



Cactus 137

Cimarex

Rev6

PATHFINDER
A Schlumberger Company

Borehole:	Original Borehole	Well:	SANDY FEDERAL 23H	Field:	NM Eddy County	Structure:	Cactus 137
Geology & Magnetic Parameters	Surface Location: (NAD83) New South Base Point, Section 20, T14N R13E Lat: N 23 17 17" Long: W 103 50 17.36" Elevation: 467283.00' US Grid Conv: 9.2316' Scale Factor: 0.99983351 Magnetic Parameters: Sandy Federal 23H Date: 20 Jun 14 Magnetic Declination: 7.500° Magnetic Variation: 13.00° (1983)						

CONTROLLED

Well Name: SANDY FEDERAL 23H

Well ID: 137

Well Type: Oil

Well Status: Active

Well Depth: 10000'

Well Completion: Open

Well Production: 100 bbl/d

Well Injection: 0 bbl/d

Well Flow: 100 bbl/d

Well Pressure: 1000 psi

Well Temperature: 100 °F

Well Corrosion: 100 mpy

Well Vibration: 100 in/s

Well Noise: 100 dBA

Well Seismicity: 100 cm/s

Well Geology: 100 ft

Well Magnetic: 100 mT

Well Gravity: 100 m/s²

Well Acceleration: 100 m/s²

Well Rotation: 100 rpm

Well Torque: 100 Nm

Well Power: 100 kW

Well Voltage: 100 V

Well Current: 100 A

Well Frequency: 100 Hz

Well Wavelength: 100 m

Well Period: 100 s

Well Amplitude: 100 m

Well Phase: 100°

Well Velocity: 100 m/s

Well Acceleration: 100 m/s²

Well Jerk: 100 m/s³

Well Snap: 100 m/s⁴

Well Crack: 100 m/s⁵

Well Jolt: 100 m/s⁶

Well Shock: 100 m/s⁷

Well Impact: 100 m/s⁸

Well Collision: 100 m/s⁹

Well Explosion: 100 m/s¹⁰

Well Fire: 100 m/s¹¹

Well Bomb: 100 m/s¹²

Well Rocket: 100 m/s¹³

Well Missile: 100 m/s¹⁴

Well Bomb: 100 m/s¹⁵

Well Rocket: 100 m/s¹⁶

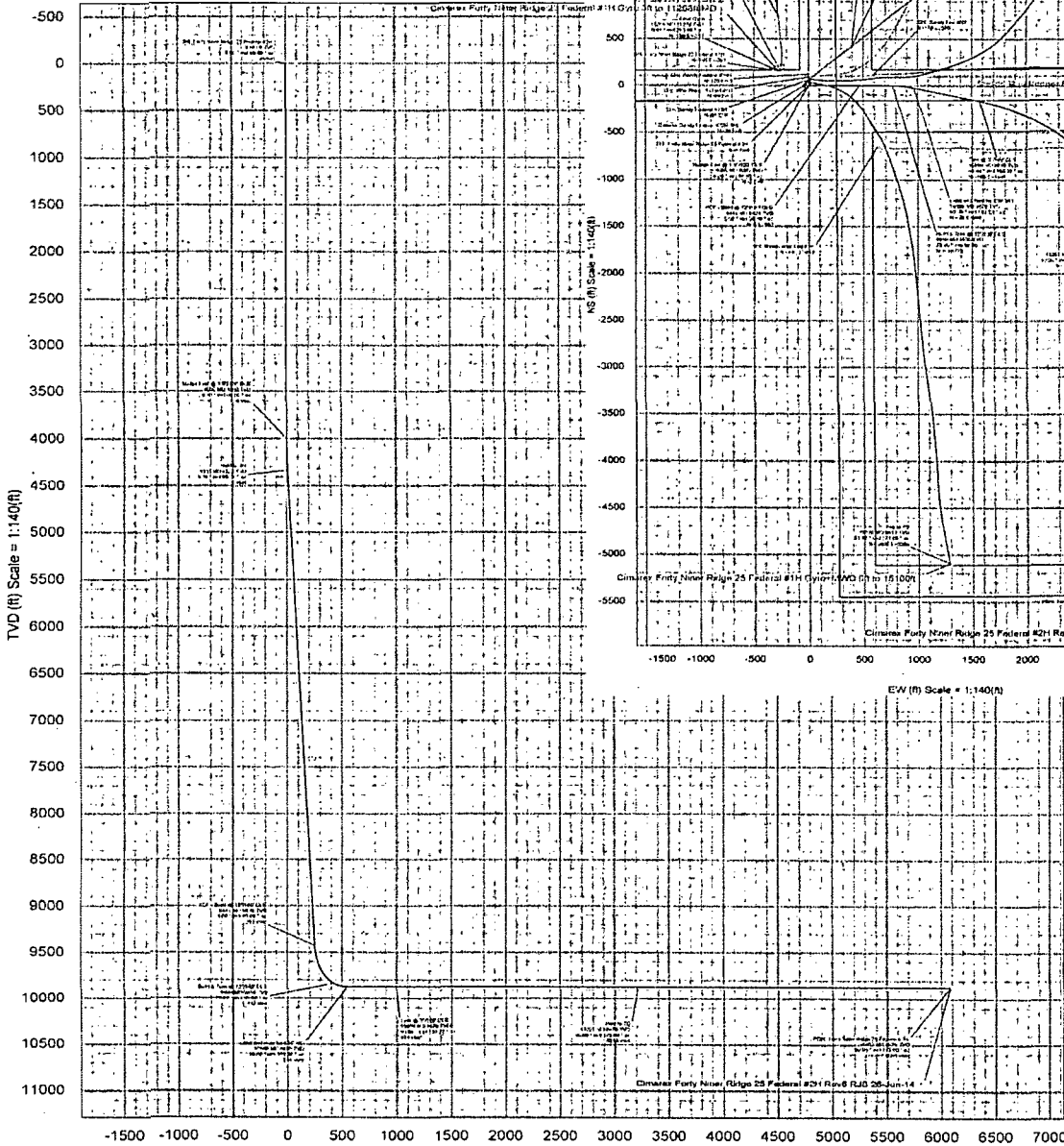
Well Missile: 100 m/s¹⁷

Well Bomb: 100 m/s¹⁸

Well Rocket: 100 m/s¹⁹

Well Missile: 100 m/s²⁰

Grid North
Tot Cor (M) = 7.242"
Mag Dec (7.500°)
Grid Conv (0.99983351)



Vertical Section (ft) Azim = 148.931° Scale = 1:140 (ft) Origin = 0N-S, 0E-W

Comments	Survey MD(ft)	Inclination(deg)	Azimuth(deg)	Critical Points										
				TVD(ft)	Sub-Sea TVD	-VS(ft)	HS(ft)	EV(ft)	Latitude(deg)	Longitude(deg)	Easting(ftUS)	Northing(ftUS)	DLS +/-100ft	Tool Face(deg)
SHL Forty Hiner Ridge 25 Federal #2H	0.00	0.00	90.00	0.00	-3318.00	0.00	0.00	0.00	N 32 17 1.271	W 103 50 37.498	692634.30	467283.20	0.00	90.00
Nudge East @ 1.57100' DLS	4000.00	0.00	90.00	4000.00	682.00	0.00	0.00	0.00	N 32 17 1.271	W 103 50 37.498	692634.30	467283.20	0.00	90.00
Hold 5' Inc	4333.45	5.00	90.00	4333.02	1015.02	7.94	0.00	14.55	N 32 17 1.271	W 103 50 37.329	692648.84	467283.20	1.50	90.00
KOP - Build @ 127100' DLS	9448.39	5.00	90.00	9428.49	6110.49	251.27	0.00	460.49	N 32 17 1.251	W 103 50 32.134	693094.76	467283.20	0.00	90.00
Build & Turn @ 127100' DLS	9990.06	70.00	90.00	9835.55	6517.55	421.70	0.00	772.84	N 32 17 1.236	W 103 50 28.496	693407.09	467283.20	12.00	34.49
Land and Hold for 620' MD	10188.62	90.00	103.22	9870.00	6552.00	546.17	-23.04	965.56	N 32 17 1.000	W 103 50 26.252	693599.80	467260.16	12.00	0.00
Turn @ 37100' DLS	10808.62	90.00	103.22	9870.00	6552.00	994.35	-164.87	1569.12	N 32 16 59.569	W 103 50 19.230	694203.32	467118.34	0.00	90.00
Hold to TD	13201.15	90.00	175.00	9870.00	6552.00	3212.66	-1857.64	3034.82	N 32 16 42.752	W 103 50 2.249	695068.91	465425.69	3.00	90.00
PBHL Forty Hiner Ridge 25 Federal #2H	16451.92	90.00	175.00	9870.00	6552.00	6081.08	-5096.04	3318.12	N 32 16 10.695	W 103 49 59.125	695952.20	462187.50	0.00	90.00



Cimarex Forty Sandy Federal 23H Rev6 RJS 26-Jun-14 Proposal Report 100' Interpolated (Non-Def Plan)



Report Date: June 26, 2014 - 02:22 PM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cactus 137 / Sandy Federal 23H
Well: Cimarex Forty Sandy Federal 23H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Sandy Federal 23H
Survey Date: February 08, 2013
Tort / AHD / DDI / ERD Ratio: 165.606 * / 7230.668 ft / 6.300 / 0.733
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 17' 1.27147", W 103° 50' 37.49823"
Location Grid N/E Y/X: N 467283.200 ftUS, E 692634.300 ftUS
CRS Grid Convergence Angle: 0.2615 *
Grid Scale Factor: 0.99993531
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 146.931 * (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 3318.000 ft above
Seabed / Ground Elevation: 3294.000 ft above
Magnetic Declination: 7.503 *
Total Gravity Field Strength: 998.7061mgn (9.80665 Based)
Gravity Model: DOX
Total Magnetic Field Strength: 48283.402 nT
Magnetic Dip Angle: 60.113 *
Declination Date: June 26, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 0.2615 *
Total Corr Mag North->Grid North: 7.2419 *
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	DLS (°/100ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Forty Niner Ridge 25 Federal #2H	0.00	0.00	90.00	0.00	-3318.00	0.00	N/A	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	100.00	0.00	90.00	100.00	-3218.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	200.00	0.00	90.00	200.00	-3118.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	300.00	0.00	90.00	300.00	-3018.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	400.00	0.00	90.00	400.00	-2918.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	500.00	0.00	90.00	500.00	-2818.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	600.00	0.00	90.00	600.00	-2718.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	700.00	0.00	90.00	700.00	-2618.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	800.00	0.00	90.00	800.00	-2518.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	900.00	0.00	90.00	900.00	-2418.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1000.00	0.00	90.00	1000.00	-2318.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1100.00	0.00	90.00	1100.00	-2218.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1200.00	0.00	90.00	1200.00	-2118.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1300.00	0.00	90.00	1300.00	-2018.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1400.00	0.00	90.00	1400.00	-1918.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1500.00	0.00	90.00	1500.00	-1818.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1600.00	0.00	90.00	1600.00	-1718.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1700.00	0.00	90.00	1700.00	-1618.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1800.00	0.00	90.00	1800.00	-1518.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	1900.00	0.00	90.00	1900.00	-1418.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2000.00	0.00	90.00	2000.00	-1318.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2100.00	0.00	90.00	2100.00	-1218.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2200.00	0.00	90.00	2200.00	-1118.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2300.00	0.00	90.00	2300.00	-1018.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2400.00	0.00	90.00	2400.00	-918.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	DLS (°/100ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2500.00	0.00	90.00	2500.00	-818.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2600.00	0.00	90.00	2600.00	-718.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2700.00	0.00	90.00	2700.00	-618.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2800.00	0.00	90.00	2800.00	-518.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	2900.00	0.00	90.00	2900.00	-418.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3000.00	0.00	90.00	3000.00	-318.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3100.00	0.00	90.00	3100.00	-218.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3200.00	0.00	90.00	3200.00	-118.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3300.00	0.00	90.00	3300.00	-18.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3400.00	0.00	90.00	3400.00	82.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3500.00	0.00	90.00	3500.00	182.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3600.00	0.00	90.00	3600.00	282.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3700.00	0.00	90.00	3700.00	382.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3800.00	0.00	90.00	3800.00	482.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	3900.00	0.00	90.00	3900.00	582.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
Nudge East @ 1.5°/100' DLS	4000.00	0.00	90.00	4000.00	682.00	0.00	0.00	0.00	0.00	467283.20	692634.30	N 32 17 1.27	W 103 50 37.50
	4100.00	1.50	90.00	4099.99	781.99	0.71	1.50	0.00	1.31	467283.20	692635.61	N 32 17 1.27	W 103 50 37.48
	4200.00	3.00	90.00	4199.91	881.91	2.86	1.50	0.00	5.23	467283.20	692639.53	N 32 17 1.27	W 103 50 37.44
	4300.00	4.50	90.00	4299.69	981.69	6.42	1.50	0.00	11.77	467283.20	692646.07	N 32 17 1.27	W 103 50 37.36
Hold 5° Inc	4333.45	5.00	90.00	4333.02	1015.02	7.94	1.50	0.00	14.55	467283.20	692648.84	N 32 17 1.27	W 103 50 37.33
	4400.00	5.00	90.00	4399.32	1081.32	11.10	0.00	0.00	20.35	467283.20	692654.65	N 32 17 1.27	W 103 50 37.26
	4500.00	5.00	90.00	4498.94	1180.94	15.86	0.00	0.00	29.07	467283.20	692663.36	N 32 17 1.27	W 103 50 37.16
	4600.00	5.00	90.00	4598.56	1280.56	20.62	0.00	0.00	37.78	467283.20	692672.08	N 32 17 1.27	W 103 50 37.06
	4700.00	5.00	90.00	4698.18	1380.18	25.37	0.00	0.00	46.50	467283.20	692680.80	N 32 17 1.27	W 103 50 36.96
	4800.00	5.00	90.00	4797.80	1479.80	30.13	0.00	0.00	55.22	467283.20	692689.52	N 32 17 1.27	W 103 50 36.85
	4900.00	5.00	90.00	4897.42	1579.42	34.89	0.00	0.00	63.94	467283.20	692698.24	N 32 17 1.27	W 103 50 36.75
	5000.00	5.00	90.00	4997.04	1679.04	39.65	0.00	0.00	72.66	467283.20	692706.95	N 32 17 1.27	W 103 50 36.65
	5100.00	5.00	90.00	5096.66	1778.66	44.40	0.00	0.00	81.38	467283.20	692715.67	N 32 17 1.27	W 103 50 36.55
	5200.00	5.00	90.00	5196.28	1878.28	49.16	0.00	0.00	90.10	467283.20	692724.39	N 32 17 1.27	W 103 50 36.45
	5300.00	5.00	90.00	5295.90	1977.90	53.92	0.00	0.00	98.81	467283.20	692733.11	N 32 17 1.27	W 103 50 36.35
	5400.00	5.00	90.00	5395.52	2077.52	58.67	0.00	0.00	107.53	467283.20	692741.83	N 32 17 1.27	W 103 50 36.25
	5500.00	5.00	90.00	5495.13	2177.13	63.43	0.00	0.00	116.25	467283.20	692750.54	N 32 17 1.27	W 103 50 36.14
	5600.00	5.00	90.00	5594.75	2276.75	68.19	0.00	0.00	124.97	467283.20	692759.26	N 32 17 1.27	W 103 50 36.04
	5700.00	5.00	90.00	5694.37	2376.37	72.95	0.00	0.00	133.69	467283.20	692767.98	N 32 17 1.27	W 103 50 35.94
	5800.00	5.00	90.00	5793.99	2475.99	77.70	0.00	0.00	142.41	467283.20	692776.70	N 32 17 1.27	W 103 50 35.84
	5900.00	5.00	90.00	5893.61	2575.61	82.46	0.00	0.00	151.13	467283.20	692785.42	N 32 17 1.26	W 103 50 35.74
	6000.00	5.00	90.00	5993.23	2675.23	87.22	0.00	0.00	159.84	467283.20	692794.13	N 32 17 1.26	W 103 50 35.64
	6100.00	5.00	90.00	6092.85	2774.85	91.98	0.00	0.00	168.56	467283.20	692802.85	N 32 17 1.26	W 103 50 35.53
	6200.00	5.00	90.00	6192.47	2874.47	96.73	0.00	0.00	177.28	467283.20	692811.57	N 32 17 1.26	W 103 50 35.43
	6300.00	5.00	90.00	6292.09	2974.09	101.49	0.00	0.00	186.00	467283.20	692820.29	N 32 17 1.26	W 103 50 35.33
	6400.00	5.00	90.00	6391.71	3073.71	106.25	0.00	0.00	194.72	467283.20	692829.01	N 32 17 1.26	W 103 50 35.23
	6500.00	5.00	90.00	6491.33	3173.33	111.00	0.00	0.00	203.44	467283.20	692837.72	N 32 17 1.26	W 103 50 35.13
	6600.00	5.00	90.00	6590.95	3272.95	115.76	0.00	0.00	212.16	467283.20	692846.44	N 32 17 1.26	W 103 50 35.03
	6700.00	5.00	90.00	6690.57	3372.57	120.52	0.00	0.00	220.87	467283.20	692855.16	N 32 17 1.26	W 103 50 34.93
	6800.00	5.00	90.00	6790.18	3472.18	125.28	0.00	0.00	229.59	467283.20	692863.88	N 32 17 1.26	W 103 50 34.82
	6900.00	5.00	90.00	6889.80	3571.80	130.03	0.00	0.00	238.31	467283.20	692872.60	N 32 17 1.26	W 103 50 34.72
	7000.00	5.00	90.00	6989.42	3671.42	134.79	0.00	0.00	247.03	467283.20	692881.31	N 32 17 1.26	W 103 50 34.62
	7100.00	5.00	90.00	7089.04	3771.04	139.55	0.00	0.00	255.75	467283.20	692890.03	N 32 17 1.26	W 103 50 34.52
	7200.00	5.00	90.00	7188.66	3870.66	144.31	0.00	0.00	264.47	467283.20	692898.75	N 32 17 1.26	W 103 50 34.42
	7300.00	5.00	90.00	7288.28	3970.28	149.06	0.00	0.00	273.19	467283.20	692907.47	N 32 17 1.26	W 103 50 34.32
	7400.00	5.00	90.00	7387.90	4069.90	153.82	0.00	0.00	281.90	467283.20	692916.18	N 32 17 1.26	W 103 50 34.21
	7500.00	5.00	90.00	7487.52	4169.52	158.58	0.00	0.00	290.62	467283.20	692924.90	N 32 17 1.26	W 103 50 34.11

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	DLS (°/100ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	7600.00	5.00	90.00	7587.14	4269.14	163.33	0.00	0.00	299.34	467283.20	692933.62	N 32 17 1.26	W 103 50 34.01
	7700.00	5.00	90.00	7686.76	4368.76	168.09	0.00	0.00	308.06	467283.20	692942.34	N 32 17 1.26	W 103 50 33.91
	7800.00	5.00	90.00	7786.38	4468.38	172.85	0.00	0.00	316.78	467283.20	692951.06	N 32 17 1.26	W 103 50 33.81
	7900.00	5.00	90.00	7886.00	4568.00	177.61	0.00	0.00	325.50	467283.20	692959.77	N 32 17 1.26	W 103 50 33.71
	8000.00	5.00	90.00	7985.61	4667.61	182.36	0.00	0.00	334.21	467283.20	692968.49	N 32 17 1.26	W 103 50 33.61
	8100.00	5.00	90.00	8085.23	4767.23	187.12	0.00	0.00	342.93	467283.20	692977.21	N 32 17 1.26	W 103 50 33.50
	8200.00	5.00	90.00	8184.85	4866.85	191.88	0.00	0.00	351.65	467283.20	692985.93	N 32 17 1.26	W 103 50 33.40
	8300.00	5.00	90.00	8284.47	4966.47	196.63	0.00	0.00	360.37	467283.20	692994.65	N 32 17 1.26	W 103 50 33.30
	8400.00	5.00	90.00	8384.09	5066.09	201.39	0.00	0.00	369.09	467283.20	693003.36	N 32 17 1.25	W 103 50 33.20
	8500.00	5.00	90.00	8483.71	5165.71	206.15	0.00	0.00	377.81	467283.20	693012.08	N 32 17 1.25	W 103 50 33.10
	8600.00	5.00	90.00	8583.33	5265.33	210.91	0.00	0.00	386.53	467283.20	693020.80	N 32 17 1.25	W 103 50 33.00
	8700.00	5.00	90.00	8682.95	5364.95	215.66	0.00	0.00	395.24	467283.20	693029.52	N 32 17 1.25	W 103 50 32.89
	8800.00	5.00	90.00	8782.57	5464.57	220.42	0.00	0.00	403.96	467283.20	693038.24	N 32 17 1.25	W 103 50 32.79
	8900.00	5.00	90.00	8882.19	5564.19	225.18	0.00	0.00	412.68	467283.20	693046.95	N 32 17 1.25	W 103 50 32.69
	9000.00	5.00	90.00	8981.81	5663.81	229.94	0.00	0.00	421.40	467283.20	693055.67	N 32 17 1.25	W 103 50 32.59
	9100.00	5.00	90.00	9081.43	5763.43	234.69	0.00	0.00	430.12	467283.20	693064.39	N 32 17 1.25	W 103 50 32.49
	9200.00	5.00	90.00	9181.05	5863.05	239.45	0.00	0.00	438.84	467283.20	693073.11	N 32 17 1.25	W 103 50 32.39
	9300.00	5.00	90.00	9280.66	5962.66	244.21	0.00	0.00	447.56	467283.20	693081.83	N 32 17 1.25	W 103 50 32.29
	9400.00	5.00	90.00	9380.28	6062.28	248.96	0.00	0.00	456.27	467283.20	693090.54	N 32 17 1.25	W 103 50 32.18
	9419.68	5.00	90.00	9399.89	6081.89	249.90	0.00	0.00	457.99	467283.20	693092.26	N 32 17 1.25	W 103 50 32.16
	9419.79	5.00	90.00	9400.00	6082.00	249.91	1.50	0.00	458.00	467283.20	693092.27	N 32 17 1.25	W 103 50 32.16
KOP - Build @ 12°/100' DLS	9448.39	5.00	90.00	9428.49	6110.49	251.27	0.00	0.00	460.49	467283.20	693094.76	N 32 17 1.25	W 103 50 32.13
	9500.00	11.19	90.00	9479.56	6161.56	255.23	12.00	0.00	467.76	467283.20	693102.03	N 32 17 1.25	W 103 50 32.05
	9600.00	23.19	90.00	9574.92	6256.92	271.33	12.00	0.00	497.26	467283.20	693131.53	N 32 17 1.25	W 103 50 31.71
	9700.00	35.19	90.00	9662.06	6344.06	297.90	12.00	0.00	545.95	467283.20	693180.21	N 32 17 1.25	W 103 50 31.14
	9800.00	47.19	90.00	9737.17	6419.17	333.77	12.00	0.00	611.69	467283.20	693245.95	N 32 17 1.24	W 103 50 30.37
	9900.00	59.19	90.00	9796.97	6478.97	377.37	12.00	0.00	691.61	467283.20	693325.86	N 32 17 1.24	W 103 50 29.44
Build & Turn @ 12°/100' DLS	9990.06	70.00	90.00	9835.55	6517.55	421.70	12.00	0.00	772.84	467283.20	693407.09	N 32 17 1.24	W 103 50 28.50
	10000.00	70.98	90.71	9838.87	6520.87	426.86	12.00	-0.06	782.21	467283.14	693416.46	N 32 17 1.24	W 103 50 28.39
	10100.00	81.01	97.52	9863.06	6545.06	485.49	12.00	-7.14	878.79	467276.06	693513.03	N 32 17 1.16	W 103 50 27.26
Land and Hold for 620' MD	10188.62	90.00	103.22	9870.00	6552.00	546.17	12.00	-23.04	965.56	467260.16	693599.80	N 32 17 1.00	W 103 50 26.25
	10200.00	90.00	103.22	9870.00	6552.00	554.40	0.00	-25.65	976.64	467257.55	693610.88	N 32 17 0.97	W 103 50 26.12
	10300.00	90.00	103.22	9870.00	6552.00	626.68	0.00	-48.52	1073.99	467234.68	693708.22	N 32 17 0.74	W 103 50 24.99
	10400.00	90.00	103.22	9870.00	6552.00	698.97	0.00	-71.40	1171.34	467211.80	693805.56	N 32 17 0.51	W 103 50 23.86
	10500.00	90.00	103.22	9870.00	6552.00	771.26	0.00	-94.28	1268.69	467188.93	693902.90	N 32 17 0.28	W 103 50 22.73
	10600.00	90.00	103.22	9870.00	6552.00	843.55	0.00	-117.15	1366.04	467166.06	694000.25	N 32 17 0.05	W 103 50 21.59
	10700.00	90.00	103.22	9870.00	6552.00	915.84	0.00	-140.03	1463.39	467143.18	694097.59	N 32 16 59.82	W 103 50 20.46
	10800.00	90.00	103.22	9870.00	6552.00	988.12	0.00	-162.90	1560.73	467120.31	694194.93	N 32 16 59.59	W 103 50 19.33
Turn @ 3°/100' DLS	10808.62	90.00	103.22	9870.00	6552.00	994.35	0.00	-164.87	1569.12	467118.34	694203.32	N 32 16 59.57	W 103 50 19.23
	10900.00	90.00	105.97	9870.00	6552.00	1061.90	3.00	-187.90	1657.55	467095.31	694291.74	N 32 16 59.34	W 103 50 18.20
	11000.00	90.00	108.97	9870.00	6552.00	1139.09	3.00	-217.91	1752.93	467065.31	694387.11	N 32 16 59.04	W 103 50 17.09
	11100.00	90.00	111.97	9870.00	6552.00	1219.50	3.00	-252.87	1846.61	467030.35	694480.78	N 32 16 58.69	W 103 50 16.00
	11200.00	90.00	114.97	9870.00	6552.00	1302.91	3.00	-292.68	1938.32	466990.54	694572.50	N 32 16 58.29	W 103 50 14.94
	11300.00	90.00	117.97	9870.00	6552.00	1389.10	3.00	-337.25	2027.83	466945.98	694662.00	N 32 16 57.84	W 103 50 13.90
	11400.00	90.00	120.97	9870.00	6552.00	1477.82	3.00	-386.43	2114.89	466896.80	694749.05	N 32 16 57.35	W 103 50 12.88
	11500.00	90.00	123.97	9870.00	6552.00	1568.83	3.00	-440.10	2199.25	466843.13	694833.41	N 32 16 56.82	W 103 50 11.90
	11600.00	90.00	126.97	9870.00	6552.00	1661.88	3.00	-498.12	2280.69	466785.12	694914.84	N 32 16 56.24	W 103 50 10.96
	11700.00	90.00	129.97	9870.00	6552.00	1756.72	3.00	-560.31	2358.98	466722.92	694993.12	N 32 16 55.62	W 103 50 10.05
	11800.00	90.00	132.97	9870.00	6552.00	1853.09	3.00	-626.52	2433.91	466656.72	695068.04	N 32 16 54.96	W 103 50 9.18

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	DLS (°/100ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	11900.00	90.00	135.97	9870.00	6552.00	1950.72	3.00	-696.56	2505.26	466586.68	695139.40	N 32 16 54.26	W 103 50 8.35
	12000.00	90.00	138.97	9870.00	6552.00	2049.35	3.00	-770.24	2572.86	466513.01	695206.99	N 32 16 53.53	W 103 50 7.57
	12100.00	90.00	141.97	9870.00	6552.00	2148.70	3.00	-847.36	2636.51	466435.90	695270.63	N 32 16 52.77	W 103 50 6.83
	12200.00	90.00	144.97	9870.00	6552.00	2248.51	3.00	-927.70	2696.03	466355.56	695330.15	N 32 16 51.97	W 103 50 6.14
	12300.00	90.00	147.97	9870.00	6552.00	2348.49	3.00	-1011.04	2751.27	466272.22	695385.38	N 32 16 51.14	W 103 50 5.51
	12400.00	90.00	150.97	9870.00	6552.00	2448.38	3.00	-1097.17	2802.07	466186.11	695436.18	N 32 16 50.29	W 103 50 4.92
	12500.00	90.00	153.97	9870.00	6552.00	2547.90	3.00	-1185.83	2848.29	466097.45	695482.40	N 32 16 49.41	W 103 50 4.39
	12600.00	90.00	156.97	9870.00	6552.00	2646.79	3.00	-1276.79	2889.81	466006.49	695523.92	N 32 16 48.51	W 103 50 3.91
	12700.00	90.00	159.97	9870.00	6552.00	2744.75	3.00	-1369.80	2926.51	465913.49	695560.62	N 32 16 47.58	W 103 50 3.48
	12800.00	90.00	162.97	9870.00	6552.00	2841.54	3.00	-1464.60	2958.30	465818.70	695592.40	N 32 16 46.64	W 103 50 3.12
	12900.00	90.00	165.97	9870.00	6552.00	2936.89	3.00	-1560.94	2985.08	465722.37	695619.18	N 32 16 45.69	W 103 50 2.81
	13000.00	90.00	168.97	9870.00	6552.00	3030.52	3.00	-1658.54	3006.78	465624.77	695640.88	N 32 16 44.72	W 103 50 2.56
	13100.00	90.00	171.97	9870.00	6552.00	3122.19	3.00	-1757.15	3023.34	465526.17	695657.44	N 32 16 43.75	W 103 50 2.38
	13200.00	90.00	174.97	9870.00	6552.00	3211.65	3.00	-1856.49	3034.72	465426.83	695668.81	N 32 16 42.76	W 103 50 2.25
Hold to TD	13201.15	90.00	175.00	9870.00	6552.00	3212.66	3.00	-1857.64	3034.82	465425.69	695668.91	N 32 16 42.75	W 103 50 2.25
	13300.00	90.00	175.00	9870.00	6552.00	3299.89	0.00	-1956.11	3043.43	465327.22	695677.53	N 32 16 41.78	W 103 50 2.15
	13400.00	90.00	175.00	9870.00	6552.00	3388.13	0.00	-2055.73	3052.15	465227.61	695686.24	N 32 16 40.79	W 103 50 2.06
	13500.00	90.00	175.00	9870.00	6552.00	3476.36	0.00	-2155.35	3060.86	465128.00	695694.96	N 32 16 39.80	W 103 50 1.96
	13600.00	90.00	175.00	9870.00	6552.00	3564.60	0.00	-2254.97	3069.58	465028.38	695703.67	N 32 16 38.82	W 103 50 1.87
	13700.00	90.00	175.00	9870.00	6552.00	3652.84	0.00	-2354.59	3078.29	464928.77	695712.39	N 32 16 37.83	W 103 50 1.77
	13800.00	90.00	175.00	9870.00	6552.00	3741.08	0.00	-2454.21	3087.01	464829.16	695721.10	N 32 16 36.85	W 103 50 1.67
	13900.00	90.00	175.00	9870.00	6552.00	3829.32	0.00	-2553.83	3095.72	464729.54	695729.82	N 32 16 35.86	W 103 50 1.58
	14000.00	90.00	175.00	9870.00	6552.00	3917.55	0.00	-2653.45	3104.44	464629.93	695738.53	N 32 16 34.87	W 103 50 1.48
	14100.00	90.00	175.00	9870.00	6552.00	4005.79	0.00	-2753.07	3113.15	464530.32	695747.24	N 32 16 33.89	W 103 50 1.39
	14200.00	90.00	175.00	9870.00	6552.00	4094.03	0.00	-2852.68	3121.87	464430.71	695755.96	N 32 16 32.90	W 103 50 1.29
	14300.00	90.00	175.00	9870.00	6552.00	4182.27	0.00	-2952.30	3130.58	464331.09	695764.67	N 32 16 31.92	W 103 50 1.19
	14400.00	90.00	175.00	9870.00	6552.00	4270.51	0.00	-3051.92	3139.30	464231.48	695773.39	N 32 16 30.93	W 103 50 1.10
	14500.00	90.00	175.00	9870.00	6552.00	4358.74	0.00	-3151.54	3148.01	464131.87	695782.10	N 32 16 29.94	W 103 50 1.00
	14600.00	90.00	175.00	9870.00	6552.00	4446.98	0.00	-3251.16	3156.73	464032.25	695790.82	N 32 16 28.96	W 103 50 0.90
	14700.00	90.00	175.00	9870.00	6552.00	4535.22	0.00	-3350.78	3165.44	463932.64	695799.53	N 32 16 27.97	W 103 50 0.81
	14800.00	90.00	175.00	9870.00	6552.00	4623.46	0.00	-3450.40	3174.16	463833.03	695808.24	N 32 16 26.99	W 103 50 0.71
	14900.00	90.00	175.00	9870.00	6552.00	4711.70	0.00	-3550.02	3182.87	463733.42	695816.96	N 32 16 26.00	W 103 50 0.62
	15000.00	90.00	175.00	9870.00	6552.00	4799.93	0.00	-3649.64	3191.59	463633.80	695825.67	N 32 16 25.01	W 103 50 0.52
	15100.00	90.00	175.00	9870.00	6552.00	4888.17	0.00	-3749.26	3200.30	463534.19	695834.39	N 32 16 24.03	W 103 50 0.42
	15200.00	90.00	175.00	9870.00	6552.00	4976.41	0.00	-3848.88	3209.02	463434.58	695843.10	N 32 16 23.04	W 103 50 0.33
	15300.00	90.00	175.00	9870.00	6552.00	5064.65	0.00	-3948.50	3217.73	463334.96	695851.82	N 32 16 22.05	W 103 50 0.23
	15400.00	90.00	175.00	9870.00	6552.00	5152.89	0.00	-4048.12	3226.45	463235.35	695860.53	N 32 16 21.07	W 103 50 0.14
	15500.00	90.00	175.00	9870.00	6552.00	5241.12	0.00	-4147.74	3235.16	463135.74	695869.25	N 32 16 20.08	W 103 50 0.04
	15600.00	90.00	175.00	9870.00	6552.00	5329.36	0.00	-4247.36	3243.88	463036.13	695877.96	N 32 16 19.10	W 103 49 59.94
	15700.00	90.00	175.00	9870.00	6552.00	5417.60	0.00	-4346.98	3252.59	462936.51	695886.67	N 32 16 18.11	W 103 49 59.85
	15800.00	90.00	175.00	9870.00	6552.00	5505.84	0.00	-4446.60	3261.31	462836.90	695895.39	N 32 16 17.12	W 103 49 59.75
	15900.00	90.00	175.00	9870.00	6552.00	5594.08	0.00	-4546.22	3270.02	462737.29	695904.10	N 32 16 16.14	W 103 49 59.66
	16000.00	90.00	175.00	9870.00	6552.00	5682.31	0.00	-4645.84	3278.74	462637.67	695912.82	N 32 16 15.15	W 103 49 59.56
	16100.00	90.00	175.00	9870.00	6552.00	5770.55	0.00	-4745.46	3287.45	462538.06	695921.53	N 32 16 14.17	W 103 49 59.46
	16200.00	90.00	175.00	9870.00	6552.00	5858.79	0.00	-4845.08	3296.17	462438.45	695930.25	N 32 16 13.18	W 103 49 59.37
	16300.00	90.00	175.00	9870.00	6552.00	5947.03	0.00	-4944.69	3304.88	462338.84	695938.96	N 32 16 12.19	W 103 49 59.27
	16400.00	90.00	175.00	9870.00	6552.00	6035.27	0.00	-5044.31	3313.60	462239.22	695947.68	N 32 16 11.21	W 103 49 59.17
PBHL Forty Niner Ridge 25 Federal #2H	16451.92	90.00	175.00	9870.00	6552.00	6081.08	0.00	-5096.04	3318.12	462187.50	695952.20	N 32 16 10.69	W 103 49 59.13

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	DLS ("/100ft)	NS (ft)	EW (ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Survey Type:	Non-Def Plan												

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	24.000	1/100.000	30.000	30.000	SLB_MWD-INC_ONLY-Depth Only	Original Borehole / Cimarex Forty Niner Ridge 25 Federal #2H Rev6 RJS 26-Jun-14
	1	24.000	8486.540	1/100.000	30.000	30.000	SLB_MWD-INC_ONLY	Original Borehole / Cimarex Forty Niner Ridge 25 Federal #2H Rev6
	1	8486.540	9448.000	1/100.000	30.000	30.000	SLB_MWD-POOR	Original Borehole / Cimarex Forty Niner Ridge 25 Federal #2H Rev6
	1	9448.000	16451.923	1/100.000	30.000	30.000	SLB_MWD-STD	Original Borehole / Cimarex Forty Niner Ridge 25 Federal #2H Rev6

**Sandy Federal 23H
30-015-41793
Cimarex Energy Co.
July 8, 2014
Conditions of Approval**

- 1. Operator name still requires resolution.**
- 2. Variance approved to use J-55 48# 13-3/8" STC casing for the surface casing.**
- 3. Cement excess for surface casing calculates to 1% excess. Operator will probably require more cement or will delay their drilling by performing one inch operations.**
- 4. Operator's intermediate casing does not meet BLM minimum collapse requirement, therefore, casing shall be kept liquid filled while running in hole.**
- 5. Cement excess for production casing calculates to 7% excess. Operator to consider pumping additional cement since well is in R-111-P potash.**

WWI 070814