

30-025-44020

HOBBS OCD

OCT 18 2018

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KAISER-FRANCIS OIL COMPANY

Lea County, NM (NAD27) NMEZ

Bell Lake Unit South

#219A

ST1

Design: ST1

Standard Survey Report

11 February, 2018

Survey Report

Company: KAISER-FRANCIS OIL COMPANY	Local Co-ordinate Reference: Well #219A
Project: Lea County, NM (NAD27) NMEZ	TVD Reference: RKB @ 3655.00usft (Rig KB = 23')
Site: Bell Lake Unit South	MD Reference: RKB @ 3655.00usft (Rig KB = 23')
Well: #219A	North Reference: Grid
Wellbore: ST1	Survey Calculation Method: Minimum Curvature
Design: ST1	Database: EDM 5000.14 Single User Db

Project Lea County, NM (NAD27) NMEZ		
Map System: US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)		
Map Zone: New Mexico East 3001		

Site Bell Lake Unit South, Centered on 402H		
Site Position:	Northing: 454,918.69 usft	Latitude: 32° 14' 53.357 N
From: Map	Easting: 747,375.70 usft	Longitude: 103° 31' 59.456 W
Position Uncertainty: 0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.43 °

Well #219A		
Well Position +N/-S 0.00 usft	Northing: 453,887.80 usft	Latitude: 32° 14' 43.140 N
+E/-W 0.00 usft	Easting: 747,590.80 usft	Longitude: 103° 31' 57.041 W
Position Uncertainty 0.00 usft	Wellhead Elevation: usft	Ground Level: 3,632.00 usft

Wellbore ST1		
Magnetics	Model Name	Sample Date
	IGRF2015	01/27/18
	Declination (°)	Dip Angle (°)
	6.87	60.08
		Field Strength (nT)
		47,890.29374646

Design ST1		
Audit Notes:		
Version: 1.0	Phase: ACTUAL	Tie On Depth: 10,244.00
Vertical Section:	Depth From (TVD) (usft)	Direction (°)
	0.00	359.62

Survey Program	Date 02/11/18	
From (usft)	To (usft)	Survey (Wellbore)
167.00	10,244.00	Survey #1 (TEST)
10,382.00	18,750.00	Survey #2 - ST1 (ST1)
18,822.00	18,822.00	Survey #3 - PTB (ST1)
		Tool Name
		MWD
		MWD
		BLIND
		Description
		OWSG MWD - Standard
		OWSG MWD - Standard
		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
167.00	0.60	15.29	167.00	0.84	0.23	0.84	0.36	0.36	0.00
228.00	1.09	333.16	227.99	1.67	0.05	1.67	1.25	0.80	-69.07
290.00	1.18	327.38	289.98	2.73	-0.56	2.74	0.23	0.15	-9.32
360.00	0.96	287.99	359.97	3.52	-1.50	3.53	1.07	-0.31	-56.27
422.00	1.60	276.93	421.95	3.79	-2.86	3.81	1.10	1.03	-17.84
515.00	2.36	265.12	514.90	3.78	-6.05	3.82	0.92	0.82	-12.70
609.00	1.97	275.62	608.83	3.77	-9.59	3.84	0.59	-0.41	11.17
703.00	2.01	267.01	702.77	3.85	-12.84	3.93	0.32	0.04	-9.16

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 Well: #219A
 Wellbore: ST1
 Design: ST1

Local Co-ordinate Reference: Well #219A
 TVD Reference: RKB @ 3655.00usft (Rig KB = 23')
 MD Reference: RKB @ 3655.00usft (Rig KB = 23')
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.14 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)
797.00	1.48	276.40	796.73	3.90	-15.70	4.00	0.64	-0.56	9.99
891.00	1.70	275.05	890.69	4.15	-18.29	4.27	0.24	0.23	-1.44
984.00	1.27	281.22	983.66	4.48	-20.68	4.61	0.49	-0.46	6.63
1,077.00	1.23	259.30	1,076.64	4.49	-22.67	4.64	0.51	-0.04	-23.57
1,171.00	1.43	259.91	1,170.61	4.10	-24.82	4.26	0.21	0.21	0.65
1,252.00	0.91	272.63	1,251.60	3.95	-26.45	4.13	0.71	-0.64	15.70
1,391.00	0.86	275.15	1,390.58	4.09	-28.59	4.28	0.05	-0.04	1.81
1,453.00	0.69	257.65	1,452.57	4.06	-29.42	4.25	0.47	-0.27	-28.23
1,547.00	0.56	303.84	1,546.57	4.19	-30.36	4.39	0.54	-0.14	49.14
1,641.00	0.66	246.17	1,640.57	4.23	-31.23	4.44	0.63	0.11	-61.35
1,735.00	0.99	238.58	1,734.56	3.59	-32.42	3.80	0.37	0.35	-8.07
1,830.00	2.06	235.35	1,829.52	2.19	-34.53	2.42	1.13	1.13	-3.40
1,924.00	3.24	226.27	1,923.42	-0.61	-37.84	-0.36	1.33	1.26	-9.66
2,019.00	3.22	225.95	2,018.27	-4.32	-41.69	-4.04	0.03	-0.02	-0.34
2,114.00	3.25	224.12	2,113.12	-8.11	-45.49	-7.81	0.11	0.03	-1.93
2,209.00	3.28	230.21	2,207.96	-11.78	-49.45	-11.45	0.37	0.03	6.41
2,304.00	3.13	228.74	2,302.81	-15.23	-53.49	-14.88	0.18	-0.16	-1.55
2,399.00	3.37	223.02	2,397.66	-18.98	-57.34	-18.60	0.42	0.25	-6.02
2,494.00	3.27	228.97	2,492.50	-22.80	-61.29	-22.40	0.38	-0.11	6.26
2,589.00	3.03	223.62	2,587.36	-26.40	-65.07	-25.97	0.40	-0.25	-5.63
2,684.00	3.11	225.79	2,682.22	-30.01	-68.65	-29.56	0.15	0.08	2.28
2,777.00	2.77	225.75	2,775.10	-33.34	-72.06	-32.86	0.37	-0.37	-0.04
2,871.00	2.95	228.42	2,868.98	-36.53	-75.50	-36.03	0.24	0.19	2.84
2,966.00	2.71	229.29	2,963.87	-39.62	-79.03	-39.09	0.26	-0.25	0.92
3,060.00	3.12	230.69	3,057.74	-42.69	-82.70	-42.14	0.44	0.44	1.49
3,154.00	3.23	231.44	3,151.60	-45.96	-86.75	-45.38	0.13	0.12	0.80
3,248.00	3.03	229.49	3,245.46	-49.22	-90.70	-48.62	0.24	-0.21	-2.07
3,342.00	3.24	223.92	3,339.32	-52.75	-94.44	-52.12	0.39	0.22	-5.93
3,437.00	2.93	226.87	3,434.18	-56.35	-98.07	-55.69	0.37	-0.33	3.11
3,532.00	3.16	226.27	3,529.05	-59.82	-101.73	-59.14	0.24	0.24	-0.63
3,627.00	2.86	222.67	3,623.92	-63.37	-105.23	-62.67	0.37	-0.32	-3.79
3,722.00	2.56	218.71	3,718.81	-66.77	-108.17	-66.05	0.37	-0.32	-4.17
3,817.00	1.95	225.34	3,813.74	-69.56	-110.64	-68.82	0.70	-0.64	6.98
3,911.00	2.32	224.37	3,907.67	-72.04	-113.11	-71.29	0.40	0.39	-1.03
4,006.00	3.05	214.52	4,002.57	-75.50	-115.89	-74.73	0.91	0.77	-10.37
4,099.00	2.90	217.83	4,095.44	-79.40	-118.73	-78.61	0.25	-0.16	3.56
4,193.00	2.87	213.91	4,189.32	-83.23	-121.50	-82.42	0.21	-0.03	-4.17
4,287.00	2.69	221.82	4,283.21	-86.82	-124.29	-86.00	0.45	-0.19	8.41
4,381.00	2.70	212.78	4,377.11	-90.33	-126.96	-89.48	0.45	0.01	-9.62
4,475.00	2.32	196.42	4,471.02	-94.02	-128.69	-93.16	0.86	-0.40	-17.40
4,569.00	2.51	187.49	4,564.94	-97.88	-129.50	-97.02	0.45	0.20	-9.50
4,663.00	2.32	184.34	4,658.85	-101.82	-129.91	-100.95	0.25	-0.20	-3.35
4,757.00	2.78	174.59	4,752.76	-105.99	-129.84	-105.12	0.67	0.49	-10.37

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 Design: ST1

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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)
4,851.00	2.20	163.52	4,846.67	-109.98	-129.11	-109.13	0.80	-0.62	-11.78
4,946.00	2.52	147.86	4,941.59	-113.50	-127.49	-112.65	0.75	0.34	-16.48
5,041.00	2.47	148.89	5,036.50	-117.02	-125.32	-116.19	0.07	-0.05	1.08
5,135.00	2.20	142.21	5,130.42	-120.18	-123.17	-119.36	0.41	-0.29	-7.11
5,198.00	2.38	149.28	5,193.37	-122.26	-121.76	-121.45	0.53	0.29	11.22
5,325.00	1.48	159.90	5,320.30	-126.07	-119.85	-125.27	0.76	-0.71	8.36
5,420.00	1.54	164.25	5,415.27	-128.45	-119.08	-127.66	0.14	0.06	4.58
5,514.00	1.43	181.04	5,509.24	-130.84	-118.76	-130.05	0.48	-0.12	17.86
5,609.00	1.34	193.39	5,604.21	-133.11	-119.03	-132.31	0.33	-0.09	13.00
5,704.00	1.36	186.72	5,699.18	-135.31	-119.42	-134.51	0.17	0.02	-7.02
5,798.00	1.44	191.75	5,793.15	-137.57	-119.79	-136.77	0.16	0.09	5.35
5,892.00	1.35	188.08	5,887.13	-139.82	-120.19	-139.02	0.13	-0.10	-3.90
5,987.00	1.44	187.93	5,982.10	-142.11	-120.51	-141.31	0.09	0.09	-0.16
6,082.00	1.30	186.61	6,077.07	-144.37	-120.80	-143.56	0.15	-0.15	-1.39
6,177.00	0.75	251.60	6,172.06	-145.63	-121.52	-144.82	1.26	-0.58	68.41
6,272.00	1.27	305.58	6,267.05	-145.22	-122.96	-144.40	1.08	0.55	56.82
6,368.00	1.20	307.01	6,363.02	-143.99	-124.63	-143.16	0.08	-0.07	1.49
6,463.00	1.15	315.78	6,458.00	-142.71	-126.09	-141.87	0.20	-0.05	9.23
6,558.00	1.13	314.40	6,552.98	-141.37	-127.42	-140.52	0.04	-0.02	-1.45
6,653.00	1.15	304.69	6,647.97	-140.17	-128.88	-139.32	0.20	0.02	-10.22
6,748.00	1.03	313.98	6,742.95	-139.04	-130.27	-138.17	0.22	-0.13	9.78
6,843.00	0.97	310.00	6,837.93	-137.93	-131.50	-137.05	0.10	-0.06	-4.19
6,938.00	1.07	304.36	6,932.92	-136.91	-132.85	-136.03	0.15	0.11	-5.94
7,033.00	0.93	296.03	7,027.90	-136.07	-134.28	-135.18	0.21	-0.15	-8.77
7,127.00	1.03	305.96	7,121.89	-135.24	-135.65	-134.34	0.21	0.11	10.56
7,223.00	1.04	289.55	7,217.88	-134.44	-137.17	-133.53	0.31	0.01	-17.09
7,318.00	1.08	292.99	7,312.86	-133.80	-138.80	-132.88	0.08	0.04	3.62
7,413.00	0.80	293.15	7,407.85	-133.19	-140.24	-132.26	0.29	-0.29	0.17
7,508.00	0.95	285.72	7,502.84	-132.72	-141.61	-131.78	0.20	0.16	-7.82
7,603.00	1.03	275.96	7,597.82	-132.42	-143.21	-131.46	0.20	0.08	-10.27
7,698.00	0.77	284.68	7,692.81	-132.17	-144.68	-131.20	0.31	-0.27	9.18
7,793.00	0.45	266.37	7,787.80	-132.03	-145.67	-131.06	0.39	-0.34	-19.27
7,888.00	0.38	260.02	7,882.80	-132.11	-146.35	-131.13	0.09	-0.07	-6.68
7,982.00	0.56	232.11	7,976.80	-132.44	-147.02	-131.47	0.30	0.19	-29.69
8,077.00	0.62	217.83	8,071.79	-133.13	-147.70	-132.15	0.17	0.06	-15.03
8,171.00	0.75	194.67	8,165.79	-134.13	-148.17	-133.15	0.32	0.14	-24.64
8,265.00	0.79	192.77	8,259.78	-135.36	-148.47	-134.37	0.05	0.04	-2.02
8,360.00	0.97	180.40	8,354.77	-136.80	-148.62	-135.81	0.27	0.19	-13.02
8,454.00	0.97	158.99	8,448.75	-138.34	-148.34	-137.35	0.38	0.00	-22.78
8,548.00	1.01	157.75	8,542.74	-139.85	-147.74	-138.87	0.05	0.04	-1.32
8,641.00	1.06	158.48	8,635.72	-141.41	-147.12	-140.43	0.06	0.05	0.78
8,736.00	0.93	152.75	8,730.71	-142.91	-146.44	-141.94	0.17	-0.14	-6.03
8,830.00	0.86	150.72	8,824.70	-144.20	-145.75	-143.23	0.08	-0.07	-2.16

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Wellbore: ST1
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8,924.00	0.74	154.75	8,918.69	-145.37	-145.14	-144.40	0.14	-0.13	4.29
9,018.00	0.71	173.17	9,012.68	-146.50	-144.81	-145.53	0.25	-0.03	19.60
9,112.00	0.91	217.21	9,106.67	-147.67	-145.20	-146.70	0.68	0.21	46.85
9,207.00	1.80	227.17	9,201.65	-149.28	-146.75	-148.31	0.97	0.94	10.48
9,300.00	2.05	233.51	9,294.59	-151.27	-149.15	-150.27	0.35	0.27	6.82
9,394.00	2.20	266.61	9,388.53	-152.37	-152.31	-151.36	1.30	0.16	35.21
9,488.00	1.71	303.67	9,482.48	-151.70	-155.28	-150.67	1.41	-0.52	39.43
9,583.00	0.84	345.40	9,577.46	-150.24	-156.63	-149.20	1.28	-0.92	43.93
9,676.00	1.07	156.25	9,670.45	-150.38	-156.45	-149.34	2.05	0.25	183.71
9,771.00	1.64	153.66	9,765.43	-152.41	-155.49	-151.37	0.60	0.60	-2.73
9,865.00	1.89	145.59	9,859.38	-154.89	-154.02	-153.87	0.37	0.27	-8.59
9,959.00	0.79	159.93	9,953.36	-156.78	-152.92	-155.76	1.21	-1.17	15.26
10,054.00	0.84	199.42	10,048.35	-158.05	-152.93	-157.03	0.58	0.05	41.57
10,150.00	1.00	180.27	10,144.33	-159.55	-153.17	-158.53	0.36	0.17	-19.95
10,244.00	1.21	149.40	10,238.32	-161.23	-152.67	-160.21	0.66	0.22	-32.84
KOP: 10244.00' MD, 10238.32' TVD									
10,382.00	8.60	29.81	10,375.83	-153.51	-146.78	-152.53	6.71	5.36	-86.66
10,400.00	9.84	30.24	10,393.59	-151.02	-145.34	-150.05	6.90	6.89	2.39
10,431.00	12.92	27.96	10,423.98	-145.66	-142.38	-144.72	10.04	9.94	-7.35
10,463.00	16.05	23.45	10,454.96	-138.44	-138.94	-137.52	10.39	9.78	-14.09
10,495.00	19.55	19.52	10,485.42	-129.34	-135.39	-128.44	11.56	10.94	-12.28
10,527.00	22.86	17.84	10,515.25	-118.37	-131.69	-117.49	10.52	10.34	-5.25
10,573.00	28.23	13.91	10,556.75	-99.29	-126.34	-98.45	12.24	11.67	-8.54
10,622.00	33.16	9.49	10,598.87	-74.80	-121.34	-74.00	11.06	10.06	-9.02
10,669.00	38.19	6.46	10,637.04	-47.67	-117.58	-46.89	11.34	10.70	-6.45
10,717.00	40.47	5.52	10,674.17	-17.42	-114.41	-16.66	4.91	4.75	-1.96
10,812.00	48.14	2.07	10,742.11	48.73	-110.16	49.46	8.46	8.07	-3.63
10,907.00	53.33	357.41	10,802.24	122.22	-110.61	122.95	6.65	5.46	-4.91
11,002.00	61.42	357.51	10,853.42	202.09	-114.15	202.84	8.52	8.52	0.11
11,096.00	68.10	356.54	10,893.48	286.95	-118.58	287.73	7.17	7.11	-1.03
11,191.00	77.34	356.38	10,921.66	377.39	-124.17	378.20	9.73	9.73	-0.17
11,286.00	87.40	356.95	10,934.26	471.27	-129.64	472.12	10.61	10.59	0.60
11,348.00	89.74	357.92	10,935.81	533.18	-132.41	534.05	4.09	3.77	1.56
EOC: 11348.00' MD, 10935.81' TVD, 89.74° INC, 357.92° AZ, 534.05° VS									
11,395.00	90.37	358.02	10,935.76	580.15	-134.08	581.03	1.36	1.34	0.21
11,490.00	90.67	358.12	10,934.90	675.09	-137.28	675.99	0.33	0.32	0.11
11,584.00	90.76	357.56	10,933.73	769.02	-140.82	769.94	0.60	0.10	-0.60
11,678.00	90.78	357.84	10,932.47	862.93	-144.59	863.87	0.30	0.02	0.30
11,774.00	90.97	0.92	10,931.00	958.91	-145.63	959.85	3.21	0.20	3.21
11,869.00	91.34	1.18	10,929.08	1,053.87	-143.89	1,054.80	0.48	0.39	0.27
11,963.00	90.12	0.58	10,927.89	1,147.85	-142.45	1,148.77	1.45	-1.30	-0.64
12,058.00	90.37	0.50	10,927.48	1,242.84	-141.55	1,243.76	0.28	0.26	-0.08
12,153.00	88.59	359.88	10,928.34	1,337.84	-141.24	1,338.74	1.98	-1.87	-0.65
12,247.00	89.12	359.95	10,930.22	1,431.82	-141.38	1,432.72	0.57	0.56	0.07

Survey Report

Company: KAISER-FRANCIS OIL COMPANY
Project: Lea County, NM (NAD27) NMEZ
Site: Bell Lake Unit South
Well: #219A
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference: Well #219A
TVD Reference: RKB @ 3655.00usft (Rig KB = 23')
MD Reference: RKB @ 3655.00usft (Rig KB = 23')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 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)
12,342.00	89.96	359.67	10,930.98	1,526.81	-141.69	1,527.72	0.93	0.88	-0.29
12,437.00	90.25	359.22	10,930.81	1,621.81	-142.61	1,622.72	0.56	0.31	-0.47
12,532.00	90.56	358.89	10,930.14	1,716.79	-144.18	1,717.71	0.48	0.33	-0.35
12,626.00	89.71	359.44	10,929.92	1,810.78	-145.55	1,811.71	1.08	-0.90	0.59
12,720.00	89.48	359.00	10,930.58	1,904.77	-146.83	1,905.70	0.53	-0.24	-0.47
12,815.00	89.86	358.99	10,931.13	1,999.75	-148.49	2,000.69	0.40	0.40	-0.01
12,909.00	90.07	358.55	10,931.19	2,093.73	-150.51	2,094.68	0.52	0.22	-0.47
13,003.00	89.99	358.11	10,931.14	2,187.69	-153.25	2,188.66	0.48	-0.09	-0.47
13,098.00	89.66	358.66	10,931.43	2,282.65	-155.93	2,283.64	0.68	-0.35	0.58
13,192.00	89.60	0.23	10,932.03	2,376.64	-156.84	2,377.63	1.67	-0.06	1.67
13,286.00	88.03	358.95	10,933.98	2,470.62	-157.51	2,471.61	2.15	-1.67	-1.36
13,380.00	90.29	359.56	10,935.36	2,564.59	-158.73	2,565.59	2.49	2.40	0.65
13,476.00	90.98	359.91	10,934.29	2,660.58	-159.18	2,661.58	0.81	0.72	0.36
13,571.00	91.38	359.42	10,932.34	2,755.56	-159.73	2,756.56	0.67	0.42	-0.52
13,665.00	91.67	358.89	10,929.83	2,849.52	-161.12	2,850.52	0.64	0.31	-0.56
13,760.00	91.93	358.70	10,926.85	2,944.45	-163.11	2,945.47	0.34	0.27	-0.20
13,855.00	91.19	359.67	10,924.26	3,039.40	-164.46	3,040.43	1.28	-0.78	1.02
13,950.00	90.57	1.90	10,922.80	3,134.38	-163.16	3,135.39	2.44	-0.65	2.35
14,045.00	88.66	1.44	10,923.44	3,229.33	-160.40	3,230.32	2.07	-2.01	-0.48
14,139.00	88.99	1.03	10,925.37	3,323.29	-158.37	3,324.26	0.56	0.35	-0.44
14,234.00	89.25	0.40	10,926.83	3,418.27	-157.18	3,419.23	0.72	0.27	-0.66
14,328.00	89.90	0.00	10,927.53	3,512.26	-156.86	3,513.23	0.81	0.69	-0.43
14,421.00	89.76	359.56	10,927.80	3,605.26	-157.21	3,606.23	0.50	-0.15	-0.47
14,515.00	89.28	358.68	10,928.59	3,699.25	-158.66	3,700.22	1.07	-0.51	-0.94
14,609.00	89.57	358.46	10,929.53	3,793.21	-161.00	3,794.20	0.39	0.31	-0.23
14,703.00	90.14	357.64	10,929.77	3,887.16	-164.20	3,888.16	1.06	0.61	-0.87
14,797.00	91.07	359.20	10,928.78	3,981.11	-166.79	3,982.13	1.93	0.99	1.66
14,891.00	91.31	359.20	10,926.83	4,075.08	-168.10	4,076.11	0.26	0.26	0.00
14,985.00	90.72	0.14	10,925.16	4,169.06	-168.65	4,170.09	1.18	-0.63	1.00
15,080.00	88.86	359.63	10,925.51	4,264.06	-168.84	4,265.09	2.03	-1.96	-0.54
15,175.00	89.36	359.14	10,926.98	4,359.04	-169.86	4,360.07	0.74	0.53	-0.52
15,269.00	88.82	359.33	10,928.48	4,453.02	-171.11	4,454.06	0.61	-0.57	0.20
15,364.00	88.94	358.57	10,930.33	4,547.99	-172.85	4,549.03	0.81	0.13	-0.80
15,459.00	89.16	357.69	10,931.91	4,642.92	-175.95	4,643.99	0.95	0.23	-0.93
15,554.00	88.15	358.35	10,934.14	4,737.84	-179.23	4,738.92	1.27	-1.06	0.69
15,649.00	88.57	358.97	10,936.86	4,832.77	-181.45	4,833.87	0.79	0.44	0.65
15,743.00	88.96	359.55	10,938.88	4,926.74	-182.67	4,927.84	0.74	0.41	0.62
15,839.00	88.74	358.80	10,940.81	5,022.71	-184.05	5,023.82	0.81	-0.23	-0.78
15,934.00	89.09	0.18	10,942.61	5,117.69	-184.89	5,118.80	1.50	0.37	1.45
16,029.00	89.11	0.40	10,944.10	5,212.67	-184.41	5,213.78	0.23	0.02	0.23
16,124.00	89.92	0.07	10,944.91	5,307.67	-184.02	5,308.77	0.92	0.85	-0.35
16,218.00	89.98	0.50	10,944.99	5,401.67	-183.56	5,402.77	0.46	0.06	0.46
16,312.00	90.99	0.09	10,944.19	5,495.66	-183.07	5,496.76	1.16	1.07	-0.44

Survey Report

Company: KAISER-FRANCIS OIL COMPANY
Project: Lea County, NM (NAD27) NMEZ
Site: Bell Lake Unit South
Well: #219A
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference: Well #219A
TVD Reference: RKB @ 3655.00usft (Rig KB = 23')
MD Reference: RKB @ 3655.00usft (Rig KB = 23')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 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)
16,406.00	89.37	0.37	10,943.90	5,589.66	-182.70	5,590.75	1.75	-1.72	0.30
16,501.00	89.66	359.54	10,944.70	5,684.65	-182.77	5,685.74	0.93	0.31	-0.87
16,595.00	88.04	359.34	10,946.59	5,778.63	-183.69	5,779.72	1.74	-1.72	-0.21
16,689.00	88.64	0.40	10,949.31	5,872.59	-183.90	5,873.68	1.30	0.64	1.13
16,783.00	89.39	0.17	10,950.93	5,966.57	-183.43	5,967.65	0.83	0.80	-0.24
16,877.00	89.09	0.65	10,952.17	6,060.56	-182.76	6,061.64	0.60	-0.32	0.51
16,971.00	89.39	0.40	10,953.42	6,154.55	-181.90	6,155.62	0.42	0.32	-0.27
17,065.00	88.26	1.13	10,955.35	6,248.52	-180.65	6,249.58	1.43	-1.20	0.78
17,160.00	88.63	1.64	10,957.93	6,343.45	-178.35	6,344.50	0.66	0.39	0.54
17,253.00	88.96	1.17	10,959.88	6,436.40	-176.07	6,437.43	0.62	0.35	-0.51
17,348.00	89.11	0.21	10,961.48	6,531.38	-174.93	6,532.40	1.02	0.16	-1.01
17,442.00	89.27	359.37	10,962.81	6,625.37	-175.27	6,626.39	0.91	0.17	-0.89
17,536.00	88.61	0.68	10,964.55	6,719.35	-175.23	6,720.37	1.56	-0.70	1.39
17,630.00	88.62	0.36	10,966.82	6,813.32	-174.38	6,814.33	0.34	0.01	-0.34
17,724.00	88.90	359.75	10,968.86	6,907.30	-174.29	6,908.30	0.71	0.30	-0.65
17,818.00	88.91	358.73	10,970.65	7,001.27	-175.53	7,002.28	1.08	0.01	-1.09
17,913.00	87.98	359.78	10,973.23	7,096.23	-176.77	7,097.24	1.48	-0.98	1.11
18,007.00	88.39	359.92	10,976.21	7,190.18	-177.01	7,191.19	0.46	0.44	0.15
18,102.00	88.81	359.00	10,978.53	7,285.14	-177.91	7,286.16	1.06	0.44	-0.97
18,197.00	88.71	1.09	10,980.58	7,380.12	-177.84	7,381.13	2.20	-0.11	2.20
18,292.00	88.76	1.02	10,982.68	7,475.08	-176.09	7,476.08	0.09	0.05	-0.07
18,386.00	89.18	0.85	10,984.37	7,569.05	-174.55	7,570.04	0.48	0.45	-0.18
18,481.00	89.56	0.54	10,985.52	7,664.04	-173.40	7,665.02	0.52	0.40	-0.33
18,576.00	90.05	0.02	10,985.74	7,759.03	-172.94	7,760.01	0.75	0.52	-0.55
18,671.00	88.29	0.47	10,987.12	7,854.02	-172.53	7,854.99	1.91	-1.85	0.47
18,750.00	88.43	0.04	10,989.38	7,932.99	-172.18	7,933.95	0.57	0.18	-0.54
Final MWD Survey: 18750.00' MD, 10989.38' TVD									
18,821.98	88.43	0.04	10,991.35	8,004.94	-172.13	8,005.91	0.00	0.00	0.00
PBHL(BLS#219A)									
18,822.00	88.43	0.04	10,991.35	8,004.96	-172.13	8,005.93	0.00	0.00	0.00
BHL: 18822.00' MD, 10991.35' TVD, 88.43° INC, 0.04° AZ, 8004.96' +N/-S, -172.13° +E/-W, 8005.93' VS - 387 FWL / 330' FNL									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
10,244.00	10,238.32	-161.23	-152.67	KOP: 10244.00' MD, 10238.32' TVD
11,348.00	10,935.81	533.18	-132.41	EOC: 11348.00' MD, 10935.81' TVD, 89.74° INC, 357.92° AZ, 534.05' VS
18,750.00	10,989.38	7,932.99	-172.18	Final MWD Survey: 18750.00' MD, 10989.38' TVD
18,822.00	10,991.35	8,004.96	-172.13	BHL: 18822.00' MD, 10991.35' TVD, 88.43° INC, 0.04° AZ, 8004.96' +N/-S, -172.13° +E/-W, 8005.93' VS - 387 FWL / 330' FNL
18,822.00	10,991.35	8,004.96	-172.13	387 FWL / 330' FNL

Checked By: _____ Approved By: _____ Date: _____