

Date Analyzed: 18-Mar-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0529/30-QC

**Method Blank**

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

**Calibration Check**

Parameter	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	19.6	2	15%
Toluene	ppb	20.0	20.2	1	15%
Ethylbenzene	ppb	20.0	20.6	3	15%
m,p-Xylene	ppb	40.0	39.4	1	15%
o-Xylene	ppb	20.0	20.3	1	15%

**Matrix Spike**

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	77	91	(39-150)	4	20%
Toluene	94	100	(46-148)	4	20%
Ethylbenzene	94	86	(32-160)	5	20%
m,p-Xylene	82	94	(35-145)	4	20%
o-Xylene	96	101	(35-145)	4	20%

**Surrogate Recoveries**

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
13908-5055	95				
13909-5055	97				
13910-5055	95				
13911-5055	96				

S1: Fluorobenzene

pe

