

Akita 90 (+30ft)

XTO Energy Inc.

Eddy County, NM (NAD27) Remuda North 31 State Pad

API#

Remuda North 31 State 164H

Wellbore #1

Design: State 164H (Actual)

Sperry Drilling Services

Combo Report

25 January, 2019

Well Coordinates: 32.25938817
-103.92124934

NAD 1927 (NADCON CONUS)
New Mexico East 3001
458,327.90 N
627,383.40 E

Ground Level: 3,215.00 usft

Local Coordinate Origin:

Centered on Well Remuda North 31 State 164H

Viewing Datum:

GL: 3215'+30ft @ 3245.00usft (Akita 90 (+30ft))

TVDs to System:

N

North Reference:

Grid

Unit System:

Midcon (2 decimal)

Version: 5000.15 Build: 91

Report Version: Midcon Combo v1.13

HALLIBURTON

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
464.00	1.80	67.00	463.94	1.38 N	6.68 E	458,329.28	627,390.08	0.00	1.34	0.00	
544.00	0.90	71.40	543.92	2.07 N	8.43 E	458,329.97	627,391.83	1.13	2.02	175.63	
635.00	1.00	74.80	634.90	2.51 N	9.88 E	458,330.41	627,393.28	0.13	2.45	31.12	
724.00	1.10	73.30	723.89	2.96 N	11.44 E	458,330.86	627,394.84	0.12	2.89	-16.12	
822.00	1.30	75.40	821.87	3.51 N	13.42 E	458,331.41	627,396.82	0.21	3.43	13.45	
917.00	1.50	69.20	916.84	4.22 N	15.63 E	458,332.12	627,399.03	0.26	4.13	-40.27	
1,012.00	1.80	74.90	1,011.80	5.05 N	18.23 E	458,332.95	627,401.63	0.36	4.95	31.55	
1,107.00	1.90	75.50	1,106.75	5.83 N	21.19 E	458,333.73	627,404.59	0.11	5.72	11.26	
1,202.00	2.00	76.60	1,201.70	6.61 N	24.33 E	458,334.51	627,407.73	0.11	6.48	21.07	
1,297.00	1.80	70.40	1,296.64	7.50 N	27.35 E	458,335.40	627,410.75	0.30	7.34	-137.28	
1,392.00	0.90	82.90	1,391.62	8.09 N	29.49 E	458,335.99	627,412.89	0.99	7.92	168.06	
1,487.00	1.00	87.80	1,486.60	8.21 N	31.06 E	458,336.11	627,414.46	0.14	8.04	41.56	
1,581.00	1.00	84.40	1,580.59	8.33 N	32.70 E	458,336.23	627,416.10	0.06	8.14	-91.70	
1,676.00	1.20	82.40	1,675.57	8.54 N	34.51 E	458,336.44	627,417.91	0.21	8.34	-11.87	
1,771.00	1.30	82.80	1,770.55	8.80 N	36.57 E	458,336.70	627,419.97	0.11	8.60	5.19	
1,866.00	1.40	82.40	1,865.52	9.09 N	38.79 E	458,336.99	627,422.19	0.11	8.88	-5.58	
1,961.00	1.60	81.60	1,960.49	9.44 N	41.25 E	458,337.34	627,424.65	0.21	9.21	-6.38	
2,056.00	1.60	97.90	2,055.45	9.45 N	43.87 E	458,337.35	627,427.27	0.48	9.21	98.15	
2,151.00	1.70	101.40	2,150.41	8.99 N	46.57 E	458,336.89	627,429.97	0.15	8.73	46.98	
2,246.00	1.90	96.80	2,245.37	8.53 N	49.51 E	458,336.43	627,432.91	0.26	8.25	-38.16	
2,341.00	2.00	97.00	2,340.31	8.14 N	52.72 E	458,336.04	627,436.12	0.11	7.84	3.99	
2,436.00	2.20	98.40	2,435.25	7.67 N	56.17 E	458,335.57	627,439.57	0.22	7.35	15.09	
2,531.00	2.50	93.20	2,530.17	7.29 N	60.04 E	458,335.19	627,443.44	0.39	6.95	-38.02	
2,626.00	2.50	93.10	2,625.08	7.06 N	64.18 E	458,334.96	627,447.58	0.00	6.70	-90.05	
2,720.00	2.70	94.00	2,718.98	6.79 N	68.44 E	458,334.69	627,451.84	0.22	6.41	11.99	
2,815.00	2.90	93.30	2,813.87	6.50 N	73.07 E	458,334.40	627,456.47	0.21	6.09	-10.05	
2,910.00	3.20	96.20	2,908.73	6.07 N	78.10 E	458,333.97	627,461.50	0.36	5.64	28.67	
3,005.00	3.30	100.80	3,003.58	5.28 N	83.43 E	458,333.18	627,466.83	0.29	4.81	71.33	
3,100.00	3.50	102.00	3,098.41	4.16 N	88.95 E	458,332.06	627,472.35	0.22	3.66	20.19	
3,194.00	3.60	106.90	3,192.23	2.71 N	94.58 E	458,330.61	627,477.98	0.34	2.18	74.21	
3,265.00	3.90	109.00	3,263.08	1.27 N	98.99 E	458,329.17	627,482.39	0.46	0.72	25.65	
3,380.00	3.78	107.13	3,377.82	1.12 S	106.32 E	458,326.78	627,489.72	0.15	-1.71	-134.71	
3,475.00	3.12	117.24	3,472.65	3.22 S	111.61 E	458,324.68	627,495.01	0.94	-3.85	142.30	
3,569.00	2.11	120.40	3,566.55	5.27 S	115.37 E	458,322.63	627,498.77	1.08	-5.91	173.45	
3,664.00	2.11	119.35	3,661.49	7.01 S	118.41 E	458,320.89	627,501.81	0.04	-7.67	-90.52	
3,759.00	2.11	118.38	3,756.42	8.70 S	121.47 E	458,319.20	627,504.87	0.04	-9.38	-90.48	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,854.00	2.11	115.57	3,851.36	10.29 S	124.59 E	458,317.61	627,507.99	0.11	-10.98	-91.40	
3,949.00	2.02	117.59	3,946.30	11.82 S	127.65 E	458,316.08	627,511.05	0.12	-12.53	142.04	
4,044.00	2.02	118.29	4,041.24	13.39 S	130.61 E	458,314.51	627,514.01	0.03	-14.12	90.35	
4,139.00	2.02	117.59	4,136.18	14.96 S	133.56 E	458,312.94	627,516.96	0.03	-15.70	-90.35	
4,234.00	1.89	117.24	4,231.12	16.45 S	136.44 E	458,311.45	627,519.84	0.14	-17.21	-174.93	
4,328.00	1.89	115.57	4,325.07	17.83 S	139.22 E	458,310.07	627,522.62	0.06	-18.60	-90.83	
4,423.00	1.71	119.17	4,420.03	19.19 S	141.87 E	458,308.71	627,525.27	0.22	-19.99	149.65	
4,518.00	1.71	118.73	4,514.98	20.57 S	144.35 E	458,307.33	627,527.75	0.01	-21.37	-90.22	
4,613.00	1.71	117.24	4,609.94	21.90 S	146.85 E	458,306.00	627,530.25	0.05	-22.72	-90.74	
4,708.00	1.71	116.80	4,704.90	23.18 S	149.38 E	458,304.72	627,532.78	0.01	-24.02	-90.22	
4,803.00	1.71	116.97	4,799.86	24.47 S	151.91 E	458,303.43	627,535.31	0.01	-25.31	90.08	
4,898.00	1.49	168.83	4,894.82	26.32 S	153.41 E	458,301.58	627,536.81	1.49	-27.18	123.97	
4,992.00	1.49	117.50	4,988.80	28.08 S	154.73 E	458,299.82	627,538.13	1.37	-28.95	-115.66	
5,087.00	1.58	117.33	5,083.76	29.25 S	156.99 E	458,298.65	627,540.39	0.09	-30.13	-2.98	
5,182.00	1.58	115.74	5,178.73	30.42 S	159.33 E	458,297.48	627,542.73	0.05	-31.31	-90.79	
5,277.00	1.58	117.50	5,273.69	31.60 S	161.67 E	458,296.30	627,545.07	0.05	-32.50	90.88	
5,372.00	1.58	117.50	5,368.65	32.81 S	164.00 E	458,295.09	627,547.40	0.00	-33.72	0.00	
5,467.00	1.58	117.15	5,463.62	34.01 S	166.32 E	458,293.89	627,549.72	0.01	-34.94	-90.17	
5,561.00	1.71	117.15	5,557.58	35.24 S	168.72 E	458,292.66	627,552.12	0.14	-36.18	0.00	
5,656.00	1.58	120.75	5,652.54	36.56 S	171.11 E	458,291.34	627,554.51	0.17	-37.51	143.31	
5,751.00	1.49	118.12	5,747.51	37.81 S	173.33 E	458,290.09	627,556.73	0.12	-38.78	-143.26	
5,846.00	1.41	124.27	5,842.48	39.05 S	175.38 E	458,288.85	627,558.78	0.18	-40.03	120.26	
5,940.00	1.49	126.64	5,936.45	40.43 S	177.32 E	458,287.47	627,560.72	0.11	-41.42	38.05	
6,035.00	1.49	127.96	6,031.41	41.93 S	179.28 E	458,285.97	627,562.68	0.04	-42.93	90.66	
6,130.00	1.49	133.59	6,126.38	43.54 S	181.15 E	458,284.36	627,564.55	0.15	-44.55	92.81	
6,225.00	1.49	137.28	6,221.35	45.30 S	182.88 E	458,282.60	627,566.28	0.10	-46.32	91.84	
6,319.00	1.41	140.62	6,315.32	47.09 S	184.45 E	458,280.81	627,567.85	0.12	-48.12	135.09	
6,414.00	1.41	143.17	6,410.29	48.93 S	185.89 E	458,278.97	627,569.29	0.07	-49.97	91.27	
6,509.00	1.41	143.43	6,505.26	50.80 S	187.29 E	458,277.10	627,570.69	0.01	-51.85	90.13	
6,604.00	1.41	145.19	6,600.23	52.70 S	188.65 E	458,275.20	627,572.05	0.05	-53.75	90.88	
6,699.00	1.41	144.13	6,695.20	54.61 S	190.00 E	458,273.29	627,573.40	0.03	-55.67	-90.53	
6,794.00	1.41	148.79	6,790.17	56.56 S	191.29 E	458,271.34	627,574.69	0.12	-57.62	92.33	
6,889.00	1.41	148.44	6,885.15	58.55 S	192.51 E	458,269.35	627,575.91	0.01	-59.62	-90.17	
6,983.00	1.49	148.88	6,979.12	60.58 S	193.75 E	458,267.32	627,577.15	0.09	-61.66	8.14	
7,078.00	1.49	149.49	7,074.08	62.70 S	195.01 E	458,265.20	627,578.41	0.02	-63.79	90.30	
7,173.00	1.49	152.66	7,169.05	64.87 S	196.21 E	458,263.03	627,579.61	0.09	-65.96	91.58	
7,268.00	1.32	155.82	7,264.02	66.96 S	197.22 E	458,260.94	627,580.62	0.20	-68.06	157.07	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	
Depth	Inclination	Azimuth	Depth	Northing	Easting	Northing	Easting	Rate	Section	Angle	Comments
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(usft)	(°)	
7,363.00	1.32	162.68	7,359.00	69.00 S	198.00 E	458,258.90	627,581.40	0.17	-70.11	93.43	
7,458.00	1.19	170.59	7,453.98	71.02 S	198.48 E	458,256.88	627,581.88	0.23	-72.13	130.79	
7,554.00	1.10	186.14	7,549.96	72.92 S	198.55 E	458,254.98	627,581.95	0.34	-74.03	113.83	
7,649.00	1.10	210.75	7,644.94	74.61 S	197.98 E	458,253.29	627,581.38	0.49	-75.72	102.30	
7,744.00	1.10	213.48	7,739.92	76.16 S	197.01 E	458,251.74	627,580.41	0.06	-77.25	91.36	
7,839.00	1.32	204.95	7,834.90	77.91 S	196.05 E	458,249.99	627,579.45	0.30	-79.00	-43.63	
7,934.00	1.41	203.55	7,929.87	79.97 S	195.12 E	458,247.93	627,578.52	0.10	-81.06	-21.03	
8,029.00	1.71	212.78	8,024.84	82.23 S	193.89 E	458,245.67	627,577.29	0.41	-83.32	44.62	
8,124.00	1.80	216.38	8,119.79	84.63 S	192.23 E	458,243.27	627,575.63	0.15	-85.70	52.58	
8,219.00	1.71	213.30	8,214.75	87.01 S	190.57 E	458,240.89	627,573.97	0.14	-88.08	-135.19	
8,313.00	1.80	212.16	8,308.71	89.44 S	189.01 E	458,238.46	627,572.41	0.10	-90.49	-21.77	
8,408.00	1.80	213.30	8,403.66	91.95 S	187.40 E	458,235.95	627,570.80	0.04	-92.99	90.57	
8,502.00	1.89	212.69	8,497.61	94.48 S	185.75 E	458,233.42	627,569.15	0.10	-95.52	-12.61	
8,596.00	1.89	206.89	8,591.56	97.17 S	184.22 E	458,230.73	627,567.62	0.20	-98.20	-92.90	
8,691.00	1.80	204.60	8,686.51	99.93 S	182.89 E	458,227.97	627,566.29	0.12	-100.94	-141.82	
8,790.00	1.32	214.80	8,785.47	102.28 S	181.59 E	458,225.62	627,564.99	0.56	-103.29	154.98	
8,885.00	3.60	210.05	8,880.38	105.76 S	179.47 E	458,222.14	627,562.87	2.41	-106.76	-7.49	
8,980.00	2.59	190.10	8,975.24	110.45 S	177.60 E	458,217.45	627,561.00	1.54	-111.44	-142.83	
9,075.00	2.51	166.46	9,070.15	114.59 S	177.71 E	458,213.31	627,561.11	1.10	-115.58	-106.10	
9,170.00	2.42	141.50	9,165.07	118.18 S	179.45 E	458,209.72	627,562.85	1.12	-119.18	-107.19	
9,265.00	1.58	128.05	9,260.01	120.56 S	181.73 E	458,207.34	627,565.13	1.01	-121.57	-157.41	
9,360.00	1.71	148.88	9,354.97	122.58 S	183.49 E	458,205.32	627,566.89	0.64	-123.60	88.28	
9,455.00	0.88	132.97	9,449.94	124.29 S	184.76 E	458,203.61	627,568.16	0.94	-125.32	-164.39	
9,549.00	2.11	156.88	9,543.91	126.37 S	185.96 E	458,201.53	627,569.36	1.44	-127.41	39.18	
9,644.00	1.41	148.79	9,638.87	128.98 S	187.26 E	458,198.92	627,570.66	0.78	-130.02	-164.47	
9,739.00	2.02	45.80	9,733.84	128.81 S	189.06 E	458,199.09	627,572.46	2.85	-129.87	-133.43	
9,834.00	1.58	55.80	9,828.79	126.91 S	191.35 E	458,200.99	627,574.75	0.57	-127.97	149.41	
9,928.00	1.89	45.40	9,922.75	125.09 S	193.52 E	458,202.81	627,576.92	0.47	-126.17	-50.72	
10,023.00	1.89	40.25	10,017.70	122.80 S	195.65 E	458,205.10	627,579.05	0.18	-123.89	-92.57	
10,118.00	1.80	34.97	10,112.65	120.38 S	197.52 E	458,207.52	627,580.92	0.20	-121.48	-120.52	
10,213.00	1.41	25.22	10,207.61	118.10 S	198.87 E	458,209.80	627,582.27	0.50	-119.21	-149.81	
10,308.00	1.10	10.63	10,302.59	116.14 S	199.54 E	458,211.76	627,582.94	0.47	-117.26	-141.27	
10,402.00	1.01	10.80	10,396.57	114.44 S	199.86 E	458,213.46	627,583.26	0.10	-115.56	178.09	
10,497.00	1.01	6.76	10,491.56	112.79 S	200.11 E	458,215.11	627,583.51	0.07	-113.90	-92.02	
10,498.00	1.01	4.30	10,492.56	112.77 S	200.11 E	458,215.13	627,583.51	4.34	-113.89	-91.23	
10,662.00	0.88	341.10	10,656.54	110.14 S	199.81 E	458,217.76	627,583.21	0.24	-111.25	-120.12	
10,757.00	2.00	330.50	10,751.50	108.01 S	198.76 E	458,219.89	627,582.16	1.21	-109.11	-18.71	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100usft)	Section (usft)	Angle (°)	
10,789.00	5.20	331.30	10,783.44	106.25 S	197.79 E	458,221.65	627,581.19	10.00	-107.35	1.30	
10,821.00	8.50	336.40	10,815.20	102.81 S	196.15 E	458,225.09	627,579.55	10.48	-103.90	12.98	
10,852.00	10.70	338.20	10,845.77	98.03 S	194.16 E	458,229.87	627,577.56	7.16	-99.12	8.66	
10,883.00	13.20	339.60	10,876.09	92.04 S	191.86 E	458,235.86	627,575.26	8.12	-93.11	7.30	
10,915.00	15.10	337.20	10,907.12	84.78 S	188.97 E	458,243.12	627,572.37	6.21	-85.83	-18.33	
10,946.00	16.60	332.80	10,936.94	77.12 S	185.38 E	458,250.78	627,568.78	6.20	-78.15	-40.83	
10,978.00	19.10	327.30	10,967.40	68.64 S	180.46 E	458,259.26	627,563.86	9.41	-69.65	-36.63	
11,010.00	21.40	324.90	10,997.42	59.46 S	174.27 E	458,268.44	627,557.67	7.64	-60.43	-20.99	
11,041.00	23.40	323.50	11,026.08	49.88 S	167.36 E	458,278.02	627,550.76	6.68	-50.82	-15.58	
11,073.00	26.30	324.50	11,055.12	39.00 S	159.46 E	458,288.90	627,542.86	9.16	-39.89	8.70	
11,104.00	29.20	324.90	11,082.55	27.22 S	151.12 E	458,300.68	627,534.52	9.37	-28.06	3.85	
11,136.00	31.30	325.80	11,110.19	13.96 S	141.96 E	458,313.94	627,525.36	6.71	-14.75	12.57	
11,169.00	33.40	326.10	11,138.07	0.67 N	132.08 E	458,328.57	627,515.48	6.38	-0.06	4.50	
11,199.00	35.20	326.30	11,162.85	14.72 N	122.67 E	458,342.62	627,506.07	6.01	14.04	3.67	
11,231.00	36.40	326.77	11,188.80	30.34 N	112.35 E	458,358.24	627,495.75	3.85	29.71	13.10	
11,262.00	38.20	326.33	11,213.46	46.01 N	102.00 E	458,373.91	627,485.40	5.87	45.44	-8.60	
11,294.00	40.62	326.86	11,238.18	62.97 N	90.82 E	458,390.87	627,474.22	7.64	62.46	8.12	
11,326.00	43.60	327.12	11,261.92	80.96 N	79.13 E	458,408.86	627,462.53	9.33	80.52	3.45	
11,357.00	46.20	327.65	11,283.88	99.39 N	67.34 E	458,427.29	627,450.74	8.47	99.02	8.38	
11,389.00	48.31	328.88	11,305.60	119.38 N	54.98 E	458,447.28	627,438.38	7.17	119.07	23.60	
11,420.00	49.90	330.40	11,325.89	139.60 N	43.14 E	458,467.50	627,426.54	6.33	139.36	36.35	
11,452.00	51.60	331.90	11,346.14	161.30 N	31.19 E	458,489.20	627,414.59	6.43	161.13	34.82	
11,484.00	53.40	334.00	11,365.62	183.91 N	19.65 E	458,511.81	627,403.05	7.66	183.80	43.43	
11,515.00	55.20	336.00	11,383.71	206.73 N	9.02 E	458,534.63	627,392.42	7.82	206.68	42.65	
11,547.00	56.90	337.20	11,401.58	231.09 N	1.52 W	458,558.99	627,381.88	6.16	231.10	30.69	
11,579.00	58.50	338.00	11,418.68	256.10 N	11.83 W	458,584.00	627,371.57	5.43	256.16	23.13	
11,610.00	60.10	339.40	11,434.51	280.93 N	21.51 W	458,608.83	627,361.89	6.46	281.05	37.32	
11,642.00	61.89	339.87	11,450.02	307.17 N	31.25 W	458,635.07	627,352.15	5.74	307.34	13.05	
11,673.00	63.52	340.92	11,464.24	333.12 N	40.49 W	458,661.02	627,342.91	6.06	333.34	30.03	
11,705.00	65.32	342.24	11,478.05	360.50 N	49.60 W	458,688.40	627,333.80	6.74	360.77	33.77	
11,737.00	67.30	343.64	11,490.91	388.51 N	58.20 W	458,716.41	627,325.20	7.37	388.83	33.21	
11,768.00	69.41	345.40	11,502.35	416.28 N	65.88 W	458,744.18	627,317.52	8.61	416.64	38.12	
11,800.00	71.30	346.72	11,513.10	445.53 N	73.14 W	458,773.43	627,310.26	7.07	445.93	33.56	
11,832.00	73.19	348.39	11,522.86	475.29 N	79.71 W	458,803.19	627,303.69	7.72	475.72	40.34	
11,895.00	76.10	350.60	11,539.54	535.01 N	90.77 W	458,862.91	627,292.63	5.72	535.51	36.52	
11,990.00	83.80	354.20	11,556.12	627.65 N	103.10 W	458,955.55	627,280.30	8.92	628.22	25.06	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100usft)	Section (usft)	Angle (°)	
12,085.00	89.90	357.60	11,561.34	722.21 N	109.87 W	459,050.11	627,273.53	7.35	722.81	29.21	
12,131.00	92.03	359.30	11,560.56	768.18 N	111.11 W	459,096.08	627,272.29	5.92	768.79	38.58	
12,226.00	89.57	358.02	11,559.23	863.13 N	113.33 W	459,191.03	627,270.07	2.92	863.75	-152.50	
12,321.00	91.17	359.60	11,558.62	958.10 N	115.31 W	459,286.00	627,268.09	2.37	958.73	44.64	
12,415.00	88.67	359.28	11,558.75	1,052.09 N	116.22 W	459,379.99	627,267.18	2.68	1,052.73	-172.71	
12,510.00	90.06	359.38	11,559.80	1,147.08 N	117.34 W	459,474.98	627,266.06	1.47	1,147.72	4.12	
12,605.00	92.98	0.90	11,557.28	1,242.03 N	117.10 W	459,569.93	627,266.30	3.46	1,242.67	27.47	
12,700.00	88.03	357.41	11,556.45	1,336.97 N	118.51 W	459,664.87	627,264.89	6.37	1,337.61	-144.78	
12,795.00	90.65	358.82	11,557.54	1,431.90 N	121.63 W	459,759.80	627,261.77	3.13	1,432.56	28.30	
12,889.00	90.62	356.53	11,556.50	1,525.82 N	125.44 W	459,853.72	627,257.96	2.44	1,526.49	-90.74	
12,984.00	87.35	355.81	11,558.18	1,620.57 N	131.79 W	459,948.47	627,251.61	3.52	1,621.29	-167.59	
13,079.00	92.44	357.47	11,558.36	1,715.38 N	137.35 W	460,043.28	627,246.05	5.64	1,716.12	18.07	
13,174.00	87.82	357.67	11,558.14	1,810.27 N	141.38 W	460,138.17	627,242.02	4.87	1,811.03	177.52	
13,269.00	91.89	356.77	11,558.38	1,905.13 N	145.99 W	460,233.03	627,237.41	4.39	1,905.92	-12.47	
13,364.00	90.25	356.38	11,556.61	1,999.94 N	151.66 W	460,327.84	627,231.74	1.77	2,000.76	-166.62	
13,459.00	89.97	359.56	11,556.43	2,094.87 N	155.02 W	460,422.77	627,228.38	3.36	2,095.70	95.03	
13,553.00	91.42	0.03	11,555.28	2,188.86 N	155.36 W	460,516.76	627,228.04	1.62	2,189.69	17.96	
13,648.00	91.94	2.06	11,552.50	2,283.80 N	153.63 W	460,611.70	627,229.77	2.20	2,284.62	75.60	
13,743.00	91.26	1.84	11,549.85	2,378.71 N	150.40 W	460,706.61	627,233.00	0.75	2,379.51	-162.08	
13,838.00	88.37	2.22	11,550.15	2,473.64 N	147.03 W	460,801.54	627,236.37	3.07	2,474.42	172.51	
13,933.00	90.71	2.77	11,550.92	2,568.54 N	142.90 W	460,896.44	627,240.50	2.53	2,569.29	13.23	
14,028.00	91.54	2.00	11,549.05	2,663.43 N	138.95 W	460,991.33	627,244.45	1.19	2,664.17	-42.84	
14,123.00	89.23	1.38	11,548.41	2,758.38 N	136.14 W	461,086.28	627,247.26	2.52	2,759.10	-164.97	
14,217.00	90.09	1.08	11,548.97	2,852.36 N	134.13 W	461,180.26	627,249.27	0.97	2,853.06	-19.23	
14,312.00	90.06	0.46	11,548.85	2,947.35 N	132.85 W	461,275.25	627,250.55	0.65	2,948.05	-92.77	
14,407.00	90.37	359.61	11,548.49	3,042.35 N	132.79 W	461,370.25	627,250.61	0.95	3,043.04	-69.96	
14,502.00	89.04	358.11	11,548.98	3,137.32 N	134.68 W	461,465.22	627,248.72	2.11	3,138.03	-131.56	
14,597.00	90.15	359.09	11,549.65	3,232.29 N	137.00 W	461,560.19	627,246.40	1.56	3,233.00	41.44	
14,691.00	88.71	359.36	11,550.59	3,326.27 N	138.27 W	461,654.17	627,245.13	1.56	3,326.99	169.38	
14,786.00	91.02	359.09	11,550.81	3,421.26 N	139.56 W	461,749.16	627,243.84	2.45	3,421.98	-6.67	
14,881.00	89.66	359.84	11,550.25	3,516.25 N	140.45 W	461,844.15	627,242.95	1.63	3,516.98	151.12	
14,976.00	91.85	0.52	11,548.99	3,611.23 N	140.15 W	461,939.13	627,243.25	2.41	3,611.96	17.24	
15,071.00	89.07	0.68	11,548.23	3,706.22 N	139.15 W	462,034.12	627,244.25	2.93	3,706.94	176.71	
15,166.00	89.82	0.24	11,549.15	3,801.21 N	138.39 W	462,129.11	627,245.01	0.92	3,801.92	-30.40	
15,260.00	90.71	1.13	11,548.72	3,895.20 N	137.27 W	462,223.10	627,246.13	1.34	3,895.90	45.00	
15,355.00	89.38	4.21	11,548.64	3,990.08 N	132.84 W	462,317.98	627,250.56	3.53	3,990.76	113.35	
15,450.00	91.51	3.71	11,547.90	4,084.85 N	126.28 W	462,412.75	627,257.12	2.30	4,085.49	-13.21	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100usft)	Section (usft)	Angle (°)	
15,545.00	86.85	359.95	11,549.26	4,179.75 N	123.25 W	462,507.65	627,260.15	6.30	4,180.37	-141.11	
15,639.00	87.97	359.36	11,553.51	4,273.65 N	123.81 W	462,601.55	627,259.59	1.35	4,274.27	-27.77	
15,734.00	88.71	0.46	11,556.26	4,368.60 N	123.96 W	462,696.50	627,259.44	1.40	4,369.23	56.08	
15,829.00	91.51	1.69	11,556.08	4,463.58 N	122.18 W	462,791.48	627,261.22	3.22	4,464.19	23.72	
15,924.00	88.89	0.35	11,555.75	4,558.55 N	120.49 W	462,886.45	627,262.91	3.10	4,559.15	-152.91	
16,019.00	89.85	0.29	11,556.79	4,653.54 N	119.96 W	462,981.44	627,263.44	1.01	4,654.14	-3.58	
16,114.00	89.45	356.63	11,557.37	4,748.49 N	122.51 W	463,076.39	627,260.89	3.88	4,749.10	-96.25	
16,208.00	91.51	355.18	11,556.59	4,842.24 N	129.22 W	463,170.14	627,254.18	2.68	4,842.88	-35.14	
16,303.00	88.06	355.21	11,556.94	4,936.89 N	137.18 W	463,264.79	627,246.22	3.63	4,937.58	179.50	
16,398.00	89.04	356.47	11,559.35	5,031.61 N	144.07 W	463,359.51	627,239.33	1.68	5,032.33	52.13	
16,493.00	89.69	357.53	11,560.40	5,126.47 N	149.04 W	463,454.37	627,234.36	1.31	5,127.22	58.49	
16,588.00	91.51	358.75	11,559.41	5,221.41 N	152.12 W	463,549.31	627,231.28	2.31	5,222.17	33.83	
16,683.00	88.06	355.76	11,559.76	5,316.27 N	156.67 W	463,644.17	627,226.73	4.81	5,317.06	-139.08	
16,778.00	92.99	359.16	11,558.89	5,411.13 N	160.88 W	463,739.03	627,222.52	6.30	5,411.94	34.59	
16,873.00	92.44	358.66	11,554.39	5,506.01 N	162.69 W	463,833.91	627,220.71	0.78	5,506.83	-137.75	
16,968.00	89.38	357.24	11,552.88	5,600.92 N	166.08 W	463,928.82	627,217.32	3.55	5,601.76	-155.09	
17,063.00	90.46	357.02	11,553.02	5,695.80 N	170.84 W	464,023.70	627,212.56	1.16	5,696.66	-11.51	
17,159.00	91.63	359.09	11,551.26	5,791.72 N	174.10 W	464,119.62	627,209.30	2.48	5,792.60	60.50	
17,254.00	87.41	359.55	11,552.06	5,886.69 N	175.22 W	464,214.59	627,208.18	4.47	5,887.58	173.78	
17,349.00	89.88	2.90	11,554.31	5,981.62 N	173.19 W	464,309.52	627,210.21	4.38	5,982.49	53.64	
17,444.00	91.23	5.78	11,553.39	6,076.33 N	166.01 W	464,404.23	627,217.39	3.35	6,077.16	64.88	
17,539.00	91.14	7.07	11,551.42	6,170.71 N	155.38 W	464,498.61	627,228.02	1.36	6,171.48	93.98	
17,634.00	89.01	5.32	11,551.30	6,265.15 N	145.13 W	464,593.05	627,238.27	2.90	6,265.86	-140.59	
17,729.00	89.51	3.27	11,552.53	6,359.87 N	138.01 W	464,687.77	627,245.39	2.22	6,360.54	-76.31	
17,824.00	91.20	2.32	11,551.94	6,454.75 N	133.38 W	464,782.65	627,250.02	2.04	6,455.39	-29.34	
17,919.00	90.46	357.24	11,550.56	6,549.71 N	133.75 W	464,877.61	627,249.65	5.40	6,550.35	-98.25	
18,013.00	90.86	358.53	11,549.48	6,643.63 N	137.21 W	464,971.53	627,246.19	1.44	6,644.30	72.76	
18,108.00	89.88	1.40	11,548.86	6,738.62 N	137.27 W	465,066.52	627,246.13	3.19	6,739.28	108.84	
18,203.00	91.57	3.03	11,547.66	6,833.54 N	133.60 W	465,161.44	627,249.80	2.47	6,834.18	43.96	
18,298.00	90.83	4.07	11,545.67	6,928.33 N	127.72 W	465,256.23	627,255.68	1.34	6,928.94	125.43	
18,394.00	88.77	1.64	11,546.01	7,024.20 N	122.94 W	465,352.10	627,260.46	3.32	7,024.78	-130.29	
18,488.00	89.26	359.39	11,547.62	7,118.17 N	122.10 W	465,446.07	627,261.30	2.45	7,118.75	-77.73	
18,583.00	89.23	358.67	11,548.87	7,213.15 N	123.70 W	465,541.05	627,259.70	0.76	7,213.73	-92.39	
18,678.00	90.68	357.33	11,548.95	7,308.09 N	127.02 W	465,635.99	627,256.38	2.08	7,308.68	-42.74	
18,773.00	90.06	356.42	11,548.34	7,402.94 N	132.20 W	465,730.84	627,251.20	1.16	7,403.57	-124.26	
18,868.00	91.48	357.06	11,547.06	7,497.78 N	137.60 W	465,825.68	627,245.80	1.64	7,498.43	24.26	
18,962.00	92.03	356.76	11,544.18	7,591.60 N	142.66 W	465,919.50	627,240.74	0.67	7,592.28	-28.59	

HALLIBURTON**Design Report for Remuda North 31 State 164H - State 164H (Actual)**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,057.00	89.60	355.03	11,542.83	7,686.33 N	149.46 W	466,014.23	627,233.94	3.14	7,687.05	-144.54	
19,152.00	88.67	354.21	11,544.26	7,780.90 N	158.37 W	466,108.80	627,225.03	1.31	7,781.67	-138.61	
19,247.00	91.57	357.99	11,544.06	7,875.66 N	164.83 W	466,203.56	627,218.57	5.01	7,876.45	52.51	
19,313.00	88.37	355.61	11,544.10	7,941.54 N	168.51 W	466,269.44	627,214.89	6.04	7,942.36	-143.35	
19,407.00	92.65	0.46	11,543.26	8,035.43 N	171.74 W	466,363.33	627,211.66	6.88	8,036.26	48.57	
19,502.00	89.04	358.37	11,541.86	8,130.39 N	172.71 W	466,458.29	627,210.69	4.39	8,131.23	-149.91	
19,597.00	90.90	2.13	11,541.91	8,225.37 N	172.29 W	466,553.27	627,211.11	4.42	8,226.21	63.69	
19,692.00	88.43	0.95	11,542.47	8,320.33 N	169.74 W	466,648.23	627,213.66	2.88	8,321.15	-154.47	
19,788.00	90.86	3.51	11,543.06	8,416.24 N	166.00 W	466,744.14	627,217.40	3.68	8,417.03	46.51	
19,883.00	88.40	0.01	11,543.67	8,511.17 N	163.09 W	466,839.07	627,220.31	4.50	8,511.95	-125.10	
19,978.00	91.14	1.85	11,544.06	8,606.14 N	161.54 W	466,934.04	627,221.86	3.47	8,606.91	33.89	
20,073.00	90.28	359.38	11,542.88	8,701.12 N	160.52 W	467,029.02	627,222.88	2.75	8,701.88	-109.18	
20,168.00	89.85	358.66	11,542.77	8,796.11 N	162.15 W	467,124.01	627,221.25	0.88	8,796.87	-120.85	
20,263.00	91.51	1.02	11,541.64	8,891.09 N	162.41 W	467,218.99	627,220.99	3.04	8,891.86	54.87	
20,358.00	90.52	2.48	11,539.96	8,986.03 N	159.51 W	467,313.93	627,223.89	1.86	8,986.78	124.13	
20,453.00	88.15	0.88	11,541.06	9,080.97 N	156.73 W	467,408.87	627,226.67	3.01	9,081.70	-145.98	
20,548.00	89.82	1.73	11,542.75	9,175.93 N	154.57 W	467,503.83	627,228.83	1.97	9,176.65	26.98	
20,643.00	90.06	1.89	11,542.84	9,270.88 N	151.57 W	467,598.78	627,231.83	0.30	9,271.58	33.69	
20,738.00	90.06	0.78	11,542.75	9,365.85 N	149.35 W	467,693.75	627,234.05	1.17	9,366.54	-90.00	
20,833.00	91.05	2.82	11,541.82	9,460.79 N	146.37 W	467,788.69	627,237.03	2.39	9,461.46	64.10	
20,928.00	88.40	1.26	11,542.28	9,555.72 N	142.99 W	467,883.62	627,240.41	3.24	9,556.37	-149.52	
21,023.00	89.66	1.20	11,543.89	9,650.68 N	140.95 W	467,978.58	627,242.45	1.33	9,651.32	-2.73	
21,117.00	87.22	359.53	11,546.45	9,744.64 N	140.35 W	468,072.54	627,243.05	3.15	9,745.27	-145.64	
21,213.00	91.36	1.71	11,547.64	9,840.60 N	139.31 W	468,168.50	627,244.09	4.87	9,841.22	27.79	
21,308.00	88.33	358.59	11,547.89	9,935.57 N	139.06 W	468,263.47	627,244.34	4.58	9,936.19	-134.16	
21,403.00	87.03	357.80	11,551.74	10,030.44 N	142.05 W	468,358.34	627,241.35	1.60	10,031.08	-148.75	Last HAL MWD survey
21,478.00	87.03	357.80	11,555.63	10,105.29 N	144.93 W	468,433.19	627,238.47	0.00	10,105.94	0.00	Projected to TD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
21,403.00	11,551.74	10,030.44	-142.05	Last HAL MWD survey
21,478.00	11,555.63	10,105.29	-144.93	Projected to TD

Design Report for Remuda North 31 State 164H - State 164H (Actual)

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	359.68	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
544.00	14,976.00	MWD (Int)	2_MWD
15,071.00	21,478.00	MWD (lateral)	2_MWD+AX

Design Targets

Target Name - hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (°)	+N/-S (°)	+E/-W (°)	Northing (°)	Easting (°)	Latitude	Longitude
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.84 °/100usft	Maximum Dogleg over Survey:	10.48 °/100usft at 10,821.00 usft
Net Tortousity applicable to Plans:	1.20 °/100usft	Directional Difficulty Index:	6.892

Audit Info

North Reference Sheet for Remuda North 31 State Pad - Remuda North 31 State 164H - Wellbore #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to GL:3215'+30ft @ 3245.00usft (Akita 90 (+30ft)). Northing and Easting are relative to Remuda North 31 State 164H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 3001 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -104.33333333°, Longitude Origin:0.00000000°, Latitude Origin:0.00000000°

False Easting: 500,000.00usft, False Northing: 0.00usft, Scale Reduction: 0.99992768

Grid Coordinates of Well: 458,327.90 usft N, 627,383.40 usft E

Geographical Coordinates of Well: 32° 15' 33.80" N, 103° 55' 16.50" W

Grid Convergence at Surface is: 0.22°

Based upon Minimum Curvature type calculations, at a Measured Depth of 21,478.00usft

the Bottom Hole Displacement is 10,106.33usft in the Direction of 359.18° (Grid).

Magnetic Convergence at surface is: -6.82° (13 November 2018, , BGGM2018)

