

30-039-29928

RCVD OCT 15 '12

OIL CONS. DIV.

DIST. 3

EnerVest Operating LLC

Rio Arriba County, NM

Jicarilla

Jicarilla A #4M

OH

Design: OH

Standard Survey Report

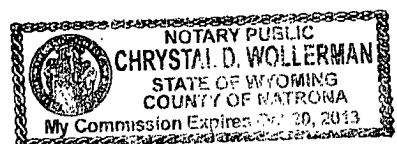
24 August, 2012

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

Notarized this date 24th of August, 2012.

Chrystal D. Wollerman

Notary Signature
County of Natrona
State of Wyoming



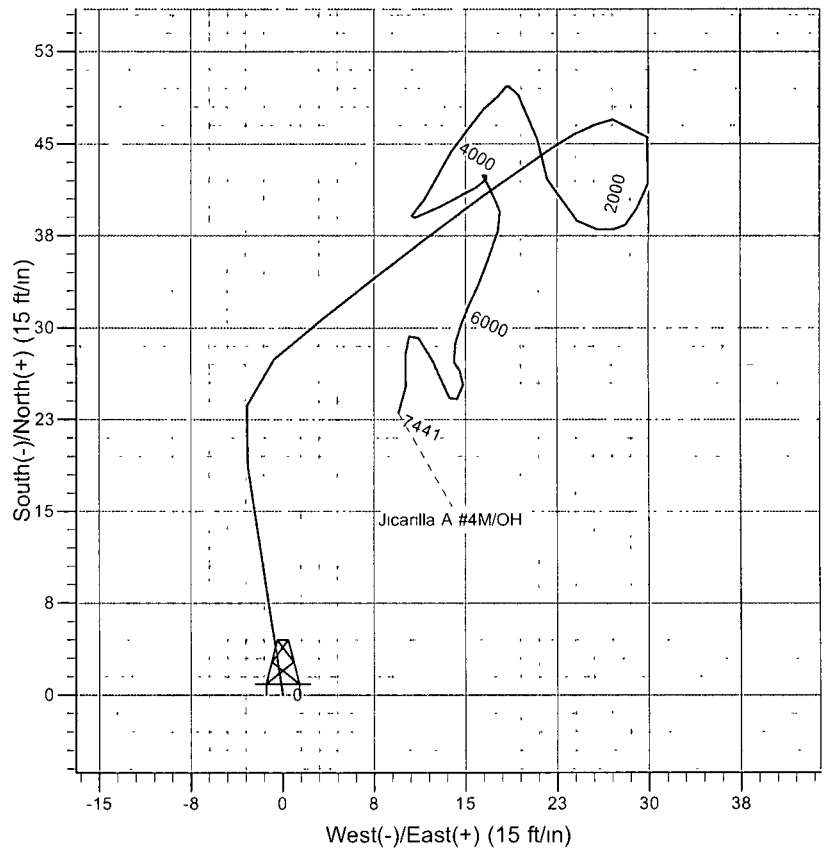
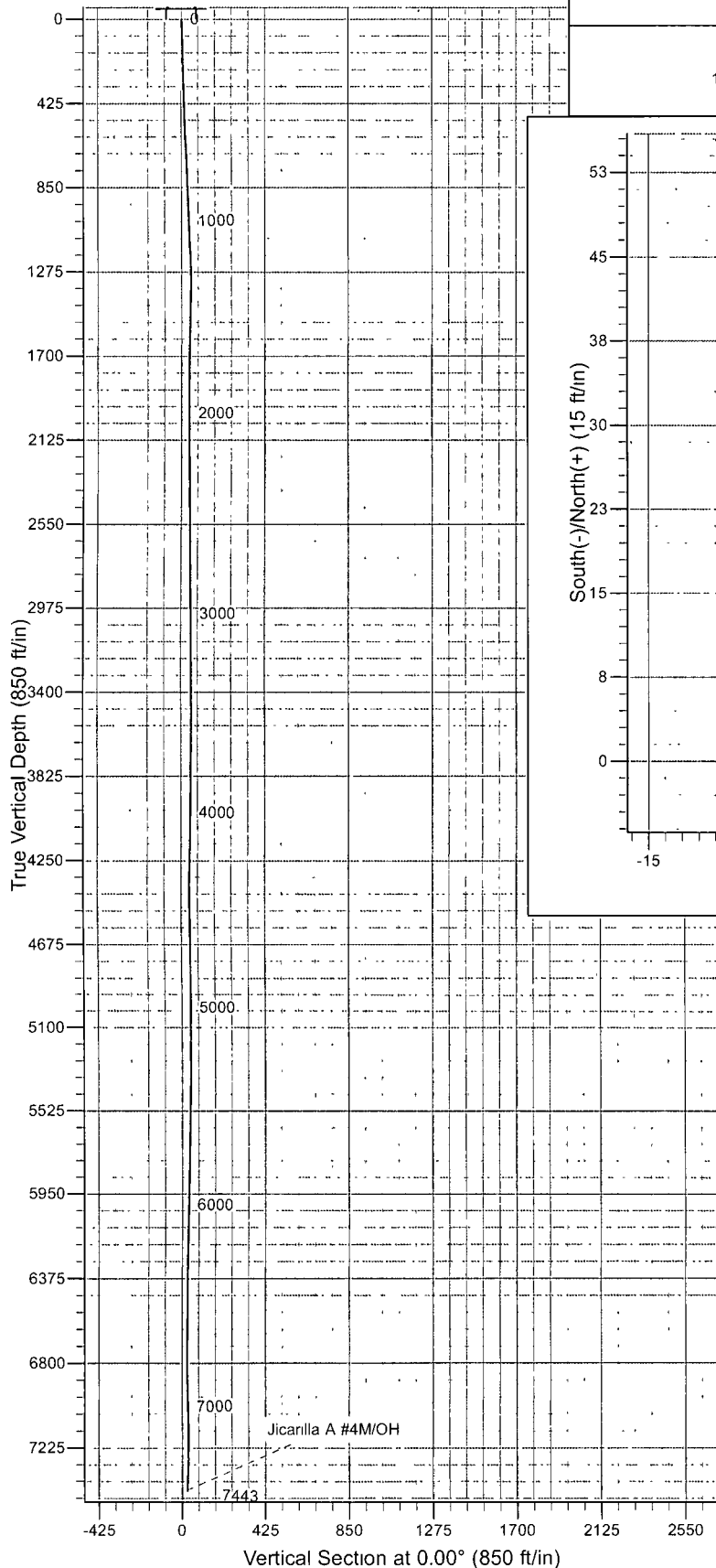
EnerVest Operating LLC

Project Rio Arriba County, NM
 Site: Jicarilla
 Well: Jicarilla A #4M
 Wellbore OH
 Design: OH



WELL DETAILS Jicarilla A #4M

Ground Level GL 6612' & KB 13' @ 6625 00ft (D&J 2)
 Northing 1990630 44 Easting 2848084 95 Latitude 36° 28' 11 701 N Longitude 107° 24' 29 592 W



REFERENCE INFORMATION

Co-ordinate (N/E) Reference Well Jicarilla A #4M, True North
 Vertical (TVD) Reference GL 6612' & KB 13' @ 6625 00ft (D&J 2)
 Section (VS) Reference Slot - (0 00N, 0 00E)
 Measured Depth Reference GL 6612' & KB 13' @ 6625 00ft (D&J 2)
 Calculation Method Minimum Curvature
 Local North True
 Location

PROJECT DETAILS Rio Arriba County, NM

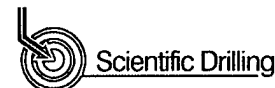
Geodetic System US State Plane 1983
 Datum North American Datum 1983
 Ellipsoid GRS 1980
 Zone New Mexico Western Zone

Design OH (Jicarilla A #4M/OH)

Created By Julie Cruse Date 24 August 2012

Scientific Drilling

Survey Report



Company:	EnerVest Operating LLC	Local Co-ordinate Reference:	Well Jicarilla A #4M
Project:	Rio Arriba County, NM	TVD Reference:	GL 6612' & KB 13' @ 6625.00ft (D&J 2)
Site:	Jicarilla	MD Reference:	GL 6612' & KB 13' @ 6625.00ft (D&J 2)
Well:	Jicarilla A #4M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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 Western Zone		

Site	Jicarilla		
Site Position:		Northing:	1,995,697.30 usft
From:	Lat/Long	Easting:	2,855,703.11 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 29' 1.464 N
		Longitude:	107° 22' 56.028 W
		Grid Convergence:	0.27 °

Well	Jicarilla A #4M, 1780' FSL 580' FWL Sec 19 T26N R5W		
Well Position	+N/-S	0.00 ft	Northing: 1,990,630.44 usft
	+E/-W	0.00 ft	Easting: 2,848,084.95 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	36° 28' 11.701 N
		Longitude:	107° 24' 29.592 W
		Ground Level:	6,612.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2012/07/10	9.58	63.27	50,520

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

Survey Program	Date 2012/08/24				
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
577.00	3,193.00	Survey #1 (OH)	MWD SDI	MWD - Standard ver 1.0.1	
3,355.00	7,443.00	Survey #2 (OH)	MWD SDI	MWD - Standard ver 1.0.1	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate	
(ft)			(ft)			(ft)	(°/100ft)	(°/100ft)	(°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
577.00	3.77	351.42	576.58	18.76	-2.83	18.76	0.65	0.65	0.00	
First SDI MWD Survey										
663.00	2.74	9.57	662.45	23.59	-2.91	23.59	1.68	-1.20	21.10	
760.00	2.85	49.95	759.34	27.42	-0.68	27.42	1.99	0.11	41.63	
853.00	3.39	50.47	852.20	30.66	3.21	30.66	0.58	0.58	0.56	
946.00	3.23	53.41	945.05	33.97	7.44	33.97	0.25	-0.17	3.16	
1,040.00	3.37	52.23	1,038.89	37.25	11.75	37.25	0.17	0.15	-1.26	
1,135.00	3.85	54.05	1,133.70	40.83	16.53	40.83	0.52	0.51	1.92	
1,229.00	4.27	56.58	1,227.47	44.61	22.01	44.61	0.49	0.45	2.69	

Scientific Drilling Survey Report



Company:	EnerVest Operating LLC	Local Co-ordinate Reference:	Well Jicarilla A #4M
Project:	Rio Arriba County, NM	TVD Reference:	GL 6612' & KB 13' @ 6625.00ft (D&J 2)
Site:	Jicarilla	MD Reference:	GL 6612' & KB 13' @ 6625 00ft (D&J 2)
Well:	Jicarilla A #4M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

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)
1,323.00	2.69	78.85	1,321.29	46.96	27.10	46.96	2.18	-1.68	23.69
1,418.00	2.37	161.39	1,416.23	45.53	29.91	45.53	3.52	-0.34	86.88
1,544.00	1.38	209.98	1,542.17	41.75	29.98	41.75	1.42	-0.79	38.56
1,638.00	1.34	199.62	1,636.14	39.73	29.05	39.73	0.26	-0.04	-11.02
1,733.00	0.74	241.48	1,731.12	38.39	28.14	38.39	0.98	-0.63	44.06
1,825.00	0.57	260.75	1,823.12	38.04	27.16	38.04	0.30	-0.18	20.95
1,981.00	0.45	280.20	1,979.11	38.02	25.79	38.02	0.13	-0.08	12.47
2,138.00	0.86	300.22	2,136.10	38.72	24.17	38.72	0.30	0.26	12.75
2,482.00	0.71	353.46	2,480.07	42.14	21.70	42.14	0.21	-0.04	15.48
2,759.00	0.74	337.87	2,757.05	45.50	20.83	45.50	0.07	0.01	-5.63
3,106.00	0.47	334.96	3,104.03	48.87	19.38	48.87	0.08	-0.08	-0.84
3,193.00	0.27	289.04	3,191.03	49.26	19.04	49.26	0.39	-0.23	-52.78
Last Survey in 8 3/4" Hole									
3,355.00	0.19	334.40	3,353.03	49.62	18.56	49.62	0.12	-0.05	28.00
First Survey in 6 1/4" Hole									
3,450.00	0.23	225.11	3,448.03	49.63	18.36	49.63	0.36	0.04	-115.04
3,604.00	0.50	218.58	3,602.03	48.89	17.72	48.89	0.18	0.18	-4.24
3,761.00	0.66	235.83	3,759.02	47.84	16.54	47.84	0.15	0.10	10.99
4,065.00	1.04	206.81	4,062.99	44.40	13.85	44.40	0.19	0.13	-9.55
4,193.00	1.28	211.83	4,190.96	42.15	12.57	42.15	0.20	0.19	3.92
4,282.00	1.18	206.48	4,279.94	40.48	11.64	40.48	0.17	-0.11	-6.01
4,373.00	1.01	231.33	4,370.92	39.14	10.59	39.14	0.55	-0.19	27.31
4,469.00	1.18	67.57	4,466.92	38.99	10.85	38.99	2.26	0.18	-170.58
4,560.00	1.53	66.14	4,557.89	39.84	12.83	39.84	0.39	0.38	-1.57
4,716.00	1.05	55.88	4,713.85	41.48	15.91	41.48	0.34	-0.31	-6.58
4,872.00	0.30	290.84	4,869.84	42.43	16.71	42.43	0.80	-0.48	-80.15
5,025.00	0.11	152.45	5,022.84	42.44	16.41	42.44	0.25	-0.12	-90.45
5,176.00	0.70	150.35	5,173.84	41.51	16.93	41.51	0.39	0.39	-1.39
5,331.00	0.31	165.92	5,328.83	40.28	17.50	40.28	0.26	-0.25	10.05
5,486.00	0.35	150.76	5,483.83	39.46	17.84	39.46	0.06	0.03	-9.78
5,641.00	0.88	198.48	5,638.82	37.92	17.69	37.92	0.45	0.34	30.79
5,795.00	1.19	199.77	5,792.80	35.29	16.77	35.29	0.20	0.20	0.84
5,890.00	1.18	203.47	5,887.77	33.47	16.05	33.47	0.08	-0.01	3.89
5,982.00	1.07	206.43	5,979.76	31.83	15.29	31.83	0.14	-0.12	3.22
6,073.00	1.00	197.34	6,070.74	30.31	14.68	30.31	0.20	-0.08	-9.99
6,167.00	1.04	198.33	6,164.73	28.72	14.16	28.72	0.05	0.04	1.05
6,292.00	0.47	152.29	6,289.72	27.19	14.04	27.19	0.63	-0.46	-36.83
6,387.00	0.57	140.40	6,384.71	26.48	14.53	26.48	0.15	0.11	-12.52
6,542.00	0.43	201.84	6,539.71	25.35	14.80	25.35	0.34	-0.09	39.64
6,698.00	0.50	203.34	6,695.70	24.18	14.31	24.18	0.05	0.04	0.96
6,853.00	0.57	332.85	6,850.70	24.24	13.69	24.24	0.62	0.05	83.55
7,008.00	1.96	336.01	7,005.66	27.35	12.27	27.35	0.90	0.90	2.04
7,102.00	0.70	307.50	7,099.63	29.17	11.16	29.17	1.47	-1.34	-30.33

Scientific Drilling

Survey Report



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Well:	Jicarilla A #4M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
7,193.00	0.51	241.32	7,190.63	29.31	10.36	29.31	0.75	-0.21	-72.73
7,286.00	1.51	175.31	7,283.61	27.89	10.10	27.89	1.49	1.08	-70.98
7,380.00	1.78	183.77	7,377.58	25.20	10.10	25.20	0.39	0.29	9.00
7,443.00	2.40	203.99	7,440.53	23.02	9.50	23.02	1.51	0.98	32.10

Last SDI MWD Survey

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
577.00	576.58	18.76	-2.83	First SDI MWD Survey
3,193.00	3,191.03	49.26	19.04	Last Survey in 8 3/4" Hole
3,355.00	3,353.03	49.62	18.56	First Survey in 6 1/4" Hole
7,443.00	7,440.53	23.02	9.50	Last SDI MWD Survey

Checked By: _____ Approved By: _____ Date: _____