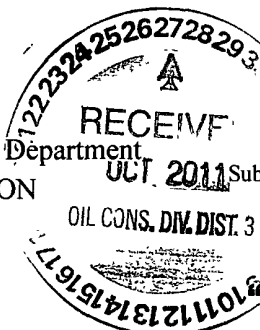


District I
1625 N French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
District II
811 S First St., Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170
District IV
1220 S St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505



Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☒ AMENDED REPORT
AS DRILLED

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-30655		² Pool Code 71599 /72319	³ Pool Name Blanco Mesa Verde / Gallup - Basin Dakota
⁴ Property Code 21939	⁵ Property Name Jicarilla 97		⁶ Well Number 6N
⁷ OGRID No. 162928	⁸ Operator Name Energen Resources Corporation		⁹ Elevation 6890' GL

¹⁰ Surface Location

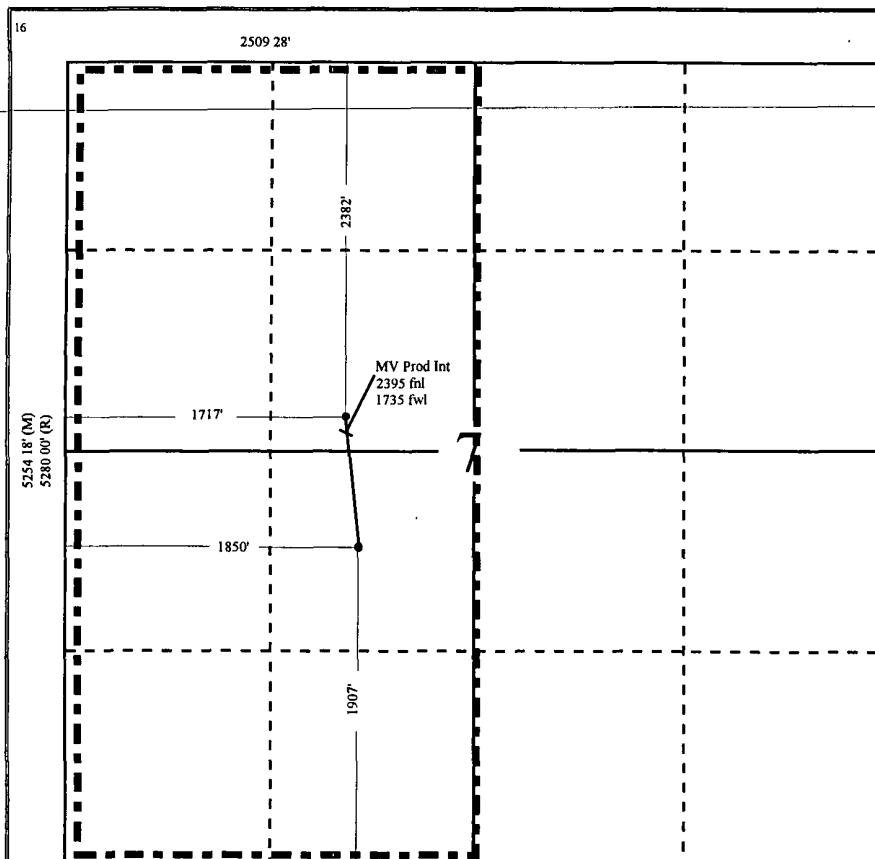
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	7	26N	3W		1907	South	1850	West	Rio Arriba

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
F	7	26N	3W		2382	North	1717	West	Rio Arriba

¹² Dedicated Acres 320.0 - W/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
--	-------------------------------	----------------------------------	-------------------------

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.



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.

Nathan Smith 10/24/2011
Signature Date

Nathan Smith
Printed Name

nsmith@energen.com
E-mail Address

¹⁸ 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.

September 15, 2008

Date of Survey

Signature and Seal of Professional Surveyor:

Original survey conducted and recorded by

David R. Russell

10201

Certificate Number

A

Energen Resources Corp.

Rio Arriba County, NM

Jicarilla

Jicarilla 97 #6N

OH

Design: OH

Standard Survey Report

08 November, 2011

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

Notarized this date _____ of _____, 2011.

Notary Signature
County of Natrona
State of Wyoming



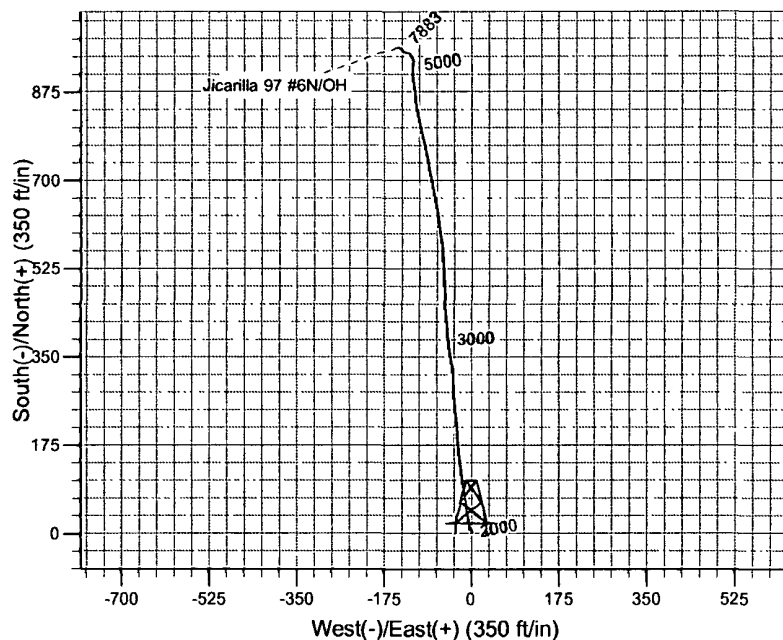
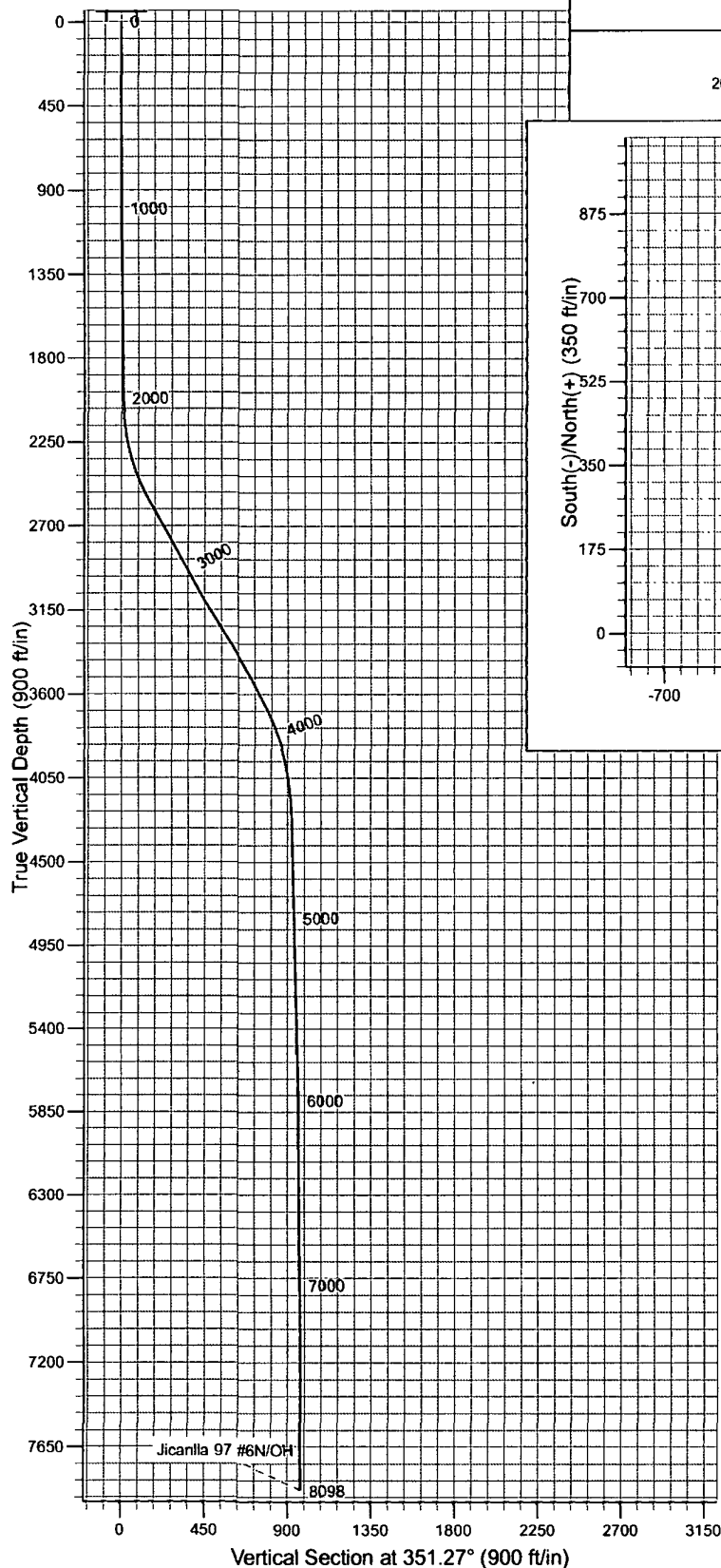
Energen Resources Corp.

Project: Rio Arriba County, NM
 Site: Jicarilla
 Well: Jicarilla 97 #6N
 Wellbore: OH
 Design: OH



WELL DETAILS: Jicarilla 97 #6N

Ground Level: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 Northing 2002243.69 Easting 1364742.09 Latitude 36° 29' 56.328 N Longitude 107° 11' 16.620 W



REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Jicarilla 97 #6N, True North
 Vertical (TVD) Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 Section (VS) Reference: Slot - (0.00N, 0.00E)
 Measured Depth Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 Calculation Method: Minimum Curvature
 Local North: True
 Location:

PROJECT DETAILS: Rio Arriba County, NM

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Central Zone

Design: OH (Jicarilla 97 #6N/OH)

Created By: Julie Cruise Date: 2011-11-08

Scientific Drilling Survey Report



Company: Energen Resources Corp.
Project: Rio Arriba County, NM
Site: Jicarilla
Well: Jicarilla 97 #6N
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Jicarilla 97 #6N
TVD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
MD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

Project	Rio Arriba County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	Jicarilla		
Site Position:	Lat/Long	Northing: 2,002,243.69 usft	Latitude: 36° 29' 56.328 N
From:		Easting: 1,364,742.09 usft	Longitude: 107° 11' 16.620 W
Position Uncertainty:	0.00 ft	Slot Radius: 13.200 in	Grid Convergence: -0.56 °

Well	Jicarilla 97 #6N, 1907' FSL 1850' FWL Sec 7 T26N R3W		
Well Position	+N/-S 0.00 ft	Northing: 2,002,243.69 usft	Latitude: 36° 29' 56.328 N
	+E/-W 0.00 ft	Easting: 1,364,742.09 usft	Longitude: 107° 11' 16.620 W
Position Uncertainty	0.00 ft	Wellhead Elevation: ft	Ground Level: 6,891.00 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	2011/11/08	9.57
			Dip Angle (°)
			63.35
			Field Strength (nT)
			50,630

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 (°)
			351.27

Survey Program	Date 2011/11/08		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
333.00	1,730.00	Survey #1 - Surface (OH)	MWD SDI
1,821.00	8,098.00	Survey #2 - Production (OH)	MWD SDI
			Description
			MWD - Standard ver 1.0.1
			MWD - Standard ver 1.0.1

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
333.00	0.30	9.70	333.00	0.86	0.15	0.83	0.09	0.09	0.00
First SDI MWD Survey									
425.00	0.55	13.23	425.00	1.53	0.29	1.47	0.27	0.27	3.84
517.00	0.23	40.25	516.99	2.10	0.51	2.00	0.39	-0.35	29.37
608.00	0.44	40.53	607.99	2.50	0.85	2.34	0.23	0.23	0.31
700.00	0.18	330.06	699.99	2.90	1.01	2.71	0.45	-0.28	-76.60
792.00	0.23	338.98	791.99	3.19	0.87	3.02	0.06	0.05	9.70
884.00	0.43	5.83	883.99	3.71	0.84	3.54	0.27	0.22	29.18
976.00	0.15	45.76	975.99	4.14	0.96	3.94	0.36	-0.30	43.40

Scientific Drilling

Survey Report



Company: Energen Resources Corp.
Project: Rio Arriba County, NM
Site: Jicarilla
Well: Jicarilla 97 #6N
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Jicarilla 97 #6N
TVD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
MD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

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)
1,068.00	0.14	30.87	1,067.99	4.32	1.11	4.10	0.04	-0.01	-16.18
1,160.00	0.39	334.14	1,159.99	4.70	1.03	4.49	0.36	0.27	-61.66
1,254.00	0.37	312.99	1,253.98	5.19	0.67	5.03	0.15	-0.02	-22.50
1,349.00	0.29	287.17	1,348.98	5.47	0.21	5.38	0.18	-0.08	-27.18
1,445.00	0.62	293.95	1,444.98	5.75	-0.49	5.76	0.35	0.34	7.06
1,540.00	0.43	329.00	1,539.98	6.27	-1.15	6.37	0.38	-0.20	36.89
1,635.00	0.26	304.33	1,634.97	6.69	-1.51	6.85	0.23	-0.18	-25.97
1,730.00	0.64	310.49	1,729.97	7.16	-2.09	7.39	0.40	0.40	6.48
Last Survey in 8 3/4" Hole									
1,821.00	0.41	309.94	1,820.97	7.70	-2.73	8.02	0.25	-0.25	-0.60
First Survey in 6 1/4" Hole									
1,917.00	0.49	292.69	1,916.96	8.08	-3.37	8.50	0.16	0.08	-17.97
1,980.00	0.92	334.38	1,979.96	8.64	-3.84	9.12	1.02	0.68	66.17
2,012.00	1.88	353.84	2,011.95	9.39	-4.00	9.89	3.31	3.00	60.81
2,044.00	2.65	359.12	2,043.92	10.65	-4.07	11.15	2.49	2.41	16.50
2,075.00	3.67	358.81	2,074.88	12.36	-4.10	12.84	3.29	3.29	-1.00
2,107.00	4.67	352.25	2,106.79	14.68	-4.30	15.16	3.46	3.13	-20.50
2,139.00	5.95	356.99	2,138.65	17.62	-4.56	18.11	4.23	4.00	14.81
2,171.00	7.63	351.10	2,170.43	21.38	-4.98	21.89	5.68	5.25	-18.41
2,202.00	8.72	347.31	2,201.11	25.71	-5.81	26.29	3.92	3.52	-12.23
2,234.00	10.35	346.67	2,232.67	30.87	-7.01	31.58	5.10	5.09	-2.00
2,266.00	12.03	351.46	2,264.06	36.96	-8.17	37.78	6.00	5.25	14.97
2,297.00	14.02	350.19	2,294.26	43.86	-9.29	44.76	6.49	6.42	-4.10
2,329.00	15.57	350.91	2,325.20	51.92	-10.63	52.93	4.88	4.84	2.25
2,361.00	16.90	348.75	2,355.92	60.72	-12.21	61.87	4.56	4.16	-6.75
2,393.00	18.26	353.83	2,386.43	70.27	-13.66	71.53	6.40	4.25	15.88
2,424.00	19.90	351.10	2,415.73	80.31	-15.00	81.66	6.02	5.29	-8.81
2,488.00	23.49	353.32	2,475.19	103.75	-18.17	105.31	5.75	5.61	3.47
2,551.00	27.29	351.94	2,532.09	130.53	-21.65	132.30	6.10	6.03	-2.19
2,583.00	29.23	352.13	2,560.28	145.53	-23.75	147.45	6.07	6.06	0.59
2,647.00	30.05	355.70	2,615.90	177.00	-27.09	179.06	3.04	1.28	5.58
2,710.00	29.74	356.60	2,670.52	208.32	-29.20	210.34	0.87	-0.49	1.43
2,773.00	29.28	352.13	2,725.36	239.19	-32.24	241.31	3.57	-0.73	-7.10
2,837.00	29.55	358.52	2,781.12	270.48	-34.79	272.62	4.92	0.42	9.98
2,900.00	29.58	357.77	2,835.92	301.54	-35.80	303.48	0.59	0.05	-1.19
2,964.00	29.25	350.56	2,891.68	332.76	-38.98	334.82	5.55	-0.52	-11.27
3,027.00	28.53	350.44	2,946.84	362.78	-44.00	365.26	1.15	-1.14	-0.19
3,091.00	28.77	357.09	3,003.02	393.24	-47.32	395.87	4.99	0.38	10.39
3,154.00	30.71	352.55	3,057.73	424.34	-50.18	427.04	4.72	3.08	-7.21
3,218.00	30.79	358.39	3,112.74	456.93	-52.76	459.64	4.67	0.13	9.13
3,281.00	31.24	356.13	3,166.74	489.35	-54.31	491.92	1.98	0.71	-3.59
3,345.00	31.40	358.37	3,221.41	522.57	-55.91	525.00	1.84	0.25	3.50
3,408.00	31.68	356.24	3,275.11	555.48	-57.46	557.77	1.82	0.44	-3.38

Scientific Drilling

Survey Report



Company: Energen Resources Corp.
 Project: Rio Arriba County, NM
 Site: Jicarilla
 Well: Jicarilla 97 #6N
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well Jicarilla 97 #6N
 TVD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 MD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: Rockies Compass Server

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)
3,472.00	31.67	349.46	3,329.59	588.78	-61.64	591.32	5.56	-0.02	-10.59
3,535.00	30.99	355.03	3,383.42	621.21	-66.07	624.04	4.72	-1.08	8.84
3,567.00	30.46	347.30	3,410.94	637.33	-68.56	640.36	12.45	-1.66	-24.16
3,599.00	30.38	354.22	3,438.54	653.30	-71.16	656.54	10.95	-0.25	21.63
3,631.00	29.44	345.22	3,466.29	668.96	-73.99	672.45	14.32	-2.94	-28.13
3,662.00	28.72	351.95	3,493.39	683.71	-76.97	687.47	10.80	-2.32	21.71
3,694.00	28.23	347.18	3,521.52	698.70	-79.73	702.71	7.27	-1.53	-14.91
3,726.00	27.40	348.00	3,549.82	713.29	-82.94	717.61	2.86	-2.59	2.56
3,757.00	26.73	349.84	3,577.43	727.13	-85.65	731.70	3.46	-2.16	5.94
3,789.00	27.40	348.82	3,605.93	741.43	-88.35	746.25	2.55	2.09	-3.19
3,821.00	29.27	350.44	3,634.09	756.37	-91.08	761.43	6.32	5.84	5.06
3,884.00	26.99	345.44	3,689.65	785.40	-97.23	791.06	5.20	-3.62	-7.94
3,948.00	22.86	346.61	3,747.68	811.57	-103.76	817.91	6.50	-6.45	1.83
3,980.00	21.81	346.42	3,777.28	823.39	-106.60	830.03	3.29	-3.28	-0.59
4,011.00	20.39	349.66	3,806.20	834.30	-108.92	841.17	5.93	-4.58	10.45
4,043.00	19.08	353.88	3,836.32	844.99	-110.48	851.97	6.05	-4.09	13.19
4,075.00	17.62	348.97	3,866.70	854.94	-111.96	862.03	6.64	-4.56	-15.34
4,107.00	16.24	357.99	3,897.31	864.17	-113.05	871.32	9.26	-4.31	28.19
4,138.00	14.21	358.46	3,927.22	872.31	-113.30	879.40	6.56	-6.55	1.52
4,170.00	12.52	352.53	3,958.36	879.67	-113.86	886.76	6.79	-5.28	-18.53
4,202.00	11.30	350.74	3,989.67	886.21	-114.81	893.37	3.98	-3.81	-5.59
4,234.00	10.07	350.48	4,021.11	892.06	-115.78	899.30	3.85	-3.84	-0.81
4,265.00	8.86	351.00	4,051.69	897.09	-116.60	904.40	3.91	-3.90	1.68
4,297.00	7.44	352.43	4,083.37	901.58	-117.26	908.93	4.48	-4.44	4.47
4,329.00	6.09	352.78	4,115.14	905.32	-117.75	912.70	4.22	-4.22	1.09
4,361.00	5.25	357.75	4,146.99	908.46	-118.02	915.85	3.04	-2.63	15.53
4,392.00	4.67	1.24	4,177.87	911.14	-118.05	918.51	2.11	-1.87	11.26
4,424.00	3.77	356.43	4,209.78	913.50	-118.08	920.84	3.02	-2.81	-15.03
4,434.00	3.36	1.92	4,219.76	914.12	-118.09	921.45	5.33	-4.10	54.90
4,519.00	1.50	3.88	4,304.68	917.72	-117.94	924.99	2.19	-2.19	2.31
4,583.00	1.82	358.57	4,368.66	919.57	-117.90	926.81	0.55	0.50	-8.30
4,648.00	1.40	0.52	4,433.63	921.39	-117.92	928.62	0.65	-0.65	3.00
4,712.00	1.28	6.92	4,497.61	922.89	-117.83	930.08	0.30	-0.19	10.00
4,775.00	1.35	9.12	4,560.60	924.32	-117.63	931.46	0.14	0.11	3.49
4,839.00	1.64	17.13	4,624.58	925.94	-117.24	933.00	0.56	0.45	12.52
5,537.00	1.21	323.32	5,322.39	941.39	-118.70	948.50	0.19	-0.06	-7.71
5,600.00	1.69	329.22	5,385.37	942.72	-119.57	949.95	0.80	0.76	9.37
5,664.00	1.69	333.18	5,449.34	944.38	-120.48	951.72	0.18	0.00	6.19
5,727.00	2.38	337.00	5,512.30	946.41	-121.41	953.87	1.12	1.10	6.06
5,791.00	2.45	326.30	5,576.24	948.77	-122.69	956.40	0.71	0.11	-16.72
5,854.00	1.74	302.99	5,639.20	950.41	-124.24	958.26	1.74	-1.13	-37.00
5,918.00	1.48	267.54	5,703.18	950.91	-125.88	959.00	1.58	-0.41	-55.39
5,981.00	1.94	270.81	5,766.15	950.89	-127.76	959.26	0.75	0.73	5.19
6,045.00	1.51	277.40	5,830.12	951.01	-129.68	959.68	0.74	-0.67	10.30

Scientific Drilling

Survey Report



Company: Energen Resources Corp.
 Project: Rio Arriba County, NM
 Site: Jicarilla
 Well: Jicarilla 97 #6N
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well Jicarilla 97 #6N
 TVD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 MD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: Rockies Compass Server

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)
6,108.00	0.98	296.40	5,893.11	951.36	-130.98	960.22	1.06	-0.84	30.16
6,172.00	0.48	281.55	5,957.10	951.65	-131.74	960.62	0.83	-0.78	-23.20
6,235.00	0.66	279.54	6,020.10	951.77	-132.35	960.83	0.29	0.29	-3.19
6,299.00	0.39	318.30	6,084.09	951.99	-132.86	961.13	0.67	-0.42	60.56
6,362.00	0.67	290.81	6,147.09	952.28	-133.35	961.49	0.59	0.44	-43.63
6,426.00	0.78	293.23	6,211.09	952.59	-134.10	961.90	0.18	0.17	3.78
6,489.00	0.87	288.84	6,274.08	952.91	-134.94	962.35	0.17	0.14	-6.97
6,552.00	0.58	295.31	6,337.07	953.20	-135.68	962.75	0.48	-0.46	10.27
6,616.00	0.64	296.85	6,401.07	953.50	-136.30	963.14	0.10	0.09	2.41
6,679.00	0.64	317.86	6,464.07	953.92	-136.85	963.64	0.37	0.00	33.35
6,743.00	0.66	321.64	6,528.06	954.47	-137.32	964.26	0.07	0.03	5.91
6,806.00	0.78	317.15	6,591.06	955.07	-137.83	964.93	0.21	0.19	-7.13
6,871.00	0.97	315.77	6,656.05	955.79	-138.52	965.74	0.29	0.29	-2.12
6,934.00	1.17	333.41	6,719.04	956.75	-139.18	966.79	0.61	0.32	28.00
6,998.00	0.98	340.67	6,783.03	957.85	-139.65	967.95	0.36	-0.30	11.34
7,061.00	0.34	333.61	6,846.02	958.53	-139.91	968.66	1.02	-1.02	-11.21
7,125.00	0.44	337.75	6,910.02	958.92	-140.09	969.08	0.16	0.16	6.47
7,188.00	0.39	336.42	6,973.02	959.34	-140.27	969.52	0.08	-0.08	-2.11
7,252.00	0.38	12.89	7,037.02	959.75	-140.31	969.93	0.38	-0.02	56.98
7,315.00	0.43	290.00	7,100.02	960.03	-140.48	970.23	0.85	0.08	-131.57
7,379.00	0.17	281.51	7,164.02	960.14	-140.80	970.38	0.41	-0.41	-13.27
7,442.00	0.59	275.18	7,227.02	960.18	-141.21	970.49	0.67	0.67	-10.05
7,506.00	0.35	279.37	7,291.01	960.25	-141.74	970.63	0.38	-0.38	6.55
7,569.00	0.71	288.34	7,354.01	960.40	-142.30	970.87	0.58	0.57	14.24
7,633.00	0.81	273.01	7,418.01	960.55	-143.12	971.14	0.35	0.16	-23.95
7,696.00	0.74	289.25	7,481.00	960.71	-143.95	971.42	0.36	-0.11	25.78
7,759.00	0.31	259.80	7,544.00	960.81	-144.51	971.61	0.78	-0.68	-46.75
7,823.00	0.24	268.95	7,608.00	960.78	-144.81	971.62	0.13	-0.11	14.30
7,886.00	0.71	313.44	7,670.99	961.04	-145.22	971.95	0.90	0.75	70.62
7,948.00	0.76	284.59	7,732.99	961.41	-145.90	972.42	0.60	0.08	-46.53
8,012.00	0.78	301.69	7,796.98	961.75	-146.68	972.87	0.36	0.03	26.72
8,075.00	0.72	284.09	7,859.98	962.07	-147.43	973.30	0.38	-0.10	-27.94
8,098.00	0.86	316.25	7,882.98	962.23	-147.69	973.50	1.99	0.61	139.83
Last SDI MWD Survey									

Scientific Drilling
Survey Report



Company: Energen Resources Corp.
Project: Rio Arriba County, NM
Site: Jicarilla
Well: Jicarilla 97 #6N
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Jicarilla 97 #6N
TVD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
MD Reference: GL 6891' & KB 18' @ 6909.00ft (Key 888)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
333.00	333.00	0.86	0.15	First SDI MWD Survey
1,730.00	1,729.97	7.16	-2.09	Last Survey in 8 3/4" Hole
1,821.00	1,820.97	7.70	-2.73	First Survey in 6 1/4" Hole
8,098.00	7,882.98	962.23	-147.69	Last SDI MWD Survey

Checked By: _____ Approved By: _____ Date: _____

Job Number: 700003163-NM-NM
 Company: Energen Resources Corp.
 Lease/Well: Jicarilla 97 #6N
 Location: SEC 7-T26N-R3W
 Rig Name: Key 888
 RKB: 6905
 G.L. or M.S.L.: 6890

State/Country: NM/USA
 Declination: 9.62
 Grid: ☐
 File name: C:\WINSERVE\J976N.SVY
 Date/Time: 28-Aug-11 / 09:27
 Curve Name: Jicarilla 97 #6N

Pathfinder Drilling

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 353.24
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead



Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
333.00	.30	9.70	333.00	.86	.15	.84	.87	9.70	.09
425.00	.55	13.33	425.00	1.53	.29	1.48	1.55	10.73	.27
517.00	.23	40.24	516.99	2.10	.51	2.02	2.16	13.68	.39
608.00	.44	40.50	607.99	2.50	.86	2.38	2.64	18.87	.23
700.00	.18	330.07	699.99	2.90	1.01	2.76	3.07	19.27	.45
792.00	.23	339.00	791.99	3.19	.87	3.07	3.31	15.31	.06
884.00	.43	5.84	883.99	3.71	.84	3.58	3.80	12.81	.27
976.00	.15	45.75	975.99	4.14	.96	3.99	4.25	13.13	.36
1068.00	.14	30.86	1067.99	4.32	1.11	4.16	4.46	14.40	.04
1160.00	.39	334.17	1159.99	4.70	1.03	4.54	4.81	12.37	.36
1254.00	.37	313.03	1253.98	5.19	.67	5.08	5.23	7.34	.15
1349.00	.29	287.21	1348.98	5.47	.21	5.41	5.48	2.25	.18

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1445.00	.62	294.03	1444.98	5.75	-.49	5.77	5.78	355.12	.35
1540.00	.43	329.03	1539.98	6.27	-1.14	6.36	6.37	349.65	.38
1635.00	.26	304.36	1634.97	6.70	-1.51	6.83	6.86	347.33	.23
1730.00	.64	310.56	1729.97	7.16	-2.09	7.36	7.46	343.76	.40
1821.00	.38	322.98	1820.97	7.74	-2.65	7.99	8.18	341.06	.31
1917.00	.47	304.40	1916.96	8.21	-3.17	8.53	8.80	338.88	.17
1980.00	.99	337.43	1979.96	8.86	-3.59	9.22	9.56	337.92	1.03
2012.00	1.88	348.04	2011.95	9.63	-3.81	10.01	10.35	338.42	2.89
2044.00	2.58	356.27	2043.93	10.86	-3.96	11.25	11.56	339.95	2.40
2075.00	3.71	356.35	2074.88	12.56	-4.07	12.95	13.20	342.03	3.65
2107.00	4.72	356.55	2106.79	14.91	-4.22	15.30	15.49	344.20	3.16
2139.00	5.99	354.62	2138.65	17.88	-4.45	18.28	18.43	346.01	4.01
2171.00	7.58	353.47	2170.43	21.64	-4.85	22.06	22.18	347.37	4.99
2202.00	8.75	351.90	2201.11	26.01	-5.42	26.46	26.57	348.24	3.84
2234.00	10.38	351.20	2232.66	31.27	-6.20	31.78	31.88	348.78	5.11
2266.00	12.10	351.45	2264.05	37.43	-7.14	38.01	38.11	349.20	5.38
2297.00	13.95	350.57	2294.25	44.33	-8.23	44.99	45.09	349.48	6.00
2329.00	15.63	350.85	2325.19	52.39	-9.55	53.15	53.26	349.67	5.25
2361.00	16.86	352.02	2355.91	61.25	-10.88	62.10	62.21	349.92	3.98
2393.00	18.32	353.98	2386.41	70.84	-12.05	71.77	71.86	350.34	4.92
2424.00	19.95	355.45	2415.70	80.96	-12.98	81.93	82.00	350.89	5.48
2488.00	23.55	356.69	2475.14	104.62	-14.59	105.61	105.63	352.06	5.67
2551.00	27.29	356.36	2532.03	131.61	-16.23	132.60	132.60	352.97	5.94
2583.00	29.21	356.23	2560.21	146.72	-17.21	147.73	147.73	353.31	6.00
2647.00	29.98	355.69	2615.86	178.25	-19.44	179.30	179.30	353.78	1.27
2710.00	29.67	355.48	2670.52	209.49	-21.85	210.60	210.62	354.04	.52
2773.00	29.35	355.14	2725.35	240.42	-24.39	241.62	241.65	354.21	.57
2837.00	29.52	354.95	2781.08	271.75	-27.11	273.05	273.10	354.30	.30
2900.00	29.60	355.26	2835.88	302.72	-29.76	304.12	304.18	354.39	.27
2964.00	29.23	354.68	2891.63	334.03	-32.51	335.53	335.61	354.44	.73
3027.00	28.52	354.72	2946.80	364.32	-35.32	365.95	366.03	354.46	1.13
3091.00	28.80	354.88	3002.96	394.89	-38.11	396.63	396.72	354.49	.45
3154.00	30.78	354.81	3057.63	426.06	-40.92	427.92	428.02	354.51	3.14
3218.00	30.75	354.86	3112.63	458.66	-43.87	460.64	460.76	354.54	.06

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3281.00	31.17	355.03	3166.65	490.95	-46.72	493.03	493.17	354.56	.68
3345.00	31.36	354.84	3221.35	524.03	-49.65	526.24	526.38	354.59	.33
3408.00	31.63	353.18	3275.08	556.76	-53.09	559.14	559.29	354.55	1.44
3472.00	31.62	351.94	3329.57	590.04	-57.43	592.70	592.83	354.44	1.02
3535.00	30.96	351.64	3383.41	622.42	-62.11	625.41	625.52	354.30	1.08
3567.00	30.51	351.65	3410.91	638.60	-64.48	641.76	641.85	354.23	1.41
3599.00	30.34	350.93	3438.51	654.62	-66.94	657.95	658.04	354.16	1.26
3631.00	29.47	350.01	3466.25	670.36	-69.58	673.89	673.96	354.07	3.07
3662.00	28.65	349.77	3493.34	685.18	-72.22	688.92	688.98	353.98	2.67
3694.00	28.17	349.73	3521.49	700.16	-74.93	704.11	704.16	353.89	1.50
3726.00	27.34	350.06	3549.81	714.83	-77.54	718.99	719.03	353.81	2.64
3757.00	26.67	350.63	3577.43	728.71	-79.90	733.05	733.08	353.74	2.32
3789.00	27.47	350.65	3605.92	743.08	-82.27	747.60	747.62	353.68	2.50
3821.00	29.33	350.31	3634.07	758.09	-84.79	762.80	762.81	353.62	5.83
3884.00	27.02	350.11	3689.60	787.40	-89.85	792.50	792.51	353.49	3.67
3948.00	22.92	350.60	3747.61	814.03	-94.38	819.48	819.48	353.39	6.41
3980.00	21.82	351.07	3777.20	826.05	-96.32	831.64	831.65	353.35	3.48
4011.00	20.46	351.67	3806.11	837.10	-98.00	842.82	842.82	353.32	4.44
4043.00	19.01	352.37	3836.23	847.80	-99.50	853.62	853.62	353.31	4.59
4075.00	17.65	353.48	3866.61	857.79	-100.75	863.68	863.68	353.30	4.39
4107.00	16.23	354.18	3897.22	867.06	-101.75	873.01	873.01	353.31	4.48
4138.00	14.21	354.91	3927.13	875.16	-102.53	881.14	881.14	353.32	6.55
4170.00	12.48	355.04	3958.26	882.51	-103.18	888.52	888.53	353.33	5.41
4202.00	11.37	353.91	3989.57	889.10	-103.81	895.13	895.14	353.34	3.54
4234.00	10.07	354.72	4021.01	895.02	-104.40	901.09	901.09	353.35	4.09
4265.00	8.84	354.75	4051.59	900.09	-104.87	906.18	906.18	353.35	3.97
4297.00	7.50	355.89	4083.26	904.62	-105.24	910.72	910.72	353.36	4.22
4329.00	6.15	356.54	4115.04	908.42	-105.50	914.52	914.52	353.38	4.23
4361.00	5.18	357.46	4146.88	911.57	-105.66	917.67	917.67	353.39	3.04
4392.00	4.60	359.58	4177.77	914.21	-105.74	920.30	920.31	353.40	1.96
4424.00	3.75	.20	4209.68	916.54	-105.74	922.62	922.62	353.42	2.66
4434.00	3.29	1.81	4219.66	917.15	-105.73	923.22	923.23	353.42	4.70
4519.00	1.50	3.88	4304.59	920.70	-105.58	926.73	926.74	353.46	2.11
4583.00	1.82	358.57	4368.56	922.55	-105.55	928.56	928.57	353.47	.55

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4648.00	1.40	.52	4433.53	924.38	-105.57	930.38	930.39	353.48	.65
4712.00	1.28	6.92	4497.52	925.87	-105.47	931.85	931.86	353.50	.30
4775.00	1.35	9.12	4560.50	927.30	-105.27	933.25	933.26	353.52	.14
4839.00	1.64	17.13	4624.48	928.92	-104.88	934.81	934.82	353.56	.56
4902.00	1.29	11.05	4687.46	930.48	-104.48	936.31	936.33	353.59	.61
4966.00	1.49	16.75	4751.44	931.98	-104.10	937.76	937.78	353.63	.38
5029.00	1.45	23.29	4814.42	933.50	-103.55	939.20	939.23	353.67	.27
5093.00	1.35	10.48	4878.40	934.99	-103.09	940.62	940.65	353.71	.51
5156.00	1.10	20.58	4941.38	936.28	-102.75	941.87	941.90	353.74	.52
5219.00	1.29	21.47	5004.37	937.51	-102.27	943.03	943.07	353.77	.30
5283.00	1.04	2.80	5068.36	938.76	-101.98	944.24	944.28	353.80	.71
5347.00	1.26	3.20	5132.34	940.04	-101.91	945.50	945.55	353.81	.34
5474.00	1.22	320.30	5259.32	942.47	-102.70	948.01	948.05	353.78	.71
5537.00	1.21	323.32	5322.30	943.52	-103.53	949.15	949.19	353.74	.10
5600.00	1.69	329.22	5385.28	944.86	-104.40	950.58	950.61	353.69	.80
5664.00	1.69	333.18	5449.25	946.51	-105.31	952.32	952.35	353.65	.18
5727.00	2.38	337.00	5512.21	948.54	-106.24	954.45	954.47	353.61	1.12
5791.00	2.45	326.30	5576.16	950.90	-107.52	956.95	956.96	353.55	.71
5854.00	1.74	302.99	5639.12	952.54	-109.06	958.76	958.77	353.47	1.74
5918.00	1.48	267.54	5703.09	953.04	-110.71	959.44	959.45	353.37	1.58
5981.00	1.94	270.81	5766.06	953.02	-112.58	959.65	959.65	353.26	.75
6045.00	1.51	277.40	5830.04	953.14	-114.50	959.99	960.00	353.15	.74
6108.00	.98	296.40	5893.02	953.49	-115.81	960.49	960.50	353.07	1.06
6172.00	.48	281.55	5957.02	953.79	-116.56	960.88	960.88	353.03	.83
6235.00	.66	279.54	6020.01	953.90	-117.18	961.06	961.07	353.00	.29
6299.00	.39	318.30	6084.01	954.12	-117.69	961.34	961.35	352.97	.67
6362.00	.67	290.81	6147.01	954.41	-118.17	961.69	961.70	352.94	.59
6426.00	.78	293.23	6211.00	954.72	-118.92	962.08	962.10	352.90	.18
6489.00	.87	288.84	6274.00	955.04	-119.77	962.50	962.52	352.85	.17
6552.00	.58	295.31	6336.99	955.33	-120.51	962.88	962.90	352.81	.48
6616.00	.64	296.85	6400.99	955.63	-121.12	963.25	963.28	352.78	.10
6679.00	.64	317.86	6463.98	956.05	-121.67	963.73	963.76	352.75	.37
6743.00	.66	321.64	6527.98	956.61	-122.14	964.33	964.37	352.72	.07
6806.00	.78	317.15	6590.97	957.21	-122.66	964.99	965.03	352.70	.21

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
6871.00	.97	315.77	6655.97	957.92	-123.34	965.78	965.83	352.66	.29
6934.00	1.17	333.41	6718.96	958.88	-124.00	966.81	966.87	352.63	.61
6998.00	.98	340.67	6782.94	959.98	-124.48	967.96	968.02	352.61	.36
7061.00	.34	333.61	6845.94	960.66	-124.74	968.66	968.72	352.60	1.02
7125.00	.44	337.75	6909.94	961.06	-124.92	969.08	969.14	352.59	.16
7188.00	.39	336.42	6972.94	961.48	-125.09	969.52	969.58	352.59	.08
7252.00	.38	12.89	7036.94	961.88	-125.13	969.92	969.99	352.59	.38
7315.00	.43	290.00	7099.93	962.17	-125.31	970.23	970.29	352.58	.85
7379.00	.17	281.51	7163.93	962.27	-125.63	970.37	970.43	352.56	.41
7442.00	.59	275.18	7226.93	962.32	-126.04	970.46	970.54	352.54	.67
7506.00	.35	279.37	7290.93	962.38	-126.56	970.58	970.66	352.51	.38
7569.00	.71	288.34	7353.93	962.53	-127.12	970.80	970.89	352.48	.58
7673.00	.81	273.01	7457.92	962.77	-128.47	971.20	971.31	352.40	.22
7696.00	.74	289.25	7480.92	962.83	-128.77	971.29	971.40	352.38	1.00
7759.00	.31	259.80	7543.91	962.93	-129.32	971.46	971.58	352.35	.78
7823.00	.24	268.95	7607.91	962.90	-129.63	971.47	971.59	352.33	.13
7886.00	.71	313.44	7670.91	963.17	-130.04	971.78	971.91	352.31	.90
7948.00	.76	284.59	7732.90	963.53	-130.72	972.22	972.36	352.27	.60
8012.00	.78	301.69	7796.90	963.87	-131.50	972.65	972.80	352.23	.36
8075.00	.72	284.09	7859.89	964.19	-132.25	973.06	973.22	352.19	.38
8098.00	.86	316.25	7882.89	964.35	-132.51	973.25	973.41	352.18	1.99
Projection to bit									
8160.00	.86	316.25	7944.88	965.02	-133.15	973.99	974.17	352.14	.00