

# Occidental Petroleum

Project: Weld County, CO (UTM-NAD83)  
 Site: 4N-68W-13 SBJ 22-13HZ PAD  
 Well: SBJ 13-9HZ  
 Wellbore: Plan C  
 Design: Surveys

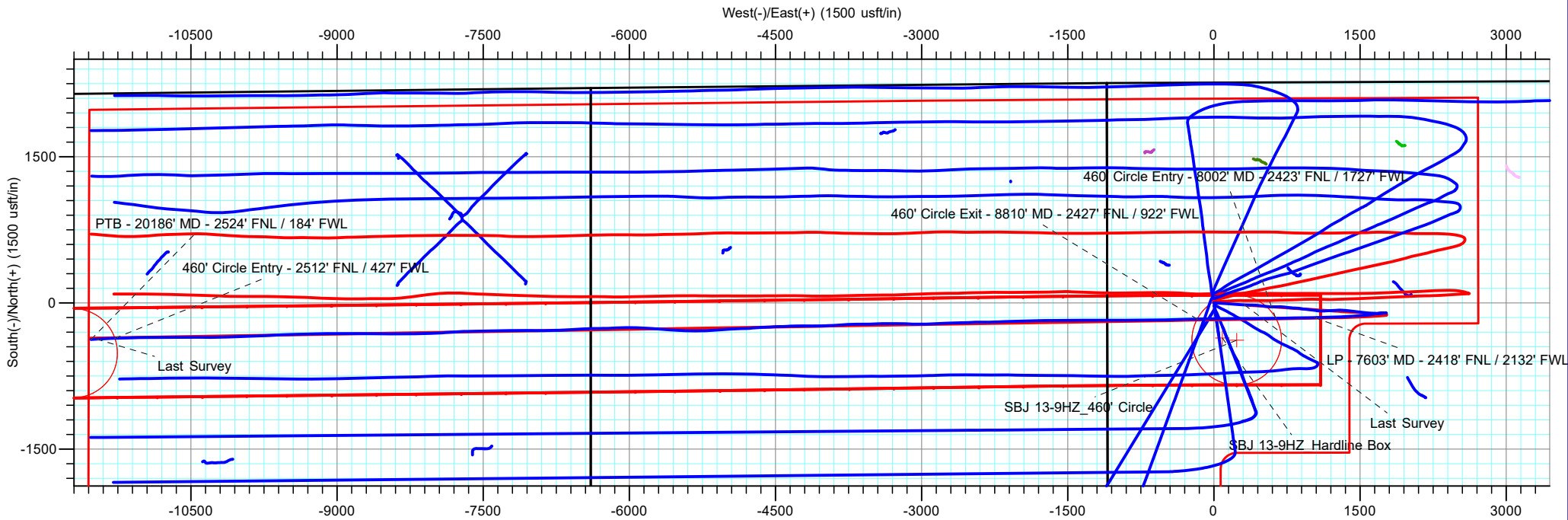
PROJECT DETAILS: Weld County, CO (UTM-NAD83)  
 Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



**ACTUAL LINE CALLS**  
**SHL: 2262' FNL, 1088' FWL**  
**LP: 2418' FNL, 2132' FWL**  
**TOE: 2524' FNL, 184' FWL**

**SHL: Sec 13-T4N-R68W**  
**LP: Sec 13-T4N-R68W**  
**BHL: Sec 15-T4N-R68W**

ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation	
1847.00	18.09	94.79	1805.49	-20.49	315.08	-314.70	316.32	Last Survey	
7603.52	89.63	269.16	6894.29	-151.20	1035.38	-1032.79	2525.69	LP - 7603' MD - 2418' FNL / 2132' FWL	
8002.98	89.62	270.06	6891.22	-156.52	635.98	-633.36	2925.10	460' Circle Entry - 8002' MD - 2423' FNL / 1727' FWL	
8810.22	93.06	268.46	6856.16	-165.66	-170.12	172.79	3731.29	460' Circle Exit - 8810' MD - 2427' FNL / 922' FWL	
19939.73	94.20	268.29	6424.65	-362.76	11280.21	11284.61	14847.68	460' Circle Entry - 2512' FNL / 427' FWL	
20129.00	95.46	267.27	6409.23	-371.53	-11468.64	11473.16	15036.32	Last Survey	
20186.00	95.46	267.27	6403.80	-374.23	-11525.31	11529.87	15093.06	PTB - 20186' MD - 2524' FNL / 184' FWL	



**TOTAL DIRECTIONAL SERVICES LLC**

Design: Surveys (SBJ 13-9HZ/Plan C)  
 4N-68W-13 SBJ 22-13HZ PAD  
 Created By: RDW Date: 15:59, December 31 2021  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# Occidental Petroleum

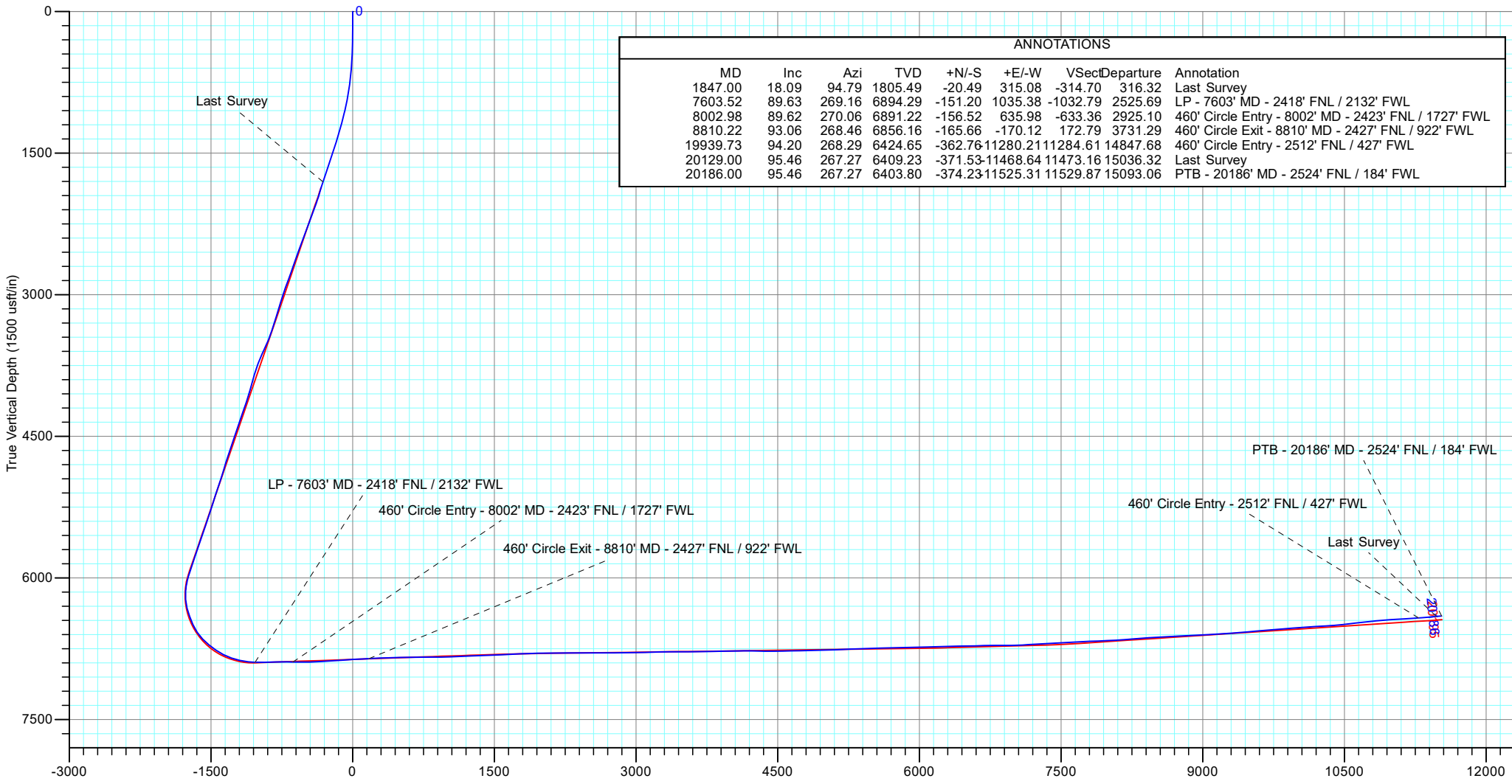
Project: Weld County, CO (UTM-NAD83)  
 Site: 4N-68W-13 SBJ 22-13HZ PAD  
 Well: SBJ 13-9HZ  
 Wellbore: Plan C  
 Design: Surveys

PROJECT DETAILS: Weld County, CO (UTM-NAD83)

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



**ACTUAL LINE CALLS**  
**SHL: 2262' FNL, 1088' FWL**  
**LP: 2418' FNL, 2132' FWL**  
**TOE: 2524' FNL, 184' FWL**



ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
1847.00	18.09	94.79	1805.49	-20.49	315.08	-314.70	316.32	Last Survey
7603.52	89.63	269.16	6894.29	-151.20	1035.38	-1032.79	2525.69	LP - 7603' MD - 2418' FNL / 2132' FWL
8002.98	89.62	270.06	6891.22	-156.52	635.98	-633.36	2925.10	460' Circle Entry - 8002' MD - 2423' FNL / 1727' FWL
8810.22	93.06	268.46	6856.16	-165.66	-170.12	172.79	3731.29	460' Circle Exit - 8810' MD - 2427' FNL / 922' FWL
19939.73	94.20	268.29	6424.65	-362.76	11280.21	11284.61	14847.68	460' Circle Entry - 2512' FNL / 427' FWL
20129.00	95.46	267.27	6409.23	-371.53	11468.64	11473.16	15036.32	Last Survey
20186.00	95.46	267.27	6403.80	-374.23	11525.31	11529.87	15093.06	PTB - 20186' MD - 2524' FNL / 184' FWL



## TOTAL DIRECTIONAL SERVICES LLC

Design: Surveys (SBJ 13-9HZ/Plan C)  
 4N-68W-13 SBJ 22-13HZ PAD  
 Created By: RDW Date: 15:39, December 31 2021  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_



# Occidental Petroleum

Weld County, CO (UTM-NAD83)  
4N-68W-13 SBJ 22-13HZ PAD  
SBJ 13-9HZ

Plan C

Design: Surveys

## Standard Survey Report

31 December, 2021





# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 Single User Db

<b>Project</b>	Weld County, CO (UTM-NAD83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Fee	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	4N-68W-13 SBJ 22-13HZ PAD				
<b>Site Position:</b>		<b>Northing:</b>	14,641,145.55 usft	<b>Latitude:</b>	40.314181
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,652,517.50 usft	<b>Longitude:</b>	-104.956591
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	SBJ 13-9HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,641,386.96 usft	<b>Latitude:</b>	40.314844
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,652,453.54 usft	<b>Longitude:</b>	-104.956820
<b>Position Uncertainty</b>	3.28 usft		<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	4,859.00 usft
<b>Grid Convergence:</b>	0.03 °					

<b>Wellbore</b>	Plan C				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM_FILE	12/12/2021	8.07	66.52	51,859.80

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	269.07	

<b>Survey Program</b>	<b>Date</b>	12/31/2021			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
99.00	1,847.00	Survey #1 (Plan C)	APC_ISCWSA REV 2 MM Fixed:v2:crustal field declination		
1,925.00	20,186.00	Survey #2 (Plan C)	APC_ISCWSA REV 2 MM Fixed:v2:Rockies, crustal dec + 3-axis correction		

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
99.00	0.05	336.88	99.00	0.04	-0.02	0.02	0.05	0.05	0.00	
185.00	0.10	277.22	185.00	0.08	-0.11	0.10	0.10	0.06	-69.37	
274.00	0.41	120.78	274.00	-0.07	0.09	-0.09	0.57	0.35	-175.78	
366.00	1.82	95.59	365.98	-0.38	1.83	-1.82	1.59	1.53	-27.38	
456.00	2.79	96.73	455.91	-0.78	5.43	-5.41	1.08	1.08	1.27	
546.00	3.28	88.85	545.78	-0.98	10.17	-10.16	0.71	0.54	-8.76	
636.00	5.03	90.32	635.54	-0.95	16.69	-16.68	1.95	1.94	1.63	
726.00	6.63	92.63	725.07	-1.21	25.83	-25.81	1.80	1.78	2.57	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 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)	
815.00	8.67	95.63	813.28	-2.11	37.64	-37.60	2.33	2.29	3.37	
905.00	10.18	93.35	902.06	-3.24	52.33	-52.27	1.73	1.68	-2.53	
995.00	11.85	93.37	990.40	-4.24	69.50	-69.42	1.86	1.86	0.02	
1,085.00	14.12	93.06	1,078.09	-5.37	89.69	-89.59	2.52	2.52	-0.34	
1,175.00	14.91	92.15	1,165.22	-6.39	112.22	-112.10	0.91	0.88	-1.01	
1,265.00	15.47	94.86	1,252.07	-7.85	135.75	-135.61	1.00	0.62	3.01	
1,355.00	16.54	92.75	1,338.58	-9.48	160.51	-160.33	1.35	1.19	-2.34	
1,445.00	17.62	93.47	1,424.61	-10.92	186.90	-186.70	1.22	1.20	0.80	
1,535.00	18.25	95.73	1,510.24	-13.15	214.52	-214.28	1.04	0.70	2.51	
1,624.00	18.85	94.03	1,594.62	-15.55	242.73	-242.44	0.91	0.67	-1.91	
1,714.00	19.22	93.68	1,679.70	-17.52	272.02	-271.70	0.43	0.41	-0.39	
1,804.00	19.02	93.86	1,764.73	-19.46	301.43	-301.08	0.23	-0.22	0.20	
1,847.00	18.09	94.79	1,805.49	-20.49	315.08	-314.70	2.27	-2.16	2.16	
<b>Last Survey</b>										
1,925.00	16.21	91.61	1,880.03	-21.81	338.03	-337.63	2.69	-2.41	-4.08	
2,018.00	17.32	88.86	1,969.07	-21.90	364.85	-364.44	1.47	1.19	-2.96	
2,111.00	19.73	92.25	2,057.25	-22.24	394.38	-393.96	2.84	2.59	3.65	
2,204.00	21.15	95.06	2,144.39	-24.33	426.78	-426.33	1.86	1.53	3.02	
2,297.00	20.06	94.31	2,231.44	-27.01	459.40	-458.90	1.21	-1.17	-0.81	
2,389.00	21.34	97.40	2,317.51	-30.35	491.73	-491.17	1.83	1.39	3.36	
2,491.00	20.78	97.66	2,412.69	-35.16	528.07	-527.43	0.56	-0.55	0.25	
2,584.00	19.59	95.88	2,499.98	-38.95	559.93	-559.22	1.44	-1.28	-1.91	
2,676.00	18.97	89.34	2,586.83	-40.36	590.23	-589.49	2.44	-0.67	-7.11	
2,768.00	20.24	91.00	2,673.49	-40.47	621.09	-620.35	1.51	1.38	1.80	
2,860.00	18.65	90.38	2,760.24	-40.84	651.72	-650.97	1.74	-1.73	-0.67	
2,953.00	19.45	89.52	2,848.15	-40.81	682.07	-681.32	0.91	0.86	-0.92	
3,045.00	20.72	93.54	2,934.56	-41.69	713.63	-712.86	2.04	1.38	4.37	
3,138.00	18.35	95.78	3,022.20	-44.18	744.62	-743.81	2.67	-2.55	2.41	
3,229.00	17.87	97.00	3,108.69	-47.32	772.73	-771.86	0.67	-0.53	1.34	
3,322.00	16.64	97.84	3,197.50	-50.88	800.09	-799.16	1.35	-1.32	0.90	
3,415.00	17.10	89.34	3,286.52	-52.54	826.96	-825.99	2.70	0.49	-9.14	
3,507.00	17.58	96.13	3,374.34	-53.86	854.30	-853.31	2.26	0.52	7.38	
3,599.00	22.16	98.04	3,460.84	-57.78	885.31	-884.25	5.03	4.98	2.08	
3,691.00	25.04	96.36	3,545.14	-62.36	921.85	-920.71	3.21	3.13	-1.83	
3,784.00	23.62	96.99	3,629.88	-66.81	959.90	-958.69	1.55	-1.53	0.68	
3,876.00	22.25	96.32	3,714.61	-70.97	995.51	-994.23	1.52	-1.49	-0.73	
3,969.00	18.28	99.07	3,801.83	-75.21	1,027.43	-1,026.07	4.39	-4.27	2.96	
4,062.00	15.42	100.35	3,890.83	-79.73	1,054.00	-1,052.56	3.10	-3.08	1.38	
4,155.00	16.02	89.13	3,980.37	-81.76	1,079.00	-1,077.53	3.33	0.65	-12.06	
4,249.00	16.56	94.73	4,070.61	-82.66	1,105.32	-1,103.83	1.77	0.57	5.96	
4,341.00	19.14	84.96	4,158.19	-82.42	1,133.42	-1,131.93	4.29	2.80	-10.62	
4,435.00	19.63	87.03	4,246.86	-80.25	1,164.54	-1,163.08	0.90	0.52	2.20	
4,528.00	19.42	88.46	4,334.51	-79.02	1,195.60	-1,194.16	0.56	-0.23	1.54	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 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)	
4,621.00	16.50	86.08	4,422.97	-77.71	1,224.23	-1,222.81	3.24	-3.14	-2.56	
4,714.00	19.10	85.30	4,511.51	-75.56	1,252.58	-1,251.19	2.81	2.80	-0.84	
4,807.00	19.64	87.51	4,599.25	-73.63	1,283.36	-1,281.99	0.98	0.58	2.38	
4,899.00	18.49	95.05	4,686.22	-74.24	1,313.34	-1,311.96	2.95	-1.25	8.20	
4,991.00	17.25	92.27	4,773.78	-76.07	1,341.50	-1,340.09	1.64	-1.35	-3.02	
5,083.00	17.36	97.40	4,861.62	-78.37	1,368.75	-1,367.30	1.66	0.12	5.58	
5,176.00	17.68	97.39	4,950.30	-81.98	1,396.51	-1,395.00	0.34	0.34	-0.01	
5,269.00	18.68	98.56	5,038.66	-86.01	1,425.24	-1,423.66	1.14	1.08	1.26	
5,362.00	17.79	96.32	5,126.99	-89.79	1,454.09	-1,452.44	1.22	-0.96	-2.41	
5,454.00	17.95	96.41	5,214.55	-92.92	1,482.15	-1,480.45	0.18	0.17	0.10	
5,548.00	19.14	91.91	5,303.67	-95.05	1,511.95	-1,510.21	1.98	1.27	-4.79	
5,640.00	18.79	95.21	5,390.68	-96.90	1,541.78	-1,540.00	1.23	-0.38	3.59	
5,734.00	18.57	97.31	5,479.73	-100.18	1,571.70	-1,569.87	0.75	-0.23	2.23	
5,828.00	18.05	96.39	5,568.97	-103.71	1,601.02	-1,599.13	0.63	-0.55	-0.98	
5,921.00	19.29	95.31	5,657.08	-106.73	1,630.64	-1,628.69	1.38	1.33	-1.16	
6,014.00	19.16	93.75	5,744.89	-109.15	1,661.16	-1,659.17	0.57	-0.14	-1.68	
6,140.00	18.16	85.35	5,864.29	-108.91	1,701.37	-1,699.38	2.27	-0.79	-6.67	
6,233.00	18.95	79.97	5,952.46	-105.11	1,730.69	-1,728.76	2.03	0.85	-5.78	
6,327.00	12.06	85.99	6,042.99	-101.76	1,755.55	-1,753.66	7.52	-7.33	6.40	
6,421.00	6.26	110.27	6,135.78	-102.85	1,770.17	-1,768.26	7.29	-6.17	25.83	
6,515.00	5.77	270.87	6,229.60	-104.56	1,770.25	-1,768.32	12.61	-0.52	170.85	
6,608.00	14.04	273.39	6,321.14	-103.82	1,754.29	-1,752.37	8.90	8.89	2.71	
6,700.00	20.42	265.72	6,408.97	-104.36	1,727.11	-1,725.19	7.35	6.93	-8.34	
6,793.00	23.16	262.08	6,495.32	-108.09	1,692.81	-1,690.83	3.28	2.95	-3.91	
6,886.00	34.81	260.98	6,576.54	-114.79	1,648.33	-1,646.25	12.54	12.53	-1.18	
6,978.00	43.30	261.25	6,647.91	-123.72	1,591.11	-1,588.89	9.23	9.23	0.29	
7,070.00	51.41	266.04	6,710.20	-131.02	1,523.92	-1,521.60	9.61	8.82	5.21	
7,163.00	54.48	267.22	6,766.24	-135.37	1,449.84	-1,447.45	3.45	3.30	1.27	
7,255.00	64.10	267.30	6,813.17	-139.14	1,370.93	-1,368.49	10.46	10.46	0.09	
7,348.00	70.09	267.10	6,849.35	-143.33	1,285.40	-1,282.91	6.44	6.44	-0.22	
7,440.00	76.46	267.67	6,875.81	-147.34	1,197.43	-1,194.88	6.95	6.92	0.62	
7,532.00	84.77	268.93	6,890.80	-150.02	1,106.78	-1,104.20	9.13	9.03	1.37	
7,603.52	89.63	269.16	6,894.29	-151.20	1,035.38	-1,032.79	6.80	6.79	0.33	
<b>LP - 7603' MD - 2418' FNL / 2132' FWL</b>										
7,624.00	91.02	269.23	6,894.18	-151.49	1,014.90	-1,012.31	6.80	6.79	0.33	
7,718.00	90.78	268.87	6,892.70	-153.05	920.93	-918.32	0.46	-0.26	-0.38	
7,811.00	90.76	269.31	6,891.45	-154.53	827.95	-825.33	0.47	-0.02	0.47	
7,904.00	89.97	269.04	6,890.86	-155.87	734.96	-732.33	0.90	-0.85	-0.29	
7,998.00	89.63	270.15	6,891.19	-156.53	640.96	-638.34	1.23	-0.36	1.18	
8,002.98	89.62	270.06	6,891.22	-156.52	635.98	-633.36	1.81	-0.29	-1.78	
<b>460' Circle Entry - 8002' MD - 2423' FNL / 1727' FWL</b>										
8,090.00	89.36	268.51	6,892.00	-157.61	548.98	-546.35	1.81	-0.29	-1.78	
8,183.00	91.84	269.23	6,891.02	-159.44	456.01	-453.36	2.78	2.67	0.77	
8,275.00	92.67	269.05	6,887.40	-160.82	364.09	-361.43	0.92	0.90	-0.20	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 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)
8,370.00	93.38	270.02	6,882.39	-161.59	269.23	-266.57	1.26	0.75	1.02
8,462.00	93.58	269.84	6,876.81	-161.70	177.40	-174.75	0.29	0.22	-0.20
8,555.00	95.06	269.59	6,869.80	-162.16	84.67	-82.02	1.61	1.59	-0.27
8,647.00	92.68	270.35	6,863.59	-162.21	-7.12	9.75	2.72	-2.59	0.83
8,739.00	92.37	268.05	6,859.54	-163.49	-99.01	101.65	2.52	-0.34	-2.50
8,810.22	93.06	268.46	6,856.16	-165.66	-170.12	172.79	1.13	0.97	0.58
<b>460' Circle Exit - 8810' MD - 2427' FNL / 922' FWL</b>									
8,832.00	93.27	268.59	6,854.96	-166.22	-191.86	194.53	1.13	0.97	0.58
8,925.00	92.76	268.72	6,850.07	-168.40	-284.70	287.40	0.57	-0.55	0.14
9,018.00	90.65	268.64	6,847.30	-170.54	-377.63	380.35	2.27	-2.27	-0.09
9,111.00	91.58	268.29	6,845.49	-173.03	-470.58	473.33	1.07	1.00	-0.38
9,204.00	91.79	268.22	6,842.76	-175.86	-563.50	566.28	0.24	0.23	-0.08
9,296.00	90.41	270.10	6,840.99	-177.21	-655.46	658.25	2.53	-1.50	2.04
9,386.00	90.24	270.03	6,840.48	-177.11	-745.46	748.24	0.20	-0.19	-0.08
9,480.00	90.64	270.24	6,839.76	-176.88	-839.46	842.22	0.48	0.43	0.22
9,574.00	90.71	269.97	6,838.65	-176.71	-933.45	936.20	0.30	0.07	-0.29
9,666.00	90.24	269.16	6,837.89	-177.41	-1,025.45	1,028.19	1.02	-0.51	-0.88
9,759.00	93.49	270.23	6,834.86	-177.91	-1,118.38	1,121.12	3.68	3.49	1.15
9,852.00	93.80	269.66	6,828.95	-178.00	-1,211.19	1,213.92	0.70	0.33	-0.61
9,946.00	91.35	269.51	6,824.73	-178.68	-1,305.09	1,307.82	2.61	-2.61	-0.16
10,038.00	91.95	270.39	6,822.08	-178.76	-1,397.05	1,399.77	1.16	0.65	0.96
10,131.00	92.24	270.95	6,818.68	-177.67	-1,489.98	1,492.67	0.68	0.31	0.60
10,225.00	92.80	268.80	6,814.55	-177.87	-1,583.88	1,586.56	2.36	0.60	-2.29
10,319.00	92.78	268.87	6,809.97	-179.78	-1,677.75	1,680.45	0.08	-0.02	0.07
10,412.00	93.08	268.48	6,805.22	-181.93	-1,770.60	1,773.32	0.53	0.32	-0.42
10,505.00	91.25	269.03	6,801.70	-183.95	-1,863.51	1,866.25	2.05	-1.97	0.59
10,598.00	91.53	267.86	6,799.45	-186.47	-1,956.45	1,959.22	1.29	0.30	-1.26
10,690.00	90.18	268.95	6,798.08	-189.03	-2,048.40	2,051.20	1.89	-1.47	1.18
10,783.00	90.24	268.49	6,797.73	-191.11	-2,141.38	2,144.20	0.50	0.06	-0.49
10,876.00	90.04	266.69	6,797.51	-195.02	-2,234.29	2,237.16	1.95	-0.22	-1.94
10,970.00	91.83	270.38	6,795.97	-197.42	-2,328.23	2,331.12	4.36	1.90	3.93
11,062.00	89.91	269.10	6,794.58	-197.84	-2,420.21	2,423.10	2.51	-2.09	-1.39
11,154.00	89.95	267.50	6,794.69	-200.57	-2,512.16	2,515.09	1.74	0.04	-1.74
11,247.00	90.15	268.74	6,794.61	-203.62	-2,605.11	2,608.07	1.35	0.22	1.33
11,342.00	90.15	268.14	6,794.36	-206.21	-2,700.08	2,703.07	0.63	0.00	-0.63
11,434.00	90.24	267.58	6,794.05	-209.64	-2,792.01	2,795.05	0.62	0.10	-0.61
11,526.00	89.52	265.61	6,794.24	-215.11	-2,883.84	2,886.96	2.28	-0.78	-2.14
11,618.00	92.10	272.55	6,792.94	-216.58	-2,975.76	2,978.88	8.05	2.80	7.54
11,711.00	91.12	269.22	6,790.32	-215.15	-3,068.70	3,071.78	3.73	-1.05	-3.58
11,806.00	92.12	271.10	6,787.64	-214.88	-3,163.65	3,166.72	2.24	1.05	1.98
11,898.00	91.62	271.53	6,784.63	-212.77	-3,255.58	3,258.60	0.72	-0.54	0.47
11,990.00	90.34	269.29	6,783.06	-212.12	-3,347.56	3,350.56	2.80	-1.39	-2.43
12,083.00	89.03	267.80	6,783.57	-214.48	-3,440.52	3,443.55	2.13	-1.41	-1.60



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 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)
12,176.00	90.67	269.07	6,783.82	-217.02	-3,533.48	3,536.54	2.23	1.76	1.37
12,268.00	90.97	269.75	6,782.50	-217.96	-3,625.46	3,628.52	0.81	0.33	0.74
12,361.00	91.25	267.76	6,780.70	-219.98	-3,718.42	3,721.50	2.16	0.30	-2.14
12,453.00	90.50	266.32	6,779.29	-224.73	-3,810.28	3,813.43	1.76	-0.82	-1.57
12,546.00	91.44	266.64	6,777.72	-230.44	-3,903.09	3,906.32	1.07	1.01	0.34
12,638.00	90.74	267.66	6,775.97	-235.02	-3,994.96	3,998.25	1.34	-0.76	1.11
12,731.00	91.52	270.12	6,774.13	-236.82	-4,087.92	4,091.22	2.77	0.84	2.65
12,824.00	89.48	270.73	6,773.32	-236.13	-4,180.91	4,184.19	2.29	-2.19	0.66
12,916.00	87.92	268.35	6,775.41	-236.87	-4,272.87	4,276.15	3.09	-1.70	-2.59
13,008.00	88.72	267.37	6,778.11	-240.30	-4,364.77	4,368.09	1.37	0.87	-1.07
13,100.00	91.28	268.67	6,778.11	-243.48	-4,456.70	4,460.07	3.12	2.78	1.41
13,193.00	91.39	267.23	6,775.94	-246.80	-4,549.61	4,553.02	1.55	0.12	-1.55
13,287.00	91.14	266.54	6,773.86	-251.91	-4,643.45	4,646.93	0.78	-0.27	-0.73
13,380.00	91.18	265.67	6,771.98	-258.23	-4,736.22	4,739.78	0.94	0.04	-0.94
13,475.00	91.73	267.85	6,769.57	-263.59	-4,831.03	4,834.67	2.37	0.58	2.29
13,569.00	91.85	267.92	6,766.63	-267.06	-4,924.92	4,928.60	0.15	0.13	0.07
13,662.00	91.40	266.25	6,764.00	-271.79	-5,017.76	5,021.51	1.86	-0.48	-1.80
13,755.00	90.74	265.08	6,762.26	-278.82	-5,110.47	5,114.32	1.44	-0.71	-1.26
13,847.00	92.16	267.60	6,759.93	-284.69	-5,202.25	5,206.18	3.14	1.54	2.74
13,940.00	93.65	269.75	6,755.22	-286.84	-5,295.09	5,299.05	2.81	1.60	2.31
14,032.00	92.78	270.82	6,750.06	-286.38	-5,386.94	5,390.88	1.50	-0.95	1.16
14,125.00	91.16	271.86	6,746.86	-284.21	-5,479.86	5,483.75	2.07	-1.74	1.12
14,218.00	91.48	275.90	6,744.72	-277.92	-5,572.60	5,576.38	4.36	0.34	4.34
14,310.00	91.32	275.83	6,742.47	-268.52	-5,664.09	5,667.71	0.19	-0.17	-0.08
14,402.00	91.24	271.72	6,740.41	-262.46	-5,755.85	5,759.35	4.47	-0.09	-4.47
14,495.00	91.22	272.79	6,738.42	-258.81	-5,848.76	5,852.19	1.15	-0.02	1.15
14,589.00	91.60	272.08	6,736.10	-254.81	-5,942.64	5,946.00	0.86	0.40	-0.76
14,682.00	91.61	268.92	6,733.50	-254.00	-6,035.59	6,038.92	3.40	0.01	-3.40
14,775.00	90.67	267.67	6,731.65	-256.77	-6,128.53	6,131.89	1.68	-1.01	-1.34
14,867.00	90.87	268.15	6,730.41	-260.12	-6,220.46	6,223.86	0.57	0.22	0.52
14,959.00	92.06	269.62	6,728.06	-261.91	-6,312.41	6,315.83	2.06	1.29	1.60
15,052.00	92.40	267.96	6,724.44	-263.88	-6,405.31	6,408.75	1.82	0.37	-1.78
15,145.00	90.78	266.31	6,721.86	-268.52	-6,498.15	6,501.66	2.49	-1.74	-1.77
15,238.00	91.22	267.22	6,720.24	-273.77	-6,590.99	6,594.57	1.09	0.47	0.98
15,329.00	90.99	266.78	6,718.48	-278.53	-6,681.85	6,685.49	0.55	-0.25	-0.48
15,422.00	90.85	268.75	6,716.99	-282.16	-6,774.76	6,778.45	2.12	-0.15	2.12
15,515.00	90.09	269.32	6,716.23	-283.72	-6,867.74	6,871.44	1.02	-0.82	0.61
15,609.00	90.61	270.52	6,715.65	-283.86	-6,961.74	6,965.43	1.39	0.55	1.28
15,701.00	92.86	270.52	6,712.87	-283.02	-7,053.69	7,057.35	2.45	2.45	0.00
15,795.00	93.33	270.15	6,707.79	-282.47	-7,147.55	7,151.19	0.64	0.50	-0.39
15,889.00	93.04	268.60	6,702.57	-283.50	-7,241.40	7,245.04	1.68	-0.31	-1.65
15,982.00	93.68	268.47	6,697.12	-285.87	-7,334.20	7,337.88	0.70	0.69	-0.14
16,074.00	93.16	269.40	6,691.63	-287.58	-7,426.02	7,429.71	1.16	-0.57	1.01
16,166.00	92.59	268.94	6,687.01	-288.91	-7,517.90	7,521.60	0.80	-0.62	-0.50



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 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)	
16,259.00	93.33	269.56	6,682.21	-290.12	-7,610.76	7,614.47	1.04	0.80	0.67	
16,351.00	92.42	266.90	6,677.60	-292.96	-7,702.60	7,706.34	3.05	-0.99	-2.89	
16,445.00	92.88	266.35	6,673.25	-298.49	-7,796.33	7,800.15	0.76	0.49	-0.59	
16,539.00	91.81	265.94	6,669.40	-304.80	-7,890.04	7,893.95	1.22	-1.14	-0.44	
16,632.00	92.94	267.92	6,665.55	-309.78	-7,982.82	7,986.80	2.45	1.22	2.13	
16,725.00	93.30	268.10	6,660.49	-313.01	-8,075.63	8,079.64	0.43	0.39	0.19	
16,817.00	94.15	269.29	6,654.51	-315.10	-8,167.40	8,171.44	1.59	0.92	1.29	
16,910.00	94.33	268.09	6,647.64	-317.22	-8,260.12	8,264.18	1.30	0.19	-1.29	
17,003.00	93.99	270.10	6,640.89	-318.68	-8,352.86	8,356.93	2.19	-0.37	2.16	
17,096.00	95.04	271.28	6,633.57	-317.57	-8,445.56	8,449.61	1.70	1.13	1.27	
17,189.00	93.36	269.97	6,626.76	-316.56	-8,538.30	8,542.32	2.29	-1.81	-1.41	
17,281.00	93.45	271.31	6,621.29	-315.53	-8,630.13	8,634.12	1.46	0.10	1.46	
17,373.00	91.20	270.22	6,617.56	-314.30	-8,722.04	8,725.99	2.72	-2.45	-1.18	
17,465.00	92.53	270.45	6,614.57	-313.77	-8,813.99	8,817.92	1.47	1.45	0.25	
17,558.00	92.24	269.01	6,610.70	-314.20	-8,906.91	8,910.83	1.58	-0.31	-1.55	
17,651.00	94.07	270.49	6,605.58	-314.61	-8,999.76	9,003.68	2.53	1.97	1.59	
17,743.00	93.15	269.33	6,599.78	-314.75	-9,091.57	9,095.48	1.61	-1.00	-1.26	
17,835.00	93.92	268.02	6,594.11	-316.88	-9,183.37	9,187.30	1.65	0.84	-1.42	
17,927.00	94.40	269.14	6,587.44	-319.15	-9,275.10	9,279.06	1.32	0.52	1.22	
18,020.00	94.40	268.37	6,580.30	-321.17	-9,367.80	9,371.78	0.83	0.00	-0.83	
18,114.00	95.19	268.43	6,572.44	-323.78	-9,461.43	9,465.44	0.84	0.84	0.06	
18,207.00	94.37	267.91	6,564.69	-326.74	-9,554.06	9,558.11	1.04	-0.88	-0.56	
18,300.00	94.79	267.25	6,557.27	-330.66	-9,646.68	9,650.78	0.84	0.45	-0.71	
18,392.00	94.71	267.30	6,549.65	-335.01	-9,738.26	9,742.42	0.10	-0.09	0.05	
18,487.00	95.10	267.59	6,541.53	-339.23	-9,832.82	9,837.03	0.51	0.41	0.31	
18,580.00	94.06	267.18	6,534.10	-343.46	-9,925.43	9,929.69	1.20	-1.12	-0.44	
18,673.00	94.10	267.81	6,527.48	-347.52	-10,018.10	10,022.42	0.68	0.04	0.68	
18,767.00	94.00	269.43	6,520.84	-349.78	-10,111.84	10,116.18	1.72	-0.11	1.72	
18,861.00	93.24	268.50	6,514.91	-351.47	-10,205.63	10,209.99	1.28	-0.81	-0.99	
18,953.00	93.29	269.35	6,509.67	-353.19	-10,297.46	10,301.84	0.92	0.05	0.92	
19,046.00	95.43	271.05	6,502.60	-352.87	-10,390.19	10,394.54	2.94	2.30	1.83	
19,139.00	95.77	269.55	6,493.52	-352.39	-10,482.74	10,487.08	1.65	0.37	-1.61	
19,231.00	95.97	269.33	6,484.11	-353.28	-10,574.25	10,578.59	0.32	0.22	-0.24	
19,325.00	96.84	269.64	6,473.63	-354.12	-10,667.66	10,672.00	0.98	0.93	0.33	
19,420.00	96.21	270.20	6,462.83	-354.25	-10,762.04	10,766.38	0.88	-0.66	0.59	
19,514.00	95.29	270.14	6,453.42	-353.98	-10,855.57	10,859.88	0.98	-0.98	-0.06	
19,608.00	93.48	268.77	6,446.23	-354.87	-10,949.28	10,953.60	2.41	-1.93	-1.46	
19,700.00	93.97	268.78	6,440.25	-356.83	-11,041.07	11,045.40	0.53	0.53	0.01	
19,792.00	93.22	268.35	6,434.48	-359.13	-11,132.86	11,137.22	0.94	-0.82	-0.47	
19,885.00	94.05	268.85	6,428.59	-361.40	-11,225.64	11,230.03	1.04	0.89	0.54	
19,939.73	94.20	268.29	6,424.65	-362.76	-11,280.21	11,284.61	1.06	0.27	-1.03	
<b>460' Circle Entry - 2512' FNL / 427' FWL</b>										
19,978.00	94.30	267.89	6,421.82	-364.04	-11,318.36	11,322.77	1.06	0.27	-1.03	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-9HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB = 20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-9HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 Single User Db

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)	
20,071.00	94.82	266.64	6,414.42	-368.46	-11,410.95	11,415.43	1.45	0.56	-1.34	
20,129.00	95.46	267.27	6,409.23	-371.53	-11,468.64	11,473.16	1.55	1.10	1.09	
<b>Last Survey</b>										
20,186.00	95.46	267.27	6,403.80	-374.23	-11,525.32	11,529.87	0.00	0.00	0.00	
<b>PTB - 20186' MD - 2524' FNL / 184' FWL</b>										

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
20,186.00	6,403.80	20" Casing	20	24

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,847.00	1,805.49	-20.49	315.08	Last Survey
7,603.52	6,894.29	-151.20	1,035.38	LP - 7603' MD - 2418' FNL / 2132' FWL
8,002.98	6,891.22	-156.52	635.98	460' Circle Entry - 8002' MD - 2423' FNL / 1727' FWL
8,810.22	6,856.16	-165.66	-170.12	460' Circle Exit - 8810' MD - 2427' FNL / 922' FWL
19,939.73	6,424.65	-362.76	-11,280.21	460' Circle Entry - 2512' FNL / 427' FWL
20,129.00	6,409.23	-371.53	-11,468.64	Last Survey
20,186.00	6,403.80	-374.23	-11,525.32	PTB - 20186' MD - 2524' FNL / 184' FWL

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_