

# Whiting Oil & Gas

Well Name: **Wildhorse #04-0414H**

Surface Location: Wildhorse Pad Sec.4-T9N-R59W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 5106.5

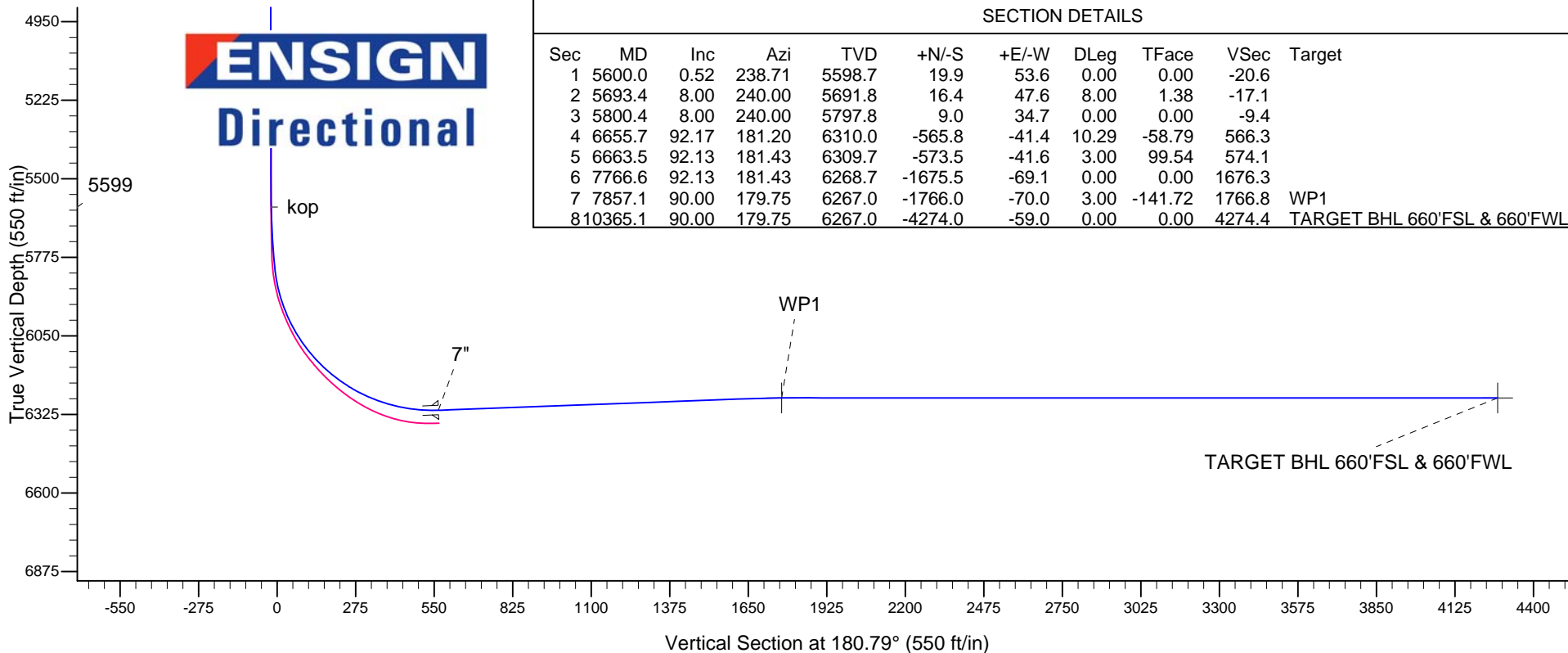
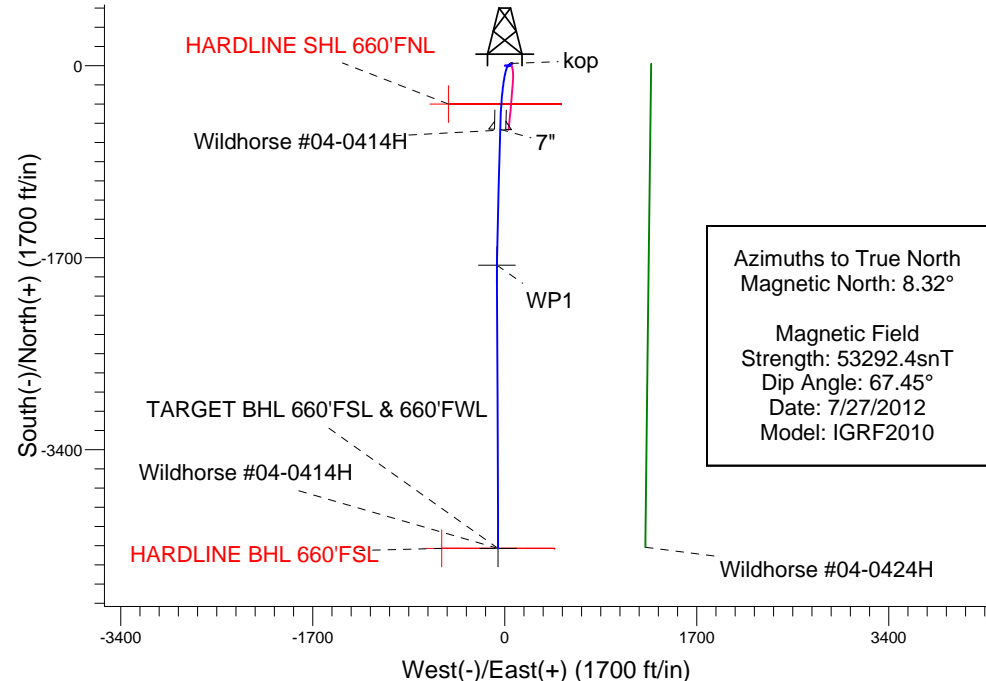
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1532733.20	3418078.95	40.785967	-103.990206	

RKB Ensign 14 - 15' WELL @ 5121.5ft (RKB Ensign 14 - 15')

Wildhorse Pad Sec.4-T9N-R59W  
Wildhorse #04-0414H  
Plan 4 (Aug 1, 2012)  
13:49, August 02 2012

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
HARDLINE BHL 660'FSL	1.0	-4274.0	-559.0	40.774236	-103.992224	Polygon
HARDLINE SHL 660'FNL	1.0	-340.0	-500.0	40.785034	-103.992012	Polygon
TARGET BHL 660'FSL & 660'FWL	6267.0	-4274.0	-59.0	40.774236	-103.990419	Point
WP1	6267.0	-1766.0	-70.0	40.781120	-103.990459	Point





## **Directional**

### **Whiting Oil & Gas**

**SEC.4-T9N-R59W**

**Wildhorse Pad Sec.4-T9N-R59W**

**Wildhorse #04-0414H**

**Wellbore #1**

**Plan: Plan 4 (Aug 1, 2012)**

### **Standard Planning Report**

**02 August, 2012**

WP1  
TARGET BHL 660'F

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Project:</b>	SEC.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan 4 (Aug 1, 2012)		

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
								0.16	0.00
								0.16	0.00
								0.16	0.00
								0.18	3.72
								0.27	12.17
								0.27	6.65
								0.28	4.16
								0.13	-2.12
								0.00	-6.98
								0.00	-7.00
								0.01	-6.96
								0.05	13.40
								0.10	16.38
								0.13	14.42
								0.14	9.89
								0.11	-3.95
								0.11	-3.57
								0.11	-3.24
								0.00	-3.31
								-0.11	-3.92
								-0.11	-4.33
								-0.11	-4.79
								0.01	7.07
								0.05	9.04
								0.06	8.59
								0.10	7.99
								0.36	5.93
								0.36	4.49
								0.37	3.50
								0.28	2.18
								-0.27	7.09
								-0.57	8.14
								-0.42	-8.00
								-0.22	-8.53
								-0.11	-8.34
								-0.02	-1.95
								0.00	0.00
								0.09	5.05
								0.11	5.35
								0.00	-6.44
								0.01	-8.29
								0.18	-22.34
								0.18	-17.72
								-0.11	-12.87
								-0.06	-10.50
								0.00	-2.00
								-0.04	-2.03
								-0.11	-2.22
								-0.16	-1.51
								-0.21	-0.74
								-0.15	-5.86
								-0.10	-10.18
								-0.21	-20.33

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Project:</b>	SEC.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan 4 (Aug 1, 2012)		

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)
								-0.19	-32.09
								0.14	-6.30
								0.21	1.12
								0.00	-18.56
								0.02	-20.75
								0.10	-5.00
								0.09	-5.16
								-0.01	-11.70
								-0.04	-7.21
								-0.22	12.50
								-0.14	13.86
								0.00	9.70
								0.04	8.19
								0.11	5.39
								-0.21	5.55
								-0.53	12.43
								-0.44	-24.69
								-0.06	-172.36
								0.17	-38.78
								0.11	-8.87
								0.09	-28.33
								0.12	-25.07
								0.00	-23.73
								0.01	-22.77
								-0.04	40.93
								0.03	39.85
								-0.03	37.53
								-0.05	35.50
								-0.28	59.55
								0.27	164.21
								1.44	46.30
								1.31	4.37
								1.05	-2.42
								0.71	-0.90
								0.42	-0.21
								0.17	-10.72
								0.13	-16.26
								0.04	2.22
								0.01	8.53
								0.18	3.47
								0.21	2.36
								-2.68	-32.41
								-1.55	-116.01
								-0.24	-114.46
								1.12	-59.51
								0.29	19.82
								0.16	10.48
								-0.43	-8.33
								-0.39	-11.11
								-0.32	-14.82
								-0.15	-8.07
								0.00	3.58
								-0.29	0.79
								-0.53	-2.22

[illegible]

[illegible]

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Company:</b>	Whiting Oil & Gas	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Project:</b>	SEC.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>North Reference:</b>	True
<b>Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan 4 (Aug 1, 2012)		

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

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
		7"		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
c				kop





## **Directional**

### **Whiting Oil & Gas**

**SEC.4-T9N-R59W**

**Wildhorse Pad Sec.4-T9N-R59W**

**Wildhorse #04-0414H**

**Wellbore #1**

**Plan 4 (Aug 1, 2012)**

### **Anticollision Report**

**02 August, 2012**

<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Project:</b>	SEC.4-T9N-R59W	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Reference Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan 4 (Aug 1, 2012)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan 4 (Aug 1, 2012)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 50.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 500.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 8/2/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
190.0	5,600.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard
5,600.0	10,365.1	Plan 4 (Aug 1, 2012) (Wellbore #1)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (ft)</b>	<b>Offset Measured Depth (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Distance Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
Offset Well - Wellbore - Design						
Wildhorse #04-0424H Pad Sec.4-T9N-R59W						
Wildhorse #04-0424H - Wellbore #1 - Plan #1 (11-14-11)						Out of range
Wildhorse Pad Sec.4-T9N-R59W						
Wildhorse #04-0414H - Wellbore #1 - Wellbore #1	5,600.0	5,600.0	0.0	0.0	0.000	Level 1, CC, ES, SF

<b>Offset Design</b>	Wildhorse Pad Sec.4-T9N-R59W - Wildhorse #04-0414H - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
<b>Survey Program:</b>	190-MWD												<b>Offset Well Error:</b>	0.0 ft
<b>Reference</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Offset Vertical Depth (ft)</b>	<b>Semi Major Axis Reference (ft)</b>	<b>Semi Major Axis Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>Offset Wellbore Centre +E/-W (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Distance Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>	
5,600.0	5,598.7	5,600.0	5,598.7	0.0	0.0	0.00	19.9	53.6	0.0	0.0	0.00	0.000	Level 1, CC, ES, SF	
5,627.6	5,626.3	5,627.6	5,626.3	0.1	0.1	-179.65	19.8	53.4	0.5	0.4	0.12	4.720		
5,650.0	5,648.6	5,650.0	5,648.6	0.1	0.1	-179.75	19.7	53.2	1.8	1.6	0.21	8.607		
5,700.0	5,698.3	5,699.7	5,698.3	0.3	0.2	-179.90	19.5	52.9	7.1	6.7	0.42	16.901		
5,750.0	5,747.8	5,749.1	5,747.8	0.4	0.3	-177.58	18.9	53.1	13.9	13.3	0.65	21.353		
5,800.0	5,797.3	5,798.7	5,797.3	0.5	0.4	-170.77	16.5	54.3	21.0	20.1	0.86	24.317		
5,850.0	5,846.6	5,848.2	5,846.4	0.8	0.5	-142.36	10.9	56.2	28.6	27.4	1.14	25.044		
5,900.0	5,895.2	5,897.0	5,894.2	1.0	0.7	-127.51	1.5	59.3	37.7	36.3	1.38	27.213		
5,950.0	5,942.6	5,946.1	5,941.1	1.1	1.2	-118.63	-12.2	63.7	48.0	46.4	1.65	29.188		
6,000.0	5,988.6	5,997.0	5,988.5	1.1	1.5	-113.22	-30.3	67.9	58.2	56.3	1.85	31.501		
6,050.0	6,032.7	6,048.2	6,034.8	1.0	1.8	-110.42	-51.9	70.9	67.1	65.1	2.07	32.481		
6,100.0	6,074.6	6,100.7	6,080.4	1.1	2.1	-109.04	-77.7	72.5	74.7	72.3	2.38	31.397		
6,150.0	6,114.0	6,154.0	6,123.9	1.3	2.4	-107.93	-108.6	72.9	80.8	78.1	2.73	29.647		
6,200.0	6,150.4	6,208.3	6,165.6	1.5	2.7	-108.04	-143.2	71.0	84.7	81.6	3.15	26.866		
6,250.0	6,183.7	6,259.9	6,202.6	1.8	2.9	-108.93	-179.1	68.0	87.4	83.8	3.65	23.946		
6,300.0	6,213.6	6,310.2	6,235.9	2.1	3.1	-110.22	-216.7	65.4	90.5	86.3	4.19	21.588		
6,350.0	6,239.8	6,365.3	6,268.8	2.5	3.4	-112.07	-260.8	62.2	93.1	88.3	4.82	19.333		
6,400.0	6,262.1	6,417.2	6,296.0	2.9	3.6	-114.18	-304.8	58.4	94.9	89.4	5.46	17.372		
6,450.0	6,280.3	6,473.1	6,320.6	3.4	3.9	-116.47	-354.8	54.1	96.1	89.9	6.17	15.576		
6,500.0	6,294.3	6,527.8	6,338.7	3.9	4.3	-118.23	-406.1	49.4	96.0	89.1	6.96	13.796		
6,550.0	6,304.0	6,584.0	6,350.8	4.4	4.7	-119.53	-460.8	44.5	94.9	87.1	7.78	12.193		
6,600.0	6,309.3	6,640.8	6,355.7	4.9	5.2	-120.14	-517.0	39.2	92.0	83.3	8.65	10.629		

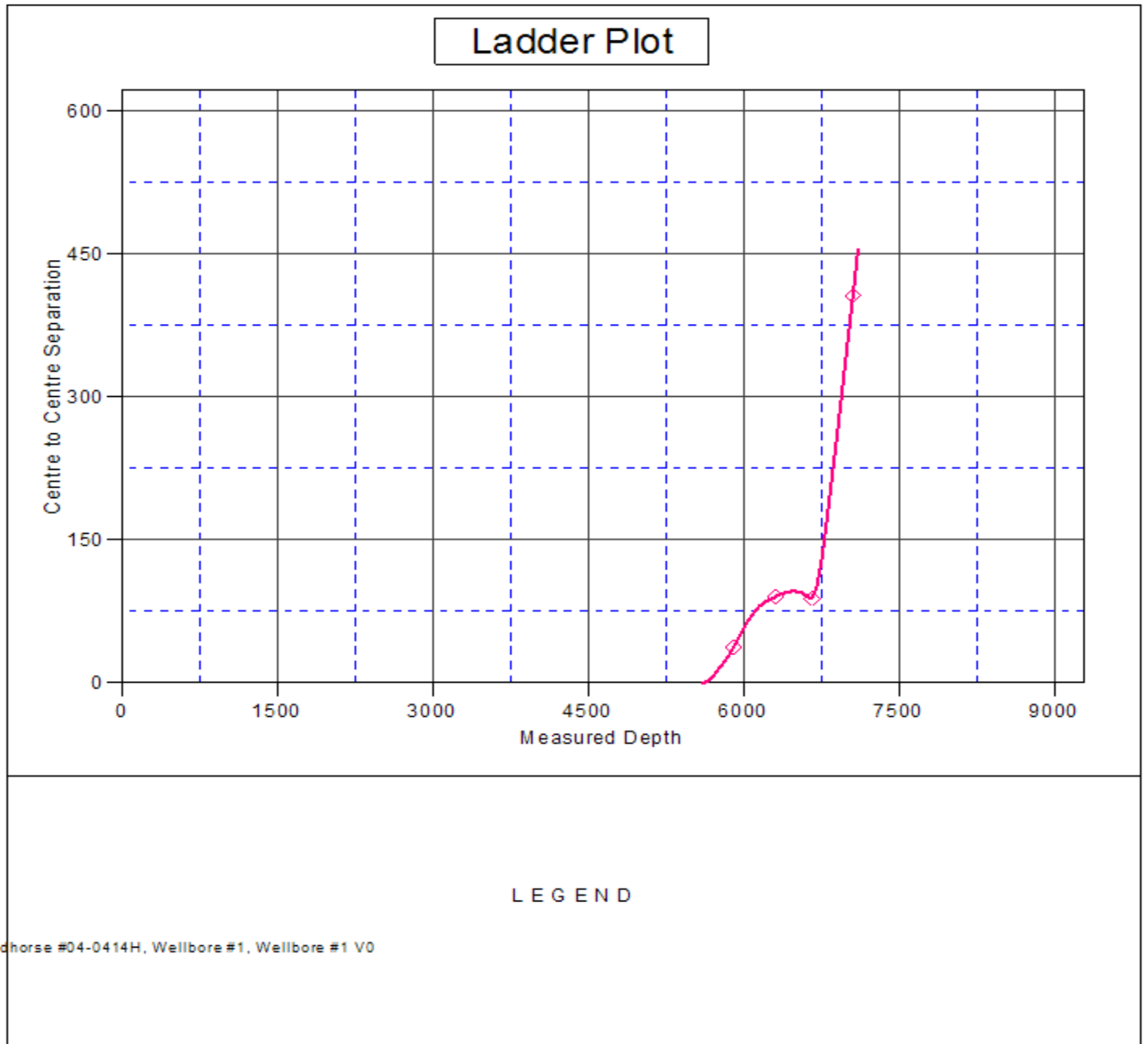
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Project:</b>	SEC.4-T9N-R59W	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Reference Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan 4 (Aug 1, 2012)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Wildhorse Pad Sec.4-T9N-R59W - Wildhorse #04-0414H - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 190-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,650.0	6,310.2	6,691.0	6,355.7	5.5	5.7	-121.05	-567.0	34.3	88.5	79.0	9.49	9.323	
6,653.9	6,310.1	6,691.0	6,355.7	5.6	5.7	-121.05	-567.0	34.3	88.4	78.9	9.53	9.278	
6,700.0	6,308.4	6,691.0	6,355.7	6.1	5.7	-121.06	-567.0	34.3	99.9	90.0	9.96	10.029	
6,750.0	6,306.5	6,691.0	6,355.7	6.7	5.7	-121.06	-567.0	34.3	130.9	120.4	10.53	12.430	
6,800.0	6,304.6	6,691.0	6,355.7	7.4	5.7	-121.06	-567.0	34.3	171.2	160.1	11.11	15.412	
6,850.0	6,302.8	6,691.0	6,355.7	8.1	5.7	-121.06	-567.0	34.3	215.6	203.9	11.72	18.390	
6,900.0	6,300.9	6,691.0	6,355.7	8.8	5.7	-121.06	-567.0	34.3	262.0	249.6	12.34	21.234	
6,950.0	6,299.1	6,691.0	6,355.7	9.5	5.7	-121.06	-567.0	34.3	309.5	296.5	12.99	23.832	
7,000.0	6,297.2	6,691.0	6,355.7	10.3	5.7	-121.06	-567.0	34.3	357.7	344.1	13.64	26.231	
7,050.0	6,295.3	6,691.0	6,355.7	11.1	5.7	-121.06	-567.0	34.3	406.4	392.0	14.31	28.388	
7,100.0	6,293.5	6,691.0	6,355.7	11.8	5.7	-121.06	-567.0	34.3	455.3	440.3	14.99	30.368	

<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Project:</b>	SEC.4-T9N-R59W	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Reference Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan 4 (Aug 1, 2012)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 5121.5ft (RKB Ensign 14 - 1 Coordinates are relative to: Wildhorse #04-0414H  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.98°



<b>Company:</b>	Whiting Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Wildhorse #04-0414H
<b>Project:</b>	SEC.4-T9N-R59W	<b>TVD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Reference Site:</b>	Wildhorse Pad Sec.4-T9N-R59W	<b>MD Reference:</b>	WELL @ 5121.5ft (RKB Ensign 14 - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Wildhorse #04-0414H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan 4 (Aug 1, 2012)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 5121.5ft (RKB Ensign 14 - 1 Coordinates are relative to: Wildhorse #04-0414H  
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone  
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.98°

