



Culpepper Martin #4 Energen

Date Remediation Started: 04/19/1999

Date Completed: 04/20/1999

Remediation Method:

Excavation ☒

Approx. Cubic Yard 1031

(Check all appropriate sections)

Landfarmed ☒

Amount Landfarmed (cubic yds) 1031

Other

Remediation Location:

Onsite ☒

Offsite

(i.e., landfarmed onsite, name and location of offsite facility)

Backfill Material Location:

General Description of Remedial Action:

Excavated contaminated soil to a pit size of 43.5' X 32' X 20' and landfarmed soil onsite within a bermed area at a depth of 6" to 12". Soil was aerated by disking/plowing until soil met regulatory levels.

\*\*\* Vertical extent drilling conducted to 35'. See attached risk analysis form.

Ground Water Encountered:

No



Yes



Depth

Final Pit Closure Sampling:

Sample Location 5 pt. composite - bottom.

(if multiple samples, attach sample result and diagram of sample locations and depths.)

Sample depth 20'

Sample date 04/21/1999

Sample time 8:10:00 AM

Sample Results

Benzene (ppm) 3

Total BTEX (ppm) 399\*\*\*

Field headspace (ppm)

TPH (ppm) 2700.00 Method 8015B

Vertical Extent (ft) 35'

Risk Analysis form attached Yes ☒ No ☐

Ground Water Sample:

Yes



No



(If yes, see attached Groundwater Site Summary Report)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND MY BELIEF

DATE January 24, 2000

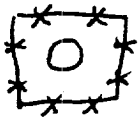
SIGNATURE

*Maureen Gannon*

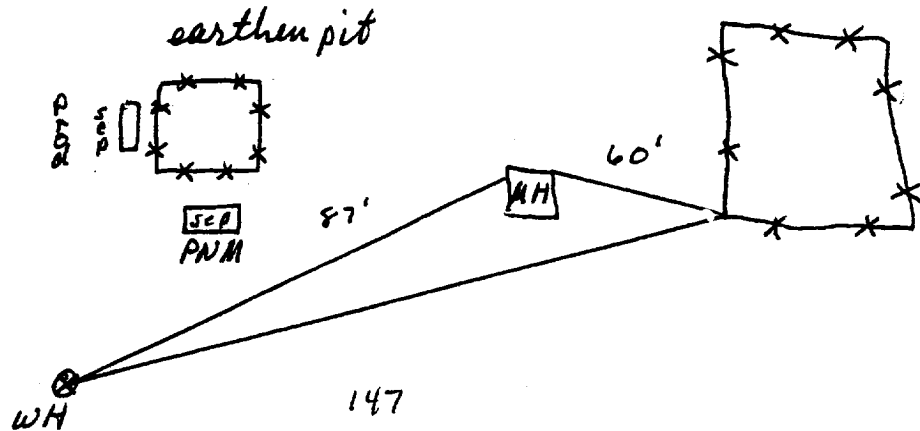
PRINTED NAME Maureen Gannon  
AND TITLE Project Manager

Culpepper Martin #4  
 (W) 6-31N-12W  
 Emergen  
 4-19-99

N



20' x 20' x 3'



## Excavation Sampling

43.5' (N+S) x 32' (E+W) x 20' (D)

## PID Readings

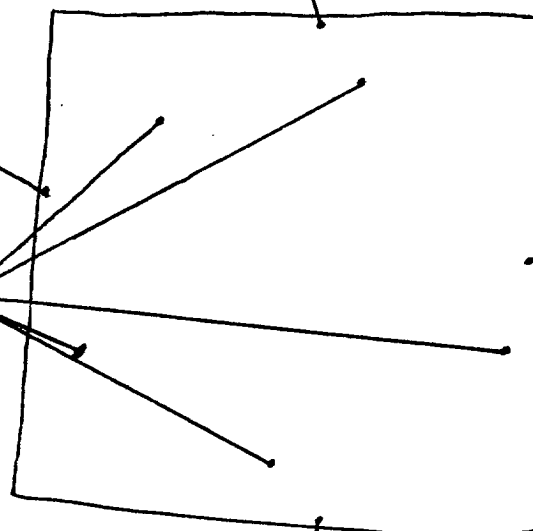
5' - 2690 ppm  
 10' - 1924 ppm  
 15' - 2160 ppm  
 20' - 1854 ppm

north wall head space  
 at 20' - 0 ppm

west wall head space  
 at 20' - 80 ppm

5 point bottom head space  
 at 20' - 1440 ppm

East wall head space  
 at 20' - 0 ppm



south wall head space  
 at 20' - 30 ppm

NOT TO SCALE

OFF: (505) 325-5667



LAB: (505) 325-1556

**On Site Technologies, LTD.**

**Date:** 04-May-99

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**CLIENT:** PNM - Public Service Company of NM

**Project:** PNM Pit Remediation

**Lab Order:** 9904047

## **CASE NARRATIVE**

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Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

## ANALYTICAL REPORT

Date: 04-May-99

**Client:** PNM - Public Service Company of NM  
**Work Order:** 9904047  
**Lab ID:** 9904047-01A    **Matrix:** SOIL  
**Project:** PNM Pit Remediation

**Client Sample Info:** Culpepper Martin #4 - *Energen*  
**Client Sample ID:** 9904210810; 5pt. Bottom Comp  
**Collection Date:** 4/21/99 8:10:00 AM  
**COC Record:** 5791

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
<b>DIESEL RANGE ORGANICS</b>		<b>SW8015B</b>				Analyst: DC
T/R Hydrocarbons: C10-C28	2700	25		mg/Kg	1	4/28/99
<b>AROMATIC VOLATILES BY GC/PID</b>		<b>SW8021B</b>				Analyst: HR
Benzene	3000	2500		µg/Kg	2500	4/21/99
Toluene	98000	5000		µg/Kg	2500	4/21/99
Ethylbenzene	20000	2500		µg/Kg	2500	4/21/99
m,p-Xylene	230000	5000		µg/Kg	2500	4/21/99
o-Xylene	48000	2500		µg/Kg	2500	4/21/99

*399000*  
*399 ppm*

**Qualifiers:**  
PQL - Practical Quantitation Limit  
ND - Not Detected at Practical Quantitation Limit  
J - Analyte detected below Practical Quantitation Limit  
B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
E - Value above quantitation range  
Surr: - Surrogate

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OFF: (505) 325-5667



LAB: (505) 325-1556

## ANALYTICAL REPORT

Date: 04-May-99

<b>Client:</b>	PNM - Public Service Company of NM	<b>Client Sample Info:</b>	Culpepper Martin #4
<b>Work Order:</b>	9904047	<b>Client Sample ID:</b>	9904210815; 4 Wall Comp
<b>Lab ID:</b>	9904047-02A	<b>Matrix:</b>	SOIL
<b>Project:</b>	PNM Pit Remediation	<b>Collection Date:</b>	4/21/99 8:15:00 AM
		<b>COC Record:</b>	5791

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
<b>DIESEL RANGE ORGANICS</b>		<b>SW8015B</b>				<b>Analyst: DC</b>
T/R Hydrocarbons: C10-C28	ND	25		mg/Kg	1	4/27/99

**Qualifiers:**

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- J - Analyte detected below Practical Quantitation Limit
- B - Analyte detected in the associated Method Blank

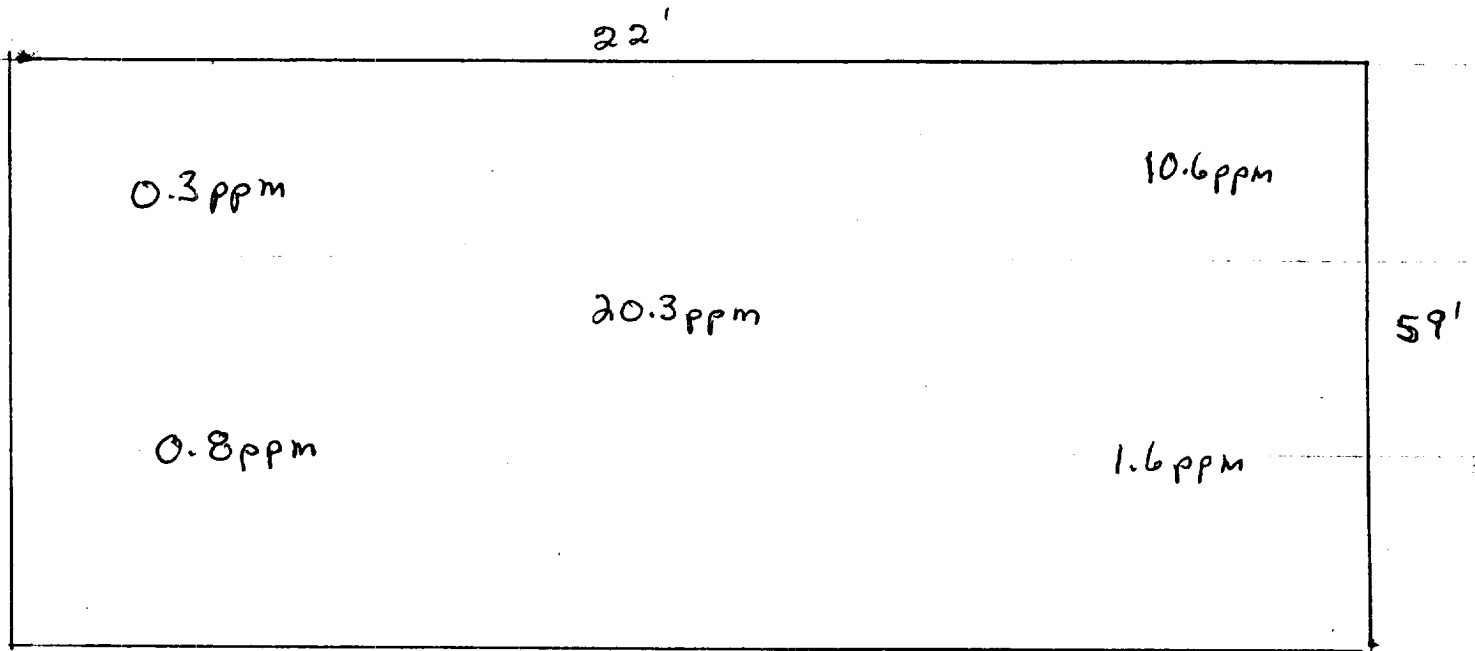
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Culpepper Martin #4  
Sec-6 T-31N R-12W UL-N  
~~Buckston~~ ENERGEEN

LAND FARM DRAWING ON Culpepper Martin #9  
Sec-6 T-31N R-12W UL-N  
APP 300 cu yds



103'



⊕ well head

2" to 12" Depth

Headspace 40.1 ppm

SAMPLE # 9907131315

Not To Scale

OFF: (505) 325-5667



LAB: (505) 325-1556

**On Site Technologies, LTD.**

**Date:** 21-Jul-99

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**CLIENT:** PNM - Public Service Company of NM  
**Project:** PNM Pit Remediation Landfarms  
**Lab Order:** 9907034

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## **CASE NARRATIVE**

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.



Roy

OFF: (505) 325-5667



LAB: (505) 325-1556

## ANALYTICAL REPORT

Date: 21-Jul-99

<b>Client:</b>	PNM - Public Service Company of NM	<b>Client Sample Info:</b>	Culpepper Martin #4 LF
<b>Work Order:</b>	9907034	<b>Client Sample ID:</b>	9907131315; 5pt. Comp
<b>Lab ID:</b>	9907034-02A	<b>Matrix:</b>	SOIL
<b>Project:</b>	PNM Pit Remediation Landfarms	<b>Collection Date:</b>	7/13/99 1:15:00 PM
		<b>COC Record:</b>	7734

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
<b>DIESEL RANGE ORGANICS</b>		<b>SW8015B</b>				Analyst: DC
T/R Hydrocarbons: C10-C28	28	25		mg/Kg	1	7/14/99

**Qualifiers:**

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S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Surr - Surrogate

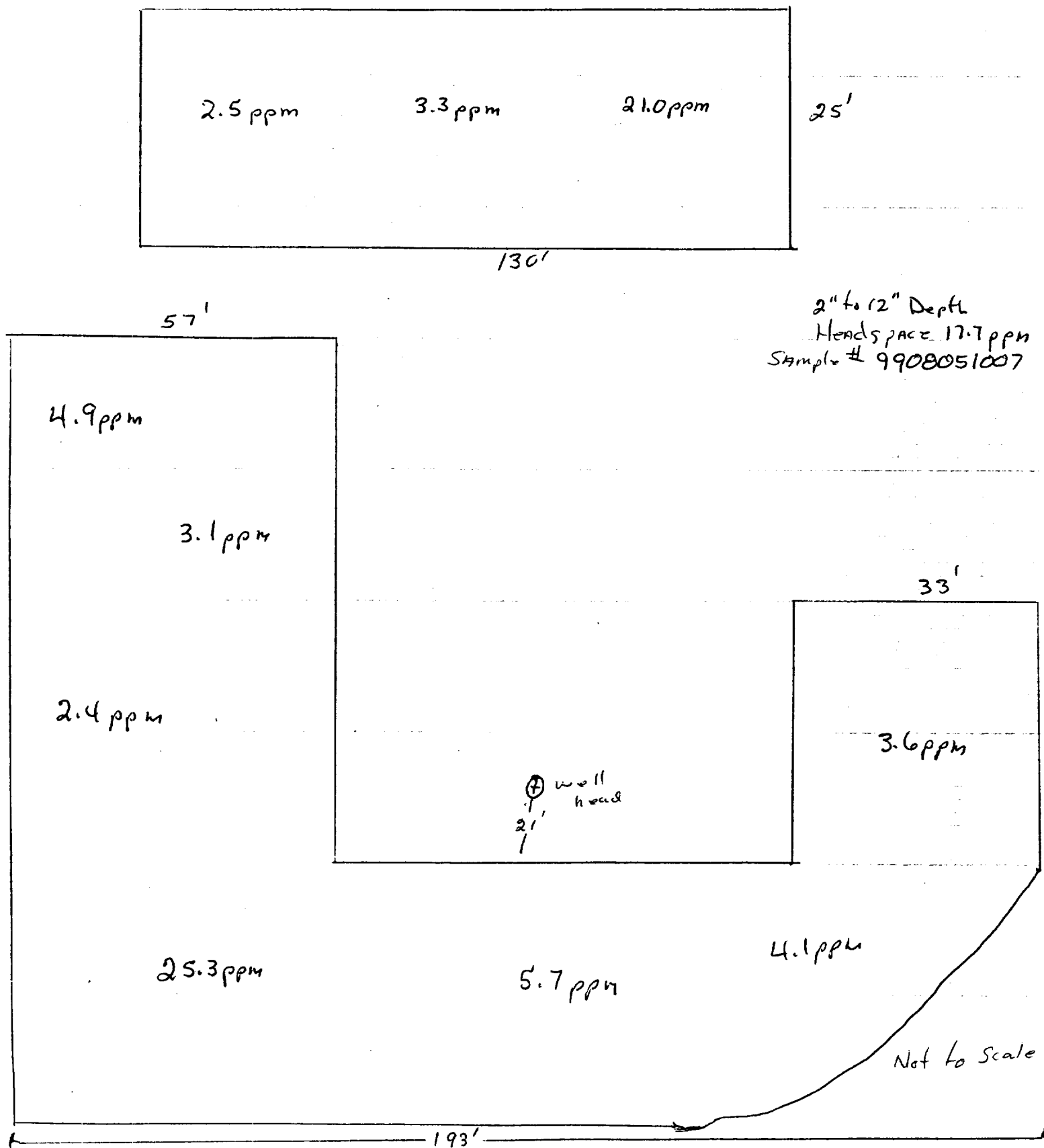
1 of 1

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- Technology Based and Compliant with the Environment -

Culpepper, Martin # 4  
Sec-6 T-31N R-12W 4L-N  
Exengen

# Landfarm Drawing



OFF: (505) 325-5667



LAB: (505) 325-1556

**On Site Technologies, LTD.**

**Date:** 11-Aug-99

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**CLIENT:** PNM - Public Service Company of NM

**Project:** Culpepper Martin 1A & 4 LF #2

**Lab Order:** 9908008

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**CASE NARRATIVE**

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

## ANALYTICAL REPORT

Date: 11-Aug-99

<b>Client:</b>	PNM - Public Service Company of NM	<b>Client Sample Info:</b>	Culpepper Martin #4 LF #2
<b>Work Order:</b>	9908008	<b>Client Sample ID:</b>	9908051007; 10 pt Comp
<b>Lab ID:</b>	9908008-01A	<b>Matrix:</b>	SOIL
<b>Project:</b>	Culpepper Martin 1A & 4 LF #2	<b>Collection Date:</b>	08/05/1999 10:07:00 AM
		<b>COC Record:</b>	7802

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
<b>DIESEL RANGE ORGANICS</b>		<b>SW8015B</b>				<b>Analyst: DC</b>
T/R Hydrocarbons: C10-C28	ND	25		mg/Kg	1	08/06/1999

**Qualifiers:**

PQL - Practical Quantitation Limit

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ND - Not Detected at Practical Quantitation Limit

R - RPD outside accepted recovery limits

J - Analyte detected below Practical Quantitation Limit

E - Value above quantitation range

B - Analyte detected in the associated Method Blank

Surr: - Surrogate

1 of 1

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OFF: (505) 325-5667



LAB: (505) 325-1556

**On Site Technologies, LTD.**

**Date:** 13-Oct-99

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**CLIENT:** PNM - Public Service Company of NM  
**Project:** Vertical Extent Drilling  
**Lab Order:** 9909077

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**CASE NARRATIVE**

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

# ANALYTICAL REPORT

Date: 13-Oct-99

<b>Client:</b>	PNM - Public Service Company of NM	<b>Client Sample Info:</b>	Culpepper Martin #4
<b>Work Order:</b>	9909077	<b>Client Sample ID:</b>	9909270940 @ 35ft.
<b>Lab ID:</b>	9909077-01A	<b>Matrix:</b>	SOIL
<b>Project:</b>	Vertical Extent Drilling	<b>Collection Date:</b>	09/27/1999 9:40:00 AM
		<b>COC Record:</b>	7762

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
<b>DIESEL RANGE ORGANICS</b>						
		<b>SW8015B</b>				Analyst: DC
T/R Hydrocarbons: C10-C28	420	25		mg/Kg	1	10/06/1999
<b>AROMATIC VOLATILES BY GC/PID</b>						
		<b>SW8021B</b>				Analyst: DM
Benzene	350	250		µg/Kg	250	10/04/1999
Toluene	21000	500		µg/Kg	250	10/04/1999
Ethylbenzene	3400	250		µg/Kg	250	10/04/1999
m,p-Xylene	39000	500		µg/Kg	250	10/04/1999
o-Xylene	7600	250		µg/Kg	250	10/04/1999

71350  
71.350 ppm

<b>Qualifiers:</b>	PQL - Practical Quantitation Limit	S - Spike Recovery outside accepted recovery limits
	ND - Not Detected at Practical Quantitation Limit	R - RPD outside accepted recovery limits
	J - Analyte detected below Practical Quantitation Limit	E - Value above quantitation range
	B - Analyte detected in the associated Method Blank	Surr: - Surrogate

1 of 1

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- TECHNOLOGY SERVING INDUSTRY WITH THE ENVIRONMENT -



## **Environmental Services**

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Well Name:	Culpepper Martin #4
Well Legals:	Unit N, Sec 6, T31N, R12W
Pit Type:	Drip blow down
Horizontal Distance to Surface Water:	Greater than 1,000 feet
Groundwater Depth:	Greater than 100 feet

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### **RISK ANALYSIS**

PNM requests closure of their former pit on the Culpepper Martin #4 well site using a limited risk analysis based on the following conditions:

1. Groundwater is estimated to be at a depth of 110 feet based upon the elevation of the site and the elevation of the nearest "listed" or "named" wash. (Reference: La Plata, NM series 7.5 minute topographic map.)
2. Distance from the site to surface water is greater than 1,000 ft.
3. PNM excavated 1,031 cu. yds. from the former pit. Vertical extent was determined using a hollow stem drilling rig. Sandstone was encountered at 35' below ground surface. Bedrock/sandstone provides a barrier between remaining contamination and groundwater. Vertical migration through bedrock or sandstone to groundwater is unlikely.
4. PNM excavated and performed remediation to the maximum depth and horizontal extent practicable.

PNM believes their former pit on the Culpepper Martin #4 well site poses minimal threat to groundwater, human health and the environment based upon our past experience in excavating over 1,000 pits.

# RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.

4000 Monroe Road

Farmington, New Mexico 87401

(505) 328-2282 FAX (505) 328-2388

Borehole #

Well #

Page

of 1

Project Name

Project Number

Project Location

PNM VERTICAL EXTENT

6200014 Phase 35

CULPEPPER MARTIN #4

Elevation

Borehole Location

GWL Depth

Logged By

Drilled By

Date/Time Started

Date/Time Completed

T3IN R12W S6 N

NONE ENCOUNTERED

C. COLLICOTT

K. PADILLA & D. PADILLA

9/27/99 8:40am

9/27/99 9:50am

Well Logged By

Personnel On-Site

Contractors On-Site

Client Personnel On-Site

C. COLLICOTT

K. PADILLA & D. PADILLA

D

C. ALY COOK

Drilling Method

Air Monitoring Method

AUGER

PID

Depth (Feet)	Sample Interval	Sample Type & Recovery (Inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU			Drilling Conditions & Blow Counts
						BZ	BH	S	
0									
5									
10									
15									
20	① 20'-22'		① PLASTIC/STIFF BROWN DRY SANDY SILT. COAR, NO STAIN. 8" RECOVERY						① 33 BLOWS SS 432 PPM HS 250 PPM
25	② 25'-26 1/2'		② BROWN SANDY SILT, COAR, NO STAIN. 6" RECOVERY DRY - STIFF						② 36 BLOWS SS 556 PPM HS 420 PPM
30	③ 30'-31 1/2'		③ 6" RECOVERY STIFF BROWN SANDY SILT, COAR, NO STAIN.						③ 45 BLOWS SS 361 PPM HS 375 PPM
35	④ 35'-37'		④ 4" RECOVERY FINE TO MEDIUM GRAINED SANDSTONE W/ OLIVINE MATRIX. OILY-LOOKING BLACK STAIN FOR ~2". TD 35' - REFUSAL ON SANDSTONE						④ 50+ BLOWS SS 358 PPM HS PPM
40									

Comments:

CLEAR, SUNNY, COOL

TD 35' - REFUSAL ON SANDSTONE

MOLE BACK FILLED WITH CUTTINGS

Geologist Signature

Cathy Collcott