

# Noble Energy

Garfield County, CO

Sec. 19-T7S-R94W (Rulison 19I PAD)

Rulison Federal 19-43D

Plan #1

Plan: Plan #1 Proposal

## Sperry Drilling Services

### Proposal Report

02 March, 2009

Well Coordinates: 587,676.81 N, 1,316,419.77 E (39° 25' 19.10" N, 107° 55' 12.00" W)

Ground Level: 8,080.00 ft

Local Coordinate Origin:

Centered on Well Rulison Federal 19-43D

Viewing Datum:

RKB-25' @ 8105.00ft (Original Well Elev)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

## Plan Report for Rulison Federal 19-43D - Plan #1 Proposal

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff at 225.00ft										
300.00	1.50	249.58	299.99	-0.34	-0.92	0.98	2.00	2.00	0.00	249.58
325.00	2.00	249.58	324.98	-0.61	-1.64	1.75	2.00	2.00	0.00	0.00
Build Rate = 2.00°/100ft										
400.00	3.50	249.58	399.89	-1.86	-5.01	5.34	2.00	2.00	0.00	0.00
427.93	4.06	249.58	427.76	-2.51	-6.73	7.18	2.00	2.00	0.00	0.00
End Build at 427.93ft										
500.00	4.06	249.58	499.65	-4.29	-11.51	12.28	0.00	0.00	0.00	0.00
600.00	4.06	249.58	599.40	-6.75	-18.15	19.36	0.00	0.00	0.00	0.00
700.00	4.06	249.58	699.15	-9.22	-24.78	26.44	0.00	0.00	0.00	0.00
800.00	4.06	249.58	798.90	-11.69	-31.41	33.52	0.00	0.00	0.00	0.00
900.00	4.06	249.58	898.65	-14.16	-38.05	40.59	0.00	0.00	0.00	0.00
1,000.00	4.06	249.58	998.40	-16.63	-44.68	47.67	0.00	0.00	0.00	0.00
1,100.00	4.06	249.58	1,098.14	-19.10	-51.31	54.75	0.00	0.00	0.00	0.00
1,200.00	4.06	249.58	1,197.89	-21.57	-57.94	61.82	0.00	0.00	0.00	0.00
1,300.00	4.06	249.58	1,297.64	-24.04	-64.58	68.90	0.00	0.00	0.00	0.00
1,400.00	4.06	249.58	1,397.39	-26.51	-71.21	75.98	0.00	0.00	0.00	0.00
1,500.00	4.06	249.58	1,497.14	-28.98	-77.84	83.06	0.00	0.00	0.00	0.00
1,600.00	4.06	249.58	1,596.89	-31.45	-84.48	90.13	0.00	0.00	0.00	0.00
1,700.00	4.06	249.58	1,696.64	-33.92	-91.11	97.21	0.00	0.00	0.00	0.00
1,800.00	4.06	249.58	1,796.39	-36.38	-97.74	104.29	0.00	0.00	0.00	0.00
1,900.00	4.06	249.58	1,896.14	-38.85	-104.38	111.36	0.00	0.00	0.00	0.00
2,000.00	4.06	249.58	1,995.89	-41.32	-111.01	118.44	0.00	0.00	0.00	0.00
2,100.00	4.06	249.58	2,095.64	-43.79	-117.64	125.52	0.00	0.00	0.00	0.00
2,200.00	4.06	249.58	2,195.39	-46.26	-124.27	132.60	0.00	0.00	0.00	0.00
2,300.00	4.06	249.58	2,295.14	-48.73	-130.91	139.67	0.00	0.00	0.00	0.00
2,400.00	4.06	249.58	2,394.88	-51.20	-137.54	146.75	0.00	0.00	0.00	0.00
2,500.00	4.06	249.58	2,494.63	-53.67	-144.17	153.83	0.00	0.00	0.00	0.00
8 5/8" Casing Pt										
2,600.00	4.06	249.58	2,594.38	-56.14	-150.81	160.90	0.00	0.00	0.00	0.00
2,700.00	4.06	249.58	2,694.13	-58.61	-157.44	167.98	0.00	0.00	0.00	0.00
2,800.00	4.06	249.58	2,793.88	-61.08	-164.07	175.06	0.00	0.00	0.00	0.00
2,900.00	4.06	249.58	2,893.63	-63.54	-170.71	182.14	0.00	0.00	0.00	0.00
3,000.00	4.06	249.58	2,993.38	-66.01	-177.34	189.21	0.00	0.00	0.00	0.00
3,100.00	4.06	249.58	3,093.13	-68.48	-183.97	196.29	0.00	0.00	0.00	0.00
3,200.00	4.06	249.58	3,192.88	-70.95	-190.61	203.37	0.00	0.00	0.00	0.00
3,300.00	4.06	249.58	3,292.63	-73.42	-197.24	210.44	0.00	0.00	0.00	0.00
3,320.00	4.06	249.58	3,312.58	-73.91	-198.56	211.86	0.00	0.00	0.00	0.00
4.06 Inclination										
3,400.00	4.06	249.58	3,392.38	-75.89	-203.87	217.52	0.00	0.00	0.00	0.00
3,500.00	4.06	249.58	3,492.13	-78.36	-210.50	224.60	0.00	0.00	0.00	0.00
3,600.00	4.06	249.58	3,591.88	-80.83	-217.14	231.68	0.00	0.00	0.00	0.00
3,700.00	4.06	249.58	3,691.62	-83.30	-223.77	238.75	0.00	0.00	0.00	0.00
3,800.00	4.06	249.58	3,791.37	-85.77	-230.40	245.83	0.00	0.00	0.00	0.00
3,900.00	4.06	249.58	3,891.12	-88.24	-237.04	252.91	0.00	0.00	0.00	0.00
4,000.00	4.06	249.58	3,990.87	-90.70	-243.67	259.98	0.00	0.00	0.00	0.00
4,100.00	4.06	249.58	4,090.62	-93.17	-250.30	267.06	0.00	0.00	0.00	0.00
4,200.00	4.06	249.58	4,190.37	-95.64	-256.94	274.14	0.00	0.00	0.00	0.00
4,300.00	4.06	249.58	4,290.12	-98.11	-263.57	281.22	0.00	0.00	0.00	0.00
4,400.00	4.06	249.58	4,389.87	-100.58	-270.20	288.29	0.00	0.00	0.00	0.00
4,500.00	4.06	249.58	4,489.62	-103.05	-276.83	295.37	0.00	0.00	0.00	0.00
4,600.00	4.06	249.58	4,589.37	-105.52	-283.47	302.45	0.00	0.00	0.00	0.00
4,700.00	4.06	249.58	4,689.12	-107.99	-290.10	309.52	0.00	0.00	0.00	0.00
4,800.00	4.06	249.58	4,788.87	-110.46	-296.73	316.60	0.00	0.00	0.00	0.00

## Plan Report for Rulison Federal 19-43D - Plan #1 Proposal

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)	Toolface Azimuth (°)
4,900.00	4.06	249.58	4,888.62	-112.93	-303.37	323.68	0.00	0.00	0.00	0.00
5,000.00	4.06	249.58	4,988.36	-115.40	-310.00	330.76	0.00	0.00	0.00	0.00
5,100.00	4.06	249.58	5,088.11	-117.87	-316.63	337.83	0.00	0.00	0.00	0.00
5,200.00	4.06	249.58	5,187.86	-120.33	-323.27	344.91	0.00	0.00	0.00	0.00
5,300.00	4.06	249.58	5,287.61	-122.80	-329.90	351.99	0.00	0.00	0.00	0.00
5,400.00	4.06	249.58	5,387.36	-125.27	-336.53	359.06	0.00	0.00	0.00	0.00
5,500.00	4.06	249.58	5,487.11	-127.74	-343.16	366.14	0.00	0.00	0.00	0.00
5,600.00	4.06	249.58	5,586.86	-130.21	-349.80	373.22	0.00	0.00	0.00	0.00
5,700.00	4.06	249.58	5,686.61	-132.68	-356.43	380.30	0.00	0.00	0.00	0.00
5,800.00	4.06	249.58	5,786.36	-135.15	-363.06	387.37	0.00	0.00	0.00	0.00
5,900.00	4.06	249.58	5,886.11	-137.62	-369.70	394.45	0.00	0.00	0.00	0.00
6,000.00	4.06	249.58	5,985.86	-140.09	-376.33	401.53	0.00	0.00	0.00	0.00
6,100.00	4.06	249.58	6,085.61	-142.56	-382.96	408.60	0.00	0.00	0.00	0.00
6,200.00	4.06	249.58	6,185.36	-145.03	-389.60	415.68	0.00	0.00	0.00	0.00
6,218.34	4.06	249.58	6,203.65	-145.48	-390.81	416.98	0.00	0.00	0.00	0.00
Begin Drop at 6218.34ft										
6,300.00	2.83	249.58	6,285.16	-147.19	-395.41	421.89	1.50	-1.50	0.00	180.00
6,353.00	2.04	249.58	6,338.11	-147.98	-397.52	424.14	1.50	-1.50	0.00	180.00
Drop Rate = 1.50°/100ft										
6,400.00	1.33	249.58	6,385.09	-148.46	-398.82	425.52	1.50	-1.50	0.00	-180.00
6,488.92	0.00	0.00	6,474.00	-148.82	-399.79	426.56	1.50	-1.50	0.00	180.00
End Drop at 6488.92ft - Williams Fork - Rulison Federal 19-43D Plan #1 Driller's TGT										
6,500.00	0.01	243.44	6,485.08	-148.82	-399.79	426.56	0.08	0.08	0.00	243.44
6,600.00	0.09	243.44	6,585.08	-148.86	-399.87	426.64	0.08	0.08	0.00	0.00
6,700.00	0.17	243.44	6,685.08	-148.96	-400.07	426.87	0.08	0.08	0.00	0.00
6,800.00	0.25	243.44	6,785.08	-149.12	-400.39	427.23	0.08	0.08	0.00	0.00
6,900.00	0.33	243.44	6,885.08	-149.35	-400.85	427.73	0.08	0.08	0.00	0.00
7,000.00	0.41	243.44	6,985.08	-149.64	-401.42	428.37	0.08	0.08	0.00	0.00
7,100.00	0.49	243.44	7,085.08	-149.99	-402.12	429.15	0.08	0.08	0.00	0.00
7,200.00	0.57	243.44	7,185.07	-150.40	-402.95	430.07	0.08	0.08	0.00	0.00
7,300.00	0.65	243.44	7,285.07	-150.87	-403.90	431.13	0.08	0.08	0.00	0.00
7,306.94	0.65	243.44	7,292.00	-150.91	-403.97	431.21	0.08	0.08	0.00	0.00
Top of gas										
7,400.00	0.73	243.44	7,385.06	-151.41	-404.97	432.33	0.08	0.08	0.00	0.00
7,500.00	0.81	243.44	7,485.05	-152.01	-406.17	433.66	0.08	0.08	0.00	0.00
7,600.00	0.89	243.44	7,585.04	-152.67	-407.50	435.14	0.08	0.08	0.00	0.00
7,700.00	0.97	243.44	7,685.03	-153.40	-408.95	436.75	0.08	0.08	0.00	0.00
7,800.00	1.05	243.44	7,785.01	-154.19	-410.52	438.50	0.08	0.08	0.00	0.00
7,900.00	1.13	243.44	7,884.99	-155.04	-412.22	440.40	0.08	0.08	0.00	0.00
8,000.00	1.21	243.44	7,984.97	-155.95	-414.05	442.43	0.08	0.08	0.00	0.00
8,100.00	1.29	243.44	8,084.95	-156.92	-416.00	444.60	0.08	0.08	0.00	0.00
8,200.00	1.37	243.44	8,184.92	-157.96	-418.07	446.90	0.08	0.08	0.00	0.00
8,300.00	1.45	243.44	8,284.89	-159.06	-420.27	449.35	0.08	0.08	0.00	0.00
8,400.00	1.53	243.44	8,384.86	-160.22	-422.59	451.94	0.08	0.08	0.00	0.00
8,500.00	1.61	243.44	8,484.82	-161.45	-425.04	454.66	0.08	0.08	0.00	0.00
8,516.50	1.62	243.44	8,501.31	-161.65	-425.46	455.13	0.08	0.08	0.00	0.00
8,600.00	1.55	243.44	8,584.78	-162.69	-427.53	457.43	0.08	-0.08	0.00	180.00
8,700.00	1.47	243.44	8,684.75	-163.87	-429.88	460.05	0.08	-0.08	0.00	180.00
8,800.00	1.38	243.44	8,784.71	-164.98	-432.11	462.53	0.08	-0.08	0.00	180.00
8,900.00	1.30	243.44	8,884.69	-166.02	-434.20	464.86	0.08	-0.08	0.00	180.00
9,000.00	1.21	243.44	8,984.66	-167.00	-436.16	467.04	0.08	-0.08	0.00	180.00
9,080.35	1.15	243.44	9,065.00	-167.74	-437.64	468.69	0.08	-0.08	0.00	180.00
Cameo										
9,100.00	1.13	243.44	9,084.64	-167.92	-437.99	469.07	0.08	-0.08	0.00	-180.00
9,200.00	1.05	243.44	9,184.62	-168.77	-439.69	470.96	0.08	-0.08	0.00	180.00
9,300.00	0.96	243.44	9,284.61	-169.55	-441.25	472.71	0.08	-0.08	0.00	180.00
9,400.00	0.88	243.44	9,384.60	-170.27	-442.69	474.30	0.08	-0.08	0.00	180.00
9,500.00	0.79	243.44	9,484.59	-170.92	-443.99	475.75	0.08	-0.08	0.00	180.00
9,540.42	0.76	243.44	9,525.00	-171.16	-444.48	476.30	0.08	-0.08	0.00	-180.00



## Plan Report for Rulison Federal 19-43D - Plan #1 Proposal

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)	Toolface Azimuth (°)
<b>Rollins</b>										
9,600.00	0.71	243.44	9,584.58	-171.50	-445.16	477.05	0.08	-0.08	0.00	180.00
9,700.00	0.62	243.44	9,684.57	-172.02	-446.20	478.21	0.08	-0.08	0.00	180.00
9,800.00	0.54	243.44	9,784.56	-172.48	-447.11	479.22	0.08	-0.08	0.00	180.00
9,879.44	0.47	243.44	9,864.00	-172.79	-447.73	479.92	0.08	-0.08	0.00	-180.00
<b>Cozzette</b>										
9,900.00	0.45	243.44	9,884.56	-172.86	-447.88	480.08	0.08	-0.08	0.00	180.00
10,000.00	0.37	243.44	9,984.56	-173.19	-448.53	480.80	0.08	-0.08	0.00	180.00
10,100.00	0.29	243.44	10,084.56	-173.44	-449.04	481.37	0.08	-0.08	0.00	180.00
10,158.44	0.24	243.44	10,143.00	-173.56	-449.28	481.63	0.08	-0.08	0.00	-180.00
<b>Corcoran</b>										
10,200.00	0.20	243.44	10,184.56	-173.63	-449.42	481.79	0.08	-0.08	0.00	180.00
10,288.44	0.13	243.44	10,273.00	-173.74	-449.64	482.04	0.08	-0.08	0.00	-180.00
<b>Mancos</b>										
10,300.00	0.12	243.44	10,284.56	-173.76	-449.67	482.07	0.08	-0.08	0.00	180.00
10,400.00	0.03	243.44	10,384.56	-173.81	-449.78	482.20	0.08	-0.08	0.00	180.00
10,438.44	0.00	0.00	10,423.00	-173.82	-449.79	482.21	0.08	-0.08	303.23	179.99
Total Depth = 10438.44ft - Rulison Federal 19-43D Plan #1 BH TGT										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
225.00	225.00	0.00	0.00	Kickoff at 225.00ft
325.00	324.98	-0.61	-1.64	Build Rate = 2.00°/100ft
427.93	427.76	-2.51	-6.73	End Build at 427.93ft
3,320.00	3,312.58	-73.91	-198.56	4.06 Inclination
6,218.34	6,203.65	-145.48	-390.81	Begin Drop at 6218.34ft
6,353.00	6,338.11	-147.98	-397.52	Drop Rate = 1.50°/100ft
6,488.92	6,474.00	-148.82	-399.79	End Drop at 6488.92ft
10,438.44	10,423.00	-173.82	-449.79	Total Depth = 10438.44ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	Rulison Federal 19-43D Plan #1 BH TGT	248.87	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,438.44	Plan #1 Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,500.00	2,494.63	8 5/8" Casing Pt	8-5/8	12-1/4

## Plan Report for Rulison Federal 19-43D - Plan #1 Proposal

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,488.92	6,474.00	Williams Fork		0.00	
7,306.94	7,292.00	Top of gas		0.00	
9,080.35	9,065.00	Cameo		0.00	
9,540.42	9,525.00	Rollins		0.00	
9,879.44	9,864.00	Cozzette		0.00	
10,158.44	10,143.00	Corcoran		0.00	
10,288.44	10,273.00	Mancos		0.00	

*Targets associated with this wellbore*

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Rulison Federal 19-43D Plan #1 BH TGT	10,423.00	-173.82	-449.79	Point
Rulison Federal 19-43D 100' FSL Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 19-43D 100' FEL Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 19-43D Plan #1 Zone TGT	6,474.00	-173.82	-449.79	Rectangle
Rulison Federal 19-43D Plan #1 Driller's TGT	6,474.00	-148.82	-399.79	Rectangle

**North Reference Sheet for Sec. 19-T7S-R94W (Rulison 19I PAD) - Rulison Federal  
19-43D - Plan #1**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB-25' @ 8105.00ft (Original Well Elev). Northing and Easting are relative to Rulison Federal 19-43D

Coordinate System is US State Plane 1927 (Exact solution), Colorado Central 502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 39° 45' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 0.99995156

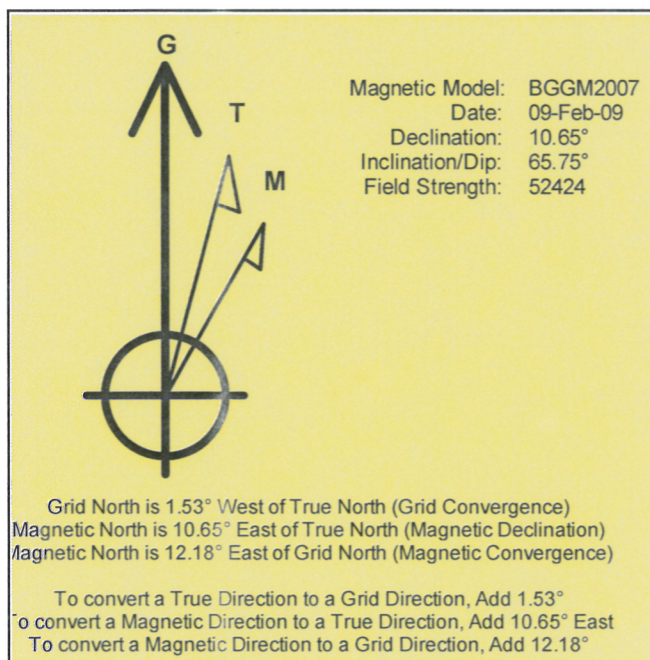
Grid Coordinates of Well: 587,676.81 ft N, 1,316,419.77 ft E

Geographical Coordinates of Well: 39° 25' 19.10" N, 107° 55' 12.00" W

Grid Convergence at Surface is: -1.53°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,438.44ft  
the Bottom Hole Displacement is 482.21ft in the Direction of 248.87° (Grid).

Magnetic Convergence at surface is: -12.18° ( 9 February 2009, , BGGM2007)



Project: Garfield County, CO  
Site: Sec. 19-T7S-R94W (Rulison 19I PAD)  
Well: Rulison Federal 19-43D  
Wellbore: Plan #1  
Plan: Plan #1 Proposal

# Noble Energy

HALLIBURTON

## SECTION DETAILS

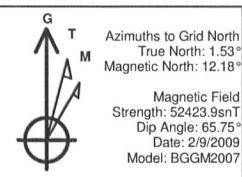
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	
427.93	4.06	249.58	427.76	-2.51	-6.73	2.00	249.58	7.18	
6218.34	4.06	249.58	6203.65	-145.48	-390.81	0.00	0.00	416.98	
6488.92	0.00	0.00	6474.00	-148.82	-399.79	1.50	180.00	426.56	Rulison Federal 19-43D Plan #1 Driller's TGT
8516.50	1.62	243.44	8501.31	-161.65	-425.46	0.08	243.44	455.13	
10438.44	0.00	360.00	10423.00	-173.82	-449.79	0.08	180.00	482.21	Rulison Federal 19-43D Plan #1 BH TGT

## WELL DETAILS: Rulison Federal 19-43D

Ground Level: 8080.00			
Northing	Easting	Latitude	Longitude
587676.81	1316419.77	39°25' 19.100 N	107°55' 12.000 W

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Rulison Federal 19-43D 100' FEL Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 19-43D 100' FSL Hardline	0.00	0.00	0.00	Polygon
Rulison Federal 19-43D Plan #1 Driller's TGT	6474.00	-148.82	-399.79	Rectangle (Sides: L25.00 W25.00)
Rulison Federal 19-43D Plan #1 Zone TGT	6474.00	-173.82	-449.79	Rectangle (Sides: L100.00 W200.00)
Rulison Federal 19-43D Plan #1 BH TGT	10423.00	-173.82	-449.79	Point



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6474.00	6488.92	Williams Fork
7292.00	7306.94	Top of gas
9065.00	9080.35	Cameo
9525.00	9540.42	Rollins
9864.00	9879.44	Cozzette
10143.00	10158.44	Corcoran
10273.00	10288.44	Mancos

