# 3R - 431

# **2012 AGWMR**

# 02/19/2013



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February 19, 2013

Reference No. 074925, 074927, 074928 074929, 074932, 074934 075038

Mr. Glenn von Gonten New Mexico Oil Conservation Division 1220 South Saint Francis Dr. Santa Fe, NM 87505

Dear Mr. von Gonten:

# Re: Groundwater Monitoring Reports - 2012

Enclosed, please find a copy of the reports listed below compiled by Conestoga-Rovers and Associates, Inc.

32454
32454
Farmington B Com No. 1E Annual Groundwater Monitoring Report - September 2012
324342. Faye Burdette No. 1 Annual Groundwater Monitoring Report - September 2012
31269
3. Hampton No. 4M Annual Groundwater Monitoring Report - September 2012
312434
3124342. Hampton No. 4M Annual Groundwater Monitoring Report - September 2012
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3124342. Faye Burdette No. 1 Annual Groundwater Monitoring Report - September 2012
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Зпись 7. Sategna No. 2E Quarterly Groundwater Monitoring Report – September 2012

If you have any questions or require additional information, please contact me at (505) 884-0672 or keblanchard@craworld.com.

# Sincerely, CONESTOGA-ROVERS & ASSOCIATES

Kelly E. Blanchard

Kelly E. Blanchard Project Manager

JP/cjg/1 Encl.

cc: Brandon Powell, NMOCD Terry Lauck, ConocoPhillips (electronic only)

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# OCTOBER 2012 ANNUAL GROUNDWATER MONITORING REPORT

# CONOCOPHILLIPS HOWELL K No. 1 SAN JUAN COUNTY, NEW MEXICO API# 30-045-09313 NMOCD# 3R-431

**Prepared For:** 

# **CONOCOPHILLIPS COMPANY**

Risk Management and Remediation 420 South Keeler Avenue Bartlesville, OK, 74004 COD CEVERORY

∧ II: 20

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DECEMBER 2012 REF. NO. 074928-95(4)

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CONESTOGA-ROVERS & ASSOCIATES

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# 1.0 <u>INTRODUCTION</u>

This report details the results of the annual groundwater monitoring event conducted by Conestoga-Rovers & Associates, Inc. (CRA) on October 3, 2012 at the ConocoPhillips Company (ConocoPhillips) Howell K No. 1 site, located on BLM land, approximately ½ mile southeast of Navajo Lake State Park and 10 miles east of Aztec in Unit Letter K, Section 21, Township 30N, Range 8W of San Juan County, New Mexico (Site). Geographical coordinates for the Site are 36° 47′ 40.34″ North, 107° 41′ 4.70″ West. The Site consists of a natural gas well and associated equipment and installations. The location and general features of the Site are shown on **Figures 1** and **2**, respectively.

# 1.1 <u>BACKGROUND</u>

The environmental investigation at the Site began in August 2005 with the excavation of approximately 4,000 cubic yards of hydrocarbon impacted soil from an area southwest of the Howell K No. 1 wellhead. The hydrocarbon impacted soils were discovered in the area during below grade tank removal activities. The final dimensions of the excavation were 70 feet by 50 feet by 36 feet deep. Groundwater was encountered at a depth of approximately 34 feet below ground surface (bgs). Once this extent had been reached, the excavation was stopped due to the inability of the equipment to operate safely; however, the limits of the hydrocarbon impact had not been delineated. The excavation was backfilled with clean soil. In March 2006, one groundwater monitor well (MW-1) was installed by Envirotech in the general area of the backfilled excavation. The location of this well is shown on **Figure 2**.

Due to the transition of Site consulting responsibilities from Lode Star LLC of Farmington, NM, to Tetra Tech, Inc. (Tetra Tech) following the acquisition of Burlington Resources by ConocoPhillips in March 2006, groundwater monitoring was not performed at the Site in March or June 2007. Tetra Tech began sampling groundwater at the Howell K No. 1 site in November 2007 using MW-1 and continued to do so until August of 2008, when 3 additional monitor wells were installed at the Site by WDC Exploration and Wells of Peralta, NM under Tetra Tech supervision. The additional wells were installed in response to a request by the New Mexico Oil Conservation Division (NMOCD) for Site characterization and enhanced laboratory analyses. This request was communicated to Tetra Tech during an April 2008 meeting conducted in Santa Fe, New Mexico with Glenn Von Gonten, NMOCD Environmental Bureau Hydrologist. Groundwater Monitor Well MW-2 was installed upgradient of MW-1 and Monitor Wells MW-3

and MW-4 were installed downgradient of MW-1 (Figure 2). A generalized geologic cross section was compiled using subsurface data collected from each boring location during installation of Monitor Wells MW-2, MW-3 and MW-4. Monitor Wells MW-2 and MW-4 are represented on the cross section which is presented in Figure 3.

October 2008 marked the first quarterly groundwater monitoring event to include all 4 monitor wells for analysis at the Site. BTEX analysis was discontinued following the December 2010 sampling event which represented eight consecutive quarters of BTEX constituents being below laboratory detection limits in samples from all Site monitor wells. Analysis for dissolved iron, dissolved manganese, sulfate, and fluoride were continued quarterly through October 2011. Sampling for these constituents is currently conducted on an annual basis.

On June 15, 2011, Site consulting responsibilities were transferred from Tetra Tech to CRA of Albuquerque, NM. A summary of the Howell K No. 1 site history can be seen in **Table 1**.

# 2.0 GROUNDWATER MONITORING SUMMARY, METHODOLOGY, AND ANALYTICAL RESULTS

# 2.1 <u>GROUNDWATER MONITORING SUMMARY</u>

Annual groundwater sampling was conducted by CRA on October 3, 2012. This represents the first annual monitoring event since quarterly monitoring was discontinued. The groundwater sampling event included samples from Monitor Wells MW-1, MW-2, MW-3, and MW-4. Groundwater levels were measured using an oil/water interface probe prior to sampling and can be found in Table 2; however, groundwater elevations for MW-1 cannot be calculated due to the damaged PVC well casing. The damage to MW-1 seems to be located at approximately 25 feet below ground surface and is likely due to the proximity of MW-1 to the 2005, below-grade tank removal excavation and the subsequent settling of the fill material in this area. Groundwater elevations for the other monitor wells are calculated from top of casing elevations, which were derived from survey data collected by Tetra Tech on August 14, 2008. Based on September 2012 groundwater elevation data, groundwater flow direction continues to be to the west. A groundwater potentiometric surface map is presented in Figure 4.

# 2.2 <u>GROUNDWATER MONITORING METHODOLOGY</u>

Prior to sampling, Monitor Wells MW-2, MW-3, and MW-4 were purged of at least three casing volumes of water. A 1.5-inch clear, polyethylene, dedicated bailer was used to purge and to collect the groundwater samples from MW-2, MW-3 and MW-4. As the result of shifted casing in Monitor Well MW-1, a 0.5inch clear, polyethylene, dedicated bailer was used to purge and to collect the groundwater samples in this well. Slightly less than two casing volumes were purged from MW-1 during the 2012 sampling event. The purge water generated during' the event was disposed of in the on-Site produced water tank. The groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped with chain-of-custody documentation to Pace Analytical Services, Inc. of Lenexa, KS. All groundwater samples collected were analyzed for dissolved iron and dissolved manganese by EPA Method 6010, and fluoride and sulfate by EPA method 300.0.

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# 2.3 <u>GROUNDWATER MONITORING ANALYTICAL RESULTS</u>

The New Mexico Water Quality Control Commission (NMWQCC) mandates that groundwater quality in New Mexico be protected, and has issued groundwater quality standards in Title 20, Chapter 6, Part 2, Section 3103 of the New Mexico Administrative Code (20.6.2.3103 NMAC). Groundwater quality standards have been set for the protection of human health, domestic water supply, and irrigation use. Exceedences of NMWQCC groundwater quality standards in Site monitor wells are discussed below.

- Dissolved Iron
  - The NMWQCC groundwater quality standard for dissolved iron is 1.0 mg/L. The groundwater samples collected in October 2012 from Monitor Wells MW-1 and MW-4 were found to contain dissolved iron at concentrations of 16.7 mg/L and 2.0 mg/L, respectively.

# Dissolved Manganese

 The NMWQCC groundwater quality standard for dissolved manganese is 0.2 mg/L. Groundwater samples collected in October 2012 from Monitor Wells MW-1, MW-3 and MW-4 were found to contain dissolved manganese at concentrations of 6.1 mg/L, 0.25 mg/L, and 18.0 mg/L, respectively.

### Sulfate

 The NMWQCC groundwater quality standard for sulfate is 600 mg/L. Groundwater samples collected in October 2012 from Monitor Wells MW-1, MW-2, MW-3 and MW-4 were found to contain sulfate at concentrations of 3,280 mg/L, 1,850 mg/L, 2,080 mg/L, and 4,280 mg/L, respectively.

# Fluoride

• The NMWQCC domestic water supply groundwater quality standard for fluoride is 1.6 mg/L. Groundwater sample collected in October 2012 from Monitor Well MW-4 exceeded this standard with a concentration of 2.1 mg/L.

Table 3 summarizes the analytical results from groundwater sampling completed during October 2012. Groundwater sampling field forms detailing

collected field parameters can be found in **Appendix A** and the corresponding laboratory analytical report, including quality control summaries, can be found in **Appendix B**.

# 3.0 <u>CONCLUSIONS AND RECOMMENDATIONS</u>

BTEX analysis at the Site was discontinued following the December 2010 sampling event; however, CRA recommends continued monitoring of fluoride, sulfate, dissolved manganese, and dissolved iron on an annual basis until concentrations of these groundwater quality parameters are below NMWQCC standards, appear stable, or reach regional background levels, at which time quarterly monitoring will resume. Once eight consecutive quarters of compliance are achieved, remediation Site closure will be requested. The next sampling event is scheduled for September 2012.

As a result of a November 2012 meeting conducted in Santa Fe, New Mexico with Glenn Von Gonten, NMOCD Environmental Bureau Hydrologist, CRA proposes the reinstallation of MW-1 and installation of an additional downgradient monitor well for the purpose of monitoring potential migration of dissolved metals from the Site.

# FIGURES

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SITE PLAN HOWELL K No. 1 NATURAL GAS WELL SITE UNIT LETTER K, SECTION 21, T30N-R8W, SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company* 

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Figure 4

SEPTEMBER 2012 GROUNDWATER POTENTIOMETRIC SURFACE MAP HOWELL K NO. 1 NATURAL GAS WELL SITE UNIT LETTER K, SECTION 21, T30N-R8W, SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company* 



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# TABLES

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### TABLE 1

### SITE HISTORY TIMELINE CONOCOPHILLIPS COMPANY SAN JUAN COUNTY, NEW MEXICO HOWELL K NO. 1

	Date/Time Period	Event/Action	Description/Comments	
· · · · · · · · · · · · · · · · · · ·	July 26, through August 18, 2005	Initial Site assessment	Environmental investigation began with the excavation of approximately 4000 cubic yards of impacted soil from an area southwest of the Howell K No.1 well head. Impacted soils were discovered during the removal activities of a below grade tank. Dimensions of the excavation were approximately 70 feet long by 50 feet wide by 36 feet deep. Groundwater was encountered at approximately 34 feet and soils were still impacted at 36 feet deep, the point at which excavation machinery was stopped at the practical limit for safe operation. The total vertical extent of hydrocarbon impacts were not completely delineated. Soil was treated with 600 total gallons of potassium permanganate solution. The excavation area was backfilled with clean soil.	
	March 10, 2006	Groundwater monitor well installation	One ground water monitor well, MW-1, was installed in the center of the backfilled excavation by Envirotech.	
	March 31, 2006	Site transfer	ConocoPhillips Company completed acquisition of Burlington Resources.	
	March and June 2007	Groundwater monitoring not performed	After the acquisition of Burlington Resources by ConocoPhillips, consulting responsibilities were transferred from Lode Star LLC of Farmington New Mexico to Tetra Tech of Albuquerque. Due to the transition, first and second quarter sampling of 2007 was not performed.	
	November 9, 2007 through March 19, 2008	Groundwater monitoring	Tetra Tech began sampling the Howell K No. 1 site quarterly in November 2007. Groundwater was sampled from MW-1 and was analyzed for BTEX constituents. No constituents were detected at levels that exceeded the NMWQCC standards.	
	April 1, 2008	Additional monitoring requested by OCD	Oil Conservation Division of NM Energy, Minerals, and Resources Dept indicates additional investigation and sampling is necessary for closure consideration during a meeting with Glenn Von Gonten.	
	July 23, 2008	Groundwater monitoring postponed	Groundwater monitoring of MW-1 was postponed after it was found that there was an obstruction caused by settling and shifting of the MW-1 casing. It was determined that the obstruction could be avoided by using a smaller bailer to collect samples. Sampling was postponed and was set to follow upcoming monitor well installation so that proper sampling materials could be used.	· · ·
	August 13 and 14, 2008	Groundwater monitor well installation and groundwater monitoring	Three additional groundwater monitor wells (MW-2, MW-3 and MW-4) were installed by WDC and overseen by Tetra Tech. MW-2 was installed upgradient of MW-1. Both MW-3 and MW-4 were installed downgradient of MW-1. All wells were developed by purging approximately 80 gallons of water using a surge block and a purge pump. A sample was collected from MW-1 on August 14th. A 1/2-inch disposable bailer was used to avoid an obstruction in MW-1. The sample was analyzed for BTEX constituents. All constituents were below NMWQCC standards.	· · · · · ·
	October 24, 2008	Groundwater monitoring	Third quarter 2008 groundwater monitoring was completed and was the first quarter of sampling to include all four monitor wells on site. A baseline suite was completed including major ions, total metals, semi-volatile organic	
	January 30, 2009	4th quarter 2008 groundwater monitoring	Tetra Tech conducted fourth quarter 2008 groundwater monitoring at the site for BTEX constituents in all four monitor wells. All wells were below NMWQCC standards for BTEX .	
	September 25,2009	2009 annual groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-2, MW-3 and MW-4 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. All three wells were below NMWQCC standards for BTEX. All three wells were above standard for sulfate. Dissolved manganese was above standard in MW-3 and MW-4 and flouride was above standard in MW-4. Dissolved metals analyses conducted for the first time since standards are based on dissolved metals testing. OCD concurred, allowing total metals testing to be discontinued.	

1 of 2

### TABLE 1

### SITE HISTORY TIMELINE CONOCOPHILLIPS COMPANY SAN JUAN COUNTY, NEW MEXICO HOWELL K NO. 1

r				ล
	Date/Time Period	Event/Action	Description/Comments	
	October 18, 2009	Groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-1 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. MW-1 was below NMWQCC standards for BTEX. Sulfate, dissolved manganese and dissolved iron were above standard in MW-1.	
	December 15, 2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, sulfate and flouride. All four monitor wells are below NMWQCC standards for BTEX. All four monitor wells were above the standard for sulfate. MW-1, MW-3 and MW-4 were above standard for dissolved manganese and MW-1 and MW-3 were also above the standard for dissolved iron.	
	March 30, 2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, and sulfate. All four monitor wells were below NMWQCC standards for BTEX. All four monitor wells were above the standard for sulfate. MW-1, MW-3 and MW-4 were also above the standard for dissolved manganese.	· · · · · · · · · · ·
,	June 8, 2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, and sulfate. All four monitor wells were below NMWQCC standards for BTEX. All four monitor wells were above the standard for sulfate. MW-1, MW-3 and MW-4 were above the standard for dissolved manganese. MW-1 was also above the standard for dissolved iron.	· · ·
	September 23,2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, fluoride and sulfate. All four monitor wells were below NMWQCC standards for BTEX. All four monitor wells were above the standard for sulfate. MW-1, MW-3 and MW-4 were above the standard for dissolved manganese. MW-1 was also above standard for dissolved iron.	· · · · · · · · · · · · · · · · · · ·
	December 15,2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, fluoride and sulfate. MW-3 was observed to be dry during this monitoring event, which was likely due to an interface probe malfunction. MW-1, MW-2 and MW-4 were sampled. All three sampled monitor wells are below NMWQCC standards for BTEX. MW-1 and MW-4 were above the the standards for sulfate, dissolved manganese, and dissolved iron. Monitor well MW-4 was also found to be above the the standard for fluoride.	
···· · · · · ·	March 15, 2011	Groundwater monitoring	First quarter of groundwater monitoring with BTEX analysis discontinued; MW-1, MW-2, MW-3, and MW-4 were sampled and analyzed for dissolved iron, dissolved manganese, fluoride and sulfate.	
	June 15, 2011	Transfer of site consulting responsibilities	On June 15, 2011, site consulting responsibilities were transferred from Tetra Tech of Albuquerque, NM to Conestoga-Rovers & Associates (CRA) of Albuquerque, NM.	
	June 23, 2011	Groundwater	Second quarter of groundwater monitoring with BTEX analysis discontinued; MW-1, MW-2, MW-3, and MW-4 were sampled and analyzed for dissolved iron, dissolved manganese; fluoride and sulfate.	· · · · · · · · · · · · · · · · · · ·
	October 11 and 12, 2011	Groundwater monitoring	Third quarter of groundwater monitoring with BTEX analysis discontinued; MW-1, MW-2, MW-3, and MW-4 were sampled and analyzed for dissolved iron, dissolved manganese, fluoride and sulfate.	
	October 3, 2012	Groundwater monitoring	MW-1, MW-2, MW-3, and MW-4 were sampled and analyzed for dissolved iron, dissolved manganese, fluoride and sulfate.	

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### TABLE 2 MONITOR WELL SPECIFICATIONS AND GROUNDWATER ELEVATIONS CONOCOPHILLIPS COMPANY HOWELL K No. 1 SAN JUAN COUNTY, NM

Well ID	Total Depth (ft bgs)	Elevation* (ft) (TOC)	Screen Interval (ft below TOC)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Water Level
				3/22/2006	28.54	69.30
				6/21/2006	29.15	68.69
				10/19/2006	27.83	70.01
				12/12/2006	28.22	69.62
				3/1/2007	NM	NM
				6/1/2007	NM	NM
				11/9/2007	29.03	68.81
				1/15/2008	28.34	69.50
				3/19/2008	NM	NM
				7/23/2008	28.46	69.38
		97.84		10/24/2008	29.91	67.93
MW-1	37.47		21 - 36	1/30/2009	28.37	69.47
				9/25/2009	29.95	67.89
				10/18/2009	29.97	67.87
				12/15/2009	29.51	(1)
				3/30/2010	28.18	(1)
				6/8/2010	28.38	(1)
				9/23/2010	29.51	(1)
				12/15/2010	28.82	(1)
				3/15/2011	28.51	(1)
				6/24/2011	28.92	(1)
				10/11/2011	30.43	(1)
				10/3/2012	31.39	(1)
				10/24/2008	25.74	69.54
				1/30/2009	24.74	70.54
				9/25/2009	26.48	68.80
				12/15/2009	25.97	69.31
				3/30/2010	24.67	70.61
MM-2	30.81	95.28	21 - 36	6/8/2010	24.84	70.44
141 4 4 - 2-	59.01	77.20	21 - 50	9/23/2010	26.38	68.90
				12/15/2010	25.68	69.60
				3/15/2011	25.05	70.23
				6/24/2011	26.70	68.58
				10/11/2011	27.10	68.18
				10/3/2012	27.99	67.29

### TABLE 2 MONITOR WELL SPECIFICATIONS AND GROUNDWATER ELEVATIONS CONOCOPHILLIPS COMPANY HOWELL K No. 1 SAN JUAN COUNTY, NM

Well ID	Total Depth (ft bgs)	Elevation* (ft) (TOC)	Screen Interval (ft below TOC)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Water Level
		4		10/24/2008	26.95	68.49
		•,		1/30/2009	25.92	69.52
				9/25/2009	27.57	67.87
				12/15/2009	27.05	68.39
				3/30/2010	25.79	69.65
MW-3	37 47	95.44	19 . 34	6/8/2010	26.02	69.42
14144-3	57.47	70.44	19-34	9/23/2010	27.35	68.09
				12/15/2010	DRY	
				3/15/2011	26.19	69.25
				6/24/2011	26.70	68.74
				10/11/2011	28.15	67.29
				10/3/2012	29.02	66.42
				10/24/2008	NM	NM
				1/30/2009	26.00	69.36
				9/25/2009	27.64	67.72
				12/15/2009	27.14	68.22
				3/30/2010	25.87	69.49
NATAZ A	24.66	05.26	17 20	6/8/2010	26.09	69.27
101 00 -4	34.00	95.50	17 - 32	9/23/2010	27.31	68.05
				12/15/2010	26.75	68.61
				3/15/2011	26.26	69.10
				6/24/2011	26.76	68.60
				10/11/2011	28.20	67.16
				10/3/2012	29.06	66.30

### Notes:

\*Casing elevations are based on an arbitrary 100 ft relative surface elevation set at the gas well head ft = Feet

. . . .

bgs = below ground surface

TOC = Top of casing

NM = Not measured

(1) Groundwater elevations can not be calculated accurately due to continual upward shifting of the PVC casing (see text of section 2.1, Monitoring Summary, of this report for more

### TABLE 3

# GROUNDWATER LABORATORY ANALYTICAL RESULTS SUMMARY CONOCOPHILLIPS COMPANY HOWELL K No. 1 SAN JUAN COUNTY, NM

						Xylenes			Iron	Manganese
Wall ID	Esmala ID	Data	Benzene	Toluene	Ethylbenzene	(total)	Fluoride	Sulfate	(dissolved)	(dissolved)
weirin	Sample ID	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	MW-1	3/22/2006	ND	ND	0.001	0.002	-	-	-	
	MW-1	6/21/2006	0.0014	0.0014	ND	0.0106				
	MW-I	10/19/2006		ND	ND	0.0011	-			
	MW-1	12/12/2006	ND	0.0005	0.0004	0.0021	-		-	
	MIW-1	1/15/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0009		-	-	
	NIVV-1	1/15/2008	< 0.0005	< 0.0007	< 0.0008	< 0.0008		_		
	MW-1	8/14/2008	< 0.0005	< 0.0005	< 0.0005	< 0.0005				
	MW-1	10/24/2008	< 0.0005	< 0.0005	< 0.0005	< 0.0005			-	
	MW-1	1/30/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 2.0	2390		
MW-1	MW-1	10/18/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.88	3840	2.24	17.40
	MW-1	12/15/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 50	3790	1.70	16.50
		3/30/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005		2950	0.87	14.90
	MW-1	6/8/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005	_	2570	11 20	14.70
		9/23/2010	< 0.001	< 0.001	< 0.000	< 0.000	< 0.5	2740	4 4 3	13.4
	MW-1	12/15/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.5	2230	9.72	11.1
	MW-1	3/15/2011	-			-	0.654	2360	20	11.4
	GW-74928-062311-PG-04	6/23/2011					< 0.50	2970	< 0.1	10.7
	GW-074928-101211-CM-006	10/12/2011					0.28	2940	< 0.05	9.6
	GW-074928-100312-CM-MW-1	10/3/2012					0.56	3280	16.7	6.1
	MW-2	10/24/2008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 2	1480		-
1 1	MW-2	1/30/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005			_	
	MW-2	9/25/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	1.09	1700	< 0.02	< 0.005
		12/15/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 100	1570	< 0.02	< 0.005
	MW-2	3/30/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005		1410	< 0.02	0.14
	MW-2	6/8/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005		1460	0.0544	0.00930
MW-2	MW-2	9/23/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.5	1760	< 0.02	< 0.005
	MW-2	12/15/2010	< 0.001	< 0.001	< 0.001	< 0.001	1.01	1890	< 0.02	< 0.005
	MW-2	3/15/2011	-	-	-	-	1.21	1680	< 0.02	0.0096
	GW-74928-062311-PG-01	6/23/2011	-	-			1.3	1990	< 0.1	< 0.015
	GW-074928-101211-CM-007	10/12/2011			-	-	0.93	1680	0.873	0.0297
	GW-074928-100312-CM-MW-2	10/3/2012		-	1		1.1	1850	< 0.05	0.0055
	MW-3	10/24/2008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 2	1480	-	
[ [	MW-3	1/30/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	+	-	
[	MW-3	9/25/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	1.00	1840	< 0.02	0.38
	MW-3	12/15/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 50	2500	1.35	0.32
[	MW-3	3/30/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005		1890	< 0.02	0.43
MW-3 [	MW-3	6/8/2010	< 0.0005	< 0.0005	< 0.0005	< 0.0005		1630	0.0573	0.383
	MW-3	9/23/2010	< 0.001	< 0.001	< 0.001	< 0.001	0.751	1960	< 0.02	0.35
	MW-3	· 3/15/2011	-		-	-	1.11	1890	< 0.02	0.572
	GW-74928-062311-PG-02	6/23/2011				1	1.2	2190	< 0.1	0.846
	GW-074928-101211-CM-008	10/12/2011	· -		-	-	0.81	1980	< 0.05	0.254
	GW-074928-100312-CM-MW-3	10/3/2012					0.95	2080	< 0.05	0.25
	MW-4	10/24/2008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2.43 .	3400	1	
	MW-4	1/30/2009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	I	-	
	MW-4	_9/25/2009	< 0.001	< 0.001	< 0.001	< 0.001	2.47	3860	< 0.02	7.80
L [	MW-4	12/15/2009	< 0.001	< 0.001	< 0.001	< 0.001	< 50	4540	0.03	7.40
·	· MW-4	3/30/2010	< 0.001	< 0.001	< 0.001	< 0.001		3970	< 0.02 .	- 7.83
	MW-4	6/8/2010	< 0.001	< 0.001	< 0.001	< 0.001		3490	0.0607	7.97
MW-4	MW-4	9/23/2010	< 0.001	< 0.001	< 0.001	< 0.001	1.81	3750	< 0.02	9.73
	MW-4	12/15/2010	0.0011	< 0.001	< 0.001	< 0.001	2.47	4310	0.223	8.64
	MW-4	3/15/2011	-	-			2.76	3990	0.522	11
	GW-/4928-062311-PG-03	6/23/2011	-	-	-	-	2.4	4400	0.492	11.1
1 -	GW-0/4928-101211-CM-005	10/12/2011	-	-	-		1.9	4120	2.75	15.6
1	Gw-0/4928-100312-CM-MW-4	10/3/2012	-				2.1	4280	2.0	18.0
	GW-0/4928-100312-CM-DUP	10/3/2012				-	-	-	2.2	18.4
I NM	IWOCC Groundwater Ouality St	andards	0.01	0.75	0.75	0.62	16	600 l	1	0.2

Notes: MW = monitoring well NMWQCC = New Mexico Water Quality Control Commission Constituents in BOLD are in excess of NMWQCC groundwater quality standards mg/L = milligrams per liter (parts per million) <1.0 = below laboratory detection limit of 1.0 mg/L = not exclused

-- = not analyzed ND = not detected

# APPENDIX A

# OCTOBER 2012 ANNUAL GROUNDWATER SAMPLING FIELD FORMS

	WELL SAMPLING FIELD INFORMATION FORM TEPPROJECT NAME: SAMPLE ID: 5111-074079-107812 (M-MW) WELL # MILL -1
	IOBSIC       IOSSIC       IOSSIC
• • •	PURGING DEVICE       A - SUBMERSIBLE PUMP       D - GAS LIFT PUMP       C - BAILER       X=         SAMPLING DEVICE       B - PERISTALTIC PUMP       E - PURGE PUMP       H - WATERRAG       PURGING DEVICE OTHER (SPECIFY)         SAMPLING DEVICE       C - BLADDER PUMP       F - DIPPER BOTTLE       X - OTHER       X=
	PURGING MATERIAL     D - PVC     X=       B - STAINLESS STEEL     E - POLYETHYLENE     PURGING MATERIAL OTHER (SPECIFY)       SAMPLING MATERIAL     C - POLYPROPYLENE     X - OTHER
	PURGE TUBING       A - TEFLON       D POLYPROPYLENE       G - COMBINATION       X=         B = TYGON       E - POLYETHYLENE       TEFLON/POLYPROPYLENE       PURGE TUBING OTHER (SPECIFY)         SAMPLING TUBING       C - ROPE       F - SILICONE       X - OTHER       X=         SAMPLING TUBING       C - ROPE       F - SILICONE       X - OTHER       X=
• · ·	FIELD MEASUREMENTS         DEPTH TO WATER       31       31       (feet)       WELL ELEVATION       97       84       (feet)         WELL DEPTH       36       50       (feet)       WELL ELEVATION       (feet)       (feet)         TEMPERATURE       pH       TDS       CONDUCTIVITY       ORP       VOLUME
	(°C)      (std)      (g/L)      (µS/cm)      (mV)      (gal)
	(°C)     (std)     (g/L)     (uS/cm)     (mV)     (gal)       SAMPLE APPEARANCE:     (uS/cm)     (mV)     (gal)       WEATHER CONDITIONS:     TEMPERATURE     (gol)     (gal)
	$\frac{100 \text{ parameters collected}}{0.818\times3 = 2.45}$
	I CERTIFY THAT'S AMPLING PROCEDUITES WERE IN ACCORTANCE WITH APPLICABLE CRAFTER DOCOLS AMALLED 10312 DATE PRINT PRINT SIGNATURE
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WELL SAMPLING FIELD INFORMATION FORM         TEPROFECT NAME:         JOUNCHI K-1         JOUNCHINT	2 1											
TE/PROJECT NAME:     JOURDAL     JOURDAL     JOURDAL     JOURDAL       SAMPLE ID:     GW-07/1220-1003/12-01-TMW 2 WELL#     MW-2       WELL PURGING INFORMATION DATION 77     GW-07/1220-1003/12-01-TMW 2 WELL#     MW-2       PURGING DATE DATION 77     SAMPLING DATE DATION 77     SAMPLING DATE DATION 77     SAMPLING EQUIPMENT DATION 77     ACTUAL VOL. FURCHD GALLONS       PURGING DEURATED DEURATED DATION 77     SAMPLING EQUIPMENT DEURCING DEURATED DEURATED SAMPLING DEURCE     D. COLUMN CIRCLE ONED D- CASHUP TUNP     CANALES DEURATED D- COLUMN CIRCLE ONED D- CASHUP TUNP     CANALES DEURATED D- COLUMN CIRCLE ONED D- COLUMN CIRCLE ONED D- COLUMN D- CIRCLE ONED D- COLUMN CIRCLE ONED D- COLUMN D- CIRCLE ONED D- CIRCLE ONED D- COLUMN D- CIRCLE ONED D- COLUMN D- CIRCLE ONED D-			WELL S	SAMPI	ING	FIELD	NFORM	IATION I	<b>ORM</b>			
SAMPLE DIF       QW_UTTAY       WELL PURCHAGE INVOIDED TITLE       TWO UTTAY         LO-03-12       ID-63-12       WELL PURCING INFORMATION (BAIDDY)       ID-63-12       SAMPLE PURCING INFORMATION (BAIDDY)       ID-63-12       I	   <i>  TE/PRC</i>   	OJECT NA	ME:	10	vel	K-1	N mil -2	JOB#	)7492	3		<del></del> .
Image: Derived and the points       Image: Derived and the point points       Image: Derived and the points		SAMPLE	$\frac{10}{10}$	0/7//	010	NOIC ()	IT-IIW C	• • • • • • • • • • • • • • • • • • •				
PUISCING EQUIPMENTDEDICATED VI CITRCLE ONED PUISCING EQUIPMENTDEDICATED VI CITRCLE ONED PUISCING DEVICE VILL SAMPLING DEVICE VILL B - DEVICE VILL C - DADRER PUMP PUISCING DEVICE OTHER GPECIPY PUISCING DEVICE OTHER GPECIPY PUISCING MATERIAL C - DADRER PUMP PUISCING MATERIAL OTHER GPECIPY PUISCING TUBING C - ROPE P - SULCONE C - COMMINATION E - POLYETHYLENE C - NOLVETHYLENE C - NOLV		03-12 GE DATE 100 m		- 63-1 MPLE DATE	2 "			ON L C C	CASING NS)	ACTUAL V (GAI	OL. PURGED LONS)	
CURCLE ONED       (CIRCLE ONED)         PURGING DEVICE       A - SOMARESBEE PUMP       D - GAS LIFT PUMP       G - AALEE         SAMPLING DEVICE       B - PRESTAIL PUMP       P. JURGING PUMP       FUNCTOR PUMP         SAMPLING DEVICE       B - PRESTAIL PUMP       P. JURGING PUMP       SAMPLING DEVICE         FURGING MATERIAL       A - TEFLON       D - PVC       X- OTHER         SAMPLING MATERIAL       A - TEFLON       D - PVC       X-         SAMPLING MATERIAL       A - TEFLON       D - PVC       X-         SAMPLING MATERIAL       A - TEFLON       D - PVC       X-         SAMPLING MATERIAL       A - TEFLON       D - PVC PUMP       X-         SAMPLING MATERIAL       A - TEFLON       D - PVC PUMP       X-         SAMPLING TUBING       A - TEFLON       D - POLYPROPILENE       C-COMEINTION       X-         SAMPLING TUBING       A - DEVICE DEPOSABLE       N - PELSUME       C-COMEINTION       X-         SAMPLING DEVICES 045       A - DEVIDE DEPOSABLE       N - PELSUME       C-UNCUMP OF PUCLOAD       X-         VELL DEPTH       Q       Q       Q       PELD MEASUREMENTS       Y-       SAMPLING MATERIAL OTHER (FRCIP)         VELL DEPTH       Q       GOON       GOUNDWATER ELEVATION       GT </th <th>PURGING EO</th> <th>UIPMENT</th> <th></th> <th>). N</th> <th>PURG</th> <th>ING AND SAN</th> <th>APLING EQUI</th> <th>PMENT SAMPI</th> <th>ING FOUIPMEN</th> <th>JTDEDI</th> <th>CATED</th> <th>ŃŇ</th>	PURGING EO	UIPMENT		). N	PURG	ING AND SAN	APLING EQUI	PMENT SAMPI	ING FOUIPMEN	JTDEDI	CATED	ŃŇ
PURCING DEVICE       A - SUBMERSIDLE PUMP       D - CAS LIF PUMP       G - BALER       X*         SAMPLING DEVICE       G - CALDER PUMP       P- DUPTER BOTTLE       X-OTHER       FUNCTION DEVICE OTHER (SPECIPY)         SAMPLING DEVICE       G - CALDER PUMP       P- DUPTER BOTTLE       X-OTHER       SAMPLING DEVICE OTHER (SPECIPY)         PURCING MATERIAL       G - CALDER PUMP       D - POC:       X*       X*         SAMPLING MATERIAL       G - CALPROPYLENE       X-OTHER       X*       TURCING DEVICE OTHER (SPECIPY)         SAMPLING MATERIAL       G - COLYPROPYLENE       X-OTHER       X*       TURCING DEVICE OTHER (SPECIPY)         SAMPLING MATERIAL       G - COLYPROPYLENE       X-OTHER       X*       TURCING DEVICE OTHER (SPECIPY)         SAMPLING TUBING       G - COLYPROPYLENE       X-OTHER       X*       TURCING TUBING OTHER (SPECIPY)         SAMPLING TUBING       G - COLYPROPYLENE       X-OTHER       X*       TURCING DEVICES DAS       X*         FILTERING DEVICES DAS       A - IN-LINE DEFOSABLE       B - PRESONE       C - VACUUM       ASAMPLINGT DUBING OTHER (SPECIPY)         VELL DEVITH       G = Q / Q / Q / Q / Q / Q / Q / Q / Q / Q				(CIRCLE ON	E)						(CIRCLE OI	NE)
SAMPLING DEVICE SAS PURCING MATERIAL C. LIADDER VIAIN PURCING MATERIAL C. LIADDER VIAIN SAMPLING MATERIAL C. LIADDER VIAINE SAMPLING TUBING C. A. TERION D. FOLVPROPYLENE SAMPLING TUBING OTHER (SPECIPY) SAMPLING THE SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING THE SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING THE SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING THE SAMPLING THE SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING THE SAMPLING THE SAMPLING TUBING OTHER (SPECIPY) SAMPLING TO SAMPLING THE SAMPLING TO SAMPLING TO SAMPLING TO SAMPLING TO SAMPLIN	PURGING DE	VIÇE	A-SI	UBMERSIBLE P	UMP	D - GAS LIFT PUM	G - BAILER		X=			<u></u>
PURGING MATERIAL SAMPLING MATERIAL SAMPLING MATERIAL SAMPLING MATERIAL SAMPLING MATERIAL SAMPLING MATERIAL SAMPLING MATERIAL OTHER (SPECIFY) SAMPLING DEVICES 0.45 SAMPLING DEVICES	SAMPLING D	EVICE	С	LADDER PUMF	MI	E - PURGE PUMP F - DIPPER BOTTLI	E X - OTHER		Y=	G DEVICE OF	HER (SPECIFY)	<u> </u>
SAMPLING MATERIAL BEIGHT BEIGH	PURGING MA	TERIAL	E A-T	EFLON		D - PVC			 X=			<i>.</i>
SAMPLING MATERIAL OTHER (SPECIFY) PURGE TUBING A - TEFLON B - TOCON B - TOLYERPYLENE C - CONBINATION X- FURGE TUBING OTHER (SPECIFY) SAMPLING TUBING OTHER (SPECIFY) C - ROPE F - SILLCONE X - OTHER X- SAMPLING TUBING OTHER (SPECIFY) FILTERING DEVICES 0.45 A - IN-LINE DISPOSABLE B - PRESSURE C - VACUUM A SIMPLENG THER (SPECIFY) FILTERING DEVICES 0.45 FIELD MEASUREMENTS DEFTH TO WATER PH TDS CONDUCTIVITY ORP VOLUME (feet)	SAMPLING M	ATERIAL	E B-ST C-PC	AINLESS STEE DLYPROPYLEN	E J	E - POLYETHYLEN X - OTHER	E		PURGIN X=	G MATERIAL	OTHER (SPECI	FY)
PORCE IDDING       Image: A - TERLON       D-HOLYROPPLENE       C-CONBINATION       X=         SAMPLING TUBING       Image: C-ROPE       F-SILCONE       X-OTHER       X=       SAMPLING TUBING OTHER GPECIFY)         FILTERING DEVICES 0.45       Image: A - IN-LINE DEPOSABLE       B-PRESSURE       C-VACUUM       45       MICLOW TCC WETA SOLUTION         DEPTH TO WATER       Image: A - IN-LINE DEPOSABLE       B-PRESSURE       C-VACUUM       45       MICLOW TCC WETA SOLUTION         DEPTH TO WATER       Image: A - IN-LINE DEPOSABLE       B-PRESSURE       C-VACUUM       45       MICLOW TCC WETA SOLUTION         VELL DEPTH       Image: A - IN-LINE DEPOSABLE       B-PRESSURE       C-VACUUM       45       MICLOW TCC WETA SOLUTION         VELL DEPTH       Image: A - IN-LINE DEFOSABLE       B-PRESSURE       C-VACUUM       45       CONDUCTIVITY         VELL DEPTH       Image: A - IN-LINE DEFOSABLE       B-PRESSURE       C-VACUUM       67       24       (rect)         VELL DEPTH       Image: A - IN-LINE DEFOSABLE       B-PRESSURE       C-VACUUM       67       24       (rect)       (rect)         Image: VELL DEPTH       Image: A - IN-LINE DEFOSABLE       Image: A - IN-LINE DEFOSABLE       B-PRESSURE       C-VACUUM       (rect)       (rect)       (rect)       (rect) <td< th=""><th></th><th></th><th></th><th></th><th><del></del></th><th><u></u></th><th>· · · · · · · · · · · · · · · · · · ·</th><th><u> </u></th><th>SAMPLI</th><th>NG MATERIAI</th><th>L OTHER (SPEC</th><th>(IFY)</th></td<>					<del></del>	<u></u>	· · · · · · · · · · · · · · · · · · ·	<u> </u>	SAMPLI	NG MATERIAI	L OTHER (SPEC	(IFY)
SAMPLING TUBING       C-ROPE       F-SILICONE       X-OTHER       X-         FILTERING DEVICES 0.45       A - IN-LINE DISPOSABLE       B - PRESSURE       C-VACUUM       45 MTCI M + 72 M + 74 S ANTLE         DEPTH TO WATER       27 99       FIELD MEASUREMENTS       95 28       (feet)         WELL DEPTH       39 36       (feet)       WELL ELEVATION       95 28       (feet)         TEMPERATURE       PH       TDS       CONDUCTIVITY       ORP       VOLUME         [°C0       [fetd]       [gfL]       [gfL]       [gfR]       [gfR]         [°C1       [fetd]       [gfL]       [gfL]       [gfR]       [gfR]         [°C2       [fetd]       [gfL]       [gfL]       [gfR]       [gfR]         [°C2       [fetd]       [gfL]       [gfR]       [gfR]       [gfR]         [°C2       [fetd]       [gfL]       [gfR]       [gfR]       [gfR]         [°C2       [fetd]       [gfL]       [gfR]       [gfR]       [gfR]       [gfR]         [°C3       [fetd]       [gfL]       [gfR]       [gfR]       [gfR]       [gfR]       [gfR]       [gfR]         [°C4       [fetd]       [gfL]       [gfR]       [gfR]       [gfR] <td< th=""><th>PURGE TUBIN</th><th>1G<sup>.</sup></th><th></th><th>eflon 'Gon'</th><th>1</th><th>D - POLYPROPYLE E - POLYETHYLEN</th><th>NE G-COMBI E TEFLON</th><th>NATION J/POLYPROPYLENE</th><th>X= PURGE1</th><th>UBING OTHE</th><th>R (SPECIFY)</th><th></th></td<>	PURGE TUBIN	1G <sup>.</sup>		eflon 'Gon'	1	D - POLYPROPYLE E - POLYETHYLEN	NE G-COMBI E TEFLON	NATION J/POLYPROPYLENE	X= PURGE1	UBING OTHE	R (SPECIFY)	
FILTERING DEVICES 0.45       A - IN-LINE DISPOSABLE       B - PRESSURE       C - VACUUMI       45 MT(LQ)       TC WETALS CANLY         DEPTH TO WATER       27       99       (reet)       WELL ELEVATION       95       28       (reet)         WELL DEPTH       39       36       (reet)       WELL ELEVATION       95       28       (reet)         TEMPERATURE       pH       TDS       CONDUCTIVITY       ORP       VOLUME         [°CC]       [6td)       [6td]       [6td]       [6td]       [6td]       [6td]         [°CC]       [6td]       [6td]       [6td]       [6td]       [6td]       [6td]       [6td]         [°CC]       [6td]       [6td]       [6td]       [6td]       [6td]       [6td]       [6td]       [6td]         [°CC]       [6td]	SAMPLING T	UBING	C-RC	OPE	1	F - SILICONE	X - OTHER		X=	بنيت استويت		
PIELD MEASUREMENTS         DEPTH TO WATER       27       99       (feet)       WELL ELEVATION       95       28       (feet)         WELL DEPTH       39       36       (feet)       GROUNDWATER ELEVATION       67       29       (feet)         TEMPERATURE       pH       TDS       CONDUCTIVITY       ORP       VOLUME        (°C)      (std)      (g/L)      (u/S/cmi)      (mV)      (gai)        (°C)      (std)      (g/L)      (u/S/cmi)	FILTERING D	EVICÉS 0.45	LA	A - IN-LINE DI	SPOSABLE	B - PRES	SURE C.VA	CUUM 451	SAMPLI MICIZI	TUBING O	vetals	anly
DEPTH TO WATER (cee) WELL ELEVATION 95 28 (reet) WELL DEPTH 94 705 GROUNDWATER ELEVATION 67 29 (reet) TEMPERATURE PH TDS CONDUCTIVITY ORP VOLUME (rec) (red) (red) (rec) (red) (r				$ \gamma $	aa	FIELD MEAS	SUREMENTS	te funte de fot energi ener¶				1
WELL DEPTH       SG       (fee)       GROUNDWATER ELEVATION       67       29       (fee)         TEMPERATURE       pH       TDS       CONDUCTIVITY       ORP       VOLUME         [°C)       [6td]       [g/L]       [u/s/cm)       [mv)       [gan]         [°C)       [6td]       [g/L]       [u/s/cm)       [mv]       [gan]         [°C)       [6td]       [g/L]       [u/s/cm)       [mv]       [gan]         [°C)       [6td]       [g/L]       [u/s/cm)       [mv]       [gan]         [°C)       [6td]       [g/L]       [u/s/cm]       [mv]       [gan]         [°C)       [ftd]       [go/D]       [mv]	, D	EPTH TO WAT	ER	21		(feet)	WELL ELEV	ATION	95	28	(feet)	
TEMPERATURE         pH         TDS         CONDUCTIVITY         ORP         VOLUME          (C)	). .]	WELL DEPI	н	39	361	(feet) GRO	UNDWATER ELE	VATION	67	29	(feet)	
Image:	TEMPER	ATURE	pH	den d	TD	Sj. Le uni	CONDUCTI	VITY	ORP	10	VOLUM	E.
Image: State in adjoint of the state in adjoint		(°C)	- <u>L</u>	(std)	<u></u>	(g/L)		[(μS/cm)	[	](mV)	1 <u>.</u>	(gal)
Image:		(°C)		(std)		(g/L)	1	(µS/cm)	۲ <u>ا</u>	(mV)	۲ <u>ـــــ</u>	(gal)
Image:	<u> </u>	(°C)	<u>.</u>	(std)	<u></u>	(g/L)	·L <u>···································</u>	(µS/cm)	۱ <u>ـــــ</u>	(mV)	۲ <u>ــــــ</u>	(gal)
Image:	l Ľ	(°C)	·	(std)		(g/L)	L	(μS/cm)	۲ <u>ــــــ</u>	(mV)	<u>t</u>	(gal)
SAMPLE APPEARANCE: WEATHER CONDITIONS: SPECIFIC COMMENTS: SPECIFIC COMMENTS:	· · · · · · · · · · · · · · · · · · ·	(°C)	ĺ	(std)		(g/L)	L <u> </u>	(µS/cm)	L	: (mV)	·L	(gal)
NO PAVAMENTS: NO PAVAMENTS: NO PAVAMENTS: Collected 1-82×3 = 5.446 ICERTIPATHAE SAMPLING PROCEDUKES VERE IN ACORDANCE AVEH APPLICABLE CRA PROPORTS DATE PROFESSION OF A CONTRACT OF	SAMPLE APPEA WEATHER CON	RANCE: DIFIONS:	<u>SIHU</u> temperature	e		FIELD CO	MMENTS COLOR:	brain PRECI	SHEEN YN PITATION YN II	) F Y TYPE)		<del></del>
1 CERTIFICATES APPLING PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVE PRINT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE IN ACCORDANCE WERH APPLICABLE CRA PROPORTS DAMAN CONTRACTOR DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROPORTS DATE PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROPORTS DATE PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROPORTS DATE PROPORTS DATE PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE PROPORTS DATE PROPORTS DATE PROVIDENT PROCEDURES VERE APPLICABLE CRA PROPORTS DATE P	SPECIFIC COM	IMEN 15:		11	<u>n n .</u>	minute	A. A.	la la l	· · · ·			_
ICERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLING PROCEDURES VERE IN ACCORDANCE AVERH APPLICABLE CRA PROTODIS 1 CERTIPATIATSAMPLICABLE CRA PROTODIS 1 CERTIPATIATIATIATIATIATIATIATIATIATIATIATIATIA		······································	<u>~ 111</u>	/V	vpa	rament	rs col	ucted	·····			
I CERTIFIC THAT SAMPLING PROCEDURES WERE IN ACCORDANCE WITH APPLICABLE CRA PROTOCOLS	1-82	X3 =	5.46						·····			
I CERTIFIC THAT SAMPLING PROCEDURES WERE IN ACCORDANCE WERH APPLICABLE CRA PROFODLS.	· · · · · · · · · · · · · · · · · · ·					•		<u>\</u>			·····	
DATE PRINT	I CERTIFICT	THATSAMPLING	PROCEDUKES	e in accord	NCENT	HAPPLICABLE CF		Pach	Mur	ð		
$\sim$	DATE		PRINT			- any	IGNATURE	× v ···································			<del></del>	

TE/PROJECT NAM	$\frac{1}{10} = \frac{1}{100} 1$	# <u>074928</u> # MW-3
PURGE DATE (MM DD YY)	Image:	er vol. in casing (Gallons): (Gallons)
PURGING EQUIPMENT	PURGING AND SAMPLING EQUIPMENT	SAMPLING EQUIPMENT
PURGING DEVICE	G - BAILER G - BAILER B - PERISTALTIC PUMP E - PURGE PUMP H - WATERRAG	X= PURGING DEVICE OTHER (SPECIFY)
SAMPLING DEVICE	C-BLADDER PUMP F-DIPPER BOTTLE X: OTHER	X=SAMPLING DEVICE OTHER (SPECIFY)
PURGING MATERIAL	A - TEFLON. D - PVC B - STAINLESS STEEL E = POLYETHYLENE C - POLYPROPYLENE X - OTHER.	X⇒ PURGING MATERIAL OTHER (SPECIFY) X=
PURGE TUBING	A-TEFLON D-POLYPROPYLENE G-COMBINATION	SAMPLING MATERIAL OTHER (SPECIFY) X=
SAMPLING TUBING	C-ROPE F-SILICONE X-OTHER	VERGE TUBING OTHER (SPECIFY) X=
FILTERING DEVICES 0.45	A - IN-LINE DISPOSABLE B - PRESSURE C - VACUUM	.46 micron for netals only
DEPTH TO WATE WELL DEPT	R 29 02 (feet) WELL ELEVATION I 36 73 (feet) GROUNDWATER ELEVATION	95 44 (feet) 66 42 (feet)
TEMPERATURE	pH TDS CONDUCTIVITY (std) (g/L)	ORP VOLUME
[](°C)	(g/L) (g/L)	(mV)
(°C)	(stā) (g/L) ((g/L) (total)	i5/cm) [(mV) [](
(°C)	(std) (g/L) (t	ı\$/cm) [(mV) [(
SAMPLE APPEARANCE: WEATHER CONDITIONS:	SIHY ODOR: ADVICE COLOR:	DLINSHEEN Y N PRECIPITATION Y N F Y TYPE)
SPECIFIC COMMENTS:	No parameters colleg	eo[
1,23×3=	Da 70	
I CERTIFY THAT SAMPLING	PROCEEDURES IVERE IN ACCORDANCE WITH APPLICABLE CRA PROTOCOLES	) ( MEUED
	Shirton	2 <sup>-1</sup> 12 <sup>-1</sup> 1

à

	WELL SAMPLING	FIELD INFORM	ATION FOR	M	
I ITE/PROJECT NAM	n: <u>Howell K-</u>	-1 0312-000-1010-4		14928	
	D. GV0_01120_10			<u>V: 1</u>	
PURGE DATE (MM DD YY)	SAMPLE DATE (MM DD YY)	SAMPLE TIME. (24 HOUR)	WATER VOL. IN CASING (GALLONS)		5 DIL PURCED ONS)
	FDICATED N	NG AND SAMPLING EQUIP	MENT		ATED N N
	(CIRCLE ONE)		SAMPLING EQ	OIFMENTDEDIC	(CIRCLE ONE)
PURGING DEVICE	A-SUBMERSIBLE PUMP D	- GAS LIFT PUMP G - BAILER	X=		,
SAMPLING DEVICE	B-PERISTALTIC PUMP E C-BLADDER PUMP F	- PURGE PUMP H - WATERF - DIPPER BOTTLE X - OTHER	κ <b>ΑΦ</b> Χ≐	PURGING DEVICE OTH	IER (SPECIFY)
PURGING MATERIAL	A - TEFLON D	- PVC		SAMPLING DEVICE OF	HER (SPECIFI)
SAMPLING MATERIAL	B - STAINLESS STEEL E C - POLYPROPYLENE X	- POLYETHYLENE - OTHER	X=	PURGING MATERIAL C	OTHER (SPECIFY)
EURCE THBING	A TELION D	- POLYPROPYTENE C. COMPAN	ATION X=	SAMPLING MATERIAL	OTHER (SPECIFY)
	B TYGON E	POLYETHYLENE TEFLON/	POLYPROPYLENE	PURGE TUBING OTHER	R (SPECIFY)
SAMPLING TUBING	C-ROPE F-	SILICONE X OTHER	X=		
FILTERING DEVICES 0.45		B - PRESSURE C - VAC	UUN, 45 MIC	M for M	etals only
	OQ No	FIELD MEASUREMENTS			•
DEPTH TO WATE		(feet) WELL ELEVA		15 36	(feet)
WELL DEPTH	1 54 21	(feet) GROUNDWATER ELEV	ATION	66 30	(feet)
TEMPERATURE	pH TDS	CONDUCTIV	urve a d	ORP	VOLUME
(°C)	(std)	(g/L)	(µS/cm)	(mV)	[(gal)
(°C)	(std)	(g/L)	(µS/cm)	(mV)	(gal)
(°C)	(std)	(g/L)	(µS/cm)	(mV)	(gal)
(°C)	(std)	(g/L)	(µS/cm)	(mV)	(gal)
(°)	(std)	(g/L)	(µS/cm)	(mV)	(gal)
		FIELD COMMENTS		i i gan a canta i	·······
SAMPLE APPEARANCE:	ODOR:	COLOR:	SHE	EN Y/N	
WEATHER CONDITIONS:	TEMPERATURE		PRECIPITATIO	N Y/N (IF Y TYPE)	
		parameters	Collected		
a most y A	A C		<u> </u>		
U. 434 X 2	- 40		() 1/0		
	Collect Pup for	netals enty	$\bigcirc 143$	2	
ICERTIFY THAT SAMPLING I	ROCEDUITES WERE IN ACCORDANCE WITH MATTER PRINT	APPLICABLE CRA PROTOCOLS () US SIGNATURE	<u>ANNAL</u>	el0	

# APPENDIX B

# OCTOBER 2012 ANNUAL GROUNDWATER LABORATORY ANALYTICAL REPORT

074928 (4)



Pace Analytical Services, Inc. 9608 Loiret Blvd. ... Lenexa, KS 66219 (913)599-5665

October 18, 2012

Christine Matthews CRA 6121 Indian School Rd NE Suite 200 Albuquerque, NM 87110

RE: Project: 074928 HOWELL K NO 1 Pace Project No.: 60130637

Dear Christine Matthews:

Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Duce Glanagan

Alice Flanagan

alice.flanagan@pacelabs.com Project Manager

Enclosures

cc: Kelly Blanchard, COP Conestoga-Rovers & Associa Angela Bown, COP Conestoga-Rovers & Associa Cassie Brown, COP Conestoga-Rovers & Associa



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# CERTIFICATIONS

Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

Kansas Certification IDs 9608 Loiret Boulevard, Lenexa, KS 66219 A2LA Certification #: 2456.01 Arkansas Certification #: 12-019-0 Illinois Certification #: 002885 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116

0

Louisiana Certification #: 03055 Nevada Certification #: KS000212008A Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407-12-3 Utah Certification #: KS000212012-2

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# SAMPLE SUMMARY

Project:074928 HOWELL K NO 1Pace Project No.:60130637

Lab ID	Sample ID	Matrix	Date Collected	Date Received		
60130637001	GW-074928-100312-CM-MW-2	Water	10/03/12 13:30	10/05/12 08:30		
60130637002	GW-074928-100312-CM-MW-3	Water	10/03/12 13:50	10/05/12 08:30		
60130637003	GW-074928-100312-CM-MW-1	Water	10/03/12 14:05	10/05/12 08:30		
60130637004	GW-074928-100312-CM-MW-4	Water	10/03/12 14:25	10/05/12 08:30		
60130637005	GW-074928-100312-CM-DUP	Water	10/03/12 14:30	10/05/12 08:30		

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# SAMPLE ANALYTE COUNT

 Project:
 074928 HOWELL K NO 1

 Pace Project No.:
 60130637

Lab ID	Sample ID	Method <sub>c</sub>	Analysts	Analytes Reported		
60130637001		EPA 6010	JGP	2		
		EPA 300.0	AJM	2		
60130637002	GW-074928-100312-CM-MW-3	EPA 6010	JGP	2		
		EPA 300.0	AJM	2		
60130637003	GW-074928-100312-CM-MW-1	EPA 6010	JGP	2		
		EPA 300.0	AJM	2		
60130637004	GW-074928-100312-CM-MW-4	EPA 6010	JGP	2		
		EPA 300.0	AJM	2		
60130637005	GW-074928-100312-CM-DUP	EPA 6010	JGP	2		

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### **PROJECT NARRATIVE**

Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

### Method: EPA 6010

Description:6010 MET ICP, DissolvedClient:COP Conestoga-Rovers & Associates, Inc. NMDate:October 18, 2012

### General Information:

5 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Additional Comments:**

**REPORT OF LABORATORY ANALYSIS** 

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# **PROJECT NARRATIVE**

Project:	074928 HOWELL K NO 1	
Pace Project No.:	60130637	;

### Method: EPA 300.0

Description:300.0 IC Anions 28 DaysClient:COP Conestoga-Rovers & Associates, Inc. NMDate:October 18, 2012

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

# **REPORT OF LABORATORY ANALYSIS**

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Pace Package 6 of 17

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Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

Sample: GW-074928-100312-CM- MW-2	Lab ID:	Lab ID: 60130637001		Collected: 10/03/12 13:30			05/12 08:30 Ma	Matrix: Water		
			Report							
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
6010 MET ICP, Dissolved	Analytical	Method: EPA 6	010 Prepa	ration Meth	od: EPA	A 3010				
Iron, Dissolved	, ND m	ND mg/L 0		0.017	1	10/10/12 12:25	10/11/12 18:36	7439-89-6		
Manganese, Dissolved	0.0055 m	ıg/L	0.0050	0.00060	1	10/10/12 12:25	10/11/12 18:36	7439-96-5		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
Fluoride	<b>1.1</b> m	ig/L	0.20	0.011	1		10/15/12 11:41	16984-48-8		
Sulfate	<b>1850</b> m	ıg/L	200	24.0	200		10/15/12 11:59	14808-79-8		

Date: 10/18/2012 10:18 AM

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Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

Sample:	GW-074928-100312-CM- MW-3	Lab ID:	60130637002	Collecte	d: 10/03/12	2 13:50	Received: 10/	atrix: Water		
				Report						
	Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ME	T ICP, Dissolved	Analytical	Method: EPA 6	010 Prepa	ration Meth	od: EPA	A 3010			
Iron, Diss	solved	ND n	ND mg/L		0.017	1	10/10/12 12:25	10/11/12 18:45	7439-89-6	
Mangane	ese, Dissolved	0.25 n	ng/L	0.0050	0.00060	1	10/10/12 12:25	10/11/12 18:45	7439-96-5	
300.0 IC	Anions 28 Days	Analytical	Method: EPA 3	00.0						
Fluoride		0.95 n	0.95 mg/L		0.011	1		10/15/12 14:07	16984-48-8	
Sulfate		<b>2080</b> m	ng/L	200	24.0	200		10/15/12 14:25	14808-79-8	

Date: 10/18/2012 10:18 AM

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Project: 074928 HOWELL K NO 1

Pace Project No.: / 60130637

Sample: GW-074928-100312-CM- MW-1	Lab ID:	60130637003	Collecte	d: 10/03/12	2 14:05	Received: 10/	atrix: Water		
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical	Method: EPA 6	010 Prepa	ration Meth	od: EPA	A 3010			
Iron, Dissolved Manganese, Dissolved	16.7 m 6.1 m	Analytical Method: EPA 6010         I           16.7 mg/L         0.           6.1 mg/L         0.0		0.017 0.00060	1 1	10/10/12 12:25 10/10/12 12:25	10/11/12 18:47 10/11/12 18:47	7439-89-6 7439-96-5	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Fluoride Sulfate	0.56 m 3280 m	ng/L ng/L	0.20 200	0.011 24.0	1 200		10/15/12 14:43 10/15/12 15:01	16984-48-8 14808-79-8	

Date: 10/18/2012 10:18 AM

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Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

Sample: GW-074928-100312-CM- MW-4	Lab ID:	60130637004	Collected	10/03/12	2 14:25	Received: 10/	05/12 08:30 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical	Method: EPA 6	010 Prepar	ation Meth	od: EPA	A 3010			
Iron, Dissolved Manganese, Dissolved	2.0 m 18.0 m	ng/L ng/L	0.050 0.0050	0.017 0.00060	1 1	10/10/12 12:25 10/10/12 12:25	10/11/12 18:49 10/11/12 18:49	7439-89-6 7439-96-5	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	0.00						
Fluoride Sulfate	2.1 m 4280 m	ng/L ng/L	0.20 500	0.011 60.0	1 500		10/15/12 15:20 10/15/12 21:42	16984-48-8 14808-79-8	

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Project: 074928 HOWELL K NO 1

Pace Project No.: 60130637

Sample:	GW-074928-100312-CM- DUP	Lab ID: 60130637005		Collected	Collected: 10/03/12 14:3		Received: 10	/05/12 08:30 N	Matrix: Water	
	Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved		Analytical	Method: EPA 6	6010 Prepar	ation Meth	od: EPA	3010			
Iron, Dissolved Manganese, Dissolved		2.2 mg/L 18.4 mg/L		0.050 0.017 0.0050 0.00060		1 1	10/10/12 12:25 10/10/12 12:25	10/11/12 18:5 <sup>.</sup> 10/11/12 18:5 <sup>.</sup>	1 7439-89-6 1 7439-96-5	

Date: 10/18/2012 10:18 AM

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# QUALITY CONTROL DATA

Project: 074928 HOWEL		VELL K NO 1											
Pace Project No.:	60130637				•							-	
QC Batch:	MPRP/198	94		Analys	is Method:	E	PA 6010						
QC Batch Method:	EPA 3010		;	Analys	is Descript	tion: 6	010 MET Di	ssolved					
Associated Lab San	nples: 6013	80637001, 60	130637002	, 60130637	003, 6013	0637004, 6	013063700	5					
METHOD BLANK:	1076621			N	Matrix: Wa	ter							
Associated Lab San	nples: 6013	0637001, 60	130637002	, 60130637	003, 6013	0637004, 6	013063700	5					
				Blank	k R	eporting							
Paran	neter		Jnits	Resu	t	Limit	Analyz	ed	Qualifiers				
Iron, Dissolved		mg/L			ND	0.050	10/11/12	18:18		_			
Manganese, Dissolv	ved	mg/L			ND	0.0050	10/11/12	18:18					
LABORATORY CON	NTROL'SAMP	LE: 10766	22										
				Spike	LCS	;	LCS	% Red	;				
Paran	neter	•	Jnits	Conc.	Resu	lt	% Rec	Limits	Qu	alifiers			
Iron, Dissolved		mg/L		10		9.2	. 92	80	-120		-		
Manganese, Dissolv	ved	mg/L		່ 1		0.99	99	80	-120				
		DUDUCAT	10766	<b>1</b> 2		1076604							
WAIRIN SFIRE & W		DUFLICATE	. 10700	20 . MC	MOD	1070024							
		601	30622001	Snike	Snike	MS	MSD	MS	MSD	% Rec		Max	
Paramet	ter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Iron, Dissolved		mg/L	9350 ua/L	10	10	18.6	18.2	92	88	75-125	2	20	
Manganese, Dissolv	ved	mg/L	600 ug/L	1	1	1.6	1.5	96	94	75-125	1	20	

Date: 10/18/2012 10:18 AM

# REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project:	074928	HOWELL K NO	1										
Pace Project No.:	6013063	37		•									
QC Batch:	WETA	/22056		Analys	sis Method	: E	PA 300.0 、						
QC Batch Method:	EPA 30	0.0		Analys	sis Descrip	tion: 30	00.0 IC Anio	ns					
Associated Lab Sa	amples:	60130637001, 60	0130637002	2, 60130637	7003, 6013	0637004							
METHOD BLANK:	1079557	7			Matrix: Wa	iter							
Associated Lab Sa	imples:	60130637001, 60	0130637002	, 60130637	003, 6013	0637004							
				Blanl	<b>к                                    </b>	Reporting							
Para	meter		Units	Resu	lt	Limit	Analyz	ed	Qualifiers				
Fluoride		mg/L			ND	0.20	10/15/12	11:05					
Sulfate		mg/L			ND	1.0	10/15/12	11:05					
			58										
				Snike	1.09	2	108	% Rec					
Para	meter		Units	Conc.	Resi	ult	% Rec	Limits	Qı	alifiers			
Fluoride		mg/L		2.5	;	2.4	98	90	)-110		-		
Sulfate		mg/L		. 5	<b>.</b>	5.0	101	90	)-110		•		
MATRIX SPIKE &			E <sup>.</sup> 10795	59		1079560							
			10700	MS	MSD	1070000							
		601	30637001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Мах	
Parame	eter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Fluoride	•	mg/L	1.1	2.5	2.5	3.5	3.5	97	96	75-110	1	10	
Sulfate		mg/L	1850	1000	1000	2710	2710	-86	86	61-119	0	10	
	MPLE:	10795	61										
				601308	29001	Spike	MS	м	IS	% Rec			
Para	meter		Units	Res	ult	Conc.	Result	% F	Rec	Limits		Qualif	iers
Fluoride		mg/L			0.66	2.5	3	3.2	100	75-	110		

Date: 10/18/2012 10:18 AM

Sulfate

# **REPORT OF LABORATORY ANALYSIS**

5.6

5

mg/L

10.4

98

61-119

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Pace Package 13 of 17



# QUALIFIERS

Project: 074928 HOWELL K NO 1 Pace Project No.: 60130637

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Date: 10/18/2012 10:18 AM

### **REPORT OF LABORATORY ANALYSIS**

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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

 Project:
 074928 HOWELL K NO 1

 Pace Project No.:
 60130637

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60130637001	GW-074928-100312-CM-MW-2	EPA 3010	MPRP/19894	EPA 6010	ICP/16356
60130637002	GW-074928-100312-CM-MW-3	EPA 3010	MPRP/19894	EPA 6010	ICP/16356
60130637003	GW-074928-100312-CM-MW-1	EPA 3010	MPRP/19894	EPA 6010	ICP/16356
60130637004	GW-074928-100312-CM-MW-4	EPA 3010	MPRP/19894	EPA 6010	ICP/16356
60130637005	GW-074928-100312-CM-DUP	EPA 3010	MPRP/19894	EPA 6010	ICP/16356
60130637001	GW-074928-100312-CM-MW-2	EPA 300.0	WETA/22056		
60130637002	GW-074928-100312-CM-MW-3	EPA 300.0	WETA/22056		
60130637003	GW-074928-100312-CM-MW-1	EPA 300.0	WETA/22056		
60130637004	GW-074928-100312-CM-MW-4	EPA 300.0	WETA/22056		

Date: 10/18/2012 10:18 AM

# **REPORT OF LABORATORY ANALYSIS**

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Pace Package 15 of 17

Pace Analytical

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# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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