



# **Whiting Petroleum Corporation**

**Weld County**

**Redtail**

**Pawnee 16-13H**

**Wellbore #1**

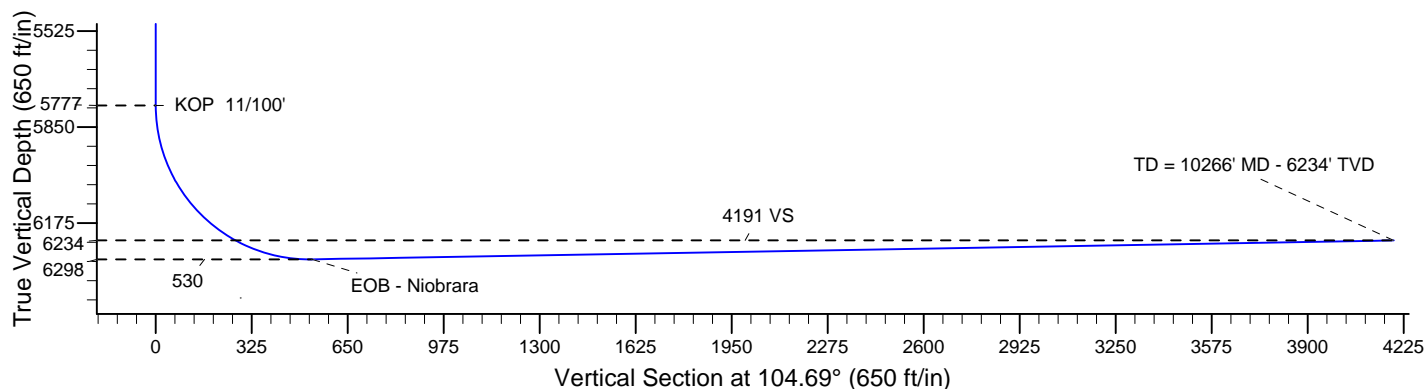
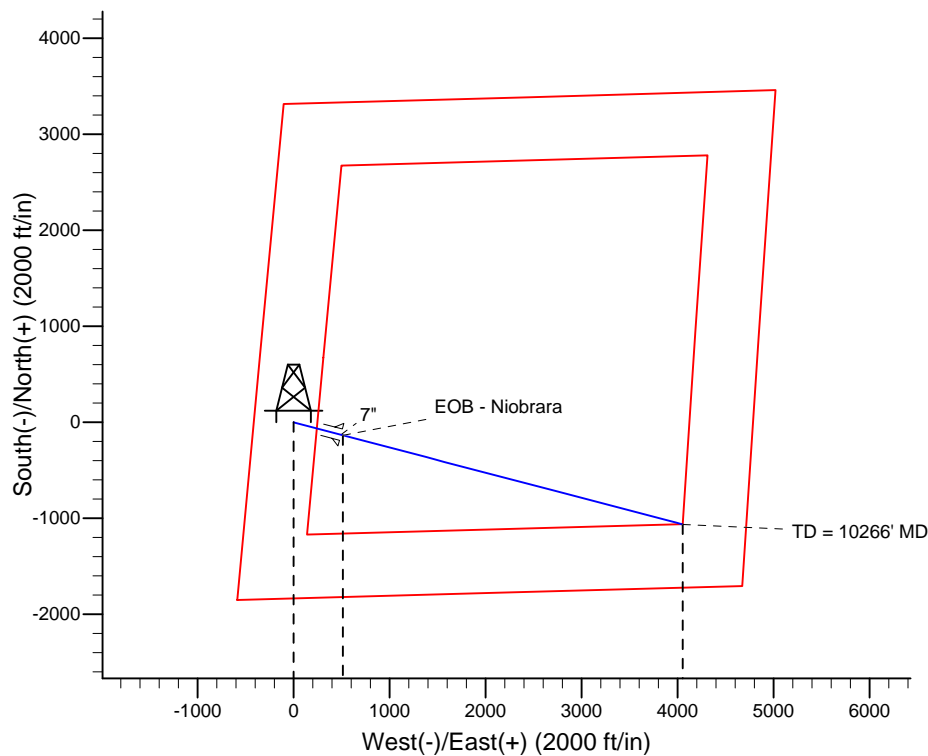
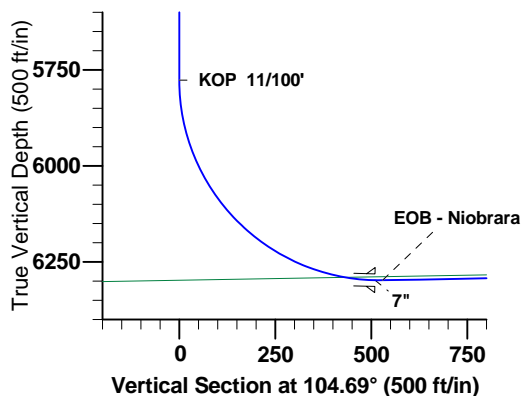
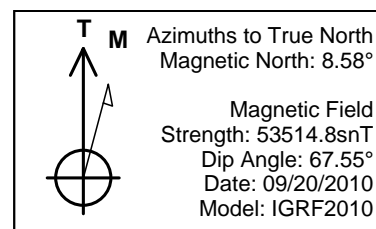
**Plan: Preliminary Plan for APD**

## **Standard Planning Report**

**21 September, 2010**

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
5776.9	0.00	0.00	5776.9	0.0	0.0	0.00	0.00	0.0
6604.2	91.00	104.69	6297.7	-134.4	512.6	11.00	104.69	530.0
10265.5	91.00	104.69	6233.8	-1062.6	4053.7	0.00	0.00	4190.7



<b>Database:</b>	EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Pawnee 16-13H
<b>Company:</b>	Whiting Petroleum Corporation	<b>TVD Reference:</b>	WELL @ 5128.0ft (Rig KB = 13')
<b>Project:</b>	Weld County	<b>MD Reference:</b>	WELL @ 5128.0ft (Rig KB = 13')
<b>Site:</b>	Redtail	<b>North Reference:</b>	True
<b>Well:</b>	Pawnee 16-13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Preliminary Plan for APD		

Project	Weld County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Redtail				
Site Position:		Northing:	1,550,666.15ft	Latitude:	40° 50' 6.792 N
From:	Lat/Long	Easting:	3,417,230.03ft	Longitude:	103° 59' 31.812 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.97 °

Well	Pawnee 16-13H					
Well Position	+N/-S	0.0 ft	Northing:	1,550,666.15 ft	Latitude:	40° 50' 6.792 N
	+E/-W	0.0 ft	Easting:	3,417,230.03 ft	Longitude:	103° 59' 31.812 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	5,128.0 ft	Ground Level:	5,115.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	09/20/10	8.58	67.55	53,515

Design	Preliminary Plan for APD			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	104.69

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,776.9	0.00	0.00	5,776.9	0.0	0.0	0.00	0.00	0.00	0.00	
6,604.2	91.00	104.69	6,297.7	-134.4	512.6	11.00	11.00	0.00	104.69	
10,265.5	91.00	104.69	6,233.8	-1,062.6	4,053.7	0.00	0.00	0.00	0.00	

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<b>Project:</b>	Weld County	<b>MD Reference:</b>	WELL @ 5128.0ft (Rig KB = 13')
<b>Site:</b>	Redtail	<b>North Reference:</b>	True
<b>Well:</b>	Pawnee 16-13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Preliminary Plan for APD		

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)
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,776.9	0.00	0.00	5,776.9	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP 11/100'</b>									
5,776.9	0.00	0.00	5,776.9	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	2.54	104.69	5,800.0	-0.1	0.5	0.5	11.00	11.00	0.00
5,900.0	13.54	104.69	5,898.9	-3.7	14.0	14.5	11.00	11.00	0.00
6,000.0	24.54	104.69	5,993.2	-11.9	45.5	47.0	11.00	11.00	0.00
6,100.0	35.54	104.69	6,079.7	-24.6	93.8	97.0	11.00	11.00	0.00
6,200.0	46.54	104.69	6,155.0	-41.2	157.2	162.6	11.00	11.00	0.00
6,300.0	57.54	104.69	6,216.4	-61.2	233.4	241.3	11.00	11.00	0.00
6,400.0	68.54	104.69	6,261.7	-83.7	319.5	330.3	11.00	11.00	0.00
6,500.0	79.54	104.69	6,289.2	-108.1	412.3	426.3	11.00	11.00	0.00
6,505.7	80.16	104.69	6,290.2	-109.5	417.8	431.9	11.00	11.00	0.00
<b>Niobrara</b>									
6,600.0	90.54	104.69	6,297.8	-133.3	508.6	525.7	11.00	11.00	0.00
6,604.2	91.00	104.69	6,297.7	-134.4	512.6	529.9	11.00	11.00	0.00
<b>EOB - Niobrara</b>									
6,700.0	91.00	104.69	6,296.1	-158.7	605.3	625.7	0.00	0.00	0.00
6,800.0	91.00	104.69	6,294.3	-184.0	702.0	725.7	0.00	0.00	0.00
6,900.0	91.00	104.69	6,292.6	-209.4	798.7	825.7	0.00	0.00	0.00
7,000.0	91.00	104.69	6,290.8	-234.7	895.4	925.7	0.00	0.00	0.00
7,100.0	91.00	104.69	6,289.1	-260.1	992.1	1,025.7	0.00	0.00	0.00
7,200.0	91.00	104.69	6,287.3	-285.4	1,088.9	1,125.6	0.00	0.00	0.00
7,300.0	91.00	104.69	6,285.6	-310.8	1,185.6	1,225.6	0.00	0.00	0.00
7,400.0	91.00	104.69	6,283.9	-336.1	1,282.3	1,325.6	0.00	0.00	0.00
7,500.0	91.00	104.69	6,282.1	-361.5	1,379.0	1,425.6	0.00	0.00	0.00
7,600.0	91.00	104.69	6,280.4	-386.8	1,475.7	1,525.6	0.00	0.00	0.00
7,700.0	91.00	104.69	6,278.6	-412.2	1,572.4	1,625.6	0.00	0.00	0.00
7,800.0	91.00	104.69	6,276.9	-437.6	1,669.2	1,725.6	0.00	0.00	0.00
7,900.0	91.00	104.69	6,275.1	-462.9	1,765.9	1,825.5	0.00	0.00	0.00
8,000.0	91.00	104.69	6,273.4	-488.3	1,862.6	1,925.5	0.00	0.00	0.00
8,100.0	91.00	104.69	6,271.6	-513.6	1,959.3	2,025.5	0.00	0.00	0.00
8,200.0	91.00	104.69	6,269.9	-539.0	2,056.0	2,125.5	0.00	0.00	0.00
8,300.0	91.00	104.69	6,268.1	-564.3	2,152.7	2,225.5	0.00	0.00	0.00
8,400.0	91.00	104.69	6,266.4	-589.7	2,249.5	2,325.5	0.00	0.00	0.00
8,500.0	91.00	104.69	6,264.7	-615.0	2,346.2	2,425.4	0.00	0.00	0.00
8,600.0	91.00	104.69	6,262.9	-640.4	2,442.9	2,525.4	0.00	0.00	0.00
8,700.0	91.00	104.69	6,261.2	-665.7	2,539.6	2,625.4	0.00	0.00	0.00
8,800.0	91.00	104.69	6,259.4	-691.1	2,636.3	2,725.4	0.00	0.00	0.00
8,900.0	91.00	104.69	6,257.7	-716.4	2,733.0	2,825.4	0.00	0.00	0.00
9,000.0	91.00	104.69	6,255.9	-741.8	2,829.8	2,925.4	0.00	0.00	0.00
9,100.0	91.00	104.69	6,254.2	-767.1	2,926.5	3,025.4	0.00	0.00	0.00
9,200.0	91.00	104.69	6,252.4	-792.5	3,023.2	3,125.3	0.00	0.00	0.00
9,300.0	91.00	104.69	6,250.7	-817.8	3,119.9	3,225.3	0.00	0.00	0.00
9,400.0	91.00	104.69	6,248.9	-843.2	3,216.6	3,325.3	0.00	0.00	0.00
9,500.0	91.00	104.69	6,247.2	-868.6	3,313.3	3,425.3	0.00	0.00	0.00
9,600.0	91.00	104.69	6,245.5	-893.9	3,410.1	3,525.3	0.00	0.00	0.00
9,700.0	91.00	104.69	6,243.7	-919.3	3,506.8	3,625.3	0.00	0.00	0.00
9,800.0	91.00	104.69	6,242.0	-944.6	3,603.5	3,725.3	0.00	0.00	0.00
9,900.0	91.00	104.69	6,240.2	-970.0	3,700.2	3,825.2	0.00	0.00	0.00
10,000.0	91.00	104.69	6,238.5	-995.3	3,796.9	3,925.2	0.00	0.00	0.00
10,100.0	91.00	104.69	6,236.7	-1,020.7	3,893.6	4,025.2	0.00	0.00	0.00



# Crescent Directional Drilling, LP

## Planning Report

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<b>Site:</b>	Redtail	<b>North Reference:</b>	True
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<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Preliminary Plan for APD		

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)
10,200.0	91.00	104.69	6,235.0	-1,046.0	3,990.4	4,125.2	0.00	0.00	0.00
10,265.5	91.00	104.69	6,233.8	-1,062.6	4,053.7	4,190.7	0.00	0.00	0.00
TD = 10266' MD									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
	6,297.7	7"	7	8-3/4

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,505.7	6,297.7	Niobrara		-1.00	104.69

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
5,776.9	5,776.9	0.0	0.0	KOP 11/100'	
6,604.2	6,297.7	-134.4	512.6	EOB - Niobrara	
10,265.5	6,233.8	-1,062.6	4,053.7	TD = 10266' MD	

# WELL LOCATION FOR WHITING OIL AND GAS CORPORATION

PAWNEE 16-13H

R 59 W

## NOTES

BEARINGS SHOWN HEREON ARE  
BASED UPON RTK GPS  
OBSERVATIONS

SEE LOCATION DRAWING FOR  
IMPROVEMENTS WITHIN 600' OF  
LOCATION.

USGS QUAD MAP:  
PAWNEE BUTTES, COLO.

LAT/LONG VALUES ARE NAD83

ELEVATIONS BASED UPON NGS  
OPUS SOLUTION NAVD 88 DATUM

ALL DISTANCES TO SECTION LINES  
ARE MEASURED PERPENDICULAR  
TO AND ARE AT RIGHT ANGLES  
TO SAID SECTION LINES.

16

T  
10  
N

## LEGEND

⊙ FIELD SURVEYED  
WELL LOCATION

⊙ FIELD SURVEYED  
BOTTOM HOLE LOCATION

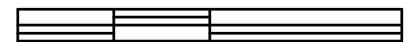
== == == ROAD

-x-x- FENCE



SCALE: 1" = 1000'

1000 500 0 1000



SCALE IN FEET

THIS WELL LOCATION PLAT HAS BEEN PREPARED FOR WHITING OIL AND GAS CORPORATION,  
TO LOCATE THE PAWNEE 16-13H WELL BEING 413 FEET FROM THE WEST LINE AND  
1834 FEET FROM THE SOUTH LINE IN THE NW1/4SW1/4 OF SECTION 16,  
TOWNSHIP 10 NORTH, RANGE 59 WEST OF THE 6TH P.M., WELD COUNTY, COLORADO.  
THE SURFACE ELEVATION AT THIS POINT IS 5115 FEET.  
THIS IS NOT A LAND SURVEY PLAT.



**LEIBERT-McATEE & ASSOCIATES, INC.**

P.O. BOX 442 615 SOUTH TENTH AVENUE  
STERLING, CO 80751 970-522-1960

FIELD DATE: 9-10-10

DWG DATE: 9-15-10

GPS OPERATOR:  
TIM LEIBERT

PAWNEE 16-13H

DWG NO. 990-10

SHEET 1 OF 1