

# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

**NW NW SEC. 29 T8N R60W 6th P.M.**

**SHOVELER FED 29-32-14HN**

**ORIGINAL WELLBORE**

**29 August, 2017**

**Plan: PROPOSAL #1**



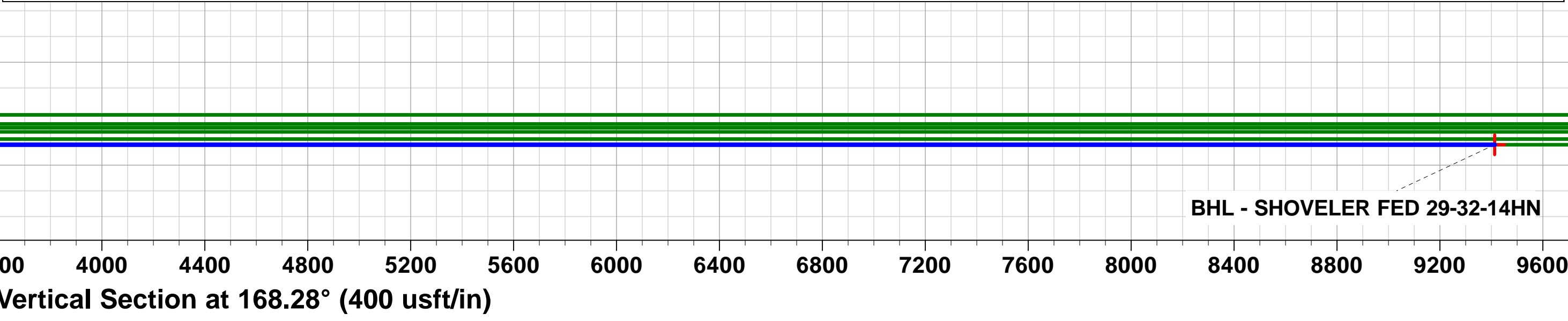
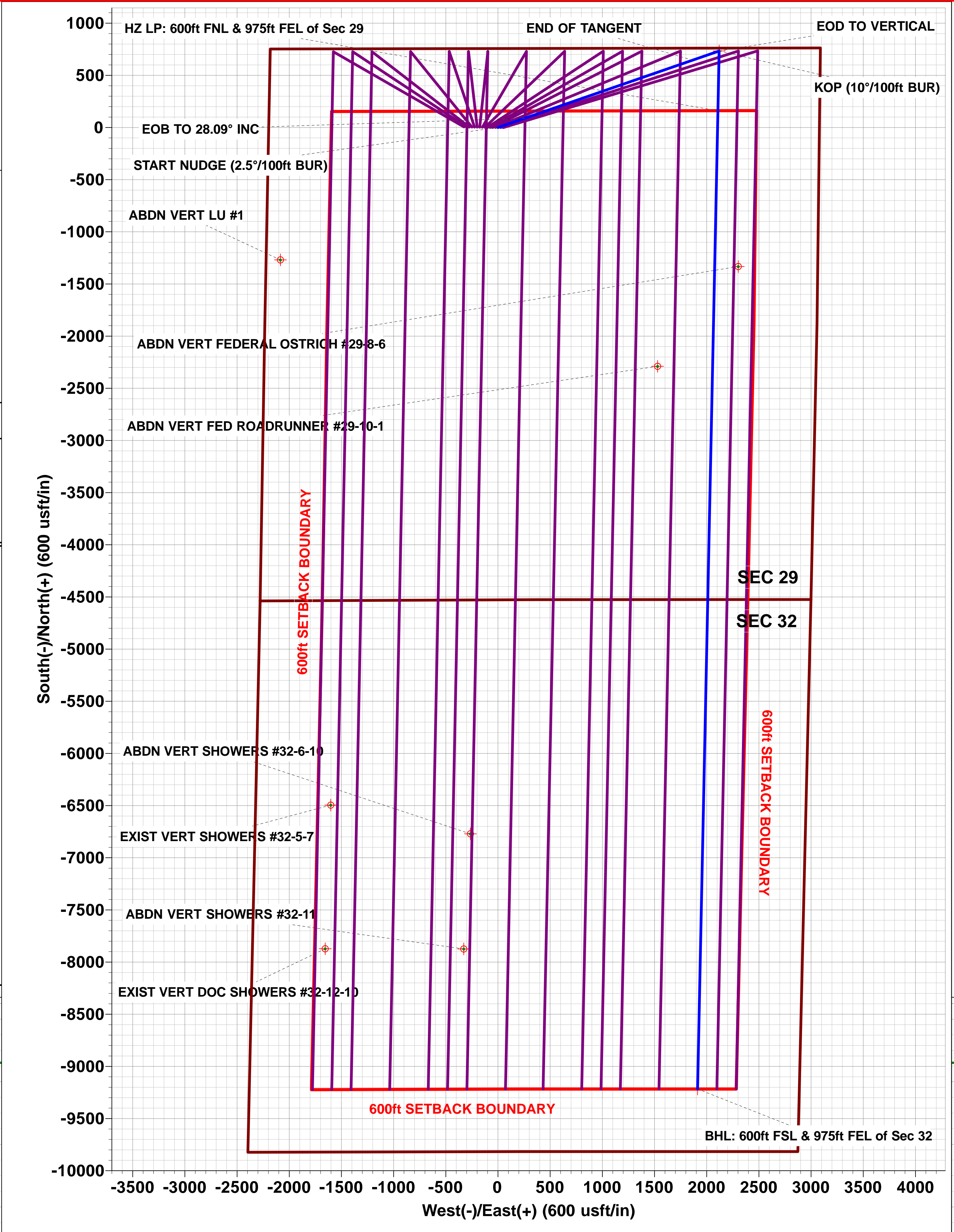
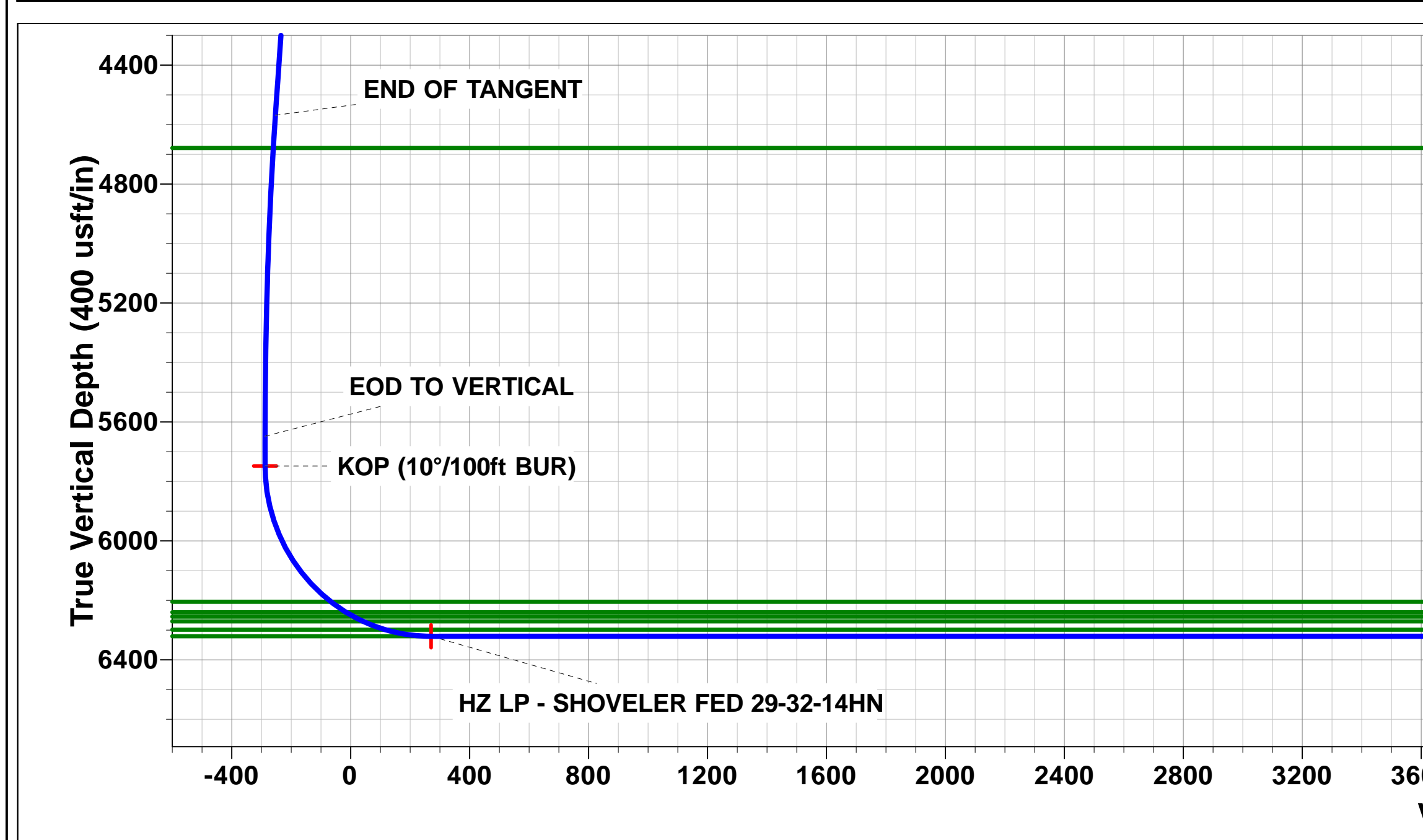
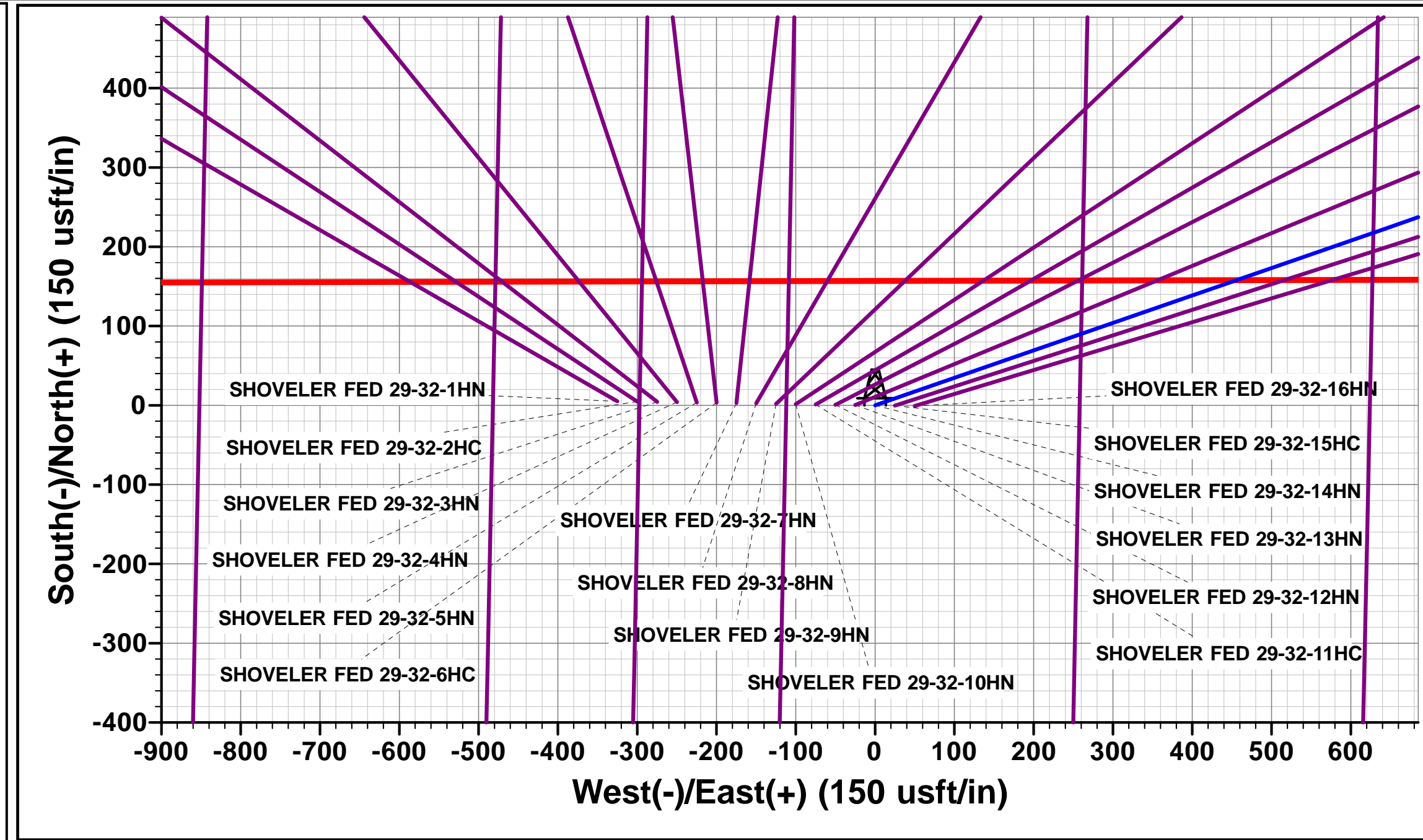
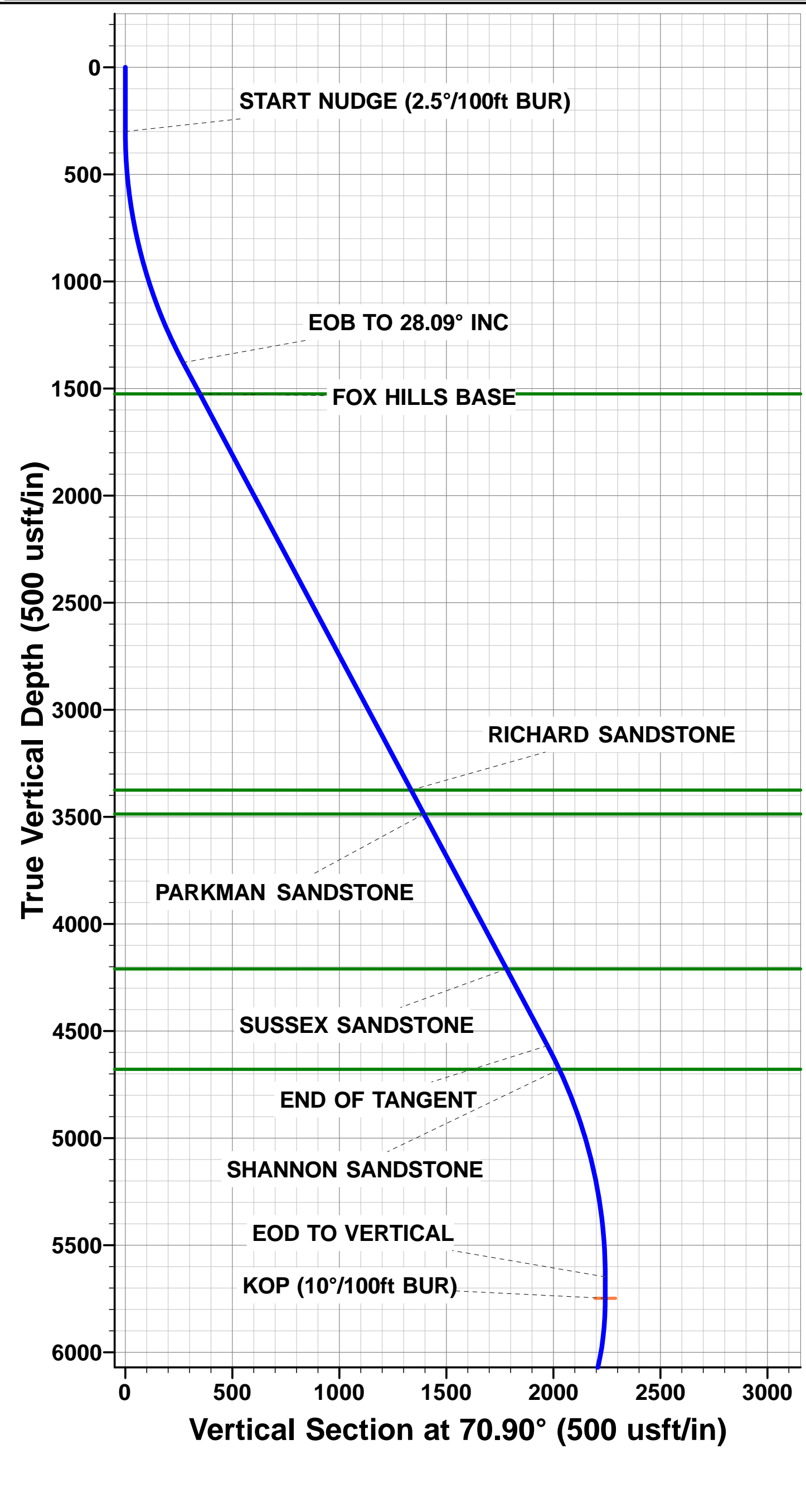


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: NW NW SEC. 29 T8N R60W 6th P.M.  
Well: SHOVELER FED 29-32-14HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #1

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation		
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 757ft FNL & 2197ft FWL of Sec 29		
300.0	300.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2.5"/100ft BUR)		
1379.1	1423.6	28.09	70.90	88.3	255.1	-34.6	269.9	EOB TO 28.09° INC		
4568.9	5039.2	28.09	70.90	645.3	1863.8	-253.2	1972.4	END OF TANGENT		
5648.0	6162.8	0.00	0.00	733.6	2118.9	-287.8	2242.3	EOD TO VERTICAL		
5748.0	6262.8	0.00	0.00	733.6	2118.9	-287.8	2242.3	KOP (10"/100ft BUR)		
6321.0	7162.8	90.00	181.19	160.8	2107.0	270.7	2815.3	HZ LP: 600ft FNL & 975ft FEL of Sec 29		
6321.0	16542.2	90.00	181.19	-9216.6	1912.4	9412.9	12194.7	BHL: 600ft FSL & 975ft FEL of Sec 32		

PROPOSED LOCAL COORDINATES:  
  
SHL: 757ft FNL & 2197ft FWL Sec 29  
  
HZ LP: 600ft FNL & 975ft FEL Sec 29  
  
BHL: 600ft FSL & 975ft FEL of Sec 32

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - SHOVELER FED 29-32-14HN	5748.0	733.6	2118.9	40.640451	-104.109827
HZ LP - SHOVELER FED 29-32-14HN	6321.0	160.8	2107.0	40.638879	-104.109870
BHL - SHOVELER FED 29-32-14HN	6321.0	-9216.6	1912.4	40.613140	-104.110574



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	NW NW SEC. 29 T8N R60W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,478,416.23 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,383,356.26 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	1.10000 ft
		<b>Latitude:</b>	40.638452
		<b>Longitude:</b>	-104.118633
		<b>Grid Convergence:</b>	0.89 °

<b>Well</b>	SHOVELER FED 29-32-14HN		
<b>Well Position</b>	<b>+N/-S</b>	-5.1 usft	<b>Northing:</b>
	<b>+E/-W</b>	325.0 usft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	29/08/2017	7.86	67.14	52,558

<b>Design</b>	PROPOSAL #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	6,321.0	0.0	0.0	168.28

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	-4,964.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	-4,664.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,423.6	28.09	70.90	1,379.1	-3,584.9	88.3	255.1	2.50	2.50	0.00	70.90	
5,039.2	28.09	70.90	4,568.9	-395.1	645.3	1,863.8	0.00	0.00	0.00	0.00	
6,162.8	0.00	0.00	5,648.0	684.0	733.6	2,118.9	2.50	-2.50	0.00	180.00	
6,262.8	0.00	0.00	5,748.0	784.0	733.6	2,118.9	0.00	0.00	0.00	0.00	KOP - SHOVELER
7,162.8	90.00	181.19	6,321.0	1,357.0	160.8	2,107.0	10.00	10.00	-19.87	181.19	HZ LP - SHOVELER
16,542.2	90.00	181.19	6,321.0	1,357.0	-9,216.6	1,912.4	0.00	0.00	0.00	37.62	BHL - SHOVELER

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>SHL: 757ft FNL &amp; 2197ft FWL of Sec 29</b>										
0.0	0.00	0.00	0.0	4,964.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,864.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,764.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>START NUDGE (2.5°/100ft BUR)</b>										
300.0	0.00	0.00	300.0	4,664.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	2.50	70.90	400.0	4,564.03	0.7	2.1	-0.3	2.50	2.50	0.00
500.0	5.00	70.90	499.7	4,464.25	2.9	8.2	-1.1	2.50	2.50	0.00
600.0	7.50	70.90	599.1	4,364.86	6.4	18.5	-2.5	2.50	2.50	0.00
700.0	10.00	70.90	698.0	4,266.03	11.4	32.9	-4.5	2.50	2.50	0.00
800.0	12.50	70.90	796.0	4,167.96	17.8	51.3	-7.0	2.50	2.50	0.00
900.0	15.00	70.90	893.2	4,070.83	25.5	73.8	-10.0	2.50	2.50	0.00
1,000.0	17.50	70.90	989.2	3,974.83	34.7	100.2	-13.6	2.50	2.50	0.00
1,100.0	20.00	70.90	1,083.9	3,880.15	45.2	130.6	-17.7	2.50	2.50	0.00
1,200.0	22.50	70.90	1,177.0	3,786.95	57.1	164.9	-22.4	2.50	2.50	0.00
1,300.0	25.00	70.90	1,268.6	3,695.43	70.3	202.9	-27.6	2.50	2.50	0.00
1,400.0	27.50	70.90	1,358.2	3,605.75	84.7	244.7	-33.2	2.50	2.50	0.00
<b>EOB TO 28.09° INC</b>										
1,423.6	28.09	70.90	1,379.1	3,584.91	88.3	255.1	-34.6	2.50	2.50	0.00
1,500.0	28.09	70.90	1,446.5	3,517.47	100.1	289.1	-39.3	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,588.9	28.09	70.90	1,525.0	3,439.00	113.8	328.7	-44.6	0.00	0.00	0.00
1,600.0	28.09	70.90	1,534.7	3,429.25	115.5	333.6	-45.3	0.00	0.00	0.00
1,700.0	28.09	70.90	1,623.0	3,341.03	130.9	378.1	-51.4	0.00	0.00	0.00
1,800.0	28.09	70.90	1,711.2	3,252.81	146.3	422.6	-57.4	0.00	0.00	0.00
1,900.0	28.09	70.90	1,799.4	3,164.59	161.7	467.1	-63.4	0.00	0.00	0.00
2,000.0	28.09	70.90	1,887.6	3,076.36	177.1	511.6	-69.5	0.00	0.00	0.00
2,100.0	28.09	70.90	1,975.9	2,988.14	192.5	556.1	-75.5	0.00	0.00	0.00
2,200.0	28.09	70.90	2,064.1	2,899.92	207.9	600.5	-81.6	0.00	0.00	0.00
2,300.0	28.09	70.90	2,152.3	2,811.70	223.3	645.0	-87.6	0.00	0.00	0.00
2,400.0	28.09	70.90	2,240.5	2,723.48	238.7	689.5	-93.7	0.00	0.00	0.00
2,500.0	28.09	70.90	2,328.7	2,635.26	254.1	734.0	-99.7	0.00	0.00	0.00
2,600.0	28.09	70.90	2,417.0	2,547.03	269.5	778.5	-105.7	0.00	0.00	0.00
2,700.0	28.09	70.90	2,505.2	2,458.81	284.9	823.0	-111.8	0.00	0.00	0.00
2,800.0	28.09	70.90	2,593.4	2,370.59	300.3	867.5	-117.8	0.00	0.00	0.00
2,900.0	28.09	70.90	2,681.6	2,282.37	315.7	912.0	-123.9	0.00	0.00	0.00
3,000.0	28.09	70.90	2,769.9	2,194.15	331.2	956.5	-129.9	0.00	0.00	0.00
3,100.0	28.09	70.90	2,858.1	2,105.93	346.6	1,001.0	-136.0	0.00	0.00	0.00
3,200.0	28.09	70.90	2,946.3	2,017.70	362.0	1,045.5	-142.0	0.00	0.00	0.00
3,300.0	28.09	70.90	3,034.5	1,929.48	377.4	1,090.0	-148.1	0.00	0.00	0.00
3,400.0	28.09	70.90	3,122.7	1,841.26	392.8	1,134.5	-154.1	0.00	0.00	0.00
3,500.0	28.09	70.90	3,211.0	1,753.04	408.2	1,179.0	-160.1	0.00	0.00	0.00
3,600.0	28.09	70.90	3,299.2	1,664.82	423.6	1,223.5	-166.2	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,685.9	28.09	70.90	3,375.0	1,589.00	436.8	1,261.7	-171.4	0.00	0.00	0.00
3,700.0	28.09	70.90	3,387.4	1,576.60	439.0	1,267.9	-172.2	0.00	0.00	0.00
3,800.0	28.09	70.90	3,475.6	1,488.37	454.4	1,312.4	-178.3	0.00	0.00	0.00
<b>PARKMAN SANDSTONE</b>										
3,812.9	28.09	70.90	3,487.0	1,477.00	456.4	1,318.2	-179.0	0.00	0.00	0.00
3,900.0	28.09	70.90	3,563.8	1,400.15	469.8	1,356.9	-184.3	0.00	0.00	0.00
4,000.0	28.09	70.90	3,652.1	1,311.93	485.2	1,401.4	-190.4	0.00	0.00	0.00
4,100.0	28.09	70.90	3,740.3	1,223.71	500.6	1,445.9	-196.4	0.00	0.00	0.00
4,200.0	28.09	70.90	3,828.5	1,135.49	516.0	1,490.4	-202.4	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.0	28.09	70.90	3,916.7	1,047.27	531.4	1,534.9	-208.5	0.00	0.00	0.00
4,400.0	28.09	70.90	4,005.0	959.04	546.8	1,579.4	-214.5	0.00	0.00	0.00
4,500.0	28.09	70.90	4,093.2	870.82	562.2	1,623.9	-220.6	0.00	0.00	0.00
4,600.0	28.09	70.90	4,181.4	782.60	577.6	1,668.4	-226.6	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,632.4</b>	<b>28.09</b>	<b>70.90</b>	<b>4,210.0</b>	<b>754.00</b>	<b>582.6</b>	<b>1,682.8</b>	<b>-228.6</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,700.0	28.09	70.90	4,269.6	694.38	593.0	1,712.9	-232.7	0.00	0.00	0.00
4,800.0	28.09	70.90	4,357.8	606.16	608.4	1,757.4	-238.7	0.00	0.00	0.00
4,900.0	28.09	70.90	4,446.1	517.94	623.8	1,801.9	-244.7	0.00	0.00	0.00
5,000.0	28.09	70.90	4,534.3	429.71	639.2	1,846.4	-250.8	0.00	0.00	0.00
<b>END OF TANGENT</b>										
<b>5,039.2</b>	<b>28.09</b>	<b>70.90</b>	<b>4,568.9</b>	<b>395.09</b>	<b>645.3</b>	<b>1,863.8</b>	<b>-253.2</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,100.0	26.57	70.90	4,622.9	341.12	654.4	1,890.2	-256.7	2.50	-2.50	0.00
<b>SHANNON SANDSTONE</b>										
<b>5,162.3</b>	<b>25.01</b>	<b>70.90</b>	<b>4,679.0</b>	<b>285.00</b>	<b>663.3</b>	<b>1,915.8</b>	<b>-260.2</b>	<b>2.50</b>	<b>-2.50</b>	<b>0.00</b>
5,200.0	24.07	70.90	4,713.3	250.73	668.4	1,930.6	-262.2	2.50	-2.50	0.00
5,300.0	21.57	70.90	4,805.4	158.57	681.1	1,967.2	-267.2	2.50	-2.50	0.00
5,400.0	19.07	70.90	4,899.2	64.80	692.5	2,000.0	-271.7	2.50	-2.50	0.00
5,500.0	16.57	70.90	4,994.4	-30.40	702.5	2,029.0	-275.6	2.50	-2.50	0.00
5,600.0	14.07	70.90	5,090.8	-126.83	711.1	2,053.9	-279.0	2.50	-2.50	0.00
5,700.0	11.57	70.90	5,188.3	-224.33	718.4	2,074.9	-281.8	2.50	-2.50	0.00
5,800.0	9.07	70.90	5,286.7	-322.71	724.2	2,091.8	-284.1	2.50	-2.50	0.00
5,900.0	6.57	70.90	5,385.8	-421.77	728.7	2,104.7	-285.9	2.50	-2.50	0.00
6,000.0	4.07	70.90	5,485.3	-521.33	731.7	2,113.4	-287.1	2.50	-2.50	0.00
6,100.0	1.57	70.90	5,585.2	-621.20	733.3	2,118.1	-287.7	2.50	-2.50	0.00
<b>EOD TO VERTICAL</b>										
<b>6,162.8</b>	<b>0.00</b>	<b>0.00</b>	<b>5,648.0</b>	<b>-684.00</b>	<b>733.6</b>	<b>2,118.9</b>	<b>-287.8</b>	<b>2.50</b>	<b>-2.50</b>	<b>0.00</b>
6,200.0	0.00	0.00	5,685.2	-721.20	733.6	2,118.9	-287.8	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
<b>6,262.8</b>	<b>0.00</b>	<b>0.00</b>	<b>5,748.0</b>	<b>-784.00</b>	<b>733.6</b>	<b>2,118.9</b>	<b>-287.8</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,300.0	3.72	181.19	5,785.2	-821.17	732.4	2,118.9	-286.6	10.00	10.00	0.00
6,400.0	13.72	181.19	5,883.9	-919.89	717.3	2,118.6	-271.9	10.00	10.00	0.00
6,500.0	23.72	181.19	5,978.5	-1,014.48	685.2	2,117.9	-240.6	10.00	10.00	0.00
6,600.0	33.72	181.19	6,066.1	-1,102.07	637.2	2,116.9	-193.9	10.00	10.00	0.00
6,700.0	43.72	181.19	6,144.0	-1,179.99	574.8	2,115.6	-133.0	10.00	10.00	0.00
<b>SHARON SPRINGS</b>										
<b>6,791.8</b>	<b>52.90</b>	<b>181.19</b>	<b>6,205.0</b>	<b>-1,241.00</b>	<b>506.3</b>	<b>2,114.2</b>	<b>-66.2</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,800.0	53.72	181.19	6,209.9	-1,245.89	499.7	2,114.1	-59.8	10.00	10.00	0.00
<b>NIORARA A CHALK</b>										
<b>6,854.5</b>	<b>59.16</b>	<b>181.19</b>	<b>6,240.0</b>	<b>-1,276.00</b>	<b>454.4</b>	<b>2,113.1</b>	<b>-15.6</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>NIORARA A CHALK BASE</b>										
<b>6,885.1</b>	<b>62.23</b>	<b>181.19</b>	<b>6,255.0</b>	<b>-1,291.00</b>	<b>427.6</b>	<b>2,112.6</b>	<b>10.5</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,900.0	63.71	181.19	6,261.8	-1,297.75	414.4	2,112.3	23.4	10.00	10.00	0.00
<b>NIORARA B1 CHALK TOP</b>										
<b>6,921.7</b>	<b>65.89</b>	<b>181.19</b>	<b>6,271.0</b>	<b>-1,307.00</b>	<b>394.8</b>	<b>2,111.9</b>	<b>42.5</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
7,000.0	73.71	181.19	6,298.0	-1,334.01	321.4	2,110.4	114.1	10.00	10.00	0.00
<b>NIORARA B1 CHALK BASE</b>										
<b>7,003.6</b>	<b>74.07</b>	<b>181.19</b>	<b>6,299.0</b>	<b>-1,335.00</b>	<b>317.9</b>	<b>2,110.3</b>	<b>117.4</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
7,100.0	83.71	181.19	6,317.6	-1,353.55	223.5	2,108.3	209.5	10.00	10.00	0.00
<b>HZ LP: 600ft FNL &amp; 975ft FEL of Sec 29 - NIOBRARA B2 CHALK TOP</b>										
<b>7,162.8</b>	<b>90.00</b>	<b>181.19</b>	<b>6,321.0</b>	<b>-1,357.00</b>	<b>160.8</b>	<b>2,107.0</b>	<b>270.7</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
7,200.0	90.00	181.19	6,321.0	-1,357.00	123.6	2,106.3	306.9	0.00	0.00	0.00
7,300.0	90.00	181.19	6,321.0	-1,357.01	23.6	2,104.2	404.4	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400.0	90.00	181.19	6,321.0	-1,357.02	-76.4	2,102.1	501.8	0.00	0.00	0.00
7,500.0	90.00	181.19	6,321.0	-1,357.02	-176.3	2,100.1	599.3	0.00	0.00	0.00
7,600.0	90.00	181.19	6,321.0	-1,357.03	-276.3	2,098.0	696.8	0.00	0.00	0.00
7,700.0	90.00	181.19	6,321.0	-1,357.04	-376.3	2,095.9	794.3	0.00	0.00	0.00
7,800.0	90.00	181.19	6,321.0	-1,357.05	-476.3	2,093.9	891.7	0.00	0.00	0.00
7,900.0	90.00	181.19	6,321.1	-1,357.05	-576.2	2,091.8	989.2	0.00	0.00	0.00
8,000.0	90.00	181.19	6,321.1	-1,357.06	-676.2	2,089.7	1,086.7	0.00	0.00	0.00
8,100.0	90.00	181.19	6,321.1	-1,357.06	-776.2	2,087.6	1,184.2	0.00	0.00	0.00
8,200.0	90.00	181.19	6,321.1	-1,357.07	-876.2	2,085.6	1,281.6	0.00	0.00	0.00
8,300.0	90.00	181.19	6,321.1	-1,357.08	-976.2	2,083.5	1,379.1	0.00	0.00	0.00
8,400.0	90.00	181.19	6,321.1	-1,357.08	-1,076.1	2,081.4	1,476.6	0.00	0.00	0.00
8,500.0	90.00	181.19	6,321.1	-1,357.09	-1,176.1	2,079.4	1,574.0	0.00	0.00	0.00
8,600.0	90.00	181.19	6,321.1	-1,357.09	-1,276.1	2,077.3	1,671.5	0.00	0.00	0.00
8,700.0	90.00	181.19	6,321.1	-1,357.10	-1,376.1	2,075.2	1,769.0	0.00	0.00	0.00
8,800.0	90.00	181.19	6,321.1	-1,357.10	-1,476.1	2,073.1	1,866.5	0.00	0.00	0.00
8,900.0	90.00	181.19	6,321.1	-1,357.11	-1,576.0	2,071.1	1,963.9	0.00	0.00	0.00
9,000.0	90.00	181.19	6,321.1	-1,357.11	-1,676.0	2,069.0	2,061.4	0.00	0.00	0.00
9,100.0	90.00	181.19	6,321.1	-1,357.12	-1,776.0	2,066.9	2,158.9	0.00	0.00	0.00
9,200.0	90.00	181.19	6,321.1	-1,357.12	-1,876.0	2,064.9	2,256.4	0.00	0.00	0.00
9,300.0	90.00	181.19	6,321.1	-1,357.13	-1,975.9	2,062.8	2,353.8	0.00	0.00	0.00
9,400.0	90.00	181.19	6,321.1	-1,357.13	-2,075.9	2,060.7	2,451.3	0.00	0.00	0.00
9,500.0	90.00	181.19	6,321.1	-1,357.13	-2,175.9	2,058.6	2,548.8	0.00	0.00	0.00
9,600.0	90.00	181.19	6,321.1	-1,357.14	-2,275.9	2,056.6	2,646.2	0.00	0.00	0.00
9,700.0	90.00	181.19	6,321.1	-1,357.14	-2,375.9	2,054.5	2,743.7	0.00	0.00	0.00
9,800.0	90.00	181.19	6,321.1	-1,357.14	-2,475.8	2,052.4	2,841.2	0.00	0.00	0.00
9,900.0	90.00	181.19	6,321.1	-1,357.15	-2,575.8	2,050.3	2,938.7	0.00	0.00	0.00
10,000.0	90.00	181.19	6,321.2	-1,357.15	-2,675.8	2,048.3	3,036.1	0.00	0.00	0.00
10,100.0	90.00	181.19	6,321.2	-1,357.15	-2,775.8	2,046.2	3,133.6	0.00	0.00	0.00
10,200.0	90.00	181.19	6,321.2	-1,357.16	-2,875.8	2,044.1	3,231.1	0.00	0.00	0.00
10,300.0	90.00	181.19	6,321.2	-1,357.16	-2,975.7	2,042.1	3,328.5	0.00	0.00	0.00
10,400.0	90.00	181.19	6,321.2	-1,357.16	-3,075.7	2,040.0	3,426.0	0.00	0.00	0.00
10,500.0	90.00	181.19	6,321.2	-1,357.16	-3,175.7	2,037.9	3,523.5	0.00	0.00	0.00
10,600.0	90.00	181.19	6,321.2	-1,357.17	-3,275.7	2,035.8	3,621.0	0.00	0.00	0.00
10,700.0	90.00	181.19	6,321.2	-1,357.17	-3,375.6	2,033.8	3,718.4	0.00	0.00	0.00
10,800.0	90.00	181.19	6,321.2	-1,357.17	-3,475.6	2,031.7	3,815.9	0.00	0.00	0.00
10,900.0	90.00	181.19	6,321.2	-1,357.17	-3,575.6	2,029.6	3,913.4	0.00	0.00	0.00
11,000.0	90.00	181.19	6,321.2	-1,357.17	-3,675.6	2,027.5	4,010.9	0.00	0.00	0.00
11,100.0	90.00	181.19	6,321.2	-1,357.17	-3,775.6	2,025.5	4,108.3	0.00	0.00	0.00
11,200.0	90.00	181.19	6,321.2	-1,357.17	-3,875.5	2,023.4	4,205.8	0.00	0.00	0.00
11,300.0	90.00	181.19	6,321.2	-1,357.18	-3,975.5	2,021.3	4,303.3	0.00	0.00	0.00
11,400.0	90.00	181.19	6,321.2	-1,357.18	-4,075.5	2,019.2	4,400.7	0.00	0.00	0.00
11,500.0	90.00	181.19	6,321.2	-1,357.18	-4,175.5	2,017.2	4,498.2	0.00	0.00	0.00
11,600.0	90.00	181.19	6,321.2	-1,357.18	-4,275.5	2,015.1	4,595.7	0.00	0.00	0.00
11,700.0	90.00	181.19	6,321.2	-1,357.18	-4,375.4	2,013.0	4,693.2	0.00	0.00	0.00
11,800.0	90.00	181.19	6,321.2	-1,357.18	-4,475.4	2,010.9	4,790.6	0.00	0.00	0.00
11,900.0	90.00	181.19	6,321.2	-1,357.18	-4,575.4	2,008.9	4,888.1	0.00	0.00	0.00
12,000.0	90.00	181.19	6,321.2	-1,357.18	-4,675.4	2,006.8	4,985.6	0.00	0.00	0.00
12,100.0	90.00	181.19	6,321.2	-1,357.18	-4,775.3	2,004.7	5,083.0	0.00	0.00	0.00
12,200.0	90.00	181.19	6,321.2	-1,357.18	-4,875.3	2,002.6	5,180.5	0.00	0.00	0.00
12,300.0	90.00	181.19	6,321.2	-1,357.18	-4,975.3	2,000.6	5,278.0	0.00	0.00	0.00
12,400.0	90.00	181.19	6,321.2	-1,357.18	-5,075.3	1,998.5	5,375.5	0.00	0.00	0.00
12,500.0	90.00	181.19	6,321.2	-1,357.17	-5,175.3	1,996.4	5,472.9	0.00	0.00	0.00
12,600.0	90.00	181.19	6,321.2	-1,357.17	-5,275.2	1,994.3	5,570.4	0.00	0.00	0.00
12,700.0	90.00	181.19	6,321.2	-1,357.17	-5,375.2	1,992.3	5,667.9	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,800.0	90.00	181.19	6,321.2	-1,357.17	-5,475.2	1,990.2	5,765.3	0.00	0.00	0.00
12,900.0	90.00	181.19	6,321.2	-1,357.17	-5,575.2	1,988.1	5,862.8	0.00	0.00	0.00
13,000.0	90.00	181.19	6,321.2	-1,357.17	-5,675.2	1,986.0	5,960.3	0.00	0.00	0.00
13,100.0	90.00	181.19	6,321.2	-1,357.17	-5,775.1	1,984.0	6,057.8	0.00	0.00	0.00
13,200.0	90.00	181.19	6,321.2	-1,357.16	-5,875.1	1,981.9	6,155.2	0.00	0.00	0.00
13,300.0	90.00	181.19	6,321.2	-1,357.16	-5,975.1	1,979.8	6,252.7	0.00	0.00	0.00
13,400.0	90.00	181.19	6,321.2	-1,357.16	-6,075.1	1,977.7	6,350.2	0.00	0.00	0.00
13,500.0	90.00	181.19	6,321.2	-1,357.16	-6,175.0	1,975.6	6,447.6	0.00	0.00	0.00
13,600.0	90.00	181.19	6,321.2	-1,357.15	-6,275.0	1,973.6	6,545.1	0.00	0.00	0.00
13,700.0	90.00	181.19	6,321.2	-1,357.15	-6,375.0	1,971.5	6,642.6	0.00	0.00	0.00
13,800.0	90.00	181.19	6,321.1	-1,357.15	-6,475.0	1,969.4	6,740.1	0.00	0.00	0.00
13,900.0	90.00	181.19	6,321.1	-1,357.14	-6,575.0	1,967.3	6,837.5	0.00	0.00	0.00
14,000.0	90.00	181.19	6,321.1	-1,357.14	-6,674.9	1,965.3	6,935.0	0.00	0.00	0.00
14,100.0	90.00	181.19	6,321.1	-1,357.14	-6,774.9	1,963.2	7,032.5	0.00	0.00	0.00
14,200.0	90.00	181.19	6,321.1	-1,357.13	-6,874.9	1,961.1	7,129.9	0.00	0.00	0.00
14,300.0	90.00	181.19	6,321.1	-1,357.13	-6,974.9	1,959.0	7,227.4	0.00	0.00	0.00
14,400.0	90.00	181.19	6,321.1	-1,357.13	-7,074.8	1,956.9	7,324.9	0.00	0.00	0.00
14,500.0	90.00	181.19	6,321.1	-1,357.12	-7,174.8	1,954.9	7,422.4	0.00	0.00	0.00
14,600.0	90.00	181.19	6,321.1	-1,357.12	-7,274.8	1,952.8	7,519.8	0.00	0.00	0.00
14,700.0	90.00	181.19	6,321.1	-1,357.11	-7,374.8	1,950.7	7,617.3	0.00	0.00	0.00
14,800.0	90.00	181.19	6,321.1	-1,357.11	-7,474.8	1,948.6	7,714.8	0.00	0.00	0.00
14,900.0	90.00	181.19	6,321.1	-1,357.10	-7,574.7	1,946.5	7,812.2	0.00	0.00	0.00
15,000.0	90.00	181.19	6,321.1	-1,357.10	-7,674.7	1,944.5	7,909.7	0.00	0.00	0.00
15,100.0	90.00	181.19	6,321.1	-1,357.09	-7,774.7	1,942.4	8,007.2	0.00	0.00	0.00
15,200.0	90.00	181.19	6,321.1	-1,357.09	-7,874.7	1,940.3	8,104.6	0.00	0.00	0.00
15,300.0	90.00	181.19	6,321.1	-1,357.08	-7,974.7	1,938.2	8,202.1	0.00	0.00	0.00
15,400.0	90.00	181.19	6,321.1	-1,357.08	-8,074.6	1,936.2	8,299.6	0.00	0.00	0.00
15,500.0	90.00	181.19	6,321.1	-1,357.07	-8,174.6	1,934.1	8,397.1	0.00	0.00	0.00
15,600.0	90.00	181.19	6,321.1	-1,357.06	-8,274.6	1,932.0	8,494.5	0.00	0.00	0.00
15,700.0	90.00	181.19	6,321.1	-1,357.06	-8,374.6	1,929.9	8,592.0	0.00	0.00	0.00
15,800.0	90.00	181.19	6,321.1	-1,357.05	-8,474.5	1,927.8	8,689.5	0.00	0.00	0.00
15,900.0	90.00	181.19	6,321.0	-1,357.05	-8,574.5	1,925.8	8,786.9	0.00	0.00	0.00
16,000.0	90.00	181.19	6,321.0	-1,357.04	-8,674.5	1,923.7	8,884.4	0.00	0.00	0.00
16,100.0	90.00	181.19	6,321.0	-1,357.03	-8,774.5	1,921.6	8,981.9	0.00	0.00	0.00
16,200.0	90.00	181.19	6,321.0	-1,357.03	-8,874.5	1,919.5	9,079.4	0.00	0.00	0.00
16,300.0	90.00	181.19	6,321.0	-1,357.02	-8,974.4	1,917.4	9,176.8	0.00	0.00	0.00
16,400.0	90.00	181.19	6,321.0	-1,357.01	-9,074.4	1,915.3	9,274.3	0.00	0.00	0.00
16,500.0	90.00	181.19	6,321.0	-1,357.00	-9,174.4	1,913.3	9,371.8	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 975ft FEL of Sec 32</b>										
<b>16,542.2</b>	<b>90.00</b>	<b>181.19</b>	<b>6,321.0</b>	<b>-1,357.00</b>	<b>-9,216.6</b>	<b>1,912.4</b>	<b>9,412.9</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-14HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-14HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,588.9	1,525.0	FOX HILLS BASE			
3,685.9	3,375.0	RICHARD SANDSTONE			
3,812.9	3,487.0	PARKMAN SANDSTONE			
4,632.4	4,210.0	SUSSEX SANDSTONE			
5,162.3	4,679.0	SHANNON SANDSTONE			
6,791.8	6,205.0	SHARON SPRINGS			
6,854.5	6,240.0	NIOBRARA A CHALK			
6,885.1	6,255.0	NIOBRARA A CHALK BASE			
6,921.7	6,271.0	NIOBRARA B1 CHALK TOP			
7,003.6	6,299.0	NIOBRARA B1 CHALK BASE			
7,162.8	6,321.0	NIOBRARA B2 CHALK TOP			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 757ft FNL & 2197ft FWL of Sec 29
300.0	300.0	0.0	0.0	START NUDGE (2.5°/100ft BUR)
1,423.6	1,379.1	88.3	255.1	EOB TO 28.09° INC
5,039.2	4,568.9	645.3	1,863.8	END OF TANGENT
6,162.8	5,648.0	733.6	2,118.9	EOD TO VERTICAL
6,262.8	5,748.0	733.6	2,118.9	KOP (10°/100ft BUR)
7,162.8	6,321.0	160.8	2,107.0	HZ LP: 600ft FNL & 975ft FEL of Sec 29
16,542.2	6,321.0	-9,216.6	1,912.4	BHL: 600ft FSL & 975ft FEL of Sec 32