

30-015-42150



Cactus 112

Cimarex

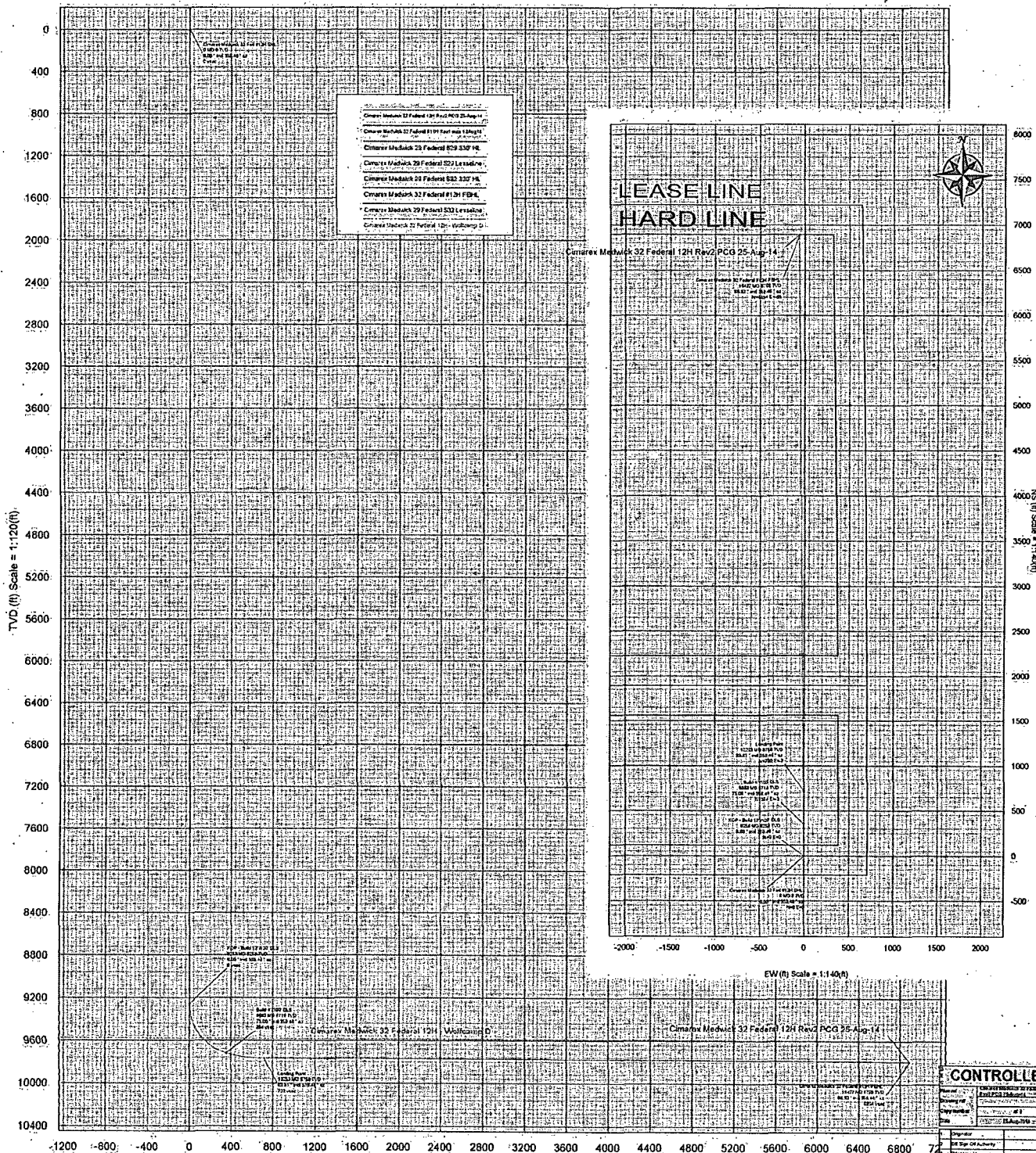
Rev2



Borehole:	Well:	Field:	Structure:
Original Borehole	Medwick 32 Federal #12H	NM Eddy County	Cactus 112

Gravity & Magnetic Parameters	Surface Location	Well Location
Model: BOGM 2014 Dip: 55.77° Date: 12-Aug-2014	HAD3 (New Mexico State Plane, Eastern Zone, US Feet)	Medwick 32
Magn: 7.635° FS: 48061.4 mT Gravity FS: 980.680 mgals (3.80665 Galileo)	Lat: N 32 0 2.17 Northing: 36392.38 NUS Grid Conv: 0.0077	Federal #12H
	Long: W 104 12 20.14 Easting: 68034.62 NUS Scale Fact: 0.9991089	Plan: Rev2 PCO 25-Aug-14

Comments	Survey (M/D)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Sub-Sea TVD	VS (ft)	HS (ft)	EW (ft)	Latitude (deg)	Longitude (deg)	Easting (ft)	Northing (ft)	DLS (ft/1000)	Tool Face (deg)
Cimarex Medwick 32 Fed #12H SHL	0.00	0.00	359.46	0.00	-3207.00	0.00	0.00	0.00	N 32 0 2.172	W 104 12 20.143	580934.52	363982.39		359.46
KOP - Build 12°/100' DLS	9258.00	0.00	359.46	9258.00	6051.00	0.00	0.00	0.00	N 32 0 2.172	W 104 12 20.143	580934.52	363982.39	0.00	359.46
Build 4°/100' DLS	9883.00	75.00	359.46	9719.20	6512.20	353.89	353.87	-3.34	N 32 0 5.674	W 104 12 20.177	580931.19	364336.23	12.00	0.00
Landing Point	10253.35	89.81	359.46	9768.00	6561.00	719.97	719.94	-6.79	N 32 0 9.296	W 104 12 20.212	580927.74	364702.26	4.00	78.93
Cimarex Medwick 32 Federal #12H PBHL	16427.43	89.81	359.46	9789.00	6581.00	6894.01	6893.71	-64.78	N 32 1 10.389	W 104 12 20.801	580869.75	370875.47	0.00	



CONTROLLED	
Drawn by	Checked by
Reviewed by	Approved by
Date	Date



Cimarex Medwick 32 Federal 12H Rev2 PCG 25-Aug-14 Proposal Geodetic Report 100ft Interpolated (Non-Def Plan)



Report Date: August 25, 2014 - 10:04:AM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Medwick 32 Federal #12H / Cimarex Medwick 32 Federal #12H
Well: Cimarex Medwick 32 Federal #12H
Borehole: Original Borehole
UWI / API#: Cactus 112 / Unknown
Survey Name: Cimarex Medwick 32 Federal 12H Rev2 PCG 25-Aug-14
Survey Date: September 29, 2013
Tort / AHD / DDI / ERD Ratio: 89.818 ° / 6894.012 ft / 6.017 / 0.704
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 0' 2.17194", W 104° 12' 20.14309"
Location Grid N/E Y/X: N 363982.390 ftUS, E 580934.520 ftUS
CRS Grid Convergence Angle: 0.0677 °
Grid Scale Factor: 0.99991089
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.462 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3207.000 ft above
Seabed / Ground Elevation: 3183.000 ft above
Magnetic Declination: 7.635 °
Total Gravity Field Strength: 998.6864 mgn (9.80665 Based)
Gravity Model: DOX
Total Magnetic Field Strength: 48051.644 nT
Magnetic Dip Angle: 59.779 °
Declination Date: August 12, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 0.0677 °
Total Corr Mag North -> Grid North: 7.5678 °
Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Cimarex Medwick 32 Fed #12H.SHL	0.00	0.00	359.46	0.00	0.00	0.00	0.00	N/A	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	100.00	0.00	359.46	100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	200.00	0.00	359.46	200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	300.00	0.00	359.46	300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	400.00	0.00	359.46	400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	500.00	0.00	359.46	500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	600.00	0.00	359.46	600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	700.00	0.00	359.46	700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	800.00	0.00	359.46	800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	900.00	0.00	359.46	900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1000.00	0.00	359.46	1000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1100.00	0.00	359.46	1100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1200.00	0.00	359.46	1200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1300.00	0.00	359.46	1300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1400.00	0.00	359.46	1400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1500.00	0.00	359.46	1500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1600.00	0.00	359.46	1600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1700.00	0.00	359.46	1700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1800.00	0.00	359.46	1800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	1900.00	0.00	359.46	1900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (%/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")		Longitude (E/W ° ' ")	
	2000.00	0.00	359.46	2000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2100.00	0.00	359.46	2100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2200.00	0.00	359.46	2200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2300.00	0.00	359.46	2300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2400.00	0.00	359.46	2400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2500.00	0.00	359.46	2500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2600.00	0.00	359.46	2600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2700.00	0.00	359.46	2700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2800.00	0.00	359.46	2800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	2900.00	0.00	359.46	2900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3000.00	0.00	359.46	3000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3100.00	0.00	359.46	3100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3200.00	0.00	359.46	3200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3300.00	0.00	359.46	3300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3400.00	0.00	359.46	3400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3500.00	0.00	359.46	3500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3600.00	0.00	359.46	3600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3700.00	0.00	359.46	3700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3800.00	0.00	359.46	3800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	3900.00	0.00	359.46	3900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4000.00	0.00	359.46	4000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4100.00	0.00	359.46	4100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4200.00	0.00	359.46	4200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4300.00	0.00	359.46	4300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4400.00	0.00	359.46	4400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4500.00	0.00	359.46	4500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4600.00	0.00	359.46	4600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4700.00	0.00	359.46	4700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4800.00	0.00	359.46	4800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	4900.00	0.00	359.46	4900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5000.00	0.00	359.46	5000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5100.00	0.00	359.46	5100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5200.00	0.00	359.46	5200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5300.00	0.00	359.46	5300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5400.00	0.00	359.46	5400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5500.00	0.00	359.46	5500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5600.00	0.00	359.46	5600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5700.00	0.00	359.46	5700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5800.00	0.00	359.46	5800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	5900.00	0.00	359.46	5900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6000.00	0.00	359.46	6000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6100.00	0.00	359.46	6100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6200.00	0.00	359.46	6200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6300.00	0.00	359.46	6300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6400.00	0.00	359.46	6400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6500.00	0.00	359.46	6500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6600.00	0.00	359.46	6600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	
	6700.00	0.00	359.46	6700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32 0	2.17	W 104 12 20.14	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6800.00	0.00	359.46	6800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	6900.00	0.00	359.46	6900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7000.00	0.00	359.46	7000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7100.00	0.00	359.46	7100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7200.00	0.00	359.46	7200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7300.00	0.00	359.46	7300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7400.00	0.00	359.46	7400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7500.00	0.00	359.46	7500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7600.00	0.00	359.46	7600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7700.00	0.00	359.46	7700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7800.00	0.00	359.46	7800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	7900.00	0.00	359.46	7900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8000.00	0.00	359.46	8000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8100.00	0.00	359.46	8100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8200.00	0.00	359.46	8200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8300.00	0.00	359.46	8300.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8400.00	0.00	359.46	8400.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8500.00	0.00	359.46	8500.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8600.00	0.00	359.46	8600.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8700.00	0.00	359.46	8700.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8800.00	0.00	359.46	8800.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	8900.00	0.00	359.46	8900.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	9000.00	0.00	359.46	9000.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	9100.00	0.00	359.46	9100.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	9200.00	0.00	359.46	9200.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
KOP:- Build 12"/100' DLS	9258.00	0.00	359.46	9258.00	0.00	0.00	0.00	0.00	363982.39	580934.52	N 32° 0' 2.17"	W 104° 12' 20.14"
	9300.00	5.04	359.46	9299.95	1.85	1.85	-0.02	12.00	363984.24	580934.50	N 32° 0' 2.19"	W 104° 12' 20.14"
	9400.00	17.04	359.46	9397.92	20.96	20.96	-0.20	12.00	364003.35	580934.32	N 32° 0' 2.38"	W 104° 12' 20.15"
	9500.00	29.04	359.46	9489.77	60.03	60.02	-0.57	12.00	364042.41	580933.95	N 32° 0' 2.77"	W 104° 12' 20.15"
	9600.00	41.04	359.46	9571.50	117.34	117.33	-1.11	12.00	364099.71	580933.41	N 32° 0' 3.33"	W 104° 12' 20.15"
	9700.00	53.04	359.46	9639.52	190.39	190.38	-1.79	12.00	364172.75	580932.73	N 32° 0' 4.06"	W 104° 12' 20.16"
	9800.00	65.04	359.46	9690.87	275.98	275.97	-2.60	12.00	364258.33	580931.92	N 32° 0' 4.90"	W 104° 12' 20.17"
Build 4"/100' DLS	9883.00	75.00	359.46	9719.20	353.89	353.87	-3.34	12.00	364336.23	580931.19	N 32° 0' 5.67"	W 104° 12' 20.18"
	9900.00	75.68	359.46	9723.50	370.33	370.32	-3.49	4.00	364352.67	580931.03	N 32° 0' 5.84"	W 104° 12' 20.18"
	10000.00	79.68	359.46	9744.83	468.01	467.99	-4.41	4.00	364450.34	580930.11	N 32° 0' 6.80"	W 104° 12' 20.19"
	10100.00	83.68	359.46	9759.30	566.94	566.91	-5.34	4.00	364549.25	580929.18	N 32° 0' 7.78"	W 104° 12' 20.20"
	10200.00	87.68	359.46	9766.83	666.63	666.61	-6.28	4.00	364648.93	580928.24	N 32° 0' 8.77"	W 104° 12' 20.21"
Landing Point	10253.35	89.81	359.46	9768.00	719.97	719.94	-6.79	4.00	364702.26	580927.74	N 32° 0' 9.30"	W 104° 12' 20.21"
	10300.00	89.81	359.46	9768.15	766.62	766.58	-7.23	0.00	364748.90	580927.30	N 32° 0' 9.76"	W 104° 12' 20.22"
	10400.00	89.81	359.46	9768.47	866.62	866.58	-8.17	0.00	364848.89	580926.35	N 32° 0' 10.75"	W 104° 12' 20.23"
	10500.00	89.81	359.46	9768.80	966.62	966.57	-9.11	0.00	364948.88	580925.41	N 32° 0' 11.74"	W 104° 12' 20.24"
	10600.00	89.81	359.46	9769.12	1066.62	1066.57	-10.05	0.00	365048.86	580924.47	N 32° 0' 12.73"	W 104° 12' 20.25"
	10700.00	89.81	359.46	9769.45	1166.62	1166.56	-10.99	0.00	365148.85	580923.53	N 32° 0' 13.72"	W 104° 12' 20.25"
	10800.00	89.81	359.46	9769.77	1266.62	1266.56	-11.94	0.00	365248.83	580922.59	N 32° 0' 14.71"	W 104° 12' 20.26"
	10900.00	89.81	359.46	9770.09	1366.62	1366.55	-12.88	0.00	365348.82	580921.64	N 32° 0' 15.69"	W 104° 12' 20.27"
	11000.00	89.81	359.46	9770.42	1466.61	1466.55	-13.82	0.00	365448.81	580920.70	N 32° 0' 16.68"	W 104° 12' 20.28"

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	11100.00	89.81	359.46	9770.74	1566.61	1566.54	-14.76	0.00	365548.79	580919.76	N 32 0 17.67	W 104 12 20.29
	11200.00	89.81	359.46	9771.07	1666.61	1666.54	-15.70	0.00	365648.78	580918.82	N 32 0 18.66	W 104 12 20.30
	11300.00	89.81	359.46	9771.39	1766.61	1766.53	-16.64	0.00	365748.76	580917.88	N 32 0 19.65	W 104 12 20.31
	11400.00	89.81	359.46	9771.72	1866.61	1866.53	-17.59	0.00	365848.75	580916.94	N 32 0 20.64	W 104 12 20.32
	11500.00	89.81	359.46	9772.04	1966.61	1966.52	-18.53	0.00	365948.74	580916.00	N 32 0 21.63	W 104 12 20.33
	11600.00	89.81	359.46	9772.37	2066.61	2066.52	-19.47	0.00	366048.72	580915.05	N 32 0 22.62	W 104 12 20.34
	11700.00	89.81	359.46	9772.69	2166.61	2166.52	-20.41	0.00	366148.71	580914.11	N 32 0 23.61	W 104 12 20.35
	11800.00	89.81	359.46	9773.01	2266.61	2266.51	-21.35	0.00	366248.69	580913.17	N 32 0 24.60	W 104 12 20.36
	11900.00	89.81	359.46	9773.34	2366.61	2366.51	-22.29	0.00	366348.68	580912.23	N 32 0 25.59	W 104 12 20.37
	12000.00	89.81	359.46	9773.66	2466.61	2466.50	-23.23	0.00	366448.67	580911.29	N 32 0 26.58	W 104 12 20.38
	12100.00	89.81	359.46	9773.99	2566.61	2566.50	-24.17	0.00	366548.65	580910.35	N 32 0 27.57	W 104 12 20.39
	12200.00	89.81	359.46	9774.31	2666.61	2666.49	-25.11	0.00	366648.64	580909.41	N 32 0 28.56	W 104 12 20.40
	12300.00	89.81	359.46	9774.64	2766.61	2766.49	-26.05	0.00	366748.62	580908.47	N 32 0 29.55	W 104 12 20.41
	12400.00	89.81	359.46	9774.96	2866.61	2866.48	-26.99	0.00	366848.61	580907.53	N 32 0 30.54	W 104 12 20.42
	12500.00	89.81	359.46	9775.28	2966.61	2966.48	-27.93	0.00	366948.60	580906.59	N 32 0 31.53	W 104 12 20.43
	12600.00	89.81	359.46	9775.61	3066.61	3066.47	-28.87	0.00	367048.58	580905.65	N 32 0 32.52	W 104 12 20.44
	12700.00	89.81	359.46	9775.93	3166.61	3166.47	-29.81	0.00	367148.57	580904.71	N 32 0 33.51	W 104 12 20.45
	12800.00	89.81	359.46	9776.26	3266.61	3266.46	-30.75	0.00	367248.55	580903.77	N 32 0 34.50	W 104 12 20.46
	12900.00	89.81	359.46	9776.58	3366.60	3366.46	-31.69	0.00	367348.54	580902.83	N 32 0 35.49	W 104 12 20.46
	13000.00	89.81	359.46	9776.90	3466.60	3466.45	-32.63	0.00	367448.52	580901.89	N 32 0 36.47	W 104 12 20.47
	13100.00	89.81	359.46	9777.23	3566.60	3566.45	-33.57	0.00	367548.51	580900.95	N 32 0 37.46	W 104 12 20.48
	13200.00	89.81	359.46	9777.55	3666.60	3666.44	-34.51	0.00	367648.50	580900.01	N 32 0 38.45	W 104 12 20.49
	13300.00	89.81	359.46	9777.88	3766.60	3766.44	-35.45	0.00	367748.48	580899.07	N 32 0 39.44	W 104 12 20.50
	13400.00	89.81	359.46	9778.20	3866.60	3866.43	-36.39	0.00	367848.47	580898.13	N 32 0 40.43	W 104 12 20.51
	13500.00	89.81	359.46	9778.52	3966.60	3966.43	-37.33	0.00	367948.45	580897.19	N 32 0 41.42	W 104 12 20.52
	13600.00	89.81	359.46	9778.85	4066.60	4066.42	-38.27	0.00	368048.44	580896.26	N 32 0 42.41	W 104 12 20.53
	13700.00	89.81	359.46	9779.17	4166.60	4166.42	-39.21	0.00	368148.43	580895.32	N 32 0 43.40	W 104 12 20.54
	13800.00	89.81	359.46	9779.50	4266.60	4266.41	-40.15	0.00	368248.41	580894.38	N 32 0 44.39	W 104 12 20.55
	13900.00	89.81	359.46	9779.82	4366.60	4366.41	-41.08	0.00	368348.40	580893.44	N 32 0 45.38	W 104 12 20.56
	14000.00	89.81	359.46	9780.14	4466.60	4466.40	-42.02	0.00	368448.38	580892.50	N 32 0 46.37	W 104 12 20.57
	14100.00	89.81	359.46	9780.47	4566.60	4566.40	-42.96	0.00	368548.37	580891.56	N 32 0 47.36	W 104 12 20.58
	14200.00	89.81	359.46	9780.79	4666.60	4666.39	-43.90	0.00	368648.36	580890.62	N 32 0 48.35	W 104 12 20.59
	14300.00	89.81	359.46	9781.12	4766.60	4766.39	-44.84	0.00	368748.34	580889.69	N 32 0 49.34	W 104 12 20.60
	14400.00	89.81	359.46	9781.44	4866.60	4866.38	-45.78	0.00	368848.33	580888.75	N 32 0 50.33	W 104 12 20.61
	14500.00	89.81	359.46	9781.76	4966.60	4966.38	-46.71	0.00	368948.31	580887.81	N 32 0 51.32	W 104 12 20.62
	14600.00	89.81	359.46	9782.09	5066.60	5066.37	-47.65	0.00	369048.30	580886.87	N 32 0 52.31	W 104 12 20.63
	14700.00	89.81	359.46	9782.41	5166.60	5166.37	-48.59	0.00	369148.29	580885.93	N 32 0 53.30	W 104 12 20.64
	14800.00	89.81	359.46	9782.73	5266.59	5266.36	-49.53	0.00	369248.27	580885.00	N 32 0 54.29	W 104 12 20.65
	14900.00	89.81	359.46	9783.06	5366.59	5366.36	-50.47	0.00	369348.26	580884.06	N 32 0 55.28	W 104 12 20.66
	15000.00	89.81	359.46	9783.38	5466.59	5466.35	-51.40	0.00	369448.24	580883.12	N 32 0 56.26	W 104 12 20.67
	15100.00	89.81	359.46	9783.71	5566.59	5566.35	-52.34	0.00	369548.23	580882.18	N 32 0 57.25	W 104 12 20.67
	15200.00	89.81	359.46	9784.03	5666.59	5666.34	-53.28	0.00	369648.22	580881.25	N 32 0 58.24	W 104 12 20.68
	15300.00	89.81	359.46	9784.35	5766.59	5766.34	-54.22	0.00	369748.20	580880.31	N 32 0 59.23	W 104 12 20.69
	15400.00	89.81	359.46	9784.68	5866.59	5866.33	-55.15	0.00	369848.19	580879.37	N 32 1 0 22	W 104 12 20.70
	15500.00	89.81	359.46	9785.00	5966.59	5966.33	-56.09	0.00	369948.17	580878.43	N 32 1 1 21	W 104 12 20.71
	15600.00	89.81	359.46	9785.32	6066.59	6066.32	-57.03	0.00	370048.16	580877.50	N 32 1 2 20	W 104 12 20.72
	15700.00	89.81	359.46	9785.65	6166.59	6166.32	-57.96	0.00	370148.15	580876.56	N 32 1 3 19	W 104 12 20.73

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S °.′.″)	Longitude (E/W °.′.″)
	15800.00	89.81	359.46	9785.97	6266.59	6266.31	-58.90	0.00	370248.13	580875.62	N 32° 1′ 4.18″ W	104° 12′ 20.74″ E
	15900.00	89.81	359.46	9786.29	6366.59	6366.31	-59.84	0.00	370348.12	580874.69	N 32° 1′ 5.17″ W	104° 12′ 20.75″ E
	16000.00	89.81	359.46	9786.62	6466.59	6466.30	-60.77	0.00	370448.10	580873.75	N 32° 1′ 6.16″ W	104° 12′ 20.76″ E
	16100.00	89.81	359.46	9786.94	6566.59	6566.30	-61.71	0.00	370548.09	580872.82	N 32° 1′ 7.15″ W	104° 12′ 20.77″ E
	16200.00	89.81	359.46	9787.26	6666.59	6666.29	-62.65	0.00	370648.08	580871.88	N 32° 1′ 8.14″ W	104° 12′ 20.78″ E
	16300.00	89.81	359.46	9787.59	6766.59	6766.29	-63.58	0.00	370748.06	580870.94	N 32° 1′ 9.13″ W	104° 12′ 20.79″ E
	16400.00	89.81	359.46	9787.91	6866.59	6866.28	-64.52	0.00	370848.05	580870.01	N 32° 1′ 10.12″ W	104° 12′ 20.80″ E
Cimarex Medwick 32 Federal #12H PBHL	16427.43	89.81	359.46	9788.00	6894.01	6893.71	-64.78	0.00	370875.47	580869.75	N 32° 1′ 10.39″ W	104° 12′ 20.80″ E

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-STD-Depth Only	Original Borehole / Cimarex Medwick 32 Federal 12H Rev2
	1	24.000	16427.426	1/100.000	30.000	30.000	SLB_MWD-STD	Original Borehole / Cimarex Medwick 32 Federal 12H Rev2

CONDITIONS OF APPROVAL

Sundry dated 08/27/2014

OPERATOR'S NAME:	Cimarex Energy Co. of Colorado
LEASE NO.:	NMM-114350
WELL NAME & NO.:	Medwick 32 Federal Com 12H -30-015-42150
SURFACE HOLE FOOTAGE:	0210' FSL & 0710' FEL
BOTTOM HOLE FOOTAGE	0330' FNL & 0710' FEL Sec. 29, T. 26 S., R 27 E
LOCATION:	Section 32, T. 26 S., R 27 E., NMPM
COUNTY:	Eddy County, New Mexico

The original COAs still stand with the following drilling modifications:**I. DRILLING****A. DRILLING OPERATIONS REQUIREMENTS**

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Medium Cave/Karst

Possibility of water flows in the Castile and Delaware.

Possibility of lost circulation in the Salado and Delaware.

1. The **13-3/8** inch surface casing shall be set at approximately **400** feet and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt. Excess calculates to 10% - Additional cement may be required.**
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at approximately **1900** feet, is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

Pilot hole has been removed

3. The minimum required fill of cement behind the **7** inch production casing is:

☒ Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess calculates to 21 % - Additional cement may be required.**
4. The minimum required fill of cement behind the **4-1/2** inch production Liner is:

☒ Cement to tie back to **9683' (200' into previous casing)**. Operator shall provide method of verification. **Excess calculates to 10% - Additional cement shall be required.**
5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the**

company man's trailer and on the rig floor. If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi (Installing 5M test to 2,000 psi).**
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M) psi (Installing 5M test to 3,000 psi).**
5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7** production casing shoe shall be **5000 (5M) psi. 5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**
6. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer.** The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

- c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

EGF 082814