

HOBBS OCD
APR 26 2018
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Joint Resources

DrilTech L.L.C.

Hadaway Consulting & Eng. LLC
 Site: Joint Resources Co. - LEA Cnty, NM (NAD 83)
 Well: Well 4H
 Wellbore: Wellbore #1
 Plan: Plan #4
 Norton 2

SURFACE LOCATION
 US State Plane 1983
 New Mexico Eastern Zone
 Elevation: GL 3635' + 17' RKB @ 3652.00ft (Norton 2)
 Commander 4H
 Latitude 32.786°N
 Longitude 103.089°W
 Northing 651859.00
 Easting 923741.90

DESIGN TARGET DETAILS

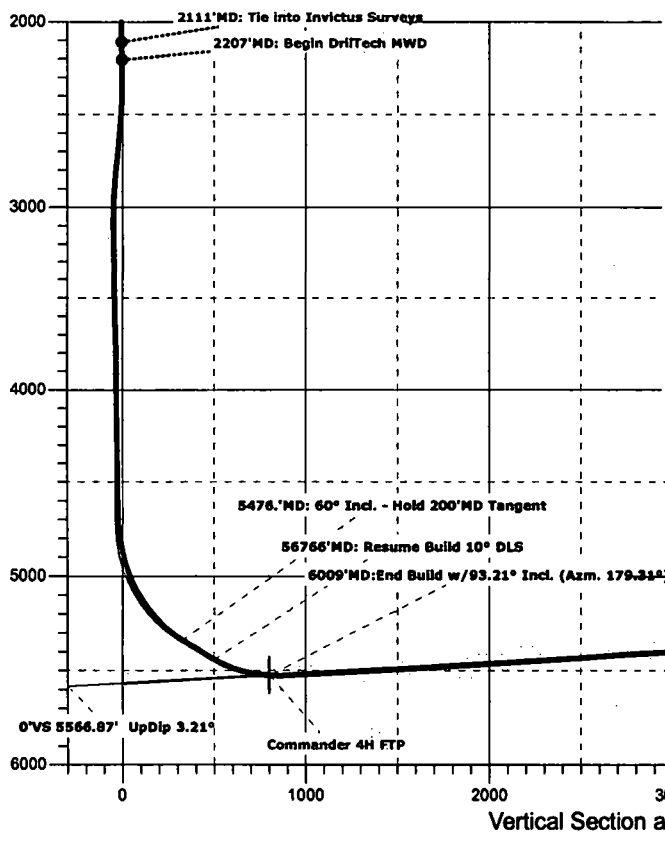
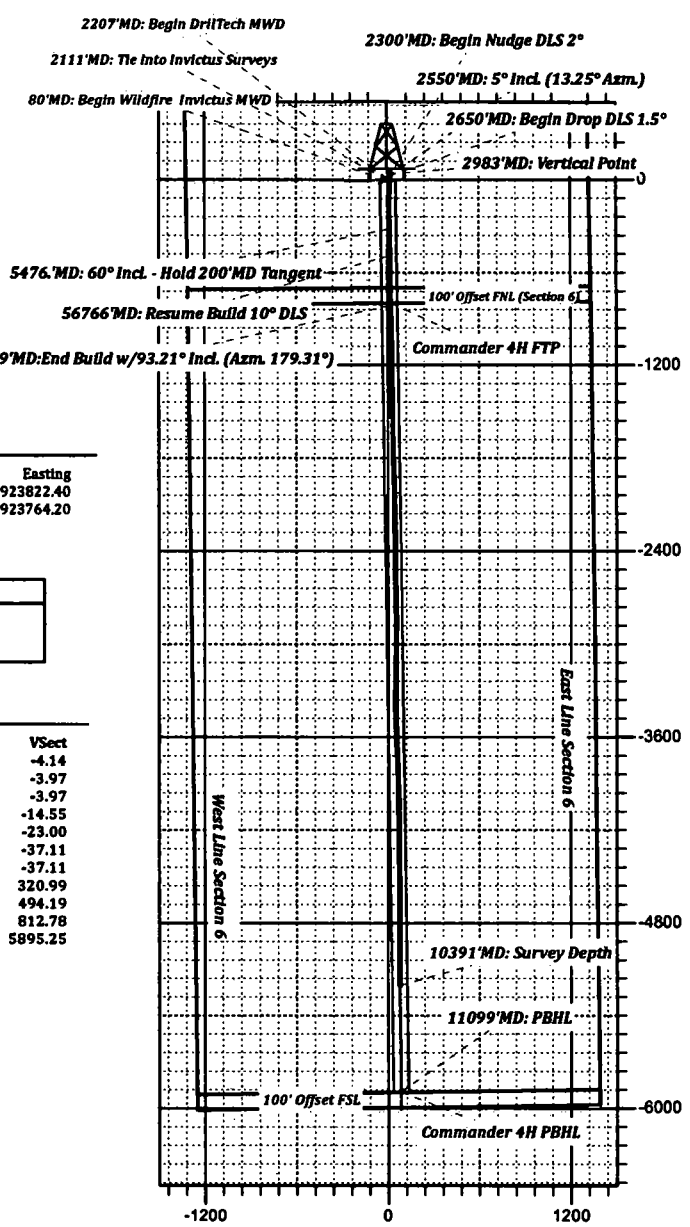
Name	TVD	+N/-S	+E/-W	Northing	Easting
Commander 4H PBHL	5236.00	-5894.71	80.50	645964.30	923822.40
Commander 4H FTP	5522.00	-799.80	22.30	651059.20	923764.20

FORMATION TOP DETAILS

Formation	DipAngle	DipDir
0°VS 5566.87' UpDip 3.21°	-3.21	179.31

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
2111.00	0.60	177.98	2110.82	4.16	1.20	0.00	0.00	-4.14
2145.00	0.00	0.00	2144.82	3.98	1.21	1.76	180.00	-3.97
2300.00	0.00	0.00	2299.82	3.98	1.21	0.00	0.00	-3.97
2550.00	5.00	13.25	2549.51	14.59	3.71	2.00	13.25	-14.55
2650.00	5.00	13.25	2649.13	23.08	5.71	0.00	0.00	-23.00
2983.33	0.00	0.00	2982.04	37.22	9.04	1.50	-180.00	-37.11
4726.48	0.00	0.00	4725.18	37.22	9.04	0.00	0.00	-37.11
5476.48	60.00	179.31	5345.43	-320.85	13.35	8.00	179.31	320.99
5676.48	60.00	179.31	5445.43	-494.04	15.44	0.00	0.00	494.19
6008.61	93.21	179.31	5521.29	-812.61	19.27	10.00	0.00	812.78
11099.08	93.21	179.31	5236.00	-5894.71	80.48	0.00	0.00	5895.25



to Correct Azimuth to Grid North
 True North: -0.67°
 Magnetic North: 5.98°
 Magnetic Field
 Strength: 48194.3enT
 Dip Angle: 60.63°
 Date: 6/1/2018
 Model: IGRF2016



Vertical Section at 179.31° (1000 ft/in)

Survey Report

Company: Hadaway Consulting & Eng. LLC	Local Co-ordinate Reference: Well Well 4H	Well Well 4H
Project: Joint Resources Co. - LEA Cnty, NM (NAD 83)	TVD Reference: GL 3835' + 17' RKB @ 3652.00ft (Norton 2)	GL 3835' + 17' RKB @ 3652.00ft (Norton 2)
Site: Commander 4H	MD Reference: GL 3835' + 17' RKB @ 3652.00ft (Norton 2)	Grid
Well: Well 4H	North Reference: Grid	
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature	
Design: Wellbore #1	Database: EDM 5000.14 Single User Db	

Project	Joint Resources Co. - LEA Cnty, NM (NAD 83), Lea County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Commander 4H		
Site Position:	Northing:	651,859.00 usft	Latitude: 32.786°N
From: Map	Easting:	923,741.90 usft	Longitude: 103.089°W
Position Uncertainty:	0.00 ft	Slot Radius: 13.200 in	Grid Convergence: 0.67 °

Well	Well 4H		
Well Position	+N/-S	0.00 ft	Northing: 651,859.00 usft
	+E/-W	0.00 ft	Easting: 923,741.90 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
			Latitude: 32.786°N
			Longitude: 103.089°W
			Ground Level: 3,635.00 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	8/31/2018	(°) 6.63
			Dip Angle (°) 60.63
			Field Strength (nT) 48,194.33848047

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase: ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction (°) 179.31

Survey Program	Date 9/17/2018		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
80.00	2,111.00	Invictus MWD (Wellbore #1)	MWD
2,207.00	10,391.00	DriTech MWD (Wellbore #1)	MWD
			Description
			MWD - Standard
			MWD - Standard

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80.00	0.90	113.98	80.00	-0.26	0.57	0.26	1.13	1.13	0.00
80'MD: Begin Wildfire Invictus MWD									
174.00	0.30	323.98	173.99	-0.36	1.10	0.37	1.24	-0.64	-159.57
261.00	1.40	8.98	260.98	0.88	1.10	-0.87	1.38	1.28	49.43
354.00	1.00	348.98	353.96	2.81	1.08	-2.79	0.59	-0.43	-19.35
443.00	0.20	261.98	442.96	3.55	0.78	-3.54	1.13	-0.90	-97.75
538.00	1.00	354.98	537.95	4.35	0.54	-4.34	1.08	0.84	97.89
634.00	0.80	74.98	633.94	5.36	1.12	-5.34	1.22	-0.21	83.33
729.00	0.30	161.98	728.94	5.29	1.83	-5.27	0.88	-0.53	91.58

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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Well 4H
TVD Reference: GL 3835' + 17' RKB @ 3652.00ft (Norton 2)
MD Reference: GL 3835' + 17' RKB @ 3652.00ft (Norton 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
821.00	1.00	33.98	820.94	5.73	2.36	-5.70	1.31	0.76	-139.13	
916.00	0.70	1.98	915.93	7.00	2.84	-6.96	0.58	-0.32	-33.68	
1,010.00	0.90	46.98	1,009.92	8.08	3.40	-8.03	0.68	0.21	47.87	
1,104.00	0.40	213.98	1,103.92	8.31	3.76	-8.26	1.38	-0.53	177.66	
1,200.00	0.80	59.98	1,199.91	8.38	4.15	-8.31	1.22	0.42	-160.42	
1,295.00	0.80	272.98	1,294.91	8.73	4.06	-8.68	1.61	0.00	-154.74	
1,387.00	0.50	351.98	1,386.90	9.16	3.36	-9.12	0.93	-0.33	85.87	
1,481.00	0.50	306.98	1,480.90	9.81	2.98	-9.78	0.41	0.00	-47.87	
1,575.00	0.30	353.98	1,574.90	10.31	2.63	-10.27	0.39	-0.21	50.00	
1,669.00	0.10	304.98	1,668.90	10.60	2.53	-10.57	0.26	-0.21	-52.13	
1,762.00	0.10	305.98	1,761.90	10.69	2.40	-10.66	0.00	0.00	1.08	
1,857.00	1.20	176.98	1,856.89	9.75	2.39	-9.72	1.33	1.16	-135.79	
1,951.00	1.40	184.98	1,950.87	7.62	2.34	-7.59	0.29	0.21	8.51	
2,045.00	1.60	207.98	2,044.84	5.32	1.62	-5.30	0.67	0.21	24.47	
2,111.00	0.60	177.98	2,110.82	4.16	1.20	-4.14	1.70	-1.52	-45.45	
2111'MD: Final Invictus Survey - 2111'MD: Tie Into Invictus Surveys										
2,207.00	0.97	201.09	2,206.82	2.90	0.93	-2.89	0.50	0.39	24.07	
2207'MD: Begin DrilTech MWD										
2,299.00	0.79	178.68	2,298.80	1.54	0.66	-1.53	0.42	-0.20	-24.36	
2,392.00	1.41	29.61	2,391.80	1.89	1.24	-1.88	2.29	0.67	-160.29	
2,486.00	4.13	24.34	2,485.68	5.98	3.21	-5.94	2.90	2.89	-5.61	
2,579.00	5.98	30.93	2,578.31	13.19	7.08	-13.10	2.08	1.99	7.09	
2,672.00	6.16	29.96	2,670.79	21.67	12.06	-21.52	0.22	0.19	-1.04	
2,766.00	5.98	13.88	2,764.27	30.79	15.76	-30.60	1.81	-0.19	-17.11	
2,859.00	4.66	8.43	2,856.87	39.23	17.47	-39.02	1.52	-1.42	-5.86	
2,954.00	3.34	344.96	2,951.64	45.72	17.32	-45.51	2.19	-1.39	-24.71	
3,049.00	1.23	315.70	3,046.56	49.12	15.89	-48.93	2.47	-2.22	-30.80	
3,144.00	1.32	207.94	3,141.55	48.89	14.66	-48.71	2.17	0.09	-113.43	
3,239.00	1.23	192.93	3,236.53	46.93	13.92	-46.76	0.37	-0.09	-15.91	
3,333.00	1.14	183.16	3,330.51	45.01	13.65	-44.84	0.23	-0.10	-10.29	
3,427.00	0.97	175.25	3,424.49	43.28	13.66	-43.12	0.24	-0.18	-8.41	
3,521.00	1.32	175.60	3,518.47	41.41	13.81	-41.24	0.37	0.37	0.37	
3,616.00	1.49	168.22	3,613.44	39.11	14.15	-38.94	0.26	0.18	-7.77	
3,710.00	1.49	166.11	3,707.41	36.73	14.69	-36.55	0.06	0.00	-2.24	
3,804.00	0.62	190.98	3,801.40	35.04	14.89	-34.86	1.02	-0.93	26.46	
3,897.00	0.62	181.49	3,894.39	34.05	14.78	-33.86	0.11	0.00	-10.20	
3,990.00	0.88	176.48	3,987.38	32.83	14.81	-32.65	0.29	0.28	-5.39	
4,084.00	1.06	170.59	4,081.37	31.25	15.00	-31.07	0.22	0.19	-6.27	
4,177.00	0.70	201.88	4,174.36	29.88	14.93	-29.69	0.63	-0.39	33.65	
4,272.00	0.88	202.58	4,269.35	28.66	14.43	-28.49	0.19	0.19	0.74	
4,366.00	1.23	200.02	4,363.33	27.05	13.81	-26.88	0.38	0.37	-2.72	
4,461.00	0.97	214.70	4,458.32	25.43	13.00	-25.27	0.40	-0.27	15.45	
4,555.00	1.23	195.54	4,552.30	23.80	12.28	-23.65	0.48	0.28	-20.38	

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Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,650.00	1.58	186.49	4,647.27	21.52	11.86	-21.38	0.44	0.37	-9.53
4,713.00	2.20	185.87	4,710.24	19.45	11.63	-19.31	0.98	0.98	-0.98
4,745.00	3.61	185.96	4,742.19	17.84	11.47	-17.70	4.41	4.41	0.28
4,776.00	5.72	181.39	4,773.09	15.33	11.33	-15.19	6.91	6.81	-14.74
4,808.00	8.00	179.37	4,804.86	11.50	11.31	-11.37	7.16	7.13	-6.31
4,839.00	10.02	182.00	4,835.47	6.65	11.24	-6.52	6.65	6.52	8.48
4,871.00	11.96	184.38	4,866.89	0.56	10.89	-0.43	6.22	6.06	7.44
4,902.00	13.98	184.20	4,897.09	-6.38	10.37	6.50	6.52	6.52	-0.58
4,933.00	16.27	182.88	4,927.02	-14.45	9.88	14.57	7.47	7.39	-4.26
4,964.00	19.08	182.18	4,956.55	-23.85	9.47	23.96	9.09	9.06	-2.26
4,995.00	21.90	180.51	4,985.59	-34.70	9.22	34.80	9.29	9.10	-5.39
5,027.00	24.45	179.63	5,015.00	-47.29	9.21	47.40	8.04	7.97	-2.75
5,058.00	27.00	179.28	5,042.93	-60.74	9.34	60.85	8.24	8.23	-1.13
5,090.00	29.28	180.60	5,071.14	-75.83	9.35	75.94	7.39	7.13	4.13
5,122.00	31.22	178.75	5,098.79	-91.95	9.45	92.06	6.73	6.06	-5.78
5,153.00	33.24	180.69	5,125.01	-108.48	9.53	108.59	7.32	6.52	6.26
5,185.00	35.61	180.95	5,151.40	-126.57	9.27	126.67	7.42	7.41	0.81
5,216.00	37.46	180.42	5,178.31	-145.02	9.05	145.12	6.05	5.97	-1.71
5,247.00	39.75	179.90	5,200.53	-164.36	8.99	164.46	7.46	7.39	-1.68
5,279.00	42.65	178.93	5,224.61	-185.44	9.22	185.53	9.28	9.06	-3.03
5,310.00	46.17	178.84	5,246.75	-207.12	9.64	207.22	11.36	11.35	-0.29
5,342.00	49.59	178.40	5,268.21	-230.85	10.21	230.95	10.74	10.69	-1.38
5,374.00	52.23	178.93	5,288.38	-255.67	10.79	255.79	8.35	8.25	1.66
5,404.00	54.69	178.75	5,306.24	-279.77	11.28	279.89	8.21	8.20	-0.60
5,431.00	56.89	179.63	5,321.42	-302.10	11.59	302.21	8.58	8.15	3.26
5,446.00	57.68	178.75	5,329.53	-314.71	11.77	314.83	7.22	5.27	-5.87
5,461.00	58.48	179.19	5,337.46	-327.44	12.00	327.56	5.89	5.33	2.93
5,468.00	58.65	178.75	5,340.07	-331.71	12.07	331.83	8.24	3.40	-8.80
5,481.00	58.92	179.63	5,347.84	-344.54	12.26	344.66	5.33	1.80	5.87
5,496.00	59.18	178.67	5,355.56	-357.40	12.45	357.52	5.76	1.73	-6.40
5,511.00	59.27	179.37	5,363.23	-370.28	12.67	370.41	4.05	0.60	4.67
5,526.00	59.36	179.37	5,370.89	-383.18	12.81	383.31	0.60	0.60	0.00
5,541.00	59.36	179.02	5,378.53	-396.09	12.99	396.22	2.01	0.00	-2.33
5,556.00	59.44	178.40	5,386.17	-409.00	13.28	409.13	3.60	0.53	-4.13
5,571.00	59.53	179.28	5,393.78	-421.92	13.54	422.05	5.09	0.60	5.87
5,586.00	59.62	179.19	5,401.38	-434.85	13.72	434.98	0.79	0.60	-0.60
5,593.00	59.62	178.75	5,404.92	-440.89	13.82	441.02	5.42	0.00	-6.29
5,608.00	59.71	179.10	5,412.50	-453.83	14.07	453.97	2.10	0.60	2.33
5,616.00	59.79	179.19	5,416.53	-460.74	14.17	460.88	1.39	1.00	1.13
5,624.00	59.79	178.05	5,420.55	-467.65	14.34	467.79	12.31	0.00	-14.25
5,656.00	60.50	178.23	5,436.48	-495.39	15.24	495.54	2.27	2.22	0.56
5,666.00	61.20	178.14	5,441.35	-504.12	15.51	504.27	7.04	7.00	-0.90
5,688.00	62.96	178.23	5,451.65	-523.55	16.13	523.70	8.01	8.00	0.41
5,719.00	65.33	179.19	5,465.17	-551.44	16.75	551.60	8.14	7.65	3.10

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5,752.00	68.59	178.63	5,478.09	-581.80	17.07	581.96	9.95	9.88	1.33
5,783.00	71.58	178.19	5,488.64	-610.94	17.37	611.10	9.74	9.65	-1.42
5,815.00	74.39	178.46	5,498.01	-641.53	17.73	641.70	8.82	8.78	0.84
5,846.00	77.21	179.63	5,505.61	-671.58	17.97	671.75	9.11	9.10	0.55
5,878.00	79.84	178.90	5,511.98	-702.94	18.09	703.11	8.26	8.22	0.64
5,909.00	82.22	180.25	5,516.81	-733.56	18.05	733.72	7.76	7.68	1.13
5,941.00	84.24	180.95	5,520.58	-765.33	17.72	765.49	6.68	6.31	2.19
5,972.00	85.30	179.63	5,523.41	-796.20	17.56	796.35	5.45	3.42	-4.26
6,004.00	87.32	179.63	5,525.47	-828.13	17.77	828.29	6.31	6.31	0.00
6,035.00	90.22	178.40	5,526.13	-859.12	18.30	859.27	10.16	9.35	-3.97
6,068.00	92.33	177.61	5,525.44	-890.09	19.38	890.26	7.27	6.81	-2.55
6,098.00	93.83	177.35	5,523.72	-922.01	20.79	922.19	4.76	4.69	-0.81
6,130.00	94.18	178.49	5,521.49	-953.91	21.95	954.10	3.72	1.09	3.56
6,161.00	92.51	179.10	5,519.68	-984.85	22.60	985.05	5.73	-5.39	1.97
6,192.00	91.71	178.93	5,518.54	-1,015.82	23.13	1,016.03	2.64	-2.58	-0.55
6,223.00	91.98	178.67	5,517.54	-1,046.80	23.78	1,047.01	1.21	0.87	-0.84
6,254.00	92.77	178.93	5,516.26	-1,077.77	24.43	1,077.98	2.68	2.55	0.84
6,285.00	93.47	179.37	5,514.57	-1,108.72	24.89	1,108.94	2.67	2.26	1.42
6,347.00	92.51	180.07	5,511.33	-1,170.63	25.19	1,170.85	1.92	-1.55	1.13
6,440.00	92.95	179.81	5,508.90	-1,263.52	25.28	1,263.74	0.55	0.47	-0.28
6,531.00	94.09	179.28	5,501.32	-1,354.35	26.01	1,354.56	1.38	1.25	-0.58
6,623.00	92.42	180.07	5,496.09	-1,446.19	26.53	1,446.41	2.01	-1.82	0.86
6,715.00	92.68	178.58	5,492.00	-1,538.09	27.61	1,538.31	1.64	0.28	-1.62
6,807.00	93.65	178.49	5,486.92	-1,629.92	29.96	1,630.16	1.06	1.05	-0.10
6,900.00	93.03	178.58	5,481.50	-1,722.73	32.33	1,723.00	0.67	-0.67	0.10
6,992.00	93.30	177.43	5,476.42	-1,814.54	35.53	1,814.83	1.28	0.29	-1.25
7,085.00	94.44	177.70	5,470.15	-1,907.24	39.47	1,907.58	1.26	1.23	0.29
7,178.00	93.03	179.02	5,464.09	-2,000.00	42.13	2,000.36	2.07	-1.52	1.42
7,273.00	93.56	178.14	5,458.83	-2,094.81	44.48	2,095.19	1.08	0.56	-0.93
7,368.00	94.26	178.40	5,452.15	-2,189.55	47.34	2,189.96	0.79	0.74	0.27
7,463.00	92.77	179.90	5,446.32	-2,284.35	48.74	2,284.77	2.22	-1.57	1.58
7,558.00	93.56	180.69	5,441.08	-2,379.20	48.25	2,379.61	1.18	0.83	0.83
7,652.00	94.70	180.16	5,434.31	-2,472.96	47.56	2,473.35	1.34	1.21	-0.56
7,747.00	93.30	179.19	5,427.68	-2,567.72	48.10	2,568.11	1.79	-1.47	-1.02
7,842.00	93.56	179.19	5,422.00	-2,662.54	49.44	2,662.94	0.27	0.27	0.00
7,937.00	94.79	178.31	5,415.08	-2,757.28	51.50	2,757.68	1.59	1.29	-0.93
8,031.00	93.65	180.07	5,408.17	-2,850.99	52.83	2,851.42	2.23	-1.21	1.87
8,125.00	93.91	180.51	5,401.97	-2,944.79	52.35	2,945.20	0.54	0.28	0.47
8,219.00	92.59	180.69	5,396.64	-3,038.63	51.37	3,039.03	1.42	-1.40	0.19
8,313.00	92.24	180.69	5,392.68	-3,132.54	50.24	3,132.92	0.37	-0.37	0.00
8,408.00	92.07	180.42	5,389.11	-3,227.47	49.32	3,227.83	0.34	-0.18	-0.28
8,501.00	92.77	180.25	5,385.18	-3,320.38	48.78	3,320.73	0.77	0.75	-0.18
8,596.00	92.51	179.81	5,380.80	-3,415.28	48.73	3,415.62	0.54	-0.27	-0.46

Survey Report

Company: Hadaway Consulting & Eng. LLC
Project: Joint Resources Co. - LEA Cnty, NM (NAD 83)
Site: Commander 4H
Well: Well 4H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Well 4H
TVD Reference: GL 3635' + 17' RKB @ 3652.00ft (Norton 2)
MD Reference: GL 3635' + 17' RKB @ 3652.00ft (Norton 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,689.00	93.47	177.70	5,375.95	-3,508.12	50.74	3,508.48	2.49	1.03	-2.27
8,783.00	93.39	177.52	5,370.33	-3,601.87	54.66	3,602.27	0.21	-0.09	-0.19
8,878.00	94.35	177.96	5,363.92	-3,696.58	58.40	3,697.02	1.11	1.01	0.46
8,972.00	94.00	177.61	5,357.07	-3,790.26	62.02	3,790.73	0.53	-0.37	-0.37
9,067.00	93.65	178.23	5,350.74	-3,884.99	65.46	3,885.49	0.75	-0.37	0.65
9,161.00	93.47	177.52	5,344.90	-3,978.74	68.94	3,979.28	0.78	-0.19	-0.76
9,256.00	93.83	179.54	5,338.85	-4,073.51	71.37	4,074.08	2.16	0.38	2.13
9,351.00	93.56	180.51	5,332.73	-4,168.31	71.33	4,168.87	1.06	-0.28	1.02
9,446.00	93.39	179.98	5,326.97	-4,263.14	70.92	4,263.68	0.58	-0.18	-0.56
9,541.00	93.12	179.10	5,321.58	-4,357.98	71.68	4,358.53	0.97	-0.28	-0.93
9,635.00	93.39	178.93	5,316.24	-4,451.81	73.30	4,452.37	0.34	0.29	-0.18
9,728.00	93.74	180.07	5,310.46	-4,544.63	74.11	4,545.19	1.28	0.38	1.23
9,824.00	93.74	180.25	5,304.19	-4,640.42	73.84	4,640.98	0.19	0.00	0.19
9,918.00	93.65	180.07	5,298.14	-4,734.23	73.58	4,734.77	0.21	-0.10	-0.19
10,014.00	93.21	180.42	5,292.39	-4,830.06	73.17	4,830.59	0.59	-0.46	0.36
10,108.00	93.03	179.90	5,287.28	-4,923.92	72.91	4,924.44	0.58	-0.19	-0.55
10,204.00	92.95	179.19	5,282.27	-5,019.78	73.67	5,020.30	0.74	-0.08	-0.74
10,297.00	91.89	179.90	5,278.34	-5,112.69	74.41	5,113.22	1.37	-1.14	0.76
10,391.00	92.07	179.28	5,275.09	-5,206.63	75.08	5,207.16	0.69	0.19	-0.66

10391 MD: Survey Depth

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape	3.21	359.22	5,236.00	-5,894.71	80.50	645,964.30	923,822.40	32.770°N	103.089°W

Commander 4H PBHL
 - actual wellpath misses target center by 689.21ft at 10391.00ft MD (5275.09 TVD, -5206.63 N, 75.08 E)
 - Rectangle (sides W100.00 H5,895.26 D0.00)

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
80.00	80.00	-0.26	0.57	80'MD: Begin Wildfire Invictus MWD
2,111.00	2,110.82	4.16	1.20	2111'MD: Final Invictus Survey
2,111.00	2,110.82	4.16	1.20	2111'MD: Tie into Invictus Surveys
2,207.00	2,206.82	2.90	0.93	2207'MD: Begin DrillTech MWD
10,391.00	5,275.09	-5,206.63	75.08	10391'MD: Survey Depth

Checked By: _____ Approved By: _____ Date: _____

