

5D Survey Report



NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 18 2017

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5D Survey Report

Cimarex Energy

Field Name: *Cimarex Nad 83 NMEZ*
Site Name: *Klein 33 Federal Com 10H*
Well Name: *Klein 33 Federal Com 10H*
Survey: *Definitive survey*

30-015-42182

26 September 2017

**Please provide signature
page for directional survey**



Weatherford®

5D Survey Report


Weatherford

Klein 33 Federal Com 10H

Field Name: Cimarex Nad 83 NMEZ	Map Units: US ft		Company Name: Cimarex Energy	
	Vertical Reference Datum (VRD): Mean Sea Level		Projected Coordinate System: NAD83 / New Mexico East (ftUS)	
Site: Klein 33 Federal Com 10H	Comment:			
	Units: US ft	North Reference: Grid	Convergence Angle: 0.08	
	Position:	Northing: 364064.96 US ft	Latitude: 32° 0' 2.92"	
		Easting: 586152.64 US ft	Longitude: -104° 11' 19.54"	
	Site TVD Reference: TVD relative to Mean Sea Level			
	Elevation above MSL: 3212.00 US ft			
	Comment: Eddy Co, NM			
Slot: Klein 33 Federal Com 10H	Position (Relative to Site Centre)			
	+N/-S: 0.00 US ft	Northing: 364064.96 US ft	Latitude: 32°0'2.92"	
	+E/-W: 0.00 US ft	Easting: 586152.64 US ft	Longitude: -104°11'19.54"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3212.00 US ft			
	Comment:			
Well: Klein 33 Federal Com 10H	Type: Main well		UWI:	
	File Number:	Comment:		
	Closure Distance: 6782.79US ft		Closure Azimuth: 1.16°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: 0.00 US ft	+E/-W: 0.00 US ft	Az: 1.16°	

Drill floor: Survey Name: Definitive Survey			
Rig Height (Drill Floor): 23.00us ft	Elevation above MSL: 3235.00us ft	Inclination: 0.00°	Azimuth: 0.00°

Survey Name:Definitive Survey			
Date: 23/Aug/2017	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:
Magnetic Model:			
Model Name: bggm2017	Date: 31/Aug/2017	Field Strength: 47791.4nT	Declination: 7.29° Dip: 59.71°
Tie Point:			
MD: 0.00 US ft	Inclination: 0.00°	Azimuth: 0.00°	TVD: 0.00 US ft
			North Offset: 0.00 US ft
			East Offset: 0.00 US ft

Survey Tool Ranges:			
Name	Start MD(USft)	End MD(USft)	Source Survey
MWD	0.00	322.00	Extreme Svy 1
MWD	322.00	1919.00	Extreme Svy 2
MWD	1919.00	6893.00	Extreme Svy 3
MWD	6893.00	7223.00	WFT Svy 1
MWD	7223.00	7380.00	WFT Svy 2

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Survey Tool Ranges:			
Name	Start MD(USft)	End MD(USft)	Source Survey
MWD	7380.00	7727.00	WFT Svy 3
MWD	7727.00	11385.00	WFT Svy 4
MWD	11385.00	12608.00	WFT Svy 5
MWD	12608.00	14089.00	WFT Svy 6

Casing Points: (Relative to Slot centre)(TVD relative to Drill Floor)								
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name
1986.00	0.73	108.52	1985.38	-7.03	-1.72	364057.93	586150.92	9 5/8 in

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)														
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	364064.9 6	586152.6 4	0.00		0.00	0.00	0.00	
23.00	0.00	0.00	23.00	0.00	0.00	0.00	364064.9 6	586152.6 4	0.00		0.00	0.00	0.00	
187.00	2.12	129.32	186.96	-1.87	-1.92	2.35	364063.0 4	586154.9 9	1.29	First Slib Svy	0.00	-0.00	0.00	
236.00	2.00	122.81	235.93	-2.88	-2.96	3.77	364062.0 0	586156.4 1	0.54		0.00	-0.00	0.00	
322.00	2.21	121.39	321.87	-4.51	-4.64	6.44	364060.3 2	586159.0 8	0.25		0.00	-0.00	0.00	
450.00	2.12	121.52	449.78	-6.94	-7.16	10.57	364057.8 0	586163.2 1	0.07		0.00	-0.00	0.00	
480.00	2.12	123.11	479.76	-7.52	-7.75	11.51	364057.2 1	586164.1 5	0.20		0.00	-0.00	0.00	
570.00	1.28	112.09	569.72	-8.76	-9.04	13.83	364055.9 2	586166.4 7	1.00		0.00	-0.00	0.00	
661.00	0.62	64.01	660.71	-8.90	-9.21	15.22	364055.7 5	586167.8 6	1.08		0.00	-0.00	0.00	
751.00	1.59	329.12	750.70	-7.62	-7.92	15.01	364057.0 4	586167.6 5	1.95		0.00	-0.00	0.00	
842.00	2.30	313.52	841.64	-5.32	-5.58	13.04	364059.3 8	586165.6 8	0.97		0.00	-0.00	0.00	
937.00	1.81	302.51	936.58	-3.25	-3.46	10.39	364061.5 0	586163.0 3	0.66		0.00	-0.00	0.00	
1032.00	0.88	271.13	1031.56	-2.47	-2.64	8.40	364062.3 2	586161.0 4	1.21		0.00	-0.00	0.00	
1128.00	0.80	278.00	1127.55	-2.39	-2.53	7.00	364062.4 3	586159.6 4	0.13		0.00	-0.00	0.00	
1222.00	1.41	285.41	1221.53	-2.03	-2.13	5.23	364062.8 3	586157.8 7	0.67		0.00	-0.00	0.00	
1316.00	1.50	249.41	1315.50	-2.20	-2.26	2.97	364062.7 0	586155.6 1	0.96		0.00	-0.00	0.00	
1411.00	1.81	236.23	1410.46	-3.52	-3.53	0.56	364061.4 3	586153.2 0	0.51		0.00	-0.00	0.00	
1506.00	1.68	241.43	1505.42	-5.07	-5.03	-1.91	364059.9 3	586150.7 3	0.22		0.00	-0.00	0.00	
1601.00	0.80	224.02	1600.39	-6.25	-6.17	-3.60	364058.7 9	586149.0 4	1.00		0.00	-0.00	0.00	
1696.00	0.60	102.01	1695.39	-6.83	-6.75	-3.57	364058.2 1	586149.0 7	1.29		0.00	-0.00	0.00	
1791.00	0.49	313.92	1790.39	-6.64	-6.58	-3.38	364058.3 8	586149.2 6	1.10		0.00	-0.00	0.00	
1886.00	0.80	116.31	1885.39	-6.65	-6.59	-3.08	364058.3 7	586149.5 6	1.34		0.00	-0.00	0.00	
1919.00	0.88	105.13	1918.38	-6.81	-6.76	-2.63	364058.2 0	586150.0 1	0.55		0.00	-0.00	0.00	
1986.00	0.73	108.52	1985.38	-7.06	-7.03	-1.72	364057.9 3	586150.9 2	0.23	9 5/8 in	0.00	-0.00	0.00	
2040.00	0.62	112.40	2039.37	-7.27	-7.25	-1.12	364057.7 1	586151.5 2	0.23		0.00	-0.00	0.00	
2071.00	0.80	97.59	2070.37	-7.35	-7.34	-0.75	364057.6 2	586151.8 9	0.82		0.00	-0.00	0.00	
2166.00	0.31	93.01	2165.36	-7.44	-7.44	0.16	364057.5 2	586152.8 0	0.52		0.00	-0.00	0.00	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (%/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)
2260.00	0.22	113.10	2259.36	-7.51	-7.53	0.58	364057.4 3	586153.2 2	0.14		0.00	-0.00	0.00
2356.00	0.62	137.83	2355.36	-7.96	-7.98	1.10	364056.9 8	586153.7 4	0.45		0.00	-0.00	0.00
2451.00	0.62	108.21	2450.36	-8.48	-8.53	1.93	364056.4 3	586154.5 7	0.33		0.00	-0.00	0.00
2545.00	1.50	110.59	2544.34	-9.04	-9.12	3.57	364055.8 4	586156.2 1	0.94		0.00	-0.00	0.00
2640.00	1.99	90.10	2639.30	-9.43	-9.56	6.38	364055.4 0	586159.0 2	0.83		0.00	-0.00	0.00
2735.00	3.40	93.71	2734.19	-9.52	-9.74	10.84	364055.2 2	586163.4 8	1.49		0.00	-0.00	0.00
2830.00	2.92	107.02	2829.04	-10.31	-10.63	15.97	364054.3 3	586168.6 1	0.92		0.00	-0.00	0.00
2924.00	2.30	103.50	2922.95	-11.36	-11.77	20.09	364053.1 9	586172.7 3	0.68		0.00	-0.00	0.00
3019.00	2.21	107.90	3017.87	-12.30	-12.78	23.69	364052.1 8	586176.3 3	0.21		0.00	-0.00	0.00
3113.00	2.30	95.12	3111.80	-12.95	-13.51	27.29	364051.4 5	586179.9 3	0.54		0.00	-0.00	0.00
3208.00	1.90	96.71	3206.74	-13.24	-13.86	30.75	364051.1 0	586183.3 9	0.43		0.00	-0.00	0.00
3303.00	2.70	101.82	3301.66	-13.80	-14.50	34.51	364050.4 6	586187.1 5	0.87		0.00	-0.00	0.00
3398.00	2.70	99.71	3396.55	-14.55	-15.34	38.90	364049.6 2	586191.5 4	0.10		0.00	-0.00	0.00
3493.00	2.52	90.72	3491.46	-14.87	-15.74	43.20	364049.2 2	586195.8 4	0.47		0.00	-0.00	0.00
3588.00	1.90	87.02	3586.39	-14.74	-15.69	46.86	364049.2 7	586199.5 0	0.67		0.00	-0.00	0.00
3682.00	1.81	101.21	3680.34	-14.88	-15.90	49.87	364049.0 6	586202.5 1	0.50		0.00	-0.00	0.00
3777.00	1.59	83.80	3775.30	-14.98	-16.04	52.65	364048.9 2	586205.2 9	0.59		0.00	-0.00	0.00
3871.00	1.68	92.52	3869.26	-14.84	-15.96	55.32	364049.0 0	586207.9 6	0.28		0.00	-0.00	0.00
3966.00	1.68	84.50	3964.22	-14.71	-15.89	58.10	364049.0 7	586210.7 4	0.25		0.00	-0.00	0.00
4060.00	2.12	94.42	4058.16	-14.65	-15.89	61.21	364049.0 7	586213.8 5	0.58		0.00	-0.00	0.00
4154.00	2.21	100.32	4152.10	-15.04	-16.35	64.72	364048.6 1	586217.3 6	0.26		0.00	-0.00	0.00
4248.00	2.21	90.32	4246.03	-15.30	-16.69	68.32	364048.2 7	586220.9 6	0.41		0.00	-0.00	0.00
4343.00	2.12	96.49	4340.96	-15.44	-16.90	71.90	364048.0 6	586224.5 4	0.26		0.00	-0.00	0.00
4437.00	1.99	100.10	4434.90	-15.85	-17.38	75.23	364047.5 8	586227.8 7	0.20		0.00	-0.00	0.00
4531.00	1.81	109.01	4528.85	-16.56	-18.15	78.24	364046.8 1	586230.8 8	0.37		0.00	-0.00	0.00
4626.00	1.68	110.72	4623.80	-17.49	-19.13	80.96	364045.8 3	586233.6 0	0.15		0.00	-0.00	0.00
4720.00	2.39	111.83	4717.74	-18.64	-20.35	84.07	364044.6 1	586236.7 1	0.76		0.00	-0.00	0.00
4815.00	2.12	108.70	4812.67	-19.87	-21.65	87.57	364043.3 1	586240.2 1	0.31		0.00	-0.00	0.00
4910.00	2.52	106.23	4907.59	-20.94	-22.79	91.24	364042.1 7	586243.8 8	0.43		0.00	-0.00	0.00
5005.00	2.21	102.70	5002.51	-21.85	-23.78	95.04	364041.1 8	586247.6 8	0.36		0.00	-0.00	0.00
5101.00	2.21	108.83	5098.44	-22.78	-24.78	98.59	364040.1 8	586251.2 3	0.25		0.00	-0.00	0.00
5195.00	2.78	101.12	5192.35	-23.73	-25.81	102.55	364039.1 5	586255.1 9	0.70		0.00	-0.00	0.00
5290.00	2.78	107.33	5287.24	-24.77	-26.94	107.00	364038.0 2	586259.6 4	0.32		0.00	-0.00	0.00
5384.00	2.39	110.72	5381.14	-26.06	-28.31	111.01	364036.6 5	586263.6 5	0.45		0.00	-0.00	0.00
5479.00	2.30	105.52	5476.06	-27.19	-29.52	114.70	364035.4 4	586267.3 4	0.24		0.00	-0.00	0.00

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)
5573.00	1.68	96.80	5570.01	-27.80	-30.19	117.89	364034.7 7	586270.5 3	0.73		0.00	-0.00	0.00
5668.00	1.68	107.99	5664.97	-28.34	-30.79	120.60	364034.1 7	586273.2 4	0.34		0.00	-0.00	0.00
5762.00	1.19	87.02	5758.94	-28.67	-31.16	122.88	364033.8 0	586275.5 2	0.76		0.00	-0.00	0.00
5856.00	1.68	75.29	5852.91	-28.22	-30.76	125.19	364034.2 0	586277.8 3	0.61		0.00	-0.00	0.00
5949.00	2.52	96.49	5945.85	-28.04	-30.64	128.54	364034.3 2	586281.1 8	1.22		0.00	-0.00	0.00
6043.00	1.90	91.42	6039.78	-28.24	-30.92	132.15	364034.0 4	586284.7 9	0.69		0.00	-0.00	0.00
6137.00	1.99	79.22	6133.72	-27.90	-30.65	135.31	364034.3 1	586287.9 5	0.45		0.00	-0.00	0.00
6232.00	1.90	76.79	6228.67	-27.17	-29.98	138.47	364034.9 8	586291.1 1	0.13		0.00	-0.00	0.00
6326.00	1.68	80.89	6322.62	-26.54	-29.41	141.34	364035.5 5	586293.9 8	0.27		0.00	-0.00	0.00
6421.00	2.70	99.22	6417.55	-26.61	-29.55	144.93	364035.4 1	586297.5 7	1.29		0.00	-0.00	0.00
6514.00	1.19	58.11	6510.50	-26.39	-29.39	147.91	364035.5 7	586300.5 5	2.11		0.00	-0.00	0.00
6609.00	1.81	23.69	6605.47	-24.46	-27.49	149.35	364037.4 7	586301.9 9	1.12		0.00	-0.00	0.00
6704.00	1.10	30.39	6700.44	-22.28	-25.33	150.41	364039.6 3	586303.0 5	0.77		0.00	-0.00	0.00
6870.00	0.31	331.19	6866.42	-20.50	-23.56	151.00	364041.4 0	586303.6 4	0.59		0.00	-0.00	0.00
6893.00	0.22	353.01	6889.42	-20.40	-23.46	150.97	364041.5 0	586303.6 1	0.58	Tie On Extreme	0.00	-0.00	0.00
6908.00	0.36	319.02	6904.42	-20.34	-23.40	150.93	364041.5 6	586303.5 7	1.44		0.00	-0.00	0.00
7002.00	4.33	357.66	6998.33	-16.58	-19.63	150.59	364045.3 3	586303.2 3	4.31		0.00	-0.00	0.00
7033.00	7.77	0.44	7029.15	-13.31	-16.36	150.56	364048.6 0	586303.2 0	11.13		0.00	-0.00	0.00
7065.00	10.69	3.26	7060.73	-8.18	-11.24	150.75	364053.7 2	586303.3 9	9.23		0.00	-0.00	0.00
7097.00	13.91	5.89	7092.00	-1.38	-4.45	151.31	364060.5 1	586303.9 5	10.21		0.00	-0.00	0.00
7128.00	16.65	7.65	7121.90	6.75	3.66	152.29	364068.6 2	586304.9 3	8.96		0.00	-0.00	0.00
7160.00	19.17	9.04	7152.34	16.51	13.40	153.72	364078.3 6	586306.3 6	7.99		0.00	-0.00	0.00
7191.00	22.01	10.20	7181.36	27.29	24.14	155.55	364089.1 0	586308.1 9	9.25		0.00	-0.00	0.00
7223.00	24.63	10.89	7210.74	39.78	36.59	157.87	364101.5 5	586310.5 1	8.23		0.00	-0.00	0.00
7235.00	25.60	10.84	7221.61	44.80	41.60	158.83	364106.5 6	586311.4 7	8.10	FTP(7235' MD)	0.00	0.00	0.00
7255.00	27.22	10.77	7239.52	53.57	50.33	160.50	364115.2 9	586313.1 4	8.10		0.00	-0.00	0.00
7286.00	29.80	10.51	7266.76	68.17	64.88	163.23	364129.8 4	586315.8 7	8.33		0.00	-0.00	0.00
7317.00	33.43	10.95	7293.15	84.19	80.84	166.26	364145.8 0	586318.9 0	11.73		0.00	-0.00	0.00
7349.00	36.71	9.27	7319.34	102.35	98.94	169.48	364163.9 0	586322.1 2	10.68		0.00	-0.00	0.00
7380.00	40.31	8.17	7343.60	121.48	118.01	172.39	364182.9 7	586325.0 3	11.82		0.00	-0.00	0.00
7412.00	44.36	6.98	7367.25	142.89	139.37	175.23	364204.3 3	586327.8 7	12.90		0.00	-0.00	0.00
7444.00	48.41	5.54	7389.32	165.96	162.40	177.74	364227.3 6	586330.3 8	13.07		0.00	-0.00	0.00
7475.00	52.88	4.46	7408.97	189.87	186.27	179.82	364251.2 3	586332.4 6	14.67		0.00	-0.00	0.00
7506.00	57.78	3.98	7426.60	215.32	211.69	181.69	364276.6 5	586334.3 3	15.86		0.00	-0.00	0.00
7538.00	62.42	3.56	7442.55	243.03	239.36	183.52	364304.3 2	586336.1 6	14.54		0.00	-0.00	0.00

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)
7570.00	66.82	3.04	7456.26	271.91	268.22	185.18	364333.1 8	586337.8 2	13.83		0.00	-0.00	0.00
7601.00	71.33	1.27	7467.33	300.86	297.15	186.26	364362.1 1	586338.9 0	15.49		0.00	-0.00	0.00
7633.00	75.92	359.32	7476.35	331.54	327.84	186.41	364392.8 0	586339.0 5	15.49		0.00	-0.00	0.00
7664.00	80.51	358.35	7482.68	361.86	358.17	185.79	364423.1 3	586338.4 3	15.12		0.00	-0.00	0.00
7696.00	85.45	358.53	7486.59	393.57	389.91	184.93	364454.8 7	586337.5 7	15.45		0.19	-0.05	0.18
7727.00	88.53	359.15	7488.21	424.50	420.85	184.30	364485.8 1	586336.9 4	10.13		0.65	0.27	0.59
7795.50	89.78	358.56	7489.23	492.93	489.33	182.93	364554.2 9	586335.5 7	2.02	Cross Lot 1 line (7795.50' MD)	2.57	1.80	1.83
7800.00	89.86	358.52	7489.24	497.43	493.83	182.82	364558.7 9	586335.4 6	2.02		2.71	1.89	1.93
7891.00	90.35	358.81	7489.07	588.34	584.81	180.70	364649.7 7	586333.3 4	0.63		5.03	3.31	3.78
7986.00	90.00	0.04	7488.78	683.30	679.80	179.74	364744.7 6	586332.3 8	1.35		6.46	4.68	4.46
8081.00	90.56	0.69	7488.32	778.29	774.79	180.35	364839.7 5	586332.9 9	0.90		6.87	5.87	3.57
8175.00	90.84	1.68	7487.17	872.28	868.77	182.29	364933.7 3	586334.9 3	1.09		6.51	6.37	1.35
8270.00	92.17	1.71	7484.68	967.24	963.69	185.10	365028.6 5	586337.7 4	1.40		5.80	5.53	-1.74
8364.00	92.31	1.37	7481.00	1061.16	1057.58	187.63	365122.5 4	586340.2 7	0.39		5.73	3.50	-4.54
8459.00	92.24	1.37	7477.23	1156.09	1152.48	189.90	365217.4 4	586342.5 4	0.07		7.23	1.39	-7.10
8554.00	90.00	359.66	7475.37	1251.06	1247.45	190.75	365312.4 1	586343.3 9	2.97		8.32	1.18	-8.23
8649.00	89.65	359.54	7475.66	1346.02	1342.45	190.09	365407.4 1	586342.7 3	0.39	8.32	2.09	-8.05	
8744.00	89.51	359.35	7476.36	1440.97	1437.44	189.17	365502.4 0	586341.8 1	0.25	8.13	1.87	-7.91	
8839.00	89.65	359.48	7477.06	1535.93	1532.43	188.20	365597.3 9	586340.8 4	0.20	7.90	1.66	-7.73	
8933.00	89.79	359.66	7477.52	1629.89	1626.43	187.49	365691.3 9	586340.1 3	0.24	7.89	1.21	-7.79	
9026.00	89.58	359.69	7478.03	1722.86	1719.43	186.96	365784.3 9	586339.6 0	0.23	8.07	0.83	-8.03	
9120.00	89.51	359.60	7478.77	1816.82	1813.42	186.38	365878.3 8	586339.0 2	0.12	8.25	0.67	-8.22	
9214.00	89.86	0.06	7479.29	1910.79	1907.42	186.10	365972.3 8	586338.7 4	0.61	8.72	0.28	-8.72	
9309.00	90.28	0.56	7479.17	2005.78	2002.42	186.62	366067.3 8	586339.2 6	0.69	10.04	-0.75	-10.01	
9403.00	90.28	359.31	7478.72	2099.76	2096.41	186.51	366161.3 7	586339.1 5	1.33	10.89	-2.12	-10.68	
9498.00	89.44	359.26	7478.95	2194.71	2191.40	185.32	366256.3 6	586337.9 6	0.89	10.65	-2.80	-10.28	
9592.00	88.81	359.17	7480.38	2288.64	2285.38	184.04	366350.3 4	586336.6 8	0.68	10.02	-2.27	-9.76	
9687.00	88.81	359.14	7482.36	2383.56	2380.35	182.63	366445.3 1	586335.2 7	0.03	9.22	-1.21	-9.14	
9782.00	88.53	359.28	7484.56	2478.48	2475.32	181.33	366540.2 8	586333.9 7	0.33	8.62	0.08	-8.62	
9877.00	89.93	359.31	7485.84	2573.42	2570.30	180.16	366635.2 6	586332.8 0	1.47	8.24	0.44	-8.23	
9968.00	90.07	359.12	7485.84	2664.37	2661.29	178.91	366726.2 5	586331.5 5	0.26	7.74	-0.43	-7.73	
10063.00	90.28	358.82	7485.55	2759.30	2756.28	177.20	366821.2 4	586329.8 4	0.39	7.00	-1.64	-6.80	
10156.00	89.02	358.24	7486.12	2852.20	2849.24	174.82	366914.2 0	586327.4 6	1.49	5.54	-1.96	-5.18	
10251.00	89.58	357.98	7487.28	2947.05	2944.18	171.68	367009.1 4	586324.3 2	0.65	3.31	-1.72	-2.83	

5D Survey Report

Survey Points (Relative to Slot centre)(TVD relative to Drill Floor)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (%/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)
10346.00	89.93	357.86	7487.68	3041.90	3039.12	168.24	367104.0 8	586320.8 8	0.39		2.23	-2.23	-0.17
10440.00	89.09	358.79	7488.49	3135.78	3133.07	165.49	367198.0 3	586318.1 3	1.33		2.95	-2.33	1.81
10535.00	89.16	358.73	7489.94	3230.69	3228.04	163.43	367293.0 0	586316.0 7	0.10		3.57	-1.79	3.08
10629.00	89.02	358.58	7491.43	3324.59	3322.00	161.23	367386.9 6	586313.8 7	0.22		4.67	-1.21	4.51
10724.00	87.06	358.78	7494.68	3419.44	3416.92	159.04	367481.8 8	586311.6 8	2.07		6.03	1.13	5.92
10819.00	89.09	359.38	7497.87	3514.31	3511.85	157.52	367576.8 1	586310.1 6	2.23		7.48	3.41	6.66
10913.00	89.79	359.44	7498.79	3608.27	3605.84	156.55	367670.8 0	586309.1 9	0.75		7.81	3.74	6.86
11007.00	90.00	359.53	7498.96	3702.23	3699.83	155.70	367764.7 9	586308.3 4	0.24		7.88	3.77	6.93
11102.00	90.07	359.32	7498.90	3797.18	3794.83	154.75	367859.7 9	586307.3 9	0.23		7.94	3.56	7.09
11196.00	90.49	359.48	7498.44	3891.14	3888.82	153.76	367953.7 8	586306.4 0	0.48		7.88	2.96	7.30
11291.00	90.77	359.43	7497.40	3986.09	3983.81	152.86	368048.7 7	586305.5 0	0.30		7.63	1.76	7.42
11385.00	90.77	359.03	7496.14	4080.03	4077.79	151.60	368142.7 5	586304.2 4	0.43		7.91	0.36	7.90
11474.00	91.19	0.27	7494.61	4168.98	4166.78	151.05	368231.7 4	586303.6 9	1.47		7.82	-1.31	7.71
11569.00	90.00	0.11	7493.63	4263.96	4261.77	151.37	368326.7 3	586304.0 1	1.26		7.05	-2.44	6.61
11664.00	90.14	0.37	7493.51	4358.95	4356.77	151.77	368421.7 3	586304.4 1	0.31		6.06	-2.71	5.43
11759.00	89.65	0.45	7493.68	4453.94	4451.76	152.45	368516.7 2	586305.0 9	0.52		4.78	-2.68	3.96
11854.00	89.65	0.66	7494.27	4548.93	4546.76	153.37	368611.7 2	586306.0 1	0.22		3.18	-2.25	2.26
11948.00	90.35	0.91	7494.27	4642.93	4640.75	154.66	368705.7 1	586307.3 0	0.79		2.40	-2.39	0.19
12042.00	90.63	1.26	7493.46	4736.93	4734.73	156.43	368799.6 9	586309.0 7	0.48		4.09	-3.34	-2.36
12137.00	89.93	0.52	7493.00	4831.92	4829.71	157.91	368894.6 7	586310.5 5	1.07		6.09	-3.96	-4.62
12229.00	90.35	0.66	7492.77	4923.92	4921.71	158.86	368986.6 7	586311.5 0	0.48		7.67	-4.32	-6.33
12324.00	89.65	359.81	7492.77	5018.90	5016.71	159.25	369081.6 7	586311.8 9	1.16		8.74	-4.47	-7.51
12419.00	89.51	359.27	7493.47	5113.86	5111.70	158.48	369176.6 6	586311.1 2	0.59		8.49	-3.92	-7.53
12514.00	89.79	358.42	7494.05	5208.78	5206.68	156.57	369271.6 4	586309.2 1	0.94		7.29	-3.49	-6.40
12608.00	90.35	358.40	7493.93	5302.67	5300.64	153.96	369365.6 0	586306.6 0	0.60		5.91	-3.75	-4.57
12706.00	89.86	358.75	7493.75	5400.57	5398.61	151.52	369463.5 7	586304.1 6	0.61		5.04	-4.09	-2.94
12801.00	90.98	358.86	7493.06	5495.49	5493.59	149.54	369558.5 5	586302.1 8	1.18		5.23	-4.93	-1.75
12896.00	89.72	359.17	7492.48	5590.42	5588.57	147.91	369653.5 3	586300.5 5	1.37		5.73	-5.66	-0.90
12991.00	89.58	359.57	7493.06	5685.37	5683.56	146.87	369748.5 2	586299.5 1	0.45		5.27	-5.23	-0.64
13086.00	88.46	359.61	7494.68	5780.32	5778.54	146.19	369843.5 0	586298.8 3	1.18		3.82	-3.75	-0.75
13181.00	89.23	359.47	7496.60	5875.26	5873.52	145.42	369938.4 8	586298.0 6	0.82		2.13	-1.98	-0.77
13276.00	90.35	359.55	7496.95	5970.22	5968.51	144.61	370033.4 7	586297.2 5	1.18		1.93	-1.78	-0.74
13371.00	89.44	359.72	7497.12	6065.18	6063.51	144.01	370128.4 7	586296.6 5	0.97		1.99	-1.76	-0.92
13466.00	88.18	359.54	7499.09	6160.13	6158.49	143.39	370223.4 5	586296.0 3	1.34		1.10	0.07	-1.10
13559.00	88.53	359.75	7501.76	6253.06	6251.45	142.82	370316.4 1	586295.4 6	0.44		2.89	2.59	-1.29

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)													
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100US ft)	Comment	Dist to Plan (US ft)	High to Plan (US ft)	Right to Plan (US ft)
13654.00	89.37	359.78	7503.50	6348.01	6346.43	142.43	370411.3 9	586295.0 7	0.88		4.51	4.18	-1.68
13749.00	90.14	359.58	7503.91	6442.98	6441.43	141.90	370506.3 9	586294.5 4	0.84		4.85	4.44	-1.94
13844.00	90.00	359.57	7503.79	6537.94	6536.42	141.19	370601.3 8	586293.8 3	0.15		4.64	4.18	-2.02
13938.00	89.86	359.11	7503.91	6631.89	6630.42	140.11	370695.3 8	586292.7 5	0.51		4.49	4.15	-1.71
14020.00	90.70	359.15	7503.51	6713.84	6712.41	138.86	370777.3 7	586291.5 0	1.03	Last Svy	3.79	3.62	-1.15
14089.00	90.70	359.15	7502.66	6782.79	6781.39	137.84	370846.3 5	586290.4 8	0.00	PTB	2.75	2.67	-0.69

Formation Points: (Relative to Slot centre)(TVD relative to Drill Floor)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name	Comment		
N/A	2.14	98.63	7562.00	-14.00	31.74	364050.96	586184.38	3rd BS Limestone			
0.00	0.00	0.00	0.00	0.00	0.00	364064.96	586152.64	Rustler			
1452.56	1.75	238.41	1452.00	-4.23	-0.53	364060.73	586152.11	Safado (Top Salt)			
1952.62	0.81	106.68	1952.00	-6.89	-2.15	364058.07	586150.49	Castille (Base Salt)			
2052.63	0.69	105.44	2052.00	-7.29	-0.99	364057.67	586151.65	Bell Canyon (Delaware)			
3073.17	2.25	100.41	3072.00	-13.29	25.72	364051.67	586178.36	Cherry Canyon			
4163.91	2.21	99.27	4162.00	-16.42	65.10	364048.54	586217.74	Brushy Canyon			
5519.96	2.02	102.38	5517.00	-29.90	116.20	364035.06	586268.84	Brushy Canyon Lower			
5720.05	1.39	98.19	5717.00	-31.11	121.95	364033.85	586274.59	Bone Spring			
5945.15	2.48	95.91	5942.00	-30.63	128.37	364034.33	586281.01	Bone Spring "A" Shale			
6300.37	1.74	79.67	6297.00	-29.54	140.59	364035.42	586293.23	Bone Spring "C" Shale			
6645.55	1.53	25.53	6642.00	-26.52	149.79	364038.44	586302.43	1st Bone Spring Ss			
7175.59	20.60	9.66	7167.00	18.63	154.58	364083.59	586307.22	2nd Bone Spring Ss			
10655.03	88.48	358.63	7492.00	3348.02	160.59	367412.98	586313.23	2nd BS Ss Horz Target			