



Survey Certification

7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Operator	Whiting Petroleum Corp.
Well Name & No.	Nelson Ranches A-7
API #	05-123-19651
County & State	Weld County, CO
SDI Job No.	410415K273672
Rig	N/A
Survey Date	17-Apr-2015

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 6500.52 feet is true and correct as determined from all available records.

Seth M. Burstad

Signature

5-May-2015

Date

Seth M. Burstad

Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District



Whiting Petroleum Corp.

**Weld County, CO
Nelson Ranches
Nelson Ranches A-7**

OH

Design: OH

Standard Survey Report

05 May, 2015



Scientific Drilling

www.scientificdrilling.com





Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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

Site	Nelson Ranches				
Site Position:		Northing:	1,554,350.31 usft	Latitude:	40° 50' 38.645 N
From:	Lat/Long	Easting:	3,443,451.35 usft	Longitude:	103° 53' 49.877 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	1.04 °

Well	Nelson Ranches A-7, 2280' FSL 2280' FEL Sec 20 T10N R58W					
Well Position	+N/-S	0.00 ft	Northing:	1,546,650.10 usft	Latitude:	40° 49' 22.105 N
	+E/-W	0.00 ft	Easting:	3,446,063.09 usft	Longitude:	103° 53' 17.722 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,808.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	4/17/2015	8.01	67.38	52,911

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	131.14	

Survey Program	Date	5/5/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	6,500.52	Survey #1 - SDI Gyro (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3	

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
25.00	0.35	288.93	25.00	0.02	-0.07	-0.07	1.40	1.40	0.00
First SDI Gyro Survey									
50.00	0.70	288.93	50.00	0.10	-0.29	-0.28	1.40	1.40	0.00
75.00	0.61	291.93	75.00	0.20	-0.56	-0.55	0.39	-0.36	12.00
100.00	0.53	295.92	100.00	0.30	-0.78	-0.79	0.36	-0.32	15.96
125.00	0.54	293.29	124.99	0.40	-1.00	-1.01	0.11	0.04	-10.52
150.00	0.56	290.82	149.99	0.49	-1.22	-1.24	0.12	0.08	-9.88
175.00	0.48	290.18	174.99	0.57	-1.43	-1.45	0.32	-0.32	-2.56
200.00	0.39	289.29	199.99	0.63	-1.61	-1.63	0.36	-0.36	-3.56
225.00	0.39	293.14	224.99	0.69	-1.77	-1.79	0.10	0.00	15.40



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Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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)
250.00	0.39	297.03	249.99	0.76	-1.92	-1.95	0.11	0.00	15.56
275.00	0.42	298.51	274.99	0.85	-2.08	-2.12	0.13	0.12	5.92
300.00	0.45	299.74	299.99	0.94	-2.24	-2.31	0.13	0.12	4.92
325.00	0.46	295.15	324.99	1.03	-2.42	-2.50	0.15	0.04	-18.36
350.00	0.48	290.85	349.99	1.11	-2.61	-2.69	0.16	0.08	-17.20
375.00	0.46	289.01	374.99	1.18	-2.80	-2.89	0.10	-0.08	-7.36
400.00	0.44	287.00	399.99	1.24	-2.99	-3.07	0.10	-0.08	-8.04
425.00	0.42	287.66	424.99	1.30	-3.17	-3.24	0.08	-0.08	2.64
450.00	0.40	288.41	449.98	1.35	-3.34	-3.40	0.08	-0.08	3.00
475.00	0.39	293.99	474.98	1.41	-3.50	-3.56	0.16	-0.04	22.32
500.00	0.39	299.67	499.98	1.49	-3.65	-3.73	0.15	0.00	22.72
525.00	0.43	296.35	524.98	1.57	-3.81	-3.90	0.19	0.16	-13.28
550.00	0.48	293.60	549.98	1.66	-3.99	-4.09	0.22	0.20	-11.00
575.00	0.45	290.76	574.98	1.73	-4.18	-4.29	0.15	-0.12	-11.36
600.00	0.42	287.58	599.98	1.80	-4.36	-4.46	0.15	-0.12	-12.72
625.00	0.40	294.39	624.98	1.86	-4.52	-4.63	0.21	-0.08	27.24
650.00	0.38	302.03	649.98	1.94	-4.67	-4.79	0.22	-0.08	30.56
675.00	0.42	296.70	674.98	2.03	-4.82	-4.97	0.22	0.16	-21.32
700.00	0.47	292.37	699.98	2.11	-5.00	-5.15	0.24	0.20	-17.32
725.00	0.42	288.78	724.98	2.17	-5.18	-5.33	0.23	-0.20	-14.36
750.00	0.37	284.18	749.98	2.22	-5.35	-5.49	0.24	-0.20	-18.40
775.00	0.33	289.61	774.98	2.27	-5.49	-5.63	0.21	-0.16	21.72
800.00	0.29	296.48	799.98	2.32	-5.62	-5.76	0.22	-0.16	27.48
825.00	0.30	299.72	824.98	2.38	-5.73	-5.88	0.08	0.04	12.96
850.00	0.30	302.76	849.98	2.45	-5.84	-6.01	0.06	0.00	12.16
875.00	0.29	299.06	874.97	2.51	-5.95	-6.14	0.09	-0.04	-14.80
900.00	0.28	295.04	899.97	2.57	-6.06	-6.26	0.09	-0.04	-16.08
925.00	0.28	291.64	924.97	2.62	-6.18	-6.37	0.07	0.00	-13.60
950.00	0.29	288.32	949.97	2.66	-6.29	-6.49	0.08	0.04	-13.28
975.00	0.22	291.33	974.97	2.70	-6.40	-6.59	0.28	-0.28	12.04
1,000.00	0.16	296.78	999.97	2.73	-6.47	-6.67	0.25	-0.24	21.80
1,025.00	0.17	307.00	1,024.97	2.77	-6.53	-6.74	0.12	0.04	40.88
1,050.00	0.19	315.56	1,049.97	2.82	-6.59	-6.82	0.13	0.08	34.24
1,075.00	0.23	308.70	1,074.97	2.88	-6.66	-6.91	0.19	0.16	-27.44
1,100.00	0.26	303.65	1,099.97	2.95	-6.75	-7.02	0.15	0.12	-20.20
1,125.00	0.25	293.83	1,124.97	3.00	-6.84	-7.13	0.18	-0.04	-39.28
1,150.00	0.24	283.27	1,149.97	3.03	-6.95	-7.23	0.18	-0.04	-42.24
1,175.00	0.20	294.12	1,174.97	3.06	-7.04	-7.31	0.23	-0.16	43.40
1,200.00	0.17	310.35	1,199.97	3.11	-7.10	-7.39	0.24	-0.12	64.92
1,225.00	0.22	309.42	1,224.97	3.16	-7.17	-7.48	0.20	0.20	-3.72
1,250.00	0.28	308.86	1,249.97	3.23	-7.25	-7.59	0.24	0.24	-2.24
1,275.00	0.25	301.85	1,274.97	3.30	-7.35	-7.70	0.18	-0.12	-28.04
1,300.00	0.23	293.03	1,299.97	3.34	-7.44	-7.80	0.17	-0.08	-35.28



Scientific Drilling International

Survey Report



Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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)
1,325.00	0.23	305.38	1,324.97	3.39	-7.53	-7.90	0.20	0.00	49.40
1,350.00	0.25	317.30	1,349.97	3.46	-7.61	-8.01	0.21	0.08	47.68
1,375.00	0.28	305.31	1,374.97	3.54	-7.69	-8.12	0.25	0.12	-47.96
1,400.00	0.32	295.81	1,399.97	3.60	-7.81	-8.25	0.25	0.16	-38.00
1,425.00	0.28	301.19	1,424.97	3.66	-7.92	-8.38	0.20	-0.16	21.52
1,450.00	0.25	308.33	1,449.97	3.73	-8.02	-8.49	0.18	-0.12	28.56
1,475.00	0.31	303.44	1,474.97	3.80	-8.11	-8.61	0.26	0.24	-19.56
1,500.00	0.38	300.13	1,499.97	3.88	-8.24	-8.76	0.29	0.28	-13.24
1,525.00	0.33	299.49	1,524.97	3.96	-8.38	-8.91	0.20	-0.20	-2.56
1,550.00	0.28	298.65	1,549.97	4.02	-8.49	-9.04	0.20	-0.20	-3.36
1,575.00	0.33	300.90	1,574.97	4.09	-8.61	-9.17	0.21	0.20	9.00
1,600.00	0.38	302.57	1,599.97	4.17	-8.74	-9.33	0.20	0.20	6.68
1,625.00	0.35	298.08	1,624.97	4.25	-8.88	-9.48	0.17	-0.12	-17.96
1,650.00	0.32	292.81	1,649.97	4.31	-9.01	-9.62	0.17	-0.12	-21.08
1,675.00	0.32	290.43	1,674.97	4.37	-9.14	-9.75	0.05	0.00	-9.52
1,700.00	0.32	288.04	1,699.97	4.41	-9.27	-9.88	0.05	0.00	-9.56
1,725.00	0.31	279.63	1,724.97	4.44	-9.40	-10.01	0.19	-0.04	-33.64
1,750.00	0.30	270.46	1,749.96	4.46	-9.54	-10.11	0.20	-0.04	-36.68
1,775.00	0.17	257.56	1,774.96	4.45	-9.64	-10.18	0.56	-0.52	-51.60
1,800.00	0.09	207.18	1,799.96	4.42	-9.68	-10.20	0.53	-0.32	-201.52
1,825.00	0.28	171.97	1,824.96	4.34	-9.68	-10.15	0.85	0.76	-140.84
1,850.00	0.48	166.05	1,849.96	4.18	-9.65	-10.02	0.81	0.80	-23.68
1,875.00	0.52	166.26	1,874.96	3.97	-9.60	-9.84	0.16	0.16	0.84
1,900.00	0.56	166.45	1,899.96	3.74	-9.54	-9.65	0.16	0.16	0.76
1,925.00	0.70	157.82	1,924.96	3.48	-9.46	-9.41	0.67	0.56	-34.52
1,950.00	0.85	152.19	1,949.96	3.18	-9.31	-9.10	0.67	0.60	-22.52
1,975.00	1.00	148.45	1,974.95	2.83	-9.11	-8.72	0.65	0.60	-14.96
2,000.00	1.16	145.68	1,999.95	2.43	-8.85	-8.27	0.67	0.64	-11.08
2,025.00	1.16	148.28	2,024.95	2.01	-8.58	-7.78	0.21	0.00	10.40
2,050.00	1.17	150.82	2,049.94	1.57	-8.32	-7.30	0.21	0.04	10.16
2,075.00	1.17	146.32	2,074.93	1.13	-8.05	-6.81	0.37	0.00	-18.00
2,100.00	1.19	141.96	2,099.93	0.72	-7.75	-6.31	0.37	0.08	-17.44
2,125.00	1.23	142.78	2,124.92	0.30	-7.43	-5.79	0.17	0.16	3.28
2,150.00	1.28	143.53	2,149.92	-0.14	-7.10	-5.26	0.21	0.20	3.00
2,175.00	1.16	141.00	2,174.91	-0.56	-6.78	-4.74	0.53	-0.48	-10.12
2,200.00	1.04	137.90	2,199.91	-0.93	-6.47	-4.26	0.54	-0.48	-12.40
2,225.00	0.97	132.31	2,224.90	-1.24	-6.16	-3.82	0.48	-0.28	-22.36
2,250.00	0.90	125.88	2,249.90	-1.49	-5.84	-3.42	0.50	-0.28	-25.72
2,275.00	0.84	124.99	2,274.90	-1.71	-5.53	-3.04	0.25	-0.24	-3.56
2,300.00	0.78	123.96	2,299.90	-1.91	-5.24	-2.69	0.25	-0.24	-4.12
2,325.00	0.76	120.93	2,324.89	-2.09	-4.96	-2.36	0.18	-0.08	-12.12
2,350.00	0.75	117.80	2,349.89	-2.26	-4.67	-2.03	0.17	-0.04	-12.52
2,375.00	0.70	117.90	2,374.89	-2.40	-4.39	-1.73	0.20	-0.20	0.40



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Survey									
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2,400.00	0.64	118.02	2,399.89	-2.54	-4.13	-1.44	0.24	-0.24	0.48
2,425.00	0.60	115.04	2,424.89	-2.66	-3.89	-1.18	0.21	-0.16	-11.92
2,450.00	0.57	111.68	2,449.88	-2.76	-3.66	-0.94	0.18	-0.12	-13.44
2,475.00	0.57	112.34	2,474.88	-2.86	-3.43	-0.70	0.03	0.00	2.64
2,500.00	0.57	113.00	2,499.88	-2.95	-3.20	-0.47	0.03	0.00	2.64
2,525.00	0.55	115.27	2,524.88	-3.05	-2.97	-0.23	0.12	-0.08	9.08
2,550.00	0.53	117.71	2,549.88	-3.16	-2.76	0.00	0.12	-0.08	9.76
2,575.00	0.48	121.74	2,574.88	-3.27	-2.57	0.21	0.25	-0.20	16.12
2,600.00	0.43	126.70	2,599.88	-3.38	-2.41	0.41	0.25	-0.20	19.84
2,625.00	0.40	124.08	2,624.88	-3.48	-2.26	0.59	0.14	-0.12	-10.48
2,650.00	0.36	120.98	2,649.88	-3.57	-2.12	0.75	0.18	-0.16	-12.40
2,675.00	0.36	115.38	2,674.88	-3.65	-1.98	0.91	0.14	0.00	-22.40
2,700.00	0.36	109.68	2,699.88	-3.71	-1.84	1.05	0.14	0.00	-22.80
2,725.00	0.41	106.89	2,724.87	-3.76	-1.68	1.21	0.21	0.20	-11.16
2,750.00	0.47	104.78	2,749.87	-3.81	-1.49	1.38	0.25	0.24	-8.44
2,775.00	0.42	105.44	2,774.87	-3.86	-1.31	1.56	0.20	-0.20	2.64
2,800.00	0.37	106.30	2,799.87	-3.91	-1.14	1.71	0.20	-0.20	3.44
2,825.00	0.43	109.80	2,824.87	-3.96	-0.97	1.87	0.26	0.24	14.00
2,850.00	0.49	112.47	2,849.87	-4.03	-0.79	2.06	0.25	0.24	10.68
2,875.00	0.48	117.57	2,874.87	-4.12	-0.60	2.26	0.18	-0.04	20.40
2,900.00	0.48	122.55	2,899.87	-4.23	-0.41	2.47	0.17	0.00	19.92
2,925.00	0.59	115.03	2,924.87	-4.34	-0.21	2.70	0.52	0.44	-30.08
2,950.00	0.70	109.83	2,949.87	-4.45	0.05	2.96	0.50	0.44	-20.80
2,975.00	0.90	116.24	2,974.86	-4.58	0.37	3.30	0.88	0.80	25.64
3,000.00	1.11	120.26	2,999.86	-4.79	0.76	3.72	0.89	0.84	16.08
3,025.00	1.16	119.64	3,024.86	-5.04	1.18	4.21	0.21	0.20	-2.48
3,050.00	1.21	118.99	3,049.85	-5.29	1.64	4.71	0.21	0.20	-2.60
3,075.00	1.30	111.77	3,074.84	-5.53	2.13	5.24	0.73	0.36	-28.88
3,100.00	1.42	105.64	3,099.84	-5.72	2.69	5.79	0.75	0.48	-24.52
3,125.00	1.52	103.53	3,124.83	-5.88	3.31	6.36	0.45	0.40	-8.44
3,150.00	1.62	101.70	3,149.82	-6.03	3.98	6.96	0.45	0.40	-7.32
3,175.00	1.63	102.05	3,174.81	-6.17	4.67	7.58	0.06	0.04	1.40
3,200.00	1.65	102.41	3,199.80	-6.32	5.37	8.21	0.09	0.08	1.44
3,225.00	1.67	101.11	3,224.79	-6.47	6.08	8.84	0.17	0.08	-5.20
3,250.00	1.70	99.84	3,249.78	-6.60	6.81	9.47	0.19	0.12	-5.08
3,275.00	1.71	100.20	3,274.77	-6.73	7.54	10.11	0.06	0.04	1.44
3,300.00	1.72	100.55	3,299.76	-6.87	8.27	10.75	0.06	0.04	1.40
3,325.00	1.70	98.65	3,324.74	-6.99	9.01	11.39	0.24	-0.08	-7.60
3,350.00	1.68	96.73	3,349.73	-7.09	9.74	12.00	0.24	-0.08	-7.68
3,375.00	1.64	96.05	3,374.72	-7.17	10.46	12.60	0.18	-0.16	-2.72
3,400.00	1.59	95.35	3,399.71	-7.24	11.16	13.17	0.22	-0.20	-2.80
3,425.00	1.59	95.74	3,424.70	-7.31	11.85	13.73	0.04	0.00	1.56
3,450.00	1.59	96.14	3,449.69	-7.38	12.54	14.30	0.04	0.00	1.60
3,475.00	1.65	95.88	3,474.68	-7.45	13.24	14.88	0.24	0.24	-1.04



Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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)
3,500.00	1.70	95.60	3,499.67	-7.53	13.97	15.47	0.20	0.20	-1.12
3,525.00	1.66	94.18	3,524.66	-7.59	14.70	16.07	0.23	-0.16	-5.68
3,550.00	1.63	92.72	3,549.65	-7.63	15.42	16.63	0.21	-0.12	-5.84
3,575.00	1.72	92.68	3,574.64	-7.67	16.15	17.21	0.36	0.36	-0.16
3,600.00	1.80	92.67	3,599.63	-7.70	16.91	17.81	0.32	0.32	-0.04
3,625.00	1.77	94.01	3,624.62	-7.75	17.69	18.42	0.21	-0.12	5.36
3,650.00	1.74	95.40	3,649.61	-7.81	18.45	19.04	0.21	-0.12	5.56
3,675.00	1.78	93.21	3,674.59	-7.87	19.22	19.65	0.31	0.16	-8.76
3,700.00	1.81	91.13	3,699.58	-7.90	20.00	20.26	0.29	0.12	-8.32
3,725.00	1.85	90.96	3,724.57	-7.91	20.80	20.87	0.16	0.16	-0.68
3,750.00	1.90	90.85	3,749.56	-7.93	21.62	21.50	0.20	0.20	-0.44
3,775.00	1.91	93.93	3,774.54	-7.96	22.45	22.14	0.41	0.04	12.32
3,800.00	1.94	96.96	3,799.53	-8.04	23.28	22.83	0.42	0.12	12.12
3,825.00	1.90	98.86	3,824.51	-8.16	24.11	23.53	0.30	-0.16	7.60
3,850.00	1.86	100.84	3,849.50	-8.30	24.92	24.23	0.31	-0.16	7.92
3,875.00	1.88	103.17	3,874.49	-8.47	25.72	24.94	0.31	0.08	9.32
3,900.00	1.91	105.48	3,899.47	-8.67	26.52	25.68	0.33	0.12	9.24
3,925.00	1.92	108.93	3,924.46	-8.92	27.32	26.44	0.46	0.04	13.80
3,950.00	1.94	112.31	3,949.45	-9.21	28.11	27.23	0.46	0.08	13.52
3,975.00	1.87	116.11	3,974.43	-9.55	28.86	28.02	0.58	-0.28	15.20
4,000.00	1.82	120.17	3,999.42	-9.93	29.57	28.81	0.56	-0.20	16.24
4,025.00	1.79	122.76	4,024.41	-10.34	30.24	29.58	0.35	-0.12	10.36
4,050.00	1.77	125.42	4,049.39	-10.78	30.89	30.35	0.34	-0.08	10.64
4,075.00	1.79	128.65	4,074.38	-11.25	31.51	31.13	0.41	0.08	12.92
4,100.00	1.80	131.82	4,099.37	-11.75	32.11	31.91	0.40	0.04	12.68
4,125.00	1.82	135.53	4,124.36	-12.30	32.68	32.70	0.48	0.08	14.84
4,150.00	1.83	139.18	4,149.34	-12.88	33.21	33.49	0.47	0.04	14.60
4,175.00	1.94	143.68	4,174.33	-13.53	33.73	34.30	0.74	0.44	18.00
4,200.00	2.06	147.70	4,199.32	-14.25	34.22	35.14	0.74	0.48	16.08
4,225.00	2.25	152.04	4,224.30	-15.06	34.69	36.03	1.00	0.76	17.36
4,250.00	2.46	155.68	4,249.28	-15.98	35.14	36.98	1.03	0.84	14.56
4,275.00	2.59	158.52	4,274.25	-17.00	35.57	37.97	0.72	0.52	11.36
4,300.00	2.72	161.07	4,299.23	-18.08	35.97	38.98	0.70	0.52	10.20
4,325.00	2.77	162.40	4,324.20	-19.22	36.34	40.01	0.32	0.20	5.32
4,350.00	2.82	163.69	4,349.17	-20.39	36.70	41.05	0.32	0.20	5.16
4,375.00	2.90	163.99	4,374.14	-21.58	37.04	42.10	0.33	0.32	1.20
4,400.00	2.98	164.28	4,399.10	-22.82	37.39	43.17	0.33	0.32	1.16
4,425.00	3.11	166.81	4,424.07	-24.10	37.72	44.27	0.75	0.52	10.12
4,450.00	3.24	169.15	4,449.03	-25.46	38.01	45.38	0.73	0.52	9.36
4,475.00	3.33	169.97	4,473.99	-26.87	38.27	46.50	0.41	0.36	3.28
4,500.00	3.42	170.76	4,498.95	-28.32	38.52	47.64	0.41	0.36	3.16
4,525.00	3.57	174.61	4,523.90	-29.83	38.71	48.78	1.11	0.60	15.40
4,550.00	3.73	178.13	4,548.85	-31.42	38.81	49.90	1.10	0.64	14.08



Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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)
4,575.00	3.63	180.79	4,573.80	-33.02	38.83	50.96	0.79	-0.40	10.64
4,600.00	3.54	183.58	4,598.75	-34.58	38.77	51.95	0.79	-0.36	11.16
4,625.00	3.30	185.54	4,623.70	-36.07	38.65	52.84	1.07	-0.96	7.84
4,650.00	3.06	187.82	4,648.67	-37.45	38.49	53.62	1.08	-0.96	9.12
4,675.00	2.61	191.54	4,673.63	-38.66	38.28	54.27	1.94	-1.80	14.88
4,700.00	2.17	196.70	4,698.61	-39.68	38.03	54.75	1.96	-1.76	20.64
4,725.00	2.03	196.07	4,723.60	-40.55	37.78	55.13	0.57	-0.56	-2.52
4,750.00	1.88	195.35	4,748.58	-41.38	37.54	55.50	0.61	-0.60	-2.88
4,775.00	1.74	196.67	4,773.57	-42.13	37.33	55.83	0.58	-0.56	5.28
4,800.00	1.59	198.22	4,798.56	-42.83	37.11	56.12	0.63	-0.60	6.20
4,825.00	1.30	195.37	4,823.55	-43.43	36.93	56.38	1.19	-1.16	-11.40
4,850.00	1.02	190.96	4,848.55	-43.92	36.81	56.62	1.17	-1.12	-17.64
4,875.00	0.86	189.27	4,873.54	-44.33	36.74	56.83	0.65	-0.64	-6.76
4,900.00	0.70	186.87	4,898.54	-44.66	36.69	57.01	0.65	-0.64	-9.60
4,925.00	0.57	181.98	4,923.54	-44.94	36.67	57.18	0.56	-0.52	-19.56
4,950.00	0.45	174.29	4,948.54	-45.16	36.67	57.33	0.55	-0.48	-30.76
4,975.00	0.48	161.06	4,973.54	-45.36	36.71	57.49	0.44	0.12	-52.92
5,000.00	0.53	149.93	4,998.54	-45.56	36.81	57.69	0.44	0.20	-44.52
5,025.00	0.44	149.91	5,023.53	-45.74	36.91	57.89	0.36	-0.36	-0.08
5,050.00	0.35	149.76	5,048.53	-45.89	37.00	58.05	0.36	-0.36	-0.60
5,075.00	0.34	139.88	5,073.53	-46.01	37.09	58.20	0.24	-0.04	-39.52
5,100.00	0.35	129.93	5,098.53	-46.12	37.19	58.35	0.24	0.04	-39.80
5,125.00	0.42	111.96	5,123.53	-46.20	37.34	58.51	0.55	0.28	-71.88
5,150.00	0.52	100.01	5,148.53	-46.25	37.53	58.70	0.56	0.40	-47.80
5,175.00	0.50	95.48	5,173.53	-46.28	37.75	58.88	0.18	-0.08	-18.12
5,200.00	0.48	90.67	5,198.53	-46.30	37.97	59.05	0.18	-0.08	-19.24
5,225.00	0.56	83.94	5,223.53	-46.28	38.19	59.21	0.40	0.32	-26.92
5,250.00	0.64	78.88	5,248.53	-46.24	38.45	59.38	0.38	0.32	-20.24
5,275.00	0.58	80.11	5,273.53	-46.20	38.71	59.55	0.25	-0.24	4.92
5,300.00	0.53	81.65	5,298.52	-46.16	38.95	59.70	0.21	-0.20	6.16
5,325.00	0.63	83.82	5,323.52	-46.13	39.20	59.87	0.41	0.40	8.68
5,350.00	0.72	85.39	5,348.52	-46.10	39.49	60.07	0.37	0.36	6.28
5,375.00	0.73	89.12	5,373.52	-46.08	39.81	60.30	0.19	0.04	14.92
5,400.00	0.74	92.70	5,398.52	-46.09	40.13	60.54	0.19	0.04	14.32
5,425.00	0.68	86.69	5,423.52	-46.09	40.44	60.78	0.38	-0.24	-24.04
5,450.00	0.63	79.75	5,448.51	-46.05	40.72	60.97	0.37	-0.20	-27.76
5,475.00	0.68	81.20	5,473.51	-46.01	41.01	61.15	0.21	0.20	5.80
5,500.00	0.72	82.47	5,498.51	-45.96	41.31	61.35	0.17	0.16	5.08
5,525.00	0.69	83.54	5,523.51	-45.93	41.61	61.55	0.13	-0.12	4.28
5,550.00	0.66	84.71	5,548.51	-45.90	41.91	61.76	0.13	-0.12	4.68
5,575.00	0.63	85.99	5,573.51	-45.87	42.19	61.95	0.13	-0.12	5.12
5,600.00	0.60	87.40	5,598.50	-45.86	42.45	62.14	0.13	-0.12	5.64
5,625.00	0.61	87.47	5,623.50	-45.85	42.72	62.33	0.04	0.04	0.28



Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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)
5,650.00	0.62	87.53	5,648.50	-45.83	42.99	62.53	0.04	0.04	0.24
5,675.00	0.63	87.60	5,673.50	-45.82	43.26	62.73	0.04	0.04	0.28
5,700.00	0.64	87.66	5,698.50	-45.81	43.54	62.93	0.04	0.04	0.24
5,725.00	0.63	92.89	5,723.50	-45.81	43.81	63.14	0.24	-0.04	20.92
5,750.00	0.62	98.42	5,748.49	-45.84	44.08	63.36	0.24	-0.04	22.12
5,775.00	0.62	104.00	5,773.49	-45.89	44.35	63.59	0.24	0.00	22.32
5,800.00	0.63	109.55	5,798.49	-45.97	44.61	63.84	0.25	0.04	22.20
5,825.00	0.57	103.81	5,823.49	-46.05	44.86	64.08	0.34	-0.24	-22.96
5,850.00	0.53	96.72	5,848.49	-46.09	45.10	64.28	0.32	-0.16	-28.36
5,875.00	0.49	88.45	5,873.49	-46.10	45.32	64.46	0.33	-0.16	-33.08
5,900.00	0.47	79.14	5,898.49	-46.08	45.52	64.60	0.32	-0.08	-37.24
5,925.00	0.50	84.18	5,923.49	-46.05	45.73	64.74	0.21	0.12	20.16
5,950.00	0.54	88.85	5,948.49	-46.03	45.96	64.90	0.23	0.16	18.68
5,975.00	0.58	92.89	5,973.48	-46.04	46.20	65.09	0.22	0.16	16.16
6,000.00	0.62	96.38	5,998.48	-46.06	46.47	65.30	0.22	0.16	13.96
6,025.00	0.60	91.10	6,023.48	-46.08	46.73	65.51	0.24	-0.08	-21.12
6,050.00	0.59	85.35	6,048.48	-46.07	46.99	65.70	0.24	-0.04	-23.00
6,075.00	0.58	79.38	6,073.48	-46.04	47.24	65.87	0.25	-0.04	-23.88
6,100.00	0.58	73.30	6,098.48	-45.98	47.49	66.01	0.25	0.00	-24.32
6,125.00	0.56	68.72	6,123.48	-45.90	47.72	66.13	0.20	-0.08	-18.32
6,150.00	0.54	63.83	6,148.48	-45.80	47.94	66.24	0.20	-0.08	-19.56
6,175.00	0.53	58.64	6,173.47	-45.69	48.15	66.32	0.20	-0.04	-20.76
6,200.00	0.52	53.20	6,198.47	-45.56	48.34	66.38	0.20	-0.04	-21.76
6,225.00	0.51	49.33	6,223.47	-45.42	48.51	66.42	0.14	-0.04	-15.48
6,250.00	0.51	45.38	6,248.47	-45.27	48.68	66.44	0.14	0.00	-15.80
6,275.00	0.50	41.39	6,273.47	-45.11	48.83	66.45	0.15	-0.04	-15.96
6,300.00	0.51	37.40	6,298.47	-44.94	48.97	66.44	0.15	0.04	-15.96
6,325.00	0.54	20.59	6,323.47	-44.74	49.08	66.39	0.63	0.12	-67.24
6,350.00	0.61	6.56	6,348.47	-44.50	49.13	66.28	0.63	0.28	-56.12
6,375.00	0.71	356.01	6,373.47	-44.21	49.14	66.09	0.63	0.40	-42.20
6,400.00	0.83	348.28	6,398.46	-43.88	49.09	65.84	0.63	0.48	-30.92
6,425.00	0.74	350.67	6,423.46	-43.54	49.03	65.57	0.38	-0.36	9.56
6,450.00	0.63	354.21	6,448.46	-43.25	48.99	65.34	0.47	-0.44	14.16
6,475.00	0.54	359.09	6,473.46	-42.99	48.97	65.16	0.41	-0.36	19.52
6,500.00	0.44	6.08	6,498.46	-42.78	48.98	65.03	0.47	-0.40	27.96
6,500.52	0.44	6.26	6,498.98	-42.77	48.98	65.03	0.27	0.00	34.62
Last SDI Gyro Survey									



Company:	Whiting Petroleum Corp.	Local Co-ordinate Reference:	Well Nelson Ranches A-7
Project:	Weld County, CO	TVD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Site:	Nelson Ranches	MD Reference:	GL 4808' & KB 11' @ 4819.00ft (Crane)
Well:	Nelson Ranches A-7	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.02	-0.07	First SDI Gyro Survey
6,500.52	6,498.98	-42.77	48.98	Last SDI Gyro Survey

Checked By: _____

Approved By: _____

Date: _____