



**Scientific Drilling**  
Directional Drilling Operations

# **Samson Resources Company**

**La Plata County, C.O.**

**SEC 23-T32N-R7W**

**Ignacio 32-7-23 #5**

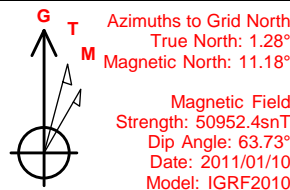
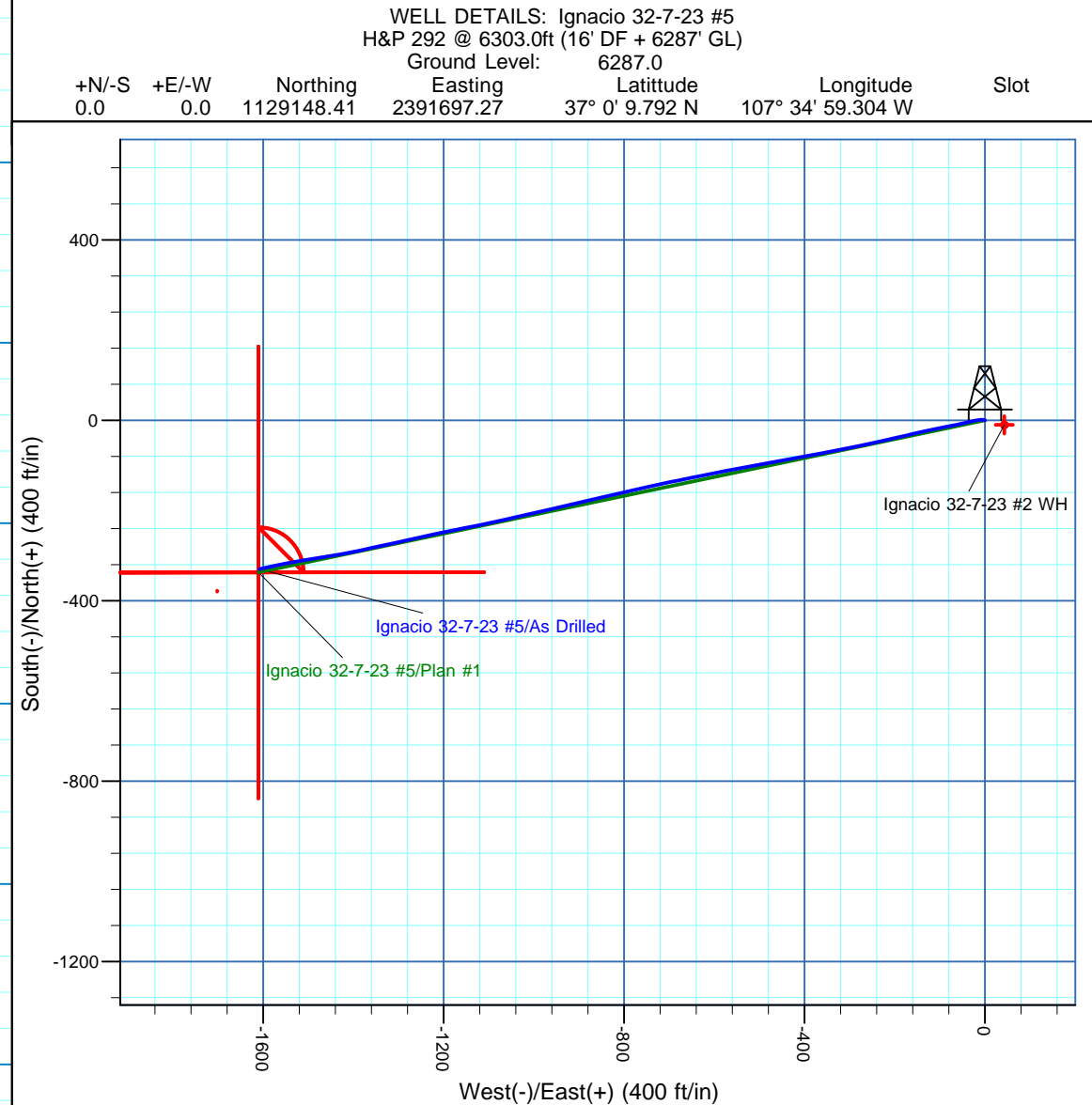
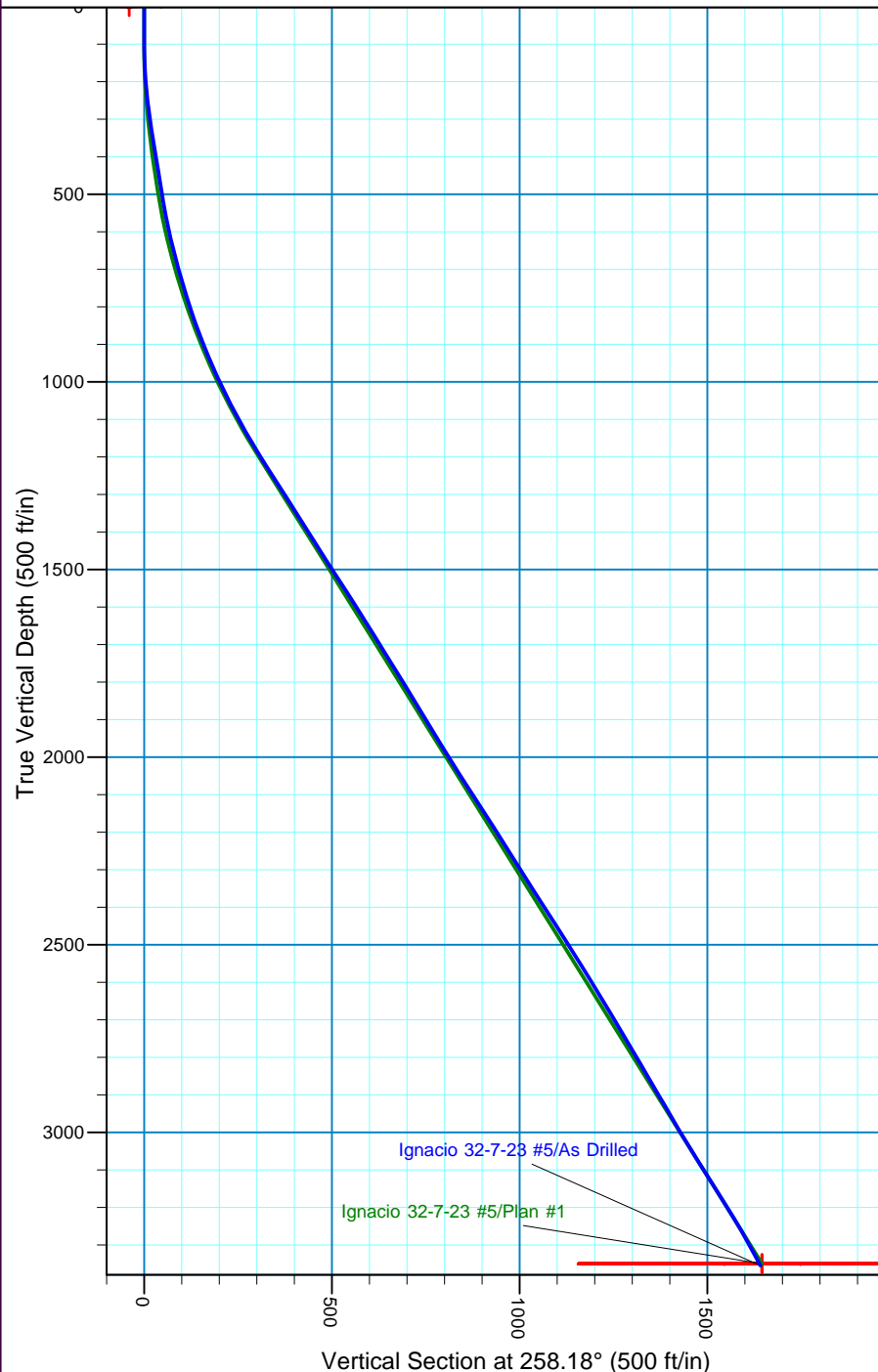
**Original Hole**

**Design: As Drilled**

## **Standard Survey Report**

**11 March, 2011**





**REFERENCE INFORMATION**

Co-ordinate (N/E) Reference: Well Ignacio 32-7-23 #5, Grid North  
 Vertical (TVD) Reference: H&P 292 @ 6303.0ft (16' DF + 6287' GL)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: H&P 292 @ 6303.0ft (16' DF + 6287' GL)  
 Calculation Method: Minimum Curvature

<b>Company:</b>	Samson Resources Company	<b>Local Co-ordinate Reference:</b>	Well Ignacio 32-7-23 #5
<b>Project:</b>	La Plata County, C.O.	<b>TVD Reference:</b>	H&P 292 @ 6303.0ft (16' DF + 6287' GL)
<b>Site:</b>	SEC 23-T32N-R7W	<b>MD Reference:</b>	H&P 292 @ 6303.0ft (16' DF + 6287' GL)
<b>Well:</b>	Ignacio 32-7-23 #5	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	La Plata County, C.O.		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Southern Zone		Using geodetic scale factor

<b>Site</b>	SEC 23-T32N-R7W		
<b>Site Position:</b>		<b>Northing:</b>	1,129,781.09 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,392,888.56 usft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	37° 0' 16.308 N
		<b>Longitude:</b>	107° 34' 44.796 W
		<b>Grid Convergence:</b>	-1.28 °

<b>Well</b>	Ignacio 32-7-23 #5, FC Slant Well		
<b>Well Position</b>	<b>+N-S</b>	0.0 ft	<b>Northing:</b> 1,129,148.41 usft
	<b>+E-W</b>	0.0 ft	<b>Easting:</b> 2,391,697.27 usft
<b>Position Uncertainty</b>		3.5 ft	<b>Wellhead Elevation:</b> ft
			<b>Latitude:</b> 37° 0' 9.792 N
			<b>Longitude:</b> 107° 34' 59.304 W
			<b>Ground Level:</b> 6,287.0 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2011/01/10	9.90	63.73	50,952

<b>Design</b>	As Drilled				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N-S (ft)</b>	<b>+E-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	258.18	

<b>Survey Program</b>	<b>Date</b>	2011/03/11			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
81.0	3,790.0	SDI MWD (Original Hole)	MWD SDI	MWD - Standard ver 1.0.1	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N-S (ft)</b>	<b>+E-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
81.0	0.26	326.63	81.0	0.2	-0.1	0.1	0.32	0.32	0.00	
110.0	1.11	295.77	110.0	0.3	-0.4	0.3	3.09	2.93	-106.41	
138.0	2.55	282.25	138.0	0.6	-1.2	1.1	5.33	5.14	-48.29	
166.0	3.32	279.61	165.9	0.8	-2.7	2.4	2.79	2.75	-9.43	
194.0	4.20	278.13	193.9	1.1	-4.5	4.1	3.16	3.14	-5.29	
223.0	5.36	272.74	222.8	1.3	-6.9	6.4	4.29	4.00	-18.59	
250.0	6.41	267.75	249.6	1.3	-9.6	9.2	4.32	3.89	-18.48	
280.0	7.61	261.65	279.4	1.0	-13.3	12.8	4.70	4.00	-20.33	
310.0	8.67	259.64	309.1	0.3	-17.5	17.0	3.66	3.53	-6.70	

<b>Company:</b>	Samson Resources Company	<b>Local Co-ordinate Reference:</b>	Well Ignacio 32-7-23 #5
<b>Project:</b>	La Plata County, C.O.	<b>TVD Reference:</b>	H&P 292 @ 6303.0ft (16' DF + 6287' GL)
<b>Site:</b>	SEC 23-T32N-R7W	<b>MD Reference:</b>	H&P 292 @ 6303.0ft (16' DF + 6287' GL)
<b>Well:</b>	Ignacio 32-7-23 #5	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
379.0	9.15	257.41	377.3	-1.8	-27.9	27.7	0.86	0.70	-3.23
410.0	9.24	256.48	407.9	-3.0	-32.8	32.7	0.56	0.29	-3.00
441.0	9.07	256.35	438.5	-4.1	-37.6	37.6	0.55	-0.55	-0.42
472.0	9.29	258.09	469.1	-5.2	-42.4	42.5	1.14	0.71	5.61
503.0	9.35	258.00	499.7	-6.2	-47.3	47.6	0.20	0.19	-0.29
533.0	9.99	256.57	529.3	-7.4	-52.2	52.6	2.28	2.13	-4.77
564.0	11.29	256.62	559.7	-8.7	-57.8	58.3	4.19	4.19	0.16
594.0	12.21	258.23	589.1	-10.0	-63.7	64.4	3.26	3.07	5.37
625.0	13.34	258.57	619.3	-11.4	-70.4	71.3	3.65	3.65	1.10
656.0	14.11	259.43	649.4	-12.8	-77.7	78.6	2.57	2.48	2.77
687.0	14.99	259.63	679.4	-14.2	-85.3	86.4	2.84	2.84	0.65
718.0	15.52	259.62	709.4	-15.7	-93.4	94.6	1.71	1.71	-0.03
749.0	16.27	259.06	739.2	-17.2	-101.7	103.1	2.47	2.42	-1.81
779.0	17.11	258.35	767.9	-18.9	-110.1	111.7	2.88	2.80	-2.37
810.0	18.01	257.87	797.5	-20.9	-119.3	121.0	2.94	2.90	-1.55
842.0	19.19	257.44	827.8	-23.0	-129.3	131.2	3.71	3.69	-1.34
873.0	20.21	257.04	857.0	-25.4	-139.5	141.7	3.32	3.29	-1.29
904.0	21.21	257.10	886.0	-27.8	-150.1	152.7	3.23	3.23	0.19
936.0	22.19	256.86	915.7	-30.5	-161.7	164.5	3.08	3.06	-0.75
967.0	23.07	257.00	944.3	-33.2	-173.3	176.4	2.84	2.84	0.45
998.0	24.04	257.19	972.7	-35.9	-185.4	188.8	3.14	3.13	0.61
1,029.0	25.29	257.11	1,000.9	-38.8	-198.0	201.7	4.03	4.03	-0.26
1,061.0	26.26	257.11	1,029.7	-41.9	-211.5	215.6	3.03	3.03	0.00
1,092.0	27.25	257.16	1,057.4	-45.0	-225.1	229.6	3.19	3.19	0.16
1,124.0	27.97	257.43	1,085.8	-48.3	-239.6	244.4	2.28	2.25	0.84
1,156.0	28.74	256.97	1,113.9	-51.7	-254.4	259.6	2.50	2.41	-1.44
1,187.0	30.12	257.84	1,140.9	-55.0	-269.3	274.8	4.66	4.45	2.81
1,219.0	31.00	258.69	1,168.5	-58.3	-285.2	291.1	3.06	2.75	2.66
1,250.0	31.75	259.09	1,194.9	-61.4	-301.1	307.3	2.51	2.42	1.29
1,282.0	31.96	259.22	1,222.1	-64.6	-317.7	324.1	0.69	0.66	0.41
1,313.0	32.53	259.43	1,248.3	-67.6	-333.9	340.7	1.87	1.84	0.68
1,342.0	32.95	259.85	1,272.7	-70.5	-349.3	356.4	1.65	1.45	1.45
1,374.0	32.79	260.00	1,299.6	-73.5	-366.4	373.7	0.56	-0.50	0.47
1,406.0	32.57	259.42	1,326.5	-76.6	-383.4	391.0	1.20	-0.69	-1.81
1,438.0	32.41	259.54	1,353.5	-79.7	-400.3	408.2	0.54	-0.50	0.38
1,469.0	32.07	259.44	1,379.8	-82.7	-416.6	424.7	1.11	-1.10	-0.32
1,500.0	31.93	259.13	1,406.0	-85.8	-432.7	441.1	0.70	-0.45	-1.00
1,532.0	31.80	259.35	1,433.2	-88.9	-449.3	458.0	0.54	-0.41	0.69
1,564.0	32.78	259.59	1,460.3	-92.1	-466.1	475.1	3.09	3.06	0.75
1,595.0	33.04	259.62	1,486.3	-95.1	-482.7	491.9	0.84	0.84	0.10
1,627.0	33.01	259.47	1,513.1	-98.3	-499.9	509.4	0.27	-0.09	-0.47
1,658.0	32.95	259.55	1,539.1	-101.3	-516.4	526.3	0.24	-0.19	0.26
1,690.0	32.69	259.33	1,566.0	-104.5	-533.5	543.6	0.89	-0.81	-0.69
1,721.0	32.41	259.54	1,592.2	-107.6	-549.9	560.3	0.97	-0.90	0.68

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1,752.0	32.23	259.16	1,618.3	-110.6	-566.2	576.8	0.88	-0.58	-1.23	
1,783.0	32.00	259.11	1,644.6	-113.7	-582.4	593.3	0.75	-0.74	-0.16	
1,814.0	31.92	259.11	1,670.9	-116.8	-598.5	609.7	0.26	-0.26	0.00	
1,846.0	31.57	258.84	1,698.1	-120.1	-615.0	626.6	1.18	-1.09	-0.84	
1,877.0	31.37	258.83	1,724.6	-123.2	-630.9	642.7	0.65	-0.65	-0.03	
1,909.0	31.16	258.77	1,751.9	-126.4	-647.2	659.3	0.66	-0.66	-0.19	
1,940.0	31.76	258.60	1,778.4	-129.6	-663.0	675.5	1.96	1.94	-0.55	
1,972.0	32.26	258.10	1,805.5	-133.0	-679.7	692.5	1.77	1.56	-1.56	
2,004.0	32.24	258.26	1,832.6	-136.5	-696.4	709.6	0.27	-0.06	0.50	
2,035.0	31.35	257.73	1,858.9	-139.9	-712.3	725.9	3.01	-2.87	-1.71	
2,067.0	30.86	257.68	1,886.3	-143.4	-728.5	742.4	1.53	-1.53	-0.16	
2,098.0	31.01	257.57	1,912.9	-146.9	-744.1	758.4	0.52	0.48	-0.35	
2,130.0	31.09	257.36	1,940.3	-150.4	-760.2	774.9	0.42	0.25	-0.66	
2,161.0	31.19	257.43	1,966.8	-153.9	-775.8	790.9	0.34	0.32	0.23	
2,192.0	31.58	257.60	1,993.3	-157.4	-791.6	807.0	1.29	1.26	0.55	
2,224.0	31.87	256.17	2,020.5	-161.2	-808.0	823.9	2.52	0.91	-4.47	
2,256.0	32.94	257.02	2,047.5	-165.2	-824.6	841.0	3.63	3.34	2.66	
2,287.0	33.13	257.51	2,073.5	-168.9	-841.1	857.9	1.06	0.61	1.58	
2,317.0	33.03	257.25	2,098.7	-172.5	-857.1	874.3	0.58	-0.33	-0.87	
2,348.0	32.79	257.26	2,124.7	-176.2	-873.5	891.1	0.77	-0.77	0.03	
2,379.0	32.66	257.28	2,150.8	-179.9	-889.9	907.9	0.42	-0.42	0.06	
2,411.0	32.37	257.15	2,177.8	-183.7	-906.7	925.1	0.93	-0.91	-0.41	
2,442.0	32.07	256.89	2,204.0	-187.4	-922.8	941.6	1.07	-0.97	-0.84	
2,474.0	31.91	256.67	2,231.1	-191.3	-939.3	958.5	0.62	-0.50	-0.69	
2,506.0	32.21	256.80	2,258.2	-195.2	-955.8	975.5	0.96	0.94	0.41	
2,538.0	32.17	256.19	2,285.3	-199.2	-972.4	992.6	1.02	-0.13	-1.91	
2,569.0	32.63	257.09	2,311.5	-203.0	-988.5	1,009.2	2.15	1.48	2.90	
2,601.0	32.85	257.13	2,338.4	-206.9	-1,005.4	1,026.5	0.69	0.69	0.13	
2,633.0	32.57	256.96	2,365.3	-210.8	-1,022.3	1,043.8	0.92	-0.88	-0.53	
2,664.0	32.62	256.68	2,391.5	-214.6	-1,038.5	1,060.5	0.51	0.16	-0.90	
2,696.0	32.84	257.92	2,418.4	-218.4	-1,055.4	1,077.8	2.21	0.69	3.88	
2,727.0	32.74	258.44	2,444.4	-221.8	-1,071.8	1,094.5	0.96	-0.32	1.68	
2,758.0	32.59	258.12	2,470.5	-225.2	-1,088.2	1,111.3	0.74	-0.48	-1.03	
2,789.0	32.21	257.79	2,496.7	-228.7	-1,104.5	1,127.9	1.35	-1.23	-1.06	
2,821.0	32.32	257.94	2,523.8	-232.3	-1,121.2	1,145.0	0.43	0.34	0.47	
2,853.0	31.63	258.59	2,550.9	-235.7	-1,137.7	1,161.9	2.41	-2.16	2.03	
2,884.0	31.36	259.09	2,577.3	-238.9	-1,153.6	1,178.1	1.21	-0.87	1.61	
2,916.0	31.22	258.65	2,604.7	-242.1	-1,169.9	1,194.7	0.84	-0.44	-1.38	
2,948.0	31.55	258.75	2,632.0	-245.3	-1,186.3	1,211.4	1.04	1.03	0.31	
2,980.0	31.57	258.57	2,659.3	-248.6	-1,202.7	1,228.1	0.30	0.06	-0.56	
3,011.0	31.01	257.67	2,685.8	-251.9	-1,218.5	1,244.2	2.35	-1.81	-2.90	
3,042.0	30.67	257.36	2,712.4	-255.4	-1,234.0	1,260.1	1.21	-1.10	-1.00	
3,074.0	31.09	257.60	2,739.8	-258.9	-1,250.0	1,276.5	1.37	1.31	0.75	

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<b>Site:</b>	SEC 23-T32N-R7W	<b>MD Reference:</b>	H&P 292 @ 6303.0ft (16' DF + 6287' GL)
<b>Well:</b>	Ignacio 32-7-23 #5	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,136.0	29.65	257.69	2,793.3	-265.6	-1,280.6	1,307.9	2.32	-2.32	0.15	
3,167.0	29.51	257.14	2,820.3	-269.0	-1,295.6	1,323.2	0.99	-0.45	-1.77	
3,198.0	30.37	257.60	2,847.2	-272.4	-1,310.7	1,338.7	2.87	2.77	1.48	
3,230.0	30.94	258.34	2,874.7	-275.8	-1,326.6	1,355.0	2.14	1.78	2.31	
3,262.0	30.91	258.27	2,902.1	-279.1	-1,342.7	1,371.4	0.15	-0.09	-0.22	
3,293.0	30.13	257.49	2,928.8	-282.4	-1,358.1	1,387.2	2.82	-2.52	-2.52	
3,325.0	30.24	257.29	2,956.5	-285.9	-1,373.8	1,403.3	0.47	0.34	-0.63	
3,356.0	30.33	257.55	2,983.3	-289.3	-1,389.1	1,418.9	0.51	0.29	0.84	
3,387.0	30.85	258.74	3,010.0	-292.6	-1,404.5	1,434.7	2.57	1.68	3.84	
3,419.0	31.79	260.60	3,037.3	-295.5	-1,420.9	1,451.3	4.21	2.94	5.81	
3,451.0	32.03	260.65	3,064.5	-298.3	-1,437.6	1,468.2	0.75	0.75	0.16	
3,482.0	31.91	260.44	3,090.8	-301.0	-1,453.8	1,484.6	0.53	-0.39	-0.68	
3,513.0	31.98	260.42	3,117.1	-303.7	-1,469.9	1,501.0	0.23	0.23	-0.06	
3,545.0	32.15	260.50	3,144.2	-306.5	-1,486.7	1,517.9	0.55	0.53	0.25	
3,576.0	32.22	260.42	3,170.4	-309.3	-1,503.0	1,534.4	0.26	0.23	-0.26	
3,607.0	32.53	260.61	3,196.6	-312.0	-1,519.3	1,551.0	1.05	1.00	0.61	
3,638.0	31.80	260.44	3,222.8	-314.7	-1,535.6	1,567.5	2.37	-2.35	-0.55	
3,670.0	30.25	259.14	3,250.3	-317.6	-1,551.8	1,584.0	5.28	-4.84	-4.06	
3,701.0	29.24	258.04	3,277.2	-320.7	-1,566.9	1,599.4	3.70	-3.26	-3.55	
3,733.0	28.63	258.08	3,305.2	-323.9	-1,582.1	1,614.9	1.91	-1.91	0.13	
3,790.0	27.54	258.15	3,355.5	-329.4	-1,608.3	1,641.7	1.91	-1.91	0.12	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Ignacio 32-7-23 #2 W	0.00	360.00	0.0	-10.2	42.8	1,129,138.22	2,391,740.06	37° 0' 9.701 N	107° 34' 58.774 W	
- actual wellpath misses target center by 44.0ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Circle (radius 5.0)										
Ignacio 32-7-23 #5 Sc	0.00	360.00	3,350.0	-337.0	-1,611.0	1,128,811.39	2,390,086.20	37° 0' 6.105 N	107° 35' 19.066 W	
- actual wellpath misses target center by 9.3ft at 3787.1ft MD (3352.9 TVD, -329.1 N, -1607.0 E)										
- Polygon										
Point 1			3,350.0	0.0	500.0	1,128,811.40	2,390,586.22			
Point 2			3,350.0	0.0	-500.0	1,128,811.40	2,389,586.17			
Ignacio 32-7-23 #5 Bf	0.00	360.00	3,350.0	-337.0	-1,611.0	1,128,811.39	2,390,086.20	37° 0' 6.105 N	107° 35' 19.066 W	
- actual wellpath misses target center by 9.3ft at 3787.1ft MD (3352.9 TVD, -329.1 N, -1607.0 E)										
- Circle (radius 100.0)										
Ignacio 32-7-23 #5 W	0.00	360.00	3,350.0	-337.0	-1,611.0	1,128,811.39	2,390,086.20	37° 0' 6.105 N	107° 35' 19.066 W	
- actual wellpath misses target center by 9.3ft at 3787.1ft MD (3352.9 TVD, -329.1 N, -1607.0 E)										
- Polygon										
Point 1			3,350.0	500.0	0.0	1,129,311.42	2,390,086.19			
Point 2			3,350.0	-500.0	0.0	1,128,311.37	2,390,086.19			

Checked By: _____	Approved By: _____	Date: _____
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