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04/02/2008

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ANNUAL GROUNDWATER MONITORING REPORT

CONOCOPHILLIPS
30-045-09513
HOWELL KI
SAN JUAN COUNTY, NEW MEXICO

OCD#

RECEIVED

APR 02 2008

Prepared for:

Oil Conservation Division Environmental Bureau

ConocoPhillips

420 South Keeler Avenue Bartlesville, OK 74004

Prepared by:



6121 Indian School Rd. NE, Suite 200 Albuquerque, NM 87110 Tetra Tech Project No. 1158690064

March 28, 2008

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ANNUAL GROUNDWATER MONITORING REPORT HOWELL K-I, SAN JUAN COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents the results of quarterly groundwater monitoring events conducted by Tetra Tech, Inc. (Tetra Tech) in November 2007 and January 2008, at the ConocoPhillips site near Aztec, New Mexico, The site is located approximately ½ mile southeast of Navajo Lake State Park and 10 miles north of Aztec, New Mexico. The site consists of a gas production well and associated equipment and installations. The location and general features of the Howell K1 site are shown on Figures 1 and 2, respectively.

1.1 Site Background

The environmental investigation at this site began in August 2005 with the excavation of approximately 4000 cubic yards of impacted soil from an area southwest of the wellhead at the Howell K-I. The impacted soils were discovered in the area during below grade tank removal activities. The excavation went to a depth of 36 feet, and soils were still impacted at this depth. During the excavation, ground water was encountered at approximately 34 feet. The excavation of soil stopped at the practical limit of the machinery to operate safely. The excavation (i.e., approximately 70 feet by 50 feet by 36 feet deep) was backfilled with clean soil.

In March 2006, one ground water monitoring well (MW-I) was installed in the center of the backfilled excavation. The location of this well is shown on Figure 2.

2.0 MONITORING SUMMARY AND SAMPLING METHODOLOGY / RESULTS

2.1 Monitoring Summary

Quarterly groundwater sampling of monitoring well MW-I was conducted in November 2007 and January 2008. Water levels were measured in this well during each sampling event and are presented on Table I. The estimated groundwater flow direction based on topography and surface water drainage is shown on Figure 2. Groundwater monitoring was not performed at the site in March and June 2007, due to the transition of site responsibilities from Lode Star LLC in Farmington to Tetra Tech in Albuquerque following the acquisition of Burlington Resources by ConocoPhillips. In addition, each of the four quarters of data collected during quarterly sampling in 2006 indicate regulatory compliance in MW-I.

2.2 Groundwater Sampling Methodology

Monitoring well MW-I was purged of three volumes of water and sampled. A 1.5-inch clear, poly-vinyl, disposable bailer was used to purge the well and to collect the groundwater sample. The purge water generated during the event was disposed of in the produced water tank located on site (Figure 2). The groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped with chain-of-custody documentation. All samples collected were analyzed for the presence of benzene, toluene,

Tetra Tech 1 March 28, 2008

ethylbenezene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B. Analysis of the samples was performed by Lancaster Laboratories in Lancaster, Pennsylvania.

2.3 Groundwater Sampling Analytical Results

Samples collected from monitor well MW-1 in November 2007 and January 2008 indicate that groundwater concentrations for BTEX were below laboratory method detection limits (MDL) / practical quantitation limits (PQL).

Table 2 summarizes the laboratory analytical results for the November 2007 and January 2008 groundwater sampling events. The corresponding laboratory analysis reports including quality control summaries are included in Appendix A.

3.0 CONCLUSIONS

Based on the historical groundwater quality data, samples collected from MW-I have never exceeded New Mexico Water Quality Control Standards for BTEX constituents. Frequently BTEX concentrations are below the method detection limits. Given that water quality samples have been below standards during each of the six quarterly sampling events, Tetra Tech plans to request closure on behalf of ConocoPhillips following the June 2008 quarterly sampling event if data indicates results remain below standards. Please contact Kelly Blanchard at 505-237-8440 or kelly.blanchard@tetratech.com if you have any questions or require additional information.

Tetra Tech 2 March 28, 2008

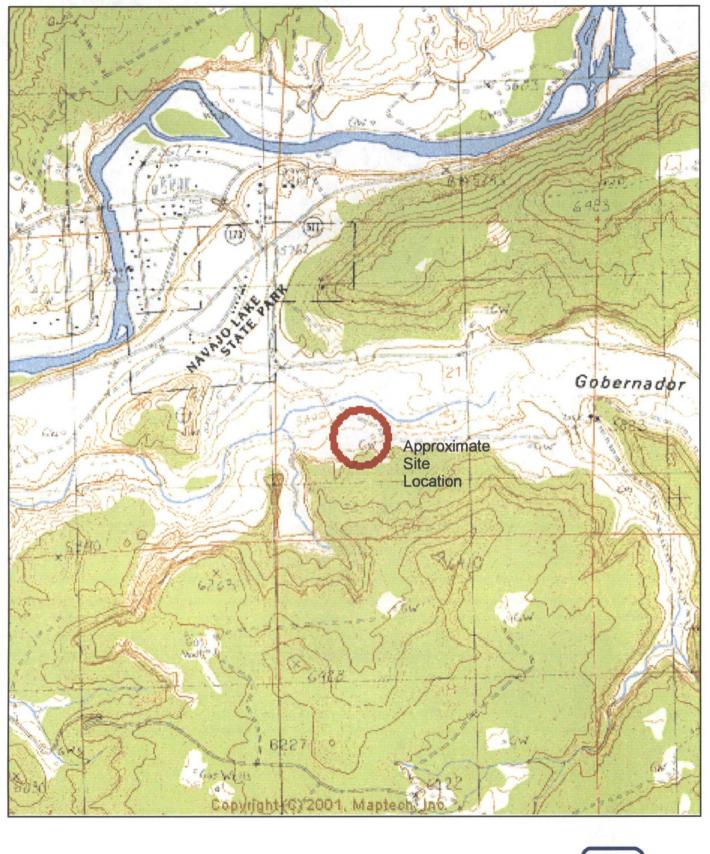
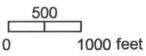


Figure 1. Site Location Map ConocoPhillips Howell K1 Site Flora Vista, New Mexico





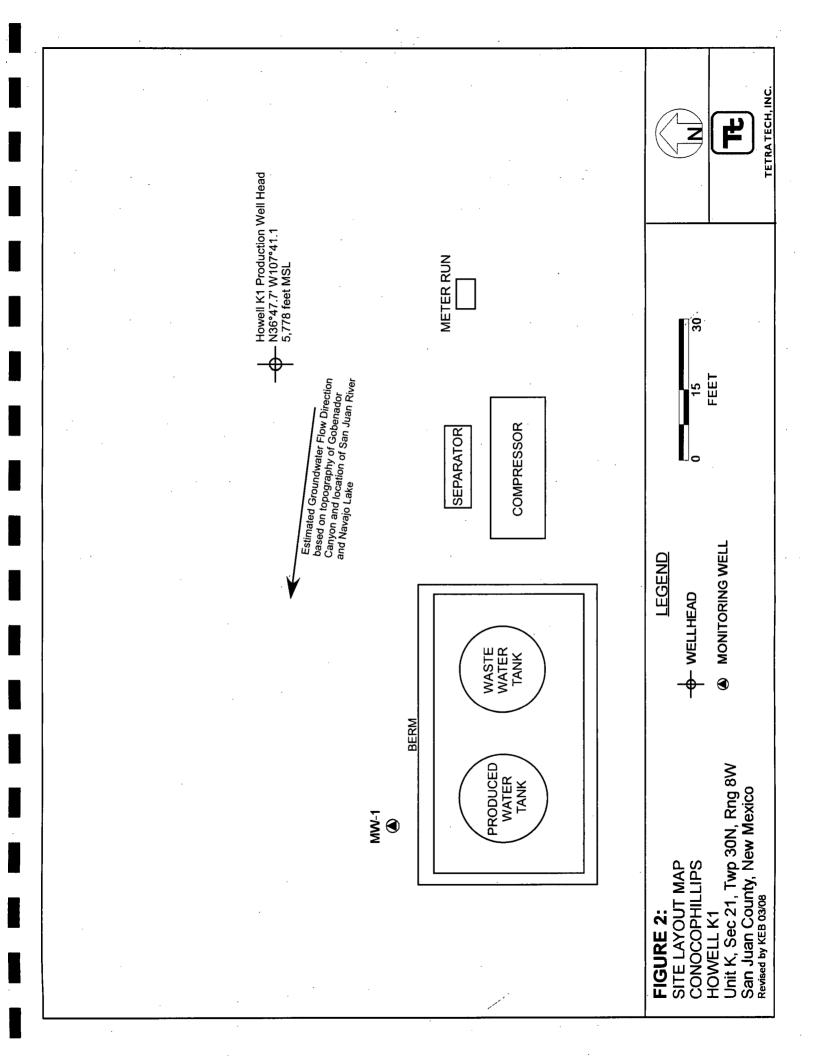


Table 1. ConocoPhilips Howell K1 - Groundwater Level Summary (November 2007 and January 2008)

Well ID	Total Depth (ft bgs)	Date Measured	Groundwater Level (ft TOC)
MW-1	39.55	11/9/2007	29.03
14144-1	33.55	1/15/2008	28.34

bgs = below ground surface

ft = Feet

TOC = Top of casing

Table 2. ConocoPhillips Howell K1 - Groundwater Analytical Results Summary

Well ID	Date	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	Xylenes (μg/L)
	3/22/2006	U	U	1	2
	6/21/2006	1.4	1.4	U	10.6
	10/19/2006	U	U	U	1.1
	12/12/2006	U	0.5	0.4	2.1
	11/9/2007	<0.5 U	<0.7 U	<0.8 U	<0.9 J
	1/15/2008	<0.5 U	<0.7 U	<0.8 U	<0.8 U
NMWQCC	Standards	10 (μg/L)	750 (μg/L)	750 (μg/L)	620 (µg/L)

Explanation

J = Analyte concetration detected at a value between MDL and PQL

MDL = Method Detection Limit

NMWQCC = New Mexico Water Quality Control Commission

PQL = Practical Quantitation Limit

U = Analyte was analyzed for but not detected at the indicated MDL

μg/L = micrograms per liter (parts per billion)

APPENDIX A LABORATORY ANALYSIS REPORT



2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

ANALYTICAL RESULTS

Prepared for:

ConocoPhillips PO Box 2200 Bartlesville OK 74005

Prepared by:

Lancaster Laboratories 2425 New Holland Pike Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 1065260. Samples arrived at the laboratory on Tuesday, November 13, 2007. The PO# for this group is 4506560639 and the release number is MULDOON.

Client Description
MW-1 Grab Water Sample

<u>Lancaster Labs Number</u> 5211122

ELECTRONIC COPY TO

Tetra Tech

Attn: Kelly Blanchard

Questions? Contact your Client Services Representative Barbara A Weyandt at (717) 656-2300

Respectfully Submitted,

Christine Dulaney Senior Specialist



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Page 1 of 1

Lancaster Laboratories Sample No. WW 5211122

MW-1 Grab Water Sample Site# Howell K-1

Collected:11/09/2007 15:00

by MC

Account Number: 11288

Submitted: 11/13/2007 09:10
Reported: 11/15/2007 at 19:17

ConocoPhillips PO Box 2200

Reported: 11/15/2007 at 19:17 Discard: 12/16/2007

Bartlesville OK 74005

•

HOMW1

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Units	Dilution Factor
02300	GC/MS Volatiles						
05401	Benzene	71-43-2	N.D.	0.5	5.	ug/l	1
05407	Toluene	108-88-3	N.D.	0.7	5.	ug/l	1.
05415	Ethylbenzene	100-41-4	N.D.	0.8	5.	ug/l	1
06310	Xylene (Total)	1330-20-7	0.9	0.8	5.	ug/1	1

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT					Dilution		
No.	Analysis Name	Method		Trial#	Date and Time	Analyst	Factor
02300	GC/MS Volatiles	SW-846 8260B		1	11/14/2007 13:03	Matthew F Regan	1
01163	GC/MS VOA Water Prep	SW-846 5030B		1	11/14/2007 13:03	Matthew F Regan	1

^{*=}This limit was used in the evaluation of the final result.



78-113

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Page 1 of 1

Quality Control Summary

Client Name: ConocoPhillips Group Number: 1065260

Reported: 11/15/07 at 07:17 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the

Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank MDL**	Blank LOO	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: T073181AB	Sample :	number(s):	5211122						
Benzene	N.D.	0.5	5.	ug/l	104	101	78-119	3	30
Toluene	N.D.	0.7	5.	ug/l	102	97	85-115	5	30
Ethylbenzene	N.D.	0.8	5.	ug/1	90	88	82-119	3	30
Xylene (Total)	N.D.	0.8	5.	ug/l	93	89	83-113	5	30

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD <u>Limits</u>	RPD	RPD <u>MAX</u>	BKG Conc	DUP <u>Conc</u>	DUP RPD	Dup RPD Max
Batch number: T073181AB Benzene Toluene Ethylbenzene Xylene (Total)	Sample 110 109 101 103	number(s)	: 5211122 83-128 83-127 82-129 82-130	UNSPK:	P2111	.39			

Surrogate Quality Control

80-113

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

77-113

80-116

Analysis Name: GC/MS Volatiles Batch number: T073181AB Dibromofluoromethane 1.2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene 5211122 102 96 101 107 Blank 102 94 100 104 99 104 105 LCS 101 LCSD 92 106 101 MS 101 96 103 105

*- Outside of specification

Limits:

- **-This limit was used in the evaluation of the final result for the blank
- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories

For Lancaster Laboratories use only Acct. # 11388 Group# 10/652/60 Sample 50 11132

Please print, Instructions on reverse side correspond with circled numbers.

COC # 0169641

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Copies: White and yellow should accompany samples to Lancaster Laboratories. The pink copy should be retained by the client.

2102.03

Lancaster Laboratories Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D. TNTC	none detected Too Numerous To Count	BMQL MPN	Below Minimum Quantitation Level Most Probable Number
IU	International Units	CP Units	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	NTU	nephelometric turbidity units
, C	degrees Celsius	, F ,	degrees Fahrenheit
Cal	(diet) calories	lb.	pound(s)
meq	milliequivalents	kg	kilogram(s)
g	gram(s)	. mg	milligram(s)
ug	microgram(s)	J.	liter(s)
mi	milliliter(s)	ul	microliter(s)
m3	cubic meter(s)	fib >5 um/ml	fibers greater than 5 microns in length per ml

- < less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than
- ppm parts per million One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

Inorganic Qualifiers

- ppb parts per billion
- Dry weight Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

U.S. EPA data qualifiers:

Organic	Qual	lifiers
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A B C D E	TIC is a possible aldol-condensation product Analyte was also detected in the blank Pesticide result confirmed by GC/MS Compound quatitated on a diluted sample Concentration exceeds the calibration range of	B E M N S	Value is <crdl, (msa)="" additions="" amount="" but="" control="" due="" duplicate="" estimated="" injection="" interference="" limits="" met="" method="" not="" of="" precision="" spike="" standard="" th="" to="" used<="" within="" ≥idl=""></crdl,>
	the instrument		for calculation
J	Estimated value	U	Compound was not detected
N	Presumptive evidence of a compound (TICs only)	W	Post digestion spike out of control limits
Р	Concentration difference between primary and	*	Duplicate analysis not within control limits
	confirmation columns >25%	+	Correlation coefficient for MSA < 0.995
U	Compound was not detected		
X,Y,Z	Defined in case narrative		

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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ANALYTICAL RESULTS

Prepared for:

ConocoPhillips PO Box 2200 Bartlesville OK 74005

Prepared by:

Lancaster Laboratories 2425 New Holland Pike Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 1074019. Samples arrived at the laboratory on Saturday, January 19, 2008. The PO# for this group is 4509350133 and the release number is LAUCKE.

Client DescriptionLancaster Labs NumberMW-1 Grab Water Sample5260849

ELECTRONIC Tetra Tech COPY TO

Attn: Kelly Blanchard

Questions? Contact your Client Services Representative Barbara A Weyandt at (717) 656-2300

Respectfully Submitted,

Maria S. Lord Senior Specialist



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Lancaster Laboratories Sample No. 5260849 WW

Group No. 1074019

MW-1 Grab Water Sample Site# 04930 Howell K-1 - Aztec, NM

Collected:01/15/2008 15:10

by AM

Account Number: 11288

Submitted: 01/19/2008 10:40

ConocoPhillips PO Box 2200

Reported: 02/12/2008 at 20:07

Bartlesville OK 74005

Discard: 03/14/2008

HWLK1

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Units	Dilution Factor
02300	GC/MS Volatiles						
02010	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	5.	ug/l	1
05401	Benzene	71-43-2	N.D.	0.5	5.	ug/l	1
05407	Toluene	108-88-3	N.D.	0.7	5.	ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.8	5.	ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.8	5.	ug/l	1

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT			Analysis		Dilution
No.	Analysis Name	Method	Trial# Date and Time	Analyst	Factor
02300	GC/MS Volatiles	SW-846 8260B	1 01/22/2008 20:19	Matthew F Regan	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1 01/22/2008 20:19	Matthew F Regan	1

^{*=}This limit was used in the evaluation of the final result



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Page 1 of 1

Quality Control Summary

Client Name: ConocoPhillips

Reported: 02/12/08 at 08:07 PM

Group Number: 1074019

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank MDL**	Blank <u>LOO</u>	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: T080221AA Methyl Tertiary Butyl Ether Benzene	Sample nu N.D. N.D.	mber(s): 5 0.5 0.5	260849 5. 5.	ug/l ug/l	105 101	104 96	73-119 78-119	1 5	30 30
Toluene Ethylbenzene Xylene (Total)	N.D. N.D. N.D.	0.7 0.8 0.8	5. 5. 5.	ug/l ug/l ug/l	106 100 103	103 101 101	85-115 82-119 83-113	3 1 1	30 30 30

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD <u>Limits</u>	RPD	RPD <u>MAX</u>	BKG <u>Conc</u>	DUP Conc	DUP RPD	Dup RPD Max
Batch number: T080221AA Methyl Tertiary Butyl Ether Benzene Toluene Ethylbenzene Xylene (Total)	Sample 101 101 108 102 103	number(s)	: 5260849 69-127 83-128 83-127 82-129 82-130	UNSPK:	P2604	03			

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: GC/MS Volatiles Batch number: T080221AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5260849	99	95	104	109
Blank	99	97	107	108
LCS	96	96	107	110
LCSD	95	99	108	108
MS	96	97	107	110
Limits:	80-116	77-113	80-113	78-113

- *- Outside of specification
- **-This limit was used in the evaluation of the final result for the blank
- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

ConocoPhillips Analysis Request/Chain of Custody

Lancaster	For Lancaster Labs Use	Labs Use ONLY Acct. #: 11288 Gr	Group # 1074019 sample	Sample#: 526 OSUQ SCR#:
Laboratories	008774	Analyses Reques	List total number of containers in the Analyses Requested box under each analysis.	
Sile #: 04930	ADC# 04930	Matrix Pri	Preservation Codes	Preservative Codes
OF A A CO	MN ::			
٦ _				$S = H_2SO_4$ $O = Other$
ConocoPhillips PM: Tarry L	wcke	Olable Sadde		
A	no + Mitch Croaks [.9 и iA		
Sample Identification HOWILL K	Date Time	Compos Soil Water		Bemarks
J-MV	1			
Consultant Information: Office City: All DIAGILITY OF	que state: New Mexico	Turnardund Time Requested in E	Turnardund Time Requested in Business Days (TAT) (Circle One): STD 5 day 48 hour 24 hour Other	(e):
Aanager: 4.00 Di	anchard Weax	Remonished by	Date Time Received by:	Date Time
Email: Felling. Chanchard @ Tettatech . Con	e testasechiosm	Relinquished by:	Date Time Regelved by	Date Time
Reporting Requirements (Circle One)	A COUNTY OF THE	Relinquished by:	Date Time Received by:	Date Time
NJ Regulatory NJ Reduced NY A	Full Validation (LLI Type I) NY ASP-A NY ASP-B Other	Relinquished by Commercial Carrier: UPS FedEx Other		Temperature Upph Receipt V7-3v4 C°

Lancaster Laboratories Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D. TNTC IU umhos/cm C Cal meq g ug ml	none detected Too Numerous To Count International Units micromhos/cm degrees Celsius (diet) calories milliequivalents gram(s) microgram(s) milliliter(s)	BMQL MPN CP Units NTU F Ib. kg mg I	Below Minimum Quantitation Level Most Probable Number cobalt-chloroplatinate units nephelometric turbidity units degrees Fahrenheit pound(s) kilogram(s) milligram(s) liter(s) microliter(s)
m3	cubic meter(s)	fib >5 um/ml	fibers greater than 5 microns in length per ml

- less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than

ppm parts per million – One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

Inorganic Qualifiers

ppb parts per billion

Dry weight Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

U.S. EPA data qualifiers:

Organic Qualifiers

Α	TIC is a possible aldol-condensation product	В	Value is <crdl, but="" th="" ≥idl<=""></crdl,>
В	Analyte was also detected in the blank	Ε	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quatitated on a diluted sample	N	Spike amount not within control limits
Е	Concentration exceeds the calibration range of	S	Method of standard additions (MSA) used
	the instrument		for calculation
j	Estimated value	U	Compound was not detected
N	Presumptive evidence of a compound (TICs only)	W	Post digestion spike out of control limits
Р	Concentration difference between primary and	*	Duplicate analysis not within control limits
	confirmation columns >25%	+	Correlation coefficient for MSA < 0.995
Ū	Compound was not detected		
X,Y,Z	Defined in case narrative		

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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