

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Alm 33U-234**

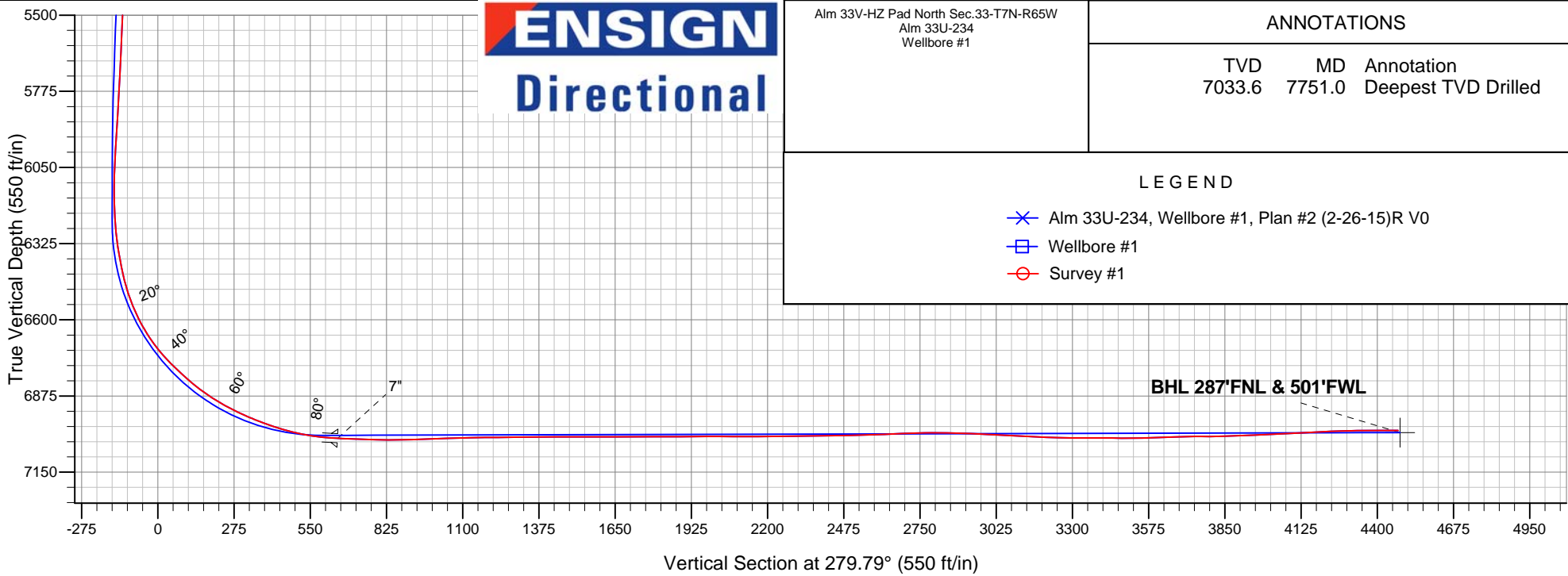
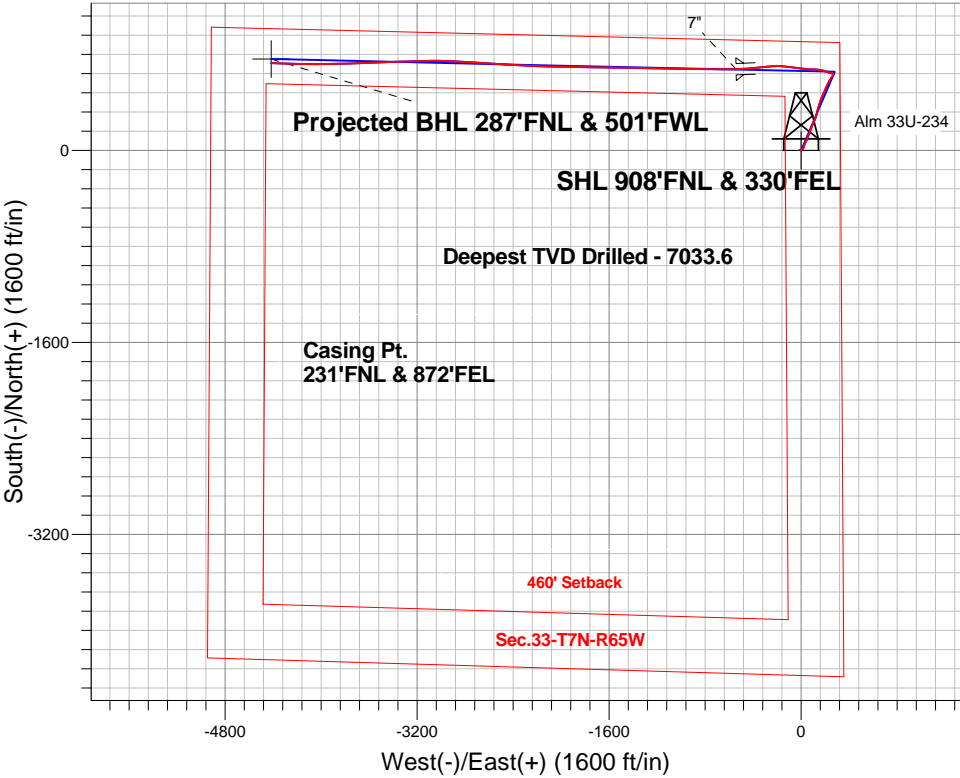
Surface Location: Alm 33V-HZ Pad North Sec.33-T7N-R65W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4792.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1439018.24	3233472.15	40.535470	-104.660020	
Ensign Rig #134 RKB - 13' WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')						

FINAL SURVEY

Projected Bottom Hole Location  
11423'MD 7000.'TVD 728'N & 4416'W of  
SHL 89.9 degree Incl @ 271.6 degree AZM



Alm 33V-HZ Pad North Sec.33-T7N-R65W Alm 33U-234 Wellbore #1	ANNOTATIONS		
	TVD	MD	Annotation
	7033.6	7751.0	Deepest TVD Drilled

- LEGEND
- Alm 33U-234, Wellbore #1, Plan #2 (2-26-15)R V0
  - Wellbore #1
  - Survey #1



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**Sec.33-T7N-R65W**

**Alm 33V-HZ Pad North Sec.33-T7N-R65W**

**Alm 33U-234**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**11 March, 2015**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33U-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad North Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33U-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	Sec.33-T7N-R65W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site		Alm 33V-HZ Pad North Sec.33-T7N-R65W			
Site Position:		Northing:	1,439,018.27 ft	Latitude:	40.535470
From:	Lat/Long	Easting:	3,233,472.15 ft	Longitude:	-104.660020
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.54 °

Well	Alm 33U-234					
Well Position	+N-S	0.0 ft	Northing:	1,439,018.24 ft	Latitude:	40.535470
	+E-W	0.0 ft	Easting:	3,233,472.15 ft	Longitude:	-104.660020
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,792.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2/26/2015	8.32	67.05	52,823

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	279.79	

<b>Survey Program</b>	<b>Date</b> 3/11/2015			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
76.0	11,423.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL 908'FNL &amp; 330'FEL</b>									
76.0	0.30	351.30	76.0	0.2	0.0	0.1	0.39	0.39	0.00
168.0	0.40	13.90	168.0	0.7	0.0	0.1	0.18	0.11	24.57
261.0	0.50	10.30	261.0	1.5	0.2	0.1	0.11	0.11	-3.87
446.0	0.60	293.10	446.0	2.6	-0.6	1.0	0.37	0.05	-41.73
630.0	0.40	328.60	630.0	3.6	-1.8	2.4	0.20	-0.11	19.29
815.0	0.70	326.30	815.0	5.1	-2.8	3.6	0.16	0.16	-1.24
883.0	1.00	295.70	883.0	5.7	-3.5	4.4	0.79	0.44	-45.00
1,016.0	0.60	307.10	1,016.0	6.6	-5.1	6.2	0.32	-0.30	8.57
1,109.0	2.00	132.40	1,108.9	5.8	-4.3	5.2	2.79	1.51	-187.85
1,201.0	1.80	81.10	1,200.9	4.9	-1.7	2.5	1.80	-0.22	-55.76

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33U-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad North Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33U-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,293.0	4.00	73.90	1,292.8	6.0	2.8	-1.7	2.42	2.39	-7.83
1,385.0	5.50	57.00	1,384.5	9.3	9.6	-7.9	2.21	1.63	-18.37
1,478.0	6.10	36.80	1,477.0	15.7	16.3	-13.4	2.27	0.65	-21.72
1,571.0	6.90	26.10	1,569.4	24.7	21.7	-17.2	1.56	0.86	-11.51
1,663.0	6.10	12.70	1,660.8	34.4	25.2	-19.0	1.86	-0.87	-14.57
1,756.0	6.60	10.30	1,753.2	44.5	27.2	-19.3	0.61	0.54	-2.58
1,848.0	6.20	25.90	1,844.7	54.2	30.4	-20.7	1.93	-0.43	16.96
1,940.0	7.70	25.20	1,936.0	64.2	35.2	-23.7	1.63	1.63	-0.76
2,033.0	8.60	30.30	2,028.1	75.9	41.3	-27.8	1.24	0.97	5.48
2,125.0	9.90	23.40	2,118.9	89.1	47.9	-32.1	1.86	1.41	-7.50
2,218.0	9.30	21.20	2,210.6	103.4	53.8	-35.5	0.76	-0.65	-2.37
2,310.0	9.00	17.60	2,301.4	117.2	58.7	-37.9	0.70	-0.33	-3.91
2,403.0	10.00	19.90	2,393.1	131.7	63.6	-40.3	1.15	1.08	2.47
2,495.0	9.10	20.10	2,483.8	146.1	68.9	-43.0	0.98	-0.98	0.22
2,587.0	9.00	18.30	2,574.7	159.7	73.6	-45.4	0.33	-0.11	-1.96
2,680.0	8.90	22.20	2,666.6	173.3	78.6	-48.0	0.66	-0.11	4.19
2,775.0	8.90	24.10	2,760.4	186.8	84.4	-51.4	0.31	0.00	2.00
2,870.0	8.90	21.30	2,854.3	200.4	90.1	-54.7	0.46	0.00	-2.95
2,965.0	8.80	20.10	2,948.1	214.0	95.2	-57.5	0.22	-0.11	-1.26
3,060.0	8.40	21.90	3,042.1	227.3	100.3	-60.2	0.51	-0.42	1.89
3,155.0	10.00	26.40	3,135.8	241.1	106.6	-64.0	1.85	1.68	4.74
3,346.0	8.80	20.40	3,324.3	269.7	119.0	-71.5	0.81	-0.63	-3.14
3,441.0	7.90	17.30	3,418.3	282.7	123.5	-73.7	1.06	-0.95	-3.26
3,536.0	8.90	15.90	3,512.3	296.0	127.5	-75.3	1.07	1.05	-1.47
3,631.0	9.30	14.80	3,606.1	310.5	131.4	-76.7	0.46	0.42	-1.16
3,726.0	8.40	13.90	3,699.9	324.7	135.1	-77.9	0.96	-0.95	-0.95
3,821.0	9.00	14.60	3,793.8	338.6	138.6	-79.0	0.64	0.63	0.74
3,916.0	9.10	14.80	3,887.7	353.0	142.4	-80.3	0.11	0.11	0.21
4,012.0	9.10	12.20	3,982.4	367.8	145.9	-81.3	0.43	0.00	-2.71
4,107.0	9.30	22.00	4,076.2	382.3	150.4	-83.2	1.66	0.21	10.32
4,202.0	9.10	20.80	4,170.0	396.4	155.9	-86.3	0.29	-0.21	-1.26
4,297.0	8.40	19.70	4,263.9	410.0	161.0	-88.9	0.76	-0.74	-1.16
4,392.0	8.40	18.70	4,357.9	423.1	165.5	-91.2	0.15	0.00	-1.05
4,487.0	7.90	15.30	4,451.9	435.9	169.5	-92.9	0.73	-0.53	-3.58
4,583.0	7.10	25.00	4,547.1	447.7	173.7	-95.1	1.56	-0.83	10.10
4,678.0	7.10	27.80	4,641.4	458.2	178.9	-98.4	0.36	0.00	2.95
4,773.0	7.40	25.90	4,735.6	468.9	184.3	-102.0	0.40	0.32	-2.00
4,868.0	7.00	22.20	4,829.9	479.7	189.2	-104.9	0.64	-0.42	-3.89
4,963.0	8.80	25.90	4,924.0	491.6	194.6	-108.2	1.97	1.89	3.89
5,058.0	8.00	21.00	5,017.9	504.4	200.1	-111.5	1.13	-0.84	-5.16
5,154.0	7.50	19.40	5,113.1	516.5	204.6	-113.8	0.57	-0.52	-1.67
5,249.0	8.40	26.80	5,207.2	528.5	209.8	-116.9	1.43	0.95	7.79
5,344.0	7.50	24.30	5,301.2	540.4	215.5	-120.5	1.01	-0.95	-2.63
5,439.0	8.00	27.80	5,395.4	551.9	221.1	-124.1	0.72	0.53	3.68
5,534.0	7.00	23.60	5,489.6	563.0	226.5	-127.5	1.20	-1.05	-4.42
5,629.0	7.60	28.50	5,583.8	573.9	231.8	-130.9	0.91	0.63	5.16
5,724.0	6.50	33.10	5,678.1	583.9	237.7	-135.0	1.30	-1.16	4.84
5,819.0	8.20	35.20	5,772.3	593.9	244.6	-140.1	1.81	1.79	2.21
5,914.0	7.60	33.60	5,866.4	604.7	252.0	-145.5	0.67	-0.63	-1.68
6,009.0	7.70	35.50	5,960.5	615.1	259.1	-150.8	0.29	0.11	2.00
6,104.0	7.30	34.70	6,054.7	625.3	266.3	-156.1	0.44	-0.42	-0.84
6,199.0	3.60	354.10	6,149.3	633.2	269.4	-157.8	5.40	-3.89	-42.74
6,294.0	3.60	293.10	6,244.2	637.3	266.3	-154.1	3.84	0.00	-64.21
6,389.0	9.10	292.00	6,338.5	641.3	256.6	-143.9	5.79	5.79	-1.16

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33U-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad North Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4805.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33U-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,484.0	12.10	284.60	6,431.9	646.6	240.0	-126.6	3.46	3.16	-7.79
6,579.0	20.20	290.60	6,523.1	654.9	215.0	-100.5	8.69	8.53	6.32
6,674.0	28.10	283.80	6,609.7	666.1	177.8	-62.0	8.80	8.32	-7.16
6,770.0	36.50	274.10	6,690.9	673.5	127.3	-11.0	10.26	8.75	-10.10
6,865.0	46.10	273.00	6,762.1	677.3	64.8	51.3	10.13	10.11	-1.16
6,960.0	49.30	276.70	6,826.1	683.3	-5.2	121.3	4.43	3.37	3.89
7,055.0	57.40	278.30	6,882.7	693.3	-80.7	197.4	8.63	8.53	1.68
7,150.0	64.10	273.90	6,929.2	702.0	-163.0	280.0	8.13	7.05	-4.63
7,245.0	69.60	265.10	6,966.5	701.1	-250.2	365.8	10.29	5.79	-9.26
7,340.0	74.10	263.70	6,996.1	692.3	-340.1	452.8	4.94	4.74	-1.47
7,435.0	80.80	265.30	7,016.8	683.4	-432.3	542.2	7.24	7.05	1.68
7,506.0	85.40	267.20	7,025.3	678.8	-502.6	610.7	7.00	6.48	2.68
7,545.0	86.89	268.12	7,027.9	677.2	-541.5	648.7	4.49	3.82	2.37
7"									
7,561.0	87.50	268.50	7,028.7	676.8	-557.5	664.4	4.49	3.82	2.36
7,656.0	88.20	270.10	7,032.3	675.6	-652.4	757.7	1.84	0.74	1.68
7,751.0	90.20	270.90	7,033.6	676.4	-747.4	851.5	2.27	2.11	0.84
Deepest TVD Drilled									
7,846.0	92.20	270.80	7,031.6	677.9	-842.3	945.3	2.11	2.11	-0.11
7,942.0	91.80	270.90	7,028.3	679.3	-938.3	1,040.1	0.43	-0.42	0.10
8,037.0	91.40	271.10	7,025.6	680.9	-1,033.2	1,133.9	0.47	-0.42	0.21
8,132.0	89.70	271.10	7,024.7	682.8	-1,128.2	1,227.8	1.79	-1.79	0.00
8,227.0	91.50	270.80	7,023.7	684.3	-1,223.2	1,321.7	1.92	1.89	-0.32
8,322.0	90.20	270.80	7,022.3	685.7	-1,318.1	1,415.5	1.37	-1.37	0.00
8,417.0	89.50	270.90	7,022.5	687.1	-1,413.1	1,509.4	0.74	-0.74	0.11
8,512.0	90.30	271.60	7,022.7	689.1	-1,508.1	1,603.3	1.12	0.84	0.74
8,607.0	90.40	271.50	7,022.1	691.7	-1,603.1	1,697.3	0.15	0.11	-0.11
8,702.0	89.70	270.60	7,022.0	693.5	-1,698.1	1,791.2	1.20	-0.74	-0.95
8,798.0	90.30	270.90	7,022.0	694.7	-1,794.0	1,886.0	0.70	0.63	0.31
8,893.0	90.60	270.60	7,021.3	696.0	-1,889.0	1,979.8	0.45	0.32	-0.32
8,988.0	89.30	271.10	7,021.4	697.4	-1,984.0	2,073.7	1.47	-1.37	0.53
9,083.0	90.40	271.80	7,021.6	699.8	-2,079.0	2,167.7	1.37	1.16	0.74
9,178.0	91.00	271.30	7,020.5	702.3	-2,173.9	2,261.7	0.82	0.63	-0.53
9,273.0	90.60	272.30	7,019.1	705.3	-2,268.9	2,355.8	1.13	-0.42	1.05
9,369.0	90.70	273.60	7,018.0	710.3	-2,364.8	2,451.1	1.36	0.10	1.35
9,464.0	91.50	274.30	7,016.2	716.8	-2,459.5	2,545.6	1.12	0.84	0.74
9,559.0	92.90	273.20	7,012.6	723.0	-2,554.2	2,640.0	1.87	1.47	-1.16
9,654.0	91.50	273.00	7,008.9	728.1	-2,649.0	2,734.2	1.49	-1.47	-0.21
9,749.0	89.00	274.10	7,008.5	734.0	-2,743.8	2,828.7	2.88	-2.63	1.16
9,844.0	88.30	273.40	7,010.7	740.2	-2,838.6	2,923.1	1.04	-0.74	-0.74
9,940.0	87.10	271.80	7,014.6	744.6	-2,934.4	3,018.3	2.08	-1.25	-1.67
10,035.0	86.80	270.40	7,019.7	746.4	-3,029.3	3,112.1	1.51	-0.32	-1.47
10,130.0	87.80	269.00	7,024.1	745.9	-3,124.2	3,205.5	1.81	1.05	-1.47
10,225.0	89.50	268.70	7,026.4	744.0	-3,219.1	3,298.7	1.82	1.79	-0.32
10,320.0	90.20	268.10	7,026.6	741.4	-3,314.1	3,391.9	0.97	0.74	-0.63
10,415.0	89.10	267.20	7,027.2	737.5	-3,409.0	3,484.7	1.50	-1.16	-0.95
10,510.0	91.80	268.10	7,026.5	733.6	-3,503.9	3,577.6	3.00	2.84	0.95
10,606.0	92.50	267.80	7,022.9	730.1	-3,599.8	3,671.5	0.79	0.73	-0.31
10,701.0	89.40	267.80	7,021.3	726.5	-3,694.7	3,764.4	3.26	-3.26	0.00
10,796.0	92.10	268.10	7,020.0	723.1	-3,789.6	3,857.3	2.86	2.84	0.32
10,891.0	92.50	268.80	7,016.2	720.5	-3,884.5	3,950.4	0.85	0.42	0.74
10,986.0	92.30	269.50	7,012.2	719.1	-3,979.4	4,043.7	0.77	-0.21	0.74
11,036.0	92.70	271.50	7,010.1	719.5	-4,029.3	4,093.0	4.08	0.80	4.00

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<b>Well:</b>	Alm 33U-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,081.0	93.40	269.70	7,007.7	720.0	-4,074.3	4,137.4	4.29	1.56	-4.00
11,176.0	92.30	270.60	7,002.9	720.3	-4,169.1	4,230.9	1.50	-1.16	0.95
11,221.0	91.80	271.60	7,001.3	721.1	-4,214.1	4,275.4	2.48	-1.11	2.22
11,272.0	90.80	272.20	7,000.2	722.8	-4,265.1	4,325.9	2.29	-1.96	1.18
11,368.0	89.90	271.60	6,999.6	726.0	-4,361.0	4,420.9	1.13	-0.94	-0.63
11,423.0	89.90	271.60	6,999.7	727.5	-4,416.0	4,475.4	0.00	0.00	0.00
BHL 253'FNL & 500'FWL									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,545.0	7,027.9	7"	7	7-1/2

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
7,751.0	7,033.6	676.4	-747.4	Deepest TVD Drilled

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