

CONFIDENTIAL**TIGHT HOLE**

Form C-102

Revised August 1, 2011

DISTRICT I1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720**DISTRICT II**811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720**DISTRICT III**1000 Rio Brancos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170**DISTRICT IV**1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462State of New Mexico
Energy, Minerals & Natural Resources Department**OIL CONSERVATION DIVISION**1220 South St. Francis Dr.
Santa Fe, NM 87505Submit one copy to appropriate
District Office☐ AMENDED REPORT☒ AS-DRILLED**WELL LOCATION AND ACREAGE DEDICATION PLAT**

¹ API Number 30-045-35647	² Pool Code 97232	³ Pool Name BASIN MANCOS GAS
⁴ Property Code 315301	⁵ Property Name CHACO 23-08-3	⁶ Well Number 1H
⁷ GRID No. 162928	⁸ Operator Name ENERGEN RESOURCES CORPORATION	⁹ Elevation 6912.3'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	3	23N	8W		2013'	NORTH	186'	EAST	SAN JUAN

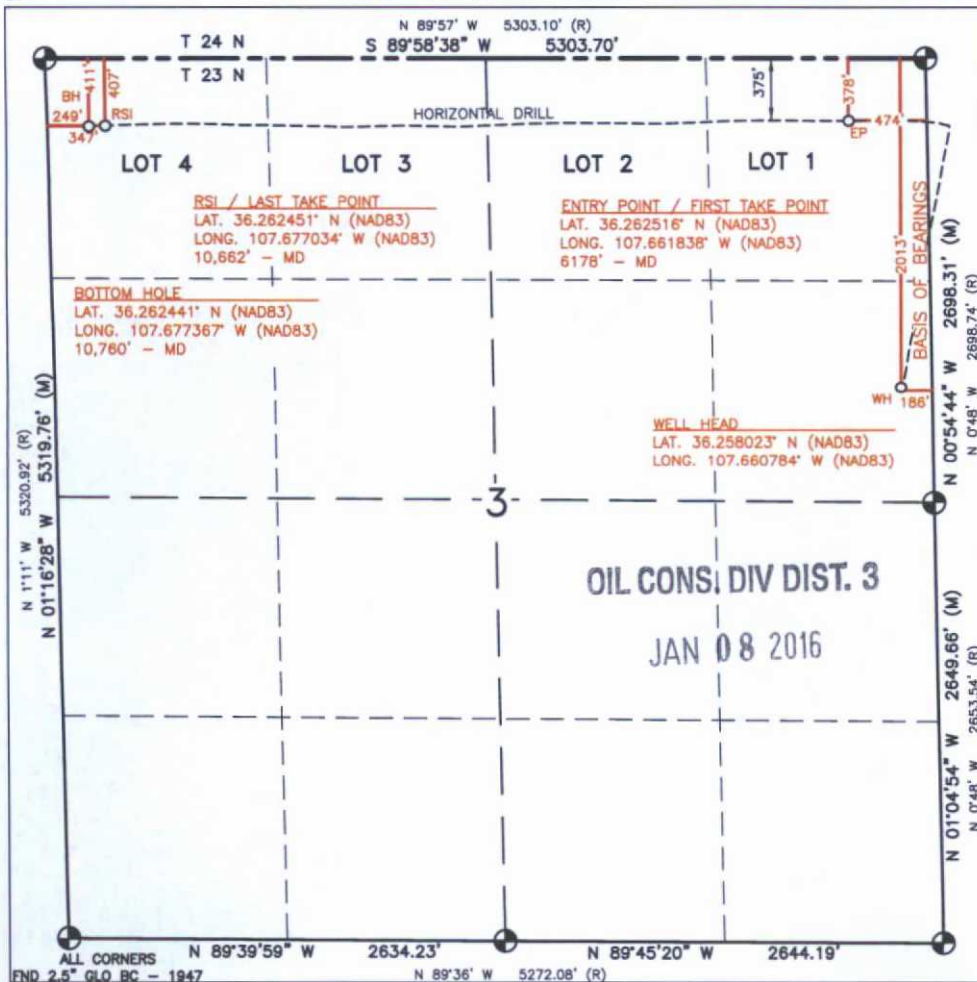
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	3	23N	8W	4	411'	NORTH	249'	WEST	SAN JUAN

¹² Dedicated Acres 323.20 ACRES - S/2 N/2 & LOTS 1 THRU 4 OF SECTION 3	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. NSL 7245-A
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

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**17 OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Theresa McAndrews 01/07/16
Signature Date

Theresa McAndrews

Printed Name

tmcandre@energen.com

E-mail Address

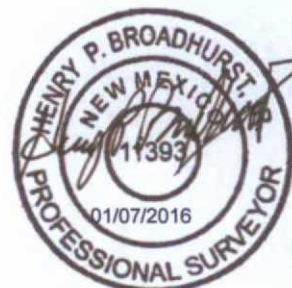
SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

DECEMBER 16, 2015

Date of Survey

Signature and Seal of Professional Surveyor:



Certificate Number

11393

AV

17



CONFIDENTIAL
TIGHT HOLE

D & D Services
P. O. Box 336
Flora Vista, NM 87415
505-215-4600 Fax: 505-334-9508
nowdrilling@yahoo.com

OIL CONS. DIV DIST. 3

JAN 08 2016

DEVIATION REPORT

Chaco

23-08-3 #1H

S3 T23N R 08W

150' 1

300' 1

To the best of my knowledge I believe these numbers to be true and accurate.

Glen Davis

Sworn to and subscribed before me

this 13 day of November, 2015.

Kia Cordell

My commission expires: 4-10-17



CONFIDENTIAL
TIGHT HOLE



Directional Survey Certification

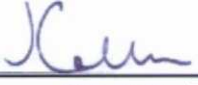
OIL CONS. DIV DIST. 3

JAN 08 2016

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	Energen
Well Name & No.	Chaco 23-08-3 #1H
County & State	San Juan County, NM
SDI Job No.	331215HEF331579
Rig	Key 881

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 396 feet to a measured depth of 10,768 feet is true and correct as determined from all available records.


Signature

22-Dec-15
Date

Janie Collins
Colorado District Well Planner
Scientific Drilling International

Company:	Energien Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	San Juan County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Chaco 23-08-3		
Site Position:		Northing:	1,913,284.76 usft
From:	Lat/Long	Easting:	2,773,962.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.2580790
		Longitude:	-107.6607850
		Grid Convergence:	0.10 °

Well	Chaco 23-08-3 #1H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.2580230
		Longitude:	-107.6607840
		Ground Level:	6,910.50 usft

Wellbore	OH		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/5/2015	9.08	62.93	49,840

Design	OH		
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	288.18

Survey Program	From (usft)	To (usft)	Date	Survey (Wellbore)	Tool Name	Description
	396.00	5,110.00	12/22/2015	Survey #1 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
	5,172.00	6,306.00		Survey #2 - Curve MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
	6,368.00	10,768.00		Survey #3 - Lateral MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1

Survey	Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	396.00	0.75	33.26	395.99	2.17	1.42	-0.67	0.19	0.19	0.00
First SDI Surface MWD Survey										
	460.00	0.76	26.44	459.98	2.90	1.84	-0.84	0.14	0.02	-10.66
	523.00	1.75	28.78	522.97	4.11	2.49	-1.08	1.57	1.57	3.71
	586.00	3.15	17.32	585.91	6.61	3.47	-1.23	2.34	2.22	-18.19
	648.00	4.29	11.23	647.78	10.51	4.43	-0.93	1.94	1.84	-9.82
	711.00	5.89	11.03	710.53	16.00	5.50	-0.24	2.54	2.54	-0.32
	774.00	6.95	12.07	773.13	22.90	6.92	0.57	1.69	1.68	1.65

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
837.00	7.47	11.49	835.63	30.64	8.53	1.45	0.83	0.83	-0.92
897.00	7.97	12.62	895.09	38.52	10.22	2.31	0.87	0.83	1.88
958.00	9.27	13.10	955.40	47.43	12.26	3.16	2.13	2.13	0.79
1,019.00	10.51	11.90	1,015.49	57.66	14.52	4.20	2.06	2.03	-1.97
1,080.00	11.22	12.87	1,075.40	68.89	16.99	5.36	1.20	1.16	1.59
1,140.00	11.93	12.49	1,134.18	80.63	19.63	6.51	1.19	1.18	-0.63
1,201.00	12.60	12.05	1,193.78	93.30	22.38	7.85	1.11	1.10	-0.72
1,262.00	14.02	11.29	1,253.14	107.05	25.22	9.45	2.35	2.33	-1.25
1,323.00	15.47	10.57	1,312.13	122.30	28.15	11.41	2.40	2.38	-1.18
1,384.00	16.91	10.46	1,370.71	139.02	31.26	13.68	2.36	2.36	-0.18
1,446.00	17.47	9.41	1,429.94	157.07	34.42	16.31	1.03	0.90	-1.69
1,506.00	18.72	8.29	1,486.97	175.48	37.28	19.34	2.16	2.08	-1.87
1,568.00	19.84	9.03	1,545.50	195.72	40.36	22.72	1.85	1.81	1.19
1,630.00	19.84	8.87	1,603.82	216.50	43.64	26.10	0.09	0.00	-0.26
1,691.00	20.71	8.72	1,661.04	237.39	46.87	29.55	1.43	1.43	-0.25
1,753.00	22.01	10.54	1,718.78	259.65	50.66	32.89	2.35	2.10	2.94
1,815.00	23.26	11.81	1,776.00	283.06	55.29	35.80	2.16	2.02	2.05
1,876.00	24.60	12.45	1,831.76	307.25	60.49	38.40	2.24	2.20	1.05
1,937.00	25.34	10.98	1,887.05	332.46	65.71	41.30	1.58	1.21	-2.41
1,999.00	26.69	9.46	1,942.77	359.22	70.53	45.08	2.43	2.18	-2.45
2,060.00	27.92	8.54	1,996.97	386.86	74.90	49.55	2.13	2.02	-1.51
2,124.00	29.23	8.01	2,053.18	417.15	79.30	54.82	2.08	2.05	-0.83
2,220.00	31.28	7.70	2,136.10	465.06	85.91	63.49	2.14	2.14	-0.32
2,283.00	32.99	8.28	2,189.44	498.25	90.57	69.42	2.76	2.71	0.92
2,346.00	35.32	9.83	2,241.57	533.17	96.15	75.01	3.95	3.70	2.46
2,409.00	36.30	11.06	2,292.67	569.42	102.84	79.97	1.93	1.56	1.95
2,471.00	36.83	10.91	2,342.46	605.67	109.88	84.60	0.87	0.85	-0.24
2,533.00	34.81	9.38	2,392.73	641.39	116.28	89.66	3.56	-3.26	-2.47
2,596.00	34.88	8.76	2,444.44	676.93	121.95	95.36	0.57	0.11	-0.98
2,658.00	34.69	8.60	2,495.36	711.90	127.29	101.20	0.34	-0.31	-0.26
2,721.00	34.88	8.72	2,547.10	747.43	132.70	107.14	0.32	0.30	0.19
2,783.00	34.84	8.49	2,597.97	782.47	138.00	113.04	0.22	-0.06	-0.37
2,846.00	35.51	9.68	2,649.47	818.30	143.74	118.77	1.52	1.06	1.89
2,910.00	35.03	12.05	2,701.73	854.59	150.70	123.48	2.27	-0.75	3.70
2,972.00	35.16	13.27	2,752.45	889.37	158.51	126.91	1.15	0.21	1.97
3,035.00	34.94	13.21	2,804.03	924.59	166.80	130.03	0.35	-0.35	-0.10
3,098.00	33.79	12.73	2,856.03	959.24	174.78	133.26	1.88	-1.83	-0.76
3,161.00	33.33	12.27	2,908.53	993.24	182.32	136.70	0.83	-0.73	-0.73
3,224.00	32.93	11.93	2,961.29	1,026.91	189.54	140.35	0.70	-0.63	-0.54
3,287.00	32.48	11.75	3,014.30	1,060.22	196.52	144.11	0.73	-0.71	-0.29
3,350.00	32.04	11.84	3,067.58	1,093.14	203.40	147.85	0.70	-0.70	0.14
3,413.00	31.69	11.87	3,121.08	1,125.69	210.23	151.51	0.56	-0.56	0.05
3,476.00	31.13	11.61	3,174.85	1,157.83	216.91	155.20	0.91	-0.89	-0.41



Survey Report

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,539.00	30.21	11.34	3,229.04	1,189.33	223.30	158.95	1.48	-1.46	-0.43
3,602.00	29.55	10.81	3,283.66	1,220.13	229.33	162.83	1.13	-1.05	-0.84
3,665.00	28.11	10.52	3,338.85	1,249.98	234.96	166.80	2.30	-2.29	-0.46
3,727.00	27.27	10.54	3,393.75	1,278.31	240.22	170.64	1.35	-1.35	0.03
3,790.00	26.77	10.12	3,449.87	1,306.46	245.36	174.55	0.85	-0.79	-0.67
3,853.00	26.22	9.30	3,506.26	1,334.16	250.10	178.69	1.05	-0.87	-1.30
3,916.00	25.06	10.07	3,563.05	1,361.04	254.68	182.72	1.92	-1.84	1.22
3,979.00	22.54	10.71	3,620.69	1,386.04	259.26	186.17	4.02	-4.00	1.02
4,042.00	21.95	10.74	3,679.00	1,409.48	263.70	189.27	0.94	-0.94	0.05
4,105.00	20.36	12.24	3,737.75	1,431.76	268.21	191.93	2.67	-2.52	2.38
4,167.00	18.67	11.58	3,796.19	1,452.02	272.49	194.18	2.75	-2.73	-1.06
4,231.00	18.62	11.67	3,856.83	1,472.06	276.62	196.52	0.09	-0.08	0.14
4,293.00	16.92	12.20	3,915.87	1,490.57	280.52	198.58	2.75	-2.74	0.85
4,356.00	15.43	11.84	3,976.38	1,507.74	284.18	200.46	2.37	-2.37	-0.57
4,418.00	14.14	9.73	4,036.32	1,523.28	287.15	202.49	2.25	-2.08	-3.40
4,481.00	13.17	10.91	4,097.54	1,537.91	289.81	204.53	1.60	-1.54	1.87
4,544.00	11.43	11.13	4,159.09	1,551.08	292.38	206.20	2.76	-2.76	0.35
4,607.00	10.05	10.20	4,220.99	1,562.62	294.56	207.73	2.21	-2.19	-1.48
4,670.00	9.28	7.42	4,283.09	1,573.06	296.18	209.44	1.43	-1.22	-4.41
4,732.00	7.69	5.67	4,344.41	1,582.15	297.24	211.28	2.60	-2.56	-2.82
4,795.00	5.89	359.85	4,406.97	1,589.58	297.65	213.21	3.06	-2.86	-9.24
4,858.00	4.86	354.19	4,469.69	1,595.46	297.37	215.31	1.84	-1.63	-8.98
4,921.00	3.75	354.61	4,532.51	1,600.17	296.91	217.22	1.76	-1.76	0.67
4,984.00	2.28	6.74	4,595.42	1,603.47	296.86	218.29	2.53	-2.33	19.25
5,047.00	1.45	5.29	4,658.39	1,605.50	297.08	218.72	1.32	-1.32	-2.30
5,110.00	0.82	301.53	4,721.38	1,606.53	296.77	219.33	2.08	-1.00	-101.21
Last SDI Surface MWD Survey									
5,172.00	4.54	274.81	4,783.30	1,606.97	293.94	222.15	6.17	6.00	-43.10
First SDI Curve MWD Survey									
5,236.00	8.52	280.09	4,846.88	1,608.02	286.75	229.31	6.28	6.22	8.25
5,299.00	12.44	283.69	4,908.81	1,610.44	275.56	240.70	6.31	6.22	5.71
5,362.00	17.36	284.95	4,969.68	1,614.47	259.88	256.86	7.83	7.81	2.00
5,425.00	21.08	282.42	5,029.16	1,619.34	239.72	277.53	6.05	5.90	-4.02
5,488.00	24.33	276.29	5,087.27	1,623.20	215.75	301.51	6.37	5.16	-9.73
5,550.00	28.52	276.30	5,142.78	1,626.22	188.33	328.50	6.76	6.76	0.02
5,613.00	32.43	275.15	5,197.07	1,629.39	156.54	359.69	6.27	6.21	-1.83
5,676.00	36.76	274.91	5,248.92	1,632.52	120.92	394.51	6.88	6.87	-0.38
5,739.00	42.50	275.95	5,297.42	1,636.34	80.94	433.69	9.17	9.11	1.65
5,802.00	51.00	272.37	5,340.55	1,639.57	35.22	478.13	14.11	13.49	-5.68
5,865.00	58.22	269.58	5,377.02	1,640.39	-16.09	527.14	12.01	11.46	-4.43
5,928.00	64.69	269.14	5,407.11	1,639.76	-71.40	579.49	10.29	10.27	-0.70
5,990.00	69.93	269.66	5,431.02	1,639.17	-128.58	633.63	8.49	8.45	0.84
6,053.00	74.92	269.06	5,450.03	1,638.49	-188.61	690.45	7.97	7.92	-0.95
6,116.00	78.12	268.49	5,464.72	1,637.18	-249.86	748.23	5.15	5.08	-0.90

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,117.13	78.17	268.49	5,464.95	1,637.15	-250.96	749.27	4.63	4.62	-0.17
Liner Top @ 6,117.13' MD - 36.2625204, -107.6616353									
6,180.00	81.08	268.38	5,476.27	1,635.46	-312.77	807.47	4.63	4.63	-0.17
6,242.00	85.64	269.89	5,483.44	1,634.54	-374.33	865.67	7.74	7.35	2.44
6,306.00	87.54	270.66	5,487.24	1,634.84	-438.22	926.46	3.20	2.97	1.20
Last SDI Curve MWD Survey									
6,368.00	90.31	270.73	5,488.41	1,635.59	-500.19	985.57	4.47	4.47	0.11
First SDI Lateral MWD Survey									
6,431.00	92.38	271.15	5,486.93	1,636.63	-563.17	1,045.72	3.35	3.29	0.67
6,492.00	92.45	269.99	5,484.36	1,637.23	-624.11	1,103.81	1.90	0.11	-1.90
6,554.00	91.58	270.24	5,482.18	1,637.36	-686.07	1,162.72	1.46	-1.40	0.40
6,616.00	91.31	270.17	5,480.61	1,637.58	-748.05	1,221.67	0.45	-0.44	-0.11
6,677.00	91.21	269.88	5,479.27	1,637.61	-809.03	1,279.62	0.50	-0.16	-0.48
6,739.00	91.45	270.04	5,477.83	1,637.56	-871.02	1,338.50	0.47	0.39	0.26
6,800.00	91.45	269.53	5,476.29	1,637.33	-932.00	1,396.36	0.84	0.00	-0.84
6,861.00	90.81	269.31	5,475.09	1,636.72	-992.98	1,454.11	1.11	-1.05	-0.36
6,921.00	90.44	267.87	5,474.43	1,635.24	-1,052.96	1,510.63	2.48	-0.62	-2.40
6,982.00	90.34	266.68	5,474.02	1,632.34	-1,113.89	1,567.61	1.96	-0.16	-1.95
7,044.00	89.06	266.40	5,474.34	1,628.60	-1,175.77	1,625.24	2.11	-2.06	-0.45
7,105.00	91.58	268.18	5,474.00	1,625.72	-1,236.69	1,682.22	5.06	4.13	2.92
7,166.00	92.76	268.81	5,471.69	1,624.11	-1,297.63	1,739.61	2.19	1.93	1.03
7,228.00	92.72	268.33	5,468.73	1,622.57	-1,359.54	1,797.95	0.78	-0.06	-0.77
7,289.00	92.56	268.97	5,465.92	1,621.13	-1,420.46	1,855.38	1.08	-0.26	1.05
7,350.00	91.88	270.26	5,463.56	1,620.72	-1,481.41	1,913.16	2.39	-1.11	2.11
7,411.00	91.38	270.81	5,461.82	1,621.29	-1,542.38	1,971.26	1.22	-0.82	0.90
7,473.00	91.68	271.19	5,460.16	1,622.38	-1,604.35	2,030.47	0.78	0.48	0.61
7,534.00	88.59	269.86	5,460.02	1,622.93	-1,665.34	2,088.59	5.51	-5.07	-2.18
7,595.00	90.74	270.67	5,460.38	1,623.22	-1,726.33	2,146.63	3.77	3.52	1.33
7,657.00	91.44	269.94	5,459.20	1,623.55	-1,788.32	2,205.62	1.63	1.13	-1.18
7,718.00	93.56	270.48	5,456.54	1,623.77	-1,849.25	2,263.59	3.59	3.48	0.89
7,780.00	91.34	270.36	5,453.89	1,624.22	-1,911.19	2,322.58	3.59	-3.58	-0.19
7,840.00	91.24	270.22	5,452.54	1,624.53	-1,971.18	2,379.66	0.29	-0.17	-0.23
7,901.00	90.47	269.10	5,451.63	1,624.17	-2,032.17	2,437.49	2.23	-1.26	-1.84
7,962.00	90.61	269.36	5,451.05	1,623.35	-2,093.16	2,495.18	0.48	0.23	0.43
8,023.00	91.38	269.43	5,449.99	1,622.70	-2,154.15	2,552.92	1.27	1.26	0.11
8,084.00	90.17	268.21	5,449.17	1,621.45	-2,215.13	2,610.47	2.82	-1.98	-2.00
8,145.00	91.11	267.58	5,448.49	1,619.20	-2,276.08	2,667.68	1.86	1.54	-1.03
8,207.00	91.31	266.95	5,447.18	1,616.25	-2,337.99	2,725.58	1.07	0.32	-1.02
8,269.00	89.83	268.38	5,446.56	1,613.72	-2,399.94	2,783.64	3.32	-2.39	2.31
8,333.00	90.40	267.75	5,446.43	1,611.56	-2,463.90	2,843.74	1.33	0.89	-0.98
8,395.00	91.58	267.53	5,445.36	1,609.01	-2,525.84	2,901.78	1.94	1.90	-0.35
8,458.00	90.60	266.86	5,444.16	1,605.93	-2,588.75	2,960.59	1.88	-1.56	-1.06
8,521.00	93.56	269.39	5,441.88	1,603.86	-2,651.66	3,019.72	6.18	4.70	4.02
8,584.00	94.20	270.76	5,437.61	1,603.95	-2,714.51	3,079.46	2.40	1.02	2.17

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,647.00	92.55	271.43	5,433.90	1,605.15	-2,777.39	3,139.58	2.83	-2.62	1.06	
8,710.00	89.93	271.79	5,432.54	1,606.92	-2,840.35	3,199.94	4.20	-4.16	0.57	
8,772.00	91.78	271.82	5,431.61	1,608.87	-2,902.31	3,259.42	2.98	2.98	0.05	
8,835.00	90.67	269.93	5,430.27	1,609.83	-2,965.28	3,319.55	3.48	-1.76	-3.00	
8,898.00	90.81	269.48	5,429.45	1,609.51	-3,028.27	3,379.29	0.75	0.22	-0.71	
8,962.00	90.77	268.39	5,428.57	1,608.32	-3,092.26	3,439.71	1.70	-0.06	-1.70	
9,024.00	91.34	268.21	5,427.43	1,606.48	-3,154.22	3,498.00	0.96	0.92	-0.29	
9,087.00	90.07	268.26	5,426.66	1,604.54	-3,217.18	3,557.22	2.02	-2.02	0.08	
9,150.00	91.88	268.94	5,425.58	1,603.00	-3,280.15	3,616.56	3.07	2.87	1.08	
9,213.00	93.40	270.73	5,422.68	1,602.82	-3,343.08	3,676.29	3.73	2.41	2.84	
9,276.00	92.19	272.18	5,419.61	1,604.42	-3,405.98	3,736.55	3.00	-1.92	2.30	
9,338.00	91.51	271.81	5,417.61	1,606.57	-3,467.91	3,796.06	1.25	-1.10	-0.60	
9,401.00	90.84	271.27	5,416.32	1,608.27	-3,530.87	3,856.41	1.37	-1.06	-0.86	
9,463.00	90.44	270.74	5,415.62	1,609.35	-3,592.86	3,915.64	1.07	-0.65	-0.85	
9,526.00	91.28	271.33	5,414.68	1,610.49	-3,655.84	3,975.84	1.63	1.33	0.94	
9,589.00	91.71	271.50	5,413.03	1,612.05	-3,718.80	4,036.14	0.73	0.68	0.27	
9,652.00	91.04	271.20	5,411.52	1,613.53	-3,781.77	4,096.42	1.17	-1.06	-0.48	
9,714.00	90.94	270.83	5,410.45	1,614.63	-3,843.75	4,155.65	0.62	-0.16	-0.60	
9,777.00	91.28	270.15	5,409.23	1,615.17	-3,906.73	4,215.66	1.21	0.54	-1.08	
9,840.00	91.31	269.98	5,407.81	1,615.24	-3,969.72	4,275.52	0.27	0.05	-0.27	
9,902.00	91.44	272.31	5,406.32	1,616.48	-4,031.68	4,334.78	3.76	0.21	3.76	
9,965.00	90.94	272.11	5,405.01	1,618.91	-4,094.62	4,395.33	0.85	-0.79	-0.32	
10,029.00	90.30	271.31	5,404.32	1,620.82	-4,158.59	4,456.70	1.60	-1.00	-1.25	
10,091.00	90.81	271.51	5,403.72	1,622.34	-4,220.57	4,516.06	0.88	0.82	0.32	
10,154.00	91.34	270.31	5,402.54	1,623.34	-4,283.55	4,576.21	2.08	0.84	-1.90	
10,217.00	90.84	269.56	5,401.34	1,623.27	-4,346.53	4,636.03	1.43	-0.79	-1.19	
10,280.00	90.74	269.23	5,400.47	1,622.61	-4,409.52	4,695.67	0.55	-0.16	-0.52	
10,343.00	90.77	268.58	5,399.64	1,621.40	-4,472.51	4,755.13	1.03	0.05	-1.03	
10,406.00	91.71	268.78	5,398.27	1,619.95	-4,535.47	4,814.50	1.53	1.49	0.32	
10,469.00	92.59	268.42	5,395.91	1,618.41	-4,598.41	4,873.81	1.51	1.40	-0.57	
10,531.00	92.99	268.38	5,392.89	1,616.68	-4,660.31	4,932.09	0.65	0.65	-0.06	
10,594.00	92.95	268.01	5,389.63	1,614.70	-4,723.20	4,991.21	0.59	-0.06	-0.59	
10,656.00	93.16	267.97	5,386.32	1,612.53	-4,785.07	5,049.32	0.34	0.34	-0.06	
10,661.51	93.19	267.95	5,386.02	1,612.33	-4,790.57	5,054.48	0.64	0.46	-0.44	
RSI @ 10,661.51' MD - 36.2624511, -107.6770340										
10,678.00	93.26	267.87	5,385.09	1,611.73	-4,807.02	5,069.93	0.64	0.46	-0.44	
Hardline Crossed @ 10,678' MD - 36.2624494, -107.6770898										
10,706.00	93.39	267.75	5,383.47	1,610.67	-4,834.95	5,096.13	0.64	0.46	-0.44	
Last SDI Lateral MWD Survey										
10,760.00	93.39	267.75	5,380.28	1,608.55	-4,888.82	5,146.65	0.00	0.00	0.00	
Shoe Set @ 10,760' MD - 36.2624406, -107.6773672										
10,768.00	93.39	267.75	5,379.80	1,608.24	-4,896.80	5,154.13	0.00	0.00	0.00	
Projection to TD										



Survey Report

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
396.00	395.99	2.17	1.42	First SDI Surface MWD Survey
5,110.00	4,721.38	1,606.53	296.77	Last SDI Surface MWD Survey
5,172.00	4,783.30	1,606.97	293.94	First SDI Curve MWD Survey
6,117.13	5,464.95	1,637.15	-250.96	Liner Top @ 6,117.13' MD
6,117.13	5,464.95	1,637.15	-250.96	36.2625204, -107.6616353
6,306.00	5,487.24	1,634.84	-438.22	Last SDI Curve MWD Survey
6,368.00	5,488.41	1,635.59	-500.19	First SDI Lateral MWD Survey
10,661.51	5,386.02	1,612.33	-4,790.57	RSI @ 10,661.51' MD
10,661.51	5,386.02	1,612.33	-4,790.57	36.2624511, -107.6770340
10,678.00	5,385.09	1,611.73	-4,807.02	Hardline Crossed @ 10,678' MD
10,678.00	5,385.09	1,611.73	-4,807.02	36.2624494, -107.6770898
10,706.00	5,383.47	1,610.67	-4,834.95	Last SDI Lateral MWD Survey
10,760.00	5,380.28	1,608.55	-4,888.82	Shoe Set @ 10,760' MD
10,760.00	5,380.28	1,608.55	-4,888.82	36.2624406, -107.6773672
10,768.00	5,379.80	1,608.24	-4,896.80	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Energen Resources Corp.

San Juan County, NM (NAD83)

Chaco 23-08-3

Chaco 23-08-3 #1H

OH

Design: OH

Standard Survey Report

22 December, 2015



www.scientificdrilling.com





Company Name: Energen Resources Corp.
Project: San Juan County, NM (NAD83)
Site: Chaco 23-08-3
Well: Chaco 23-08-3 #1H



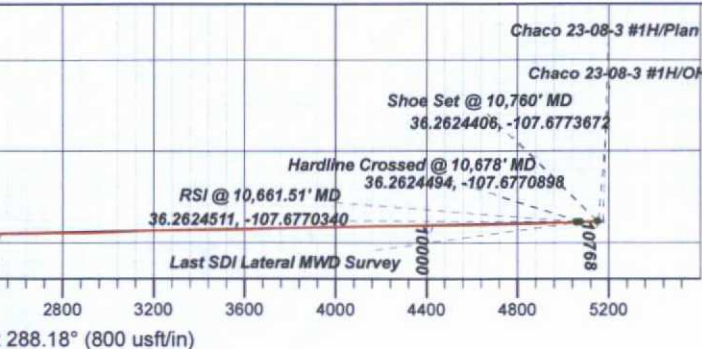
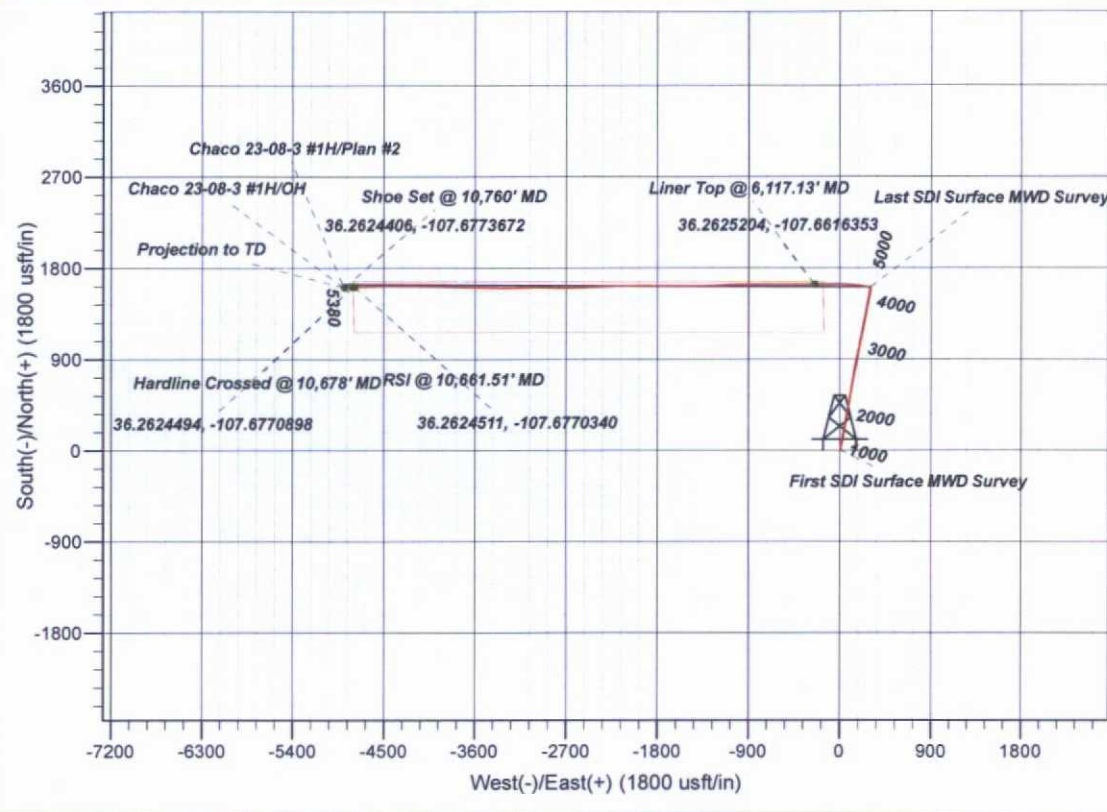
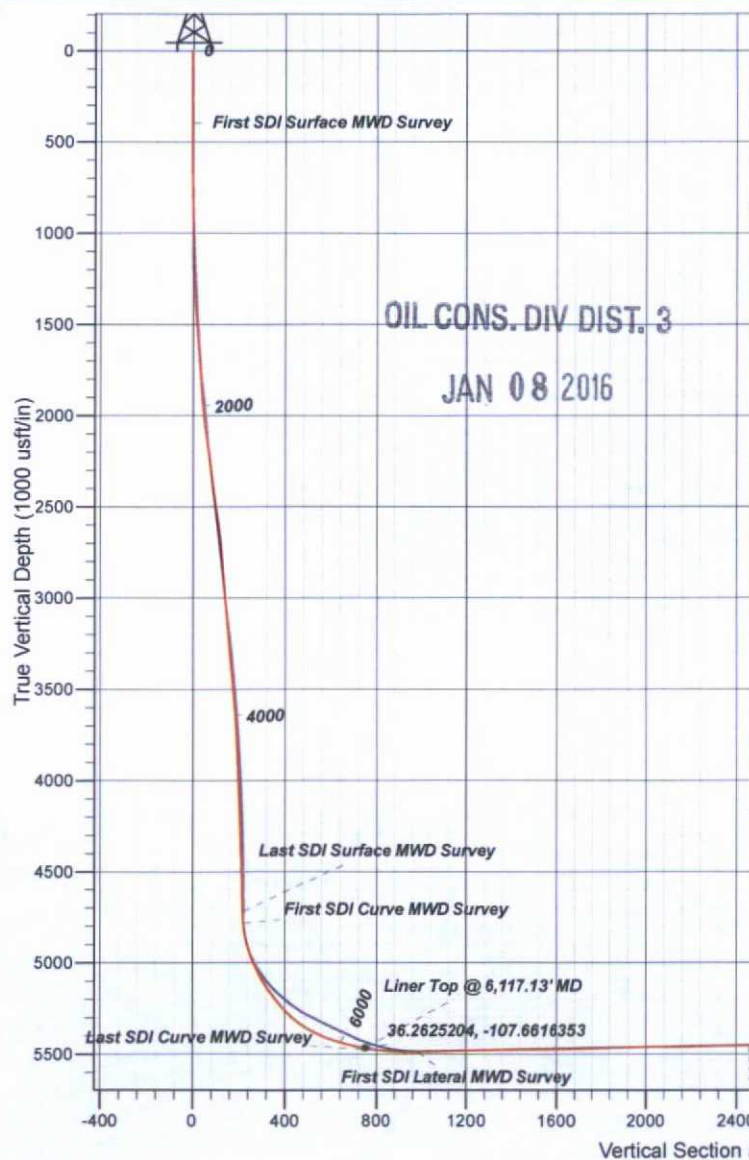
Azimuths to True North
Magnetic North: 9.08°

Magnetic Field
Strength: 49840.2snT
Dip Angle: 62.93°
Date: 12/5/2015
Model: HDGM

WELL DETAILS: Chaco 23-08-3 #1H

	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)	0.00	0.00	1913264.37	2773962.83	36.2580230	-107.6607840

CONFIDENTIAL
TIGHT HOLE



Design: OH (Chaco 23-08-3 #1H/OH)
Created By: Janie Collins Date: 11:37, December 22 2015
PROJECT DETAILS: San Juan County, NM (NAD83)
Geodetic System: US State Plane 1983 Datum: North American Datum 1983 Ellipsoid: GRS 1980 Zone: New Mexico Western Zone
System Datum: Mean Sea Level Local North: True

JAN 08 2016



Scientific Drilling

ENERGEN

Survey Report

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	San Juan County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Chaco 23-08-3		
Site Position:		Northing:	1,913,284.76 usft
From:	Lat/Long	Easting:	2,773,962.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.2580790
		Longitude:	-107.6607850
		Grid Convergence:	0.10 °

Well	Chaco 23-08-3 #1H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.2580230
		Longitude:	-107.6607840
		Ground Level:	6,910.50 usft

Wellbore	OH		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/5/2015	9.08	62.93	49,840

Design	OH		
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	288.18

Survey Program	From (usft)	To (usft)	Date	Survey (Wellbore)	Tool Name	Description
	396.00	5,110.00	12/22/2015	Survey #1 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
	5,172.00	6,306.00		Survey #2 - Curve MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1
	6,368.00	10,768.00		Survey #3 - Lateral MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1

Survey	Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	396.00	0.75	33.26	395.99	2.17	1.42	-0.67	0.19	0.19	0.00
First SDI Surface MWD Survey										
	460.00	0.76	26.44	459.98	2.90	1.84	-0.84	0.14	0.02	-10.66
	523.00	1.75	28.78	522.97	4.11	2.49	-1.08	1.57	1.57	3.71
	586.00	3.15	17.32	585.91	6.61	3.47	-1.23	2.34	2.22	-18.19
	648.00	4.29	11.23	647.78	10.51	4.43	-0.93	1.94	1.84	-9.82
	711.00	5.89	11.03	710.53	16.00	5.50	-0.24	2.54	2.54	-0.32
	774.00	6.95	12.07	773.13	22.90	6.92	0.57	1.69	1.68	1.65

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
837.00	7.47	11.49	835.63	30.64	8.53	1.45	0.83	0.83	-0.92
897.00	7.97	12.62	895.09	38.52	10.22	2.31	0.87	0.83	1.88
958.00	9.27	13.10	955.40	47.43	12.26	3.16	2.13	2.13	0.79
1,019.00	10.51	11.90	1,015.49	57.66	14.52	4.20	2.06	2.03	-1.97
1,080.00	11.22	12.87	1,075.40	68.89	16.99	5.36	1.20	1.16	1.59
1,140.00	11.93	12.49	1,134.18	80.63	19.63	6.51	1.19	1.18	-0.63
1,201.00	12.60	12.05	1,193.78	93.30	22.38	7.85	1.11	1.10	-0.72
1,262.00	14.02	11.29	1,253.14	107.05	25.22	9.45	2.35	2.33	-1.25
1,323.00	15.47	10.57	1,312.13	122.30	28.15	11.41	2.40	2.38	-1.18
1,384.00	16.91	10.46	1,370.71	139.02	31.26	13.68	2.36	2.36	-0.18
1,446.00	17.47	9.41	1,429.94	157.07	34.42	16.31	1.03	0.90	-1.69
1,506.00	18.72	8.29	1,486.97	175.48	37.28	19.34	2.16	2.08	-1.87
1,568.00	19.84	9.03	1,545.50	195.72	40.36	22.72	1.85	1.81	1.19
1,630.00	19.84	8.87	1,603.82	216.50	43.64	26.10	0.09	0.00	-0.26
1,691.00	20.71	8.72	1,661.04	237.39	46.87	29.55	1.43	1.43	-0.25
1,753.00	22.01	10.54	1,718.78	259.65	50.66	32.89	2.35	2.10	2.94
1,815.00	23.26	11.81	1,776.00	283.06	55.29	35.80	2.16	2.02	2.05
1,876.00	24.60	12.45	1,831.76	307.25	60.49	38.40	2.24	2.20	1.05
1,937.00	25.34	10.98	1,887.05	332.46	65.71	41.30	1.58	1.21	-2.41
1,999.00	26.69	9.46	1,942.77	359.22	70.53	45.08	2.43	2.18	-2.45
2,060.00	27.92	8.54	1,996.97	386.86	74.90	49.55	2.13	2.02	-1.51
2,124.00	29.23	8.01	2,053.18	417.15	79.30	54.82	2.08	2.05	-0.83
2,220.00	31.28	7.70	2,136.10	465.06	85.91	63.49	2.14	2.14	-0.32
2,283.00	32.99	8.28	2,189.44	498.25	90.57	69.42	2.76	2.71	0.92
2,346.00	35.32	9.83	2,241.57	533.17	96.15	75.01	3.95	3.70	2.46
2,409.00	36.30	11.06	2,292.67	569.42	102.84	79.97	1.93	1.56	1.95
2,471.00	36.83	10.91	2,342.46	605.67	109.88	84.60	0.87	0.85	-0.24
2,533.00	34.81	9.38	2,392.73	641.39	116.28	89.66	3.56	-3.26	-2.47
2,596.00	34.88	8.76	2,444.44	676.93	121.95	95.36	0.57	0.11	-0.98
2,658.00	34.69	8.60	2,495.36	711.90	127.29	101.20	0.34	-0.31	-0.26
2,721.00	34.88	8.72	2,547.10	747.43	132.70	107.14	0.32	0.30	0.19
2,783.00	34.84	8.49	2,597.97	782.47	138.00	113.04	0.22	-0.06	-0.37
2,846.00	35.51	9.68	2,649.47	818.30	143.74	118.77	1.52	1.06	1.89
2,910.00	35.03	12.05	2,701.73	854.59	150.70	123.48	2.27	-0.75	3.70
2,972.00	35.16	13.27	2,752.45	889.37	158.51	126.91	1.15	0.21	1.97
3,035.00	34.94	13.21	2,804.03	924.59	166.80	130.03	0.35	-0.35	-0.10
3,098.00	33.79	12.73	2,856.03	959.24	174.78	133.26	1.88	-1.83	-0.76
3,161.00	33.33	12.27	2,908.53	993.24	182.32	136.70	0.83	-0.73	-0.73
3,224.00	32.93	11.93	2,961.29	1,026.91	189.54	140.35	0.70	-0.63	-0.54
3,287.00	32.48	11.75	3,014.30	1,060.22	196.52	144.11	0.73	-0.71	-0.29
3,350.00	32.04	11.84	3,067.58	1,093.14	203.40	147.85	0.70	-0.70	0.14
3,413.00	31.69	11.87	3,121.08	1,125.69	210.23	151.51	0.56	-0.56	0.05
3,476.00	31.13	11.61	3,174.85	1,157.83	216.91	155.20	0.91	-0.89	-0.41

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,539.00	30.21	11.34	3,229.04	1,189.33	223.30	158.95	1.48	-1.46	-0.43
3,602.00	29.55	10.81	3,283.66	1,220.13	229.33	162.83	1.13	-1.05	-0.84
3,665.00	28.11	10.52	3,338.85	1,249.98	234.96	166.80	2.30	-2.29	-0.46
3,727.00	27.27	10.54	3,393.75	1,278.31	240.22	170.64	1.35	-1.35	0.03
3,790.00	26.77	10.12	3,449.87	1,306.46	245.36	174.55	0.85	-0.79	-0.67
3,853.00	26.22	9.30	3,506.26	1,334.16	250.10	178.69	1.05	-0.87	-1.30
3,916.00	25.06	10.07	3,563.05	1,361.04	254.68	182.72	1.92	-1.84	1.22
3,979.00	22.54	10.71	3,620.69	1,386.04	259.26	186.17	4.02	-4.00	1.02
4,042.00	21.95	10.74	3,679.00	1,409.48	263.70	189.27	0.94	-0.94	0.05
4,105.00	20.36	12.24	3,737.75	1,431.76	268.21	191.93	2.67	-2.52	2.38
4,167.00	18.67	11.58	3,796.19	1,452.02	272.49	194.18	2.75	-2.73	-1.06
4,231.00	18.62	11.67	3,856.83	1,472.06	276.62	196.52	0.09	-0.08	0.14
4,293.00	16.92	12.20	3,915.87	1,490.57	280.52	198.58	2.75	-2.74	0.85
4,356.00	15.43	11.84	3,976.38	1,507.74	284.18	200.46	2.37	-2.37	-0.57
4,418.00	14.14	9.73	4,036.32	1,523.28	287.15	202.49	2.25	-2.08	-3.40
4,481.00	13.17	10.91	4,097.54	1,537.91	289.81	204.53	1.60	-1.54	1.87
4,544.00	11.43	11.13	4,159.09	1,551.08	292.38	206.20	2.76	-2.76	0.35
4,607.00	10.05	10.20	4,220.99	1,562.62	294.56	207.73	2.21	-2.19	-1.48
4,670.00	9.28	7.42	4,283.09	1,573.06	296.18	209.44	1.43	-1.22	-4.41
4,732.00	7.69	5.67	4,344.41	1,582.15	297.24	211.28	2.60	-2.56	-2.82
4,795.00	5.89	359.85	4,406.97	1,589.58	297.65	213.21	3.06	-2.86	-9.24
4,858.00	4.86	354.19	4,469.69	1,595.46	297.37	215.31	1.84	-1.63	-8.98
4,921.00	3.75	354.61	4,532.51	1,600.17	296.91	217.22	1.76	-1.76	0.67
4,984.00	2.28	6.74	4,595.42	1,603.47	296.86	218.29	2.53	-2.33	19.25
5,047.00	1.45	5.29	4,658.39	1,605.50	297.08	218.72	1.32	-1.32	-2.30
5,110.00	0.82	301.53	4,721.38	1,606.53	296.77	219.33	2.08	-1.00	-101.21
Last SDI Surface MWD Survey									
5,172.00	4.54	274.81	4,783.30	1,606.97	293.94	222.15	6.17	6.00	-43.10
First SDI Curve MWD Survey									
5,236.00	8.52	280.09	4,846.88	1,608.02	286.75	229.31	6.28	6.22	8.25
5,299.00	12.44	283.69	4,908.81	1,610.44	275.56	240.70	6.31	6.22	5.71
5,362.00	17.36	284.95	4,969.68	1,614.47	259.88	256.86	7.83	7.81	2.00
5,425.00	21.08	282.42	5,029.16	1,619.34	239.72	277.53	6.05	5.90	-4.02
5,488.00	24.33	276.29	5,087.27	1,623.20	215.75	301.51	6.37	5.16	-9.73
5,550.00	28.52	276.30	5,142.78	1,626.22	188.33	328.50	6.76	6.76	0.02
5,613.00	32.43	275.15	5,197.07	1,629.39	156.54	359.69	6.27	6.21	-1.83
5,676.00	36.76	274.91	5,248.92	1,632.52	120.92	394.51	6.88	6.87	-0.38
5,739.00	42.50	275.95	5,297.42	1,636.34	80.94	433.69	9.17	9.11	1.65
5,802.00	51.00	272.37	5,340.55	1,639.57	35.22	478.13	14.11	13.49	-5.68
5,865.00	58.22	269.58	5,377.02	1,640.39	-16.09	527.14	12.01	11.46	-4.43
5,928.00	64.69	269.14	5,407.11	1,639.76	-71.40	579.49	10.29	10.27	-0.70
5,990.00	69.93	269.66	5,431.02	1,639.17	-128.58	633.63	8.49	8.45	0.84
6,053.00	74.92	269.06	5,450.03	1,638.49	-188.61	690.45	7.97	7.92	-0.95
6,116.00	78.12	268.49	5,464.72	1,637.18	-249.86	748.23	5.15	5.08	-0.90

Survey Report

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,117.13	78.17	268.49	5,464.95	1,637.15	-250.96	749.27	4.63	4.62	-0.17	
Liner Top @ 6,117.13' MD - 36.2625204, -107.6616353										
6,180.00	81.08	268.38	5,476.27	1,635.46	-312.77	807.47	4.63	4.63	-0.17	
6,242.00	85.64	269.89	5,483.44	1,634.54	-374.33	865.67	7.74	7.35	2.44	
6,306.00	87.54	270.66	5,487.24	1,634.84	-438.22	926.46	3.20	2.97	1.20	
Last SDI Curve MWD Survey										
6,368.00	90.31	270.73	5,488.41	1,635.59	-500.19	985.57	4.47	4.47	0.11	
First SDI Lateral MWD Survey										
6,431.00	92.38	271.15	5,486.93	1,636.63	-563.17	1,045.72	3.35	3.29	0.67	
6,492.00	92.45	269.99	5,484.36	1,637.23	-624.11	1,103.81	1.90	0.11	-1.90	
6,554.00	91.58	270.24	5,482.18	1,637.36	-686.07	1,162.72	1.46	-1.40	0.40	
6,616.00	91.31	270.17	5,480.61	1,637.58	-748.05	1,221.67	0.45	-0.44	-0.11	
6,677.00	91.21	269.88	5,479.27	1,637.61	-809.03	1,279.62	0.50	-0.16	-0.48	
6,739.00	91.45	270.04	5,477.83	1,637.56	-871.02	1,338.50	0.47	0.39	0.26	
6,800.00	91.45	269.53	5,476.29	1,637.33	-932.00	1,396.36	0.84	0.00	-0.84	
6,861.00	90.81	269.31	5,475.09	1,636.72	-992.98	1,454.11	1.11	-1.05	-0.36	
6,921.00	90.44	267.87	5,474.43	1,635.24	-1,052.96	1,510.63	2.48	-0.62	-2.40	
6,982.00	90.34	266.68	5,474.02	1,632.34	-1,113.89	1,567.61	1.96	-0.16	-1.95	
7,044.00	89.06	266.40	5,474.34	1,628.60	-1,175.77	1,625.24	2.11	-2.06	-0.45	
7,105.00	91.58	268.18	5,474.00	1,625.72	-1,236.69	1,682.22	5.06	4.13	2.92	
7,166.00	92.76	268.81	5,471.69	1,624.11	-1,297.63	1,739.61	2.19	1.93	1.03	
7,228.00	92.72	268.33	5,468.73	1,622.57	-1,359.54	1,797.95	0.78	-0.06	-0.77	
7,289.00	92.56	268.97	5,465.92	1,621.13	-1,420.46	1,855.38	1.08	-0.26	1.05	
7,350.00	91.88	270.26	5,463.56	1,620.72	-1,481.41	1,913.16	2.39	-1.11	2.11	
7,411.00	91.38	270.81	5,461.82	1,621.29	-1,542.38	1,971.26	1.22	-0.82	0.90	
7,473.00	91.68	271.19	5,460.16	1,622.38	-1,604.35	2,030.47	0.78	0.48	0.61	
7,534.00	88.59	269.86	5,460.02	1,622.93	-1,665.34	2,088.59	5.51	-5.07	-2.18	
7,595.00	90.74	270.67	5,460.38	1,623.22	-1,726.33	2,146.63	3.77	3.52	1.33	
7,657.00	91.44	269.94	5,459.20	1,623.55	-1,788.32	2,205.62	1.63	1.13	-1.18	
7,718.00	93.56	270.48	5,456.54	1,623.77	-1,849.25	2,263.59	3.59	3.48	0.89	
7,780.00	91.34	270.36	5,453.89	1,624.22	-1,911.19	2,322.58	3.59	-3.58	-0.19	
7,840.00	91.24	270.22	5,452.54	1,624.53	-1,971.18	2,379.66	0.29	-0.17	-0.23	
7,901.00	90.47	269.10	5,451.63	1,624.17	-2,032.17	2,437.49	2.23	-1.26	-1.84	
7,962.00	90.61	269.36	5,451.05	1,623.35	-2,093.16	2,495.18	0.48	0.23	0.43	
8,023.00	91.38	269.43	5,449.99	1,622.70	-2,154.15	2,552.92	1.27	1.26	0.11	
8,084.00	90.17	268.21	5,449.17	1,621.45	-2,215.13	2,610.47	2.82	-1.98	-2.00	
8,145.00	91.11	267.58	5,448.49	1,619.20	-2,276.08	2,667.68	1.86	1.54	-1.03	
8,207.00	91.31	266.95	5,447.18	1,616.25	-2,337.99	2,725.58	1.07	0.32	-1.02	
8,269.00	89.83	268.38	5,446.56	1,613.72	-2,399.94	2,783.64	3.32	-2.39	2.31	
8,333.00	90.40	267.75	5,446.43	1,611.56	-2,463.90	2,843.74	1.33	0.89	-0.98	
8,395.00	91.58	267.53	5,445.36	1,609.01	-2,525.84	2,901.78	1.94	1.90	-0.35	
8,458.00	90.60	266.86	5,444.16	1,605.93	-2,588.75	2,960.59	1.88	-1.56	-1.06	
8,521.00	93.56	269.39	5,441.88	1,603.86	-2,651.66	3,019.72	6.18	4.70	4.02	
8,584.00	94.20	270.76	5,437.61	1,603.95	-2,714.51	3,079.46	2.40	1.02	2.17	

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,647.00	92.55	271.43	5,433.90	1,605.15	-2,777.39	3,139.58	2.83	-2.62	1.06
8,710.00	89.93	271.79	5,432.54	1,606.92	-2,840.35	3,199.94	4.20	-4.16	0.57
8,772.00	91.78	271.82	5,431.61	1,608.87	-2,902.31	3,259.42	2.98	2.98	0.05
8,835.00	90.67	269.93	5,430.27	1,609.83	-2,965.28	3,319.55	3.48	-1.76	-3.00
8,898.00	90.81	269.48	5,429.45	1,609.51	-3,028.27	3,379.29	0.75	0.22	-0.71
8,962.00	90.77	268.39	5,428.57	1,608.32	-3,092.26	3,439.71	1.70	-0.06	-1.70
9,024.00	91.34	268.21	5,427.43	1,606.48	-3,154.22	3,498.00	0.96	0.92	-0.29
9,087.00	90.07	268.26	5,426.66	1,604.54	-3,217.18	3,557.22	2.02	-2.02	0.08
9,150.00	91.88	268.94	5,425.58	1,603.00	-3,280.15	3,616.56	3.07	2.87	1.08
9,213.00	93.40	270.73	5,422.68	1,602.82	-3,343.08	3,676.29	3.73	2.41	2.84
9,276.00	92.19	272.18	5,419.61	1,604.42	-3,405.98	3,736.55	3.00	-1.92	2.30
9,338.00	91.51	271.81	5,417.61	1,606.57	-3,467.91	3,796.06	1.25	-1.10	-0.60
9,401.00	90.84	271.27	5,416.32	1,608.27	-3,530.87	3,856.41	1.37	-1.06	-0.86
9,463.00	90.44	270.74	5,415.62	1,609.35	-3,592.86	3,915.64	1.07	-0.65	-0.85
9,526.00	91.28	271.33	5,414.68	1,610.49	-3,655.84	3,975.84	1.63	1.33	0.94
9,589.00	91.71	271.50	5,413.03	1,612.05	-3,718.80	4,036.14	0.73	0.68	0.27
9,652.00	91.04	271.20	5,411.52	1,613.53	-3,781.77	4,096.42	1.17	-1.06	-0.48
9,714.00	90.94	270.83	5,410.45	1,614.63	-3,843.75	4,155.65	0.62	-0.16	-0.60
9,777.00	91.28	270.15	5,409.23	1,615.17	-3,906.73	4,215.66	1.21	0.54	-1.08
9,840.00	91.31	269.98	5,407.81	1,615.24	-3,969.72	4,275.52	0.27	0.05	-0.27
9,902.00	91.44	272.31	5,406.32	1,616.48	-4,031.68	4,334.78	3.76	0.21	3.76
9,965.00	90.94	272.11	5,405.01	1,618.91	-4,094.62	4,395.33	0.85	-0.79	-0.32
10,029.00	90.30	271.31	5,404.32	1,620.82	-4,158.59	4,456.70	1.60	-1.00	-1.25
10,091.00	90.81	271.51	5,403.72	1,622.34	-4,220.57	4,516.06	0.88	0.82	0.32
10,154.00	91.34	270.31	5,402.54	1,623.34	-4,283.55	4,576.21	2.08	0.84	-1.90
10,217.00	90.84	269.56	5,401.34	1,623.27	-4,346.53	4,636.03	1.43	-0.79	-1.19
10,280.00	90.74	269.23	5,400.47	1,622.61	-4,409.52	4,695.67	0.55	-0.16	-0.52
10,343.00	90.77	268.58	5,399.64	1,621.40	-4,472.51	4,755.13	1.03	0.05	-1.03
10,406.00	91.71	268.78	5,398.27	1,619.95	-4,535.47	4,814.50	1.53	1.49	0.32
10,469.00	92.59	268.42	5,395.91	1,618.41	-4,598.41	4,873.81	1.51	1.40	-0.57
10,531.00	92.99	268.38	5,392.89	1,616.68	-4,660.31	4,932.09	0.65	0.65	-0.06
10,594.00	92.95	268.01	5,389.63	1,614.70	-4,723.20	4,991.21	0.59	-0.06	-0.59
10,656.00	93.16	267.97	5,386.32	1,612.53	-4,785.07	5,049.32	0.34	0.34	-0.06
10,661.51	93.19	267.95	5,386.02	1,612.33	-4,790.57	5,054.48	0.64	0.46	-0.44
RSI @ 10,661.51' MD - 36.2624511, -107.6770340									
10,678.00	93.26	267.87	5,385.09	1,611.73	-4,807.02	5,069.93	0.64	0.46	-0.44
Hardline Crossed @ 10,678' MD - 36.2624494, -107.6770898									
10,706.00	93.39	267.75	5,383.47	1,610.67	-4,834.95	5,096.13	0.64	0.46	-0.44
Last SDI Lateral MWD Survey									
10,760.00	93.39	267.75	5,380.28	1,608.55	-4,888.82	5,146.65	0.00	0.00	0.00
Shoe Set @ 10,760' MD - 36.2624406, -107.6773672									
10,768.00	93.39	267.75	5,379.80	1,608.24	-4,896.80	5,154.13	0.00	0.00	0.00
Projection to TD									

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Chaco 23-08-3 #1H
Project:	San Juan County, NM (NAD83)	TVD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Site:	Chaco 23-08-3	MD Reference:	GL 6910.50' & RKB 17' @ 6927.50usft (Key 881)
Well:	Chaco 23-08-3 #1H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
396.00	395.99	2.17	1.42	First SDI Surface MWD Survey
5,110.00	4,721.38	1,606.53	296.77	Last SDI Surface MWD Survey
5,172.00	4,783.30	1,606.97	293.94	First SDI Curve MWD Survey
6,117.13	5,464.95	1,637.15	-250.96	Liner Top @ 6,117.13' MD
6,117.13	5,464.95	1,637.15	-250.96	36.2625204, -107.6616353
6,306.00	5,487.24	1,634.84	-438.22	Last SDI Curve MWD Survey
6,368.00	5,488.41	1,635.59	-500.19	First SDI Lateral MWD Survey
10,661.51	5,386.02	1,612.33	-4,790.57	RSI @ 10,661.51' MD
10,661.51	5,386.02	1,612.33	-4,790.57	36.2624511, -107.6770340
10,678.00	5,385.09	1,611.73	-4,807.02	Hardline Crossed @ 10,678' MD
10,678.00	5,385.09	1,611.73	-4,807.02	36.2624494, -107.6770898
10,706.00	5,383.47	1,610.67	-4,834.95	Last SDI Lateral MWD Survey
10,760.00	5,380.28	1,608.55	-4,888.82	Shoe Set @ 10,760' MD
10,760.00	5,380.28	1,608.55	-4,888.82	36.2624406, -107.6773672
10,768.00	5,379.80	1,608.24	-4,896.80	Projection to TD

Checked By: _____ Approved By: _____ Date: _____