

009-26728



Black Hills Exploration & Production

SEC 14-T29N-R3W
Jicarilla 29-03-14 #1

OH

OIL CONS. DIV DIST. 3

APR 23 2014

Design: OH

Standard Survey Report

18 December, 2013

This survey is correct to the best of my knowledge and is supported by actual field data.

A handwritten signature in black ink, appearing to be 'L. Stanley', is written over a horizontal line.

Notarized this date 18 of December, 2013.

A handwritten signature in black ink, reading 'Leaudra Stanley', is written over a horizontal line.

Notary Signature
County of Mesa
State of Colorado

LEAUDRA STANLEY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20044039346
My Commission Expires December 5, 2016

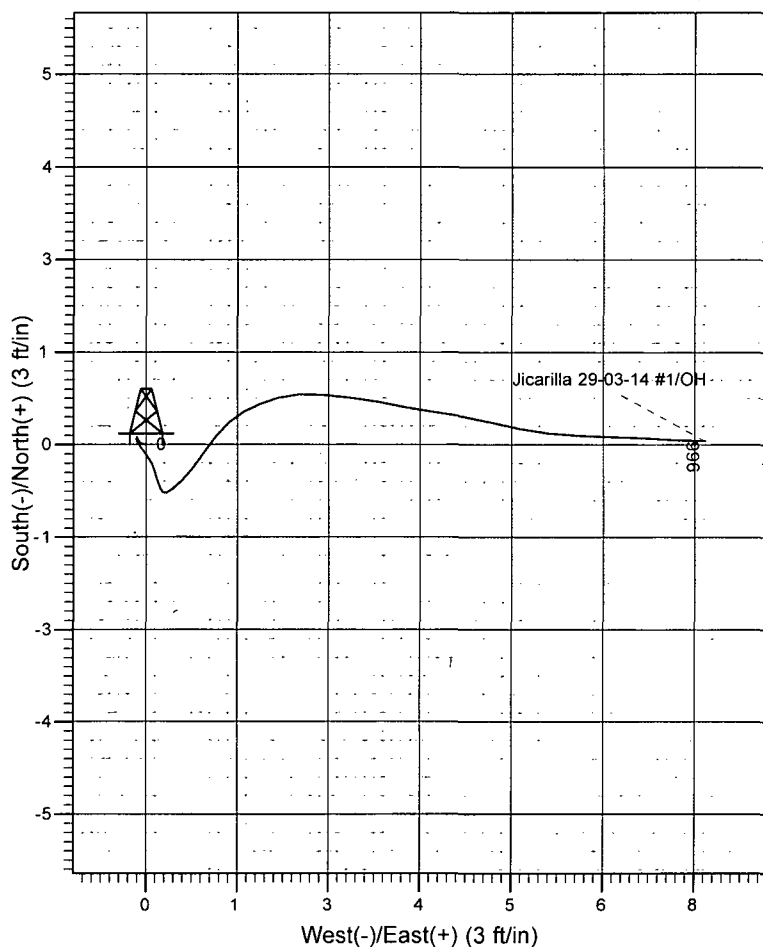
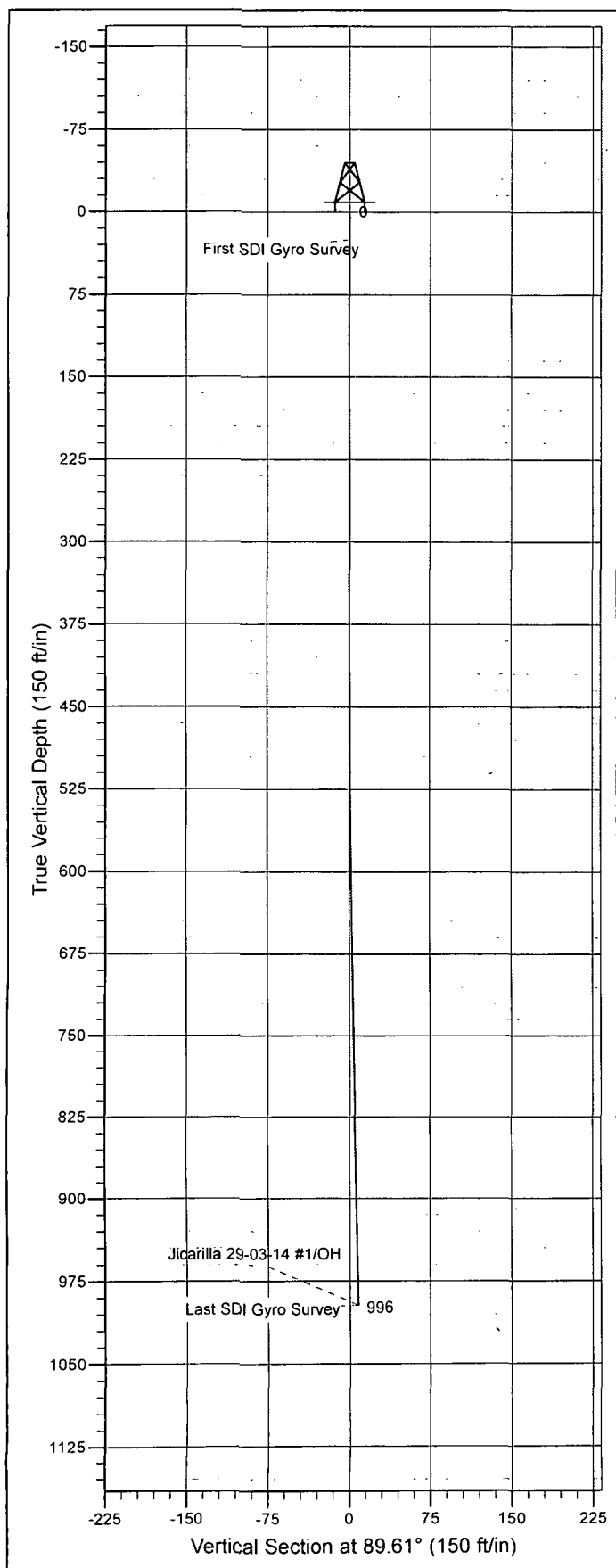


Scientific Drilling



Scientific Drilling

Company: Blackhills Exploration & Prod.
Project: Rio Arriba County, NM
Site: Jicarilla 29-03-14 #1
Well: Jicarilla 29-03-14 #1
Wellbore: OH
Design: OH



Well Details: Jicarilla 29-03-14 #1

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	2085797.84	709561.26	36° 43' 48.396 N	107° 7' 5.592 W	

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Site Jicarilla 29-03-14 #1, True North
Vertical (TVD) Reference: GL 7173' & RKB 13' @ 7186.00ft
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: GL 7173' & RKB 13' @ 7186.00ft
Calculation Method: Minimum Curvature

PROJECT DETAILS: Rio Arriba County, NM

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico West 3003

System Datum: Mean Sea Level

Plan: OH

11:03, December 18 2013
Created By: Janie Collins

Survey Report



Company:	Blackhills Exploration & Prod.	Local Co-ordinate Reference:	Site Jicarilla 29-03-14 #1
Project:	Rio Arriba County, NM	TVD Reference:	GL 7173' & RKB 13' @ 7186.00ft
Site:	Jicarilla 29-03-14 #1	MD Reference:	GL 7173' & RKB 13' @ 7186.00ft
Well:	Jicarilla 29-03-14 #1	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Rio Arriba County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	Jicarilla 29-03-14 #1		
Site Position:		Northing:	2,085,797.84 usft
From:	Lat/Long	Easting:	709,561.26 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 43' 48.396 N
		Longitude:	107° 7' 5.592 W
		Grid Convergence:	0.43 °

Well	Jicarilla 29-03-14 #1		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	36° 43' 48.396 N
		Longitude:	107° 7' 5.592 W
		Ground Level:	7,173.00 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	BGGM2013	10/28/2013	9.37
			Dip Angle (°)
			63.53
			Field Strength (nT)
			50,509

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			89.61

Survey Program	Date	12/18/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
25.00	996.36	Survey #1 - Gyro Survey (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.13	276.24	25.00	0.00	-0.03	-0.03	0.52	0.52	0.00
First SDI Gyro Survey									
50.00	0.15	298.02	50.00	0.02	-0.09	-0.09	0.23	0.08	87.12
75.00	0.17	352.74	75.00	0.07	-0.12	-0.12	0.59	0.08	218.88
100.00	0.04	190.96	100.00	0.10	-0.13	-0.12	0.83	-0.52	-647.12
125.00	0.04	213.71	125.00	0.09	-0.13	-0.13	0.06	0.00	91.00
150.00	0.07	174.56	150.00	0.06	-0.14	-0.13	0.19	0.12	-156.60
175.00	0.21	148.53	175.00	0.01	-0.11	-0.11	0.60	0.56	-104.12
200.00	0.25	137.73	200.00	-0.07	-0.05	-0.05	0.24	0.16	-43.20
225.00	0.30	149.25	225.00	-0.17	0.02	0.02	0.30	0.20	46.08

Survey Report



Company:	Blackhills Exploration & Prod.	Local Co-ordinate Reference:	Site Jicarilla 29-03-14 #1
Project:	Rio Arriba County, NM	TVD Reference:	GL 7173' & RKB 13' @ 7186.00ft
Site:	Jicarilla 29-03-14 #1	MD Reference:	GL 7173' & RKB 13' @ 7186.00ft
Well:	Jicarilla 29-03-14 #1	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
250.00	0.25	151.36	250.00	-0.27	0.08	0.08	0.20	-0.20	8.44
275.00	0.24	166.54	275.00	-0.37	0.12	0.12	0.26	-0.04	60.72
300.00	0.19	161.43	300.00	-0.46	0.14	0.14	0.21	-0.20	-20.44
325.00	0.18	157.32	325.00	-0.54	0.17	0.17	0.07	-0.04	-16.44
350.00	0.13	155.81	350.00	-0.60	0.20	0.20	0.20	-0.20	-6.04
375.00	0.13	142.09	375.00	-0.65	0.23	0.22	0.12	0.00	-54.88
400.00	0.17	59.89	400.00	-0.65	0.28	0.27	0.80	0.16	-328.80
425.00	0.29	59.08	425.00	-0.60	0.36	0.36	0.48	0.48	-3.24
450.00	0.47	42.50	450.00	-0.49	0.49	0.48	0.84	0.72	-66.32
475.00	0.54	40.05	475.00	-0.32	0.63	0.63	0.29	0.28	-9.80
500.00	0.70	33.87	499.99	-0.11	0.79	0.79	0.69	0.64	-24.72
525.00	0.60	40.76	524.99	0.12	0.96	0.97	0.51	-0.40	27.56
550.00	0.59	46.77	549.99	0.31	1.14	1.15	0.25	-0.04	24.04
575.00	0.53	64.62	574.99	0.44	1.34	1.34	0.73	-0.24	71.40
600.00	0.55	64.55	599.99	0.54	1.55	1.56	0.08	0.08	-0.28
625.00	0.65	77.09	624.99	0.63	1.80	1.81	0.66	0.40	50.16
650.00	0.70	84.65	649.99	0.67	2.09	2.10	0.41	0.20	30.24
675.00	0.82	96.02	674.98	0.67	2.42	2.43	0.77	0.48	45.48
700.00	0.83	95.51	699.98	0.63	2.78	2.78	0.05	0.04	-2.04
725.00	0.94	101.19	724.98	0.58	3.16	3.16	0.56	0.44	22.72
750.00	0.91	100.88	749.98	0.50	3.56	3.56	0.12	-0.12	-1.24
775.00	0.92	96.86	774.97	0.44	3.95	3.95	0.26	0.04	-16.08
800.00	0.89	100.71	799.97	0.38	4.34	4.34	0.27	-0.12	15.40
825.00	0.91	102.56	824.97	0.30	4.73	4.73	0.14	0.08	7.40
850.00	0.89	101.89	849.96	0.21	5.11	5.11	0.09	-0.08	-2.68
875.00	0.87	95.79	874.96	0.16	5.49	5.49	0.38	-0.08	-24.40
900.00	1.03	93.43	899.96	0.12	5.90	5.90	0.66	0.64	-9.44
925.00	1.01	91.40	924.95	0.10	6.35	6.35	0.17	-0.08	-8.12
950.00	1.00	92.52	949.95	0.09	6.78	6.79	0.09	-0.04	4.48
975.00	1.05	94.25	974.94	0.06	7.23	7.23	0.24	0.20	6.92
996.36	1.17	89.06	996.30	0.05	7.64	7.64	0.73	0.56	-24.30
Last SDI Gyro Survey									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
996.36	996.30	0.05	7.64	Last SDI Gyro Survey

Checked By: _____ Approved By: _____ Date: _____