



Centennial Resource Development, LLC

**Lea County, NM (NAD 83 - UTM Zone 13 - True)
Winnebago 30 State Com
Winnebago 30 State Com 501H**

OH

Design: OH

Standard Survey Report

15 January, 2020

HOBBS OCD

MAR 03 2020

RECEIVED





Total Directional Services

Survey Report



Company:	Centennial Resource Development, LLC	Local Co-ordinate Reference:	Well Winnebago 30 State Com 501H
Project:	Lea County, NM (NAD 83 - UTM Zone 13 - True)	TVD Reference:	3455.1' GE + 26.5' KB @ 3481.60usft
Site:	Winnebago 30 State Com	MD Reference:	3455.1' GE + 26.5' KB @ 3481.60usft
Well:	Winnebago 30 State Com 501H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Project	Lea County, NM (NAD 83 - UTM Zone 13 - True)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site	Winnebago 30 State Com		
Site Position:		Northing:	11,748,785.38 usft
From:	Map	Easting:	2,131,624.41 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.356247
		Longitude:	-103.408813
		Grid Convergence:	0.85 °

Well	Winnebago 30 State Com 501H		
Well Position	+N/-S	0.00 usft	Latitude:
	+E/-W	0.00 usft	Longitude:
Position Uncertainty	0.00 usft	Wellhead Elevation:	3,455.10 usft
			Ground Level:

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/9/2019	6.62	60.18	47,777.63522807

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	356.04	

Survey Program	Date 1/15/2020				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
198.00	20,515.00	Survey #1 (OH)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction	
20,547.00	20,547.00	Survey #2 - Proj to TD (OH)	BLIND	OWSG BLIND	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHL (Winnebago 30 State Com 501H)									
198.00	0.11	284.60	198.00	0.05	-0.18	0.06	0.06	0.06	0.00
287.00	0.12	354.95	287.00	0.16	-0.27	0.18	0.15	0.01	79.04
378.00	0.15	259.25	378.00	0.23	-0.40	0.26	0.22	0.03	-105.16
467.00	0.05	158.88	467.00	0.18	-0.50	0.21	0.19	-0.11	-112.78
557.00	0.11	94.18	557.00	0.13	-0.40	0.16	0.11	0.07	-71.89
648.00	0.08	276.15	648.00	0.13	-0.38	0.16	0.21	-0.03	-195.64
738.00	0.12	213.39	738.00	0.06	-0.49	0.10	0.12	0.04	-69.73
830.00	0.10	157.70	830.00	-0.09	-0.51	-0.06	0.11	-0.02	-60.53



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Wellbore: OH
Design: OH

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TVD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
MD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.15 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
922.00	0.23	185.98	922.00	-0.35	-0.50	-0.31	0.16	0.14	30.74
1,013.00	0.19	171.18	1,013.00	-0.68	-0.50	-0.64	0.07	-0.04	-16.26
1,104.00	0.35	234.77	1,104.00	-0.99	-0.70	-0.94	0.35	0.18	69.88
1,195.00	0.41	232.09	1,195.00	-1.35	-1.19	-1.27	0.07	0.07	-2.95
1,286.00	0.16	231.03	1,285.99	-1.63	-1.54	-1.52	0.27	-0.27	-1.16
1,378.00	0.34	227.50	1,377.99	-1.90	-1.84	-1.76	0.20	0.20	-3.84
1,469.00	0.44	234.61	1,468.99	-2.28	-2.33	-2.11	0.12	0.11	7.81
1,560.00	0.44	223.67	1,559.99	-2.74	-2.85	-2.53	0.09	0.00	-12.02
1,652.00	0.45	250.04	1,651.99	-3.11	-3.44	-2.87	0.22	0.01	28.66
1,730.00	0.51	283.03	1,729.98	-3.14	-4.06	-2.85	0.36	0.08	42.29
1,908.00	0.46	251.90	1,907.98	-3.18	-5.51	-2.80	0.15	-0.03	-17.49
2,002.00	0.13	357.46	2,001.98	-3.19	-5.88	-2.78	0.54	-0.35	112.30
2,096.00	0.65	267.79	2,095.97	-3.11	-6.41	-2.66	0.70	0.55	-95.39
2,190.00	2.53	255.94	2,189.93	-3.63	-8.96	-3.01	2.02	2.00	-12.61
2,284.00	4.06	252.57	2,283.78	-5.13	-14.15	-4.14	1.64	1.63	-3.59
2,379.00	3.73	254.04	2,378.56	-6.99	-20.33	-5.57	0.36	-0.35	1.55
2,473.00	3.38	253.36	2,472.38	-8.63	-25.92	-6.81	0.38	-0.37	-0.72
2,567.00	4.04	254.94	2,566.18	-10.28	-31.77	-8.06	0.71	0.70	1.68
2,661.00	5.79	258.28	2,659.83	-12.10	-39.62	-9.34	1.89	1.86	3.55
2,754.00	6.50	254.09	2,752.29	-14.50	-49.27	-11.06	0.90	0.76	-4.51
2,849.00	7.83	249.73	2,846.55	-18.22	-60.51	-13.99	1.51	1.40	-4.59
2,943.00	8.88	247.06	2,939.55	-23.26	-73.20	-18.15	1.19	1.12	-2.84
3,037.00	10.59	247.32	3,032.20	-29.42	-87.85	-23.28	1.82	1.82	0.28
3,132.00	10.58	244.62	3,125.58	-36.52	-103.79	-29.26	0.52	-0.01	-2.84
3,226.00	11.33	238.61	3,217.87	-45.03	-119.47	-36.67	1.45	0.80	-6.39
3,321.00	10.34	248.46	3,311.18	-53.02	-135.37	-43.54	2.21	-1.04	10.37
3,415.00	10.94	234.35	3,403.58	-61.32	-150.46	-50.78	2.84	0.64	-15.01
3,509.00	11.39	217.57	3,495.83	-73.88	-163.37	-62.41	3.48	0.48	-17.85
3,603.00	10.29	226.25	3,588.15	-87.05	-175.10	-74.74	2.09	-1.17	9.23
3,697.00	10.03	225.75	3,680.68	-98.56	-187.03	-85.40	0.29	-0.28	-0.53
3,791.00	11.73	227.09	3,772.99	-110.78	-199.89	-96.70	1.83	1.81	1.43
3,885.00	13.32	230.64	3,864.75	-124.16	-215.26	-108.98	1.88	1.69	3.78
3,979.00	12.21	230.72	3,956.42	-137.32	-231.33	-121.00	1.18	-1.18	0.09
4,073.00	11.20	232.33	4,048.47	-149.19	-246.25	-131.81	1.13	-1.07	1.71
4,167.00	11.76	241.30	4,140.59	-159.37	-261.88	-140.89	1.99	0.60	9.54
4,261.00	11.70	248.32	4,232.64	-167.49	-279.14	-147.80	1.52	-0.06	7.47
4,355.00	10.64	248.38	4,324.85	-174.21	-296.06	-153.33	1.13	-1.13	0.06
4,449.00	10.45	249.05	4,417.27	-180.45	-312.09	-158.45	0.24	-0.20	0.71
4,543.00	11.47	251.27	4,509.55	-186.50	-328.91	-163.33	1.17	1.09	2.36
4,638.00	12.09	253.56	4,602.55	-192.35	-347.39	-167.89	0.82	0.65	2.41
4,732.00	11.41	254.28	4,694.58	-197.66	-365.79	-171.91	0.74	-0.72	0.77
4,826.00	10.52	255.31	4,786.86	-202.35	-383.04	-175.40	0.97	-0.95	1.10
4,920.00	9.81	256.57	4,879.39	-206.39	-399.13	-178.31	0.79	-0.76	1.34



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5,014.00	8.61	261.48	4,972.18	-209.29	-413.88	-180.19	1.52	-1.28	5.22
5,202.00	11.31	260.28	5,157.32	-214.49	-445.97	-183.16	1.44	1.44	-0.64
5,296.00	11.18	259.86	5,249.52	-217.65	-464.02	-185.06	0.16	-0.14	-0.45
5,484.00	10.01	261.85	5,434.31	-223.18	-498.14	-188.22	0.65	-0.62	1.06
5,547.00	9.69	261.90	5,496.38	-224.70	-508.81	-189.00	0.51	-0.51	0.08
5,650.00	9.22	263.41	5,597.98	-226.87	-525.59	-190.00	0.52	-0.46	1.47
5,744.00	10.30	256.96	5,690.63	-229.63	-541.26	-191.67	1.63	1.15	-6.86
5,838.00	11.92	249.49	5,782.87	-234.93	-558.54	-195.77	2.30	1.72	-7.95
5,932.00	12.63	245.43	5,874.72	-242.60	-576.98	-202.15	1.19	0.76	-4.32
6,027.00	11.70	244.16	5,967.58	-251.12	-595.09	-209.39	1.02	-0.98	-1.34
6,121.00	11.60	244.62	6,059.65	-259.32	-612.21	-216.39	0.15	-0.11	0.49
6,215.00	11.35	244.11	6,151.77	-267.41	-629.07	-223.30	0.29	-0.27	-0.54
6,309.00	11.05	243.25	6,243.98	-275.51	-645.44	-230.24	0.37	-0.32	-0.91
6,403.00	10.70	242.87	6,336.29	-283.54	-661.25	-237.17	0.38	-0.37	-0.40
6,497.00	10.63	242.55	6,428.67	-291.52	-676.71	-244.05	0.10	-0.07	-0.34
6,591.00	10.05	242.79	6,521.14	-299.26	-691.69	-250.75	0.62	-0.62	0.26
6,685.00	8.85	243.96	6,613.86	-306.19	-705.49	-256.70	1.29	-1.28	1.24
6,779.00	8.07	243.40	6,706.84	-312.32	-717.88	-261.96	0.83	-0.83	-0.60
6,873.00	7.16	238.65	6,800.01	-318.32	-728.79	-267.19	1.18	-0.97	-5.05
6,967.00	6.05	242.41	6,893.38	-323.66	-738.18	-271.87	1.27	-1.18	4.00
7,061.00	4.75	241.30	6,986.97	-327.82	-745.98	-275.49	1.39	-1.38	-1.18
7,155.00	3.56	240.61	7,080.72	-331.13	-751.94	-278.37	1.27	-1.27	-0.73
7,249.00	2.60	239.29	7,174.58	-333.65	-756.32	-280.58	1.02	-1.02	-1.40
7,343.00	2.37	242.35	7,268.49	-335.64	-759.87	-282.32	0.28	-0.24	3.26
7,437.00	0.32	210.51	7,362.46	-336.77	-761.73	-283.32	2.24	-2.18	-33.87
7,531.00	0.49	197.23	7,456.46	-337.38	-761.98	-283.91	0.21	0.18	-14.13
7,625.00	0.58	179.74	7,550.45	-338.23	-762.10	-284.76	0.20	0.10	-18.61
7,719.00	0.57	168.00	7,644.45	-339.17	-762.00	-285.70	0.13	-0.01	-12.49
7,813.00	0.61	168.63	7,738.44	-340.12	-761.80	-286.66	0.04	0.04	0.67
7,907.00	0.39	147.27	7,832.44	-340.88	-761.53	-287.43	0.30	-0.23	-22.72
8,001.00	0.20	148.87	7,926.44	-341.29	-761.27	-287.86	0.20	-0.20	1.70
8,095.00	0.16	167.11	8,020.44	-341.55	-761.16	-288.14	0.07	-0.04	19.40
8,189.00	0.15	142.99	8,114.44	-341.78	-761.05	-288.37	0.07	-0.01	-25.66
8,284.00	0.13	123.03	8,209.44	-341.94	-760.89	-288.54	0.06	-0.02	-21.01
8,377.00	0.26	66.03	8,302.44	-341.91	-760.61	-288.53	0.23	0.14	-61.29
8,472.00	0.44	72.76	8,397.44	-341.71	-760.06	-288.37	0.19	0.19	7.08
8,566.00	0.61	55.48	8,491.43	-341.32	-759.30	-288.03	0.25	0.18	-18.38
8,660.00	0.95	47.93	8,585.42	-340.52	-758.31	-287.30	0.38	0.36	-8.03
8,754.00	1.13	49.84	8,679.41	-339.40	-757.03	-286.27	0.19	0.19	2.03
8,848.00	1.06	58.18	8,773.39	-338.34	-755.58	-285.32	0.18	-0.07	8.87
8,942.00	0.90	72.76	8,867.38	-337.66	-754.14	-284.74	0.31	-0.17	15.51
9,036.00	0.79	54.06	8,961.37	-337.07	-752.91	-284.23	0.31	-0.12	-19.89
9,131.00	0.95	71.15	9,056.36	-336.43	-751.63	-283.68	0.32	0.17	17.99



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9,225.00	1.05	88.58	9,150.34	-336.15	-750.03	-283.52	0.34	0.11	18.54
9,319.00	1.22	90.51	9,244.32	-336.14	-748.17	-283.63	0.19	0.18	2.05
9,413.00	1.18	93.79	9,338.30	-336.21	-746.20	-283.84	0.08	-0.04	3.49
9,507.00	0.98	98.60	9,432.29	-336.40	-744.44	-284.15	0.23	-0.21	5.12
9,601.00	0.51	79.34	9,526.28	-336.44	-743.24	-284.27	0.56	-0.50	-20.49
9,695.00	0.68	40.14	9,620.27	-335.94	-742.47	-283.82	0.46	0.18	-41.70
9,790.00	0.69	343.86	9,715.27	-334.96	-742.26	-282.86	0.68	0.01	-59.24
9,822.00	0.90	330.86	9,747.26	-334.55	-742.44	-282.44	0.86	0.66	-40.63
KOP									
9,883.00	2.08	328.90	9,808.24	-333.19	-743.24	-281.03	1.94	1.93	-3.21
9,930.00	7.13	348.45	9,855.08	-329.59	-744.27	-277.37	11.10	10.74	41.60
9,978.00	12.21	351.77	9,902.38	-321.65	-745.59	-269.35	10.64	10.58	6.92
10,025.00	16.86	357.56	9,947.87	-309.91	-746.60	-257.58	10.35	9.89	12.32
10,072.00	20.86	358.68	9,992.33	-294.73	-747.08	-242.40	8.55	8.51	2.38
10,119.00	25.30	358.88	10,035.56	-276.31	-747.47	-224.00	9.45	9.45	0.43
10,166.00	27.97	358.10	10,077.57	-255.25	-748.03	-202.95	5.73	5.68	-1.66
10,197.00	30.28	355.70	10,104.65	-240.19	-748.86	-187.87	8.35	7.45	-7.74
10,229.00	34.26	354.87	10,131.70	-223.17	-750.27	-170.79	12.51	12.44	-2.59
10,260.00	38.95	355.51	10,156.58	-204.75	-751.81	-152.31	15.18	15.13	2.06
10,291.00	43.11	358.12	10,179.96	-184.44	-752.92	-131.97	14.51	13.42	8.42
10,323.00	47.48	0.39	10,202.47	-161.71	-753.20	-109.27	14.56	13.66	7.09
10,354.00	51.99	0.77	10,222.50	-138.06	-752.96	-85.70	14.58	14.55	1.23
10,401.00	59.92	0.37	10,248.79	-99.15	-752.58	-46.91	16.89	16.87	-0.85
10,448.00	66.42	0.15	10,269.99	-57.23	-752.39	-5.10	13.84	13.83	-0.47
10,495.00	70.78	0.78	10,287.14	-13.49	-752.03	38.52	9.36	9.28	1.34
10,542.00	76.10	2.07	10,300.53	31.53	-750.90	83.35	11.62	11.32	2.74
10,589.00	82.04	2.94	10,309.44	77.62	-748.89	129.18	12.77	12.64	1.85
10,631.44	85.78	2.80	10,313.94	119.76	-746.77	171.08	8.82	8.81	-0.33
LP (Winnebago 30 State Com 501H)									
10,637.00	86.27	2.78	10,314.33	125.30	-746.50	176.58	8.82	8.81	-0.33
10,684.00	90.31	2.54	10,315.73	172.21	-744.32	223.24	8.61	8.60	-0.51
10,731.00	91.60	2.72	10,314.94	219.16	-742.17	269.92	2.77	2.74	0.38
10,795.00	92.38	2.70	10,312.72	283.05	-739.14	333.45	1.22	1.22	-0.03
10,889.00	90.46	1.13	10,310.39	376.96	-736.00	426.92	2.64	-2.04	-1.67
10,983.00	90.43	1.00	10,309.66	470.94	-734.26	520.56	0.14	-0.03	-0.14
11,078.00	90.32	1.46	10,309.04	565.91	-732.22	615.16	0.50	-0.12	0.48
11,172.00	90.29	2.79	10,308.54	659.85	-728.73	708.63	1.42	-0.03	1.41
11,266.00	90.90	0.83	10,307.56	753.79	-725.76	802.14	2.18	0.65	-2.09
11,360.00	90.53	1.81	10,306.39	847.76	-723.60	895.73	1.11	-0.39	1.04
11,454.00	90.97	0.46	10,305.16	941.73	-721.74	989.35	1.51	0.47	-1.44
11,548.00	90.28	357.50	10,304.14	1,035.70	-723.41	1,083.21	3.23	-0.73	-3.15
11,642.00	90.64	357.46	10,303.38	1,129.60	-727.54	1,177.18	0.39	0.38	-0.04
11,736.00	91.05	359.83	10,301.99	1,223.56	-729.76	1,271.06	2.56	0.44	2.52
11,830.00	92.28	357.97	10,299.26	1,317.50	-731.57	1,364.90	2.37	1.31	-1.98



Total Directional Services

Survey Report



Company: Centennial Resource Development, LLC
Project: Lea County, NM (NAD 83 - UTM Zone 13 - True)
Site: Winnebago 30 State Com
Well: Winnebago 30 State Com 501H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Winnebago 30 State Com 501H
TVD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
MD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.15 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,924.00	92.20	359.18	10,295.59	1,411.39	-733.90	1,458.74	1.29	-0.09	1.29
12,018.00	92.73	359.01	10,291.55	1,505.29	-735.39	1,552.51	0.59	0.56	-0.18
12,113.00	92.42	359.71	10,287.28	1,600.19	-736.45	1,647.26	0.81	-0.33	0.74
12,207.00	92.61	358.38	10,283.15	1,694.09	-738.01	1,741.04	1.43	0.20	-1.41
12,301.00	92.37	359.82	10,279.07	1,787.98	-739.49	1,834.81	1.55	-0.26	1.53
12,395.00	93.60	359.55	10,274.17	1,881.85	-740.00	1,928.49	1.34	1.31	-0.29
12,490.00	93.09	358.73	10,268.63	1,976.68	-741.43	2,023.19	1.02	-0.54	-0.86
12,584.00	92.14	357.21	10,264.34	2,070.52	-744.75	2,117.03	1.91	-1.01	-1.62
12,678.00	89.20	358.79	10,263.24	2,164.44	-748.03	2,210.96	3.55	-3.13	1.68
12,772.00	89.29	359.45	10,264.48	2,258.42	-749.48	2,304.82	0.71	0.10	0.70
12,866.00	89.27	359.33	10,265.66	2,352.41	-750.48	2,398.65	0.13	-0.02	-0.13
12,960.00	89.23	358.90	10,266.89	2,446.39	-751.93	2,492.50	0.46	-0.04	-0.46
13,054.00	88.19	358.57	10,269.01	2,540.34	-754.00	2,586.37	1.16	-1.11	-0.35
13,148.00	88.26	359.18	10,271.92	2,634.28	-755.85	2,680.21	0.65	0.07	0.65
13,243.00	89.29	0.03	10,273.95	2,729.25	-756.50	2,775.00	1.41	1.08	0.89
13,337.00	89.73	1.00	10,274.76	2,823.24	-755.66	2,868.71	1.13	0.47	1.03
13,431.00	89.85	0.99	10,275.10	2,917.23	-754.03	2,962.36	0.13	0.13	-0.01
13,525.00	89.86	0.86	10,275.34	3,011.21	-752.51	3,056.02	0.14	0.01	-0.14
13,619.00	89.83	1.05	10,275.59	3,105.20	-750.94	3,149.67	0.20	-0.03	0.20
13,713.00	89.87	1.30	10,275.84	3,199.18	-749.01	3,243.29	0.27	0.04	0.27
13,807.00	90.53	1.62	10,275.51	3,293.15	-746.62	3,336.87	0.78	0.70	0.34
13,901.00	90.78	1.59	10,274.44	3,387.11	-743.99	3,430.42	0.27	0.27	-0.03
13,996.00	90.83	1.72	10,273.10	3,482.06	-741.24	3,524.96	0.15	0.05	0.14
14,090.00	90.92	1.93	10,271.67	3,576.00	-738.25	3,618.47	0.24	0.10	0.22
14,184.00	90.85	1.85	10,270.21	3,669.94	-735.15	3,711.97	0.11	-0.07	-0.09
14,278.00	90.77	1.79	10,268.88	3,763.88	-732.16	3,805.48	0.11	-0.09	-0.06
14,372.00	90.29	1.15	10,268.02	3,857.84	-729.75	3,899.05	0.85	-0.51	-0.68
14,466.00	90.35	0.56	10,267.49	3,951.83	-728.35	3,992.72	0.63	0.06	-0.63
14,560.00	90.43	0.83	10,266.85	4,045.82	-727.21	4,086.40	0.30	0.09	0.29
14,654.00	90.83	0.37	10,265.82	4,139.81	-726.23	4,180.10	0.65	0.43	-0.49
14,748.00	90.56	359.75	10,264.68	4,233.80	-726.13	4,273.86	0.72	-0.29	-0.66
14,842.00	91.09	1.30	10,263.32	4,327.79	-725.27	4,367.56	1.74	0.56	1.65
14,936.00	91.89	0.77	10,260.88	4,421.74	-723.57	4,461.17	1.02	0.85	-0.56
15,031.00	91.64	0.31	10,257.95	4,516.69	-722.67	4,555.83	0.55	-0.26	-0.48
15,125.00	92.38	1.27	10,254.66	4,610.62	-721.38	4,649.45	1.29	0.79	1.02
15,219.00	91.18	1.44	10,251.74	4,704.55	-719.16	4,743.00	1.29	-1.28	0.18
15,313.00	91.76	0.80	10,249.32	4,798.50	-717.32	4,836.60	0.92	0.62	-0.68
15,343.99	91.58	0.98	10,248.42	4,829.47	-716.84	4,867.46	0.83	-0.57	0.60
S30/19 Crossing									
15,407.00	91.22	1.36	10,246.88	4,892.45	-715.55	4,930.20	0.83	-0.57	0.60
15,501.00	90.48	0.31	10,245.49	4,986.43	-714.18	5,023.86	1.37	-0.79	-1.12
15,595.00	90.35	0.08	10,244.80	5,080.42	-713.86	5,117.61	0.28	-0.14	-0.24
15,689.00	90.43	0.79	10,244.17	5,174.42	-713.15	5,211.33	0.76	0.09	0.76
15,784.00	90.32	0.94	10,243.54	5,269.40	-711.71	5,305.99	0.20	-0.12	0.16



Total Directional Services Survey Report



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Well: Winnebago 30 State Com 501H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Winnebago 30 State Com 501H
TVD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
MD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.15 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,878.00	91.36	1.35	10,242.17	5,363.37	-709.83	5,399.61	1.19	1.11	0.44
15,972.00	91.78	1.17	10,239.59	5,457.32	-707.77	5,493.18	0.49	0.45	-0.19
16,066.00	91.43	0.79	10,236.96	5,551.26	-706.16	5,586.79	0.55	-0.37	-0.40
16,160.00	91.57	0.85	10,234.50	5,645.22	-704.82	5,680.43	0.16	0.15	0.06
16,254.00	91.47	358.17	10,232.00	5,739.18	-705.62	5,774.22	2.85	-0.11	-2.85
16,348.00	91.43	358.88	10,229.62	5,833.12	-708.04	5,868.10	0.76	-0.04	0.76
16,442.00	91.39	0.98	10,227.31	5,927.08	-708.15	5,961.85	2.23	-0.04	2.23
16,536.00	91.40	359.16	10,225.02	6,021.05	-708.04	6,055.59	1.94	0.01	-1.94
16,630.00	91.88	359.25	10,222.33	6,115.00	-709.34	6,149.40	0.52	0.51	0.10
16,724.00	91.72	0.12	10,219.38	6,208.95	-709.86	6,243.17	0.94	-0.17	0.93
16,818.00	91.99	358.44	10,216.34	6,302.89	-711.04	6,336.96	1.81	0.29	-1.79
16,912.00	92.03	357.42	10,213.04	6,396.77	-714.43	6,430.85	1.09	0.04	-1.09
17,006.00	92.36	355.95	10,209.44	6,490.54	-719.86	6,524.77	1.60	0.35	-1.56
17,100.00	92.92	352.83	10,205.11	6,583.98	-729.04	6,618.62	3.37	0.60	-3.32
17,131.00	92.75	351.74	10,203.57	6,614.66	-733.20	6,649.52	3.55	-0.55	-3.52
17,194.00	92.72	349.58	10,200.57	6,676.75	-743.41	6,712.17	3.42	-0.05	-3.43
17,288.00	91.09	349.36	10,197.44	6,769.12	-760.58	6,805.49	1.75	-1.73	-0.23
17,382.00	89.38	351.30	10,197.06	6,861.77	-776.37	6,899.02	2.75	-1.82	2.06
17,429.00	89.03	352.60	10,197.71	6,908.30	-782.95	6,945.89	2.86	-0.74	2.77
17,476.00	88.50	354.04	10,198.72	6,954.97	-788.41	6,992.83	3.26	-1.13	3.06
17,523.00	87.86	355.50	10,200.22	7,001.75	-792.70	7,039.79	3.39	-1.36	3.11
17,570.00	88.38	357.20	10,201.76	7,048.63	-795.69	7,086.76	3.78	1.11	3.62
17,617.00	89.19	358.94	10,202.75	7,095.59	-797.27	7,133.72	4.08	1.72	3.70
17,665.00	89.83	0.24	10,203.16	7,143.59	-797.61	7,181.63	3.02	1.33	2.71
17,712.00	90.24	1.55	10,203.14	7,190.58	-796.88	7,228.46	2.92	0.87	2.79
17,759.00	90.78	2.64	10,202.72	7,237.54	-795.16	7,275.19	2.59	1.15	2.32
17,853.00	92.24	4.00	10,200.24	7,331.35	-789.72	7,368.40	2.12	1.55	1.45
17,948.00	93.64	2.43	10,195.37	7,426.07	-784.40	7,462.52	2.21	1.47	-1.65
18,042.00	92.68	1.06	10,190.19	7,519.88	-781.54	7,555.91	1.78	-1.02	-1.46
18,136.00	92.18	2.84	10,186.20	7,613.74	-778.34	7,649.32	1.97	-0.53	1.89
18,230.00	92.69	3.64	10,182.21	7,707.50	-773.04	7,742.50	1.01	0.54	0.85
18,324.00	92.45	2.74	10,177.99	7,801.26	-767.81	7,835.67	0.99	-0.26	-0.96
18,418.00	91.79	2.87	10,174.51	7,895.08	-763.21	7,928.95	0.72	-0.70	0.14
18,512.00	91.67	2.88	10,171.68	7,988.92	-758.50	8,022.24	0.13	-0.13	0.01
18,606.00	91.18	3.21	10,169.34	8,082.76	-753.51	8,115.51	0.63	-0.52	0.35
18,700.00	91.47	2.90	10,167.17	8,176.60	-748.50	8,208.78	0.45	0.31	-0.33
18,794.00	90.60	3.84	10,165.47	8,270.42	-742.98	8,301.99	1.36	-0.93	1.00
18,888.00	91.78	3.37	10,163.52	8,364.21	-737.07	8,395.15	1.35	1.26	-0.50
18,982.00	92.04	1.05	10,160.38	8,458.08	-733.44	8,488.55	2.48	0.28	-2.47
19,076.00	90.62	1.53	10,158.20	8,552.03	-731.33	8,582.13	1.59	-1.51	0.51
19,170.00	91.40	1.49	10,156.54	8,645.98	-728.85	8,675.68	0.83	0.83	-0.04
19,264.00	90.88	1.92	10,154.67	8,739.92	-726.05	8,769.20	0.72	-0.55	0.46
19,358.00	91.08	1.54	10,153.07	8,833.87	-723.22	8,862.73	0.46	0.21	-0.40



Total Directional Services

Survey Report



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Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Winnebago 30 State Com 501H
TVD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
MD Reference: 3455.1' GE + 26.5' KB @ 3481.60usft
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.15 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,452.00	91.13	1.35	10,151.25	8,927.82	-720.85	8,956.29	0.21	0.05	-0.20
19,547.00	91.19	2.28	10,149.33	9,022.75	-717.84	9,050.79	0.98	0.06	0.98
19,641.00	91.76	359.97	10,146.91	9,116.69	-715.99	9,144.38	2.53	0.61	-2.46
19,735.00	90.83	2.21	10,144.78	9,210.65	-714.21	9,237.98	2.58	-0.99	2.38
19,829.00	91.27	1.35	10,143.06	9,304.58	-711.29	9,331.49	1.03	0.47	-0.91
19,923.00	90.69	1.13	10,141.45	9,398.55	-709.25	9,425.09	0.66	-0.62	-0.23
20,017.00	91.76	1.30	10,139.44	9,492.50	-707.26	9,518.69	1.15	1.14	0.18
20,111.00	90.64	2.23	10,137.48	9,586.44	-704.37	9,612.19	1.55	-1.19	0.99
20,205.00	91.41	1.66	10,135.79	9,680.37	-701.18	9,705.68	1.02	0.82	-0.61
20,299.00	91.53	1.34	10,133.38	9,774.30	-698.72	9,799.22	0.36	0.13	-0.34
20,394.00	90.84	1.64	10,131.42	9,869.25	-696.25	9,893.77	0.79	-0.73	0.32
20,488.00	92.41	0.41	10,128.75	9,963.19	-694.57	9,987.37	2.12	1.67	-1.31
20,515.00	91.85	0.27	10,127.75	9,990.17	-694.41	10,014.28	2.14	-2.07	-0.52
20,531.08	91.85	0.27	10,127.23	10,006.24	-694.33	10,030.30	0.00	0.00	0.00
PBHL (Winnebago 30 State Com 501H)									
20,547.00	91.85	0.27	10,126.72	10,022.16	-694.25	10,046.17	0.00	0.00	0.00
BHL									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,822.00	9,747.26	-334.55	-742.44	KOP
15,343.99	10,248.42	4,829.47	-716.84	S30/19 Crossing
20,547.00	10,126.72	10,022.16	-694.25	BHL

Checked By: _____ Approved By: _____ Date: _____