

HOBBS OCD

OCT 18 2018

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Kaiser-Francis Oil Company

Lea County, NM (NAD 83)

Bell Lake Unit South

220H

OH / Job 62614

Survey: Phoenix MWD Surveys

Standard Survey Report

30 April, 2018

Survey Report

Company: Kaiser-Francis Oil Company
Project: Lea County, NM (NAD 83)
Site: Bell Lake Unit South
Well: 220H
Wellbore: OH / Job 62614
Design: Surveys (Cactus 171)

Local Co-ordinate Reference: Well 220H
TVD Reference: RKB @ 3653.40usft (Cactus 171)
MD Reference: RKB @ 3653.40usft (Cactus 171)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

Project	Lea County, NM (NAD 83)
Map System:	US State Plane 1983
Geo Datum:	North American Datum 1983
Map Zone:	New Mexico Eastern Zone
System Datum:	Mean Sea Level

Site Bell Lake Unit South

Site Position: Northing: 453,977.40 usft Latitude: 32° 14' 43.88291 N
From: Map Easting: 788,854.22 usft Longitude: 103° 31' 57.83548 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.43 °

Well 220H
Well Position +N/-S 0.00 usft Northing: 453,977.40 usft Latitude: 32° 14' 43.88291 N
 +E/-W 0.00 usft Easting: 788,854.22 usft Longitude: 103° 31' 57.83548 W
Position Uncertainty 0.00 usft Wellhead Elevation: usft Ground Level: 3,630.40 usft

Wellbore OH / Job 62614

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	4/27/2018	6.71	59.96	48,000.58080258

Design Surveys (Cactus 171)

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	359.54

Survey Program Date 4/30/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
144.00	18,835.00	Phoenix MWD Surveys (OH / Job 62614)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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
144.00	0.51	150.93	144.00	-0.56	0.31	-0.56	0.35	0.35	0.00
First Phoenix MWD Survey									
234.00	0.49	76.66	234.00	-0.82	0.88	-0.83	0.67	-0.02	-82.52
326.00	0.36	86.73	325.99	-0.71	1.55	-0.73	0.16	-0.14	10.95
419.00	0.25	97.81	418.99	-0.73	2.04	-0.74	0.13	-0.12	11.91
513.00	0.20	20.58	512.99	-0.60	2.31	-0.62	0.30	-0.05	-82.16
607.00	0.16	28.52	606.99	-0.33	2.43	-0.35	0.05	-0.04	8.45
700.00	0.29	108.41	699.99	-0.29	2.71	-0.31	0.33	0.14	85.90
794.00	0.42	38.30	793.99	-0.10	3.15	-0.12	0.45	0.14	-74.59
888.00	0.53	44.49	887.99	0.49	3.67	0.46	0.13	0.12	6.59

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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)
982.00	0.51	77.68	981.98	0.88	4.38	0.85	0.32	-0.02	35.31
1,075.00	0.25	25.53	1,074.98	1.16	4.87	1.12	0.44	-0.28	-56.08
1,169.00	0.38	40.10	1,168.98	1.58	5.16	1.54	0.16	0.14	15.50
1,263.00	0.45	86.18	1,262.98	1.84	5.73	1.80	0.35	0.07	49.02
1,451.00	0.15	120.40	1,450.97	1.77	6.68	1.71	0.18	-0.16	18.20
1,545.00	0.15	13.95	1,544.97	1.82	6.82	1.77	0.26	0.00	-113.24
1,639.00	0.10	290.96	1,638.97	1.97	6.77	1.92	0.18	-0.05	-88.29
1,732.00	0.32	278.24	1,731.97	2.04	6.44	1.99	0.24	0.24	-13.68
1,826.00	0.01	0.44	1,825.97	2.09	6.18	2.04	0.34	-0.33	87.45
1,920.00	0.05	286.38	1,919.97	2.10	6.14	2.06	0.05	0.04	-78.79
2,015.00	0.09	249.05	2,014.97	2.09	6.03	2.04	0.06	0.04	-39.29
2,109.00	0.16	315.22	2,108.97	2.16	5.87	2.11	0.16	0.07	70.39
2,204.00	0.21	311.89	2,203.97	2.37	5.64	2.32	0.05	0.05	-3.51
2,299.00	0.33	349.14	2,298.97	2.75	5.46	2.71	0.22	0.13	39.21
2,392.00	0.21	346.28	2,391.97	3.18	5.37	3.14	0.13	-0.13	-3.08
2,486.00	0.14	309.69	2,485.97	3.42	5.24	3.38	0.14	-0.07	-38.93
2,580.00	0.26	300.20	2,579.97	3.60	4.97	3.56	0.13	0.13	-10.10
2,674.00	0.40	327.69	2,673.97	3.99	4.61	3.95	0.22	0.15	29.24
2,768.00	0.20	333.28	2,767.97	4.41	4.36	4.38	0.21	-0.21	5.95
2,862.00	0.33	301.33	2,861.96	4.70	4.06	4.66	0.20	0.14	-33.99
2,957.00	0.17	267.75	2,956.96	4.83	3.68	4.80	0.22	-0.17	-35.35
3,051.00	0.13	23.87	3,050.96	4.93	3.59	4.90	0.27	-0.04	123.53
3,145.00	0.20	34.20	3,144.96	5.16	3.72	5.13	0.08	0.07	10.99
3,239.00	0.13	12.25	3,238.96	5.40	3.84	5.37	0.10	-0.07	-23.35
3,333.00	0.02	303.28	3,332.96	5.51	3.84	5.48	0.13	-0.12	-73.37
3,428.00	0.13	220.15	3,427.96	5.44	3.76	5.41	0.14	0.12	-87.51
3,523.00	0.32	155.25	3,522.96	5.12	3.80	5.09	0.31	0.20	-68.32
3,617.00	0.46	179.95	3,616.96	4.50	3.91	4.47	0.23	0.15	26.28
3,712.00	0.81	183.48	3,711.95	3.45	3.87	3.42	0.37	0.37	3.72
3,806.00	0.82	183.62	3,805.94	2.11	3.79	2.08	0.01	0.01	0.15
3,901.00	0.56	165.85	3,900.94	0.99	3.86	0.95	0.35	-0.27	-18.71
3,995.00	0.45	182.92	3,994.93	0.17	3.95	0.14	0.20	-0.12	18.16
4,089.00	0.35	175.63	4,088.93	-0.48	3.96	-0.52	0.12	-0.11	-7.76
4,183.00	0.33	183.06	4,182.93	-1.04	3.96	-1.07	0.05	-0.02	7.90
4,277.00	0.12	298.83	4,276.93	-1.26	3.86	-1.29	0.42	-0.22	123.16
4,372.00	0.50	101.12	4,371.93	-1.29	4.18	-1.33	0.65	0.40	170.83
4,467.00	1.16	107.09	4,466.92	-1.66	5.51	-1.70	0.70	0.69	6.28
4,562.00	1.77	104.14	4,561.89	-2.30	7.85	-2.36	0.65	0.64	-3.11
4,656.00	0.12	188.32	4,655.87	-2.75	9.24	-2.82	1.87	-1.76	89.55
4,750.00	0.85	138.21	4,749.87	-3.37	9.69	-3.45	0.83	0.78	-53.31
4,844.00	1.87	118.32	4,843.84	-4.62	11.51	-4.71	1.18	1.09	-21.16
4,938.00	1.69	105.01	4,937.80	-5.70	14.20	-5.82	0.48	-0.19	-14.16
5,032.00	0.80	98.18	5,031.77	-6.15	16.19	-6.28	0.96	-0.95	-7.27

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5,126.00	0.20	90.38	5,125.77	-6.25	17.00	-6.38	0.64	-0.64	-8.30
5,151.00	0.19	266.40	5,150.77	-6.25	17.00	-6.39	1.56	-0.04	704.08
5,216.00	0.61	257.93	5,215.77	-6.33	16.56	-6.46	0.65	0.65	-13.03
5,310.00	0.70	244.01	5,309.76	-6.69	15.55	-6.81	0.19	0.10	-14.81
5,404.00	0.64	135.33	5,403.76	-7.31	15.40	-7.44	1.16	-0.06	-115.62
5,499.00	1.78	118.22	5,498.73	-8.39	17.08	-8.52	1.25	1.20	-18.01
5,593.00	2.55	117.86	5,592.67	-10.05	20.21	-10.22	0.82	0.82	-0.38
5,688.00	3.18	107.64	5,687.55	-11.84	24.59	-12.04	0.85	0.66	-10.76
5,782.00	3.92	101.18	5,781.37	-13.25	30.23	-13.50	0.89	0.79	-6.87
5,877.00	5.23	101.36	5,876.06	-14.74	37.66	-15.04	1.38	1.38	0.19
5,972.00	6.43	104.21	5,970.57	-16.89	47.06	-17.27	1.30	1.26	3.00
6,066.00	7.51	104.02	6,063.87	-19.68	58.12	-20.14	1.15	1.15	-0.20
6,160.00	8.26	103.96	6,156.98	-22.79	70.64	-23.36	0.80	0.80	-0.06
6,254.00	9.75	103.79	6,249.82	-26.32	84.92	-27.00	1.59	1.59	-0.18
6,348.00	11.18	106.11	6,342.26	-30.74	101.41	-31.56	1.59	1.52	2.47
6,442.00	12.45	106.24	6,434.26	-36.11	119.89	-37.07	1.35	1.35	0.14
6,536.00	12.61	107.75	6,526.03	-42.07	139.39	-43.19	0.39	0.17	1.61
6,631.00	12.74	107.42	6,618.71	-48.37	159.26	-49.64	0.16	0.14	-0.35
6,725.00	12.42	106.39	6,710.45	-54.32	178.85	-55.76	0.42	-0.34	-1.10
6,821.00	12.10	106.87	6,804.26	-60.16	198.38	-61.75	0.35	-0.33	0.50
6,915.00	11.50	105.38	6,896.28	-65.50	216.85	-67.24	0.72	-0.64	-1.59
7,010.00	11.10	105.41	6,989.44	-70.44	234.79	-72.32	0.42	-0.42	0.03
7,104.00	11.89	104.95	7,081.55	-75.34	252.87	-77.37	0.85	0.84	-0.49
7,199.00	11.77	104.45	7,174.53	-80.29	271.71	-82.46	0.17	-0.13	-0.53
7,293.00	11.59	104.17	7,266.58	-84.99	290.15	-87.32	0.20	-0.19	-0.30
7,387.00	11.43	104.92	7,358.69	-89.70	308.31	-92.17	0.23	-0.17	0.80
7,482.00	11.35	103.96	7,451.82	-94.38	326.47	-97.00	0.22	-0.08	-1.01
7,577.00	10.24	103.15	7,545.14	-98.55	343.77	-101.31	1.18	-1.17	-0.85
7,671.00	10.71	102.53	7,637.57	-102.35	360.43	-105.24	0.51	0.50	-0.66
7,766.00	12.08	104.09	7,730.70	-106.69	378.69	-109.72	1.48	1.44	1.64
7,860.00	11.81	104.15	7,822.66	-111.43	397.56	-114.62	0.29	-0.29	0.06
7,955.00	11.50	104.97	7,915.71	-116.25	416.13	-119.59	0.37	-0.33	0.86
8,049.00	10.86	105.45	8,007.92	-121.03	433.72	-124.51	0.69	-0.68	0.51
8,143.00	11.77	103.88	8,100.09	-125.69	451.56	-129.31	1.02	0.97	-1.67
8,238.00	11.10	104.01	8,193.21	-130.23	469.84	-134.00	0.71	-0.71	0.14
8,332.00	9.86	104.39	8,285.64	-134.42	486.42	-138.32	1.32	-1.32	0.40
8,427.00	11.24	105.86	8,379.03	-138.97	503.21	-143.01	1.48	1.45	1.55
8,521.00	10.98	106.13	8,471.27	-143.97	520.62	-148.14	0.28	-0.28	0.29
8,616.00	10.46	106.34	8,564.61	-148.90	537.58	-153.22	0.55	-0.55	0.22
8,710.00	9.19	105.54	8,657.23	-153.32	553.00	-157.75	1.36	-1.35	-0.85
8,805.00	8.49	105.02	8,751.10	-157.17	567.09	-161.71	0.74	-0.74	-0.55
8,899.00	7.18	103.17	8,844.22	-160.30	579.51	-164.95	1.42	-1.39	-1.97
8,993.00	6.28	103.63	8,937.57	-162.85	590.23	-167.59	0.96	-0.96	0.49

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9,088.00	5.63	104.44	9,032.06	-165.24	599.79	-170.05	0.69	-0.68	0.85
9,183.00	4.35	99.17	9,126.70	-166.98	607.86	-171.85	1.43	-1.35	-5.55
9,277.00	3.89	96.41	9,220.45	-167.90	614.55	-172.83	0.53	-0.49	-2.94
9,371.00	3.02	90.54	9,314.28	-168.28	620.19	-173.25	1.00	-0.93	-6.24
9,467.00	3.62	115.71	9,410.13	-169.62	625.45	-174.63	1.63	0.63	26.22
9,561.00	3.54	122.66	9,503.94	-172.47	630.57	-177.53	0.47	-0.09	7.39
9,655.00	4.25	120.26	9,597.73	-175.79	636.02	-180.89	0.77	0.76	-2.55
9,749.00	4.37	117.63	9,691.46	-179.21	642.20	-184.36	0.25	0.13	-2.80
9,842.00	3.84	104.49	9,784.22	-181.63	648.35	-186.83	1.16	-0.57	-14.13
9,937.00	1.01	102.80	9,879.13	-182.61	652.25	-187.84	2.98	-2.98	-1.78
10,030.00	0.27	341.31	9,972.12	-182.59	652.98	-187.82	1.26	-0.80	-130.63
10,125.00	0.29	308.04	10,067.12	-182.23	652.72	-187.46	0.17	0.02	-35.02
10,219.00	0.27	245.85	10,161.12	-182.17	652.33	-187.40	0.31	-0.02	-66.16
10,312.00	1.08	264.73	10,254.11	-182.34	651.26	-187.56	0.89	0.87	20.30
10,359.00	4.22	346.08	10,301.07	-180.70	650.40	-185.92	8.93	6.68	173.09
10,406.00	8.99	356.89	10,347.74	-175.35	649.78	-180.57	10.44	10.15	23.00
10,453.00	13.62	358.60	10,393.82	-166.15	649.45	-171.36	9.88	9.85	3.64
10,500.00	18.29	0.91	10,439.00	-153.24	649.43	-158.45	10.03	9.94	4.91
10,547.00	22.97	2.87	10,482.97	-136.69	650.01	-141.91	10.06	9.96	4.17
10,595.00	27.84	4.73	10,526.32	-116.16	651.40	-121.38	10.28	10.15	3.88
10,642.00	31.74	2.52	10,567.10	-92.86	652.85	-98.10	8.62	8.30	-4.70
10,689.00	35.20	359.74	10,606.30	-66.95	653.33	-72.20	8.05	7.36	-5.91
10,736.00	39.71	358.60	10,643.60	-38.38	652.91	-43.62	9.71	9.60	-2.43
10,783.00	43.34	359.61	10,678.78	-7.23	652.43	-12.47	7.85	7.72	2.15
10,830.00	46.95	1.96	10,711.93	26.07	652.91	20.83	8.46	7.68	5.00
10,877.00	50.64	3.44	10,742.89	61.38	654.58	56.13	8.20	7.85	3.15
10,924.00	54.43	4.60	10,771.47	98.59	657.21	93.31	8.30	8.06	2.47
10,971.00	60.18	3.31	10,796.85	138.03	659.92	132.73	12.45	12.23	-2.74
11,018.00	64.75	1.55	10,818.57	179.66	661.67	174.34	10.27	9.72	-3.74
11,066.00	68.35	359.73	10,837.67	223.68	662.16	218.36	8.27	7.50	-3.79
11,113.00	72.65	358.37	10,853.36	267.97	661.42	262.65	9.55	9.15	-2.89
11,160.00	76.61	357.38	10,865.82	313.24	659.73	307.94	8.67	8.43	-2.11
11,207.00	80.54	357.23	10,875.12	359.25	657.57	353.96	8.37	8.36	-0.32
11,254.00	83.24	356.94	10,881.75	405.72	655.20	400.44	5.78	5.74	-0.62
11,301.00	86.13	356.58	10,886.11	452.44	652.55	447.18	6.20	6.15	-0.77
11,348.00	89.58	356.89	10,887.87	499.32	649.88	494.09	7.37	7.34	0.66
11,442.00	89.55	356.90	10,888.58	593.18	644.79	587.98	0.03	-0.03	0.01
11,467.00	89.21	356.47	10,888.85	618.14	643.34	612.95	2.19	-1.36	-1.72
11,561.00	90.76	357.45	10,888.87	712.00	638.36	706.85	1.95	1.65	1.04
11,656.00	91.72	359.86	10,886.82	806.94	636.13	801.81	2.73	1.01	2.54
11,750.00	92.36	359.26	10,883.47	900.88	635.41	895.75	0.93	0.68	-0.64
11,844.00	91.30	359.68	10,880.47	994.83	634.54	989.70	1.21	-1.13	0.45
11,939.00	90.01	0.80	10,879.38	1,089.82	634.94	1,084.68	1.80	-1.36	1.18
12,034.00	88.72	1.16	10,880.44	1,184.79	636.56	1,179.64	1.41	-1.36	0.38

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Well: 220H
Wellbore: OH / Job 62614
Design: Surveys (Cactus 171)

Local Co-ordinate Reference: Well 220H
TVD Reference: RKB @ 3653.40usft (Cactus 171)
MD Reference: RKB @ 3653.40usft (Cactus 171)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
12,129.00	89.28	0.77	10,882.09	1,279.77	638.16	1,274.60	0.72	0.59	-0.41
12,224.00	89.95	0.95	10,882.73	1,374.75	639.59	1,369.57	0.73	0.71	0.19
12,319.00	89.24	0.72	10,883.40	1,469.74	640.97	1,464.55	0.79	-0.75	-0.24
12,414.00	89.59	0.60	10,884.37	1,564.73	642.06	1,559.52	0.39	0.37	-0.13
12,509.00	90.39	0.49	10,884.39	1,659.72	642.97	1,654.51	0.85	0.84	-0.12
12,603.00	90.24	1.10	10,883.87	1,753.71	644.27	1,748.48	0.67	-0.16	0.65
12,698.00	88.96	0.19	10,884.54	1,848.70	645.34	1,843.46	1.65	-1.35	-0.96
12,793.00	89.22	1.03	10,886.05	1,943.68	646.35	1,938.43	0.93	0.27	0.88
12,887.00	89.79	0.98	10,886.86	2,037.66	648.00	2,032.40	0.61	0.61	-0.05
12,982.00	90.62	1.14	10,886.52	2,132.65	649.76	2,127.36	0.89	0.87	0.17
13,077.00	89.88	1.35	10,886.10	2,227.62	651.82	2,222.32	0.81	-0.78	0.22
13,171.00	89.81	0.83	10,886.36	2,321.60	653.61	2,316.28	0.56	-0.07	-0.55
13,266.00	90.08	1.21	10,886.45	2,416.59	655.30	2,411.25	0.49	0.28	0.40
13,361.00	88.93	0.93	10,887.27	2,511.57	657.08	2,506.21	1.25	-1.21	-0.29
13,456.00	88.59	358.19	10,889.33	2,606.53	656.35	2,601.18	2.91	-0.36	-2.88
13,550.00	88.70	355.30	10,891.55	2,700.34	651.01	2,695.03	3.08	0.12	-3.07
13,644.00	89.24	355.40	10,893.24	2,794.02	643.39	2,788.76	0.58	0.57	0.11
13,740.00	89.18	357.89	10,894.56	2,889.84	637.78	2,884.62	2.59	-0.06	2.59
13,834.00	89.56	358.19	10,895.60	2,983.78	634.56	2,978.59	0.52	0.40	0.32
13,929.00	87.78	358.87	10,897.80	3,078.72	632.12	3,073.54	2.01	-1.87	0.72
14,024.00	86.28	358.57	10,902.72	3,173.56	630.01	3,168.40	1.61	-1.58	-0.32
14,119.00	86.95	358.50	10,908.33	3,268.36	627.58	3,263.22	0.71	0.71	-0.07
14,213.00	87.39	358.79	10,912.97	3,362.22	625.36	3,357.09	0.56	0.47	0.31
14,308.00	87.78	359.00	10,916.98	3,457.12	623.53	3,452.00	0.47	0.41	0.22
14,403.00	88.13	359.31	10,920.37	3,552.05	622.13	3,546.94	0.49	0.37	0.33
14,498.00	86.76	359.47	10,924.60	3,646.95	621.12	3,641.84	1.45	-1.44	0.17
14,592.00	87.48	359.83	10,929.33	3,740.83	620.55	3,735.72	0.86	0.77	0.38
14,688.00	85.05	359.07	10,935.58	3,836.61	619.63	3,831.51	2.65	-2.53	-0.79
14,783.00	84.99	358.96	10,943.83	3,931.24	618.00	3,926.15	0.13	-0.06	-0.12
14,877.00	86.39	359.14	10,950.89	4,024.96	616.45	4,019.88	1.50	1.49	0.19
14,972.00	87.96	0.98	10,955.57	4,119.83	616.55	4,114.75	2.54	1.65	1.94
15,067.00	88.27	1.55	10,958.70	4,214.76	618.64	4,209.66	0.68	0.33	0.60
15,162.00	89.12	1.89	10,960.86	4,309.69	621.49	4,304.56	0.96	0.89	0.36
15,257.00	88.72	0.43	10,962.65	4,404.65	623.42	4,399.50	1.59	-0.42	-1.54
15,352.00	89.22	1.12	10,964.36	4,499.63	624.70	4,494.47	0.90	0.53	0.73
15,447.00	89.38	359.52	10,965.52	4,594.62	625.23	4,589.45	1.69	0.17	-1.68
15,542.00	89.47	359.84	10,966.47	4,689.61	624.70	4,684.44	0.35	0.09	0.34
15,637.00	89.65	359.99	10,967.20	4,784.61	624.56	4,779.44	0.25	0.19	0.16
15,731.00	89.36	359.99	10,968.01	4,878.60	624.54	4,873.43	0.31	-0.31	0.00
15,825.00	90.21	358.73	10,968.37	4,972.59	623.49	4,967.43	1.62	0.90	-1.34
15,919.00	90.81	358.47	10,967.53	5,066.56	621.20	5,061.41	0.70	0.64	-0.28
16,013.00	91.33	358.67	10,965.78	5,160.51	618.85	5,155.38	0.59	0.55	0.21
16,108.00	89.61	359.10	10,965.00	5,255.49	617.00	5,250.37	1.87	-1.81	0.45

Survey Report

Company: Kaiser-Francis Oil Company
Project: Lea County, NM (NAD 83)
Site: Bell Lake Unit South
Well: 220H
Wellbore: OH / Job 62614
Design: Surveys (Cactus 171)

Local Co-ordinate Reference: Well 220H
TVD Reference: RKB @ 3653.40usft (Cactus 171)
MD Reference: RKB @ 3653.40usft (Cactus 171)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)
16,203.00	89.45	358.91	10,965.78	5,350.47	615.35	5,345.36	0.26	-0.17	-0.20
16,297.00	89.76	359.15	10,966.42	5,444.46	613.76	5,439.35	0.42	0.33	0.26
16,392.00	89.78	359.36	10,966.80	5,539.45	612.53	5,534.35	0.22	0.02	0.22
16,486.00	89.85	359.49	10,967.11	5,633.44	611.58	5,628.35	0.16	0.07	0.14
16,581.00	90.10	359.83	10,967.15	5,728.44	611.02	5,723.35	0.44	0.26	0.36
16,676.00	90.56	0.21	10,966.60	5,823.44	611.05	5,818.34	0.63	0.48	0.40
16,771.00	90.95	1.17	10,965.35	5,918.42	612.20	5,913.32	1.09	0.41	1.01
16,865.00	88.87	0.37	10,965.50	6,012.41	613.46	6,007.29	2.37	-2.21	-0.85
16,960.00	89.45	0.83	10,966.89	6,107.39	614.46	6,102.26	0.78	0.61	0.48
17,055.00	89.93	1.57	10,967.40	6,202.37	616.45	6,197.22	0.93	0.51	0.78
17,150.00	89.56	0.45	10,967.83	6,297.35	618.12	6,292.19	1.24	-0.39	-1.18
17,244.00	88.79	358.89	10,969.18	6,391.34	617.58	6,386.17	1.85	-0.82	-1.66
17,339.00	88.84	358.81	10,971.15	6,486.30	615.67	6,481.14	0.10	0.05	-0.08
17,434.00	91.35	358.73	10,970.99	6,581.27	613.63	6,576.13	2.64	2.64	-0.08
17,529.00	92.21	358.17	10,968.04	6,676.18	611.07	6,671.06	1.08	0.91	-0.59
17,623.00	91.04	358.08	10,965.37	6,770.10	607.99	6,765.00	1.25	-1.24	-0.10
17,718.00	90.72	358.87	10,963.91	6,865.05	605.46	6,859.97	0.90	-0.34	0.83
17,812.00	91.72	358.56	10,961.91	6,959.00	603.36	6,953.93	1.11	1.06	-0.33
17,907.00	90.53	358.07	10,960.05	7,053.94	600.56	7,048.89	1.35	-1.25	-0.52
18,001.00	89.04	357.69	10,960.40	7,147.87	597.09	7,142.85	1.64	-1.59	-0.40
18,095.00	89.05	357.76	10,961.97	7,241.79	593.35	7,236.79	0.08	0.01	0.07
18,189.00	91.30	357.59	10,961.68	7,335.70	589.54	7,330.73	2.40	2.39	-0.18
18,284.00	91.10	357.34	10,959.69	7,430.59	585.34	7,425.65	0.34	-0.21	-0.26
18,379.00	90.21	358.92	10,958.60	7,525.53	582.24	7,520.61	1.91	-0.94	1.66
18,473.00	90.13	358.54	10,958.32	7,619.50	580.16	7,614.60	0.41	-0.09	-0.40
18,568.00	89.88	0.13	10,958.32	7,714.49	579.06	7,709.60	1.69	-0.26	1.67
18,662.00	90.22	0.20	10,958.23	7,808.49	579.33	7,803.59	0.37	0.36	0.07
18,757.00	90.79	0.36	10,957.40	7,903.49	579.79	7,898.58	0.62	0.60	0.17
18,777.00	90.82	0.22	10,957.12	7,923.49	579.89	7,918.58	0.72	0.15	-0.70
Final Phoenix MWD Survey									
18,835.00	90.82	0.22	10,956.29	7,981.48	580.11	7,976.56	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
144.00	144.00	-0.56	0.31	First Phoenix MWD Survey
18,777.00	10,957.12	7,923.49	579.89	Final Phoenix MWD Survey
18,835.00	10,956.29	7,981.48	580.11	Projection to TD