

Occidental Petroleum

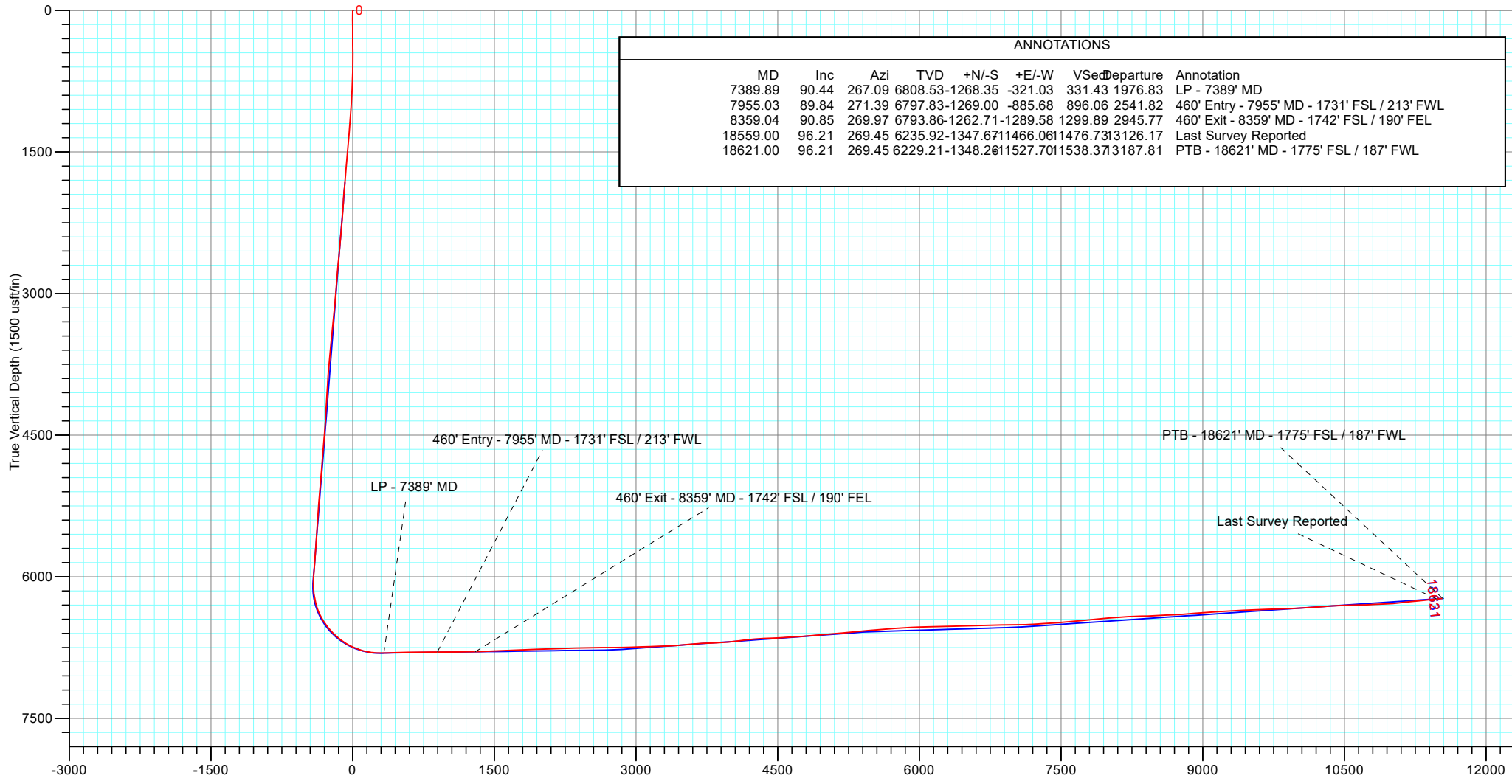
Project: Weld County, CO (UTM-NAD83)
 Site: 4N-68W-13 SBJ 22-13HZ PAD
 Well: SBJ 13-11HZ
 Wellbore: Wellbore 1
 Design: Surveys

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: 2291' FNL, 1094' FWL
LP: 1732' FSL, 774' FWL
TOE: 1775' FSL, 187' FWL



ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation	
7389.89	90.44	267.09	6808.53	-1268.35	-321.03	331.43	1976.83	LP - 7389' MD	
7955.03	89.84	271.39	6797.83	-1269.00	-885.68	896.06	2541.82	460' Entry - 7955' MD - 1731' FSL / 213' FWL	
8359.04	90.85	269.97	6793.86	-1262.71	-1289.58	1299.89	2945.77	460' Exit - 8359' MD - 1742' FSL / 190' FEL	
18559.00	96.21	269.45	6235.92	-1347.67	11466.06	1476.73	3126.17	Last Survey Reported	
18621.00	96.21	269.45	6229.21	-1348.26	11527.70	1538.37	3187.81	PTB - 18621' MD - 1775' FSL / 187' FWL	



TOTAL DIRECTIONAL SERVICES LLC

Design: Surveys (SBJ 13-11HZ/Wellbore 1)
 4N-68W-13 SBJ 22-13HZ PAD
 Created By: RDW Date: 19:41, January 07 2022
 Approved: _____ Date: _____

Occidental Petroleum

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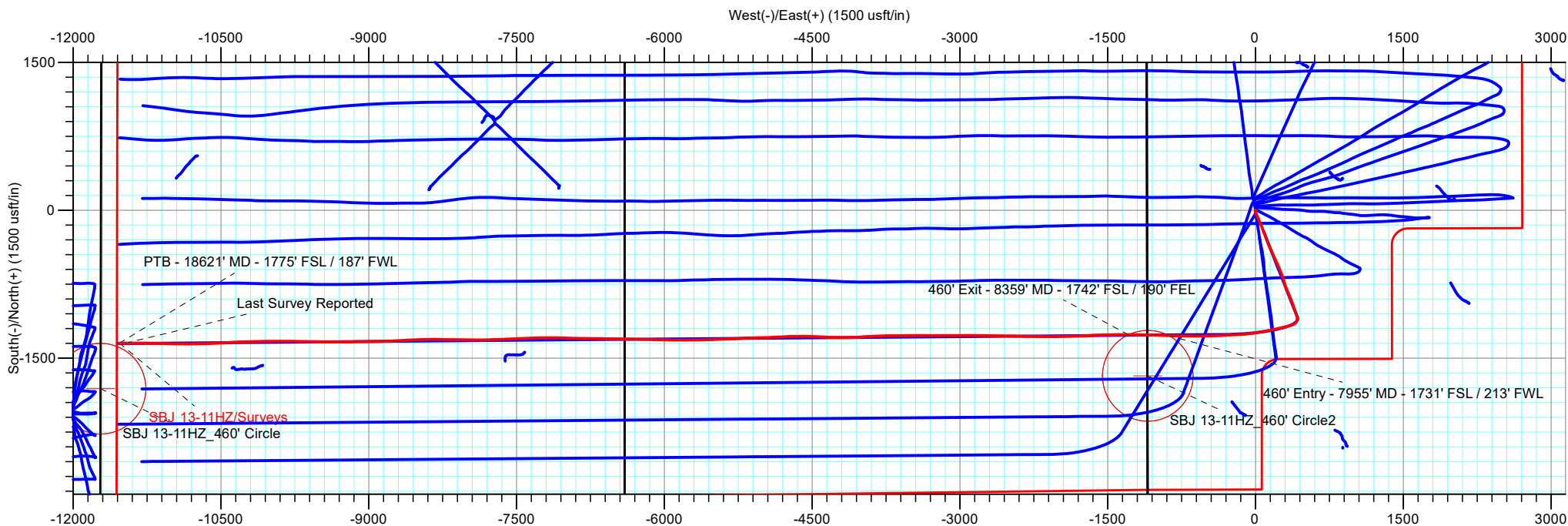


ACTUAL LINE CALLS
SHL: 2291' FNL, 1094' FWL
LP: 1732' FSL, 774' FWL
TOE: 1775 FSL, 187' FWL

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
7389.89	90.44	267.09	6808.53	-1268.35	-321.03	331.43	1976.83	LP - 7389' MD
7955.03	89.84	271.39	6797.83	-1269.00	-885.68	896.06	2541.82	460' Entry - 7955' MD - 1731' FSL / 213' FWL
8359.04	90.85	269.97	6793.86	-1262.71	-1289.58	1299.89	2945.77	460' Exit - 8359' MD - 1742' FSL / 190' FEL
18559.00	96.21	269.45	6235.92	-1347.67	11466.06	1476.73	13126.17	Last Survey Reported
18621.00	96.21	269.45	6229.21	-1348.26	11527.70	1538.37	13187.81	PTB - 18621' MD - 1775' FSL / 187' FWL



TOTAL DIRECTIONAL SERVICES LLC

Design: Surveys (SBJ 13-11HZ/Wellbore 1)
 4N-68W-13 SBJ 22-13HZ PAD
 Created By: RDW Date: 19:45, January 07 2022
 Date: _____
 Approved: _____ Date: _____



Occidental Petroleum

Weld County, CO (UTM-NAD83)
4N-68W-13 SBJ 22-13HZ PAD
SBJ 13-11HZ

Wellbore 1

Design: Surveys

Standard Survey Report

07 January, 2022





Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

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

Site	4N-68W-13 SBJ 22-13HZ PAD		
Site Position:		Northing:	14,641,145.55 usft
From:	Lat/Long	Easting:	1,652,517.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	40.314181
		Longitude:	-104.956591

Well	SBJ 13-11HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,641,357.83 usft	Latitude:	40.314764
	+E/-W	0.00 usft	Easting:	1,652,459.41 usft	Longitude:	-104.956799
Position Uncertainty	3.28 usft		Wellhead Elevation:	usft	Ground Level:	4,859.00 usft
Grid Convergence:	0.03 °					

Wellbore	Wellbore 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IFR	10/6/2021	7.86	66.48	51,857.80000000

Design	Surveys				
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	269.53	

Survey Program	Date	1/7/2022			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
99.00	1,847.00	Survey #1 (Wellbore 1)	APC_ISCWSA REV 2 MM Fixed:v2:crustal field declination		
1,926.00	18,621.00	Survey #2 (Wellbore 1)	APC_ISCWSA REV 2 MM Fixed:v2:Rockies, crustal dec + 3-axis correction		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99.00	0.24	5.36	99.00	0.21	0.02	-0.02	0.24	0.24	0.00	
185.00	0.38	255.34	185.00	0.31	-0.24	0.24	0.60	0.16	-127.93	
274.00	0.37	241.29	274.00	0.10	-0.78	0.78	0.10	-0.01	-15.79	
366.00	0.94	166.54	365.99	-0.78	-0.86	0.87	0.99	0.62	-81.25	
456.00	1.70	185.11	455.97	-2.82	-0.81	0.83	0.96	0.84	20.63	
546.00	2.84	177.57	545.90	-6.38	-0.83	0.89	1.31	1.27	-8.38	
636.00	4.20	174.47	635.72	-11.89	-0.42	0.52	1.53	1.51	-3.44	
726.00	5.79	166.04	725.38	-19.58	0.99	-0.83	1.94	1.77	-9.37	



Survey Report



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Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
815.00	7.20	160.32	813.81	-29.18	3.95	-3.71	1.74	1.58	-6.43	
905.00	8.13	153.77	903.00	-40.20	8.67	-8.34	1.42	1.03	-7.28	
995.00	9.31	155.14	991.96	-52.52	14.54	-14.11	1.33	1.31	1.52	
1,085.00	9.63	153.07	1,080.74	-65.84	21.01	-20.47	0.52	0.36	-2.30	
1,175.00	11.80	155.49	1,169.16	-80.92	28.24	-27.57	2.46	2.41	2.69	
1,265.00	12.87	157.30	1,257.08	-98.54	35.92	-35.11	1.26	1.19	2.01	
1,355.00	12.59	158.41	1,344.87	-116.91	43.40	-42.44	0.41	-0.31	1.23	
1,445.00	11.91	157.29	1,432.82	-134.60	50.59	-49.49	0.80	-0.76	-1.24	
1,535.00	11.90	155.87	1,520.89	-151.63	57.97	-56.73	0.33	-0.01	-1.58	
1,624.00	12.01	159.83	1,607.96	-168.70	64.92	-63.53	0.93	0.12	4.45	
1,714.00	14.05	159.15	1,695.64	-187.70	72.03	-70.49	2.27	2.27	-0.76	
1,804.00	13.39	158.78	1,783.07	-207.62	79.70	-77.99	0.74	-0.73	-0.41	
1,847.00	12.90	156.76	1,824.94	-216.68	83.39	-81.61	1.56	-1.14	-4.70	
1,926.00	11.25	150.67	1,902.19	-231.50	90.65	-88.74	2.64	-2.09	-7.71	
2,019.00	11.91	161.89	1,993.31	-248.53	98.07	-96.03	2.52	0.71	12.06	
2,111.00	13.18	163.84	2,083.11	-267.63	103.94	-101.75	1.45	1.38	2.12	
2,205.00	12.27	160.68	2,174.80	-287.35	110.23	-107.87	1.22	-0.97	-3.36	
2,297.00	13.85	158.13	2,264.42	-306.79	117.57	-115.05	1.83	1.72	-2.77	
2,389.00	14.11	157.17	2,353.70	-327.35	126.02	-123.33	0.38	0.28	-1.04	
2,481.00	13.96	159.50	2,442.95	-348.08	134.26	-131.40	0.64	-0.16	2.53	
2,573.00	11.82	156.50	2,532.63	-367.12	141.90	-138.89	2.44	-2.33	-3.26	
2,666.00	12.58	155.95	2,623.53	-385.10	149.83	-146.67	0.83	0.82	-0.59	
2,758.00	12.88	155.03	2,713.27	-403.55	158.24	-154.93	0.39	0.33	-1.00	
2,850.00	12.48	157.39	2,803.02	-422.02	166.39	-162.92	0.71	-0.43	2.57	
2,943.00	12.55	157.85	2,893.81	-440.65	174.06	-170.44	0.13	0.08	0.49	
3,035.00	11.66	158.61	2,983.77	-458.57	181.22	-177.46	0.98	-0.97	0.83	
3,127.00	12.38	157.17	3,073.75	-476.31	188.44	-184.53	0.85	0.78	-1.57	
3,219.00	12.24	152.37	3,163.64	-494.04	196.79	-192.73	1.12	-0.15	-5.22	
3,312.00	11.97	151.07	3,254.57	-511.22	206.03	-201.83	0.41	-0.29	-1.40	
3,404.00	12.00	150.90	3,344.56	-527.92	215.29	-210.96	0.05	0.03	-0.18	
3,497.00	13.98	155.76	3,435.18	-546.62	224.61	-220.12	2.43	2.13	5.23	
3,589.00	14.24	156.30	3,524.41	-567.11	233.72	-229.06	0.32	0.28	0.59	
3,681.00	14.30	157.16	3,613.57	-587.94	242.68	-237.85	0.24	0.07	0.93	
3,774.00	13.60	157.64	3,703.82	-608.64	251.30	-246.29	0.76	-0.75	0.52	
3,866.00	11.75	156.71	3,793.58	-627.25	259.11	-253.96	2.02	-2.01	-1.01	
3,959.00	11.75	161.40	3,884.63	-644.92	265.88	-260.58	1.03	0.00	5.04	
4,052.00	11.76	163.11	3,975.68	-662.97	271.65	-266.21	0.37	0.01	1.84	
4,145.00	11.85	161.32	4,066.72	-681.08	277.47	-271.87	0.41	0.10	-1.92	
4,238.00	12.64	164.71	4,157.60	-699.94	283.21	-277.46	1.15	0.85	3.65	
4,331.00	11.70	167.15	4,248.51	-718.95	287.99	-282.08	1.15	-1.01	2.62	
4,425.00	11.84	162.81	4,340.54	-737.46	292.96	-286.90	0.95	0.15	-4.62	
4,517.00	12.67	157.95	4,430.44	-755.83	299.53	-293.32	1.44	0.90	-5.28	
4,610.00	13.76	158.68	4,520.98	-775.58	307.39	-301.01	1.19	1.17	0.78	



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,703.00	13.05	159.82	4,611.44	-795.74	315.03	-308.49	0.81	-0.76	1.23
4,796.00	11.76	156.85	4,702.27	-814.31	322.38	-315.69	1.55	-1.39	-3.19
4,912.00	10.30	156.12	4,816.12	-834.66	331.22	-324.37	1.26	-1.26	-0.63
5,004.00	12.85	156.27	4,906.25	-851.55	338.67	-331.67	2.77	2.77	0.16
5,096.00	12.97	157.40	4,995.92	-870.45	346.76	-339.60	0.30	0.13	1.23
5,188.00	12.96	158.21	5,085.58	-889.56	354.55	-347.24	0.20	-0.01	0.88
5,282.00	11.79	156.93	5,177.39	-908.19	362.23	-354.77	1.28	-1.24	-1.36
5,375.00	11.96	162.14	5,268.40	-926.10	368.91	-361.30	1.17	0.18	5.60
5,467.00	11.78	154.93	5,358.44	-943.68	375.81	-368.06	1.62	-0.20	-7.84
5,561.00	12.57	161.72	5,450.33	-962.08	383.09	-375.18	1.74	0.84	7.22
5,653.00	11.70	166.70	5,540.28	-980.67	388.37	-380.31	1.48	-0.95	5.41
5,746.00	13.00	159.86	5,631.13	-999.67	394.14	-385.93	2.10	1.40	-7.35
5,840.00	13.00	159.86	5,722.72	-1,019.52	401.42	-393.05	0.00	0.00	0.00
5,934.00	12.78	163.47	5,814.35	-1,039.41	408.02	-399.48	0.89	-0.23	3.84
6,027.00	12.68	160.12	5,905.06	-1,058.87	414.42	-405.72	0.80	-0.11	-3.60
6,120.00	13.16	160.41	5,995.71	-1,078.45	421.44	-412.58	0.52	0.52	0.31
6,213.00	13.00	178.31	6,086.33	-1,098.89	425.30	-416.27	4.34	-0.17	19.25
6,307.00	16.65	204.46	6,177.29	-1,121.74	420.03	-410.81	8.01	3.88	27.82
6,401.00	18.38	227.10	6,267.03	-1,144.12	403.58	-394.18	7.43	1.84	24.09
6,495.00	22.30	244.48	6,355.24	-1,161.91	376.59	-367.05	7.62	4.17	18.49
6,588.00	30.55	257.40	6,438.52	-1,174.70	337.50	-327.85	10.77	8.87	13.89
6,680.00	37.25	257.75	6,514.83	-1,185.72	287.42	-277.68	7.29	7.28	0.38
6,773.00	43.82	255.82	6,585.48	-1,199.60	228.63	-218.78	7.19	7.06	-2.08
6,866.00	50.66	258.51	6,648.59	-1,214.67	162.08	-152.12	7.65	7.35	2.89
6,958.00	57.99	260.36	6,702.21	-1,228.31	88.66	-78.58	8.13	7.97	2.01
7,050.00	66.67	260.58	6,744.89	-1,241.78	8.38	1.80	9.44	9.43	0.24
7,143.00	71.94	263.57	6,777.75	-1,253.73	-77.75	88.03	6.41	5.67	3.22
7,235.00	80.99	267.19	6,799.27	-1,260.87	-166.80	177.13	10.55	9.84	3.93
7,327.00	88.30	267.30	6,807.85	-1,265.27	-258.23	268.60	7.95	7.95	0.12
7,389.89	90.44	267.09	6,808.53	-1,268.35	-321.03	331.43	3.42	3.41	-0.33
LP - 7389' MD									
7,420.00	91.47	266.99	6,808.03	-1,269.90	-351.10	361.50	3.42	3.41	-0.33
7,512.00	91.75	267.05	6,805.45	-1,274.68	-442.94	453.38	0.31	0.30	0.07
7,604.00	92.16	269.54	6,802.31	-1,277.42	-534.84	545.30	2.74	0.45	2.71
7,698.00	91.51	271.22	6,799.30	-1,276.79	-628.78	639.24	1.92	-0.69	1.79
7,791.00	89.77	272.03	6,798.26	-1,274.16	-721.74	732.16	2.06	-1.87	0.87
7,884.00	90.50	271.85	6,798.04	-1,271.01	-814.68	825.08	0.81	0.78	-0.19
7,955.03	89.84	271.39	6,797.83	-1,269.00	-885.68	896.06	1.13	-0.92	-0.65
460' Entry - 7955' MD - 1731' FSL / 213' FWL									
7,977.00	89.64	271.25	6,797.93	-1,268.49	-907.65	918.02	1.13	-0.92	-0.65
8,070.00	89.50	271.55	6,798.62	-1,266.22	-1,000.62	1,010.97	0.36	-0.15	0.32
8,163.00	91.68	270.73	6,797.67	-1,264.37	-1,093.59	1,103.92	2.50	2.34	-0.88
8,255.00	91.06	270.64	6,795.47	-1,263.27	-1,185.55	1,195.88	0.68	-0.67	-0.10
8,350.00	90.73	270.04	6,793.98	-1,262.71	-1,280.54	1,290.85	0.72	-0.35	-0.63



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
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Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,359.04	90.85	269.97	6,793.86	-1,262.71	-1,289.58	1,299.89	1.55	1.36	-0.75	
460' Exit - 8359' MD - 1742' FSL / 190' FEL										
8,442.00	91.98	269.35	6,791.81	-1,263.20	-1,372.51	1,382.82	1.55	1.36	-0.75	
8,535.00	92.38	269.47	6,788.27	-1,264.15	-1,465.44	1,475.76	0.45	0.43	0.13	
8,627.00	92.91	268.50	6,784.02	-1,265.78	-1,557.32	1,567.65	1.20	0.58	-1.05	
8,719.00	91.51	267.75	6,780.48	-1,268.79	-1,649.20	1,659.55	1.73	-1.52	-0.82	
8,812.00	91.33	266.32	6,778.17	-1,273.60	-1,742.05	1,752.44	1.55	-0.19	-1.54	
8,905.00	93.03	268.70	6,774.63	-1,277.64	-1,834.88	1,845.30	3.14	1.83	2.56	
8,998.00	91.95	267.89	6,770.59	-1,280.40	-1,927.75	1,938.19	1.45	-1.16	-0.87	
9,091.00	93.20	270.04	6,766.41	-1,282.08	-2,020.63	2,031.08	2.67	1.34	2.31	
9,184.00	92.27	270.07	6,761.98	-1,281.99	-2,113.53	2,123.97	1.00	-1.00	0.03	
9,276.00	91.80	271.58	6,758.71	-1,280.67	-2,205.46	2,215.89	1.72	-0.51	1.64	
9,366.00	90.60	271.04	6,756.83	-1,278.61	-2,295.41	2,305.82	1.46	-1.33	-0.60	
9,459.00	90.96	270.71	6,755.56	-1,277.19	-2,388.39	2,398.79	0.53	0.39	-0.35	
9,553.00	91.66	270.30	6,753.41	-1,276.36	-2,482.36	2,492.75	0.86	0.74	-0.44	
9,646.00	89.63	271.29	6,752.36	-1,275.07	-2,575.34	2,585.71	2.43	-2.18	1.06	
9,739.00	90.19	271.38	6,752.51	-1,272.91	-2,668.32	2,678.67	0.61	0.60	0.10	
9,832.00	91.20	271.06	6,751.38	-1,270.93	-2,761.29	2,771.62	1.14	1.09	-0.34	
9,925.00	91.96	269.87	6,748.82	-1,270.17	-2,854.25	2,864.57	1.52	0.82	-1.28	
10,018.00	91.59	269.73	6,745.94	-1,270.50	-2,947.20	2,957.52	0.43	-0.40	-0.15	
10,110.00	92.25	270.17	6,742.85	-1,270.58	-3,039.15	3,049.47	0.86	0.72	0.48	
10,205.00	91.03	269.75	6,740.14	-1,270.64	-3,134.11	3,144.42	1.36	-1.28	-0.44	
10,299.00	91.61	269.75	6,737.97	-1,271.05	-3,228.08	3,238.40	0.62	0.62	0.00	
10,391.00	92.44	269.82	6,734.72	-1,271.40	-3,320.02	3,330.34	0.91	0.90	0.08	
10,484.00	94.56	270.55	6,729.04	-1,271.10	-3,412.84	3,423.15	2.41	2.28	0.78	
10,577.00	94.95	269.97	6,721.33	-1,270.68	-3,505.52	3,515.83	0.75	0.42	-0.62	
10,670.00	95.56	269.94	6,712.81	-1,270.75	-3,598.13	3,608.43	0.66	0.66	-0.03	
10,763.00	92.53	269.30	6,706.26	-1,271.37	-3,690.88	3,701.19	3.33	-3.26	-0.69	
10,856.00	91.84	268.00	6,702.71	-1,273.56	-3,783.79	3,794.11	1.58	-0.74	-1.40	
10,949.00	92.99	266.06	6,698.79	-1,278.37	-3,876.57	3,886.93	2.42	1.24	-2.09	
11,042.00	95.57	266.32	6,691.85	-1,284.53	-3,969.10	3,979.51	2.79	2.77	0.28	
11,134.00	97.39	268.31	6,681.47	-1,288.82	-4,060.41	4,070.84	2.92	1.98	2.16	
11,227.00	96.58	268.97	6,670.16	-1,291.01	-4,152.69	4,163.14	1.12	-0.87	0.71	
11,322.00	95.02	271.29	6,660.56	-1,290.79	-4,247.19	4,257.64	2.93	-1.64	2.44	
11,414.00	92.87	272.52	6,654.23	-1,287.74	-4,338.92	4,349.33	2.69	-2.34	1.34	
11,506.00	92.77	272.30	6,649.70	-1,283.87	-4,430.72	4,441.11	0.26	-0.11	-0.24	
11,598.00	92.51	272.52	6,645.46	-1,280.01	-4,522.54	4,532.89	0.37	-0.28	0.24	
11,691.00	92.62	269.46	6,641.30	-1,278.40	-4,615.43	4,625.76	3.29	0.12	-3.29	
11,785.00	94.31	267.75	6,635.62	-1,280.69	-4,709.22	4,719.57	2.56	1.80	-1.82	
11,878.00	94.54	267.74	6,628.44	-1,284.34	-4,801.87	4,812.24	0.25	0.25	-0.01	
11,970.00	94.62	267.23	6,621.10	-1,288.36	-4,893.49	4,903.89	0.56	0.09	-0.55	
12,062.00	95.20	268.68	6,613.22	-1,291.63	-4,985.09	4,995.52	1.69	0.63	1.58	
12,156.00	95.20	268.69	6,604.70	-1,293.78	-5,078.68	5,089.12	0.01	0.00	0.01	



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,248.00	95.23	266.74	6,596.34	-1,297.43	-5,170.22	5,180.69	2.11	0.03	-2.12	
12,341.00	95.65	266.97	6,587.52	-1,302.51	-5,262.66	5,273.17	0.51	0.45	0.25	
12,433.00	95.03	268.33	6,578.96	-1,306.27	-5,354.18	5,364.72	1.62	-0.67	1.48	
12,525.00	94.99	267.69	6,570.93	-1,309.45	-5,445.78	5,456.33	0.69	-0.04	-0.70	
12,618.00	95.40	267.38	6,562.51	-1,313.43	-5,538.31	5,548.89	0.55	0.44	-0.33	
12,711.00	93.75	269.48	6,555.09	-1,315.97	-5,630.97	5,641.57	2.87	-1.77	2.26	
12,803.00	94.53	269.73	6,548.44	-1,316.60	-5,722.72	5,733.33	0.89	0.85	0.27	
12,988.00	92.92	271.14	6,536.43	-1,315.20	-5,907.32	5,917.91	1.16	-0.87	0.76	
13,080.00	91.08	271.02	6,533.21	-1,313.47	-5,999.24	6,009.81	2.00	-2.00	-0.13	
13,173.00	91.67	271.40	6,530.98	-1,311.50	-6,092.19	6,102.75	0.75	0.63	0.41	
13,267.00	91.85	270.47	6,528.10	-1,309.97	-6,186.14	6,196.67	1.01	0.19	-0.99	
13,360.00	92.41	270.69	6,524.64	-1,309.03	-6,279.07	6,289.59	0.65	0.60	0.24	
13,455.00	90.50	270.92	6,522.23	-1,307.69	-6,374.02	6,384.53	2.03	-2.01	0.24	
13,548.00	90.60	271.54	6,521.33	-1,305.70	-6,467.00	6,477.49	0.68	0.11	0.67	
13,642.00	91.13	270.66	6,519.92	-1,303.89	-6,560.97	6,571.44	1.09	0.56	-0.94	
13,735.00	92.03	270.97	6,517.35	-1,302.57	-6,653.92	6,664.38	1.02	0.97	0.33	
13,827.00	93.01	270.99	6,513.31	-1,301.00	-6,745.82	6,756.26	1.07	1.07	0.02	
13,919.00	90.97	270.88	6,510.11	-1,299.50	-6,837.74	6,848.17	2.22	-2.22	-0.12	
14,012.00	90.60	271.53	6,508.84	-1,297.54	-6,930.71	6,941.12	0.80	-0.40	0.70	
14,105.00	89.29	271.11	6,508.93	-1,295.40	-7,023.69	7,034.08	1.48	-1.41	-0.45	
14,197.00	91.58	270.75	6,508.23	-1,293.91	-7,115.67	7,126.04	2.52	2.49	-0.39	
14,290.00	93.94	269.76	6,503.75	-1,293.49	-7,208.55	7,218.92	2.75	2.54	-1.06	
14,382.00	94.04	269.04	6,497.35	-1,294.46	-7,300.32	7,310.69	0.79	0.11	-0.78	
14,474.00	92.99	266.76	6,491.71	-1,297.82	-7,392.08	7,402.48	2.72	-1.14	-2.48	
14,568.00	95.00	267.55	6,485.16	-1,302.48	-7,485.73	7,496.16	2.30	2.14	0.84	
14,661.00	94.82	266.40	6,477.20	-1,307.37	-7,578.26	7,588.73	1.25	-0.19	-1.24	
14,754.00	96.11	269.16	6,468.34	-1,310.95	-7,670.75	7,681.25	3.26	1.39	2.97	
14,846.00	95.83	269.00	6,458.77	-1,312.42	-7,762.24	7,772.75	0.35	-0.30	-0.17	
14,939.00	95.07	269.72	6,449.94	-1,313.46	-7,854.82	7,865.33	1.12	-0.82	0.77	
15,031.00	95.54	269.41	6,441.43	-1,314.15	-7,946.42	7,956.93	0.61	0.51	-0.34	
15,125.00	95.02	270.78	6,432.78	-1,314.00	-8,040.02	8,050.52	1.55	-0.55	1.46	
15,217.00	92.30	271.11	6,426.91	-1,312.48	-8,131.81	8,142.30	2.98	-2.96	0.36	
15,308.00	91.93	270.10	6,423.55	-1,311.52	-8,222.74	8,233.22	1.18	-0.41	-1.11	
15,401.00	92.02	271.13	6,420.35	-1,310.52	-8,315.68	8,326.15	1.11	0.10	1.11	
15,494.00	92.32	269.25	6,416.82	-1,310.22	-8,408.61	8,419.07	2.05	0.32	-2.02	
15,588.00	93.49	267.77	6,412.06	-1,312.66	-8,502.45	8,512.93	2.01	1.24	-1.57	
15,681.00	92.63	266.67	6,407.10	-1,317.16	-8,595.21	8,605.72	1.50	-0.92	-1.18	
15,774.00	92.99	267.33	6,402.54	-1,322.02	-8,687.97	8,698.52	0.81	0.39	0.71	
15,868.00	92.71	266.80	6,397.86	-1,326.83	-8,781.73	8,792.31	0.64	-0.30	-0.56	
15,961.00	95.49	268.89	6,391.21	-1,330.32	-8,874.41	8,885.02	3.74	2.99	2.25	
16,053.00	94.72	269.75	6,383.03	-1,331.41	-8,966.03	8,976.65	1.25	-0.84	0.93	
16,146.00	94.72	269.42	6,375.37	-1,332.08	-9,058.72	9,069.34	0.35	0.00	-0.35	
16,238.00	92.20	268.11	6,369.82	-1,334.06	-9,150.52	9,161.15	3.09	-2.74	-1.42	
16,331.00	92.97	270.14	6,365.63	-1,335.48	-9,243.41	9,254.05	2.33	0.83	2.18	



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,425.00	92.87	270.01	6,360.84	-1,335.35	-9,337.28	9,347.92	0.17	-0.11	-0.14
16,518.00	93.43	271.45	6,355.73	-1,334.17	-9,430.13	9,440.76	1.66	0.60	1.55
16,611.00	93.14	271.06	6,350.40	-1,332.14	-9,522.96	9,533.57	0.52	-0.31	-0.42
16,704.00	91.77	270.42	6,346.42	-1,330.94	-9,615.86	9,626.46	1.63	-1.47	-0.69
16,796.00	91.40	270.42	6,343.87	-1,330.26	-9,707.83	9,718.41	0.40	-0.40	0.00
16,889.00	91.60	270.40	6,341.44	-1,329.60	-9,800.79	9,811.37	0.22	0.22	-0.02
16,983.00	91.80	270.53	6,338.65	-1,328.84	-9,894.75	9,905.31	0.25	0.21	0.14
17,075.00	93.63	269.71	6,334.29	-1,328.64	-9,986.64	9,997.20	2.18	1.99	-0.89
17,168.00	93.33	268.63	6,328.64	-1,329.99	-10,079.46	10,090.03	1.20	-0.32	-1.16
17,260.00	93.82	268.83	6,322.91	-1,332.02	-10,171.25	10,181.84	0.58	0.53	0.22
17,352.00	93.67	267.96	6,316.90	-1,334.60	-10,263.02	10,273.62	0.96	-0.16	-0.95
17,444.00	94.35	268.01	6,310.47	-1,337.82	-10,354.74	10,365.36	0.74	0.74	0.05
17,537.00	92.45	267.38	6,304.95	-1,341.56	-10,447.49	10,458.15	2.15	-2.04	-0.68
17,630.00	91.39	265.14	6,301.83	-1,347.62	-10,540.24	10,550.94	2.66	-1.14	-2.41
17,722.00	91.35	267.50	6,299.63	-1,353.52	-10,632.01	10,642.76	2.56	-0.04	2.57
17,814.00	91.70	269.75	6,297.18	-1,355.73	-10,723.95	10,734.71	2.47	0.38	2.45
17,906.00	92.81	271.07	6,293.56	-1,355.07	-10,815.87	10,826.62	1.87	1.21	1.43
17,999.00	92.26	270.47	6,289.45	-1,353.82	-10,908.77	10,919.51	0.87	-0.59	-0.65
18,093.00	94.84	270.49	6,283.63	-1,353.04	-11,002.58	11,013.31	2.74	2.74	0.02
18,186.00	96.99	271.67	6,274.05	-1,351.30	-11,095.06	11,105.77	2.63	2.31	1.27
18,279.00	95.29	270.92	6,264.10	-1,349.21	-11,187.50	11,198.19	2.00	-1.83	-0.81
18,372.00	95.74	270.74	6,255.16	-1,347.87	-11,280.06	11,290.74	0.52	0.48	-0.19
18,466.00	95.84	270.02	6,245.68	-1,347.25	-11,373.58	11,384.25	0.77	0.11	-0.77
18,559.00	96.21	269.45	6,235.92	-1,347.67	-11,466.06	11,476.73	0.73	0.40	-0.61
Last Survey Reported									
18,621.00	96.21	269.45	6,229.21	-1,348.27	-11,527.70	11,538.37	0.00	0.00	0.00
PTB - 18621' MD - 1775' FSL / 187' FWL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SBJ 13-11HZ_460' Ci	0.00	0.00	0.00	-1,678.80	-1,092.93	14,639,678.50	1,651,367.30	40.310154	-104.960720
- actual wellpath misses target center by 2003.21usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 460.00)									
SBJ 13-11HZ_460' Ci	0.00	0.00	0.00	-1,810.01	-11,721.20	14,639,542.10	1,640,739.10	40.309786	-104.998844
- actual wellpath misses target center by 6249.30usft at 18621.00usft MD (6229.21 TVD, -1348.26 N, -11527.70 E)									
- Circle (radius 460.00)									



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-11HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-11HZ	North Reference:	True
Wellbore:	Wellbore 1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,389.89	6,808.53	-1,268.35	-321.03	LP - 7389' MD
7,955.03	6,797.83	-1,269.00	-885.68	460' Entry - 7955' MD - 1731' FSL / 213' FWL
8,359.04	6,793.86	-1,262.71	-1,289.58	460' Exit - 8359' MD - 1742' FSL / 190' FEL
18,559.00	6,235.92	-1,347.67	-11,466.06	Last Survey Reported
18,621.00	6,229.21	-1,348.27	-11,527.70	PTB - 18621' MD - 1775' FSL / 187' FWL

Checked By: _____	Approved By: _____	Date: _____
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