

XTO Energy - Western Div. (NM, CO, UT)

LaPlata County (NAD83)

Penrose 02-08H

Penrose 02-08H

Penrose 02-08H -- Slant Well

Plan: Slant well -- Design #4

Standard Planning Report

30 January, 2015

XTO Energy, Inc.

Planning Report

Database:	LMRKPROD	Local Co-ordinate Reference:	Site Penrose 02-08H
Company:	XTO Energy - Western Div. (NM, CO, UT)	TVD Reference:	WELL @ 6401.00ft (Original Well Elev)
Project:	LaPlata County (NAD83)	MD Reference:	WELL @ 6401.00ft (Original Well Elev)
Site:	Penrose 02-08H	North Reference:	True
Well:	Penrose 02-08H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Penrose 02-08H -- Slant Well		
Design:	Slant well -- Design #4		

Project	LaPlata County (NAD83), LaPlata County, Colorado, Directional Fruitland Coal Wells		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Southern Zone		

Site		Penrose 02-08H				
Site Position:		Northing:	1,137,608.03 usft	Latitude:	37° 1' 36.840000 N	
From:	Lat/Long	Easting:	2,407,450.36 usft	Longitude:	107° 31' 47.424000 W	
Position Uncertainty:		0.00 ft	Slot Radius:	0 "	Grid Convergence:	-1.25 °

Well	Penrose 02-08H					
Well Position	+N/-S	0.00 ft	Northing:	1,137,608.03 usft	Latitude:	37° 1' 36.839948 N
	+E/-W	0.00 ft	Easting:	2,407,450.36 usft	Longitude:	107° 31' 47.424000 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	6,389.00 ft	Ground Level:	6,389.00 ft

Wellbore	Penrose 02-08H -- Slant Well				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.99	63.80	51,105

Design	Slant well -- Design #4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	334.23

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,035.02	0.00	0.00	2,035.02	0.00	0.00	0.00	0.00	0.00	0.00	
2,480.40	35.63	334.23	2,452.25	120.75	-58.29	8.00	8.00	0.00	334.23	
2,930.40	35.63	334.23	2,818.00	356.84	-172.24	0.00	0.00	0.00	0.00	Slant BHL
2,980.40	35.63	334.23	2,858.64	383.07	-184.91	0.00	0.00	0.00	0.00	

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Wellbore:	Penrose 02-08H -- Slant Well		
Design:	Slant well -- Design #4		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,543.00	0.00	0.00	1,543.00	0.00	0.00	0.00	0.00	0.00	0.00
Ojo Alamo									
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,637.00	0.00	0.00	1,637.00	0.00	0.00	0.00	0.00	0.00	0.00
Kirtland Shale									
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,035.02	0.00	0.00	2,035.02	0.00	0.00	0.00	0.00	0.00	0.00
2,050.00	1.20	334.23	2,050.00	0.14	-0.07	0.16	8.00	8.00	0.00
2,100.00	5.20	334.23	2,099.91	2.65	-1.28	2.95	8.00	8.00	0.00
2,150.00	9.20	334.23	2,149.51	8.29	-4.00	9.21	8.00	8.00	0.00
2,200.00	13.20	334.23	2,198.54	17.04	-8.22	18.92	8.00	8.00	0.00
2,250.00	17.20	334.23	2,246.79	28.84	-13.92	32.02	8.00	8.00	0.00
2,300.00	21.20	334.23	2,294.00	43.64	-21.07	48.46	8.00	8.00	0.00
2,350.00	25.20	334.23	2,339.94	61.38	-29.63	68.15	8.00	8.00	0.00
2,400.00	29.20	334.23	2,384.41	81.96	-39.56	91.00	8.00	8.00	0.00
2,406.42	29.71	334.23	2,390.00	84.80	-40.93	94.16	8.00	8.00	0.00
Fruitland Formation									
2,450.00	33.20	334.23	2,427.17	105.28	-50.82	116.90	8.00	8.00	0.00
2,480.40	35.63	334.23	2,452.25	120.75	-58.29	134.08	8.00	8.00	0.00
2,500.00	35.63	334.23	2,468.17	131.03	-63.25	145.50	0.00	0.00	0.00
2,600.00	35.63	334.23	2,549.45	183.49	-88.57	203.75	0.00	0.00	0.00
2,700.00	35.63	334.23	2,630.73	235.96	-113.90	262.01	0.00	0.00	0.00
2,715.09	35.63	334.23	2,643.00	243.88	-117.72	270.80	0.00	0.00	0.00
Upper Fruitland Coal									
2,791.37	35.63	334.23	2,705.00	283.90	-137.04	315.24	0.00	0.00	0.00
Middle Fruitland Coal									
2,800.00	35.63	334.23	2,712.01	288.42	-139.22	320.26	0.00	0.00	0.00
2,819.67	35.63	334.23	2,728.00	298.74	-144.20	331.73	0.00	0.00	0.00
Lower Fruitland Coal									
2,900.00	35.63	334.23	2,793.29	340.89	-164.54	378.52	0.00	0.00	0.00
2,930.40	35.63	334.23	2,818.00	356.84	-172.24	396.23	0.00	0.00	0.00
Upper Pictured Cliffs SS									

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Project:	LaPlata County (NAD83)	MD Reference:	WELL @ 6401.00ft (Original Well Elev)
Site:	Penrose 02-08H	North Reference:	True
Well:	Penrose 02-08H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Penrose 02-08H -- Slant Well		
Design:	Slant well -- Design #4		

Planned 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)
2,980.00	35.63	334.23	2,858.31	382.86	-184.80	425.13	0.00	0.00	0.00
7"									
2,980.40	35.63	334.23	2,858.64	383.07	-184.91	425.36	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Slant BHL	0.00	0.00	2,818.00	356.84	-172.24	1,137,968.53	2,407,285.91	37° 1' 40.367948 N	107° 31' 49.548000 W
- plan hits target center									
- Point									

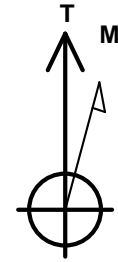
Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
225.00	225.00	9 5/8"	9-5/8	12-1/4	
2,980.00	2,858.31	7"	7	8-3/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,543.00	1,543.00	Ojo Alamo		0.00		
1,637.00	1,637.00	Kirtland Shale		0.00		
2,406.42	2,390.00	Fruitland Formation		0.00		
2,715.09	2,643.00	Upper Fruitland Coal		0.00		
2,791.37	2,705.00	Middle Fruitland Coal		0.00		
2,819.67	2,728.00	Lower Fruitland Coal		0.00		
2,930.40	2,818.00	Upper Pictured Cliffs SS		0.00		

Well Name: Penrose 02-08H

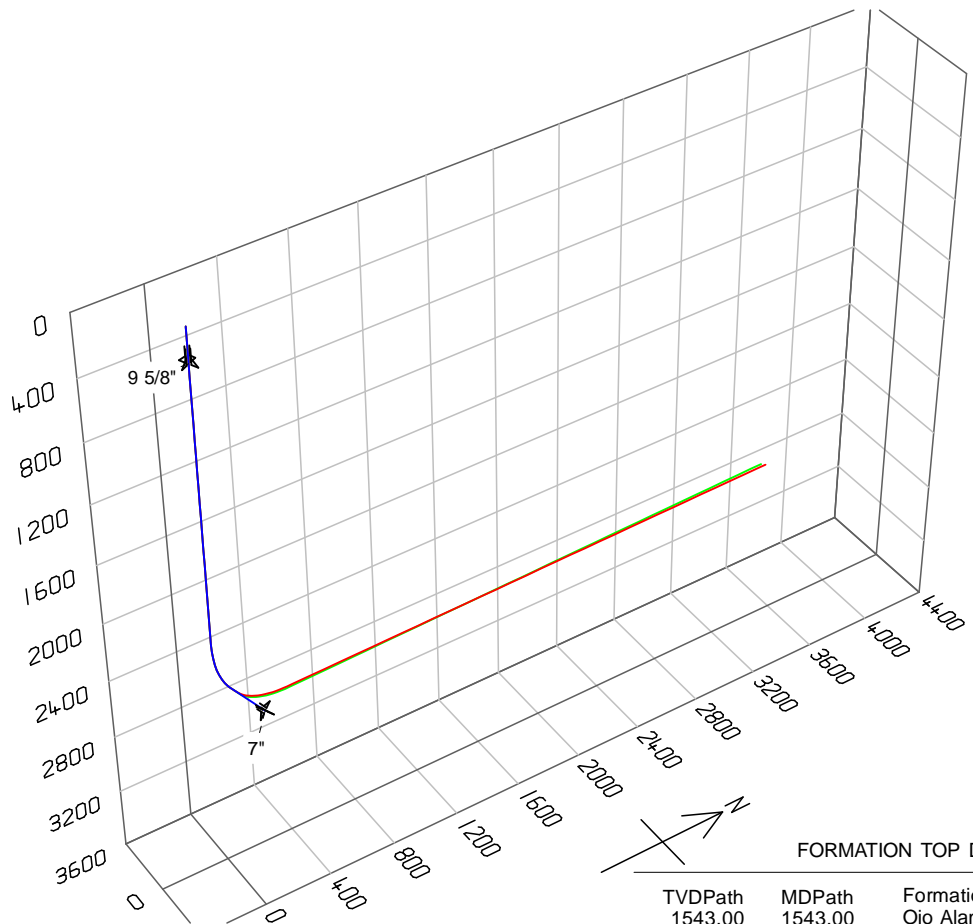
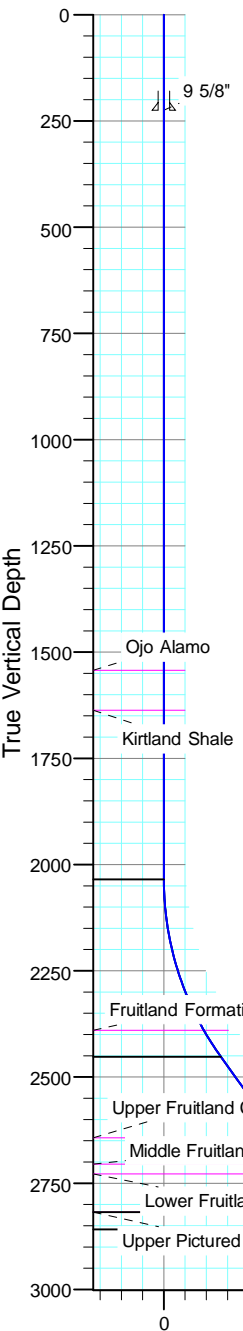
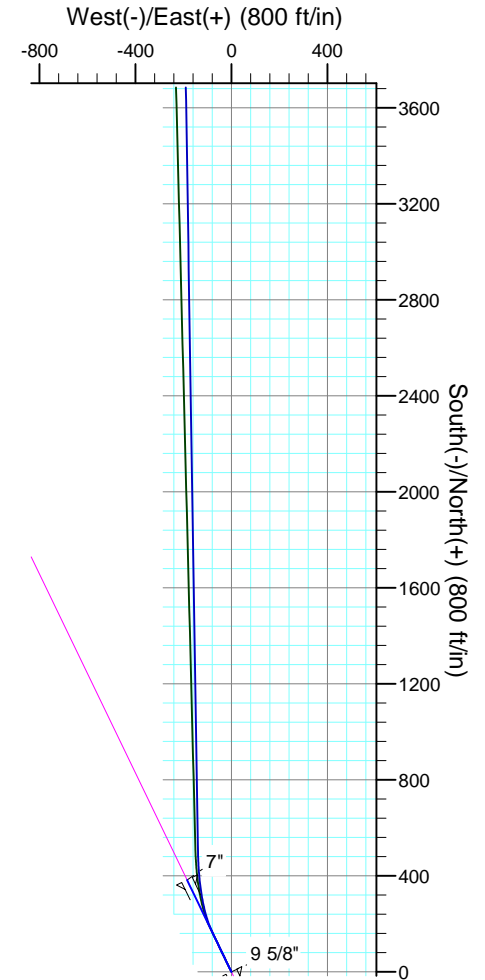
Western Division
Drilling Department

Calculation Method: Minimum Curvature
Geodetic Datum: North American Datum 1983
Lat: 37° 1' 36.840000 N
Long: 107° 31' 47.424000 W



Azimuths to True North
Magnetic North: 9.99°

Magnetic Field
Strength: 51105.0snT
Dip Angle: 63.80°
Date: 12/31/2009
Model: IGRF200510



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1543.00	1543.00	Ojo Alamo
1637.00	1637.00	Kirtland Shale
2390.00	2406.42	Fruitland Formation
2643.00	2715.09	Upper Fruitland Coal
2705.00	2791.37	Middle Fruitland Coal
2728.00	2819.67	Lower Fruitland Coal
2818.00	2930.40	Upper Pictured Cliffs SS

4 1/2" TD at 6155.29
4 1/2" TD at 6170.54

Vertical Section at 334.23°