ENSIGN Directional

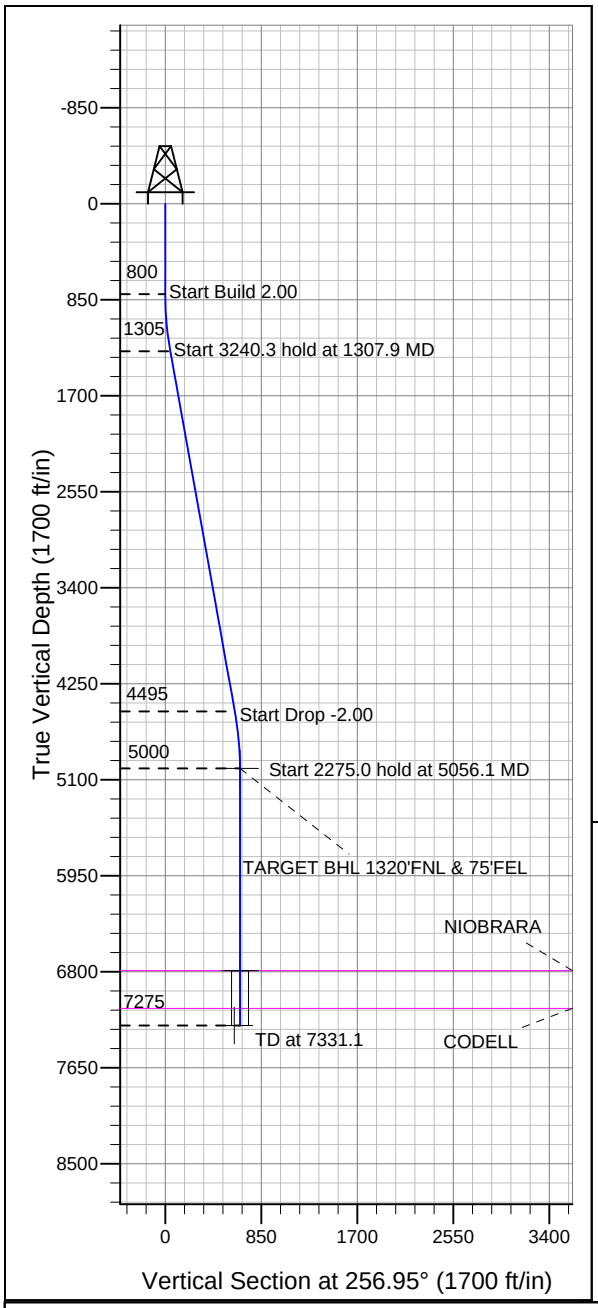
Well Name: Boiko G15-31D

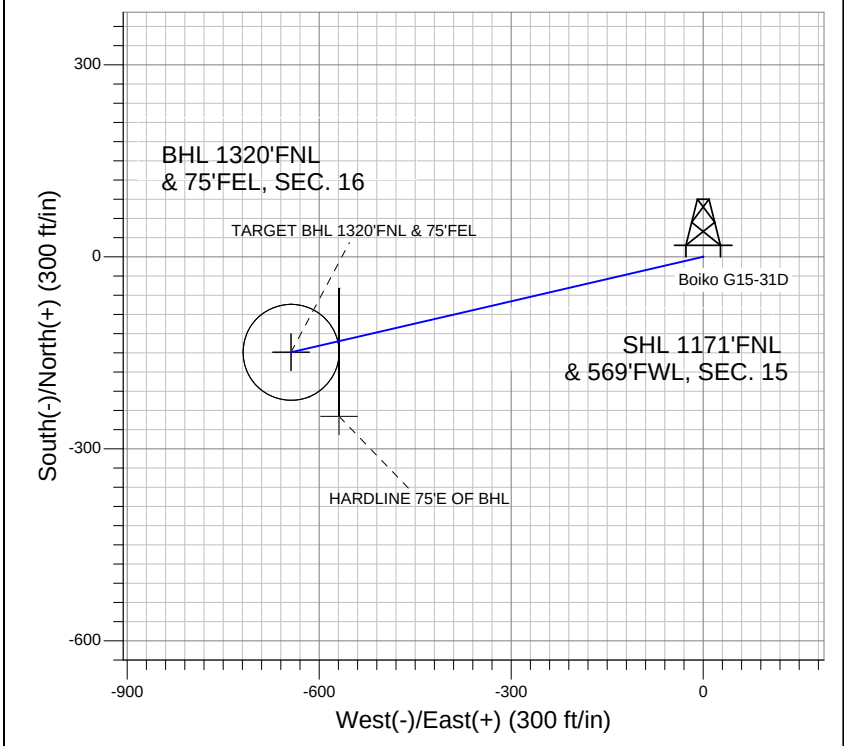
Surface Location: Boiko G15-30D Pad Sec.15-T4N-R65W
North American Datum 1983 , US State Plane 1983Colorado Northern Zone
Ground Elevation: 4738.0

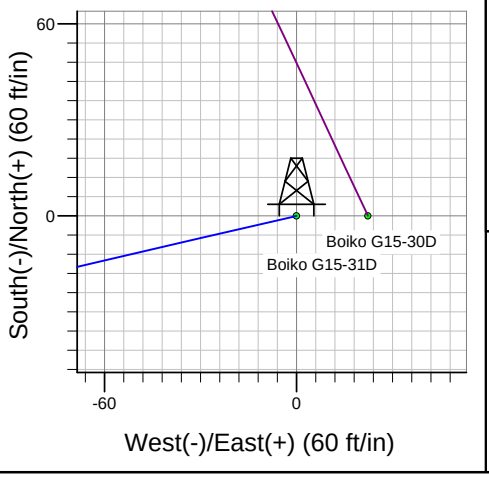
+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1359260.37	3235189.77	40.316500	-104.656570	

Original Well Elev — WELL @ 4751.0ft (Original Well Elev)

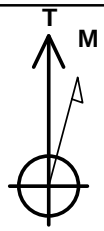
NOBLE ENERGY INC WELD COUNTY CO







Boiko G15-30D Pad Sec.15-T4N-R65W
Boiko G15-31D
Noble Boiko G15-31D Plan #1 (2-29-12)
14:20, February 29 2012



Azimuths to True North
Magnetic North: 8.66°

Magnetic Field
Strength: 53048.8snT
Dip Angle: 66.99°
Date: 2/29/2012
Model: IGRF200510

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1320'FNL & 75'FEL	5000.0	-149.3	-644.2	40.316090	-104.658880	Point
TARGET CIRCLE 1320'FNL & 75'FEL	6790.0	-149.3	-644.2	40.316090	-104.658880	Circle (Radius: 75.0)
HARDLINE 75'E OF BHL	7275.0	-249.3	-569.2	40.315816	-104.658611	Polygon

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1307.9	10.16	256.95	1305.2	-10.1	-43.7	2.00	256.95	44.9	
4	4548.2	10.16	256.95	4494.8	-139.2	-600.4	0.00	0.00	616.4	
5	5056.1	0.00	0.00	5000.0	-149.3	-644.2	2.00	180.00	661.3	TARGET BHL 1320'FNL & 75'FEL
6	7331.1	0.00	0.00	7275.0	-149.3	-644.2	0.00	0.00	661.3	

ENSIGN Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.15-T4N-R65W
Boiko G15-30D Pad Sec.15-T4N-R65W
Boiko G15-31D

Wellbore #1

Plan: Noble Boiko G15-31D Plan #1 (2-29-12)

Standard Planning Report

29 February, 2012

noble energy

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

Project SEC.15-T4N-R65W, Weld County, Colorado

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Boiko G15-30D Pad Sec.15-T4N-R65W

Site Position:		**Northing:**	1,359,260.59 ft	**Latitude:**	40.316500
From:	Lat/Long	**Easting:**	3,235,212.08 ft	**Longitude:**	-104.656490
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.55 °

Well Boiko G15-31D

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,359,260.37 ft	**Latitude:**	40.316500
	+E/-W	-22.3 ft	**Easting:**	3,235,189.77 ft	**Longitude:**	-104.656570
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,738.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2/29/2012	8.66	66.99	53,049

Design Noble Boiko G15-31D Plan #1 (2-29-12)

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	256.95

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	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,307.9	10.16	256.95	1,305.2	-10.1	-43.7	2.00	2.00	0.00	256.95	
4,548.2	10.16	256.95	4,494.8	-139.2	-600.4	0.00	0.00	0.00	0.00	
5,056.1	0.00	0.00	5,000.0	-149.3	-644.2	2.00	-2.00	0.00	180.00	TARGET BHL 132C
7,331.1	0.00	0.00	7,275.0	-149.3	-644.2	0.00	0.00	0.00	0.00	

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
650.0	0.00	0.00	650.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.80	256.95	840.0	-0.1	-0.3	0.3	2.00	2.00	0.00
880.0	1.60	256.95	880.0	-0.3	-1.1	1.1	2.00	2.00	0.00
920.0	2.40	256.95	920.0	-0.6	-2.4	2.5	2.00	2.00	0.00
960.0	3.20	256.95	959.9	-1.0	-4.4	4.5	2.00	2.00	0.00
1,000.0	4.00	256.95	999.8	-1.6	-6.8	7.0	2.00	2.00	0.00
1,040.0	4.80	256.95	1,039.7	-2.3	-9.8	10.0	2.00	2.00	0.00
1,080.0	5.60	256.95	1,079.6	-3.1	-13.3	13.7	2.00	2.00	0.00
1,120.0	6.40	256.95	1,119.3	-4.0	-17.4	17.9	2.00	2.00	0.00
1,160.0	7.20	256.95	1,159.1	-5.1	-22.0	22.6	2.00	2.00	0.00
1,200.0	8.00	256.95	1,198.7	-6.3	-27.2	27.9	2.00	2.00	0.00
1,240.0	8.80	256.95	1,238.3	-7.6	-32.9	33.7	2.00	2.00	0.00
1,280.0	9.60	256.95	1,277.8	-9.1	-39.1	40.1	2.00	2.00	0.00
1,307.9	10.16	256.95	1,305.2	-10.1	-43.7	44.9	2.00	2.00	0.00
1,320.0	10.16	256.95	1,317.2	-10.6	-45.8	47.0	0.00	0.00	0.00
1,360.0	10.16	256.95	1,356.5	-12.2	-52.7	54.1	0.00	0.00	0.00
1,400.0	10.16	256.95	1,395.9	-13.8	-59.6	61.1	0.00	0.00	0.00
1,440.0	10.16	256.95	1,435.3	-15.4	-66.4	68.2	0.00	0.00	0.00
1,480.0	10.16	256.95	1,474.6	-17.0	-73.3	75.3	0.00	0.00	0.00
1,520.0	10.16	256.95	1,514.0	-18.6	-80.2	82.3	0.00	0.00	0.00
1,560.0	10.16	256.95	1,553.4	-20.2	-87.1	89.4	0.00	0.00	0.00
1,600.0	10.16	256.95	1,592.8	-21.8	-93.9	96.4	0.00	0.00	0.00
1,640.0	10.16	256.95	1,632.1	-23.4	-100.8	103.5	0.00	0.00	0.00
1,680.0	10.16	256.95	1,671.5	-25.0	-107.7	110.5	0.00	0.00	0.00
1,720.0	10.16	256.95	1,710.9	-26.6	-114.5	117.6	0.00	0.00	0.00
1,760.0	10.16	256.95	1,750.3	-28.1	-121.4	124.6	0.00	0.00	0.00
1,800.0	10.16	256.95	1,789.6	-29.7	-128.3	131.7	0.00	0.00	0.00
1,840.0	10.16	256.95	1,829.0	-31.3	-135.2	138.7	0.00	0.00	0.00
1,880.0	10.16	256.95	1,868.4	-32.9	-142.0	145.8	0.00	0.00	0.00
1,920.0	10.16	256.95	1,907.7	-34.5	-148.9	152.9	0.00	0.00	0.00
1,960.0	10.16	256.95	1,947.1	-36.1	-155.8	159.9	0.00	0.00	0.00
2,000.0	10.16	256.95	1,986.5	-37.7	-162.6	167.0	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

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)
2,040.0	10.16	256.95	2,025.9	-39.3	-169.5	174.0	0.00	0.00	0.00
2,080.0	10.16	256.95	2,065.2	-40.9	-176.4	181.1	0.00	0.00	0.00
2,120.0	10.16	256.95	2,104.6	-42.5	-183.3	188.1	0.00	0.00	0.00
2,160.0	10.16	256.95	2,144.0	-44.1	-190.1	195.2	0.00	0.00	0.00
2,200.0	10.16	256.95	2,183.4	-45.7	-197.0	202.2	0.00	0.00	0.00
2,240.0	10.16	256.95	2,222.7	-47.3	-203.9	209.3	0.00	0.00	0.00
2,280.0	10.16	256.95	2,262.1	-48.9	-210.8	216.3	0.00	0.00	0.00
2,320.0	10.16	256.95	2,301.5	-50.5	-217.6	223.4	0.00	0.00	0.00
2,360.0	10.16	256.95	2,340.9	-52.0	-224.5	230.5	0.00	0.00	0.00
2,400.0	10.16	256.95	2,380.2	-53.6	-231.4	237.5	0.00	0.00	0.00
2,440.0	10.16	256.95	2,419.6	-55.2	-238.2	244.6	0.00	0.00	0.00
2,480.0	10.16	256.95	2,459.0	-56.8	-245.1	251.6	0.00	0.00	0.00
2,520.0	10.16	256.95	2,498.3	-58.4	-252.0	258.7	0.00	0.00	0.00
2,560.0	10.16	256.95	2,537.7	-60.0	-258.9	265.7	0.00	0.00	0.00
2,600.0	10.16	256.95	2,577.1	-61.6	-265.7	272.8	0.00	0.00	0.00
2,640.0	10.16	256.95	2,616.5	-63.2	-272.6	279.8	0.00	0.00	0.00
2,680.0	10.16	256.95	2,655.8	-64.8	-279.5	286.9	0.00	0.00	0.00
2,720.0	10.16	256.95	2,695.2	-66.4	-286.3	293.9	0.00	0.00	0.00
2,760.0	10.16	256.95	2,734.6	-68.0	-293.2	301.0	0.00	0.00	0.00
2,800.0	10.16	256.95	2,774.0	-69.6	-300.1	308.1	0.00	0.00	0.00
2,840.0	10.16	256.95	2,813.3	-71.2	-307.0	315.1	0.00	0.00	0.00
2,880.0	10.16	256.95	2,852.7	-72.8	-313.8	322.2	0.00	0.00	0.00
2,920.0	10.16	256.95	2,892.1	-74.4	-320.7	329.2	0.00	0.00	0.00
2,960.0	10.16	256.95	2,931.4	-75.9	-327.6	336.3	0.00	0.00	0.00
3,000.0	10.16	256.95	2,970.8	-77.5	-334.5	343.3	0.00	0.00	0.00
3,040.0	10.16	256.95	3,010.2	-79.1	-341.3	350.4	0.00	0.00	0.00
3,080.0	10.16	256.95	3,049.6	-80.7	-348.2	357.4	0.00	0.00	0.00
3,120.0	10.16	256.95	3,088.9	-82.3	-355.1	364.5	0.00	0.00	0.00
3,160.0	10.16	256.95	3,128.3	-83.9	-361.9	371.5	0.00	0.00	0.00
3,200.0	10.16	256.95	3,167.7	-85.5	-368.8	378.6	0.00	0.00	0.00
3,240.0	10.16	256.95	3,207.1	-87.1	-375.7	385.7	0.00	0.00	0.00
3,280.0	10.16	256.95	3,246.4	-88.7	-382.6	392.7	0.00	0.00	0.00
3,320.0	10.16	256.95	3,285.8	-90.3	-389.4	399.8	0.00	0.00	0.00
3,360.0	10.16	256.95	3,325.2	-91.9	-396.3	406.8	0.00	0.00	0.00
3,400.0	10.16	256.95	3,364.6	-93.5	-403.2	413.9	0.00	0.00	0.00
3,440.0	10.16	256.95	3,403.9	-95.1	-410.0	420.9	0.00	0.00	0.00
3,480.0	10.16	256.95	3,443.3	-96.7	-416.9	428.0	0.00	0.00	0.00
3,520.0	10.16	256.95	3,482.7	-98.3	-423.8	435.0	0.00	0.00	0.00
3,560.0	10.16	256.95	3,522.0	-99.8	-430.7	442.1	0.00	0.00	0.00
3,600.0	10.16	256.95	3,561.4	-101.4	-437.5	449.1	0.00	0.00	0.00
3,640.0	10.16	256.95	3,600.8	-103.0	-444.4	456.2	0.00	0.00	0.00
3,680.0	10.16	256.95	3,640.2	-104.6	-451.3	463.2	0.00	0.00	0.00
3,720.0	10.16	256.95	3,679.5	-106.2	-458.2	470.3	0.00	0.00	0.00
3,760.0	10.16	256.95	3,718.9	-107.8	-465.0	477.4	0.00	0.00	0.00
3,800.0	10.16	256.95	3,758.3	-109.4	-471.9	484.4	0.00	0.00	0.00
3,840.0	10.16	256.95	3,797.7	-111.0	-478.8	491.5	0.00	0.00	0.00
3,880.0	10.16	256.95	3,837.0	-112.6	-485.6	498.5	0.00	0.00	0.00
3,920.0	10.16	256.95	3,876.4	-114.2	-492.5	505.6	0.00	0.00	0.00
3,960.0	10.16	256.95	3,915.8	-115.8	-499.4	512.6	0.00	0.00	0.00
4,000.0	10.16	256.95	3,955.1	-117.4	-506.3	519.7	0.00	0.00	0.00
4,040.0	10.16	256.95	3,994.5	-119.0	-513.1	526.7	0.00	0.00	0.00
4,080.0	10.16	256.95	4,033.9	-120.6	-520.0	533.8	0.00	0.00	0.00
4,120.0	10.16	256.95	4,073.3	-122.2	-526.9	540.8	0.00	0.00	0.00
4,160.0	10.16	256.95	4,112.6	-123.7	-533.7	547.9	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

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)
4,200.0	10.16	256.95	4,152.0	-125.3	-540.6	555.0	0.00	0.00	0.00
4,240.0	10.16	256.95	4,191.4	-126.9	-547.5	562.0	0.00	0.00	0.00
4,280.0	10.16	256.95	4,230.8	-128.5	-554.4	569.1	0.00	0.00	0.00
4,320.0	10.16	256.95	4,270.1	-130.1	-561.2	576.1	0.00	0.00	0.00
4,360.0	10.16	256.95	4,309.5	-131.7	-568.1	583.2	0.00	0.00	0.00
4,400.0	10.16	256.95	4,348.9	-133.3	-575.0	590.2	0.00	0.00	0.00
4,440.0	10.16	256.95	4,388.3	-134.9	-581.8	597.3	0.00	0.00	0.00
4,480.0	10.16	256.95	4,427.6	-136.5	-588.7	604.3	0.00	0.00	0.00
4,520.0	10.16	256.95	4,467.0	-138.1	-595.6	611.4	0.00	0.00	0.00
4,548.2	10.16	256.95	4,494.8	-139.2	-600.4	616.4	0.00	0.00	0.00
4,560.0	9.92	256.95	4,506.4	-139.7	-602.4	618.4	2.00	-2.00	0.00
4,600.0	9.12	256.95	4,545.8	-141.2	-608.9	625.0	2.00	-2.00	0.00
4,640.0	8.32	256.95	4,585.4	-142.5	-614.8	631.1	2.00	-2.00	0.00
4,680.0	7.52	256.95	4,625.0	-143.8	-620.2	636.6	2.00	-2.00	0.00
4,720.0	6.72	256.95	4,664.7	-144.9	-625.0	641.6	2.00	-2.00	0.00
4,760.0	5.92	256.95	4,704.4	-145.9	-629.3	646.0	2.00	-2.00	0.00
4,800.0	5.12	256.95	4,744.2	-146.8	-633.0	649.8	2.00	-2.00	0.00
4,840.0	4.32	256.95	4,784.1	-147.5	-636.2	653.1	2.00	-2.00	0.00
4,880.0	3.52	256.95	4,824.0	-148.1	-638.9	655.9	2.00	-2.00	0.00
4,920.0	2.72	256.95	4,863.9	-148.6	-641.0	658.0	2.00	-2.00	0.00
4,960.0	1.92	256.95	4,903.9	-149.0	-642.6	659.7	2.00	-2.00	0.00
5,000.0	1.12	256.95	4,943.9	-149.2	-643.6	660.7	2.00	-2.00	0.00
5,040.0	0.32	256.95	4,983.9	-149.3	-644.1	661.2	2.00	-2.00	0.00
5,056.1	0.00	0.00	5,000.0	-149.3	-644.2	661.3	2.00	-2.00	639.98
TARGET BHL 1320'FNL & 75'FEL									
5,080.0	0.00	0.00	5,023.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,120.0	0.00	0.00	5,063.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,160.0	0.00	0.00	5,103.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,200.0	0.00	0.00	5,143.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,240.0	0.00	0.00	5,183.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,280.0	0.00	0.00	5,223.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,320.0	0.00	0.00	5,263.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,360.0	0.00	0.00	5,303.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,400.0	0.00	0.00	5,343.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,440.0	0.00	0.00	5,383.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,480.0	0.00	0.00	5,423.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,520.0	0.00	0.00	5,463.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,560.0	0.00	0.00	5,503.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,543.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,640.0	0.00	0.00	5,583.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,680.0	0.00	0.00	5,623.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,720.0	0.00	0.00	5,663.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,760.0	0.00	0.00	5,703.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,743.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,840.0	0.00	0.00	5,783.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,880.0	0.00	0.00	5,823.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,920.0	0.00	0.00	5,863.9	-149.3	-644.2	661.3	0.00	0.00	0.00
5,960.0	0.00	0.00	5,903.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,943.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,040.0	0.00	0.00	5,983.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,080.0	0.00	0.00	6,023.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,120.0	0.00	0.00	6,063.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,160.0	0.00	0.00	6,103.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,143.9	-149.3	-644.2	661.3	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

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)
6,240.0	0.00	0.00	6,183.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,280.0	0.00	0.00	6,223.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,320.0	0.00	0.00	6,263.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,360.0	0.00	0.00	6,303.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,343.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,440.0	0.00	0.00	6,383.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,480.0	0.00	0.00	6,423.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,520.0	0.00	0.00	6,463.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,560.0	0.00	0.00	6,503.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,543.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,640.0	0.00	0.00	6,583.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,680.0	0.00	0.00	6,623.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,720.0	0.00	0.00	6,663.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,760.0	0.00	0.00	6,703.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,743.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,840.0	0.00	0.00	6,783.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,846.1	0.00	0.00	6,790.0	-149.3	-644.2	661.3	0.00	0.00	0.00
NIOBRARA - TARGET CIRCLE 1320'FNL & 75'FEL									
6,880.0	0.00	0.00	6,823.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,920.0	0.00	0.00	6,863.9	-149.3	-644.2	661.3	0.00	0.00	0.00
6,960.0	0.00	0.00	6,903.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,943.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,040.0	0.00	0.00	6,983.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,080.0	0.00	0.00	7,023.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,120.0	0.00	0.00	7,063.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,160.0	0.00	0.00	7,103.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,181.1	0.00	0.00	7,125.0	-149.3	-644.2	661.3	0.00	0.00	0.00
CODELL									
7,200.0	0.00	0.00	7,143.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,240.0	0.00	0.00	7,183.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,280.0	0.00	0.00	7,223.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,320.0	0.00	0.00	7,263.9	-149.3	-644.2	661.3	0.00	0.00	0.00
7,331.1	0.00	0.00	7,275.0	-149.3	-644.2	661.3	0.00	0.00	0.00
HARDLINE 75'E OF BHL									

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HARDLINE 75'E OF E	0.00	0.00	7,275.0	-249.3	-569.2	1,359,005.68	3,234,622.99	40.315816	-104.658611
- plan misses target center by 125.0ft at 7331.1ft MD (7275.0 TVD, -149.3 N, -644.2 E)									
- Polygon									
Point 1			7,275.0	0.0	0.0	1,359,005.68	3,234,622.99		
Point 2			7,275.0	200.0	0.0	1,359,205.66	3,234,621.09		
TARGET CIRCLE 132	0.00	0.00	6,790.0	-149.3	-644.2	1,359,104.91	3,234,547.06	40.316090	-104.658880
- plan hits target center									
- Circle (radius 75.0)									
TARGET BHL 1320'F	0.00	0.00	5,000.0	-149.3	-644.2	1,359,104.91	3,234,547.06	40.316090	-104.658880
- plan hits target center									
- Point									

Database:	Landmark	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**North Reference:**	True
Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Boiko G15-31D Plan #1 (2-29-12)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
650.0	650.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,846.1	6,790.0	NIOBRARA		0.00	
7,181.1	7,125.0	CODELL		0.00	

ENSIGN Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.15-T4N-R65W
Boiko G15-30D Pad Sec.15-T4N-R65W
Boiko G15-31D

Wellbore #1
Noble Boiko G15-31D Plan #1 (2-29-12)

Anticollision Report

29 February, 2012

noble energy

Company:	NOBLE ENERGY INC WELD COUNTY CO	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Project:	SEC.15-T4N-R65W	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Reference Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Boiko G15-31D Plan #1 (2-29-12)	**Offset TVD Reference:**	Offset Datum

Reference Noble Boiko G15-31D Plan #1 (2-29

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	**Error Surface:**	Elliptical Conic

Warning Levels Evaluated at: 2.00 **Sigma**

Survey Tool Program **Date** 2/29/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,331.1	Noble Boiko G15-31D Plan #1 (2-29-12) (\	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Boiko G15-30D Pad Sec.15-T4N-R65W						
Boiko G15-30D - Wellbore #1 - Noble Boiko G15-30D Pl	800.0	799.0	22.3	18.9	6.621	CC, ES
Boiko G15-30D - Wellbore #1 - Noble Boiko G15-30D Pl	900.0	899.0	24.0	20.2	6.316	SF

Offset Design Boiko G15-30D Pad Sec.15-T4N-R65W - Boiko G15-30D - Wellbore #1 - Noble Boiko G15-30D Plan #1

Offset Site Error: 0.0 ft
Survey Program: 0-MWD
Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	22.3	22.3				
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	22.3	22.3	22.1	0.22	99.753	
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	22.3	22.3	21.6	0.67	33.196	
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	22.3	22.3	21.2	1.12	19.891	
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	22.3	22.3	20.7	1.57	14.200	
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	22.3	22.3	20.3	2.02	11.041	
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	22.3	22.3	19.8	2.47	9.031	
700.0	700.0	699.0	699.0	1.5	1.5	90.00	0.0	22.3	22.3	19.4	2.92	7.641	
800.0	800.0	799.0	799.0	1.7	1.7	90.00	0.0	22.3	22.3	18.9	3.37	6.621	CC, ES
900.0	900.0	899.0	899.0	1.9	1.9	-167.88	0.0	22.3	24.0	20.2	3.80	6.316	SF
1,000.0	999.8	998.8	998.8	2.1	2.1	-170.02	0.0	22.3	29.2	24.9	4.22	6.906	
1,100.0	1,099.5	1,098.9	1,098.8	2.3	2.4	-174.78	1.5	21.6	37.2	32.6	4.64	8.023	
1,200.0	1,198.7	1,198.4	1,198.3	2.6	2.6	177.99	6.2	19.4	48.2	43.2	5.06	9.531	
1,300.0	1,297.5	1,297.3	1,296.8	2.8	2.8	170.68	14.0	15.8	62.9	57.4	5.49	11.446	
1,400.0	1,395.9	1,395.5	1,394.2	3.2	3.1	164.10	24.7	10.8	80.2	74.2	5.97	13.437	
1,500.0	1,494.3	1,492.9	1,490.5	3.5	3.3	157.96	38.3	4.4	98.7	92.2	6.49	15.206	
1,600.0	1,592.8	1,589.5	1,585.3	3.8	3.6	152.25	54.7	-3.3	118.8	111.7	7.06	16.814	
1,700.0	1,691.2	1,684.9	1,678.4	4.2	3.9	146.98	73.8	-12.2	140.8	133.1	7.69	18.308	
1,800.0	1,789.6	1,779.1	1,769.6	4.6	4.3	142.15	95.4	-22.3	165.1	156.7	8.37	19.731	
1,900.0	1,888.1	1,872.4	1,859.0	5.0	4.7	137.77	119.3	-33.5	191.7	182.6	9.08	21.115	
2,000.0	1,986.5	1,967.6	1,950.0	5.3	5.2	134.14	144.7	-45.4	219.7	209.9	9.82	22.375	
2,100.0	2,084.9	2,062.8	2,041.0	5.7	5.7	131.34	170.0	-57.2	248.4	237.8	10.56	23.519	
2,200.0	2,183.4	2,157.9	2,131.9	6.1	6.2	129.11	195.3	-69.1	277.5	266.2	11.31	24.539	
2,300.0	2,281.8	2,253.1	2,222.9	6.5	6.7	127.30	220.6	-80.9	306.9	294.8	12.06	25.452	
2,400.0	2,380.2	2,348.3	2,313.9	6.9	7.2	125.81	246.0	-92.8	336.5	323.7	12.81	26.271	

Company:	NOBLE ENERGY INC WELD COUNTY CO	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Project:	SEC.15-T4N-R65W	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Reference Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Boiko G15-31D Plan #1 (2-29-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Boiko G15-30D Pad Sec.15-T4N-R65W - Boiko G15-30D - Wellbore #1 - Noble Boiko G15-30D Plan #1

Offset Site Error: 0.0 ft
Offset Well Error: 0.0 ft

Survey Program: 0-MWD

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,500.0	2,478.7	2,443.5	2,404.9	7.3	7.7	124.56	271.3	-104.6	366.3	352.8	13.56	27.007	
2,600.0	2,577.1	2,538.6	2,495.8	7.7	8.3	123.49	296.6	-116.5	396.3	382.0	14.32	27.671	
2,700.0	2,675.5	2,633.8	2,586.8	8.1	8.8	122.58	321.9	-128.3	426.3	411.3	15.08	28.273	
2,800.0	2,774.0	2,729.0	2,677.8	8.5	9.3	121.78	347.2	-140.2	456.5	440.6	15.84	28.819	
2,900.0	2,872.4	2,824.1	2,768.7	8.9	9.9	121.09	372.6	-152.0	486.7	470.1	16.60	29.316	
3,000.0	2,970.8	2,919.3	2,859.7	9.3	10.4	120.47	397.9	-163.9	517.0	499.6	17.37	29.771	
3,100.0	3,069.3	3,014.5	2,950.7	9.7	11.0	119.93	423.2	-175.7	547.3	529.2	18.13	30.188	
3,200.0	3,167.7	3,109.6	3,041.6	10.1	11.5	119.44	448.5	-187.6	577.7	558.8	18.89	30.572	
3,300.0	3,266.1	3,204.8	3,132.6	10.5	12.1	119.00	473.9	-199.4	608.1	588.4	19.66	30.927	
3,400.0	3,364.6	3,300.0	3,223.6	10.9	12.6	118.60	499.2	-211.3	638.5	618.1	20.43	31.254	
3,500.0	3,463.0	3,395.1	3,314.5	11.3	13.2	118.23	524.5	-223.1	668.9	647.7	21.20	31.558	
3,600.0	3,561.4	3,490.3	3,405.5	11.7	13.8	117.90	549.8	-235.0	699.4	677.4	21.97	31.841	
3,700.0	3,659.8	3,585.5	3,496.5	12.1	14.3	117.60	575.1	-246.8	729.9	707.2	22.74	32.104	
3,800.0	3,758.3	3,680.6	3,587.5	12.5	14.9	117.32	600.5	-258.7	760.4	736.9	23.51	32.350	
3,900.0	3,856.7	3,775.8	3,678.4	12.9	15.4	117.06	625.8	-270.5	790.9	766.7	24.28	32.581	
4,000.0	3,955.1	3,871.0	3,769.4	13.3	16.0	116.82	651.1	-282.3	821.5	796.4	25.05	32.797	
4,100.0	4,053.6	3,966.1	3,860.4	13.7	16.6	116.60	676.4	-294.2	852.0	826.2	25.82	33.000	
4,200.0	4,152.0	4,061.3	3,951.3	14.2	17.1	116.40	701.8	-306.0	882.6	856.0	26.59	33.191	
4,300.0	4,250.4	4,156.5	4,042.3	14.6	17.7	116.20	727.1	-317.9	913.2	885.8	27.36	33.371	
4,400.0	4,348.9	4,251.7	4,133.3	15.0	18.3	116.02	752.4	-329.7	943.8	915.6	28.14	33.540	
4,500.0	4,447.3	4,346.8	4,224.2	15.4	18.8	115.85	777.7	-341.6	974.3	945.4	28.91	33.701	
4,600.0	4,545.8	4,442.0	4,315.3	15.7	19.4	115.97	803.1	-353.4	1,004.7	975.0	29.71	33.822	
4,700.0	4,644.8	4,537.5	4,406.5	16.0	20.0	116.18	828.5	-365.3	1,033.9	1,003.4	30.44	33.964	
4,800.0	4,744.2	4,633.2	4,498.0	16.2	20.5	116.21	853.9	-377.2	1,061.6	1,030.5	31.12	34.108	
4,900.0	4,844.0	4,729.0	4,589.6	16.4	21.1	116.06	879.4	-389.2	1,087.9	1,056.1	31.75	34.261	
5,000.0	4,943.9	4,824.7	4,681.1	16.6	21.7	115.76	904.9	-401.1	1,112.9	1,080.6	32.33	34.427	
5,100.0	5,043.9	4,920.4	4,772.5	16.7	22.2	12.09	930.3	-413.0	1,136.8	1,104.0	32.82	34.632	
5,200.0	5,143.9	5,015.9	4,863.8	16.8	22.8	11.22	955.8	-424.9	1,160.7	1,127.4	33.28	34.872	
5,300.0	5,243.9	5,111.5	4,955.2	17.0	23.4	10.39	981.2	-436.8	1,184.9	1,151.1	33.74	35.118	
5,400.0	5,343.9	5,257.1	5,095.4	17.1	24.1	9.29	1,016.9	-453.5	1,207.3	1,173.1	34.24	35.261	
5,500.0	5,443.9	5,408.4	5,242.9	17.3	24.6	8.40	1,047.0	-467.6	1,225.8	1,191.1	34.69	35.337	
5,600.0	5,543.9	5,562.9	5,395.2	17.4	25.1	7.73	1,070.5	-478.6	1,239.9	1,204.8	35.11	35.315	
5,700.0	5,643.9	5,719.8	5,551.1	17.6	25.5	7.28	1,086.8	-486.2	1,249.5	1,214.0	35.51	35.189	
5,800.0	5,743.9	5,878.3	5,709.2	17.7	25.7	7.05	1,095.3	-490.2	1,254.6	1,218.7	35.88	34.965	
5,900.0	5,843.9	6,012.0	5,842.9	17.9	25.9	7.02	1,096.6	-490.8	1,255.3	1,219.1	36.21	34.672	
6,000.0	5,943.9	6,112.0	5,942.9	18.0	26.0	7.02	1,096.6	-490.8	1,255.3	1,218.8	36.51	34.384	
6,100.0	6,043.9	6,212.0	6,042.9	18.2	26.1	7.02	1,096.6	-490.8	1,255.3	1,218.5	36.81	34.099	
6,200.0	6,143.9	6,312.0	6,142.9	18.3	26.2	7.02	1,096.6	-490.8	1,255.3	1,218.2	37.12	33.815	
6,300.0	6,243.9	6,412.0	6,242.9	18.5	26.3	7.02	1,096.6	-490.8	1,255.3	1,217.9	37.44	33.533	
6,400.0	6,343.9	6,512.0	6,342.9	18.6	26.4	7.02	1,096.6	-490.8	1,255.3	1,217.6	37.75	33.254	
6,500.0	6,443.9	6,612.0	6,442.9	18.8	26.6	7.02	1,096.6	-490.8	1,255.3	1,217.3	38.07	32.977	
6,600.0	6,543.9	6,712.0	6,542.9	18.9	26.7	7.02	1,096.6	-490.8	1,255.3	1,216.9	38.39	32.702	
6,700.0	6,643.9	6,812.0	6,642.9	19.1	26.8	7.02	1,096.6	-490.8	1,255.3	1,216.6	38.71	32.430	
6,800.0	6,743.9	6,912.0	6,742.9	19.3	26.9	7.02	1,096.6	-490.8	1,255.3	1,216.3	39.03	32.160	
6,900.0	6,843.9	7,012.0	6,842.9	19.4	27.0	7.02	1,096.6	-490.8	1,255.3	1,216.0	39.36	31.892	
7,000.0	6,943.9	7,112.0	6,942.9	19.6	27.1	7.02	1,096.6	-490.8	1,255.3	1,215.6	39.69	31.627	
7,100.0	7,043.9	7,212.0	7,042.9	19.8	27.3	7.02	1,096.6	-490.8	1,255.3	1,215.3	40.02	31.365	
7,200.0	7,143.9	7,312.0	7,142.9	19.9	27.4	7.02	1,096.6	-490.8	1,255.3	1,215.0	40.36	31.105	
7,300.0	7,243.9	7,412.0	7,242.9	20.1	27.5	7.02	1,096.6	-490.8	1,255.3	1,214.6	40.69	30.848	
7,331.1	7,275.0	7,443.1	7,274.0	20.1	27.5	7.02	1,096.6	-490.8	1,255.3	1,214.5	40.80	30.768	

Company:	NOBLE ENERGY INC WELD COUNTY CO	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Project:	SEC.15-T4N-R65W	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Reference Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Boiko G15-31D Plan #1 (2-29-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4751.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinates are relative to: Boiko G15-31D
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.54°

Company:	NOBLE ENERGY INC WELD COUNTY CO	**Local Co-ordinate Reference:**	Well Boiko G15-31D
Project:	SEC.15-T4N-R65W	**TVD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Reference Site:	Boiko G15-30D Pad Sec.15-T4N-R65W	**MD Reference:**	WELL @ 4751.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Boiko G15-31D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Boiko G15-31D Plan #1 (2-29-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4751.0ft (Original Well Elev) Coordinates are relative to: Boiko G15-31D
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: 0.54°