



Directional Survey

HOBBS OCD

JAN 10 2020

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DELAWARE BASIN UNRESTRICTED

Well Name: JAYHAWK 7 FED 10H

Sub-Division DELAWARE BASIN		Region LEA COUNTY CORE		Field Name RATTLESNAKE DBBU				County LEA		State/Province NM			
Surface Legal Location 7-26S-34E		API/UWI 3002545548		Latitude (°) 32° 3' 49.322" N		Longitude (°) 103° 30' 39.281" W		Orig KB Elevation (ft) 3,372.80		Ground Elev MSL (ft) 3,339.80		KB - GL (ft) 33.00	
Wellbores													
Wellbore Name OH		Parent Wellbore				SAP Well ID				Vertical Section Direction (°) 179.69			
Kick Offs & Key Depths													
Date 6/21/2019				Type CURVE				Top Depth (ftKB) 12,213.2					
Date 6/27/2019				Type CURVE				Top Depth (ftKB) 12,199.0					
Actual Deviation Survey COMPOSITE OH, Proposed? No				Definitive? No		Proposed? No		Proposed Deviation Survey COMPOSITE WELL PLAN - OH, Proposed? Yes					
Deviation Survey													
Date 6/15/2019		Description COMPOSITE OH											
MD Tie In (ftKB) 0.00		TVD Tie In (ftKB) 0.00		Inclination Tie In (°) 0.00		Azimuth Tie In (°) 0.00		NSTie In (ft) 0.00		EWTie In (ft) 0.00			
Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company			
6/16/2019	183.00	0.40	95.90	183.00	0.07	-0.07	0.64	0.22	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	233.00	0.60	102.80	233.00	0.15	-0.14	1.06	0.42	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	327.00	0.70	94.90	326.99	0.31	-0.30	2.12	0.14	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	422.00	1.40	129.60	421.97	1.11	-1.09	3.59	0.96	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	517.00	0.90	113.90	516.96	2.16	-2.13	5.17	0.62	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	612.00	1.10	118.20	611.94	2.90	-2.86	6.65	0.22	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	706.00	1.00	115.00	705.93	3.68	-3.64	8.19	0.12	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	801.00	1.20	125.60	800.91	4.62	-4.57	9.75	0.30	MWD	TOTAL DIRECTIONAL SERV...			
6/16/2019	850.00	1.20	126.80	849.90	5.23	-5.17	10.58	0.05	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	981.00	1.50	145.60	980.86	7.48	-7.41	12.64	0.41	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,075.00	1.60	145.90	1,074.83	9.59	-9.51	14.08	0.11	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,170.00	0.30	168.40	1,169.81	10.93	-10.85	14.87	1.40	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,265.00	1.20	296.50	1,264.81	10.73	-10.65	14.03	1.48	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,359.00	1.00	294.00	1,358.79	9.95	-9.88	12.40	0.22	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,454.00	0.90	297.10	1,453.78	9.26	-9.20	10.98	0.12	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,549.00	0.80	319.90	1,548.77	8.41	-8.36	9.89	0.37	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,644.00	1.00	344.20	1,643.75	7.10	-7.05	9.23	0.45	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,739.00	1.00	356.30	1,738.74	5.47	-5.43	8.95	0.22	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,833.00	0.80	3.90	1,832.73	4.00	-3.95	8.95	0.25	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	1,928.00	1.00	12.80	1,927.72	2.53	-2.48	9.17	0.26	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,023.00	1.00	11.60	2,022.70	0.91	-0.86	9.52	0.02	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,117.00	1.00	9.60	2,116.69	-0.70	0.75	9.83	0.04	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,212.00	1.10	13.50	2,211.67	-2.40	2.45	10.18	0.13	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,306.00	1.20	33.50	2,305.65	-4.09	4.15	10.93	0.44	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,401.00	1.10	33.70	2,400.63	-5.68	5.74	11.99	0.11	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,496.00	2.10	22.90	2,495.60	-8.03	8.10	13.17	1.09	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,591.00	4.00	19.90	2,590.46	-12.74	12.82	14.97	2.01	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,685.00	4.60	21.40	2,684.19	-19.32	19.41	17.47	0.65	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,780.00	4.50	24.60	2,778.89	-26.24	26.35	20.41	0.29	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,875.00	4.50	32.50	2,873.60	-32.75	32.88	23.96	0.65	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	2,970.00	4.80	42.20	2,968.29	-38.81	38.97	28.63	0.88	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,064.00	5.80	33.20	3,061.89	-45.67	45.86	33.88	1.38	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,159.00	7.00	21.60	3,156.30	-55.05	55.26	38.64	1.85	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,254.00	7.90	23.30	3,250.49	-66.40	66.64	43.35	0.98	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,348.00	8.30	33.50	3,343.56	-77.96	78.23	49.65	1.58	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,443.00	7.10	31.80	3,437.70	-88.63	88.94	56.53	1.29	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,538.00	5.90	21.20	3,532.09	-98.14	98.48	61.39	1.78	MWD	TOTAL DIRECTIONAL SERV...			
6/18/2019	3,635.00	5.70	20.90	3,628.60	-107.27	107.63	64.91	0.21	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	3,730.00	6.20	31.60	3,723.09	-116.03	116.40	69.28	1.28	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	3,825.00	6.50	34.60	3,817.51	-124.79	125.20	75.02	0.47	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	3,920.00	7.20	39.40	3,911.83	-133.78	134.23	81.85	0.95	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,015.00	6.90	39.70	4,006.11	-142.73	143.22	89.28	0.32	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,110.00	6.10	21.40	4,100.51	-151.79	152.31	94.77	2.33	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,202.00	7.10	7.60	4,191.90	-161.97	162.50	97.30	2.03	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,297.00	7.90	13.50	4,286.09	-174.12	174.66	99.60	1.17	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,391.00	7.30	24.60	4,379.27	-185.81	186.38	103.60	1.68	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,486.00	5.60	36.10	4,473.67	-195.02	195.61	108.84	2.24	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,581.00	5.40	48.00	4,568.24	-201.72	202.35	114.89	1.22	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,675.00	5.50	41.20	4,661.81	-208.04	208.70	121.15	0.69	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,770.00	4.80	16.50	4,756.44	-215.25	215.93	125.28	2.43	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,864.00	4.20	25.40	4,850.15	-222.12	222.81	127.87	0.98	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	4,959.00	4.10	37.00	4,944.90	-227.95	228.67	131.41	0.89	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,053.00	4.80	21.70	5,038.62	-234.27	235.01	134.88	1.46	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,147.00	6.60	6.90	5,132.16	-243.28	244.02	136.99	2.46	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,242.00	7.10	4.70	5,226.48	-254.54	255.30	138.12	0.59	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,337.00	6.60	3.50	5,320.80	-265.84	266.60	138.94	0.55	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,432.00	6.80	6.90	5,415.15	-276.87	277.63	139.95	0.47	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,526.00	8.40	18.80	5,508.33	-288.88	289.66	142.83	2.38	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,621.00	9.10	21.90	5,602.22	-302.39	303.19	147.87	0.89	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,715.00	7.90	23.80	5,695.19	-315.17	316.00	153.25	1.31	MWD	TOTAL DIRECTIONAL SERV...			
6/19/2019	5,810.00	6.80	22.90	5,789.41	-326.30	327.16	158.07	1.16	MWD	TOTAL DIRECTIONAL SERV...			
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				Ground Elev MSL (ft) 3,339.80
				KB - GL (ft) 33.00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
6/19/2019	5,905.00	6.50	21.60	5,883.77	-336.46	337.34	162.24	0.35	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,000.00	6.50	18.20	5,978.16	-346.54	347.45	165.90	0.41	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,094.00	6.60	24.60	6,071.55	-356.49	357.41	169.81	0.78	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,189.00	7.10	31.60	6,165.87	-366.42	367.38	175.16	1.02	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,284.00	6.80	30.50	6,260.17	-376.24	377.22	181.09	0.35	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,379.00	6.60	30.90	6,354.52	-385.74	386.75	186.75	0.22	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,474.00	6.30	28.80	6,448.92	-394.96	396.01	192.06	0.40	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,569.00	6.60	30.00	6,543.32	-404.23	405.30	197.30	0.35	MWD	TOTAL DIRECTIONAL SERV...
6/19/2019	6,663.00	7.10	33.10	6,636.65	-413.74	414.85	203.17	0.66	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	6,758.00	6.80	38.10	6,730.95	-423.05	424.19	209.85	0.71	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	6,853.00	6.40	40.80	6,825.32	-431.45	432.63	216.78	0.53	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	6,947.00	6.60	39.00	6,918.72	-439.57	440.79	223.60	0.30	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,042.00	6.60	38.40	7,013.09	-448.06	449.31	230.43	0.07	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,137.00	6.60	37.50	7,107.46	-456.63	457.92	237.15	0.11	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,231.00	6.30	34.10	7,200.86	-465.15	466.48	243.33	0.52	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,326.00	6.10	34.00	7,295.31	-473.62	474.98	249.07	0.21	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,421.00	6.00	34.00	7,389.78	-481.89	483.28	254.67	0.11	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,515.00	5.70	32.50	7,483.29	-489.88	491.29	259.93	0.36	MWD	TOTAL DIRECTIONAL SERV...
6/20/2019	7,610.00	4.90	38.30	7,577.88	-497.01	498.45	264.97	1.01	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	7,705.00	3.60	55.60	7,672.62	-501.85	503.32	269.95	1.91	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	7,800.00	2.80	57.90	7,767.48	-504.75	506.24	274.38	0.85	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	7,894.00	1.80	49.50	7,861.40	-506.91	508.42	277.44	1.12	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	7,989.00	1.60	61.10	7,956.36	-508.51	510.03	279.74	0.42	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,084.00	1.30	62.70	8,051.33	-509.63	511.16	281.86	0.32	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,179.00	1.30	51.30	8,146.30	-510.79	512.33	283.66	0.27	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,274.00	0.80	154.70	8,241.29	-510.86	512.41	284.78	1.77	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,369.00	1.10	161.70	8,336.28	-509.39	510.94	285.35	0.34	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,464.00	1.00	179.30	8,431.26	-507.69	509.25	285.65	0.35	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,559.00	1.00	183.00	8,526.25	-506.04	507.59	285.62	0.07	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,653.00	1.00	183.80	8,620.23	-504.40	505.95	285.52	0.01	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,748.00	1.40	171.10	8,715.21	-502.42	503.98	285.64	0.50	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,842.00	1.20	169.80	8,809.19	-500.32	501.87	285.99	0.22	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	8,937.00	1.00	184.90	8,904.17	-498.51	500.07	286.10	0.37	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	9,032.00	1.20	191.60	8,999.15	-496.72	498.27	285.83	0.25	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	9,126.00	1.00	203.90	9,093.14	-495.00	496.55	285.30	0.33	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	9,220.00	0.80	219.80	9,187.13	-493.75	495.30	284.55	0.34	MWD	TOTAL DIRECTIONAL SERV...
6/21/2019	9,311.00	0.80	234.30	9,278.12	-492.90	494.44	283.62	0.22	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,411.00	0.80	236.10	9,378.11	-492.11	493.65	282.48	0.03	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,506.00	0.70	231.10	9,473.10	-491.38	492.91	281.48	0.13	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,601.00	0.50	277.20	9,568.09	-491.07	492.60	280.61	0.53	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,696.00	0.50	271.50	9,663.09	-491.14	492.66	279.79	0.05	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,791.00	0.90	259.60	9,758.08	-491.02	492.54	278.64	0.45	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,886.00	1.10	276.20	9,853.07	-491.00	492.50	277.00	0.37	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	9,981.00	1.10	299.30	9,948.05	-491.55	493.05	275.30	0.46	MWD	TOTAL DIRECTIONAL SERV...
6/22/2019	10,076.00	1.30	325.50	10,043.03	-492.89	494.38	273.89	0.61	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,171.00	1.30	339.00	10,138.01	-494.79	496.27	272.89	0.32	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,266.00	1.00	333.40	10,232.99	-496.54	498.02	272.14	0.34	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,361.00	0.90	326.50	10,327.98	-497.91	499.39	271.35	0.16	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,456.00	0.80	308.70	10,422.97	-498.95	500.42	270.42	0.30	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,551.00	0.70	295.60	10,517.96	-499.62	501.09	269.38	0.21	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,646.00	0.90	302.20	10,612.95	-500.28	501.74	268.23	0.23	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,741.00	1.30	293.10	10,707.93	-501.11	502.56	266.61	0.46	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,836.00	1.40	304.00	10,802.90	-502.19	503.63	264.65	0.29	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	10,930.00	1.40	306.10	10,896.88	-503.52	504.95	262.77	0.05	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	11,025.00	0.80	310.30	10,991.86	-504.64	506.06	261.33	0.64	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	11,119.00	0.80	312.10	11,085.85	-505.51	506.92	260.34	0.03	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	11,214.00	0.90	283.80	11,180.84	-506.14	507.55	259.13	0.45	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	11,308.00	1.00	257.20	11,274.83	-506.14	507.54	257.61	0.48	MWD	TOTAL DIRECTIONAL SERV...
6/23/2019	11,403.00	1.20	243.50	11,369.81	-505.52	506.91	255.91	0.35	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,498.00	1.20	244.70	11,464.79	-504.66	506.04	254.12	0.03	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,593.00	1.50	237.50	11,559.76	-503.58	504.95	252.17	0.36	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,687.00	2.00	235.30	11,653.72	-502.00	503.36	249.79	0.54	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,782.00	2.90	230.20	11,748.63	-499.53	500.87	246.58	0.97	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,876.00	4.10	233.40	11,842.45	-496.03	497.35	242.05	1.29	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	11,971.00	3.40	246.80	11,937.25	-492.93	494.21	236.74	1.18	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	12,066.00	3.20	253.10	12,032.09	-491.07	492.33	231.61	0.44	MWD	TOTAL DIRECTIONAL SERV...
6/24/2019	12,124.00	3.00	251.80	12,090.01	-490.14	491.39	228.62	0.37	MWD	TOTAL DIRECTIONAL SERV...
6/27/2019	12,177.00	2.70	245.80	12,142.94	-489.21	490.44	226.16	0.80	MWD	TOTAL DIRECTIONAL SERV...
6/27/2019	12,272.00	8.20	216.20	12,237.49	-482.86	484.05	220.12	6.32	MWD	TOTAL DIRECTIONAL SERV...
6/27/2019	12,367.00	20.00	206.60	12,329.48	-462.85	463.99	208.80	12.62	MWD	TOTAL DIRECTIONAL SERV...
6/27/2019	12,462.00	31.70	190.00	12,414.93	-423.62	424.69	197.13	14.37	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,557.00	45.60	178.60	12,489.03	-364.77	365.82	193.61	16.39	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,651.00	56.70	178.30	12,547.91	-291.70	292.76	195.60	11.81	MWD	TOTAL DIRECTIONAL SERV...



Well Name: JAYHAWK 7 FED 10H

Sub-Division	Region	Field Name	County	State/Province		
DELAWARE BASIN	LEA COUNTY CORE	RATTLESNAKE DBBU	LEA	NM		
Surface Legal Location	API/UWI	Latitude (°)	Longitude (°)	Orig KB Elevation (ft)	Ground Elev MSL (ft)	KB - GL (ft)
7-26S-34E	3002545548	32° 3' 49.322" N	103° 30' 39.281" W	3,372.80	3,339.80	33.00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
6/28/2019	12,746.00	62.50	170.40	12,596.02	-210.26	211.37	203.82	9.41	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,841.00	69.10	168.50	12,634.94	-125.05	126.24	219.71	7.18	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,936.00	79.80	168.70	12,660.37	-35.36	36.65	237.77	11.26	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,030.00	91.70	168.70	12,667.32	56.49	-55.11	256.11	12.66	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,125.00	91.00	171.90	12,665.09	150.18	-148.71	272.11	3.45	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,220.00	91.80	176.90	12,662.76	244.72	-243.20	281.37	5.33	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,314.00	92.00	182.10	12,659.64	338.63	-337.11	282.19	5.53	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,409.00	92.40	182.70	12,656.00	433.46	-431.96	278.22	0.76	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,504.00	90.60	180.70	12,653.51	528.36	-526.87	275.40	2.83	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,598.00	89.90	179.90	12,653.10	622.35	-620.87	274.91	1.13	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,693.00	90.00	180.50	12,653.18	717.34	-715.87	274.58	0.64	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,787.00	90.60	181.10	12,652.69	811.32	-809.86	273.27	0.90	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,883.00	90.20	180.70	12,652.02	907.30	-905.84	271.76	0.59	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,977.00	90.00	181.10	12,651.86	1,001.28	-999.83	270.28	0.48	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,071.00	88.00	180.20	12,653.50	1,095.25	-1,093.81	269.21	2.33	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,166.00	87.90	180.00	12,656.90	1,190.18	-1,188.74	269.05	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,260.00	87.70	180.40	12,660.50	1,284.11	-1,282.67	268.72	0.48	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,354.00	87.80	180.90	12,664.20	1,378.02	-1,376.60	267.66	0.54	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,448.00	87.20	179.90	12,668.30	1,471.93	-1,470.50	267.00	1.24	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,543.00	89.40	177.60	12,671.11	1,566.86	-1,565.43	269.07	3.35	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,637.00	88.30	178.20	12,673.00	1,660.79	-1,659.34	272.52	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,731.00	88.00	175.90	12,676.04	1,754.64	-1,753.16	277.35	2.47	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,826.00	89.40	178.30	12,678.19	1,849.51	-1,848.01	282.15	2.92	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,920.00	90.00	178.40	12,678.68	1,943.48	-1,941.97	284.86	0.65	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,015.00	91.10	180.60	12,677.77	2,038.47	-2,036.95	285.69	2.59	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,109.00	90.60	181.10	12,676.38	2,132.44	-2,130.93	284.30	0.75	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,204.00	90.20	181.90	12,675.71	2,227.39	-2,225.89	281.81	0.94	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,298.00	89.10	181.90	12,676.29	2,321.31	-2,319.84	278.69	1.17	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,393.00	92.00	183.80	12,675.38	2,416.15	-2,414.70	273.97	3.65	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,487.00	88.80	179.60	12,674.72	2,510.06	-2,508.62	271.18	5.62	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,581.00	90.50	181.40	12,675.29	2,604.04	-2,602.61	270.36	2.63	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,676.00	90.00	178.40	12,674.88	2,699.02	-2,697.60	270.53	3.20	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,771.00	89.60	178.90	12,675.21	2,794.01	-2,792.57	272.77	0.67	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,866.00	89.80	180.20	12,675.71	2,889.00	-2,887.57	273.51	1.38	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,960.00	90.40	176.90	12,675.54	2,982.97	-2,981.52	275.89	3.57	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,055.00	91.30	178.70	12,674.13	3,077.90	-3,076.44	279.54	2.12	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,149.00	90.40	179.00	12,672.74	3,171.88	-3,170.41	281.42	1.01	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,244.00	89.00	179.10	12,673.24	3,266.87	-3,265.39	283.00	1.48	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,338.00	90.70	180.90	12,673.48	3,360.86	-3,359.38	283.00	2.63	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,433.00	90.60	181.40	12,672.41	3,455.83	-3,454.36	281.09	0.54	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,527.00	91.20	182.50	12,670.93	3,549.74	-3,548.29	277.89	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,622.00	88.60	178.90	12,671.10	3,644.70	-3,643.26	276.73	4.67	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,716.00	90.70	180.10	12,671.67	3,738.69	-3,737.25	277.55	2.57	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,811.00	91.10	178.90	12,670.18	3,833.68	-3,832.23	278.38	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,905.00	91.50	177.40	12,668.04	3,927.62	-3,926.15	281.42	1.65	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,999.00	90.30	175.00	12,666.57	4,021.42	-4,019.93	287.65	2.85	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,094.00	90.30	175.70	12,666.07	4,116.15	-4,114.61	295.35	0.74	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,189.00	90.20	175.90	12,665.66	4,210.93	-4,209.35	302.30	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,283.00	89.70	174.80	12,665.74	4,304.66	-4,303.04	309.92	1.29	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,378.00	91.50	178.70	12,664.74	4,399.51	-4,397.86	315.31	4.52	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,472.00	91.60	179.10	12,662.20	4,493.46	-4,491.81	317.11	0.44	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,567.00	91.40	179.20	12,659.71	4,588.42	-4,586.77	318.52	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,662.00	90.20	179.10	12,658.39	4,683.41	-4,681.75	319.93	1.27	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,712.00	90.20	179.10	12,658.21	4,733.41	-4,731.74	320.72	0.00	BIT	



Directional Survey

DELAWARE BASIN UNRESTRICTED

Well Name: JAYHAWK 7 FED 10H

Sub-Division DELAWARE BASIN	Region LEA COUNTY CORE	Field Name RATTLESNAKE DBBU	County LEA	State/Province NM		
Surface Legal Location 7-26S-34E	API/UWI 3002545548	Latitude (°) 32° 3' 49.322" N	Longitude (°) 103° 30' 39.281" W	Orig KB Elevation (ft) 3,372.80	Ground Elev MSL (ft) 3,339.80	KB - GL (ft) 33.00

Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
6/28/2019	12,746.00	62.50	170.40	12,596.02	-210.26	211.37	203.82	9.41	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,841.00	69.10	168.50	12,634.94	-125.05	126.24	219.71	7.18	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	12,936.00	79.80	168.70	12,660.37	-35.36	36.65	237.77	11.26	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,030.00	91.70	168.70	12,667.32	56.49	-55.11	256.11	12.66	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,125.00	91.00	171.90	12,665.09	150.18	-148.71	272.11	3.45	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,220.00	91.80	176.90	12,662.76	244.72	-243.20	281.37	5.33	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,314.00	92.00	182.10	12,659.64	338.63	-337.11	282.19	5.53	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,409.00	92.40	182.70	12,656.00	433.46	-431.96	278.22	0.76	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,504.00	90.60	180.70	12,653.51	528.36	-526.87	275.40	2.83	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,598.00	89.90	179.90	12,653.10	622.35	-620.87	274.91	1.13	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,693.00	90.00	180.50	12,653.18	717.34	-715.87	274.58	0.64	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,787.00	90.60	181.10	12,652.69	811.32	-809.86	273.27	0.90	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,883.00	90.20	180.70	12,652.02	907.30	-905.84	271.76	0.59	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	13,977.00	90.00	181.10	12,651.86	1,001.28	-999.83	270.28	0.48	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,071.00	88.00	180.20	12,653.50	1,095.25	-1,093.81	269.21	2.33	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,166.00	87.90	180.00	12,656.90	1,190.18	-1,188.74	269.05	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/28/2019	14,260.00	87.70	180.40	12,660.50	1,284.11	-1,282.67	268.72	0.48	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,354.00	87.80	180.90	12,664.20	1,378.02	-1,376.60	267.66	0.54	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,448.00	87.20	179.90	12,668.30	1,471.93	-1,470.50	267.00	1.24	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,543.00	89.40	177.60	12,671.11	1,566.86	-1,565.43	269.07	3.35	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,637.00	88.30	178.20	12,673.00	1,660.79	-1,659.34	272.52	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,731.00	88.00	175.90	12,676.04	1,754.64	-1,753.16	277.35	2.47	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,826.00	89.40	178.30	12,678.19	1,849.51	-1,848.01	282.15	2.92	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	14,920.00	90.00	178.40	12,678.68	1,943.48	-1,941.97	284.86	0.65	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,015.00	91.10	180.60	12,677.77	2,038.47	-2,036.95	285.69	2.59	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,109.00	90.60	181.10	12,676.38	2,132.44	-2,130.93	284.30	0.75	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,204.00	90.20	181.90	12,675.71	2,227.39	-2,225.89	281.81	0.94	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,298.00	89.10	181.90	12,676.29	2,321.31	-2,319.84	278.69	1.17	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,393.00	92.00	183.80	12,675.38	2,416.15	-2,414.70	273.97	3.65	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,487.00	88.80	179.60	12,674.72	2,510.06	-2,508.62	271.18	5.62	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,581.00	90.50	181.40	12,675.29	2,604.04	-2,602.61	270.36	2.63	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,676.00	90.00	178.40	12,674.88	2,699.02	-2,697.60	270.53	3.20	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,771.00	89.60	178.90	12,675.21	2,794.01	-2,792.57	272.77	0.67	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,866.00	89.80	180.20	12,675.71	2,889.00	-2,887.57	273.51	1.38	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	15,960.00	90.40	176.90	12,675.54	2,982.97	-2,981.52	275.89	3.57	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,055.00	91.30	178.70	12,674.13	3,077.90	-3,076.44	279.54	2.12	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,149.00	90.40	179.00	12,672.74	3,171.88	-3,170.41	281.42	1.01	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,244.00	89.00	179.10	12,673.24	3,266.87	-3,265.39	283.00	1.48	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,338.00	90.70	180.90	12,673.48	3,360.86	-3,359.38	283.00	2.63	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,433.00	90.60	181.40	12,672.41	3,455.83	-3,454.36	281.09	0.54	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,527.00	91.20	182.50	12,670.93	3,549.74	-3,548.29	277.89	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,622.00	88.60	178.90	12,671.10	3,644.70	-3,643.26	276.73	4.67	MWD	TOTAL DIRECTIONAL SERV...
6/29/2019	16,716.00	90.70	180.10	12,671.67	3,738.69	-3,737.25	277.55	2.57	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,811.00	91.10	178.90	12,670.18	3,833.68	-3,832.23	278.38	1.33	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,905.00	91.50	177.40	12,668.04	3,927.62	-3,926.15	281.42	1.65	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	16,999.00	90.30	175.00	12,666.57	4,021.42	-4,019.93	287.65	2.85	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,094.00	90.30	175.70	12,666.07	4,116.15	-4,114.61	295.35	0.74	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,189.00	90.20	175.90	12,665.66	4,210.93	-4,209.35	302.30	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,283.00	89.70	174.80	12,665.74	4,304.66	-4,303.04	309.92	1.29	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,378.00	91.50	178.70	12,664.74	4,399.51	-4,397.86	315.31	4.52	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,472.00	91.60	179.10	12,662.20	4,493.46	-4,491.81	317.11	0.44	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,567.00	91.40	179.20	12,659.71	4,588.42	-4,586.77	318.52	0.24	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,662.00	90.20	179.10	12,658.39	4,683.41	-4,681.75	319.93	1.27	MWD	TOTAL DIRECTIONAL SERV...
6/30/2019	17,712.00	90.20	179.10	12,658.21	4,733.41	-4,731.74	320.72	0.00	BIT	