

Results of Directional Survey

API number:	30-025-40936		
OGRID:		Operator:	CAZA OPERATING, LLC
		Property:	CAZA RIDGE 14 STATE # 4H

surface	ULSTR:	P	14	T	23S	R	34E
				330	FSL	660	FEL

BH Loc	ULSTR:	A	14	T	23S	R	34E
15775	MD	11397.9	TVD	345	FNL	596	FEL
				4935	FSL		

Top Perf/OH	ULSTR:	P	14	T	23S	R	34E
11733	MD	11299.8	TVD	906	FSL	770	FEL

Bot Perf/OH	ULSTR:	A	14	T	23S	R	34E
15606	MD	11394.1	TVD	514	FNL	605	FEL
				4766	FSL		

	MD	N/S	E/W	VD
	11717	560.04	-108.73	11297.85
TOP PERFS/OH	11733	575.84	-110.45	11299.75
	11749	591.63	-112.16	11301.64
	15583	4413.40	54.16	11393.50
BOT PERFS/OH	15606	4436.36	55.34	11394.10
	15678	4508.24	59.04	11395.98

NEXT TO LAST	15718	4548.19	60.96	11396.82
LAST READING	15775	4605.12	63.55	11397.91
TD	15775	4605.12	63.55	11397.91

Surface Location	330	FS	660	FE
Projected BHL	4935	FS	596	FE
Location of				
Top Perfs/OH	906	FS	770	FE
Bottom Perfs/OH	4766	FS	605	FE

SUMMARY of Subsurface Locations

Surface Location	P-14-23S-34E	330	FS	660	FE	Vert. Depth
Top Perfs/OH	P-14-23S-34E	906	FS	770	FE	11299.75
Bottom Perfs/OH	A-14-23S-34E	4766	FS	605	FE	11394.10
Projected TD	A-14-23S-34E	4935	FS	596	FE	11397.91

SEP 19 2013

OPERATOR: Caza Operating, LLC
WELL/LEASE: Caza Ridge 14 State # 4 H
COUNTY: Lea Co., New Mexico
Sec 14, T23S, R34E

HOBBS OCD

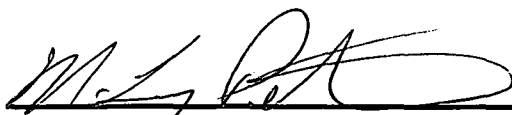
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**STATE OF NEW MEXICO
DEVIATION REPORT**

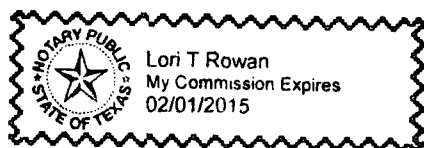
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
236	1/4	3,904	2
470	3/4	3,936	2 1/2
703	1/4	4,033	2 1/4
838	1/4	4,128	2 1/4
1,033	2	4,177	1 3/4
1,187	2	4,233	2 1/4
1,289	2 3/4	4,326	2
1,472	2 1/4	4,371	2
1,567	2	4,421	1 1/4
1,662	1 1/2	4,516	1
1,756	1 1/2	4,611	1 1/4
1,851	1 3/4	5,272	1 3/4
1,946	1 1/2	5,556	1 3/4
2,041	1 1/2	6,125	1
2,136	1 1/2	6,409	3/4
2,230	1	7,062	1/4
2,325	1 1/4	7,276	1/2
2,420	1 1/2	7,632	1
2,515	2 1/2	7,821	3/4
2,705	2 3/4	8,012	3/4
2,799	2 1/2	8,203	3/4
2,894	2 1/2	8,394	1
2,989	2 3/4	8,585	1
3,084	3	9,154	1 1/4
3,179	2 1/2	9,440	1
3,274	2 1/2	9,725	1 3/4
3,369	2 3/4	9,916	1 3/4
3,463	3	10,011	1
3,558	3	10,106	1 1/4
3,653	2 1/2	10,297	1 1/4
3,703	2 1/2	10,487	2
3,748	2 1/2	10,582	2 1/4
3,843	2		

Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 16th day of July, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




Lori T. Rowan
Notary Public for Ector Co., Texas



Company: Caza Operating
Lease/Well: caza ridge 14 state /#4H
Location: Sec 14 T23S R34E
Rig Name: PATRIOT 4
State/County: NEW MEXICO/Lea
Latitude: 32.30, Longitude: -103.43
GRID North is 0.48 Degrees East of True North
VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB 22 Feet

HOBBS OCD

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: caza ridge 14 state #4h-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/30/2013 / 11:13

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Vaughn Energy Services

West Texas

Chris Bankson

432-563-5444

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.11	135.03	100.00	-0.07	0.07	-0.07	0.10	135.03	0.11
200.00	0.16	146.63	200.00	-0.25	0.21	-0.25	0.33	139.84	0.05
300.00	0.26	163.03	300.00	-0.59	0.36	-0.59	0.69	148.79	0.12
400.00	0.19	169.37	400.00	-0.97	0.45	-0.97	1.07	154.98	0.07
500.00	0.57	172.14	500.00	-1.63	0.55	-1.63	1.72	161.25	0.37
600.00	0.27	141.53	599.99	-2.30	0.77	-2.30	2.42	161.59	0.36
700.00	0.60	130.74	699.99	-2.83	1.31	-2.83	3.12	155.12	0.34
800.00	0.88	92.96	799.98	-3.21	2.48	-3.21	4.06	142.38	0.54
900.00	1.48	93.62	899.96	-3.33	4.53	-3.33	5.63	126.34	0.61
1000.00	1.93	93.10	999.92	-3.51	7.51	-3.51	8.29	115.03	0.45
1100.00	1.72	94.56	1099.86	-3.72	10.69	-3.72	11.32	109.17	0.22
1200.00	1.80	86.79	1199.82	-3.75	13.76	-3.75	14.26	105.25	0.25
1300.00	1.79	86.51	1299.77	-3.57	16.88	-3.57	17.26	101.93	0.01
1400.00	2.53	83.70	1399.70	-3.23	20.63	-3.23	20.89	98.90	0.74
1500.00	2.49	81.07	1499.60	-2.65	24.97	-2.65	25.11	96.06	0.12
1600.00	1.79	83.45	1599.53	-2.13	28.68	-2.13	28.76	94.26	0.71
1700.00	1.57	85.73	1699.49	-1.85	31.60	-1.85	31.65	93.36	0.23
1800.00	1.52	80.01	1799.45	-1.52	34.27	-1.52	34.30	92.54	0.16
1900.00	1.43	83.68	1899.42	-1.15	36.81	-1.15	36.83	91.80	0.13
2000.00	1.35	70.92	1999.39	-0.63	39.16	-0.63	39.16	90.93	0.32
2100.00	1.25	64.57	2099.36	0.22	41.25	0.22	41.26	89.70	0.17
2200.00	1.32	60.75	2199.34	1.25	43.24	1.25	43.26	88.35	0.11
2300.00	1.06	55.72	2299.32	2.33	45.01	2.33	45.07	87.03	0.27
2400.00	1.35	56.33	2399.29	3.51	46.76	3.51	46.89	85.71	0.28
2500.00	1.38	55.09	2499.27	4.85	48.72	4.85	48.96	84.32	0.05
2600.00	1.52	58.83	2599.23	6.22	50.84	6.22	51.22	83.02	0.17
2700.00	1.95	56.44	2699.19	7.85	53.40	7.85	53.97	81.63	0.44
2800.00	2.46	50.49	2799.11	10.16	56.47	10.16	57.38	79.80	0.56
2900.00	2.21	45.33	2899.03	12.88	59.50	12.88	60.88	77.79	0.33
3000.00	2.23	49.75	2998.96	15.49	62.35	15.49	64.25	76.05	0.17
3100.00	2.58	48.48	3098.87	18.24	65.53	18.24	68.02	74.44	0.36
3200.00	2.68	50.89	3198.76	21.21	69.03	21.21	72.22	72.92	0.15
3300.00	2.59	59.65	3298.66	23.83	72.79	23.83	76.59	71.87	0.41
3400.00	2.43	75.66	3398.56	25.49	76.79	25.49	80.91	71.64	0.72

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Section FT	Distance FT	Direction Deg	Severity Deg/100
3500.00	2.63	85.60	3498.47	26.19	81.13	26.19	85.25	72.11	0.48
3600.00	2.55	87.49	3598.36	26.47	85.63	26.47	89.63	72.83	0.12
3700.00	2.59	79.83	3698.26	26.96	90.08	26.96	94.03	73.34	0.35
3800.00	2.32	70.27	3798.17	28.05	94.21	28.05	98.30	73.42	0.49
3900.00	2.06	74.75	3898.10	29.20	97.86	29.20	102.12	73.38	0.31
4000.00	2.17	79.36	3998.03	30.03	101.46	30.03	105.81	73.51	0.20
4100.00	2.05	83.33	4097.96	30.58	105.09	30.58	109.45	73.77	0.19
4200.00	1.60	82.11	4197.91	30.98	108.25	30.98	112.60	74.03	0.45
4300.00	2.00	78.03	4297.86	31.54	111.34	31.54	115.72	74.18	0.42
4400.00	1.59	83.28	4397.81	32.06	114.42	32.06	118.83	74.35	0.43
4500.00	1.24	106.50	4497.78	31.92	116.84	31.92	121.12	74.72	0.67
4600.00	1.23	129.36	4597.76	30.93	118.71	30.93	122.68	75.40	0.49
4700.00	1.33	146.79	4697.74	29.27	120.18	29.27	123.69	76.31	0.40
4800.00	1.81	156.63	4797.70	26.85	121.44	26.85	124.38	77.53	0.55
4900.00	1.99	156.16	4897.64	23.82	122.77	23.82	125.06	79.02	0.18
5000.00	1.49	159.35	4997.60	21.01	123.93	21.01	125.70	80.38	0.51
5100.00	1.54	155.87	5097.56	18.57	124.94	18.57	126.31	81.54	0.10
5200.00	1.62	150.08	5197.52	16.12	126.19	16.12	127.22	82.72	0.18
5300.00	1.60	152.43	5297.48	13.66	127.54	13.66	128.27	83.89	0.07
5400.00	1.57	153.54	5397.45	11.20	128.79	11.20	129.28	85.03	0.04
5500.00	1.57	155.15	5497.41	8.73	129.98	8.73	130.27	86.16	0.04
5600.00	1.56	154.28	5597.37	6.27	131.15	6.27	131.30	87.26	0.03
5700.00	1.46	150.29	5697.34	3.94	132.37	3.94	132.43	88.30	0.14
5800.00	1.42	147.59	5797.31	1.79	133.66	1.79	133.67	89.23	0.08
5900.00	0.99	144.75	5897.28	0.03	134.83	0.03	134.83	89.99	0.43
6000.00	0.78	136.40	5997.27	-1.17	135.79	-1.17	135.80	90.49	0.25
6100.00	1.00	133.23	6097.26	-2.26	136.90	-2.26	136.91	90.94	0.22
6200.00	0.72	128.78	6197.25	-3.25	138.02	-3.25	138.06	91.35	0.28
6300.00	0.78	99.31	6297.24	-3.75	139.19	-3.75	139.24	91.54	0.39
6400.00	0.74	92.43	6397.23	-3.89	140.51	-3.89	140.56	91.59	0.10
6500.00	0.67	88.74	6497.22	-3.90	141.74	-3.90	141.79	91.58	0.09
6600.00	0.76	86.53	6597.22	-3.85	142.98	-3.85	143.03	91.54	0.09
6700.00	0.49	71.43	6697.21	-3.68	144.04	-3.68	144.09	91.46	0.31
6800.00	0.37	48.22	6797.21	-3.33	144.68	-3.33	144.72	91.32	0.21
6900.00	0.39	28.85	6897.20	-2.82	145.09	-2.82	145.11	91.11	0.13
7000.00	0.13	3.55	6997.20	-2.40	145.26	-2.40	145.28	90.95	0.28
7100.00	0.33	25.88	7097.20	-2.03	145.39	-2.03	145.41	90.80	0.22
7200.00	0.06	79.69	7197.20	-1.75	145.57	-1.75	145.58	90.69	0.30
7300.00	0.22	144.53	7297.20	-1.90	145.74	-1.90	145.76	90.75	0.21
7400.00	0.42	144.00	7397.20	-2.36	146.07	-2.36	146.09	90.93	0.19
7500.00	0.80	147.54	7497.19	-3.24	146.66	-3.24	146.70	91.27	0.38
7600.00	0.90	142.73	7597.18	-4.45	147.51	-4.45	147.58	91.73	0.13
7700.00	1.15	145.56	7697.17	-5.91	148.56	-5.91	148.67	92.28	0.25
7800.00	0.72	139.16	7797.15	-7.21	149.53	-7.21	149.71	92.76	0.45
7900.00	0.61	131.63	7897.15	-8.04	150.34	-8.04	150.55	93.06	0.13
8000.00	0.69	111.95	7997.14	-8.62	151.30	-8.62	151.54	93.26	0.23
8100.00	0.69	113.11	8097.13	-9.08	152.41	-9.08	152.68	93.41	0.01
8200.00	0.73	112.08	8197.13	-9.55	153.55	-9.55	153.85	93.56	0.04
8300.00	0.96	107.47	8297.11	-10.04	154.94	-10.04	155.27	93.71	0.25
8400.00	0.81	108.07	8397.10	-10.52	156.42	-10.52	156.77	93.85	0.15
8500.00	0.66	107.68	8497.09	-10.91	157.65	-10.91	158.02	93.96	0.15
8600.00	0.91	113.50	8597.08	-11.40	158.92	-11.40	159.33	94.10	0.26
8700.00	0.99	137.79	8697.07	-12.36	160.22	-12.36	160.70	94.41	0.41
8800.00	0.88	137.30	8797.06	-13.56	161.32	-13.56	161.89	94.80	0.11
8900.00	0.33	133.80	8897.05	-14.31	162.04	-14.31	162.67	95.05	0.55

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Section FT	Distance FT	Direction Deg	Severity Deg/100
9000.00	0.17	124.07	8997.05	-14.59	162.37	-14.59	163.02	95.14	0.16
9100.00	1.10	78.51	9097.04	-14.48	163.43	-14.48	164.08	95.06	0.99
9200.00	1.00	50.68	9197.03	-13.74	165.05	-13.74	165.62	94.76	0.52
9300.00	1.33	29.71	9297.01	-12.17	166.31	-12.17	166.75	94.19	0.53
9400.00	0.55	351.18	9396.99	-10.69	166.81	-10.69	167.15	93.67	0.97
9500.00	1.21	331.60	9496.98	-9.29	166.24	-9.29	166.50	93.20	0.71
9600.00	1.92	326.38	9596.94	-6.97	164.81	-6.97	164.96	92.42	0.73
9700.00	1.97	326.88	9696.89	-4.13	162.94	-4.13	162.99	91.45	0.05
9800.00	1.66	327.30	9796.84	-1.47	161.21	-1.47	161.22	90.52	0.31
9900.00	1.85	330.64	9896.79	1.16	159.64	1.16	159.64	89.59	0.21
10000.00	1.21	311.16	9996.75	3.26	158.05	3.26	158.09	88.82	0.81
10100.00	1.10	289.18	10096.73	4.27	156.35	4.27	156.41	88.44	0.45
10200.00	1.43	272.21	10196.71	4.63	154.20	4.63	154.27	88.28	0.50
10300.00	1.17	236.66	10296.69	4.12	152.10	4.12	152.15	88.45	0.83
10400.00	1.63	214.84	10396.66	2.39	150.43	2.39	150.45	89.09	0.69
10500.00	2.67	214.57	10496.58	-0.69	148.30	-0.69	148.30	90.27	1.05
10600.00	3.43	215.20	10596.44	-5.06	145.25	-5.06	145.34	91.99	0.77
10696.00	3.49	214.51	10692.27	-9.81	141.94	-9.81	142.28	93.96	0.07

HORIZONTAL DISPLACEMENT IS
142.28 FEET AT 93.96 DEGREES



HOBBS OCD

AUG 14 2013

RECEIVED

State of New Mexico
Energy, Mineral & Natural Resources Department
Oil Conversation Division
1625 N. French Dr.
Hobbs, New Mexico 88240

Ridge 14 State 4H
Lea County, New Mexico
API No. 30-025-40936

CATHEDRAL ENERGY SERVICES

6622 Willow Brook Park
Houston, Texas 77066

281.440.1010 Office
877.825.1002 Toll-Free
281.440.1025 Fax

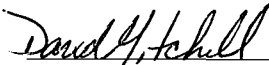
CathedralEnergyServices.com

Drilling + Completions

Enclosed, please find the original and one copy of the survey performed on the referenced well by Cathedral Energy Services. Other information required by your office is as follows:

Name & Title of Surveyor	Drainhole Number	Surveyed Depths	Date Performed	Type of Survey
David Mitchell Original Hole MWD Coordinator		10738' - 15775'	07/02/13-07/10/13	Directional MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease line (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.


David Mitchell
MWD Coordinator

Enclosures

cc: Caza Operating, LLC



State of New Mexico
County of Lea, New Mexico

I, David Mitchell, certify that; I am employed by Cathedral Energy Services; that I did on the day(s) of 07/02/13 through 07/10/13 conduct or supervise the taking of a directional MWD survey from a depth of 10738 feet to a depth of 15775 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Cathedral Energy Services; that I am authorized and qualified to make this report; that this survey was conducted at the request of Caza Operating, LLC. for the Ridge 14 State 4H Well API No. 30-025-40936 in Lea County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Cathedral Energy Services.

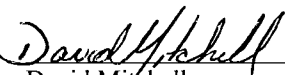
CATHEDRAL ENERGY SERVICES

6622 Willow Brook Park
Houston, Texas 77066

281.440.1010 Office
877.825.1002 Toll-Free
281.440.1025 Fax

CathedralEnergyServices.com

Drilling + Completions



David Mitchell
MWD Coordinator

AUG 14 2013

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Survey Report

Service Company: Cathedral Energy Services

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Well: Caza Ridge 14 State 4H

Rig: Patriot Drilling 4

API or UWI: 30-025-40936

Job Number: 137050

State: New Mexico

Operating Company: Caza Operating, LLC

County: Lea

Magnetic North: 6.80

Comment: Surveys are Corrected to Grid North:

Proposed Azimuth: 359.47

6.80

Last Survey is Projected to Total Depth

North Reference: GRID

(TD)

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
100.00	0.11	135.03	100.00	-0.07	0.07	135.03	0.10	-0.07	0.11
200.00	0.16	146.63	200.00	-0.25	0.21	139.91	0.33	-0.25	0.06
300.00	0.26	163.03	300.00	-0.59	0.36	148.76	0.69	-0.59	0.12
400.00	0.19	169.37	400.00	-0.97	0.45	154.91	1.07	-0.97	0.07
500.00	0.57	172.14	500.00	-1.62	0.55	161.24	1.71	-1.63	0.38
600.00	0.27	141.53	599.99	-2.30	0.77	161.58	2.42	-2.31	0.36
700.00	0.60	130.74	699.99	-2.83	1.31	155.14	3.11	-2.84	0.34
800.00	0.88	92.96	799.98	-3.21	2.47	142.37	4.05	-3.23	0.55
900.00	1.48	93.62	899.96	-3.33	4.53	126.31	5.62	-3.37	0.60
1000.00	1.93	93.10	999.92	-3.50	7.50	115.02	8.28	-3.57	0.45
1100.00	1.72	94.56	1099.87	-3.71	10.68	109.17	11.30	-3.81	0.22
1200.00	1.80	86.79	1199.82	-3.74	13.74	105.23	14.24	-3.87	0.25
1300.00	1.79	86.51	1299.77	-3.56	16.87	101.91	17.24	-3.71	0.01
1400.00	2.53	83.70	1399.70	-3.22	20.62	98.88	20.87	-3.41	0.75
1500.00	2.49	81.07	1499.60	-2.64	24.96	96.04	25.10	-2.87	0.12
1600.00	1.79	83.45	1599.53	-2.13	28.66	94.24	28.74	-2.39	0.71
1700.00	1.57	85.73	1699.49	-1.85	31.57	93.35	31.63	-2.14	0.23
1800.00	1.52	80.01	1799.45	-1.51	34.25	92.53	34.28	-1.83	0.16
1900.00	1.43	83.68	1899.42	-1.15	36.79	91.79	36.81	-1.49	0.13
2000.00	1.35	70.92	1999.39	-0.62	39.15	90.91	39.15	-0.99	0.32
2100.00	1.25	64.57	2099.36	0.23	41.25	89.68	41.25	-0.15	0.18
2200.00	1.32	60.75	2199.34	1.26	43.24	88.33	43.25	0.86	0.11
2300.00	1.06	55.72	2299.32	2.34	45.00	87.02	45.07	1.93	0.28
2400.00	1.35	56.33	2399.29	3.52	46.75	85.70	46.88	3.08	0.29
2500.00	1.38	55.09	2499.27	4.86	48.72	84.30	48.96	4.41	0.04
2600.00	1.52	58.83	2599.23	6.24	50.84	83.01	51.22	5.76	0.17
2700.00	1.95	56.44	2699.19	7.86	53.39	81.62	53.97	7.37	0.44
2800.00	2.46	50.49	2799.11	10.17	56.47	79.79	57.37	9.65	0.56
2900.00	2.21	45.33	2899.03	12.89	59.49	77.78	60.87	12.34	0.33
3000.00	2.23	49.75	2998.96	15.50	62.35	76.04	64.25	14.92	0.17
3100.00	2.58	48.48	3098.87	18.25	65.52	74.43	68.01	17.64	0.35
3200.00	2.68	50.89	3198.76	21.22	69.02	72.91	72.21	20.58	0.15



Survey Report

Service Company: Cathedral Energy Services

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Well: Caza Ridge 14 State 4H

Rig: Patriot Drilling 4

API or UWI: 30-025-40936

Job Number: 137050

State: New Mexico

Operating Company: Caza Operating, LLC

County: Lea

Magnetic North: 6.80

Comment: Surveys are Corrected to Grid North:
6.80
Last Survey is Projected to Total Depth
(TD)

Proposed Azimuth: 359.47

North Reference: GRID

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
3300.00	2.59	59.65	3298.66	23.83	72.78	71.87	76.58	23.16	0.41
3400.00	2.43	75.66	3398.56	25.50	76.79	71.63	80.91	24.79	0.72
3500.00	2.63	85.60	3498.47	26.20	81.13	72.10	85.25	25.45	0.48
3600.00	2.55	87.49	3598.36	26.48	85.64	72.82	89.64	25.68	0.12
3700.00	2.59	79.83	3698.26	26.97	90.08	73.33	94.03	26.14	0.35
3800.00	2.32	70.27	3798.17	28.05	94.21	73.42	98.30	27.18	0.49
3900.00	2.06	74.75	3898.10	29.21	97.85	73.38	102.12	28.30	0.31
4000.00	2.17	79.36	3998.03	30.03	101.45	73.51	105.80	29.09	0.20
4100.00	2.05	83.33	4097.96	30.59	105.08	73.77	109.45	29.62	0.19
4200.00	1.60	82.11	4197.91	30.99	108.24	74.02	112.59	29.99	0.45
4300.00	2.00	78.03	4297.86	31.54	111.33	74.18	115.71	30.51	0.42
4400.00	1.59	83.28	4397.81	32.07	114.42	74.34	118.83	31.01	0.44
4500.00	1.24	106.50	4497.78	31.92	116.83	74.72	121.12	30.84	0.66
4600.00	1.23	129.36	4597.76	30.93	118.70	75.39	122.66	29.83	0.49
4700.00	1.33	146.79	4697.74	29.28	120.17	76.31	123.68	28.17	0.40
4800.00	1.81	156.63	4797.70	26.86	121.43	77.53	124.36	25.74	0.55
4900.00	1.99	156.16	4897.64	23.82	122.76	79.02	125.05	22.69	0.18
5000.00	1.49	159.35	4997.60	21.02	123.92	80.37	125.69	19.87	0.51
5100.00	1.54	155.87	5097.56	18.58	124.92	81.54	126.30	17.42	0.10
5200.00	1.62	150.08	5197.52	16.12	126.18	82.72	127.20	14.96	0.18
5300.00	1.60	152.43	5297.49	13.66	127.53	83.89	128.26	12.48	0.07
5400.00	1.57	153.54	5397.45	11.20	128.79	85.03	129.27	10.01	0.04
5500.00	1.57	155.15	5497.41	8.73	129.97	86.16	130.27	7.53	0.04
5600.00	1.56	154.28	5597.37	6.26	131.14	87.27	131.29	5.05	0.03
5700.00	1.46	150.29	5697.34	3.93	132.36	88.30	132.42	2.70	0.15
5800.00	1.42	147.59	5797.31	1.77	133.66	89.24	133.67	0.54	0.08
5900.00	0.99	144.75	5897.28	0.02	134.82	89.99	134.82	-1.23	0.43
6000.00	0.78	136.40	5997.27	-1.18	135.79	90.50	135.79	-2.43	0.25
6100.00	1.00	133.23	6097.26	-2.27	136.89	90.95	136.91	-3.53	0.23
6200.00	0.72	128.78	6197.25	-3.26	138.02	91.35	138.06	-4.53	0.29
6300.00	0.78	99.31	6297.24	-3.76	139.18	91.55	139.23	-5.05	0.39
6400.00	0.74	92.43	6397.23	-3.90	140.50	91.59	140.55	-5.20	0.10



Survey Report

Service Company: Cathedral Energy Services

Well: Caza Ridge 14 State 4H

API or UWI: 30-025-40936

State: New Mexico

County: Lea

Comment: Surveys are Corrected to Grid North:
6.80
Last Survey is Projected to Total Depth
(TD)

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Rig: Patriot Drilling 4

Job Number: 137050

Operating Company: Caza Operating, LLC

Magnetic North: 6.80

Proposed Azimuth: 359.47

North Reference: GRID

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
6500.00	0.67	88.74	6497.22	-3.91	141.73	91.58	141.78	-5.22	0.08
6600.00	0.76	86.53	6597.22	-3.86	142.97	91.55	143.02	-5.18	0.09
6700.00	0.49	71.43	6697.21	-3.68	144.04	91.47	144.09	-5.02	0.31
6800.00	0.37	48.22	6797.21	-3.33	144.69	91.32	144.72	-4.67	0.21
6900.00	0.39	28.85	6897.21	-2.82	145.09	91.11	145.12	-4.16	0.13
7000.00	0.13	3.55	6997.20	-2.41	145.26	90.95	145.28	-3.75	0.28
7100.00	0.33	25.88	7097.20	-2.04	145.39	90.80	145.41	-3.38	0.22
7200.00	0.06	79.69	7197.20	-1.77	145.57	90.70	145.58	-3.11	0.30
7300.00	0.22	144.53	7297.20	-1.91	145.74	90.75	145.75	-3.26	0.20
7400.00	0.42	144.00	7397.20	-2.37	146.06	90.93	146.08	-3.72	0.20
7500.00	0.80	147.54	7497.19	-3.25	146.65	91.27	146.69	-4.61	0.38
7600.00	0.90	142.73	7597.18	-4.47	147.50	91.73	147.57	-5.83	0.12
7700.00	1.15	145.56	7697.17	-5.92	148.55	92.28	148.66	-7.29	0.25
7800.00	0.72	139.16	7797.15	-7.22	149.52	92.77	149.70	-8.61	0.44
7900.00	0.61	131.63	7897.15	-8.05	150.33	93.07	150.55	-9.44	0.14
8000.00	0.69	111.95	7997.14	-8.63	151.29	93.27	151.53	-10.03	0.24
8100.00	0.69	113.11	8097.13	-9.09	152.40	93.41	152.67	-10.50	0.01
8200.00	0.73	112.08	8197.13	-9.57	153.55	93.57	153.84	-10.99	0.04
8300.00	0.96	107.47	8297.12	-10.06	154.93	93.71	155.26	-11.49	0.24
8400.00	0.81	108.07	8397.10	-10.53	156.41	93.85	156.76	-11.98	0.15
8500.00	0.66	107.68	8497.10	-10.92	157.63	93.96	158.00	-12.38	0.15
8600.00	0.91	113.50	8597.09	-11.42	158.90	94.11	159.31	-12.88	0.26
8700.00	0.99	137.79	8697.07	-12.37	160.21	94.42	160.69	-13.85	0.41
8800.00	0.88	137.30	8797.06	-13.58	161.31	94.81	161.88	-15.07	0.11
8900.00	0.33	133.80	8897.05	-14.34	162.04	95.06	162.68	-15.84	0.55
9000.00	0.17	124.07	8997.05	-14.62	162.37	95.15	163.03	-16.12	0.16
9100.00	1.10	78.51	9097.04	-14.51	163.44	95.07	164.08	-16.03	0.99
9200.00	1.00	50.68	9197.03	-13.77	165.05	94.77	165.63	-15.30	0.51
9300.00	1.33	29.71	9297.01	-12.21	166.30	94.20	166.75	-13.75	0.53
9400.00	0.55	351.18	9396.99	-10.73	166.80	93.68	167.15	-12.27	0.96
9500.00	1.21	331.60	9496.98	-9.32	166.23	93.21	166.49	-10.86	0.72
9600.00	1.92	326.38	9596.94	-7.00	164.80	92.43	164.95	-8.52	0.72



Survey Report

Service Company: Cathedral Energy Services

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Well: Caza Ridge 14 State 4H

Rig: Patriot Drilling 4

API or UWI: 30-025-40936

Job Number: 137050

State: New Mexico

Operating Company: Caza Operating, LLC

County: Lea

Magnetic North: 6.80

Comment: Surveys are Corrected to Grid North:
6.80
Last Survey is Projected to Total Depth
(TD)

Proposed Azimuth: 359.47

North Reference: GRID

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
9700.00	1.97	326.88	9696.89	-4.17	162.93	91.46	162.98	-5.67	0.05
9800.00	1.66	327.30	9796.84	-1.51	161.21	90.54	161.22	-3.00	0.31
9900.00	1.85	330.64	9896.79	1.12	159.64	89.60	159.64	-0.36	0.22
10000.00	1.21	311.16	9996.75	3.22	158.05	88.83	158.08	1.76	0.82
10100.00	1.10	289.18	10096.74	4.23	156.35	88.45	156.41	2.78	0.45
10200.00	1.43	272.21	10196.71	4.59	154.19	88.29	154.26	3.17	0.50
10300.00	1.17	236.66	10296.69	4.08	152.09	88.46	152.15	2.67	0.83
10400.00	1.63	214.84	10396.66	2.35	150.43	89.10	150.45	0.96	0.70
10500.00	2.67	214.57	10496.59	-0.73	148.30	90.28	148.30	-2.10	1.04
10600.00	3.43	215.20	10596.44	-5.09	145.25	92.01	145.34	-6.44	0.76
10696.00	3.49	214.51	10692.27	-9.85	141.94	93.97	142.28	-11.16	0.08
10738.00	8.90	230.00	10734.01	-12.99	138.72	95.35	139.33	-14.28	13.37
10833.00	19.20	256.50	10826.13	-21.39	117.83	100.29	119.76	-22.48	12.52
10896.00	22.20	271.00	10885.09	-23.61	95.84	103.84	98.70	-24.49	9.39
10927.00	24.60	279.20	10913.55	-22.47	83.61	105.04	86.57	-23.24	13.03
10958.00	27.30	288.30	10941.43	-19.21	70.48	105.24	73.05	-19.86	15.50
10990.00	30.20	296.80	10969.50	-13.27	56.32	103.26	57.86	-13.79	15.64
11021.00	32.00	303.90	10996.05	-5.17	42.54	96.93	42.85	-5.56	13.17
11053.00	34.90	311.70	11022.76	5.66	28.65	78.83	29.21	5.39	16.19
11085.00	38.10	318.50	11048.49	19.15	15.27	38.57	24.49	19.01	16.11
11116.00	40.40	324.30	11072.50	34.48	3.06	5.08	34.61	34.45	13.96
11148.00	43.80	329.40	11096.25	52.44	-8.63	350.65	53.15	52.52	15.06
11180.00	47.60	332.70	11118.59	72.48	-19.69	344.80	75.11	72.66	13.98
11211.00	52.00	335.30	11138.60	93.76	-30.05	342.23	98.46	94.04	15.57
11243.00	56.50	338.90	11157.30	117.68	-40.13	341.17	124.34	118.05	16.76
11306.00	64.70	346.20	11188.23	169.99	-56.43	341.64	179.11	170.50	16.46
11345.00	65.50	350.40	11204.66	204.62	-63.59	342.74	214.27	205.20	9.98
11401.00	67.80	351.30	11226.85	255.37	-71.77	344.30	265.27	256.03	4.36
11452.00	71.10	351.80	11244.75	302.60	-78.78	345.41	312.69	303.32	6.54
11527.00	77.00	353.30	11265.35	374.08	-88.11	346.75	384.31	374.88	8.10
11559.00	78.20	353.70	11272.22	405.13	-91.65	347.25	415.37	405.96	3.94
11591.00	79.10	353.70	11278.52	436.31	-95.09	347.70	446.55	437.17	2.81



Survey Report

Service Company: Cathedral Energy Services

Well: Caza Ridge 14 State 4H

API or UWI: 30-025-40936

State: New Mexico

County: Lea

Comment: Surveys are Corrected to Grid North:
6.80
Last Survey is Projected to Total Depth
(TD)

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Rig: Patriot Drilling 4

Job Number: 137050

Operating Company: Caza Operating, LLC

Magnetic North: 6.80

Proposed Azimuth: 359.47

North Reference: GRID

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
11622.00	80.20	353.60	11284.09	466.62	-98.46	348.08	476.90	467.51	3.56
11654.00	81.10	353.80	11289.29	498.00	-101.93	348.43	508.33	498.93	2.88
11685.00	82.00	353.90	11293.84	528.49	-105.21	348.74	538.86	529.44	2.92
11717.00	83.60	353.40	11297.85	560.04	-108.73	349.01	570.50	561.02	5.23
11749.00	82.80	354.30	11301.64	591.63	-112.13	349.27	602.17	592.65	3.75
11780.00	83.30	354.80	11305.39	622.27	-115.05	349.52	632.81	623.30	2.27
11811.00	83.10	355.20	11309.07	652.93	-117.74	349.78	663.46	653.99	1.43
11843.00	83.60	355.50	11312.77	684.61	-120.31	350.03	695.10	685.70	1.82
11874.00	84.30	355.50	11316.04	715.34	-122.73	350.26	725.80	716.45	2.26
11905.00	85.50	355.60	11318.79	746.13	-125.13	350.48	756.55	747.25	3.88
11968.00	87.60	356.10	11322.59	808.85	-129.68	350.89	819.17	810.01	3.43
12063.00	88.40	356.80	11325.90	903.60	-135.56	351.47	913.71	904.82	1.12
12158.00	88.90	357.30	11328.14	998.45	-140.44	351.99	1008.28	999.71	0.74
12253.00	87.10	358.50	11331.46	1093.32	-143.92	352.50	1102.76	1094.61	2.28
12348.00	88.80	359.20	11334.85	1188.24	-145.83	353.00	1197.15	1189.54	1.94
12442.00	90.60	359.60	11335.35	1282.23	-146.81	353.47	1290.61	1283.53	1.96
12537.00	92.90	359.70	11332.44	1377.18	-147.39	353.89	1385.04	1378.48	2.42
12632.00	91.10	1.30	11329.13	1472.11	-146.56	354.31	1479.39	1473.40	2.53
12727.00	91.60	1.60	11326.89	1567.05	-144.16	354.74	1573.67	1568.32	0.61
12822.00	90.70	2.90	11324.98	1661.96	-140.43	355.17	1667.88	1663.18	1.66
12917.00	90.00	3.60	11324.40	1756.80	-135.04	355.60	1761.98	1757.97	1.04
13011.00	91.30	4.00	11323.34	1850.58	-128.82	356.02	1855.06	1851.70	1.45
13106.00	90.60	4.90	11321.76	1945.28	-121.45	356.43	1949.07	1946.32	1.20
13201.00	90.10	5.90	11321.18	2039.86	-112.51	356.84	2042.96	2040.81	1.18
13296.00	92.40	6.40	11319.11	2134.28	-102.33	357.25	2136.73	2135.14	2.48
13391.00	91.70	5.60	11315.71	2228.70	-92.41	357.63	2230.62	2229.46	1.12
13485.00	91.80	5.40	11312.84	2322.22	-83.40	357.94	2323.72	2322.90	0.24
13580.00	89.10	5.10	11312.09	2416.81	-74.71	358.23	2417.97	2417.40	2.86
13675.00	88.50	4.80	11314.08	2511.44	-66.52	358.48	2512.32	2511.95	0.71
13770.00	87.30	4.40	11317.57	2606.07	-58.90	358.71	2606.73	2606.50	1.33
13865.00	87.00	4.40	11322.29	2700.67	-51.62	358.90	2701.16	2701.03	0.32
13961.00	87.30	4.90	11327.06	2796.23	-43.85	359.10	2796.58	2796.52	0.61



Survey Report

Service Company: Cathedral Energy Services

Well: Caza Ridge 14 State 4H

API or UWI: 30-025-40936

State: New Mexico

County: Lea

Comment: Surveys are Corrected to Grid North:
6.80
Last Survey is Projected to Total Depth
(TD)

Bottom Hole Location:

Surface Location: 330' FSL & 660' FEL

Rig: Patriot Drilling 4

Job Number: 137050

Operating Company: Caza Operating, LLC

Magnetic North: 6.80

Proposed Azimuth: 359.47

North Reference: GRID

Tie-In Data:

MD	Inclination	Azimuth	TVD	NS	EW
0.00	0.00	0.00	0.00	0.00	0.00

Survey Data:

MD	Inclination	Azimuth	TVD	NS	EW	CA	CD	VS	DLS
14056.00	88.00	5.30	11330.96	2890.78	-35.41	359.30	2890.99	2890.98	0.85
14152.00	88.50	4.90	11333.89	2986.35	-26.88	359.48	2986.47	2986.47	0.67
14247.00	88.30	4.60	11336.54	3080.99	-19.02	359.65	3081.05	3081.03	0.38
14343.00	87.90	5.30	11339.72	3176.58	-10.74	359.81	3176.60	3176.54	0.84
14438.00	87.50	4.90	11343.54	3271.13	-2.30	359.96	3271.13	3271.01	0.60
14534.00	86.30	3.90	11348.73	3366.70	5.05	0.09	3366.70	3366.51	1.63
14629.00	85.30	3.50	11355.69	3461.25	11.17	0.18	3461.26	3460.99	1.13
14725.00	87.00	2.80	11362.13	3556.88	16.43	0.26	3556.92	3556.58	1.91
14820.00	86.80	2.10	11367.27	3651.65	20.48	0.32	3651.71	3651.31	0.77
14916.00	87.40	2.40	11372.13	3747.46	24.25	0.37	3747.53	3747.07	0.70
15011.00	87.90	2.10	11376.02	3842.30	27.98	0.42	3842.40	3841.88	0.61
15107.00	88.30	1.80	11379.20	3938.19	31.24	0.45	3938.32	3937.74	0.52
15202.00	89.00	1.90	11381.44	4033.12	34.31	0.49	4033.26	4032.63	0.74
15297.00	88.00	3.00	11383.93	4128.00	38.37	0.53	4128.17	4127.46	1.56
15392.00	88.10	3.10	11387.16	4222.81	43.42	0.59	4223.03	4222.22	0.15
15488.00	88.00	3.40	11390.43	4318.60	48.86	0.65	4318.87	4317.96	0.33
15583.00	88.30	3.00	11393.50	4413.40	54.16	0.70	4413.73	4412.71	0.53
15678.00	88.70	2.90	11395.98	4508.24	59.04	0.75	4508.63	4507.50	0.43
15718.00	88.90	2.60	11396.82	4548.19	60.96	0.77	4548.59	4547.43	0.90
15775.00	88.90	2.60	11397.91	4605.12	63.55	0.79	4605.55	4604.33	0.00

HOBBES OCD Cathedral Energy Services

Survey Report

AUG-14-2013

RECEIVED

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM	TVD Reference:	WELL @ 3391.0usft (Patriot 4)
Site:	Caza Ridge 14 State	MD Reference:	WELL @ 3391.0usft (Patriot 4)
Well:	4H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	USA EDM 5000 Multi Users DB

Project	Lea 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 East 3001		

Site		Caza Ridge 14 State			
Site Position:		Northing:	473,346.10 usft	Latitude:	32° 17' 53.308 N
From:	Map	Easting:	777,902.70 usft	Longitude:	103° 26' 2.225 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.48 °

Well	4H					
Well Position	+N/-S	0.0 usft	Northing:	473,346.10 usft	Latitude:	32° 17' 53.308 N
	+E/-W	0.0 usft	Easting:	777,902.70 usft	Longitude:	103° 26' 2.225 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,366.0 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/4/2013	7.28	60.23	48,479

Design		HZ		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.47

Survey Program	Date	8/7/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	10,696.0	Survey #1 (HZ)	Gyro	Gyro	
10,738.0	15,775.0	Survey #2 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,696.0	3.49	214.51	10,692.2	-9.8	141.9	-11.2	0.00	0.00	
10,738.0	8.90	230.00	10,734.0	-13.0	138.7	-14.3	13.37	12.88	
10,833.0	19.20	256.50	10,826.1	-21.4	117.8	-22.5	12.52	10.84	
10,896.0	22.20	271.00	10,885.1	-23.6	95.8	-24.5	9.39	4.76	
10,927.0	24.60	279.20	10,913.5	-22.5	83.6	-23.2	13.03	7.74	
10,958.0	27.30	288.30	10,941.4	-19.2	70.5	-19.9	15.50	8.71	
10,990.0	30.20	296.80	10,969.5	-13.3	56.3	-13.8	15.64	9.06	
11,021.0	32.00	304.00	10,996.0	-5.2	42.5	-5.6	13.32	5.81	
11,053.0	34.90	311.70	11,022.7	5.7	28.7	5.4	16.05	9.06	
11,085.0	38.10	318.50	11,048.5	19.2	15.3	19.0	16.11	10.00	
11,116.0	40.40	324.30	11,072.5	34.5	3.1	34.5	13.96	7.42	
11,148.0	43.80	329.40	11,096.2	52.5	-8.6	52.5	15.06	10.63	

Cathedral Energy Services

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM	TVD Reference:	WELL @ 3391.0usft (Patriot 4)
Site:	Caza Ridge 14 State	MD Reference:	WELL @ 3391.0usft (Patriot 4)
Well:	4H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
11,180.0	47.60	332.70	11,118.6	72.5	-19.7	72.7	13.98	11.88	
11,211.0	52.00	335.30	11,138.6	93.8	-30.0	94.1	15.57	14.19	
11,243.0	56.50	338.90	11,157.3	117.7	-40.1	118.1	16.76	14.06	
11,306.0	64.70	346.20	11,188.2	170.0	-56.4	170.5	16.46	13.02	
11,345.0	65.50	350.40	11,204.6	204.6	-63.6	205.2	9.98	2.05	
11,401.0	67.80	351.30	11,226.8	255.4	-71.7	256.1	4.36	4.11	
11,452.0	71.10	351.80	11,244.7	302.6	-78.8	303.4	6.53	6.47	
11,527.0	77.00	353.30	11,265.3	374.1	-88.1	374.9	8.10	7.87	
11,559.0	78.20	353.70	11,272.2	405.2	-91.6	406.0	3.94	3.75	
11,591.0	79.10	353.70	11,278.5	436.3	-95.1	437.2	2.81	2.81	
11,622.0	80.20	353.60	11,284.1	466.6	-98.4	467.5	3.56	3.55	
11,654.0	81.10	353.80	11,289.3	498.0	-101.9	498.9	2.88	2.81	
11,685.0	82.00	353.90	11,293.8	528.5	-105.2	529.5	2.92	2.90	
11,717.0	83.60	353.40	11,297.8	560.1	-108.7	561.0	5.23	5.00	
11,749.0	82.80	354.30	11,301.6	591.7	-112.1	592.7	3.75	-2.50	
11,780.0	83.30	354.80	11,305.4	622.3	-115.0	623.3	2.27	1.61	
11,811.0	83.10	355.20	11,309.0	653.0	-117.7	654.0	1.43	-0.65	
11,843.0	83.60	355.50	11,312.7	684.6	-120.3	685.7	1.82	1.56	
11,874.0	84.30	355.50	11,316.0	715.4	-122.7	716.5	2.26	2.26	
11,905.0	85.50	355.60	11,318.8	746.1	-125.1	747.3	3.88	3.87	
11,968.0	87.60	356.10	11,322.6	808.9	-129.7	810.0	3.43	3.33	
12,063.0	88.40	356.80	11,325.9	903.6	-135.5	904.8	1.12	0.84	
12,158.0	88.90	357.30	11,328.1	998.5	-140.4	999.7	0.74	0.53	
12,253.0	87.10	358.50	11,331.4	1,093.3	-143.9	1,094.6	2.28	-1.89	
12,348.0	88.80	359.20	11,334.8	1,188.3	-145.8	1,189.6	1.94	1.79	
12,442.0	90.60	359.60	11,335.3	1,282.2	-146.8	1,283.6	1.96	1.91	
12,537.0	92.90	359.70	11,332.4	1,377.2	-147.4	1,378.5	2.42	2.42	
12,632.0	91.10	1.30	11,329.1	1,472.1	-146.5	1,473.4	2.53	-1.89	
12,727.0	91.60	1.60	11,326.9	1,567.1	-144.1	1,568.4	0.61	0.53	
12,822.0	90.70	2.90	11,325.0	1,662.0	-140.4	1,663.2	1.66	-0.95	
12,917.0	90.00	3.60	11,324.4	1,756.8	-135.0	1,758.0	1.04	-0.74	
13,011.0	91.30	4.00	11,323.3	1,850.6	-128.8	1,851.7	1.45	1.38	
13,106.0	90.60	4.90	11,321.7	1,945.3	-121.4	1,946.4	1.20	-0.74	
13,201.0	90.10	5.90	11,321.2	2,039.9	-112.5	2,040.9	1.18	-0.53	
13,296.0	92.40	6.40	11,319.1	2,134.3	-102.3	2,135.2	2.48	2.42	
13,391.0	91.70	5.60	11,315.7	2,228.7	-92.4	2,229.5	1.12	-0.74	
13,485.0	91.80	5.40	11,312.8	2,322.3	-83.4	2,322.9	0.24	0.11	
13,580.0	89.10	5.10	11,312.1	2,416.9	-74.7	2,417.4	2.86	-2.84	
13,675.0	88.50	4.80	11,314.1	2,511.5	-66.5	2,512.0	0.71	-0.63	
13,770.0	87.30	4.40	11,317.5	2,606.1	-58.9	2,606.5	1.33	-1.26	
13,865.0	87.00	4.40	11,322.3	2,700.7	-51.6	2,701.1	0.32	-0.32	
13,961.0	87.30	4.90	11,327.0	2,796.3	-43.8	2,796.6	0.61	0.31	
14,056.0	88.00	5.30	11,330.9	2,890.8	-35.4	2,891.0	0.85	0.74	
14,152.0	88.50	4.90	11,333.9	2,986.4	-26.9	2,986.5	0.67	0.52	
14,247.0	88.30	4.60	11,336.5	3,081.0	-19.0	3,081.1	0.38	-0.21	
14,343.0	88.00	5.40	11,339.6	3,176.6	-10.6	3,176.6	0.89	-0.31	
14,438.0	87.50	4.90	11,343.3	3,271.2	-2.1	3,271.0	0.74	-0.53	
14,534.0	86.30	3.90	11,348.5	3,366.7	5.2	3,366.5	1.63	-1.25	
14,629.0	85.30	3.50	11,355.5	3,461.3	11.4	3,461.0	1.13	-1.05	
14,725.0	87.00	2.80	11,361.9	3,556.9	16.6	3,556.6	1.91	1.77	
14,820.0	86.80	2.10	11,367.1	3,651.7	20.7	3,651.3	0.77	-0.21	
14,916.0	87.40	2.40	11,371.9	3,747.5	24.4	3,747.1	0.70	0.62	
15,011.0	87.90	2.10	11,375.8	3,842.3	28.2	3,841.9	0.61	0.53	

Cathedral Energy Services

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM	TVD Reference:	WELL @ 3391.0usft (Patriot 4)
Site:	Caza Ridge 14 State	MD Reference:	WELL @ 3391.0usft (Patriot 4)
Well:	4H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
15,107.0	88.30	1.90	11,379.0	3,938.2	31.5	3,937.8	0.47	0.42	
15,202.0	89.00	1.90	11,381.3	4,033.1	34.7	4,032.7	0.74	0.74	
15,297.0	88.00	3.00	11,383.7	4,128.0	38.7	4,127.5	1.56	-1.05	
15,392.0	88.10	3.10	11,387.0	4,222.8	43.8	4,222.3	0.15	0.11	
15,488.0	88.00	3.40	11,390.2	4,318.6	49.2	4,318.0	0.33	-0.10	
15,583.0	88.30	3.00	11,393.3	4,413.4	54.5	4,412.7	0.53	0.32	
15,678.0	88.70	2.90	11,395.8	4,508.3	59.4	4,507.5	0.43	0.42	
15,718.0	88.90	2.60	11,396.6	4,548.2	61.3	4,547.5	0.90	0.50	Last Cathedral Survey @ 15718' MD
15,775.0	88.90	2.60	11,397.7	4,605.1	63.9	4,604.4	0.00	0.00	Bit Projection @ 15775' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Caza #4H BHL	0.00	0.00	11,300.0	4,619.4	-42.8	477,965.50	777,859.90	32° 18' 39.020 N	103° 26' 2.272 W
- survey misses target center by 145.4usft at 15775.0usft MD (11397.7 TVD, 4605.1 N, 63.9 E)									
- Point									
Caza #4H BHL P5	0.00	0.00	11,330.0	4,619.4	-42.8	477,965.50	777,859.90	32° 18' 39.020 N	103° 26' 2.272 W
- survey misses target center by 127.2usft at 15775.0usft MD (11397.7 TVD, 4605.1 N, 63.9 E)									
- Point									
Caza #4H BHL P4	0.00	0.00	11,340.0	4,619.4	-42.8	477,965.50	777,859.90	32° 18' 39.020 N	103° 26' 2.272 W
- survey misses target center by 122.1usft at 15775.0usft MD (11397.7 TVD, 4605.1 N, 63.9 E)									
- Point									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
15,718.0	11,396.6	4,548.2	61.3	Last Cathedral Survey @ 15718' MD
15,775.0	11,397.7	4,605.1	63.9	Bit Projection @ 15775' MD

Checked By: _____	Approved By: _____	Date: _____
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