

CIMAREX

REFERENCE INFORMATION

Co-ordinate (NKT) Reference:	Wellhead 13 Fnd 82H Grid North
Vertical (TVD) Reference:	WELL 6.3 Down (Original Well Elev)
Section (VS) Reference:	Stn - (0.0N, 0.0E)
Measured Depth Reference:	WELL 6.3 Down (Original Well Elev)
Calculation Method:	Minimum Curvature

WELL DETAILS: Inlet 13 Fed #2H

46-5		46-6W		Northing		Easting		Latitude		Longitude		Site
0.0	0.0	602234.00	669363.00	32° 39' 17.642 N	103° 55' 2.448 W							

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TYD	off-G	4EAW	Latitude	Longitude	Shadow
Irwin #24: PDM	8772.0	-19.6	-1023.1	32° 35' 17.332 N	-103° 55' 58.864 W	Point
Target #1	8752.0	-19.8	-1023.1	32° 35' 17.332 N	-103° 55' 58.864 W	Point
Irwin #2 Target:	8772.0	-19.6	-1023.1	32° 35' 17.332 N	-103° 55' 58.864 W	Point
PDM	15450.6	-19.8	-1023.1	32° 35' 17.332 N	-103° 55' 58.864 W	Point

SECTION DETAILS

MD	Inc	Azi	TYD	HWG	EWV	Ong	Tface	VISct
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
64480.0	0.00	0.00	0440.0	0.0	0.0	0.00	0.00	0.0
8090.7	90.16	269.70	8725.4	-1.2	-287.2	20.00	269.76	287.2
73326.6	90.16	269.77	8726.0	-19.0	-1823.1	0.00	178.11	1823.1

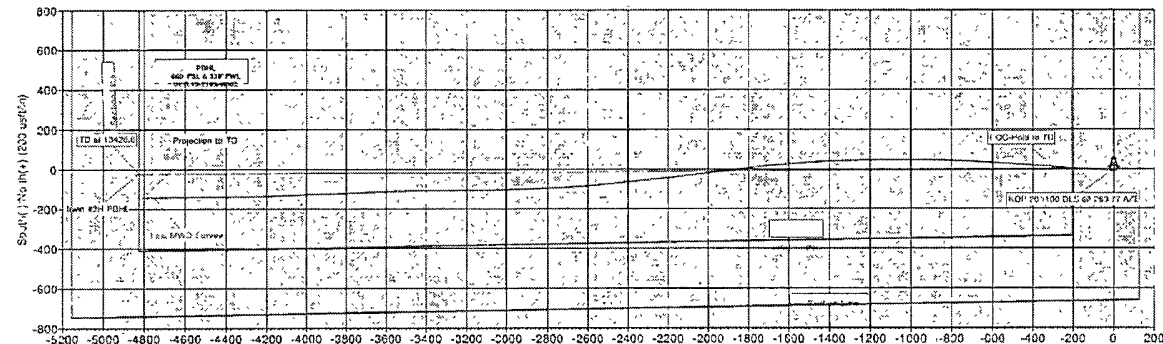
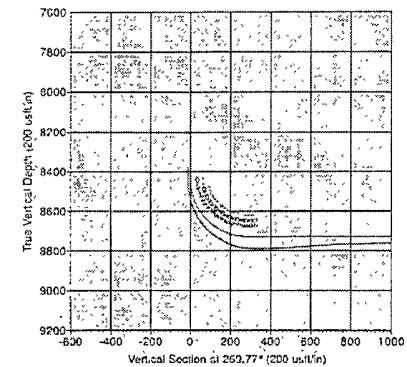
Company: Cimarex Energy Co. (Midland)
Project: Eddy County (NM83E)
Site: Sec 13-19S-R30E
Well: Irwin 13-Fed #2H
Wellbore: Wellbore #1
Design: Plan #2
Lat: 32° 39' 17.642 N
Long: 103° 55' 2.448 W
GL: 0.0
KB: WELL @ 0.0usft (Original Well Elev)
Job #: 02752-433-22

PROJECT DETAILS, Eddy County (NM332)

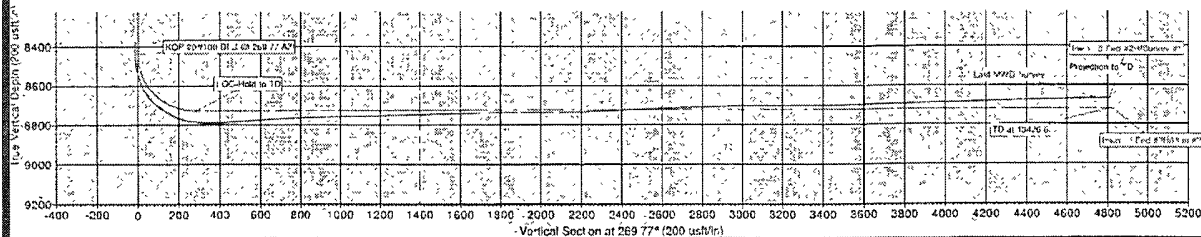
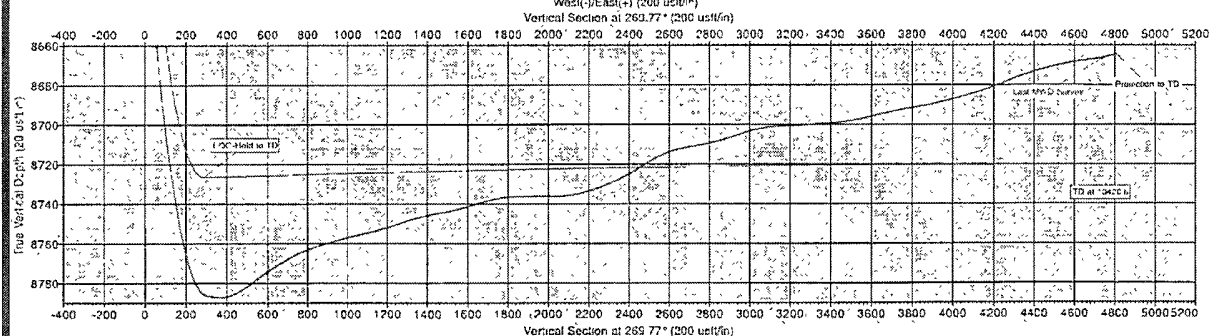
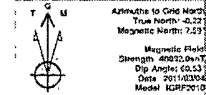
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
FIPS Code: GRS 1600
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

SITE DETAILS: Sac 17-193-200C

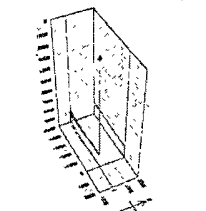
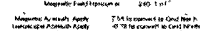
Site Centre Latitude 32° 30' 17.642 N
Longitude 103° 55' 2.468 W
Positional Uncertainty: 0.0
Convergence: 0.22
Local North, Grid -



FBI
 605 PUL & 127 PUL
 SEC. 15-7109-1109



Commonwealth Expenditures		U.S. Expenditures	
Age: American		1912-1940	1940-1945
Debt: 100% of GDP		Monthly National Income	Monthly National Income
Local: Chicago		and Local Taxes (Percent GDP)	
Local: London		2.50% 1932-40	
Local: Los Angeles		10.10% 1930-40	
Local: New York		10.10% 1930-40	
Local: San Francisco		10.10% 1930-40	
Local: Seattle		10.10% 1930-40	
Local: Washington		10.10% 1930-40	
Local: Wisconsin		10.10% 1930-40	
Local: Wyoming		10.10% 1930-40	
Local: Alaska		10.10% 1930-40	
Local: Hawaii		10.10% 1930-40	
Local: Puerto Rico		10.10% 1930-40	
Local: Virgin Islands		10.10% 1930-40	
Local: Guam		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: American Samoa		10.10% 1930-40	
Local: Johnston Atoll		10.10% 1930-40	
Local: Baker Island		10.10% 1930-40	
Local: Jarvis Island		10.10% 1930-40	
Local: Line Islands		10.10% 1930-40	
Local: Marshall Islands		10.10% 1930-40	
Local: Micronesia		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: Palau		10.10% 1930-40	
Local: Philippines		10.10% 1930-40	
Local: Samoa		10.10% 1930-40	
Local: Tonga		10.10% 1930-40	
Local: Tuvalu		10.10% 1930-40	
Local: Vanuatu		10.10% 1930-40	
Local: Wallis and Futuna		10.10% 1930-40	
Local: Western Samoa		10.10% 1930-40	
Local: American Samoa		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: Palau		10.10% 1930-40	
Local: Philippines		10.10% 1930-40	
Local: Samoa		10.10% 1930-40	
Local: Tonga		10.10% 1930-40	
Local: Tuvalu		10.10% 1930-40	
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Local: Wallis and Futuna		10.10% 1930-40	
Local: Western Samoa		10.10% 1930-40	
Local: American Samoa		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: Palau		10.10% 1930-40	
Local: Philippines		10.10% 1930-40	
Local: Samoa		10.10% 1930-40	
Local: Tonga		10.10% 1930-40	
Local: Tuvalu		10.10% 1930-40	
Local: Vanuatu		10.10% 1930-40	
Local: Wallis and Futuna		10.10% 1930-40	
Local: Western Samoa		10.10% 1930-40	
Local: American Samoa		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: Palau		10.10% 1930-40	
Local: Philippines		10.10% 1930-40	
Local: Samoa		10.10% 1930-40	
Local: Tonga		10.10% 1930-40	
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Local: American Samoa		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
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Local: Philippines		10.10% 1930-40	
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Local: Tonga		10.10% 1930-40	
Local: Tuvalu		10.10% 1930-40	
Local: Vanuatu		10.10% 1930-40	
Local: Wallis and Futuna		10.10% 1930-40	
Local: Western Samoa		10.10% 1930-40	
Local: American Samoa		10.10% 1930-40	
Local: Northern Mariana		10.10% 1930-40	
Local: Palau		10.10% 1930-40	



Plan: Plan #2 (Grade 12 Fed #24(Wetbore #1))		
Created By:	Miranda Morgan	Date: 15-20, April 26, 2011

Cimarex Energy Co. (Midland)

Eddy County (NM83E)

Sec 13-19S-R30E

Irwin 13 Fed #2H

Wellbore #1

Survey: Survey #1

Standard Survey Report

26 April, 2011

Great White Directional Services

Survey Report

Company:	Cimarex Energy Co. (Midland)	Local Co-ordinate Reference:	Well Irwin 13 Fed #2H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 13-19S-R30E	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Irwin 13 Fed #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County (NM83E)
Map System:	US State Plane 1983
Geo Datum:	North American Datum 1983
Map Zone:	New Mexico Eastern Zone
System Datum:	Mean Sea Level

Site:	Sec 13-19S-R30E					
Site Position:	From:	Map	Northings:	602,234.60 usft	Latitude:	32° 39' 17.642 N
			Easting:	669,363.90 usft	Longitude:	103° 55' 2.448 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.22 °	

Well:	Irwin 13 Fed #2H					
Well Position	+N-S	0.0 usft	Northings:	602,234.60 usft	Latitude:	32° 39' 17.642 N
	+E-W	0.0 usft	Easting:	669,363.90 usft	Longitude:	103° 55' 2.448 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft	

Wellbore:	Wellbore #1				
Magnetics:	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	2011/03/04	(°)	(°)	(nT)
			7.81	60.53	48,892

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	269.77	

Survey Program	Date	2011/04/26
From	To	Survey (Wellbore)
(usft)	(usft)	
8,375.0	13,480.0	Survey #1 (Wellbore #1)
Tool Name	Description	
MWD	MWD - Standard	

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)
8,375.0	1.93	53.28	8,373.9	-7.6	-12.3	-12.3	0.00	0.00	0.00
8,398.0	1.90	52.60	8,396.9	-7.1	12.9	-12.9	0.16	-0.13	-2.96
8,461.0	2.20	269.40	8,459.9	-6.5	12.5	-12.5	6.18	0.48	-227.30
8,493.0	7.10	270.50	8,491.8	-6.5	9.9	-9.9	15.31	15.31	3.44
8,524.0	12.00	273.00	8,522.3	-6.3	4.8	-4.8	15.86	15.81	8.06
8,556.0	17.30	272.90	8,553.3	-5.9	-3.3	3.3	16.56	16.56	-0.31
8,587.0	22.20	273.70	8,582.4	-5.3	-13.7	13.8	15.83	15.81	2.58
8,618.0	27.30	273.70	8,610.6	-4.5	-26.7	26.7	16.45	16.45	0.00
8,650.0	32.80	271.70	8,638.3	-3.7	-42.7	42.7	17.47	17.19	-6.25
8,682.0	38.90	273.80	8,664.2	-2.8	-61.4	61.4	19.44	19.06	6.56

Great White Directional Services

Survey Report

Company: Cimarex Energy Co. (Midland)
 Project: Eddy County (NM83E)
 Site: Sec 13-19S-R30E
 Well: Irwin 13 Fed #2H
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Irwin 13 Fed #2H
 TVD Reference: WELL @ 0.0usft (Original Well Elev)
 MD Reference: WELL @ 0.0usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: CDM 5000.1 Single User Db

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)
8,714.0	45.30	275.40	8,687.9	-1.1	-82.8	82.8	20.28	20.00	5.00
8,745.0	51.70	274.80	8,708.5	1.0	-105.9	105.9	20.70	20.65	-1.94
8,774.0	56.50	273.50	8,725.5	2.7	-129.3	129.3	16.94	16.55	-4.48
8,806.0	57.20	272.60	8,743.0	4.1	-156.0	156.0	3.21	2.19	-2.81
8,838.0	64.80	272.10	8,758.5	5.3	-184.0	184.0	23.79	23.75	-1.56
8,870.0	70.40	274.30	8,770.6	6.9	-213.5	213.5	18.62	17.50	6.88
8,901.0	77.10	274.00	8,779.3	9.1	-243.2	243.1	21.63	21.61	-0.97
8,933.0	84.20	274.20	8,784.5	11.3	-274.7	274.6	22.20	22.19	0.63
8,964.0	89.00	274.20	8,786.3	13.6	-305.5	305.4	15.48	15.48	0.00
8,996.0	89.30	274.30	8,786.8	16.0	-337.4	337.3	0.99	0.94	0.31
9,027.0	89.40	273.70	8,787.2	18.1	-368.3	368.3	1.96	0.32	-1.94
9,058.0	91.70	274.20	8,786.9	20.3	-399.3	399.2	7.59	7.42	1.61
9,090.0	92.80	273.80	8,785.6	22.5	-431.2	431.1	3.66	3.44	-1.25
9,122.0	93.60	274.20	8,783.8	24.7	-463.0	462.9	2.79	2.50	1.25
9,154.0	94.10	274.20	8,781.7	27.1	-494.9	494.8	1.56	1.56	0.00
9,186.0	94.50	274.30	8,779.3	29.4	-526.7	526.6	1.29	1.25	0.31
9,216.0	94.70	273.70	8,776.9	31.5	-556.5	556.4	2.10	0.67	-2.00
9,310.0	93.10	273.30	8,770.5	37.2	-650.1	650.0	1.75	-1.70	-0.43
9,405.0	93.40	273.00	8,765.1	42.4	-744.8	744.7	0.45	0.32	-0.32
9,499.0	91.10	270.80	8,761.4	45.6	-838.7	838.5	3.38	-2.45	-2.34
9,594.0	92.20	270.80	8,758.7	46.9	-933.6	933.4	1.16	1.16	0.00
9,687.0	90.90	269.60	8,756.2	47.2	-1,026.6	1,026.4	1.90	-1.40	-1.29
9,782.0	91.80	270.00	8,753.9	46.9	-1,121.6	1,121.4	1.04	0.95	0.42
9,876.0	91.30	268.90	8,751.4	46.0	-1,215.5	1,215.3	1.29	-0.63	-1.17
9,972.0	92.60	269.00	8,748.1	44.2	-1,311.5	1,311.3	1.36	1.35	0.10
10,066.0	90.40	267.30	8,745.7	41.2	-1,405.4	1,405.2	2.96	-2.34	-1.81
10,161.0	91.60	266.00	8,744.0	35.6	-1,500.2	1,500.0	1.86	1.26	-1.37
10,254.0	91.30	265.50	8,741.6	28.7	-1,592.9	1,592.8	0.63	-0.32	-0.54
10,350.0	92.30	264.30	8,738.6	20.2	-1,688.5	1,688.4	1.63	1.04	-1.25
10,444.0	90.00	263.60	8,736.7	10.3	-1,781.9	1,781.9	2.56	-2.45	-0.74
10,539.0	90.60	263.00	8,736.2	-0.8	-1,876.3	1,876.3	0.89	0.63	-0.63
10,634.0	89.60	262.50	8,736.1	-12.8	-1,970.5	1,970.6	1.18	-1.05	-0.53
10,728.0	90.20	262.90	8,736.2	-24.7	-2,063.8	2,063.8	0.77	0.64	0.43
10,822.0	91.60	263.60	8,734.8	-35.8	-2,157.1	2,157.2	1.67	1.49	0.74
10,917.0	91.90	264.00	8,731.9	-46.0	-2,251.5	2,251.7	0.53	0.32	0.42
11,012.0	92.90	264.00	8,727.9	-55.9	-2,345.9	2,346.1	1.05	1.05	0.00
11,107.0	93.60	263.10	8,722.5	-66.6	-2,440.1	2,440.4	1.20	0.74	-0.95
11,202.0	93.50	264.20	8,716.6	-77.1	-2,534.4	2,534.7	1.16	-0.11	1.16
11,297.0	91.30	266.20	8,712.6	-85.0	-2,628.9	2,629.3	3.13	-2.32	2.11
11,392.0	91.00	267.10	8,710.7	-90.6	-2,723.8	2,724.1	1.00	-0.32	0.95
11,486.0	91.50	267.30	8,708.7	-95.2	-2,817.6	2,818.0	0.57	0.53	0.21
11,581.0	91.70	267.70	8,706.0	-99.3	-2,912.5	2,912.9	0.47	0.21	0.42
11,675.0	92.10	268.60	8,702.9	-102.3	-3,006.4	3,006.8	1.05	0.43	0.96
11,770.0	90.00	269.10	8,701.2	-104.2	-3,101.3	3,101.7	2.27	-2.21	0.53

Great White Directional Services

Survey Report

Company:	Cimarex Energy Co. (Midland)	Local Co-ordinate Reference:	Well Irwin 13 Fed #2H
Project:	Eddy County (NM83E)	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 13-19S-R30E	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Irwin 13 Fed #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
11,865.0	90.50	269.30	8,700.8	-105.6	-3,196.3	3,196.7	0.57	0.53	0.21
11,960.0	90.40	269.90	8,700.0	-106.2	-3,291.3	3,291.7	0.64	-0.11	0.63
12,055.0	90.40	270.10	8,699.3	-106.2	-3,386.3	3,386.7	0.21	0.00	0.21
12,150.0	90.90	268.40	8,698.3	-107.5	-3,481.3	3,481.7	1.87	0.53	-1.79
12,244.0	91.20	267.80	8,696.5	-110.6	-3,575.2	3,575.7	0.71	0.32	-0.64
12,339.0	91.80	267.60	8,694.1	-114.4	-3,670.1	3,670.6	0.67	0.63	-0.21
12,433.0	90.70	268.30	8,692.0	-117.8	-3,764.0	3,764.5	1.39	-1.17	0.74
12,528.0	91.20	267.50	8,690.4	-121.2	-3,859.0	3,859.4	0.99	0.53	-0.84
12,623.0	91.60	268.00	8,688.1	-125.0	-3,953.9	3,954.3	0.67	0.42	0.53
12,717.0	91.50	268.30	8,685.6	-128.0	-4,047.8	4,048.3	0.34	-0.11	0.32
12,812.0	92.00	267.60	8,682.7	-131.4	-4,142.7	4,143.2	0.91	0.53	-0.74
12,908.0	92.30	268.40	8,679.1	-134.7	-4,238.6	4,239.1	0.89	0.31	0.83
13,002.0	92.30	269.50	8,675.3	-136.5	-4,332.5	4,333.0	1.17	0.00	1.17
13,097.0	91.30	270.00	8,672.3	-136.9	-4,427.4	4,427.9	1.18	-1.05	0.53
13,192.0	91.90	269.40	8,669.7	-137.4	-4,522.4	4,522.9	0.89	0.63	-0.63
13,286.0	90.30	269.30	8,667.9	-138.4	-4,616.3	4,616.9	1.71	-1.70	-0.11
13,382.0	91.20	268.80	8,666.6	-140.0	-4,712.3	4,712.9	1.07	-0.94	-0.52
13,423.0	91.30	268.30	8,665.7	-141.1	-4,753.3	4,753.8	1.24	0.24	-1.22
13,480.0	91.30	268.30	8,664.4	-142.8	-4,810.3	4,810.8	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
13,423.0	8,665.7	+N-S (usft) -141.1 +E-W (usft) -4,753.3	Last MWD Survey
13,480.0	8,664.4	+N-S (usft) -142.8 +E-W (usft) -4,810.3	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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