

Results of Directional Survey

API number:	30-025-40254		
OGRID:		Operator:	CIMAREX ENERGY CO. OF COLORADO
		Property:	HALLERTAU 5 FEDERAL # 4H

surface	ULSTR:	M	05	T 26S	R 32E
				350 FSL	660 FWL

BH Loc	ULSTR:	D	05	T 26S	R 32E
13840	MD	9232.9	TVD	285 FNL	872 FWL
				4995 FSL	

Top Perf/OH	ULSTR:	M	05	T 26S	R 32E
9305	MD	9194.9	TVD	467 FSL	810 FWL

Bot Perf/OH	ULSTR:	D	05	T 26S	R 32E
13545	MD	9232.6	TVD	580 FNL	875 FWL
				4700 FSL	

	MD	N/S	E/W	VD
	9286	99.20	150.10	9189.4
TOP PERFS/OH	9305	117.40	150.04	9194.85
	9317	128.90	150.00	9198.30
	13471	4275.70	214.80	9232.50
BOT PERFS/OH	13545	4349.70	214.72	9232.58
	13567	4371.70	214.70	9232.60

NEXT TO LAST	13789	4593.70	212.80	9232.90
LAST READING	13840	4644.70	212.40	9232.90
TD	13840	4644.70	212.40	9232.90

Surface Location	350	FS	660	FW
Projected BHL	4995	FS	872	FW
Location of				
Top Perfs/OH	467	FS	810	FW
Bottom Perfs/OH	4700	FS	875	FW

SUMMARY of Subsurface Locations

Surface Location	M-05-26S-32E	350	FS	660	FW	Vert. Depth
Top Perfs/OH	M-05-26S-32E	467	FS	810	FW	9194.85
Bottom Perfs/OH	D-05-26S-32E	4700	FS	875	FW	9232.58
Projected TD	D-05-26S-32E	4995	FS	872	FW	9232.90



HOBBS OCD

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RECEIVED

Cimarex Energy

Lea County, NM (NAD83 NME)

Hallertau "5" Federal #4H

Hallertau "5" Federal #4H (350' FSL & 660' FWL)

OH - Job #32D11111069

SUR: M-05-26s-32e, 350/S & 660/W
BHL: D-05-26s-32e, 4995/S & 872/W
API # 30-025-40254

Survey: MWD Survey

SDI Standard Survey Report

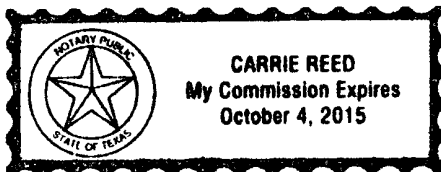
This survey is correct to the best of my knowledge and is supported by actual field data.

K. Hart

Notarized this date 31st of December, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	Cimarex Energy	Local Co-ordinate Reference:	Site Hallertau "5" Federal #4H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	RF @ 3288 0usft (Key #880)
Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660' FWL)	North Reference:	Grid
Wellbore:	OH - Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

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

Site	Hallertau "5" Federal #4H		
Site Position:		Northing:	388,267 27 usft
From:	Map	Easting:	736,383 19 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 3' 57 105 N
		Longitude:	103° 42' 13 264 W
		Grid Convergence:	0 33 °

Well	Hallertau "5" Federal #4H (350' FSL & 660' FWL)		
Well Position	+N/-S	0 0 usft	Northing:
	+E/-W	0 0 usft	Easting:
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 57 105 N
		Longitude:	103° 42' 13 264 W
		Ground Level:	3,271 0 usft

Wellbore	OH - Job #32D11111069		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	11/28/2011	7 58
			Dip Angle
			(°)
			60 01
			Field Strength
			(nT)
			48,462

Design	Actual		
Audit Notes:			
Version:	1 0	Phase:	ACTUAL
		Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0 0	0 0	0 0
			Direction
			(°)
			356 01

Survey Program	Date 1/30/2012		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
106 2	8,894 4	Gyro Survey (OH - Job #32D11111069)	Keeper
8,937 0	13,840 0	MWD Survey (OH - Job #32D11111069)	MWD
			Description
			Standard Wireline Keeper ver 1 0 2
			MWD - Standard

Survey							
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0
106 2	0 35	104 82	106 2	-0 1	0 3	104 82	0 3
168 1	0 38	104 72	168 1	-0 2	0 7	104 79	0 7
230 0	0 38	104 82	230 0	-0 3	1 1	104 78	1 1
291 9	0 39	126 58	291 9	-0 5	1 5	107 72	1 5
353 9	0 40	109 25	353 9	-0 7	1 8	109 89	1 9
415 8	0 49	110 72	415 8	-0 8	2 3	109 92	2 4
477 7	0 62	103 33	477 7	-1 0	2 9	109 27	3 0
539 6	0 98	114 27	539 6	-1 3	3 7	109 44	3 9
601 5	1 76	124 13	601 5	-2 0	4 9	112 50	5 3
663 5	2 34	128 04	663 4	-3 4	6 7	116 55	7 5



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Well:	Hallertau "5" Federal #4H (350' FSL & 660'	North Reference:	Grid
Wellbore:	EWL/Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
725 4	2 67	126 02	725 3	-5 0	8 9	119 30	10 2
787 3	3 14	122 27	787 1	-6 7	11 5	120 41	13 3
849 2	3 56	119 26	848 9	-8 6	14 6	120 46	16 9
911 1	3 89	118 33	910 6	-10 5	18 1	120 14	20 9
973 1	4 01	116 77	972 5	-12 5	21 9	119 70	25 2
1,035 0	4 10	114 37	1,034 2	-14 4	25 9	119 09	29 6
1,096 9	4 51	107 93	1,096 0	-16 0	30 2	117 99	34 2
1,158 8	5 11	105 78	1,157 7	-17 5	35 2	116 52	39 3
1,220 8	6 45	106 61	1,219 3	-19 3	41 1	115 12	45 4
1,282 7	6 84	106 29	1,280 8	-21 3	48 0	113 94	52 5
1,344 6	6 36	103 32	1,342 3	-23 1	54 9	112 86	59 6
1,406 5	5 32	102 16	1,403 9	-24 5	61 0	111 90	65 8
1,468 4	4 58	100 53	1,465 6	-25 6	66 3	111 12	71 0
1,538 7	3 74	98 77	1,535 7	-26 5	71 3	110 36	76 0
1,601 5	3 11	97 53	1,598 4	-27 0	75 0	109 79	79 7
1,664 3	2 88	93 81	1,661 1	-27 3	78 3	109 24	82 9
1,727 2	2 82	90 31	1,723 9	-27 4	81 4	108 62	85 9
1,790 0	2 47	83 13	1,786 6	-27 3	84 3	107 93	88 6
1,852 8	2 13	70 84	1,849 4	-26 7	86 7	107 13	90 8
1,915 7	2 09	54 48	1,912 2	-25 7	88 8	106 14	92 4
1,978 5	2 01	48 69	1,975 0	-24 3	90 5	105 02	93 7
2,041 3	1 71	48 38	2,037 8	-22 9	92 1	103 99	94 9
2,167 0	1 59	48 38	2,163 4	-20 5	94 8	102 23	97 0
2,229 8	1 71	49 27	2,226 2	-19 3	96 1	101 38	98 0
2,292 6	1 71	54 37	2,289 0	-18 2	97 6	100 56	99 3
2,355 5	1 66	58 88	2,351 8	-17 2	99 1	99 83	100 6
2,418 3	1 80	62 29	2,414 6	-16 2	100 8	99 16	102 1
2,481 1	1 75	59 54	2,477 4	-15 3	102 5	98 49	103 6
2,546 4	1 52	41 69	2,542 6	-14 1	103 9	97 75	104 9
2,609 7	1 50	30 83	2,605 9	-12 8	104 9	96 96	105 7
2,673 0	1 00	29 98	2,669 2	-11 6	105 6	96 28	106 2
2,736 3	0 48	36 62	2,732 5	-10 9	106 0	95 88	106 6
2,799 6	0 20	112 79	2,795 8	-10 8	106 3	95 78	106 8
2,862 9	0 52	184 27	2,859 1	-11 1	106 4	95 95	107 0
2,926 2	0 89	196 43	2,922 4	-11 8	106 2	96 36	106 9
2,989 5	1 20	200 72	2,985 7	-12 9	105 8	96 97	106 6
3,052 8	1 37	202 47	3,049 0	-14 3	105 3	97 71	106 3
3,116 1	1 39	195 29	3,112 3	-15 7	104 8	98 51	106 0
3,179 4	1 37	183 05	3,175 5	-17 2	104 6	99 33	106 0
3,242 7	0 96	124 38	3,238 8	-18 2	105 0	99 86	106 6
3,306 0	1 42	95 09	3,302 1	-18 6	106 2	99 94	107 8
3,359 4	1 65	81 22	3,355 5	-18 6	107 6	99 78	109 2
3,423 2	1 73	66 71	3,419 3	-18 0	109 4	99 36	110 9
3,486 9	1 67	52 58	3,482 9	-17 1	111 0	98 75	112 3



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Project:	Lea County, NM (NAD83 NME)	TVD Reference:	RF @ 3288 0usft (Key #880)
Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660'	North Reference:	Grid
Wellbore:	FWL Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
3,550.7	1.59	38.96	3,546.7	-15.8	112.3	98.03	113.4
3,614.4	1.68	37.70	3,610.4	-14.4	113.5	97.24	114.4
3,678.2	1.96	56.96	3,674.2	-13.1	114.9	96.49	115.7
3,741.9	2.49	78.22	3,737.8	-12.2	117.2	95.94	117.8
3,805.7	2.85	88.53	3,801.5	-11.9	120.2	95.65	120.7
3,869.4	3.06	91.89	3,865.2	-11.9	123.4	95.50	124.0
3,933.2	3.48	98.32	3,928.8	-12.2	127.1	95.50	127.6
3,996.9	4.15	103.52	3,992.4	-13.0	131.2	95.68	131.9
4,060.7	4.69	110.80	4,056.0	-14.5	135.9	96.10	136.7
4,124.4	5.15	113.54	4,119.5	-16.6	140.9	96.71	141.9
4,188.2	4.83	118.01	4,183.0	-19.0	145.9	97.41	147.2
4,251.9	4.64	121.90	4,246.5	-21.6	150.5	98.17	152.0
4,315.7	4.43	121.01	4,310.1	-24.2	154.8	98.90	156.7
4,379.4	4.63	123.18	4,373.6	-26.9	159.1	99.60	161.3
4,443.2	4.26	126.97	4,437.2	-29.7	163.1	100.34	165.8
4,506.9	4.21	127.90	4,500.8	-32.6	166.8	101.06	170.0
4,634.4	3.10	129.02	4,628.0	-37.7	173.2	102.26	177.3
4,698.2	2.96	128.94	4,691.7	-39.8	175.8	102.75	180.3
4,761.9	3.03	126.02	4,755.3	-41.8	178.5	103.18	183.3
4,825.7	3.19	126.65	4,819.0	-43.8	181.3	103.60	186.5
4,889.4	2.26	141.02	4,882.7	-45.9	183.5	104.04	189.1
4,953.2	1.60	165.59	4,946.4	-47.7	184.5	104.50	190.6
5,016.9	1.70	165.98	5,010.1	-49.5	184.9	104.98	191.5
5,080.7	1.63	161.08	5,073.9	-51.3	185.5	105.46	192.4
5,144.4	1.60	160.09	5,137.5	-53.0	186.1	105.89	193.5
5,208.2	1.42	159.17	5,201.3	-54.5	186.6	106.29	194.5
5,271.9	1.18	156.12	5,265.0	-55.9	187.2	106.62	195.4
5,335.7	1.09	155.00	5,328.8	-57.0	187.7	106.90	196.2
5,399.4	1.15	155.46	5,392.5	-58.2	188.2	107.17	197.0
5,463.2	1.30	151.20	5,456.3	-59.4	188.8	107.46	198.0
5,526.9	1.25	157.26	5,519.9	-60.7	189.5	107.75	198.9
5,590.7	1.10	158.46	5,583.7	-61.9	190.0	108.04	199.8
5,654.4	0.98	157.26	5,647.4	-62.9	190.4	108.29	200.5
5,718.2	1.08	155.25	5,711.2	-64.0	190.9	108.53	201.3
5,788.4	1.17	156.28	5,781.4	-65.2	191.4	108.82	202.2
5,851.7	1.31	156.36	5,844.7	-66.5	192.0	109.11	203.2
5,978.3	1.17	157.97	5,971.3	-69.0	193.0	109.68	205.0
6,041.6	0.96	154.10	6,034.5	-70.1	193.5	109.91	205.8
6,104.9	1.09	154.81	6,097.8	-71.1	194.0	110.13	206.6
6,168.2	1.11	153.90	6,161.1	-72.2	194.5	110.37	207.5
6,231.4	1.06	155.93	6,224.3	-73.3	195.0	110.60	208.4
6,294.7	0.96	155.94	6,287.6	-74.3	195.5	110.82	209.1
6,358.0	1.02	163.93	6,350.9	-75.3	195.9	111.04	209.9
6,421.3	1.00	165.32	6,414.2	-76.4	196.2	111.29	210.5
6,484.6	0.96	173.03	6,477.5	-77.5	196.4	111.53	211.1



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Project:	Lea County, NM (NAD83 NME)	TVD Reference:	RF @ 3288 0usft (Key #880)
Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660'	North Reference:	Grid
Wellbore:	FWL Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
6,547.9	0.81	176.22	6,540.8	-78.5	196.5	111.77	211.5
6,611.2	0.71	176.58	6,604.1	-79.3	196.5	111.97	211.9
6,674.5	0.64	170.55	6,667.4	-80.0	196.6	112.15	212.3
6,737.8	0.60	182.51	6,730.7	-80.7	196.6	112.32	212.6
6,801.1	0.75	206.43	6,793.9	-81.4	196.4	112.51	212.6
6,864.4	1.03	217.18	6,857.2	-82.2	195.9	112.77	212.5
6,927.6	1.20	222.49	6,920.4	-83.2	195.1	113.09	212.1
6,990.9	1.25	232.45	6,983.7	-84.1	194.1	113.42	211.6
7,054.2	1.39	236.83	7,047.0	-84.9	192.9	113.76	210.8
7,117.5	1.43	234.74	7,110.3	-85.8	191.6	114.12	210.0
7,180.8	1.41	234.83	7,173.6	-86.7	190.4	114.49	209.2
7,244.1	1.30	237.47	7,236.8	-87.5	189.1	114.84	208.4
7,307.4	1.03	237.10	7,300.1	-88.2	188.0	115.14	207.7
7,370.7	0.97	230.96	7,363.4	-88.9	187.1	115.41	207.2
7,434.0	0.61	229.48	7,426.7	-89.4	186.5	115.63	206.8
7,497.3	0.69	230.41	7,490.0	-89.9	185.9	115.81	206.5
7,560.5	0.69	230.81	7,553.2	-90.4	185.3	116.00	206.2
7,623.8	0.73	230.37	7,616.5	-90.9	184.7	116.20	205.9
7,687.1	0.59	221.87	7,679.8	-91.4	184.2	116.39	205.6
7,750.4	0.63	213.03	7,743.1	-91.9	183.8	116.57	205.5
7,813.7	0.68	203.15	7,806.4	-92.6	183.5	116.77	205.5
7,882.6	0.95	200.74	7,875.3	-93.5	183.1	117.04	205.6
7,945.8	1.13	197.47	7,938.5	-94.6	182.7	117.36	205.7
8,009.1	1.14	196.11	8,001.8	-95.8	182.4	117.70	206.0
8,072.3	1.14	194.20	8,064.9	-97.0	182.0	118.04	206.2
8,135.5	1.21	195.36	8,128.1	-98.2	181.7	118.39	206.5
8,198.8	1.08	197.12	8,191.4	-99.4	181.3	118.74	206.8
8,262.0	1.07	209.50	8,254.6	-100.5	180.9	119.06	206.9
8,325.3	0.92	207.31	8,317.9	-101.5	180.4	119.37	206.9
8,388.5	1.12	220.07	8,381.1	-102.4	179.7	119.67	206.9
8,451.7	1.28	243.07	8,444.3	-103.2	178.7	120.01	206.4
8,515.0	1.12	247.00	8,507.6	-103.8	177.5	120.31	205.6
8,578.2	1.15	252.23	8,570.7	-104.2	176.3	120.58	204.8
8,641.5	1.29	263.49	8,634.0	-104.5	175.0	120.83	203.8
8,704.7	0.91	240.54	8,697.2	-104.8	173.9	121.08	203.0
8,767.9	0.78	223.18	8,760.4	-105.4	173.1	121.32	202.7
8,831.2	0.99	238.18	8,823.7	-106.0	172.4	121.58	202.3
8,894.4	0.89	246.27	8,886.9	-106.4	171.5	121.83	201.8
8,957.7	0.44	277.23	8,950.2	-106.6	170.8	121.98	201.3
9,020.9	0.44	289.45	9,013.4	-106.5	170.3	122.02	200.9
9,084.1	0.95	280.71	9,076.6	-106.3	169.6	122.09	200.1
9,147.4	0.80	269.65	9,139.9	-106.2	168.6	122.21	199.3
9,210.6	0.72	249.59	9,203.1	-106.4	167.8	122.37	198.7
9,273.9	0.71	234.79	9,266.4	-106.7	167.1	122.57	198.3



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Design:	Actual	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
9,337.1	0.78	215.30	9,329.6	-107.3	166.5	122.80	198.1	
9,400.3	0.80	214.36	9,392.8	-108.0	166.0	123.05	198.1	
9,463.6	0.91	210.03	9,456.1	-108.8	165.5	123.32	198.1	
9,526.8	1.27	209.93	9,519.2	-109.9	164.9	123.67	198.2	
9,590.1	1.78	196.42	9,582.5	-111.4	164.3	124.14	198.5	



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Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660' FWL)	North Reference:	Grid
Wellbore:	OH - Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

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

Site	Hallertau "5" Federal #4H		
Site Position:	Map	Northings:	388,267 27 usft
From:		Easting:	736,383 19 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 3' 57 105 N
		Longitude:	103° 42' 13 264 W
		Grid Convergence:	0 33 °

Well	Hallertau "5" Federal #4H (350' FSL & 660' FWL)		
Well Position	+N/-S	0 0 usft	Northings:
	+E/-W	0 0 usft	Easting:
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 57 105 N
		Longitude:	103° 42' 13 264 W
		Ground Level:	3,271 0 usft

Wellbore	OH - Job #32D11111069				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/28/2011	7 58	60 01	48,462

Design	Actual			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth:
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0 0	0 0	0 0	356 01

Survey Program	Date 1/30/2012				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
106 2	8,894 4	Gyro Survey (OH - Job #32D11111069)	Keeper	Standard Wireline Keeper ver 1 0 2	
8,937 0	13,840 0	MWD Survey (OH - Job #32D11111069)	MWD	MWD - Standard	

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
8,894 4	0 89	246 27	8,886 9	-106 4	171 5	121 83	201 8
Gyro Tie-in							
8,937 0	4 52	0 95	8,929 5	-104 9	171 2	121 50	200 8
8,968 0	12 27	359 19	8,960 1	-100 4	171 2	120 39	198 4
9,000 0	19 08	355 97	8,990 9	-91 7	170 7	118 25	193 8
9,031 0	23 73	355 12	9,019 7	-80 5	169 9	115 35	188 0
9,063 0	30 27	354 90	9,048 2	-66 0	168 6	111 38	181 1
9,095 0	34 04	356 59	9,075 3	-49 0	167 3	106 33	174 4
9,126 0	40 80	352 90	9,099 9	-30 3	165 6	100 37	168 3
9,158 0	46 46	352 92	9,123 1	-8 4	162 8	92 95	163 1
9,190 0	52 36	352 43	9,143 9	15 7	159 7	84 39	160 5



Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	Cimarex Energy	Local Co-ordinate Reference:	Site Hallertau "5" Federal #4H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	RF @ 3288 0usft (Key #880)
Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660'	North Reference:	Grid
Wellbore:	BNL Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
9,222 0	58 55	351 76	9,162 0	41 8	156 1	75 01	161 6
9,254 0	64 76	352 95	9,177 2	69 7	152 4	65 42	167 6
9,286 0	70 38	358 20	9,189 4	99 2	150 1	56 56	179 9
9,317 0	76 55	1 27	9,198 3	128 9	150 0	49 34	197 8
9,348 0	77 25	1 65	9,205 3	159 0	150 8	43 47	219 2
9,380 0	77 90	359 93	9,212 2	190 3	151 2	38 47	243 0
9,399 0	78 48	359 40	9,216 1	208 9	151 1	35 88	257 8
9,413 0	78 70	0 14	9,218 8	222 6	151 0	34 16	269 0
9,444 0	81 71	359 12	9,224 1	253 2	150 8	30 79	294 7
9,476 0	90 67	356 80	9,226 2	285 0	149 7	27 71	321 9
9,507 0	92 86	353 08	9,225 3	315 9	147 0	24 95	348 4
9,539 0	92 39	352 73	9,223 8	347 6	143 0	22 36	375 9
9,603 0	91 68	353 45	9,221 5	411 1	135 3	18 22	432 8
9,666 0	92 08	355 80	9,219 5	473 8	129 4	15 28	491 1
9,730 0	90 77	357 89	9,217 9	537 7	125 9	13 18	552 2
9,793 0	90 20	357 67	9,217 3	600 6	123 5	11 62	613 2
9,857 0	89 19	359 85	9,217 7	664 6	122 1	10 41	675 7
9,920 0	89 56	0 37	9,218 4	727 6	122 2	9 53	737 8
9,984 0	89 36	1 44	9,219 0	791 6	123 2	8 85	801 1
10,047 0	89 56	1 66	9,219 6	854 6	124 9	8 32	863 6
10,142 0	90 10	1 89	9,219 8	949 5	127 9	7 67	958 1
10,237 0	89 97	1 08	9,219 8	1,044 5	130 3	7 11	1,052 6
10,332 0	88 89	0 52	9,220 7	1,139 5	131 7	6 59	1,147 0
10,427 0	87 08	359 31	9,224 1	1,234 4	131 5	6 08	1,241 4
10,522 0	87 51	0 19	9,228 6	1,329 3	131 1	5 63	1,335 7
10,617 0	87 75	1 01	9,232 5	1,424 2	132 1	5 30	1,430 3
10,713 0	88 38	1 19	9,235 7	1,520 1	133 9	5 04	1,526 0
10,808 0	89 16	0 69	9,237 8	1,615 1	135 5	4 80	1,620 8
10,903 0	89 97	1 82	9,238 5	1,710 1	137 6	4 60	1,715 6
10,998 0	90 40	1 00	9,238 2	1,805 0	139 9	4 43	1,810 4
11,093 0	90 57	1 76	9,237 4	1,900 0	142 2	4 28	1,905 3
11,188 0	90 27	1 56	9,236 7	1,995 0	144 9	4 16	2,000 2
11,283 0	91 45	1 27	9,235 3	2,089 9	147 3	4 03	2,095 1
11,378 0	91 98	1 57	9,232 4	2,184 8	149 6	3 92	2,190 0
11,474 0	92 96	2 31	9,228 3	2,280 7	152 9	3 84	2,285 8
11,569 0	93 13	1 73	9,223 2	2,375 5	156 2	3 76	2,380 6
11,664 0	91 88	1 51	9,219 1	2,470 4	158 9	3 68	2,475 5
11,759 0	92 66	2 64	9,215 3	2,565 2	162 4	3 62	2,570 4
11,854 0	91 04	3 70	9,212 2	2,660 0	167 6	3 61	2,665 3
11,949 0	91 28	3 41	9,210 3	2,754 8	173 5	3 60	2,760 3
12,044 0	90 67	3 31	9,208 7	2,849 7	179 1	3 60	2,855 3
12,139 0	88 79	2 75	9,209 2	2,944 5	184 1	3 58	2,950 3
12,234 0	88 72	2 63	9,211 2	3,039 4	188 5	3 55	3,045 2
12,328 0	89 50	2 79	9,212 7	3,133 3	193 0	3 52	3,139 2
12,424 0	90 00	2 37	9,213 1	3,229 2	197 3	3 50	3,235 2



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	Cimarex Energy	Local Co-ordinate Reference:	Site Hallertau "5" Federal #4H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	RF @ 3288 0usft (Key #880)
Site:	Hallertau "5" Federal #4H	MD Reference:	RF @ 3288 0usft (Key #880)
Well:	Hallertau "5" Federal #4H (350' FSL & 660'	North Reference:	Grid
Wellbore:	OWL Job #32D11111069	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
12,519 0	89 09	1 99	9,213 9	3,324 1	200 9	3 46	3,330 2
12,615 0	88 35	1 21	9,216 0	3,420 0	203 6	3 41	3,426 1
12,709 0	88 59	1 22	9,218 5	3,514 0	205 6	3 35	3,520 0
12,805 0	88 86	2 05	9,220 6	3,609 9	208 3	3 30	3,615 9
12,900 0	88 29	0 11	9,223 0	3,704 9	210 1	3 25	3,710 8
12,996 0	88 49	0 58	9,225 7	3,800 8	210 7	3 17	3,806 7
13,091 0	88 82	0 25	9,227 9	3,895 8	211 4	3 11	3,901 5
13,186 0	88 79	0 75	9,229 9	3,990 8	212 2	3 04	3,996 4
13,281 0	89 36	0 49	9,231 4	4,085 8	213 2	2 99	4,091 3
13,376 0	89 63	0 75	9,232 3	4,180 7	214 3	2 93	4,186 2
13,471 0	90 10	359 92	9,232 5	4,275 7	214 8	2 88	4,281 1
13,567 0	89 80	359 97	9,232 6	4,371 7	214 7	2 81	4,377 0
13,661 0	89 80	359 36	9,232 9	4,465 7	214 2	2 75	4,470 9
13,756 0	90 13	359 38	9,233 0	4,560 7	213 1	2 68	4,565 7
13,789 0	90 07	359 55	9,232 9	4,593 7	212 8	2 65	4,598 7
Last MWD Survey							
13,840 0	90 07	359 55	9,232 9	4,644 7	212 4	2 62	4,649 6
Projection to Bit							

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,894 4	8,886 9	-106 4	171 5	Gyro Tie-in
13,789 0	9,232 9	4,593 7	212 8	Last MWD Survey
13,840 0	9,232 9	4,644 7	212 4	Projection to Bit



Scientific Drilling for Cimarex Energy
Site: Lea County, NM (NAD83 NME)
Well: Hallertau "5" Federal #4H (350' FSL & 660' FWL)
Wellbore: OH
Design: Plan #4 - 7-7/8" Hole



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	9444.00	81.71	359.12	9224.10	253.15	150.84	0.00	0.00	261.30	
2	9553.35	90.00	1.51	9232.00	362.11	151.45	7.89	16.16	370.12	
3	13856.53	90.00	1.51	9232.00	4663.79	265.03	0.00	0.00	4671.32	PBHL-Hallertau "5" Fed #4H (330' FNL & 970' FWL)

PROJECT DETAILS: Lea County, NM (NAD83 NME)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
North HL-Hallertau "5" Fed #4H	0.00	4661.33	-374.96	392928.60	736008.23	32° 4' 43.253 N 103° 42' 17.306 W		Rectangle (Sides: L0.00 W1000.00)
West HL-Hallertau "5" Fed #4H	0.00	4661.33	-374.96	392928.60	736008.23	32° 4' 43.253 N 103° 42' 17.306 W		Rectangle (Sides: L5000.00 W0.00)
PBHL-Hallertau "5" Fed #4H (330' FNL & 970' FWL)	9232.00	4663.79	265.03	392931.06	736648.22	32° 4' 43.241 N 103° 42' 9.868 W		Rectangle (Sides: L20.00 W100.00)

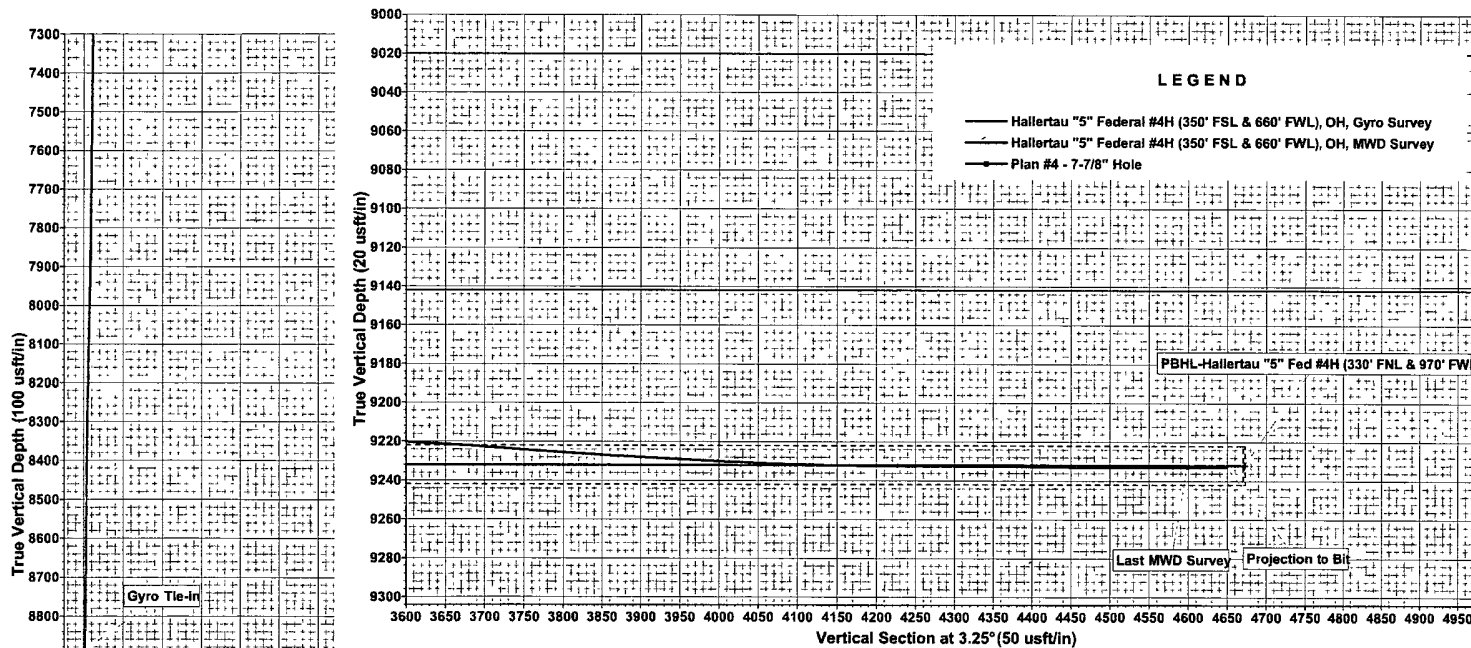


Azimuths to Grid North
True North: -0.33°
Magnetic North: 7.24°

Magnetic Field
Strength: 48461.8nT
Dip Angle: 60.01°
Date: 2011/11/28
Model: IGRF2010

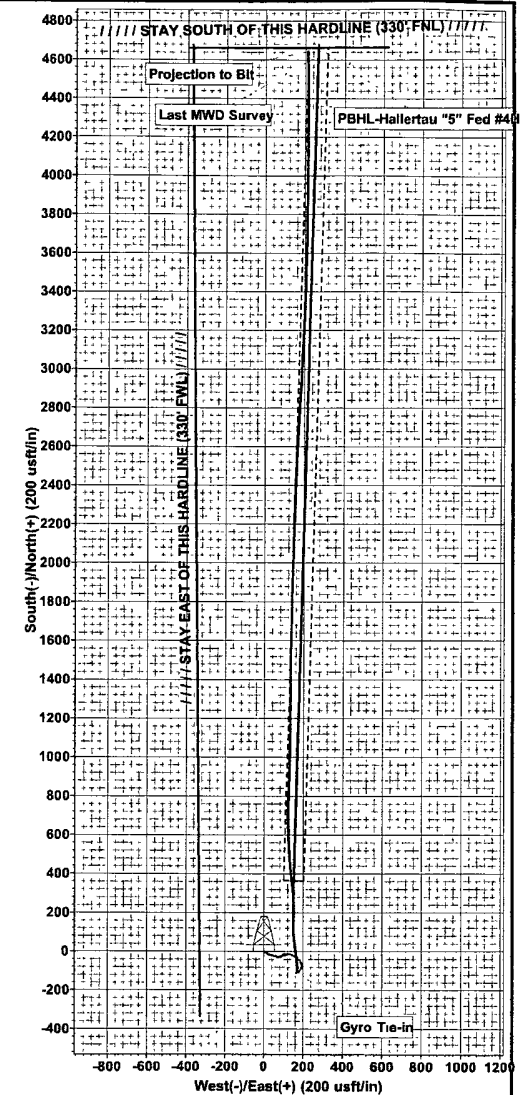
WELL DETAILS: Hallertau "5" Federal #4H (350' FSL & 660' FWL)

	+N/-S	+E/-W	Ground Level:	Northing	Easting	Latitude	Longitude	Slot
	0.00	0.00	3271.00	392927.77	736707.40	32° 2' 57.405 N	103° 43' 42.764 W	



LEGEND

- Hallertau "5" Federal #4H (350' FSL & 660' FWL), OH, Gyro Survey
- Hallertau "5" Federal #4H (350' FSL & 660' FWL), OH, MWD Survey
- Plan #4 - 7-7/8" Hole



1st Carbonate B

1st Carbonate C

PBHL-Hallertau "5" Fed #4H (330' FNL & 970' FWL)

Last MWD Survey

Projection to Bit

Vertical Section at 3.25° (100 usft/in)