



# Scientific Drilling

## **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**SPARBOE 37-35HZ**

**SPARBOE 1N-26HZ**

**SPARBOE 1N-26HZX**

**PLAN #1**

## **Anticollision Report**

**01 March, 2013**

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PLAN #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.00ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	0.00 to 200,000.00ft	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 6,000.00 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	2013/03/01		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
25.00	1,762.00	Survey #1 MS GYRO (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
1,884.00	6,397.00	Survey #2 SDI MWD PRODUCTION (OH)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0
6,397.00	17,027.14	PLAN #1 (SPARBOE 1N-26HZX)	SDI_MWD+CRUST_1.0	SDI MWD + Crustal anomaly, Version 1.0

<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>Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
SPARBOE 37-35HZ						
SHAKLEE GAS UNIT-TRUE 1 - OH - OH	13,157.60	6,985.45	216.03	120.55	2.263	CC, ES, SF
SPARBOE 1N-26HZ - OH - OH	6,397.00	6,397.00	0.00	0.00	10,000.000	CC
SPARBOE 1N-26HZ - OH - OH	6,400.00	6,400.00	0.01	0.00	0.645	Level 1, ES, SF
SPARBOE 26C-26HZ - OH - OH	644.39	644.59	23.12	20.19	7.894	CC
SPARBOE 26C-26HZ - OH - OH	700.00	700.12	23.36	20.15	7.276	ES
SPARBOE 26C-26HZ - OH - OH	800.00	799.89	25.10	21.38	6.755	SF
SPARBOE 26C-26HZ - OH - PLAN #6	644.39	644.59	23.12	20.19	7.894	CC
SPARBOE 26C-26HZ - OH - PLAN #6	700.00	700.12	23.36	20.15	7.276	ES
SPARBOE 26C-26HZ - OH - PLAN #6	17,000.00	16,934.13	388.01	163.13	1.725	SF
SPARBOE 8-35 - OH - OH	9,992.86	6,995.45	266.25	212.80	4.981	CC, ES
SPARBOE 8-35 - OH - OH	10,000.00	6,995.44	266.34	212.81	4.975	SF
SPARBOE 9-35A - OH - OH	9,022.39	6,996.67	278.50	236.17	6.579	CC, ES, SF

<b>Offset Design</b>	SPARBOE 37-35HZ - SHAKLEE GAS UNIT-TRUE 1 - OH - OH											<b>Offset Site Error:</b>	0.00 ft
<b>Survey Program:</b>	100-NS-GYRO-MS											<b>Offset Well Error:</b>	0.00 ft
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>			<b>Distance</b>								<b>Warning</b>
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>	
0.00	0.00	0.00	0.00	0.00	0.00	-1.49	5,848.27	-152.25	5,850.47				
100.00	100.00	35.57	35.57	0.14	0.05	-142.33	5,848.31	-152.28	5,850.57	5,850.38	0.19	N/A	
200.00	199.99	110.18	110.18	0.36	0.16	-141.47	5,848.65	-152.53	5,851.96	5,851.44	0.52	N/A	
300.00	299.98	200.00	200.00	0.61	0.39	-147.69	5,849.31	-152.73	5,853.84	5,852.84	1.00	5,848.781	
400.00	399.96	275.12	275.11	0.87	0.58	-162.31	5,850.09	-152.92	5,856.58	5,855.13	1.45	4,034.199	
500.00	499.93	351.23	351.21	1.12	0.78	-168.19	5,851.19	-153.49	5,860.71	5,858.80	1.91	3,075.060	
600.00	599.86	444.39	444.34	1.38	1.03	-173.00	5,852.85	-154.72	5,866.14	5,863.74	2.40	2,441.289	
700.00	699.77	560.53	560.46	1.63	1.33	-176.70	5,854.69	-156.68	5,871.85	5,868.90	2.96	1,985.481	
800.00	799.67	700.86	700.77	1.89	1.69	-179.55	5,856.35	-158.35	5,877.64	5,874.07	3.57	1,644.652	
900.00	899.56	827.13	827.03	2.15	2.01	-175.81	5,857.00	-159.33	5,882.88	5,878.73	4.15	1,417.675	
1,000.00	999.46	917.51	917.41	2.40	2.24	-172.68	5,857.34	-160.20	5,887.68	5,883.05	4.63	1,271.296	
1,100.00	1,099.39	1,000.00	999.89	2.66	2.45	-169.04	5,857.98	-161.00	5,892.15	5,887.06	5.10	1,156.407	
1,200.00	1,199.34	1,083.30	1,083.18	2.91	2.67	-167.58	5,858.86	-161.76	5,896.26	5,890.69	5.57	1,058.540	
1,300.00	1,299.31	1,200.00	1,199.87	3.17	2.98	-164.25	5,859.89	-162.72	5,899.65	5,893.52	6.13	961.930	

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

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<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
1,400.00	1,399.28	1,282.33	1,282.20	3.41	3.20	151.47	5,860.60	-163.25	5,902.74	5,896.15	6.60	894.743		
1,500.00	1,499.26	1,372.14	1,371.99	3.65	3.43	139.07	5,861.70	-163.88	5,905.82	5,898.75	7.06	836.094		
1,600.00	1,599.23	1,474.72	1,474.57	3.87	3.70	133.25	5,863.00	-164.45	5,908.63	5,901.08	7.55	782.233		
1,700.00	1,699.22	1,579.54	1,579.38	4.09	3.98	129.55	5,864.24	-165.27	5,911.02	5,902.97	8.05	734.297		
1,800.00	1,799.20	1,692.85	1,692.68	4.27	4.27	118.27	5,865.44	-165.77	5,913.22	5,904.69	8.52	693.756		
1,900.00	1,899.18	1,782.97	1,782.80	4.38	4.48	104.43	5,866.34	-165.78	5,914.44	5,905.60	8.84	669.019		
2,000.00	1,999.13	1,865.46	1,865.28	4.39	4.68	-174.27	5,867.37	-165.72	5,918.47	5,909.42	9.04	654.410		
2,100.00	2,098.85	1,953.62	1,953.43	4.42	4.88	-163.84	5,868.72	-165.68	5,927.20	5,917.94	9.26	640.205		
2,200.00	2,198.49	2,057.98	2,057.78	4.45	5.13	-155.82	5,870.39	-165.44	5,936.75	5,927.21	9.54	622.400		
2,300.00	2,298.11	2,154.16	2,153.95	4.50	5.35	-156.04	5,871.82	-165.21	5,946.09	5,936.29	9.80	606.949		
2,400.00	2,397.54	2,245.30	2,245.07	4.56	5.56	-162.64	5,873.35	-164.73	5,957.72	5,947.69	10.03	593.881		
2,500.00	2,496.69	2,360.42	2,360.17	4.65	5.81	-162.35	5,875.26	-163.93	5,971.83	5,961.51	10.32	578.767		
2,600.00	2,595.45	2,476.74	2,476.48	4.74	6.06	-159.92	5,876.73	-163.24	5,987.90	5,977.29	10.61	564.314		
7,200.00	7,004.68	7,032.26	7,029.81	12.10	14.38	-6.65	5,933.64	-82.78	5,957.76	5,943.54	14.22	418.932		
7,300.00	7,029.41	7,057.87	7,055.41	12.41	14.39	-14.08	5,933.30	-83.10	5,860.76	5,847.28	13.48	434.831		
7,400.00	7,037.00	7,064.68	7,062.22	12.83	14.39	-109.35	5,933.21	-83.18	5,761.15	5,735.04	26.11	220.658		
7,500.00	7,037.00	7,063.19	7,060.73	13.35	14.39	-109.00	5,933.23	-83.16	5,661.23	5,634.60	26.63	212.567		
7,600.00	7,037.00	7,061.70	7,059.24	13.97	14.39	-108.65	5,933.25	-83.14	5,561.31	5,534.06	27.26	204.032		
7,700.00	7,037.00	7,060.22	7,057.76	14.68	14.39	-108.30	5,933.27	-83.12	5,461.40	5,433.43	27.97	195.255		
7,800.00	7,037.00	7,058.75	7,056.29	15.48	14.39	-107.95	5,933.29	-83.11	5,361.49	5,332.73	28.76	186.410		
7,900.00	7,037.00	7,057.27	7,054.81	16.34	14.39	-107.60	5,933.31	-83.09	5,261.58	5,231.96	29.62	177.634		
8,000.00	7,037.00	7,055.80	7,053.35	17.25	14.39	-107.24	5,933.33	-83.07	5,161.68	5,131.14	30.54	169.031		
8,100.00	7,037.00	7,054.34	7,051.88	18.22	14.39	-106.89	5,933.35	-83.06	5,061.77	5,030.27	31.50	160.674		
8,200.00	7,037.00	7,052.88	7,050.42	19.23	14.39	-106.54	5,933.37	-83.04	4,961.88	4,929.36	32.51	152.612		
8,300.00	7,037.00	7,051.42	7,048.96	20.27	14.39	-106.19	5,933.39	-83.02	4,861.98	4,828.42	33.56	144.875		
8,400.00	7,037.00	7,049.97	7,047.51	21.34	14.38	-105.83	5,933.41	-83.00	4,762.09	4,727.45	34.64	137.479		
8,500.00	7,037.00	7,048.52	7,046.06	22.44	14.38	-105.48	5,933.43	-82.99	4,662.21	4,626.46	35.75	130.427		
8,600.00	7,037.00	7,047.07	7,044.61	23.56	14.38	-105.13	5,933.45	-82.97	4,562.33	4,525.45	36.88	123.717		
8,700.00	7,037.00	7,045.63	7,043.17	24.70	14.38	-104.77	5,933.47	-82.95	4,462.45	4,424.42	38.03	117.341		
8,800.00	7,037.00	7,044.19	7,041.74	25.86	14.38	-104.42	5,933.49	-82.93	4,362.58	4,323.38	39.20	111.287		
8,900.00	7,037.00	7,042.76	7,040.30	27.03	14.38	-104.06	5,933.50	-82.91	4,262.71	4,222.32	40.39	105.541		
9,000.00	7,037.00	7,041.33	7,038.87	28.22	14.38	-103.71	5,933.52	-82.90	4,162.85	4,121.26	41.59	100.088		
9,100.00	7,037.00	7,039.90	7,037.45	29.41	14.38	-103.35	5,933.54	-82.88	4,063.00	4,020.19	42.81	94.912		
9,200.00	7,037.00	7,038.48	7,036.02	30.62	14.38	-103.00	5,933.56	-82.86	3,963.15	3,919.12	44.04	89.999		
9,300.00	7,037.00	7,037.06	7,034.60	31.83	14.38	-102.64	5,933.58	-82.84	3,863.32	3,818.04	45.27	85.332		
9,400.00	7,037.00	7,035.65	7,033.19	33.06	14.38	-102.28	5,933.60	-82.82	3,763.49	3,716.96	46.52	80.898		
9,500.00	7,037.00	7,034.23	7,031.78	34.28	14.38	-101.93	5,933.62	-82.80	3,663.66	3,615.89	47.78	76.682		
9,600.00	7,037.00	7,032.83	7,030.37	35.52	14.38	-101.57	5,933.64	-82.79	3,563.85	3,514.81	49.04	72.671		
9,700.00	7,037.00	7,031.42	7,028.97	36.76	14.38	-101.22	5,933.66	-82.77	3,464.05	3,413.74	50.31	68.852		
9,800.00	7,037.00	7,030.02	7,027.57	38.01	14.37	-100.86	5,933.67	-82.75	3,364.26	3,312.67	51.59	65.214		
9,900.00	7,037.00	7,028.62	7,026.17	39.26	14.37	-100.51	5,933.69	-82.73	3,264.48	3,211.61	52.87	61.745		
10,000.00	7,037.00	7,027.23	7,024.78	40.51	14.37	-100.15	5,933.71	-82.71	3,164.72	3,110.56	54.16	58.435		
10,100.00	7,037.00	7,025.84	7,023.39	41.77	14.37	-99.79	5,933.73	-82.69	3,064.96	3,009.52	55.45	55.275		
10,200.00	7,037.00	7,024.46	7,022.00	43.03	14.37	-99.44	5,933.75	-82.67	2,965.23	2,908.49	56.75	52.255		
10,300.00	7,037.00	7,023.07	7,020.62	44.30	14.37	-99.08	5,933.77	-82.66	2,865.51	2,807.47	58.04	49.367		
10,400.00	7,037.00	7,021.69	7,019.24	45.57	14.37	-98.73	5,933.78	-82.64	2,765.82	2,706.47	59.35	46.604		
10,500.00	7,037.00	7,020.32	7,017.87	46.84	14.37	-98.37	5,933.80	-82.62	2,666.14	2,605.49	60.65	43.958		
10,600.00	7,037.00	7,018.95	7,016.49	48.11	14.37	-98.02	5,933.82	-82.60	2,566.49	2,504.53	61.96	41.421		
10,700.00	7,037.00	7,017.58	7,015.13	49.39	14.37	-97.66	5,933.84	-82.58	2,466.87	2,403.60	63.27	38.989		
10,800.00	7,037.00	7,016.22	7,013.76	50.67	14.37	-97.31	5,933.86	-82.56	2,367.28	2,302.70	64.58	36.655		
10,900.00	7,037.00	7,014.85	7,012.40	51.95	14.37	-96.95	5,933.87	-82.54	2,267.72	2,201.83	65.90	34.414		
11,000.00	7,037.00	7,013.50	7,011.04	53.23	14.37	-96.60	5,933.89	-82.52	2,168.21	2,101.00	67.21	32.260		

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<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
11,100.00	7,037.00	7,012.14	7,009.69	54.51	14.37	-96.25	5,933.91	-82.50	2,068.74	2,000.21	68.53	30.189		
11,200.00	7,037.00	7,010.79	7,008.34	55.80	14.37	-95.89	5,933.93	-82.48	1,969.32	1,899.48	69.84	28.197		
11,300.00	7,037.00	7,009.45	7,006.99	57.08	14.36	-95.54	5,933.94	-82.46	1,869.97	1,798.81	71.16	26.279		
11,400.00	7,037.00	7,008.10	7,005.65	58.37	14.36	-95.19	5,933.96	-82.44	1,770.68	1,698.20	72.48	24.431		
11,500.00	7,037.00	7,006.76	7,004.31	59.66	14.36	-94.84	5,933.98	-82.43	1,671.48	1,597.69	73.79	22.651		
11,600.00	7,037.00	7,005.43	7,002.97	60.95	14.36	-94.49	5,934.00	-82.41	1,572.38	1,497.27	75.11	20.934		
11,700.00	7,037.00	7,004.09	7,001.64	62.24	14.36	-94.14	5,934.01	-82.39	1,473.40	1,396.97	76.43	19.278		
11,800.00	7,037.00	7,002.76	7,000.31	63.53	14.36	-93.79	5,934.03	-82.37	1,374.57	1,296.82	77.74	17.681		
11,900.00	7,037.00	7,001.44	6,998.99	64.83	14.36	-93.44	5,934.05	-82.35	1,275.92	1,196.86	79.06	16.139		
12,000.00	7,037.00	7,000.11	6,997.66	66.12	14.36	-93.09	5,934.06	-82.33	1,177.49	1,097.12	80.37	14.650		
12,100.00	7,037.00	7,000.00	6,997.55	67.42	14.36	-93.06	5,934.07	-82.33	1,079.35	997.68	81.67	13.216		
12,200.00	7,037.00	6,997.60	6,995.15	68.71	14.36	-92.42	5,934.10	-82.29	981.59	898.59	83.00	11.827		
12,300.00	7,037.00	6,996.34	6,993.89	70.01	14.36	-92.09	5,934.11	-82.27	884.32	800.01	84.31	10.489		
12,400.00	7,037.00	6,995.08	6,992.63	71.31	14.36	-91.76	5,934.13	-82.25	787.74	702.12	85.62	9.201		
12,500.00	7,037.00	6,993.81	6,991.36	72.60	14.36	-91.42	5,934.15	-82.23	692.12	605.20	86.93	7.962		
12,600.00	7,037.00	6,992.55	6,990.10	73.90	14.36	-91.09	5,934.16	-82.22	597.94	509.71	88.23	6.777		
12,700.00	7,037.00	6,991.28	6,988.83	75.20	14.36	-90.75	5,934.18	-82.20	505.99	416.46	89.54	5.651		
12,800.00	7,037.00	6,990.01	6,987.56	76.50	14.36	-90.41	5,934.20	-82.18	417.76	326.92	90.84	4.599		
12,900.00	7,037.00	6,988.74	6,986.29	77.80	14.36	-90.08	5,934.21	-82.16	336.17	244.04	92.14	3.649		
13,000.00	7,037.00	6,987.46	6,985.02	79.10	14.35	-89.74	5,934.23	-82.14	267.40	173.96	93.43	2.862		
13,100.00	7,037.00	6,986.19	6,983.74	80.40	14.35	-89.40	5,934.24	-82.13	223.57	128.84	94.73	2.360		
13,157.60	7,037.00	6,985.45	6,983.00	81.15	14.35	-89.21	5,934.25	-82.12	216.03	120.55	95.47	2.263 CC, ES, SF		
13,200.00	7,037.00	6,984.91	6,982.46	81.71	14.35	-89.06	5,934.26	-82.11	220.15	124.13	96.02	2.293		
13,300.00	7,037.00	6,983.63	6,981.18	83.01	14.35	-88.72	5,934.28	-82.09	258.73	161.42	97.31	2.659		
13,400.00	7,037.00	6,982.34	6,979.90	84.31	14.35	-88.38	5,934.29	-82.07	324.68	226.08	98.60	3.293		
13,500.00	7,037.00	6,981.06	6,978.61	85.62	14.35	-88.04	5,934.31	-82.06	404.83	304.95	99.88	4.053		
13,600.00	7,037.00	6,979.77	6,977.32	86.92	14.35	-87.70	5,934.33	-82.04	492.29	391.14	101.16	4.867		
13,700.00	7,037.00	6,978.48	6,976.03	88.22	14.35	-87.36	5,934.35	-82.02	583.80	481.36	102.43	5.699		
13,800.00	7,037.00	6,977.19	6,974.74	89.53	14.35	-87.01	5,934.36	-82.00	677.70	573.99	103.71	6.535		
13,900.00	7,037.00	6,975.89	6,973.45	90.83	14.35	-86.67	5,934.38	-81.99	773.13	668.16	104.97	7.365		
14,000.00	7,037.00	6,974.59	6,972.15	92.14	14.35	-86.33	5,934.40	-81.97	869.59	763.35	106.24	8.185		
14,100.00	7,037.00	6,973.29	6,970.85	93.44	14.35	-85.98	5,934.41	-81.95	966.77	859.27	107.50	8.993		
14,200.00	7,037.00	6,971.99	6,969.55	94.75	14.35	-85.64	5,934.43	-81.94	1,064.46	955.71	108.75	9.788		
14,300.00	7,037.00	6,970.69	6,968.24	96.06	14.35	-85.30	5,934.45	-81.92	1,162.55	1,052.55	110.01	10.568		
14,400.00	7,037.00	6,969.38	6,966.93	97.36	14.35	-84.95	5,934.46	-81.90	1,260.94	1,149.69	111.25	11.334		
14,500.00	7,037.00	6,968.07	6,965.63	98.67	14.35	-84.61	5,934.48	-81.89	1,359.56	1,247.07	112.49	12.086		
14,600.00	7,037.00	6,966.76	6,964.31	99.98	14.35	-84.26	5,934.50	-81.87	1,458.37	1,344.64	113.73	12.823		
14,700.00	7,037.00	6,965.44	6,963.00	101.28	14.35	-83.91	5,934.52	-81.85	1,557.33	1,442.36	114.96	13.546		
14,800.00	7,037.00	6,964.13	6,961.68	102.59	14.34	-83.57	5,934.53	-81.84	1,656.41	1,540.22	116.19	14.256		
14,900.00	7,037.00	6,962.81	6,960.37	103.90	14.34	-83.22	5,934.55	-81.82	1,755.60	1,638.19	117.41	14.953		
15,000.00	7,037.00	6,961.49	6,959.04	105.21	14.34	-82.88	5,934.57	-81.81	1,854.87	1,736.24	118.63	15.636		
15,100.00	7,037.00	6,960.16	6,957.72	106.51	14.34	-82.53	5,934.59	-81.79	1,954.21	1,834.38	119.84	16.307		
15,200.00	7,037.00	6,958.84	6,956.39	107.82	14.34	-82.18	5,934.60	-81.77	2,053.62	1,932.58	121.04	16.967		
15,300.00	7,037.00	6,957.51	6,955.07	109.13	14.34	-81.84	5,934.62	-81.76	2,153.08	2,030.85	122.24	17.614		
15,400.00	7,037.00	6,956.18	6,953.74	110.44	14.34	-81.49	5,934.64	-81.74	2,252.59	2,129.16	123.43	18.250		
15,500.00	7,037.00	6,954.84	6,952.40	111.75	14.34	-81.14	5,934.66	-81.73	2,352.14	2,227.53	124.62	18.875		
15,600.00	7,037.00	6,953.51	6,951.07	113.06	14.34	-80.80	5,934.67	-81.71	2,451.73	2,325.93	125.80	19.490		
15,700.00	7,037.00	6,952.17	6,949.73	114.37	14.34	-80.45	5,934.69	-81.70	2,551.35	2,424.38	126.97	20.094		
15,800.00	7,037.00	6,950.83	6,948.39	115.68	14.34	-80.10	5,934.71	-81.68	2,650.99	2,522.86	128.14	20.689		
15,900.00	7,037.00	6,949.49	6,947.05	116.99	14.34	-79.76	5,934.73	-81.67	2,750.66	2,621.37	129.30	21.274		
16,000.00	7,037.00	6,948.14	6,945.70	118.30	14.34	-79.41	5,934.75	-81.65	2,850.36	2,719.91	130.45	21.850		
16,100.00	7,037.00	6,946.79	6,944.35	119.61	14.34	-79.06	5,934.76	-81.64	2,950.07	2,818.47	131.60	22.418		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> SPARBOE 37-35HZ - SHAKLEE GAS UNIT-TRUE 1 - OH - OH												<b>Offset Site Error:</b>	0.00 ft
Survey Program: 100-NS-GYRO-MS												<b>Offset Well Error:</b>	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
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	
16,200.00	7,037.00	6,945.44	6,943.00	120.92	14.34	-78.72	5,934.78	-81.62	3,049.80	2,917.07	132.74	22.977	
16,300.00	7,037.00	6,944.09	6,941.65	122.23	14.34	-78.37	5,934.80	-81.61	3,149.55	3,015.68	133.87	23.527	
16,400.00	7,037.00	6,942.73	6,940.29	123.54	14.34	-78.02	5,934.82	-81.59	3,249.31	3,114.32	134.99	24.070	
16,500.00	7,037.00	6,941.37	6,938.93	124.85	14.33	-77.68	5,934.84	-81.58	3,349.09	3,212.98	136.11	24.606	
16,600.00	7,037.00	6,940.01	6,937.57	126.16	14.33	-77.33	5,934.85	-81.56	3,448.88	3,311.66	137.22	25.134	
16,700.00	7,037.00	6,938.65	6,936.21	127.47	14.33	-76.99	5,934.87	-81.55	3,548.68	3,410.35	138.32	25.655	
16,800.00	7,037.00	6,937.28	6,934.85	128.78	14.33	-76.64	5,934.89	-81.53	3,648.49	3,509.07	139.42	26.169	
16,900.00	7,037.00	6,935.92	6,933.48	130.09	14.33	-76.30	5,934.91	-81.52	3,748.31	3,607.80	140.51	26.677	
17,000.00	7,037.00	6,934.55	6,932.11	131.40	14.33	-75.95	5,934.93	-81.51	3,848.14	3,706.55	141.59	27.179	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1884-SDI_MWD+CRUST_1.0													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Distance							Warning	
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		
6,397.00	6,367.67	6,397.00	6,367.67	0.00	0.00	29.57	-403.25	134.02	0.00	0.00	0.00	N/A CC		
6,400.00	6,370.67	6,400.00	6,370.67	0.01	0.01	127.53	-403.24	134.03	0.01	0.00	0.01	0.645 Level 1, ES, SF		
6,500.00	6,470.67	6,499.69	6,470.24	0.20	0.20	123.38	-405.95	137.39	4.44	4.06	0.38	11.561		
6,600.00	6,570.05	6,596.14	6,565.17	0.39	0.44	138.34	-413.92	151.56	27.46	26.71	0.75	36.672		
6,700.00	6,666.22	6,686.66	6,650.93	0.58	0.74	131.14	-414.76	180.16	68.37	67.38	0.99	68.752		
6,800.00	6,756.24	6,794.42	6,749.45	0.76	1.07	125.24	-396.44	219.09	112.07	111.05	1.02	109.854		
6,900.00	6,837.38	6,836.00	6,786.77	0.94	1.15	120.37	-382.86	231.35	160.72	159.55	1.17	137.573		
7,000.00	6,907.18	6,836.00	6,786.77	1.17	1.15	105.67	-382.86	231.35	244.43	243.11	1.32	184.933		
7,100.00	6,963.52	6,836.00	6,786.77	1.55	1.15	77.84	-382.86	231.35	338.47	337.26	1.21	279.262		
7,200.00	7,004.68	6,836.00	6,786.77	2.91	1.15	48.40	-382.86	231.35	434.30	432.27	2.04	213.338		
7,300.00	7,029.41	6,836.00	6,786.77	3.81	1.15	30.21	-382.86	231.35	528.83	527.23	1.60	330.715		
7,400.00	7,037.00	6,836.00	6,786.77	4.37	1.15	20.94	-382.86	231.35	620.43	618.72	1.71	361.819		
7,500.00	7,037.00	6,836.00	6,786.77	4.86	1.15	20.94	-382.86	231.35	711.94	710.04	1.90	374.726		
7,600.00	7,037.00	6,836.00	6,786.77	5.34	1.15	20.94	-382.86	231.35	805.46	803.34	2.13	378.857		
7,700.00	7,037.00	6,836.00	6,786.77	5.83	1.15	20.94	-382.86	231.35	900.38	897.99	2.39	376.668		
7,800.00	7,037.00	6,836.00	6,786.77	6.37	1.15	20.94	-382.86	231.35	996.30	993.61	2.69	370.506		
7,900.00	7,037.00	6,836.00	6,786.77	6.96	1.15	20.94	-382.86	231.35	1,092.95	1,089.93	3.02	362.174		
8,000.00	7,037.00	6,836.00	6,786.77	7.62	1.15	20.94	-382.86	231.35	1,190.15	1,186.77	3.37	352.892		
8,100.00	7,037.00	6,836.00	6,786.77	8.35	1.15	20.94	-382.86	231.35	1,287.78	1,284.03	3.75	343.415		
8,200.00	7,037.00	6,836.00	6,786.77	9.15	1.15	20.94	-382.86	231.35	1,385.74	1,381.60	4.15	334.173		
8,300.00	7,037.00	6,836.00	6,786.77	10.01	1.15	20.94	-382.86	231.35	1,483.98	1,479.42	4.56	325.397		
8,400.00	7,037.00	6,836.00	6,786.77	10.93	1.15	20.94	-382.86	231.35	1,582.44	1,577.45	4.99	317.188		
8,500.00	7,037.00	6,836.00	6,786.77	11.91	1.15	20.94	-382.86	231.35	1,681.08	1,675.65	5.43	309.578		
8,600.00	7,037.00	6,836.00	6,786.77	12.93	1.15	20.94	-382.86	231.35	1,779.88	1,773.99	5.88	302.556		
8,700.00	7,037.00	6,836.00	6,786.77	13.99	1.15	20.94	-382.86	231.35	1,878.80	1,872.45	6.35	296.093		
8,800.00	7,037.00	6,836.00	6,786.77	15.08	1.15	20.94	-382.86	231.35	1,977.83	1,971.01	6.82	290.148		
8,900.00	7,037.00	6,836.00	6,786.77	16.19	1.15	20.94	-382.86	231.35	2,076.95	2,069.65	7.30	284.678		
9,000.00	7,037.00	6,836.00	6,786.77	17.33	1.15	20.94	-382.86	231.35	2,176.15	2,168.37	7.78	279.639		
9,100.00	7,037.00	6,836.00	6,786.77	18.49	1.15	20.94	-382.86	231.35	2,275.43	2,267.15	8.27	274.992		
9,200.00	7,037.00	6,836.00	6,786.77	19.66	1.15	20.94	-382.86	231.35	2,374.76	2,365.99	8.77	270.697		
9,300.00	7,037.00	6,836.00	6,786.77	20.85	1.15	20.94	-382.86	231.35	2,474.15	2,464.87	9.28	266.721		
9,400.00	7,037.00	6,836.00	6,786.77	22.05	1.15	20.94	-382.86	231.35	2,573.58	2,563.80	9.78	263.034		
9,500.00	7,037.00	6,836.00	6,786.77	23.26	1.15	20.94	-382.86	231.35	2,673.06	2,662.76	10.30	259.607		
9,600.00	7,037.00	6,836.00	6,786.77	24.47	1.15	20.94	-382.86	231.35	2,772.57	2,761.76	10.81	256.416		
9,700.00	7,037.00	6,836.00	6,786.77	25.70	1.15	20.94	-382.86	231.35	2,872.12	2,860.79	11.33	253.439		
9,800.00	7,037.00	6,836.00	6,786.77	26.93	1.15	20.94	-382.86	231.35	2,971.70	2,959.84	11.86	250.656		
9,900.00	7,037.00	6,836.00	6,786.77	28.17	1.15	20.94	-382.86	231.35	3,071.30	3,058.92	12.38	248.050		
10,000.00	7,037.00	6,836.00	6,786.77	29.42	1.15	20.94	-382.86	231.35	3,170.94	3,158.02	12.91	245.605		
10,100.00	7,037.00	6,836.00	6,786.77	30.67	1.15	20.94	-382.86	231.35	3,270.59	3,257.15	13.44	243.308		
10,200.00	7,037.00	6,836.00	6,786.77	31.92	1.15	20.94	-382.86	231.35	3,370.26	3,356.29	13.98	241.146		
10,300.00	7,037.00	6,836.00	6,786.77	33.18	1.15	20.94	-382.86	231.35	3,469.96	3,455.44	14.51	239.107		
10,400.00	7,037.00	6,836.00	6,786.77	34.44	1.15	20.94	-382.86	231.35	3,569.66	3,554.61	15.05	237.183		
10,500.00	7,037.00	6,836.00	6,786.77	35.71	1.15	20.94	-382.86	231.35	3,669.39	3,653.80	15.59	235.364		
10,600.00	7,037.00	6,836.00	6,786.77	36.98	1.15	20.94	-382.86	231.35	3,769.13	3,753.00	16.13	233.641		
10,700.00	7,037.00	6,836.00	6,786.77	38.25	1.15	20.94	-382.86	231.35	3,868.88	3,852.21	16.68	232.008		
10,800.00	7,037.00	6,836.00	6,786.77	39.52	1.15	20.94	-382.86	231.35	3,968.65	3,951.43	17.22	230.458		
10,900.00	7,037.00	6,836.00	6,786.77	40.80	1.15	20.94	-382.86	231.35	4,068.43	4,050.66	17.77	228.985		
11,000.00	7,037.00	6,836.00	6,786.77	42.08	1.15	20.94	-382.86	231.35	4,168.22	4,149.90	18.32	227.583		
11,100.00	7,037.00	6,836.00	6,786.77	43.36	1.15	20.94	-382.86	231.35	4,268.01	4,249.15	18.86	226.248		
11,200.00	7,037.00	6,836.00	6,786.77	44.64	1.15	20.94	-382.86	231.35	4,367.82	4,348.41	19.41	224.975		
11,300.00	7,037.00	6,836.00	6,786.77	45.92	1.15	20.94	-382.86	231.35	4,467.64	4,447.67	19.97	223.760		
11,400.00	7,037.00	6,836.00	6,786.77	47.21	1.15	20.94	-382.86	231.35	4,567.46	4,546.94	20.52	222.599		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> SPARBOE 37-35HZ - SPARBOE 1N-26HZ - OH - OH												<b>Offset Site Error:</b>	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1884-SDI_MWD+CRUST_1.0												<b>Offset Well Error:</b>	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)		
11,500.00	7,037.00	6,836.00	6,786.77	48.49	1.15	20.94	-382.86	231.35	4,667.29	4,646.22	21.07	221.488	
11,600.00	7,037.00	6,836.00	6,786.77	49.78	1.15	20.94	-382.86	231.35	4,767.13	4,745.50	21.63	220.425	
11,700.00	7,037.00	6,836.00	6,786.77	51.07	1.15	20.94	-382.86	231.35	4,866.98	4,844.79	22.18	219.406	
11,800.00	7,037.00	6,836.00	6,786.77	52.36	1.15	20.94	-382.86	231.35	4,966.83	4,944.09	22.74	218.429	
11,900.00	7,037.00	6,836.00	6,786.77	53.65	1.15	20.94	-382.86	231.35	5,066.68	5,043.39	23.30	217.492	
12,000.00	7,037.00	6,836.00	6,786.77	54.94	1.15	20.94	-382.86	231.35	5,166.55	5,142.69	23.85	216.591	
12,100.00	7,037.00	6,836.00	6,786.77	56.24	1.15	20.94	-382.86	231.35	5,266.42	5,242.00	24.41	215.726	
12,200.00	7,037.00	6,836.00	6,786.77	57.53	1.15	20.94	-382.86	231.35	5,366.29	5,341.32	24.97	214.893	
12,300.00	7,037.00	6,836.00	6,786.77	58.83	1.15	20.94	-382.86	231.35	5,466.17	5,440.63	25.53	214.092	
12,400.00	7,037.00	6,836.00	6,786.77	60.12	1.15	20.94	-382.86	231.35	5,566.05	5,539.96	26.09	213.320	
12,500.00	7,037.00	6,836.00	6,786.77	61.42	1.15	20.94	-382.86	231.35	5,665.93	5,639.28	26.65	212.575	
12,600.00	7,037.00	6,836.00	6,786.77	62.72	1.15	20.94	-382.86	231.35	5,765.82	5,738.61	27.22	211.858	
12,700.00	7,037.00	6,836.00	6,786.77	64.02	1.15	20.94	-382.86	231.35	5,865.72	5,837.94	27.78	211.165	
12,800.00	7,037.00	6,836.00	6,786.77	65.32	1.15	20.94	-382.86	231.35	5,965.62	5,937.27	28.34	210.496	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
0.00	0.00	0.00	0.00	0.00	0.00	89.28	0.38	30.22	30.22					
100.00	100.00	100.14	100.13	0.14	0.15	-51.86	0.27	30.05	29.84	29.55	0.29	102.887		
200.00	199.99	200.13	200.12	0.36	0.36	-51.75	-0.28	29.53	28.58	27.86	0.72	39.478		
300.00	299.98	300.19	300.18	0.61	0.60	-58.46	-1.20	29.03	27.23	26.02	1.21	22.431		
400.00	399.96	400.23	400.22	0.87	0.85	-75.59	-1.83	28.18	25.61	23.89	1.72	14.881		
500.00	499.93	500.23	500.21	1.12	1.09	-88.05	-1.84	27.08	24.18	21.97	2.21	10.917		
600.00	599.86	600.23	600.20	1.38	1.33	-103.64	-1.44	25.62	23.25	20.55	2.71	8.591		
644.39	644.22	644.59	644.55	1.49	1.44	-110.73	-1.28	24.82	23.12	20.19	2.93	7.894 CC		
700.00	699.77	700.12	700.07	1.63	1.58	-119.33	-1.16	23.87	23.36	20.15	3.21	7.276 ES		
800.00	799.67	799.89	799.83	1.89	1.83	-134.36	-0.92	22.37	25.10	21.38	3.72	6.755 SF		
900.00	899.56	899.64	899.57	2.15	2.07	-147.39	-0.28	21.13	28.47	24.26	4.21	6.765		
1,000.00	999.46	999.44	999.36	2.40	2.30	-156.89	0.54	20.08	32.51	27.82	4.69	6.928		
1,100.00	1,099.39	1,099.16	1,099.07	2.66	2.51	-164.72	1.61	19.17	36.61	31.45	5.16	7.098		
1,200.00	1,199.34	1,198.76	1,198.66	2.91	2.67	-168.32	3.04	18.99	40.88	35.30	5.58	7.327		
1,300.00	1,299.31	1,298.49	1,298.37	3.17	2.82	-172.56	4.91	19.49	45.33	39.36	5.97	7.589		
1,400.00	1,399.28	1,398.38	1,398.24	3.41	2.95	-174.46	6.90	20.20	49.80	43.44	6.36	7.833		
1,500.00	1,499.26	1,498.26	1,498.09	3.65	3.08	-163.19	8.64	21.52	54.10	47.39	6.71	8.060		
1,600.00	1,599.23	1,598.27	1,598.07	3.87	3.19	-159.36	10.07	23.52	58.23	51.18	7.05	8.260		
1,700.00	1,699.22	1,698.44	1,698.22	4.09	3.30	-157.76	11.05	25.69	61.72	54.34	7.38	8.365		
1,800.00	1,799.20	1,798.83	1,798.57	4.27	3.39	-149.19	11.12	28.43	64.71	57.06	7.65	8.461		
1,900.00	1,899.18	1,899.15	1,898.86	4.38	3.43	-138.48	10.48	30.63	66.42	58.62	7.80	8.516		
2,000.00	1,999.13	1,997.79	1,997.46	4.39	3.45	-139.01	10.31	33.46	70.47	62.64	7.83	8.995		
2,100.00	2,098.85	2,096.46	2,096.02	4.42	3.48	-130.02	11.13	37.98	78.72	70.83	7.88	9.988		
2,200.00	2,198.49	2,196.19	2,195.52	4.45	3.53	-122.81	11.14	44.62	87.27	79.31	7.96	10.958		
2,300.00	2,298.11	2,294.97	2,293.92	4.50	3.58	-122.64	9.99	53.25	95.34	87.27	8.07	11.818		
2,400.00	2,397.54	2,391.80	2,390.29	4.56	3.66	-129.48	10.61	62.59	107.25	99.06	8.19	13.093		
2,500.00	2,496.69	2,489.15	2,487.09	4.65	3.74	-130.17	13.19	72.69	123.33	114.99	8.35	14.778		
2,600.00	2,595.45	2,587.49	2,584.73	4.74	3.85	-128.91	15.41	84.15	141.06	132.53	8.52	16.548		
2,700.00	2,693.87	2,687.73	2,684.07	4.87	3.97	-129.16	16.32	97.43	159.37	150.62	8.75	18.210		
2,800.00	2,792.19	2,789.65	2,784.70	5.01	4.12	-128.50	13.79	113.38	176.10	167.10	9.00	19.559		
2,900.00	2,890.46	2,889.05	2,882.48	5.17	4.29	-124.85	8.95	130.61	191.42	182.11	9.31	20.555		
3,000.00	2,988.68	2,988.01	2,979.75	5.34	4.47	-121.65	3.89	148.07	206.08	196.44	9.64	21.382		
3,100.00	3,086.94	3,084.52	3,074.59	5.49	4.66	-122.06	-0.63	165.36	220.95	210.98	9.96	22.175		
3,200.00	3,185.31	3,180.50	3,168.92	5.65	4.85	-122.88	-3.94	182.75	236.95	226.66	10.29	23.026		
3,300.00	3,283.80	3,277.80	3,264.57	5.80	5.05	-125.39	-6.35	200.42	254.01	243.40	10.62	23.926		
3,400.00	3,382.42	3,374.98	3,360.15	5.96	5.24	-127.44	-8.12	217.89	271.88	260.93	10.95	24.834		
3,500.00	3,481.11	3,473.73	3,457.34	6.14	5.45	-127.89	-9.59	235.37	290.02	278.72	11.30	25.670		
3,600.00	3,579.83	3,573.21	3,555.31	6.32	5.65	-129.24	-11.02	252.57	308.13	296.47	11.65	26.442		
3,700.00	3,678.49	3,678.62	3,659.06	6.52	5.89	-131.51	-14.33	270.84	325.75	313.70	12.04	27.049		
3,800.00	3,777.09	3,782.16	3,760.81	6.72	6.12	-133.98	-20.38	289.03	342.22	329.78	12.44	27.507		
3,900.00	3,875.93	3,880.90	3,857.93	6.92	6.35	-137.70	-26.44	305.83	358.03	345.18	12.85	27.868		
4,000.00	3,974.98	3,979.40	3,954.95	7.11	6.59	-138.37	-32.02	321.87	373.53	360.28	13.25	28.182		
4,100.00	4,074.12	4,077.41	4,051.47	7.31	6.83	-136.56	-37.59	337.99	388.81	375.15	13.66	28.456		
4,200.00	4,173.35	4,172.93	4,145.44	7.50	7.07	-128.46	-43.06	354.18	403.57	389.48	14.09	28.639		
4,300.00	4,272.71	4,265.57	4,236.39	7.69	7.33	-116.29	-47.88	371.17	417.48	402.95	14.52	28.744		
4,400.00	4,372.17	4,357.36	4,326.25	7.88	7.58	-106.38	-52.01	389.37	430.90	415.94	14.96	28.810		
4,500.00	4,471.72	4,448.04	4,414.86	8.07	7.85	-95.61	-54.87	408.40	444.50	429.11	15.39	28.888		
4,600.00	4,571.36	4,542.87	4,507.40	8.25	8.12	-91.04	-56.41	429.06	458.71	442.90	15.81	29.013		
4,700.00	4,671.09	4,646.59	4,609.20	8.44	8.40	-86.11	-55.98	448.87	472.13	455.89	16.23	29.081		
4,800.00	4,770.92	4,759.15	4,720.44	8.62	8.67	-80.18	-53.47	465.83	483.66	467.02	16.64	29.058		
4,900.00	4,870.82	4,880.03	4,840.67	8.79	8.92	-72.50	-51.38	477.98	490.90	473.85	17.05	28.796		
5,000.00	4,970.76	4,998.26	4,958.73	8.96	9.12	-76.79	-50.53	484.30	494.29	476.87	17.42	28.377		

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



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
5,100.00	5,070.73	5,110.28	5,070.73	9.13	9.30	-85.40	-51.02	486.16	494.70	476.92	17.78	27.826		
5,200.00	5,170.72	5,211.23	5,171.67	9.30	9.46	-98.04	-51.95	486.96	494.67	476.55	18.12	27.306		
5,300.00	5,270.72	5,313.21	5,273.64	9.46	9.62	-116.08	-53.16	487.71	494.43	475.97	18.45	26.795		
5,400.00	5,370.72	5,416.27	5,376.69	9.63	9.79	86.23	-54.62	487.86	493.52	474.73	18.79	26.263		
5,500.00	5,470.71	5,515.58	5,475.98	9.79	9.95	83.31	-56.08	487.53	492.14	473.02	19.12	25.736		
5,600.00	5,570.70	5,612.83	5,573.23	9.95	10.10	77.92	-56.99	487.34	491.15	471.70	19.45	25.252		
5,700.00	5,670.70	5,711.24	5,671.64	10.11	10.27	71.36	-57.59	487.49	490.54	470.76	19.78	24.794		
5,789.34	5,760.04	5,799.59	5,759.98	10.26	10.42	93.32	-58.55	488.32	490.33	470.24	20.09	24.410		
5,800.00	5,770.69	5,810.13	5,770.51	10.28	10.44	97.46	-58.69	488.46	490.25	470.12	20.12	24.363		
5,900.00	5,870.69	5,911.73	5,872.10	10.44	10.61	168.12	-60.17	489.80	490.62	470.15	20.47	23.971		
6,000.00	5,970.69	6,014.11	5,974.46	10.61	10.79	-167.73	-61.55	490.38	491.22	470.41	20.81	23.600		
6,100.00	6,070.68	6,117.52	6,077.86	10.78	10.96	-167.17	-63.02	490.20	491.53	470.36	21.17	23.216		
6,200.00	6,170.67	6,220.33	6,180.65	10.95	11.14	-172.04	-64.80	489.32	490.62	469.09	21.53	22.786		
6,300.00	6,270.67	6,318.12	6,278.42	11.13	11.30	133.79	-65.92	487.95	489.16	467.28	21.88	22.356		
6,400.00	6,370.67	6,416.96	6,377.24	11.31	11.46	15.03	-65.94	486.09	487.60	465.37	22.24	21.927		
6,500.00	6,470.67	6,520.52	6,480.79	11.49	11.64	34.66	-66.52	484.18	485.44	462.83	22.60	21.476		
6,600.00	6,570.05	6,623.47	6,583.70	11.64	11.81	47.02	-68.46	482.53	476.05	453.22	22.83	20.853		
6,700.00	6,666.22	6,722.76	6,682.94	11.73	11.98	51.71	-71.33	480.73	454.80	431.96	22.84	19.909		
6,800.00	6,756.24	6,806.01	6,766.12	11.78	12.12	58.50	-73.83	478.88	424.71	401.92	22.79	18.634		
6,900.00	6,837.38	6,873.08	6,833.07	11.81	12.23	66.22	-71.01	476.49	392.47	369.64	22.83	17.193		
7,000.00	6,907.18	6,929.00	6,888.25	11.85	12.33	73.91	-62.30	474.89	364.46	341.47	22.99	15.853		
7,100.00	6,963.52	6,985.96	6,942.98	11.92	12.42	81.71	-46.66	474.42	345.67	322.40	23.27	14.855		
7,200.00	7,004.68	7,055.23	7,006.69	12.10	12.54	90.31	-19.58	474.08	338.67	315.10	23.57	14.370		
7,201.87	7,005.29	7,056.60	7,007.90	12.11	12.54	90.47	-18.96	474.07	338.67	315.10	23.57	14.366		
7,300.00	7,029.41	7,143.03	7,080.85	12.41	12.68	99.89	27.09	473.00	345.10	321.40	23.69	14.565		
7,400.00	7,037.00	7,257.90	7,156.15	12.83	12.85	109.72	112.90	467.86	358.85	335.29	23.55	15.235		
7,500.00	7,037.00	7,399.19	7,206.15	13.35	13.11	116.82	244.03	470.05	376.38	352.79	23.59	15.952		
7,600.00	7,037.00	7,401.00	7,206.43	13.97	13.12	116.85	245.82	470.08	397.32	373.18	24.14	16.460		
7,700.00	7,037.00	7,401.00	7,206.43	14.68	13.12	116.85	245.82	470.08	440.52	415.76	24.76	17.789		
7,800.00	7,037.00	7,401.00	7,206.43	15.48	13.12	116.85	245.82	470.08	500.26	474.79	25.46	19.648		
7,900.00	7,037.00	7,401.00	7,206.43	16.34	13.12	116.85	245.82	470.08	571.36	545.14	26.22	21.791		
8,000.00	7,037.00	7,401.00	7,206.43	17.25	13.12	116.85	245.82	470.08	650.12	623.08	27.03	24.050		
8,100.00	7,037.00	7,401.00	7,206.43	18.22	13.12	116.85	245.82	470.08	734.06	706.17	27.89	26.320		
8,200.00	7,037.00	7,401.00	7,206.43	19.23	13.12	116.85	245.82	470.08	821.61	792.83	28.78	28.543		
8,300.00	7,037.00	7,401.00	7,206.43	20.27	13.12	116.85	245.82	470.08	911.72	882.01	29.71	30.684		
8,400.00	7,037.00	7,401.00	7,206.43	21.34	13.12	116.85	245.82	470.08	1,003.71	973.04	30.67	32.727		
8,500.00	7,037.00	7,401.00	7,206.43	22.44	13.12	116.85	245.82	470.08	1,097.10	1,065.45	31.65	34.664		
8,600.00	7,037.00	7,401.00	7,206.43	23.56	13.12	116.85	245.82	470.08	1,191.57	1,158.92	32.65	36.494		
8,700.00	7,037.00	7,401.00	7,206.43	24.70	13.12	116.85	245.82	470.08	1,286.87	1,253.20	33.67	38.220		
8,800.00	7,037.00	7,401.00	7,206.43	25.86	13.12	116.85	245.82	470.08	1,382.83	1,348.13	34.71	39.845		
8,900.00	7,037.00	7,401.00	7,206.43	27.03	13.12	116.85	245.82	470.08	1,479.33	1,443.58	35.75	41.376		
9,000.00	7,037.00	7,401.00	7,206.43	28.22	13.12	116.85	245.82	470.08	1,576.27	1,539.45	36.81	42.817		
9,100.00	7,037.00	7,401.00	7,206.43	29.41	13.12	116.85	245.82	470.08	1,673.56	1,635.68	37.89	44.175		
9,200.00	7,037.00	7,401.00	7,206.43	30.62	13.12	116.85	245.82	470.08	1,771.16	1,732.20	38.97	45.454		
9,300.00	7,037.00	7,401.00	7,206.43	31.83	13.12	116.85	245.82	470.08	1,869.01	1,828.96	40.05	46.662		
9,400.00	7,037.00	7,401.00	7,206.43	33.06	13.12	116.85	245.82	470.08	1,967.08	1,925.93	41.15	47.803		
9,500.00	7,037.00	7,401.00	7,206.43	34.28	13.12	116.85	245.82	470.08	2,065.33	2,023.08	42.25	48.881		
9,600.00	7,037.00	7,401.00	7,206.43	35.52	13.12	116.85	245.82	470.08	2,163.75	2,120.39	43.36	49.901		
9,700.00	7,037.00	7,401.00	7,206.43	36.76	13.12	116.85	245.82	470.08	2,262.30	2,217.82	44.47	50.867		
9,800.00	7,037.00	7,401.00	7,206.43	38.01	13.12	116.85	245.82	470.08	2,360.97	2,315.38	45.59	51.783		
9,900.00	7,037.00	7,401.00	7,206.43	39.26	13.12	116.85	245.82	470.08	2,459.75	2,413.04	46.72	52.653		
10,000.00	7,037.00	7,401.00	7,206.43	40.51	13.12	116.85	245.82	470.08	2,558.63	2,510.79	47.84	53.480		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
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	
10,100.00	7,037.00	7,401.00	7,206.43	41.77	13.12	116.85	245.82	470.08	2,657.59	2,608.62	48.97	54.266	
10,200.00	7,037.00	7,401.00	7,206.43	43.03	13.12	116.85	245.82	470.08	2,756.63	2,706.52	50.11	55.015	
10,300.00	7,037.00	7,401.00	7,206.43	44.30	13.12	116.85	245.82	470.08	2,855.73	2,804.48	51.24	55.728	
10,400.00	7,037.00	7,401.00	7,206.43	45.57	13.12	116.85	245.82	470.08	2,954.89	2,902.51	52.38	56.409	
10,500.00	7,037.00	7,401.00	7,206.43	46.84	13.12	116.85	245.82	470.08	3,054.11	3,000.58	53.52	57.060	
10,600.00	7,037.00	7,401.00	7,206.43	48.11	13.12	116.85	245.82	470.08	3,153.38	3,098.71	54.67	57.681	
10,700.00	7,037.00	7,401.00	7,206.43	49.39	13.12	116.85	245.82	470.08	3,252.69	3,196.87	55.82	58.276	
10,800.00	7,037.00	7,401.00	7,206.43	50.67	13.12	116.85	245.82	470.08	3,352.04	3,295.08	56.96	58.845	
10,900.00	7,037.00	7,401.00	7,206.43	51.95	13.12	116.85	245.82	470.08	3,451.43	3,393.32	58.11	59.391	
11,000.00	7,037.00	7,401.00	7,206.43	53.23	13.12	116.85	245.82	470.08	3,550.85	3,491.59	59.27	59.914	
11,100.00	7,037.00	7,401.00	7,206.43	54.51	13.12	116.85	245.82	470.08	3,650.31	3,589.89	60.42	60.416	
11,200.00	7,037.00	7,401.00	7,206.43	55.80	13.12	116.85	245.82	470.08	3,749.79	3,688.22	61.57	60.899	
11,300.00	7,037.00	7,401.00	7,206.43	57.08	13.12	116.85	245.82	470.08	3,849.31	3,786.58	62.73	61.363	
11,400.00	7,037.00	7,401.00	7,206.43	58.37	13.12	116.85	245.82	470.08	3,948.84	3,884.95	63.89	61.809	
11,500.00	7,037.00	7,401.00	7,206.43	59.66	13.12	116.85	245.82	470.08	4,048.40	3,983.35	65.05	62.238	
11,600.00	7,037.00	7,401.00	7,206.43	60.95	13.12	116.85	245.82	470.08	4,147.98	4,081.77	66.21	62.652	
11,700.00	7,037.00	7,401.00	7,206.43	62.24	13.12	116.85	245.82	470.08	4,247.58	4,180.21	67.37	63.051	
11,800.00	7,037.00	7,401.00	7,206.43	63.53	13.12	116.85	245.82	470.08	4,347.20	4,278.67	68.53	63.435	
11,900.00	7,037.00	7,401.00	7,206.43	64.83	13.12	116.85	245.82	470.08	4,446.83	4,377.14	69.69	63.807	
12,000.00	7,037.00	7,401.00	7,206.43	66.12	13.12	116.85	245.82	470.08	4,546.49	4,475.63	70.86	64.165	
12,100.00	7,037.00	7,401.00	7,206.43	67.42	13.12	116.85	245.82	470.08	4,646.15	4,574.13	72.02	64.511	
12,200.00	7,037.00	7,401.00	7,206.43	68.71	13.12	116.85	245.82	470.08	4,745.83	4,672.65	73.19	64.846	
12,300.00	7,037.00	7,401.00	7,206.43	70.01	13.12	116.85	245.82	470.08	4,845.53	4,771.17	74.35	65.170	
12,400.00	7,037.00	7,401.00	7,206.43	71.31	13.12	116.85	245.82	470.08	4,945.23	4,869.71	75.52	65.483	
12,500.00	7,037.00	7,401.00	7,206.43	72.60	13.12	116.85	245.82	470.08	5,044.95	4,968.26	76.69	65.787	
12,600.00	7,037.00	7,401.00	7,206.43	73.90	13.12	116.85	245.82	470.08	5,144.68	5,066.82	77.85	66.081	
12,700.00	7,037.00	7,401.00	7,206.43	75.20	13.12	116.85	245.82	470.08	5,244.42	5,165.39	79.02	66.366	
12,800.00	7,037.00	7,401.00	7,206.43	76.50	13.12	116.85	245.82	470.08	5,344.17	5,263.97	80.19	66.642	
12,900.00	7,037.00	7,401.00	7,206.43	77.80	13.12	116.85	245.82	470.08	5,443.92	5,362.56	81.36	66.910	
13,000.00	7,037.00	7,401.00	7,206.43	79.10	13.12	116.85	245.82	470.08	5,543.69	5,461.16	82.53	67.170	
13,100.00	7,037.00	7,401.00	7,206.43	80.40	13.12	116.85	245.82	470.08	5,643.47	5,559.76	83.70	67.422	
13,200.00	7,037.00	7,401.00	7,206.43	81.71	13.12	116.85	245.82	470.08	5,743.25	5,658.37	84.87	67.668	
13,300.00	7,037.00	7,401.00	7,206.43	83.01	13.12	116.85	245.82	470.08	5,843.04	5,756.99	86.05	67.906	
13,400.00	7,037.00	7,401.00	7,206.43	84.31	13.12	116.85	245.82	470.08	5,942.84	5,855.62	87.22	68.138	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													SPARBOE 37-35HZ - SPARBOE 26C-26HZ - OH - PLAN #6		Offset Site Error:	0.00 ft
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0, 7401-SDI_MWD+CRUST_1.0													Offset Well Error:	0.00 ft		
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
0.00	0.00	0.00	0.00	0.00	0.00	89.28	0.38	30.22	30.22							
100.00	100.00	100.14	100.13	0.14	0.15	-51.86	0.27	30.05	29.84	29.55	0.29	102.887				
200.00	199.99	200.13	200.12	0.36	0.36	-51.75	-0.28	29.53	28.58	27.86	0.72	39.478				
300.00	299.98	300.19	300.18	0.61	0.60	-58.46	-1.20	29.03	27.23	26.02	1.21	22.431				
400.00	399.96	400.23	400.22	0.87	0.85	-75.59	-1.83	28.18	25.61	23.89	1.72	14.881				
500.00	499.93	500.23	500.21	1.12	1.09	-88.05	-1.84	27.08	24.18	21.97	2.21	10.917				
600.00	599.86	600.23	600.20	1.38	1.33	-103.64	-1.44	25.62	23.25	20.55	2.71	8.591				
644.39	644.22	644.59	644.55	1.49	1.44	-110.73	-1.28	24.82	23.12	20.19	2.93	7.894 CC				
700.00	699.77	700.12	700.07	1.63	1.58	-119.33	-1.16	23.87	23.36	20.15	3.21	7.276 ES				
800.00	799.67	799.89	799.83	1.89	1.83	-134.36	-0.92	22.37	25.10	21.38	3.72	6.755				
900.00	899.56	899.64	899.57	2.15	2.07	-147.39	-0.28	21.13	28.47	24.26	4.21	6.765				
1,000.00	999.46	999.44	999.36	2.40	2.30	-156.89	0.54	20.08	32.51	27.82	4.69	6.928				
1,100.00	1,099.39	1,099.16	1,099.07	2.66	2.51	-164.72	1.61	19.17	36.61	31.45	5.16	7.098				
1,200.00	1,199.34	1,198.76	1,198.66	2.91	2.67	-168.32	3.04	18.99	40.88	35.30	5.58	7.327				
1,300.00	1,299.31	1,298.49	1,298.37	3.17	2.82	-172.56	4.91	19.49	45.33	39.36	5.97	7.589				
1,400.00	1,399.28	1,398.38	1,398.24	3.41	2.95	-174.46	6.90	20.20	49.80	43.44	6.36	7.833				
1,500.00	1,499.26	1,498.26	1,498.09	3.65	3.08	-163.19	8.64	21.52	54.10	47.39	6.71	8.060				
1,600.00	1,599.23	1,598.27	1,598.07	3.87	3.19	-159.36	10.07	23.52	58.23	51.18	7.05	8.260				
1,700.00	1,699.22	1,698.44	1,698.22	4.09	3.30	-157.76	11.05	25.69	61.72	54.34	7.38	8.365				
1,800.00	1,799.20	1,798.83	1,798.57	4.27	3.39	-149.19	11.12	28.43	64.71	57.06	7.65	8.461				
1,900.00	1,899.18	1,899.15	1,898.86	4.38	3.43	-138.48	10.48	30.63	66.42	58.62	7.80	8.516				
2,000.00	1,999.13	1,997.79	1,997.46	4.39	3.45	-139.01	10.31	33.46	70.47	62.64	7.83	8.995				
2,100.00	2,098.85	2,096.46	2,096.02	4.42	3.48	-130.02	11.13	37.98	78.72	70.83	7.88	9.988				
2,200.00	2,198.49	2,196.19	2,195.52	4.45	3.53	-122.81	11.14	44.62	87.27	79.31	7.96	10.958				
2,300.00	2,298.11	2,294.97	2,293.92	4.50	3.58	-122.64	9.99	53.25	95.34	87.27	8.07	11.818				
2,400.00	2,397.54	2,391.80	2,390.29	4.56	3.66	-129.48	10.61	62.59	107.25	99.06	8.19	13.093				
2,500.00	2,496.69	2,489.15	2,487.09	4.65	3.74	-130.17	13.19	72.69	123.33	114.99	8.35	14.778				
2,600.00	2,595.45	2,587.49	2,584.73	4.74	3.85	-128.91	15.41	84.15	141.06	132.53	8.52	16.548				
2,700.00	2,693.87	2,687.73	2,684.07	4.87	3.97	-129.16	16.32	97.43	159.37	150.62	8.75	18.210				
2,800.00	2,792.19	2,789.65	2,784.70	5.01	4.12	-128.50	13.79	113.38	176.10	167.10	9.00	19.559				
2,900.00	2,890.46	2,889.05	2,882.48	5.17	4.29	-124.85	8.95	130.61	191.42	182.11	9.31	20.555				
3,000.00	2,988.68	2,988.01	2,979.75	5.34	4.47	-121.65	3.89	148.07	206.08	196.44	9.64	21.382				
3,100.00	3,086.94	3,084.52	3,074.59	5.49	4.66	-122.06	-0.63	165.36	220.95	210.98	9.96	22.175				
3,200.00	3,185.31	3,180.50	3,168.92	5.65	4.85	-122.88	-3.94	182.75	236.95	226.66	10.29	23.026				
3,300.00	3,283.80	3,277.80	3,264.57	5.80	5.05	-125.39	-6.35	200.42	254.01	243.40	10.62	23.926				
3,400.00	3,382.42	3,374.98	3,360.15	5.96	5.24	-127.44	-8.12	217.89	271.88	260.93	10.95	24.834				
3,500.00	3,481.11	3,473.73	3,457.34	6.14	5.45	-127.89	-9.59	235.37	290.02	278.72	11.30	25.670				
3,600.00	3,579.83	3,573.21	3,555.31	6.32	5.65	-129.24	-11.02	252.57	308.13	296.47	11.65	26.442				
3,700.00	3,678.49	3,678.62	3,659.06	6.52	5.89	-131.51	-14.33	270.84	325.75	313.70	12.04	27.049				
3,800.00	3,777.09	3,782.16	3,760.81	6.72	6.12	-133.98	-20.38	289.03	342.22	329.78	12.44	27.507				
3,900.00	3,875.93	3,880.90	3,857.93	6.92	6.35	-137.70	-26.44	305.83	358.03	345.18	12.85	27.868				
4,000.00	3,974.98	3,979.40	3,954.95	7.11	6.59	-138.37	-32.02	321.87	373.53	360.28	13.25	28.182				
4,100.00	4,074.12	4,077.41	4,051.47	7.31	6.83	-136.56	-37.59	337.99	388.81	375.15	13.66	28.456				
4,200.00	4,173.35	4,172.93	4,145.44	7.50	7.07	-128.46	-43.06	354.18	403.57	389.48	14.09	28.639				
4,300.00	4,272.71	4,265.58	4,236.39	7.69	7.33	-116.29	-47.88	371.17	417.48	402.95	14.52	28.744				
4,400.00	4,372.17	4,357.36	4,326.25	7.88	7.58	-106.38	-52.01	389.37	430.90	415.94	14.96	28.810				
4,500.00	4,471.72	4,448.04	4,414.86	8.07	7.85	-95.61	-54.87	408.40	444.50	429.11	15.39	28.888				
4,600.00	4,571.36	4,542.87	4,507.40	8.25	8.12	-91.04	-56.41	429.06	458.71	442.90	15.81	29.013				
4,700.00	4,671.09	4,646.59	4,609.20	8.44	8.40	-86.11	-55.98	448.87	472.13	455.89	16.23	29.081				
4,800.00	4,770.92	4,759.15	4,720.44	8.62	8.67	-80.18	-53.47	465.83	483.66	467.02	16.64	29.058				
4,900.00	4,870.82	4,880.03	4,840.67	8.79	8.92	-72.50	-51.38	477.98	490.90	473.85	17.05	28.796				
5,000.00	4,970.76	4,998.26	4,958.73	8.96	9.12	-76.79	-50.53	484.30	494.29	476.87	17.42	28.377				

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													SPARBOE 37-35HZ - SPARBOE 26C-26HZ - OH - PLAN #6		Offset Site Error: 0.00 ft	
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0, 7401-SDI_MWD+CRUST_1.0													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
5,100.00	5,070.73	5,110.28	5,070.73	9.13	9.30	-85.40	-51.02	486.16	494.70	476.92	17.78	27.826				
5,200.00	5,170.72	5,211.23	5,171.67	9.30	9.46	-98.04	-51.95	486.96	494.67	476.55	18.12	27.306				
5,300.00	5,270.72	5,313.21	5,273.64	9.46	9.62	-116.08	-53.16	487.71	494.43	475.97	18.45	26.795				
5,400.00	5,370.72	5,416.27	5,376.69	9.63	9.79	86.23	-54.62	487.86	493.52	474.73	18.79	26.263				
5,500.00	5,470.71	5,515.58	5,475.98	9.79	9.95	83.31	-56.08	487.53	492.14	473.02	19.12	25.736				
5,600.00	5,570.70	5,612.83	5,573.23	9.95	10.10	77.92	-56.99	487.34	491.15	471.70	19.45	25.252				
5,700.00	5,670.70	5,711.25	5,671.64	10.11	10.27	71.36	-57.59	487.49	490.54	470.76	19.78	24.794				
5,789.34	5,760.04	5,799.59	5,759.98	10.26	10.42	93.32	-58.55	488.32	490.33	470.24	20.09	24.410				
5,800.00	5,770.69	5,810.13	5,770.51	10.28	10.44	97.46	-58.69	488.46	490.25	470.12	20.12	24.363				
5,900.00	5,870.69	5,911.74	5,872.10	10.44	10.61	168.12	-60.17	489.80	490.62	470.15	20.47	23.971				
6,000.00	5,970.69	6,014.11	5,974.46	10.61	10.79	-167.73	-61.55	490.38	491.22	470.41	20.81	23.600				
6,100.00	6,070.68	6,117.52	6,077.86	10.78	10.96	-167.17	-63.02	490.20	491.53	470.36	21.17	23.216				
6,200.00	6,170.67	6,220.33	6,180.65	10.95	11.14	-172.04	-64.80	489.32	490.62	469.09	21.53	22.786				
6,300.00	6,270.67	6,318.12	6,278.42	11.13	11.30	133.79	-65.92	487.95	489.16	467.28	21.88	22.356				
6,400.00	6,370.67	6,416.96	6,377.24	11.31	11.46	15.03	-65.94	486.09	487.60	465.37	22.24	21.927				
6,500.00	6,470.67	6,520.52	6,480.79	11.49	11.64	34.66	-66.52	484.18	485.44	462.83	22.60	21.476				
6,600.00	6,570.05	6,623.47	6,583.70	11.64	11.81	47.02	-68.46	482.53	476.05	453.22	22.83	20.853				
6,700.00	6,666.22	6,722.76	6,682.94	11.73	11.98	51.71	-71.33	480.73	454.80	431.96	22.84	19.909				
6,800.00	6,756.24	6,806.01	6,766.12	11.78	12.12	58.50	-73.83	478.88	424.71	401.92	22.79	18.634				
6,900.00	6,837.38	6,873.08	6,833.07	11.81	12.23	66.22	-71.01	476.49	392.47	369.64	22.83	17.193				
7,000.00	6,907.18	6,929.00	6,888.25	11.85	12.33	73.91	-62.30	474.89	364.46	341.47	22.99	15.853				
7,100.00	6,963.52	6,985.96	6,942.98	11.92	12.42	81.71	-46.66	474.42	345.67	322.40	23.27	14.855				
7,200.00	7,004.68	7,055.24	7,006.69	12.10	12.54	90.31	-19.58	474.08	338.67	315.10	23.57	14.370				
7,201.87	7,005.29	7,056.60	7,007.90	12.11	12.54	90.47	-18.96	474.07	338.67	315.10	23.57	14.366				
7,300.00	7,029.41	7,143.03	7,080.85	12.41	12.68	99.89	27.09	473.00	345.10	321.40	23.69	14.565				
7,400.00	7,037.00	7,257.90	7,156.15	12.83	12.85	109.72	112.90	467.86	358.85	335.29	23.55	15.235				
7,500.00	7,037.00	7,399.19	7,206.15	13.35	13.11	116.82	244.03	470.05	376.38	352.79	23.59	15.952				
7,600.00	7,037.00	7,506.98	7,220.98	13.97	13.46	118.70	350.78	471.50	384.05	359.76	24.28	15.815				
7,700.00	7,037.00	7,614.95	7,231.82	14.68	14.00	120.02	458.19	472.52	389.84	364.64	25.21	15.466				
7,800.00	7,037.00	7,723.60	7,238.66	15.48	14.69	120.84	566.62	473.12	393.54	367.18	26.35	14.934				
7,900.00	7,037.00	7,832.61	7,241.40	16.34	15.50	121.16	675.59	473.29	394.99	367.28	27.71	14.256				
8,000.00	7,037.00	7,934.13	7,241.46	17.25	16.33	121.18	777.11	473.18	394.94	365.74	29.20	13.526				
8,100.00	7,037.00	8,034.13	7,241.45	18.22	17.21	121.18	877.11	473.06	394.87	364.09	30.78	12.831				
8,200.00	7,037.00	8,134.13	7,241.45	19.23	18.14	121.19	977.11	472.95	394.79	362.35	32.44	12.172				
8,300.00	7,037.00	8,234.13	7,241.44	20.27	19.12	121.19	1,077.11	472.84	394.71	360.54	34.17	11.552				
8,400.00	7,037.00	8,334.13	7,241.44	21.34	20.14	121.20	1,177.11	472.72	394.63	358.67	35.96	10.974				
8,500.00	7,037.00	8,434.13	7,241.43	22.44	21.20	121.21	1,277.11	472.61	394.56	356.75	37.81	10.436				
8,600.00	7,037.00	8,534.13	7,241.43	23.56	22.28	121.21	1,377.11	472.49	394.48	354.78	39.70	9.937				
8,700.00	7,037.00	8,634.13	7,241.42	24.70	23.38	121.22	1,477.11	472.38	394.40	352.77	41.63	9.474				
8,800.00	7,037.00	8,734.13	7,241.42	25.86	24.51	121.22	1,577.11	472.27	394.33	350.73	43.59	9.046				
8,900.00	7,037.00	8,834.13	7,241.41	27.03	25.65	121.23	1,677.11	472.15	394.25	348.66	45.58	8.649				
9,000.00	7,037.00	8,934.13	7,241.41	28.22	26.81	121.24	1,777.11	472.04	394.17	346.57	47.60	8.280				
9,100.00	7,037.00	9,034.13	7,241.40	29.41	27.99	121.24	1,877.11	471.92	394.09	344.45	49.64	7.939				
9,200.00	7,037.00	9,134.13	7,241.40	30.62	29.17	121.25	1,977.11	471.81	394.02	342.31	51.70	7.621				
9,300.00	7,037.00	9,234.13	7,241.39	31.83	30.37	121.25	2,077.11	471.69	393.94	340.16	53.78	7.325				
9,400.00	7,037.00	9,334.13	7,241.39	33.06	31.57	121.26	2,177.11	471.58	393.86	337.99	55.87	7.049				
9,500.00	7,037.00	9,434.13	7,241.38	34.28	32.79	121.27	2,277.11	471.47	393.78	335.80	57.98	6.792				
9,600.00	7,037.00	9,534.13	7,241.38	35.52	34.01	121.27	2,377.11	471.35	393.71	333.61	60.10	6.551				
9,700.00	7,037.00	9,634.13	7,241.37	36.76	35.24	121.28	2,477.11	471.24	393.63	331.40	62.23	6.325				
9,800.00	7,037.00	9,734.13	7,241.37	38.01	36.48	121.28	2,577.11	471.12	393.55	329.18	64.37	6.114				
9,900.00	7,037.00	9,834.13	7,241.36	39.26	37.72	121.29	2,677.11	471.01	393.48	326.96	66.52	5.915				
10,000.00	7,037.00	9,934.13	7,241.36	40.51	38.96	121.30	2,777.11	470.90	393.40	324.72	68.68	5.728				

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													SPARBOE 37-35HZ - SPARBOE 26C-26HZ - OH - PLAN #6		Offset Site Error: 0.00 ft	
Survey Program: 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0, 7401-SDI_MWD+CRUST_1.0													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance									
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
10,100.00	7,037.00	10,034.13	7,241.35	41.77	40.22	121.30	2,877.11	470.78	393.32	322.48	70.84	5.552				
10,200.00	7,037.00	10,134.13	7,241.35	43.03	41.47	121.31	2,977.11	470.67	393.25	320.24	73.01	5.386				
10,300.00	7,037.00	10,234.13	7,241.34	44.30	42.73	121.31	3,077.11	470.55	393.17	317.98	75.19	5.229				
10,400.00	7,037.00	10,334.13	7,241.34	45.57	43.99	121.32	3,177.11	470.44	393.09	315.72	77.37	5.081				
10,500.00	7,037.00	10,434.13	7,241.33	46.84	45.26	121.33	3,277.11	470.33	393.01	313.46	79.55	4.940				
10,600.00	7,037.00	10,534.13	7,241.32	48.11	46.52	121.33	3,377.11	470.21	392.94	311.19	81.75	4.807				
10,700.00	7,037.00	10,634.13	7,241.32	49.39	47.79	121.34	3,477.11	470.10	392.86	308.92	83.94	4.680				
10,800.00	7,037.00	10,734.13	7,241.31	50.67	49.07	121.34	3,577.11	469.98	392.78	306.64	86.14	4.560				
10,900.00	7,037.00	10,834.13	7,241.31	51.95	50.34	121.35	3,677.11	469.87	392.71	304.36	88.34	4.445				
11,000.00	7,037.00	10,934.13	7,241.30	53.23	51.62	121.36	3,777.11	469.76	392.63	302.08	90.55	4.336				
11,100.00	7,037.00	11,034.13	7,241.30	54.51	52.90	121.36	3,877.11	469.64	392.55	299.79	92.76	4.232				
11,200.00	7,037.00	11,134.13	7,241.29	55.80	54.18	121.37	3,977.11	469.53	392.47	297.50	94.97	4.133				
11,300.00	7,037.00	11,234.13	7,241.29	57.08	55.46	121.37	4,077.11	469.41	392.40	295.21	97.18	4.038				
11,400.00	7,037.00	11,334.13	7,241.28	58.37	56.75	121.38	4,177.11	469.30	392.32	292.92	99.40	3.947				
11,500.00	7,037.00	11,434.13	7,241.28	59.66	58.03	121.39	4,277.11	469.18	392.24	290.62	101.62	3.860				
11,600.00	7,037.00	11,534.13	7,241.27	60.95	59.32	121.39	4,377.11	469.07	392.17	288.32	103.84	3.777				
11,700.00	7,037.00	11,634.13	7,241.27	62.24	60.61	121.40	4,477.11	468.96	392.09	286.02	106.06	3.697				
11,800.00	7,037.00	11,734.13	7,241.26	63.53	61.90	121.40	4,577.11	468.84	392.01	283.72	108.29	3.620				
11,900.00	7,037.00	11,834.13	7,241.26	64.83	63.19	121.41	4,677.11	468.73	391.93	281.42	110.52	3.546				
12,000.00	7,037.00	11,934.13	7,241.25	66.12	64.48	121.42	4,777.11	468.61	391.86	279.11	112.74	3.476				
12,100.00	7,037.00	12,034.13	7,241.25	67.42	65.78	121.42	4,877.11	468.50	391.78	276.81	114.97	3.408				
12,200.00	7,037.00	12,134.13	7,241.24	68.71	67.07	121.43	4,977.10	468.39	391.70	274.50	117.20	3.342				
12,300.00	7,037.00	12,234.13	7,241.24	70.01	68.36	121.43	5,077.10	468.27	391.63	272.19	119.43	3.279				
12,400.00	7,037.00	12,334.13	7,241.23	71.31	69.66	121.44	5,177.10	468.16	391.55	269.88	121.67	3.218				
12,500.00	7,037.00	12,434.13	7,241.23	72.60	70.96	121.45	5,277.10	468.04	391.47	267.57	123.90	3.160				
12,600.00	7,037.00	12,534.13	7,241.22	73.90	72.25	121.45	5,377.10	467.93	391.40	265.26	126.14	3.103				
12,700.00	7,037.00	12,634.13	7,241.22	75.20	73.55	121.46	5,477.10	467.82	391.32	262.95	128.37	3.048				
12,800.00	7,037.00	12,734.13	7,241.21	76.50	74.85	121.46	5,577.10	467.70	391.24	260.63	130.61	2.996				
12,900.00	7,037.00	12,834.13	7,241.21	77.80	76.15	121.47	5,677.10	467.59	391.16	258.32	132.85	2.944				
13,000.00	7,037.00	12,934.13	7,241.20	79.10	77.45	121.48	5,777.10	467.47	391.09	256.00	135.08	2.895				
13,100.00	7,037.00	13,034.13	7,241.20	80.40	78.75	121.48	5,877.10	467.36	391.01	253.69	137.32	2.847				
13,200.00	7,037.00	13,134.13	7,241.19	81.71	80.05	121.49	5,977.10	467.25	390.93	251.37	139.56	2.801				
13,300.00	7,037.00	13,234.13	7,241.19	83.01	81.35	121.49	6,077.10	467.13	390.86	249.05	141.80	2.756				
13,400.00	7,037.00	13,334.13	7,241.18	84.31	82.65	121.50	6,177.10	467.02	390.78	246.74	144.04	2.713				
13,500.00	7,037.00	13,434.13	7,241.18	85.62	83.96	121.51	6,277.10	466.90	390.70	244.42	146.29	2.671				
13,600.00	7,037.00	13,534.13	7,241.17	86.92	85.26	121.51	6,377.10	466.79	390.63	242.10	148.53	2.630				
13,700.00	7,037.00	13,634.13	7,241.17	88.22	86.56	121.52	6,477.10	466.67	390.55	239.78	150.77	2.590				
13,800.00	7,037.00	13,734.13	7,241.16	89.53	87.87	121.52	6,577.10	466.56	390.47	237.46	153.01	2.552				
13,900.00	7,037.00	13,834.13	7,241.16	90.83	89.17	121.53	6,677.10	466.45	390.39	235.14	155.26	2.515				
14,000.00	7,037.00	13,934.13	7,241.15	92.14	90.47	121.54	6,777.10	466.33	390.32	232.82	157.50	2.478				
14,100.00	7,037.00	14,034.13	7,241.15	93.44	91.78	121.54	6,877.10	466.22	390.24	230.50	159.74	2.443				
14,200.00	7,037.00	14,134.13	7,241.14	94.75	93.09	121.55	6,977.10	466.10	390.16	228.18	161.99	2.409				
14,300.00	7,037.00	14,234.13	7,241.14	96.06	94.39	121.55	7,077.10	465.99	390.09	225.85	164.23	2.375				
14,400.00	7,037.00	14,334.13	7,241.13	97.36	95.70	121.56	7,177.10	465.88	390.01	223.53	166.48	2.343				
14,500.00	7,037.00	14,434.13	7,241.13	98.67	97.00	121.57	7,277.10	465.76	389.93	221.21	168.72	2.311				
14,600.00	7,037.00	14,534.13	7,241.12	99.98	98.31	121.57	7,377.10	465.65	389.86	218.89	170.97	2.280				
14,700.00	7,037.00	14,634.13	7,241.12	101.28	99.62	121.58	7,477.10	465.53	389.78	216.57	173.21	2.250				
14,800.00	7,037.00	14,734.13	7,241.11	102.59	100.92	121.59	7,577.10	465.42	389.70	214.24	175.46	2.221				
14,900.00	7,037.00	14,834.13	7,241.11	103.90	102.23	121.59	7,677.10	465.31	389.63	211.92	177.70	2.193				
15,000.00	7,037.00	14,934.13	7,241.10	105.21	103.54	121.60	7,777.10	465.19	389.55	209.60	179.95	2.165				
15,100.00	7,037.00	15,034.13	7,241.10	106.51	104.85	121.60	7,877.10	465.08	389.47	207.28	182.20	2.138				
15,200.00	7,037.00	15,134.13	7,241.09	107.82	106.15	121.61	7,977.10	464.96	389.39	204.95	184.44	2.111				

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> SPARBOE 37-35HZ - SPARBOE 26C-26HZ - OH - PLAN #6												<b>Offset Site Error:</b>	0.00 ft
<b>Survey Program:</b> 25-NS-GYRO-MS, 1886-SDI_MWD+CRUST_1.0, 7401-SDI_MWD+CRUST_1.0												<b>Offset Well Error:</b>	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
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	
15,300.00	7,037.00	15,234.13	7,241.09	109.13	107.46	121.62	8,077.10	464.85	389.32	202.63	186.69	2.085	
15,400.00	7,037.00	15,334.13	7,241.08	110.44	108.77	121.62	8,177.10	464.74	389.24	200.31	188.94	2.060	
15,500.00	7,037.00	15,434.13	7,241.08	111.75	110.08	121.63	8,277.10	464.62	389.16	197.98	191.18	2.036	
15,600.00	7,037.00	15,534.13	7,241.07	113.06	111.39	121.63	8,377.10	464.51	389.09	195.66	193.43	2.012	
15,700.00	7,037.00	15,634.13	7,241.07	114.37	112.70	121.64	8,477.10	464.39	389.01	193.34	195.67	1.988	
15,800.00	7,037.00	15,734.13	7,241.06	115.68	114.01	121.65	8,577.10	464.28	388.93	191.01	197.92	1.965	
15,900.00	7,037.00	15,834.13	7,241.06	116.99	115.32	121.65	8,677.10	464.17	388.86	188.69	200.17	1.943	
16,000.00	7,037.00	15,934.13	7,241.05	118.30	116.63	121.66	8,777.10	464.05	388.78	186.36	202.41	1.921	
16,100.00	7,037.00	16,034.13	7,241.05	119.61	117.94	121.66	8,877.10	463.94	388.70	184.04	204.66	1.899	
16,200.00	7,037.00	16,134.13	7,241.04	120.92	119.25	121.67	8,977.10	463.82	388.63	181.72	206.91	1.878	
16,300.00	7,037.00	16,234.13	7,241.04	122.23	120.56	121.68	9,077.10	463.71	388.55	179.39	209.15	1.858	
16,400.00	7,037.00	16,334.13	7,241.03	123.54	121.87	121.68	9,177.10	463.59	388.47	177.07	211.40	1.838	
16,500.00	7,037.00	16,434.13	7,241.03	124.85	123.18	121.69	9,277.10	463.48	388.40	174.75	213.65	1.818	
16,600.00	7,037.00	16,534.13	7,241.02	126.16	124.49	121.69	9,377.10	463.37	388.32	172.42	215.90	1.799	
16,700.00	7,037.00	16,634.13	7,241.02	127.47	125.80	121.70	9,477.10	463.25	388.24	170.10	218.14	1.780	
16,800.00	7,037.00	16,734.13	7,241.01	128.78	127.11	121.71	9,577.10	463.14	388.17	167.78	220.39	1.761	
16,900.00	7,037.00	16,834.13	7,241.01	130.09	128.42	121.71	9,677.10	463.02	388.09	165.45	222.63	1.743	
17,000.00	7,037.00	16,934.13	7,241.00	131.40	129.73	121.72	9,777.10	462.91	388.01	163.13	224.88	1.725 SF	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design SPARBOE 37-35HZ - SPARBOE 8-35 - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
0.00	0.00	0.00	0.00	0.00	0.00	8.31	2,714.73	396.53	2,743.84					
100.00	100.00	73.63	73.63	0.14	0.10	-132.53	2,714.50	396.77	2,743.60	2,743.37	0.24	N/A		
200.00	199.99	182.94	182.93	0.36	0.35	-131.65	2,713.52	397.74	2,743.63	2,742.92	0.71	3,840.960		
211.84	211.83	195.39	195.38	0.39	0.39	-132.56	2,713.39	397.87	2,743.63	2,742.85	0.78	3,531.203		
300.00	299.98	262.54	262.53	0.61	0.54	-137.87	2,712.93	398.46	2,744.03	2,742.88	1.15	2,382.656		
400.00	399.96	363.65	363.64	0.87	0.78	-152.49	2,712.93	399.11	2,745.67	2,744.03	1.64	1,671.807		
500.00	499.93	466.75	466.73	1.12	1.04	-158.36	2,712.45	399.86	2,747.82	2,745.66	2.16	1,273.760		
600.00	599.86	558.22	558.19	1.38	1.27	-163.16	2,712.18	400.85	2,751.14	2,748.50	2.65	1,038.799		
700.00	699.77	652.22	652.18	1.63	1.51	-166.82	2,712.17	401.95	2,755.28	2,752.13	3.14	876.634		
800.00	799.67	758.34	758.29	1.89	1.79	-170.54	2,712.16	403.50	2,759.94	2,756.27	3.67	751.881		
900.00	899.56	861.71	861.66	2.15	2.06	-174.26	2,711.88	404.60	2,764.50	2,760.30	4.20	658.589		
1,000.00	999.46	959.25	959.20	2.40	2.32	-177.39	2,711.72	405.23	2,768.84	2,764.13	4.71	587.815		
1,100.00	1,099.39	1,053.61	1,053.55	2.66	2.49	-178.99	2,711.70	405.65	2,772.63	2,767.49	5.14	539.240		
1,200.00	1,199.34	1,157.92	1,157.86	2.91	2.62	-177.53	2,711.95	405.44	2,775.95	2,770.42	5.53	502.261		
1,300.00	1,299.31	1,261.56	1,261.50	3.17	2.83	-174.20	2,711.79	405.59	2,778.37	2,772.39	5.99	464.139		
1,400.00	1,399.28	1,350.35	1,350.29	3.41	3.02	-161.43	2,711.78	405.80	2,780.72	2,774.29	6.42	432.870		
1,500.00	1,499.26	1,445.49	1,445.43	3.65	3.16	-149.05	2,712.25	405.90	2,783.24	2,776.45	6.79	409.726		
1,600.00	1,599.23	1,541.63	1,541.57	3.87	3.25	-143.24	2,712.64	405.81	2,785.40	2,778.29	7.11	391.937		
1,700.00	1,699.22	1,633.48	1,633.42	4.09	3.34	-139.55	2,713.48	405.68	2,787.68	2,780.27	7.41	375.984		
1,800.00	1,799.20	1,735.07	1,735.01	4.27	3.44	-128.26	2,714.30	405.00	2,789.72	2,782.03	7.70	362.492		
1,900.00	1,899.18	1,818.64	1,818.56	4.38	3.53	-114.42	2,715.36	404.55	2,791.41	2,783.52	7.89	353.819		
2,000.00	1,999.13	1,915.15	1,915.06	4.39	3.66	-164.27	2,716.88	404.07	2,795.74	2,787.70	8.04	347.803		
2,100.00	2,098.85	2,017.12	2,017.01	4.42	3.81	-153.89	2,718.59	403.36	2,804.13	2,795.93	8.20	341.981		
2,200.00	2,198.49	2,138.97	2,138.85	4.45	3.98	-145.99	2,720.01	402.25	2,812.48	2,804.08	8.40	334.652		
2,300.00	2,298.11	2,250.04	2,249.92	4.50	4.15	-146.30	2,720.59	401.58	2,820.00	2,811.39	8.62	327.301		
2,400.00	2,297.54	2,356.07	2,355.94	4.56	4.34	-152.96	2,720.74	401.54	2,829.36	2,820.52	8.84	320.198		
2,500.00	2,496.69	2,463.20	2,463.07	4.65	4.47	-152.75	2,720.63	401.46	2,840.94	2,831.91	9.02	314.900		
2,600.00	2,595.45	2,569.11	2,568.98	4.74	4.59	-150.43	2,720.27	401.00	2,854.36	2,845.17	9.19	310.597		
2,700.00	2,693.87	2,671.88	2,671.75	4.87	4.71	-149.92	2,719.77	400.16	2,869.16	2,859.76	9.40	305.348		
2,800.00	2,792.19	2,773.09	2,772.95	5.01	4.84	-149.76	2,719.18	399.11	2,884.27	2,874.65	9.62	299.756		
2,900.00	2,890.46	2,877.01	2,876.86	5.17	4.98	-147.16	2,718.47	397.81	2,899.35	2,889.46	9.89	293.276		
3,000.00	2,988.68	2,970.22	2,970.06	5.34	5.12	-144.79	2,717.75	396.75	2,914.08	2,903.93	10.15	287.110		
3,100.00	3,086.94	3,060.56	3,060.40	5.49	5.27	-145.94	2,717.25	396.15	2,928.82	2,918.40	10.42	281.130		
3,200.00	3,185.31	3,145.49	3,145.33	5.65	5.41	-147.46	2,717.03	395.79	2,943.59	2,932.90	10.69	275.465		
3,300.00	3,283.80	3,228.42	3,228.26	5.80	5.55	-150.70	2,717.29	395.39	2,958.72	2,947.76	10.96	269.986		
3,400.00	3,382.42	3,317.01	3,316.85	5.96	5.71	-153.53	2,717.91	395.16	2,974.10	2,962.85	11.25	264.319		
3,500.00	3,481.11	3,410.43	3,410.26	6.14	5.89	-154.71	2,718.79	395.33	2,989.62	2,978.05	11.57	258.461		
3,600.00	3,579.83	3,527.07	3,526.90	6.32	6.11	-156.76	2,719.52	395.77	3,004.78	2,992.85	11.93	251.929		
3,700.00	3,678.49	3,630.26	3,630.08	6.52	6.31	-159.92	2,719.76	396.23	3,020.27	3,008.01	12.26	246.356		
3,800.00	3,777.09	3,728.87	3,728.70	6.72	6.50	-163.49	2,719.98	396.92	3,036.38	3,023.78	12.60	240.972		
3,900.00	3,875.93	3,841.00	3,840.82	6.92	6.70	-168.34	2,719.96	397.70	3,051.17	3,038.19	12.98	235.091		
4,000.00	3,974.98	3,950.94	3,950.75	7.11	6.90	-170.17	2,719.43	398.25	3,064.24	3,050.90	13.33	229.798		
4,100.00	4,074.12	4,049.82	4,049.63	7.31	7.07	-169.52	2,718.83	398.69	3,076.59	3,062.92	13.67	225.107		
4,200.00	4,173.35	4,147.13	4,146.94	7.50	7.25	-162.50	2,718.28	399.33	3,088.18	3,074.15	14.02	220.226		
4,300.00	4,272.71	4,241.83	4,241.64	7.69	7.43	-151.36	2,717.77	400.38	3,098.15	3,083.76	14.39	215.346		
4,400.00	4,372.17	4,324.95	4,324.74	7.88	7.60	-142.50	2,717.57	401.21	3,106.70	3,091.96	14.74	210.804		
4,500.00	4,471.72	4,400.00	4,399.79	8.07	7.75	-132.77	2,718.05	401.79	3,114.39	3,099.32	15.07	206.659		
4,600.00	4,571.36	4,480.28	4,480.06	8.25	7.90	-129.27	2,719.16	402.20	3,121.35	3,105.94	15.41	202.586		
4,700.00	4,671.09	4,560.07	4,559.84	8.44	8.06	-125.17	2,720.66	402.36	3,127.69	3,111.95	15.74	198.718		
4,800.00	4,770.92	4,652.23	4,651.98	8.62	8.23	-119.71	2,722.97	402.32	3,133.38	3,117.29	16.09	194.729		
4,900.00	4,870.82	4,742.89	4,742.60	8.79	8.40	-112.30	2,725.27	402.04	3,137.81	3,121.37	16.44	190.883		
5,000.00	4,970.76	4,818.47	4,818.15	8.96	8.55	-116.67	2,727.68	401.80	3,142.31	3,125.55	16.76	187.487		

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



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design SPARBOE 37-35HZ - SPARBOE 8-35 - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
5,100.00	5,070.73	4,900.00	4,899.60	9.13	8.71	-125.23	2,731.02	401.73	3,147.54	3,130.44	17.10	184.092		
5,200.00	5,170.72	4,980.15	4,979.67	9.30	8.88	-137.88	2,734.77	401.96	3,153.17	3,135.73	17.44	180.824		
5,300.00	5,270.72	5,080.98	5,080.38	9.46	9.09	-156.04	2,739.54	402.59	3,158.36	3,140.54	17.82	177.205		
5,400.00	5,370.72	5,178.79	5,178.08	9.63	9.30	-166.07	2,744.14	403.35	3,162.86	3,144.65	18.21	173.728		
5,500.00	5,470.71	5,282.18	5,281.35	9.79	9.52	-176.07	2,749.02	404.08	3,166.76	3,148.16	18.60	170.227		
5,600.00	5,570.70	5,412.51	5,411.56	9.95	9.80	-186.07	2,754.55	404.59	3,170.11	3,151.05	19.06	166.311		
5,700.00	5,670.70	5,552.26	5,551.24	10.11	10.11	-196.07	2,758.88	404.85	3,172.29	3,152.75	19.54	162.329		
5,800.00	5,770.69	5,703.11	5,702.07	10.28	10.44	-206.07	2,761.46	404.65	3,173.27	3,153.23	20.05	158.302		
5,900.00	5,870.69	5,806.42	5,805.38	10.44	10.65	-216.07	2,762.33	404.22	3,174.13	3,153.70	20.43	155.339		
6,000.00	5,970.69	5,900.00	5,898.95	10.61	10.84	-226.07	2,763.29	403.72	3,176.00	3,155.20	20.80	152.693		
6,100.00	6,070.68	5,991.31	5,990.25	10.78	11.03	-236.07	2,764.44	403.18	3,178.49	3,157.32	21.17	150.129		
6,200.00	6,170.67	6,097.58	6,096.51	10.95	11.25	-246.07	2,765.73	402.46	3,180.43	3,158.86	21.57	147.419		
6,300.00	6,270.67	6,199.95	6,198.88	11.13	11.46	-256.07	2,766.82	401.82	3,181.70	3,159.73	21.97	144.826		
6,400.00	6,370.67	6,310.92	6,309.84	11.31	11.69	-266.07	2,767.76	401.09	3,182.28	3,159.90	22.38	142.179		
6,500.00	6,470.67	6,415.72	6,414.64	11.49	11.90	-276.07	2,768.38	400.49	3,182.40	3,159.62	22.78	139.704		
6,600.00	6,570.05	6,517.25	6,516.16	11.64	12.11	-286.07	2,768.86	400.00	3,172.99	3,150.18	22.81	139.134		
6,700.00	6,666.22	6,613.33	6,612.24	11.73	12.32	-296.07	2,769.27	399.77	3,146.50	3,124.22	22.28	141.205		
6,800.00	6,756.24	6,703.99	6,702.90	11.78	12.53	-306.07	2,769.66	399.67	3,103.76	3,082.51	21.24	146.111		
6,900.00	6,837.38	6,793.99	6,792.90	11.81	12.71	-316.07	2,769.87	399.88	3,045.94	3,026.19	19.74	154.278		
7,000.00	6,907.18	6,869.24	6,868.15	11.85	12.84	-326.07	2,769.85	400.30	2,974.78	2,956.87	17.91	166.076		
7,100.00	6,963.52	6,926.54	6,925.45	11.92	12.93	-336.07	2,769.76	400.59	2,892.58	2,876.52	16.06	180.136		
7,200.00	7,004.68	6,966.07	6,964.97	12.10	12.99	-346.07	2,769.71	400.81	2,801.94	2,787.06	14.88	188.281		
7,300.00	7,029.41	6,989.83	6,988.73	12.41	13.03	-356.07	2,769.69	400.95	2,705.62	2,688.60	17.02	158.965		
7,400.00	7,037.00	6,997.09	6,995.99	12.83	13.04	-366.07	2,769.68	400.99	2,606.53	2,580.68	25.85	100.828		
7,500.00	7,037.00	6,997.03	6,995.93	13.35	13.04	-376.07	2,769.68	400.99	2,507.08	2,480.71	26.36	95.092		
7,600.00	7,037.00	6,996.97	6,995.87	13.97	13.04	-386.07	2,769.68	400.99	2,407.67	2,380.68	26.98	89.225		
7,700.00	7,037.00	6,996.90	6,995.81	14.68	13.04	-396.07	2,769.68	400.99	2,308.31	2,280.61	27.70	83.344		
7,800.00	7,037.00	6,996.84	6,995.75	15.48	13.04	-406.07	2,769.68	400.99	2,209.00	2,180.52	28.49	77.543		
7,900.00	7,037.00	6,996.78	6,995.69	16.34	13.04	-416.07	2,769.68	400.99	2,109.77	2,080.42	29.35	71.890		
8,000.00	7,037.00	6,996.72	6,995.62	17.25	13.04	-426.07	2,769.68	400.99	2,010.61	1,980.34	30.26	66.434		
8,100.00	7,037.00	6,996.66	6,995.56	18.22	13.04	-436.07	2,769.68	400.99	1,911.53	1,880.30	31.23	61.206		
8,200.00	7,037.00	6,996.59	6,995.50	19.23	13.04	-446.07	2,769.68	400.99	1,812.56	1,780.32	32.24	56.222		
8,300.00	7,037.00	6,996.53	6,995.44	20.27	13.04	-456.07	2,769.68	400.99	1,713.71	1,680.43	33.28	51.489		
8,400.00	7,037.00	6,996.47	6,995.37	21.34	13.04	-466.07	2,769.68	400.99	1,615.00	1,580.64	34.36	47.006		
8,500.00	7,037.00	6,996.40	6,995.31	22.44	13.04	-476.07	2,769.68	400.99	1,516.46	1,481.00	35.46	42.769		
8,600.00	7,037.00	6,996.34	6,995.25	23.56	13.04	-486.07	2,769.68	400.99	1,418.12	1,381.54	36.58	38.769		
8,700.00	7,037.00	6,996.28	6,995.18	24.70	13.04	-496.07	2,769.68	400.99	1,320.03	1,282.31	37.72	34.995		
8,800.00	7,037.00	6,996.21	6,995.12	25.86	13.04	-506.07	2,769.68	400.99	1,222.25	1,183.37	38.88	31.438		
8,900.00	7,037.00	6,996.15	6,995.06	27.03	13.04	-516.07	2,769.68	400.99	1,124.86	1,084.81	40.05	28.086		
9,000.00	7,037.00	6,996.09	6,994.99	28.22	13.04	-526.07	2,769.68	400.99	1,027.98	986.74	41.24	24.929		
9,100.00	7,037.00	6,996.02	6,994.93	29.41	13.04	-536.07	2,769.68	400.99	931.75	889.32	42.43	21.958		
9,200.00	7,037.00	6,995.96	6,994.87	30.62	13.04	-546.07	2,769.68	400.99	836.41	792.77	43.64	19.167		
9,300.00	7,037.00	6,995.90	6,994.80	31.83	13.04	-556.07	2,769.68	400.99	742.29	697.44	44.85	16.549		
9,400.00	7,037.00	6,995.83	6,994.74	33.06	13.04	-566.07	2,769.68	400.99	649.94	603.86	46.08	14.105		
9,500.00	7,037.00	6,995.77	6,994.67	34.28	13.04	-576.07	2,769.68	400.99	560.21	512.91	47.31	11.842		
9,600.00	7,037.00	6,995.70	6,994.61	35.52	13.04	-586.07	2,769.68	400.99	474.61	426.07	48.54	9.777		
9,700.00	7,037.00	6,995.64	6,994.54	36.76	13.04	-596.07	2,769.69	400.99	395.83	346.04	49.78	7.951		
9,800.00	7,037.00	6,995.57	6,994.48	38.01	13.04	-606.07	2,769.69	400.98	328.78	277.75	51.03	6.443		
9,900.00	7,037.00	6,995.51	6,994.41	39.26	13.04	-616.07	2,769.69	400.98	281.99	229.71	52.28	5.394		
9,992.86	7,037.00	6,995.45	6,994.35	40.42	13.04	-626.07	2,769.69	400.98	266.25	212.80	53.45	4.981 CC, ES		
10,000.00	7,037.00	6,995.44	6,994.35	40.51	13.04	-636.07	2,769.69	400.98	266.34	212.81	53.54	4.975 SF		
10,100.00	7,037.00	6,995.38	6,994.28	41.77	13.04	-646.07	2,769.69	400.98	286.98	232.19	54.80	5.237		

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



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design SPARBOE 37-35HZ - SPARBOE 8-35 - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
10,200.00	7,037.00	6,995.31	6,994.22	43.03	13.04	89.62	2,769.69	400.98	337.31	281.25	56.06	6.017		
10,300.00	7,037.00	6,995.25	6,994.15	44.30	13.04	89.60	2,769.69	400.98	406.45	349.12	57.33	7.090		
10,400.00	7,037.00	6,995.18	6,994.08	45.57	13.04	89.59	2,769.69	400.98	486.43	427.84	58.59	8.302		
10,500.00	7,037.00	6,995.11	6,994.02	46.84	13.04	89.57	2,769.69	400.98	572.75	512.88	59.87	9.567		
10,600.00	7,037.00	6,995.05	6,993.95	48.11	13.04	89.56	2,769.69	400.98	662.92	601.78	61.14	10.843		
10,700.00	7,037.00	6,994.98	6,993.89	49.39	13.04	89.54	2,769.69	400.98	755.57	693.15	62.41	12.106		
10,800.00	7,037.00	6,994.91	6,993.82	50.67	13.04	89.53	2,769.69	400.98	849.88	786.19	63.69	13.343		
10,900.00	7,037.00	6,994.85	6,993.75	51.95	13.04	89.52	2,769.69	400.98	945.37	880.39	64.97	14.550		
11,000.00	7,037.00	6,994.78	6,993.69	53.23	13.04	89.50	2,769.69	400.98	1,041.70	975.45	66.25	15.723		
11,100.00	7,037.00	6,994.71	6,993.62	54.51	13.04	89.49	2,769.69	400.98	1,138.67	1,071.13	67.54	16.860		
11,200.00	7,037.00	6,994.65	6,993.55	55.80	13.04	89.47	2,769.69	400.98	1,236.11	1,167.29	68.82	17.961		
11,300.00	7,037.00	6,994.58	6,993.48	57.08	13.04	89.46	2,769.69	400.98	1,333.94	1,263.83	70.11	19.027		
11,400.00	7,037.00	6,994.51	6,993.42	58.37	13.04	89.44	2,769.69	400.98	1,432.07	1,360.67	71.40	20.058		
11,500.00	7,037.00	6,994.44	6,993.35	59.66	13.04	89.43	2,769.69	400.98	1,530.44	1,457.75	72.69	21.056		
11,600.00	7,037.00	6,994.38	6,993.28	60.95	13.04	89.41	2,769.69	400.98	1,629.00	1,555.03	73.98	22.021		
11,700.00	7,037.00	6,994.31	6,993.21	62.24	13.04	89.40	2,769.69	400.98	1,727.74	1,652.47	75.27	22.955		
11,800.00	7,037.00	6,994.24	6,993.14	63.53	13.04	89.39	2,769.69	400.98	1,826.61	1,750.05	76.56	23.859		
11,900.00	7,037.00	6,994.17	6,993.08	64.83	13.04	89.37	2,769.69	400.98	1,925.60	1,847.74	77.85	24.734		
12,000.00	7,037.00	6,994.10	6,993.01	66.12	13.04	89.36	2,769.69	400.98	2,024.68	1,945.54	79.15	25.581		
12,100.00	7,037.00	6,994.03	6,992.94	67.42	13.04	89.34	2,769.69	400.98	2,123.85	2,043.41	80.44	26.402		
12,200.00	7,037.00	6,993.96	6,992.87	68.71	13.04	89.33	2,769.69	400.97	2,223.10	2,141.36	81.74	27.198		
12,300.00	7,037.00	6,993.90	6,992.80	70.01	13.04	89.31	2,769.69	400.97	2,322.41	2,239.38	83.03	27.970		
12,400.00	7,037.00	6,993.83	6,992.73	71.31	13.04	89.30	2,769.69	400.97	2,421.78	2,337.45	84.33	28.718		
12,500.00	7,037.00	6,993.76	6,992.66	72.60	13.04	89.28	2,769.69	400.97	2,521.20	2,435.57	85.63	29.443		
12,600.00	7,037.00	6,993.69	6,992.59	73.90	13.04	89.27	2,769.69	400.97	2,620.66	2,533.73	86.93	30.148		
12,700.00	7,037.00	6,993.62	6,992.52	75.20	13.04	89.25	2,769.69	400.97	2,720.16	2,631.93	88.23	30.832		
12,800.00	7,037.00	6,993.55	6,992.45	76.50	13.04	89.24	2,769.69	400.97	2,819.70	2,730.17	89.53	31.496		
12,900.00	7,037.00	6,993.48	6,992.38	77.80	13.04	89.22	2,769.69	400.97	2,919.27	2,828.44	90.83	32.141		
13,000.00	7,037.00	6,993.41	6,992.31	79.10	13.04	89.21	2,769.69	400.97	3,018.86	2,926.74	92.13	32.768		
13,100.00	7,037.00	6,993.34	6,992.24	80.40	13.04	89.19	2,769.69	400.97	3,118.49	3,025.06	93.43	33.378		
13,200.00	7,037.00	6,993.27	6,992.17	81.71	13.04	89.18	2,769.69	400.97	3,218.13	3,123.40	94.73	33.972		
13,300.00	7,037.00	6,993.19	6,992.10	83.01	13.04	89.16	2,769.69	400.97	3,317.80	3,221.77	96.03	34.549		
13,400.00	7,037.00	6,993.12	6,992.03	84.31	13.04	89.15	2,769.69	400.97	3,417.49	3,320.15	97.34	35.111		
13,500.00	7,037.00	6,993.05	6,991.96	85.62	13.04	89.13	2,769.69	400.97	3,517.19	3,418.55	98.64	35.658		
13,600.00	7,037.00	6,992.98	6,991.89	86.92	13.04	89.11	2,769.69	400.97	3,616.91	3,516.97	99.94	36.190		
13,700.00	7,037.00	6,992.91	6,991.81	88.22	13.04	89.10	2,769.69	400.97	3,716.65	3,615.40	101.25	36.709		
13,800.00	7,037.00	6,992.84	6,991.74	89.53	13.04	89.08	2,769.69	400.97	3,816.40	3,713.85	102.55	37.215		
13,900.00	7,037.00	6,992.77	6,991.67	90.83	13.04	89.07	2,769.69	400.97	3,916.16	3,812.31	103.85	37.708		
14,000.00	7,037.00	6,992.69	6,991.60	92.14	13.04	89.05	2,769.69	400.97	4,015.93	3,910.78	105.16	38.189		
14,100.00	7,037.00	6,992.62	6,991.53	93.44	13.04	89.04	2,769.69	400.97	4,115.72	4,009.26	106.46	38.658		
14,200.00	7,037.00	6,992.55	6,991.45	94.75	13.04	89.02	2,769.69	400.97	4,215.52	4,107.75	107.77	39.116		
14,300.00	7,037.00	6,992.48	6,991.38	96.06	13.04	89.01	2,769.69	400.97	4,315.32	4,206.25	109.07	39.563		
14,400.00	7,037.00	6,992.40	6,991.31	97.36	13.04	88.99	2,769.69	400.97	4,415.13	4,304.75	110.38	39.999		
14,500.00	7,037.00	6,992.33	6,991.24	98.67	13.04	88.97	2,769.69	400.96	4,514.96	4,403.27	111.69	40.425		
14,600.00	7,037.00	6,992.26	6,991.16	99.98	13.04	88.96	2,769.69	400.96	4,614.79	4,501.79	112.99	40.841		
14,700.00	7,037.00	6,992.18	6,991.09	101.28	13.04	88.94	2,769.69	400.96	4,714.62	4,600.32	114.30	41.248		
14,800.00	7,037.00	6,992.11	6,991.01	102.59	13.04	88.93	2,769.69	400.96	4,814.47	4,698.86	115.61	41.645		
14,900.00	7,037.00	6,992.04	6,990.94	103.90	13.04	88.91	2,769.69	400.96	4,914.32	4,797.40	116.91	42.034		
15,000.00	7,037.00	6,991.96	6,990.87	105.21	13.04	88.90	2,769.69	400.96	5,014.17	4,895.95	118.22	42.414		
15,100.00	7,037.00	6,991.89	6,990.79	106.51	13.04	88.88	2,769.69	400.96	5,114.03	4,994.51	119.53	42.785		
15,200.00	7,037.00	6,991.81	6,990.72	107.82	13.03	88.86	2,769.69	400.96	5,213.90	5,093.07	120.84	43.149		
15,300.00	7,037.00	6,991.74	6,990.64	109.13	13.03	88.85	2,769.69	400.96	5,313.77	5,191.63	122.14	43.504		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> SPARBOE 37-35HZ - SPARBOE 8-35 - OH - OH												<b>Offset Site Error:</b>	0.00 ft
Survey Program: 100-NS-GYRO-MS												<b>Offset Well Error:</b>	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
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	
15,400.00	7,037.00	6,991.66	6,990.57	110.44	13.03	88.83	2,769.69	400.96	5,413.65	5,290.20	123.45	43.852	
15,500.00	7,037.00	6,991.59	6,990.49	111.75	13.03	88.81	2,769.69	400.96	5,513.53	5,388.77	124.76	44.193	
15,600.00	7,037.00	6,991.51	6,990.42	113.06	13.03	88.80	2,769.69	400.96	5,613.42	5,487.35	126.07	44.527	
15,700.00	7,037.00	6,991.44	6,990.34	114.37	13.03	88.78	2,769.69	400.96	5,713.31	5,585.93	127.38	44.854	
15,800.00	7,037.00	6,991.36	6,990.27	115.68	13.03	88.77	2,769.69	400.96	5,813.20	5,684.51	128.68	45.174	
15,900.00	7,037.00	6,991.29	6,990.19	116.99	13.03	88.75	2,769.69	400.96	5,913.10	5,783.10	129.99	45.488	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design SPARBOE 37-35HZ - SPARBOE 9-35A - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
0.00	0.00	0.00	0.00	0.00	0.00	11.39	1,712.42	344.97	1,747.35					
100.00	100.00	59.14	59.14	0.14	0.08	-129.46	1,712.37	345.02	1,747.00	1,746.78	0.22	7,974.952		
200.00	199.99	159.88	159.88	0.36	0.29	-128.60	1,712.15	345.25	1,747.57	1,746.92	0.65	2,684.679		
300.00	299.98	258.80	258.80	0.61	0.53	-134.85	1,712.00	345.32	1,748.36	1,747.21	1.14	1,530.907		
400.00	399.96	359.69	359.69	0.87	0.76	-149.50	1,711.89	345.28	1,749.73	1,748.11	1.63	1,075.900		
500.00	499.93	459.30	459.30	1.12	0.96	-155.41	1,711.74	345.14	1,752.00	1,749.92	2.08	841.369		
600.00	599.86	558.70	558.70	1.38	1.14	-160.26	1,711.71	344.81	1,755.30	1,752.79	2.51	698.010		
700.00	699.77	657.08	657.07	1.63	1.31	-163.97	1,711.70	344.42	1,759.13	1,756.19	2.94	597.564		
800.00	799.67	748.18	748.17	1.89	1.46	-167.75	1,711.91	344.05	1,763.70	1,760.35	3.35	527.248		
900.00	899.56	838.67	838.67	2.15	1.58	-171.53	1,712.75	343.63	1,769.16	1,765.43	3.72	475.095		
1,000.00	999.46	938.31	938.29	2.40	1.72	-174.70	1,713.92	343.24	1,774.61	1,770.50	4.11	431.275		
1,100.00	1,099.39	1,041.49	1,041.47	2.66	1.88	-178.36	1,714.92	342.96	1,779.25	1,774.72	4.53	392.661		
1,200.00	1,199.34	1,140.45	1,140.43	2.91	2.06	-179.83	1,715.79	342.84	1,783.20	1,778.24	4.96	359.699		
1,300.00	1,299.31	1,239.69	1,239.66	3.17	2.25	-176.83	1,716.80	342.61	1,786.72	1,781.32	5.40	330.605		
1,400.00	1,399.28	1,342.42	1,342.38	3.41	2.46	-164.04	1,717.75	342.27	1,789.89	1,784.03	5.87	305.178		
1,500.00	1,499.26	1,442.77	1,442.74	3.65	2.67	-151.66	1,718.51	342.26	1,792.71	1,786.40	6.31	284.204		
1,600.00	1,599.23	1,545.45	1,545.40	3.87	2.90	-145.85	1,719.33	342.04	1,795.27	1,788.51	6.76	265.558		
1,700.00	1,699.22	1,650.43	1,650.39	4.09	3.16	-142.16	1,719.89	341.45	1,797.14	1,789.91	7.23	248.409		
1,800.00	1,799.20	1,747.91	1,747.86	4.27	3.40	-130.89	1,720.31	341.04	1,798.88	1,791.22	7.66	234.942		
1,900.00	1,899.18	1,842.56	1,842.51	4.38	3.63	-117.06	1,720.95	340.84	1,800.10	1,792.11	7.99	225.355		
2,000.00	1,999.13	1,944.28	1,944.23	4.39	3.88	-161.64	1,721.89	340.31	1,803.75	1,795.50	8.25	218.649		
2,100.00	2,098.85	2,049.42	2,049.36	4.42	4.14	-151.32	1,722.51	339.54	1,810.89	1,802.37	8.53	212.399		
2,200.00	2,198.49	2,146.59	2,146.53	4.45	4.39	-143.46	1,723.02	338.90	1,818.43	1,809.62	8.81	206.430		
2,300.00	2,298.11	2,246.72	2,246.66	4.50	4.64	-143.84	1,723.70	338.38	1,825.86	1,816.75	9.10	200.564		
2,400.00	2,397.54	2,353.86	2,353.79	4.56	4.90	-150.57	1,724.02	338.10	1,835.10	1,825.70	9.40	195.239		
2,500.00	2,496.69	2,454.10	2,454.03	4.65	5.13	-150.44	1,724.01	337.80	1,846.47	1,836.80	9.67	190.854		
2,600.00	2,595.45	2,550.41	2,550.34	4.74	5.36	-148.19	1,724.12	337.54	1,860.06	1,850.10	9.96	186.720		
2,700.00	2,693.87	2,647.36	2,647.29	4.87	5.61	-147.77	1,724.30	337.30	1,875.25	1,864.95	10.30	182.134		
2,800.00	2,792.19	2,743.26	2,743.19	5.01	5.86	-147.70	1,724.59	337.01	1,890.97	1,880.33	10.64	177.750		
2,900.00	2,890.46	2,837.26	2,837.18	5.17	6.10	-145.18	1,725.05	336.59	1,906.94	1,895.94	11.00	173.356		
3,000.00	2,988.68	2,930.28	2,930.21	5.34	6.34	-142.91	1,725.76	336.17	1,922.89	1,911.53	11.36	169.247		
3,100.00	3,086.94	3,025.86	3,025.78	5.49	6.58	-144.21	1,726.68	335.82	1,938.80	1,927.08	11.72	165.415		
3,200.00	3,185.31	3,124.48	3,124.40	5.65	6.79	-145.86	1,727.59	335.82	1,954.50	1,942.44	12.06	162.032		
3,300.00	3,283.80	3,220.67	3,220.58	5.80	6.96	-149.21	1,728.42	336.41	1,970.08	1,957.72	12.36	159.452		
3,400.00	3,382.42	3,312.68	3,312.57	5.96	7.08	-152.08	1,729.38	337.69	1,985.79	1,973.18	12.61	157.435		
3,500.00	3,481.11	3,410.51	3,410.38	6.14	7.21	-153.29	1,730.47	339.60	2,001.54	1,988.66	12.88	155.416		
3,600.00	3,579.83	3,506.91	3,506.75	6.32	7.33	-155.34	1,731.58	341.78	2,017.30	2,004.16	13.14	153.511		
3,700.00	3,678.49	3,600.00	3,599.80	6.52	7.46	-158.50	1,732.86	344.27	2,034.05	2,020.65	13.40	151.762		
3,800.00	3,777.09	3,691.93	3,691.67	6.72	7.59	-162.06	1,734.36	347.01	2,051.70	2,038.01	13.69	149.864		
3,900.00	3,875.93	3,782.10	3,781.79	6.92	7.73	-166.91	1,736.07	349.79	2,068.57	2,054.56	14.00	147.712		
4,000.00	3,974.98	3,874.99	3,874.61	7.11	7.89	-168.71	1,738.17	352.64	2,084.61	2,070.28	14.33	145.485		
4,100.00	4,074.12	3,971.35	3,970.90	7.31	8.07	-168.02	1,740.58	355.40	2,100.26	2,085.59	14.67	143.207		
4,200.00	4,173.35	4,062.44	4,061.92	7.50	8.24	-160.96	1,743.01	357.99	2,115.24	2,100.22	15.02	140.814		
4,300.00	4,272.71	4,158.66	4,158.06	7.69	8.44	-149.80	1,745.98	360.50	2,128.87	2,113.47	15.40	138.239		
4,400.00	4,372.17	4,260.75	4,260.07	7.88	8.65	-140.96	1,749.05	363.14	2,140.69	2,124.89	15.80	135.507		
4,500.00	4,471.72	4,358.45	4,357.70	8.07	8.86	-131.26	1,751.91	365.73	2,150.74	2,134.55	16.19	132.866		
4,600.00	4,571.36	4,470.49	4,469.66	8.25	9.10	-127.81	1,755.18	368.30	2,159.32	2,142.71	16.61	130.004		
4,700.00	4,671.09	4,562.31	4,561.42	8.44	9.34	-123.75	1,757.58	370.66	2,165.97	2,148.94	17.03	127.210		
4,800.00	4,770.92	4,660.85	4,659.92	8.62	9.56	-118.29	1,759.45	373.01	2,171.01	2,153.58	17.43	124.577		
4,900.00	4,870.82	4,762.65	4,761.69	8.79	9.75	-110.85	1,760.97	375.09	2,174.73	2,156.93	17.79	122.225		
5,000.00	4,970.76	4,861.53	4,860.53	8.96	9.92	-115.19	1,762.79	376.83	2,178.56	2,160.41	18.14	120.074		
5,100.00	5,070.73	4,937.51	4,936.44	9.13	10.10	-123.71	1,765.38	378.50	2,183.32	2,164.82	18.50	118.039		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
5,200.00	5,170.72	5,018.29	5,017.12	9.30	10.29	-136.33	1,769.01	380.41	2,189.00	2,170.13	18.87	116.027		
5,300.00	5,270.72	5,121.95	5,120.61	9.46	10.54	-154.43	1,773.81	383.74	2,194.37	2,175.08	19.29	113.772		
5,400.00	5,370.72	5,223.26	5,221.75	9.63	10.78	47.76	1,778.35	387.30	2,198.98	2,179.28	19.70	111.625		
5,500.00	5,470.71	5,331.64	5,329.97	9.79	11.03	44.71	1,783.08	391.03	2,202.89	2,182.76	20.13	109.439		
5,600.00	5,570.70	5,449.91	5,448.09	9.95	11.31	39.26	1,787.24	395.42	2,205.89	2,185.31	20.58	107.211		
5,700.00	5,670.70	5,546.61	5,544.69	10.11	11.53	32.60	1,790.34	398.54	2,208.56	2,187.59	20.97	105.295		
5,800.00	5,770.69	5,649.72	5,647.69	10.28	11.78	58.51	1,794.07	401.27	2,211.75	2,190.35	21.40	103.360		
5,900.00	5,870.69	5,776.45	5,774.35	10.44	12.09	128.95	1,797.58	403.89	2,214.84	2,192.95	21.88	101.214		
6,000.00	5,970.69	5,887.07	5,884.93	10.61	12.36	153.00	1,799.74	405.50	2,217.87	2,195.54	22.33	99.344		
6,100.00	6,070.68	5,994.90	5,992.74	10.78	12.61	153.55	1,801.43	407.17	2,220.93	2,198.17	22.76	97.577		
6,200.00	6,170.67	6,107.08	6,104.90	10.95	12.87	148.67	1,802.72	408.59	2,223.03	2,199.82	23.20	95.806		
6,300.00	6,270.67	6,212.35	6,210.16	11.13	13.11	94.55	1,803.54	409.84	2,224.22	2,200.60	23.62	94.173		
6,400.00	6,370.67	6,322.83	6,320.63	11.31	13.33	-24.05	1,804.01	411.10	2,224.58	2,200.55	24.03	92.589		
6,500.00	6,470.67	6,435.23	6,433.02	11.49	13.50	-4.31	1,803.90	412.14	2,224.16	2,199.77	24.39	91.196		
6,600.00	6,570.05	6,543.69	6,541.48	11.64	13.62	6.65	1,803.31	412.93	2,213.91	2,189.59	24.32	91.026		
6,700.00	6,666.22	6,642.67	6,640.46	11.73	13.69	7.48	1,802.47	413.35	2,186.38	2,162.75	23.63	92.535		
6,800.00	6,756.24	6,732.08	6,729.86	11.78	13.73	8.46	1,801.80	413.39	2,142.80	2,120.41	22.39	95.717		
6,900.00	6,837.38	6,816.43	6,814.21	11.81	13.78	9.97	1,801.04	413.48	2,084.35	2,063.62	20.73	100.546		
7,000.00	6,907.18	6,885.98	6,883.76	11.85	13.82	12.42	1,800.36	413.55	2,012.89	1,994.02	18.86	106.701		
7,100.00	6,963.52	6,943.29	6,941.07	11.92	13.85	16.74	1,799.77	413.55	1,930.67	1,913.43	17.24	112.002		
7,200.00	7,004.68	6,985.05	6,982.82	12.10	13.87	25.44	1,799.31	413.51	1,840.20	1,823.17	17.04	108.007		
7,300.00	7,029.41	7,008.74	7,006.51	12.41	13.89	46.95	1,799.04	413.48	1,744.33	1,723.08	21.25	82.083		
7,400.00	7,037.00	7,014.88	7,012.65	12.83	13.89	93.83	1,798.97	413.47	1,646.01	1,619.40	26.62	61.845		
7,500.00	7,037.00	7,013.81	7,011.57	13.35	13.89	93.61	1,798.98	413.47	1,547.55	1,520.42	27.13	57.035		
7,600.00	7,037.00	7,012.73	7,010.50	13.97	13.89	93.39	1,798.99	413.47	1,449.30	1,421.55	27.76	52.213		
7,700.00	7,037.00	7,011.64	7,009.41	14.68	13.89	93.17	1,799.00	413.47	1,351.31	1,322.84	28.47	47.458		
7,800.00	7,037.00	7,010.55	7,008.32	15.48	13.89	92.94	1,799.02	413.48	1,253.63	1,224.36	29.27	42.830		
7,900.00	7,037.00	7,009.45	7,007.22	16.34	13.89	92.72	1,799.03	413.48	1,156.35	1,126.22	30.13	38.374		
8,000.00	7,037.00	7,008.35	7,006.12	17.25	13.89	92.49	1,799.04	413.48	1,059.57	1,028.52	31.06	34.118		
8,100.00	7,037.00	7,007.24	7,005.01	18.22	13.89	92.26	1,799.05	413.48	963.46	931.43	32.03	30.083		
8,200.00	7,037.00	7,006.12	7,003.89	19.23	13.89	92.03	1,799.07	413.48	868.21	835.17	33.04	26.278		
8,300.00	7,037.00	7,005.00	7,002.77	20.27	13.89	91.80	1,799.08	413.48	774.17	740.08	34.09	22.711		
8,400.00	7,037.00	7,003.87	7,001.64	21.34	13.88	91.57	1,799.09	413.49	681.82	646.65	35.17	19.389		
8,500.00	7,037.00	7,002.74	7,000.51	22.44	13.88	91.34	1,799.11	413.49	591.96	555.69	36.27	16.321		
8,600.00	7,037.00	7,001.59	6,999.36	23.56	13.88	91.10	1,799.12	413.49	505.91	468.52	37.39	13.529		
8,700.00	7,037.00	7,000.00	6,997.77	24.70	13.88	90.78	1,799.14	413.49	426.01	387.46	38.54	11.054		
8,800.00	7,037.00	6,999.28	6,997.05	25.86	13.88	90.63	1,799.15	413.49	356.38	316.68	39.70	8.977		
8,900.00	7,037.00	6,998.10	6,995.87	27.03	13.88	90.38	1,799.16	413.49	304.20	263.32	40.87	7.442		
9,000.00	7,037.00	6,996.93	6,994.70	28.22	13.88	90.14	1,799.17	413.50	279.39	237.33	42.06	6.642		
9,022.39	7,037.00	6,996.67	6,994.44	28.48	13.88	90.09	1,799.18	413.50	278.50	236.17	42.33	6.579 CC, ES, SF		
9,100.00	7,037.00	6,995.76	6,993.53	29.41	13.88	89.90	1,799.19	413.50	289.11	245.85	43.26	6.683		
9,200.00	7,037.00	6,994.60	6,992.37	30.62	13.88	89.66	1,799.20	413.50	330.31	285.84	44.47	7.428		
9,300.00	7,037.00	6,993.44	6,991.21	31.83	13.88	89.43	1,799.21	413.50	393.21	347.53	45.68	8.608		
9,400.00	7,037.00	6,992.28	6,990.05	33.06	13.88	89.19	1,799.23	413.50	469.18	422.28	46.90	10.003		
9,500.00	7,037.00	6,991.13	6,988.90	34.28	13.88	88.95	1,799.24	413.51	552.85	504.72	48.13	11.486		
9,600.00	7,037.00	6,989.98	6,987.75	35.52	13.88	88.71	1,799.25	413.51	641.21	591.85	49.36	12.990		
9,700.00	7,037.00	6,988.84	6,986.61	36.76	13.88	88.48	1,799.27	413.51	732.57	681.97	50.60	14.477		
9,800.00	7,037.00	6,987.70	6,985.47	38.01	13.88	88.25	1,799.28	413.51	825.93	774.09	51.84	15.931		
9,900.00	7,037.00	6,986.56	6,984.33	39.26	13.87	88.01	1,799.29	413.51	920.68	867.60	53.09	17.342		
10,000.00	7,037.00	6,985.43	6,983.20	40.51	13.87	87.78	1,799.31	413.51	1,016.44	962.11	54.34	18.706		
10,100.00	7,037.00	6,984.30	6,982.07	41.77	13.87	87.55	1,799.32	413.51	1,112.95	1,057.36	55.59	20.021		
10,200.00	7,037.00	6,983.18	6,980.95	43.03	13.87	87.32	1,799.33	413.52	1,210.02	1,153.18	56.84	21.288		

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

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design SPARBOE 37-35HZ - SPARBOE 9-35A - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
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		
10,300.00	7,037.00	6,982.06	6,979.83	44.30	13.87	87.09	1,799.34	413.52	1,307.53	1,249.43	58.10	22.506		
10,400.00	7,037.00	6,980.94	6,978.71	45.57	13.87	86.86	1,799.36	413.52	1,405.39	1,346.04	59.35	23.678		
10,500.00	7,037.00	6,979.83	6,977.60	46.84	13.87	86.63	1,799.37	413.52	1,503.53	1,442.92	60.61	24.806		
10,600.00	7,037.00	6,978.72	6,976.49	48.11	13.87	86.40	1,799.38	413.52	1,601.90	1,540.03	61.87	25.891		
10,700.00	7,037.00	6,977.62	6,975.39	49.39	13.87	86.18	1,799.39	413.52	1,700.46	1,637.33	63.13	26.935		
10,800.00	7,037.00	6,976.52	6,974.29	50.67	13.87	85.95	1,799.41	413.52	1,799.18	1,734.79	64.39	27.941		
10,900.00	7,037.00	6,975.42	6,973.19	51.95	13.87	85.73	1,799.42	413.53	1,898.03	1,832.38	65.65	28.910		
11,000.00	7,037.00	6,974.33	6,972.10	53.23	13.87	85.50	1,799.43	413.53	1,997.00	1,930.08	66.91	29.844		
11,100.00	7,037.00	6,973.24	6,971.01	54.51	13.87	85.28	1,799.44	413.53	2,096.06	2,027.88	68.18	30.745		
11,200.00	7,037.00	6,972.15	6,969.92	55.80	13.87	85.06	1,799.46	413.53	2,195.21	2,125.77	69.44	31.614		
11,300.00	7,037.00	6,971.07	6,968.84	57.08	13.87	84.84	1,799.47	413.53	2,294.43	2,223.73	70.70	32.454		
11,400.00	7,037.00	6,969.99	6,967.76	58.37	13.87	84.62	1,799.48	413.53	2,393.71	2,321.75	71.96	33.265		
11,500.00	7,037.00	6,968.92	6,966.69	59.66	13.86	84.40	1,799.49	413.53	2,493.05	2,419.84	73.22	34.049		
11,600.00	7,037.00	6,967.84	6,965.62	60.95	13.86	84.18	1,799.50	413.53	2,592.45	2,517.97	74.48	34.808		
11,700.00	7,037.00	6,966.78	6,964.55	62.24	13.86	83.96	1,799.52	413.53	2,691.88	2,616.15	75.74	35.542		
11,800.00	7,037.00	6,965.71	6,963.48	63.53	13.86	83.75	1,799.53	413.54	2,791.36	2,714.36	77.00	36.253		
11,900.00	7,037.00	6,964.65	6,962.42	64.83	13.86	83.53	1,799.54	413.54	2,890.87	2,812.62	78.25	36.942		
12,000.00	7,037.00	6,963.60	6,961.37	66.12	13.86	83.32	1,799.55	413.54	2,990.42	2,910.91	79.51	37.611		
12,100.00	7,037.00	6,962.54	6,960.31	67.42	13.86	83.10	1,799.56	413.54	3,089.99	3,009.22	80.77	38.259		
12,200.00	7,037.00	6,961.49	6,959.26	68.71	13.86	82.89	1,799.57	413.54	3,189.59	3,107.57	82.02	38.888		
12,300.00	7,037.00	6,960.45	6,958.22	70.01	13.86	82.68	1,799.59	413.54	3,289.21	3,205.94	83.27	39.499		
12,400.00	7,037.00	6,959.40	6,957.18	71.31	13.86	82.47	1,799.60	413.54	3,388.86	3,304.33	84.52	40.093		
12,500.00	7,037.00	6,958.36	6,956.14	72.60	13.86	82.26	1,799.61	413.54	3,488.52	3,402.75	85.77	40.671		
12,600.00	7,037.00	6,957.33	6,955.10	73.90	13.86	82.05	1,799.62	413.54	3,588.21	3,501.18	87.02	41.233		
12,700.00	7,037.00	6,956.30	6,954.07	75.20	13.86	81.84	1,799.63	413.54	3,687.91	3,599.64	88.27	41.779		
12,800.00	7,037.00	6,955.27	6,953.04	76.50	13.86	81.63	1,799.64	413.54	3,787.62	3,698.11	89.52	42.312		
12,900.00	7,037.00	6,954.24	6,952.02	77.80	13.86	81.43	1,799.65	413.54	3,887.35	3,796.59	90.76	42.830		
13,000.00	7,037.00	6,953.22	6,950.99	79.10	13.86	81.22	1,799.66	413.55	3,987.10	3,895.09	92.00	43.336		
13,100.00	7,037.00	6,952.20	6,949.97	80.40	13.86	81.02	1,799.68	413.55	4,086.85	3,993.61	93.25	43.829		
13,200.00	7,037.00	6,951.19	6,948.96	81.71	13.85	80.81	1,799.69	413.55	4,186.62	4,092.14	94.48	44.310		
13,300.00	7,037.00	6,950.17	6,947.95	83.01	13.85	80.61	1,799.70	413.55	4,286.40	4,190.68	95.72	44.780		
13,400.00	7,037.00	6,949.17	6,946.94	84.31	13.85	80.41	1,799.71	413.55	4,386.19	4,289.23	96.96	45.238		
13,500.00	7,037.00	6,948.16	6,945.93	85.62	13.85	80.21	1,799.72	413.55	4,485.98	4,387.79	98.19	45.686		
13,600.00	7,037.00	6,947.16	6,944.93	86.92	13.85	80.01	1,799.73	413.55	4,585.79	4,486.36	99.42	46.124		
13,700.00	7,037.00	6,946.16	6,943.93	88.22	13.85	79.81	1,799.74	413.55	4,685.60	4,584.95	100.65	46.552		
13,800.00	7,037.00	6,945.16	6,942.94	89.53	13.85	79.61	1,799.75	413.55	4,785.42	4,683.54	101.88	46.970		
13,900.00	7,037.00	6,944.17	6,941.95	90.83	13.85	79.41	1,799.76	413.55	4,885.25	4,782.14	103.11	47.380		
14,000.00	7,037.00	6,943.18	6,940.96	92.14	13.85	79.22	1,799.77	413.55	4,985.09	4,880.75	104.33	47.781		
14,100.00	7,037.00	6,942.20	6,939.97	93.44	13.85	79.02	1,799.78	413.55	5,084.93	4,979.37	105.55	48.174		
14,200.00	7,037.00	6,941.22	6,938.99	94.75	13.85	78.83	1,799.79	413.55	5,184.77	5,078.00	106.77	48.558		
14,300.00	7,037.00	6,940.24	6,938.01	96.06	13.85	78.63	1,799.80	413.55	5,284.63	5,176.64	107.99	48.935		
14,400.00	7,037.00	6,939.26	6,937.03	97.36	13.85	78.44	1,799.81	413.55	5,384.49	5,275.28	109.21	49.305		
14,500.00	7,037.00	6,938.29	6,936.06	98.67	13.85	78.25	1,799.83	413.55	5,484.35	5,373.93	110.42	49.668		
14,600.00	7,037.00	6,937.32	6,935.09	99.98	13.85	78.06	1,799.84	413.55	5,584.22	5,472.58	111.63	50.023		
14,700.00	7,037.00	6,936.35	6,934.12	101.28	13.85	77.87	1,799.85	413.55	5,684.09	5,571.25	112.84	50.372		
14,800.00	7,037.00	6,935.39	6,933.16	102.59	13.85	77.68	1,799.86	413.55	5,783.96	5,669.92	114.05	50.715		
14,900.00	7,037.00	6,934.43	6,932.20	103.90	13.84	77.49	1,799.87	413.55	5,883.84	5,768.59	115.25	51.052		
15,000.00	7,037.00	6,933.47	6,931.24	105.21	13.84	77.30	1,799.88	413.55	5,983.73	5,867.27	116.46	51.382		

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to GL 4946' &amp; KB 25' @ 4971.00ft (HP 3

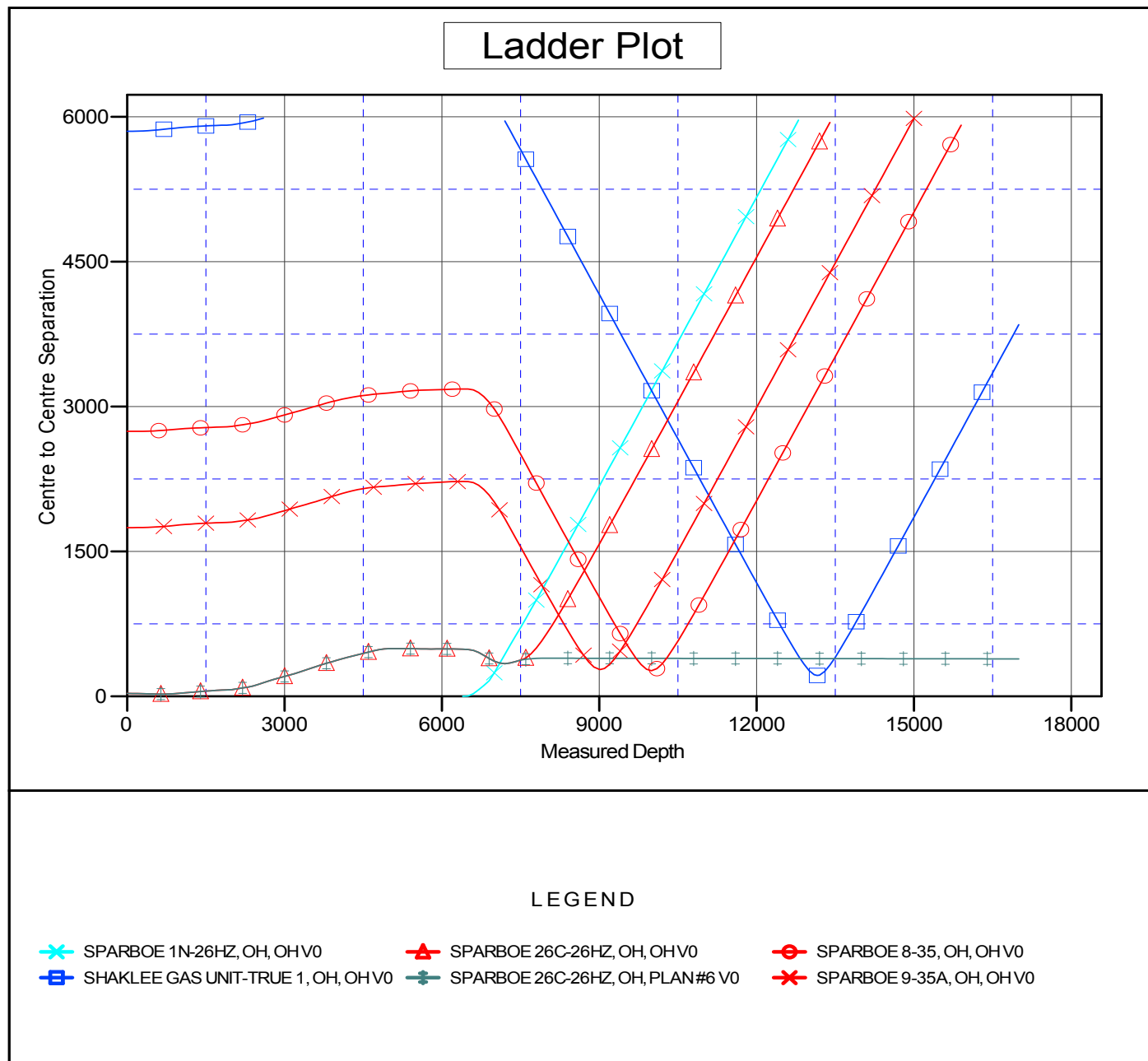
Offset Depths are relative to Offset Datum

Central Meridian is -105.5000000

Coordinates are relative to: SPARBOE 1N-26HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.57°



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 1N-26HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Reference Site:</b>	SPARBOE 37-35HZ	<b>MD Reference:</b>	GL 4946' & KB 25' @ 4971.00ft (HP 311)
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	SPARBOE 1N-26HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	SPARBOE 1N-26HZX	<b>Database:</b>	EDM5000-RobertS-Local
<b>Reference Design:</b>	PLAN #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to GL 4946' & KB 25' @ 4971.00ft (HP 3)

Offset Depths are relative to Offset Datum

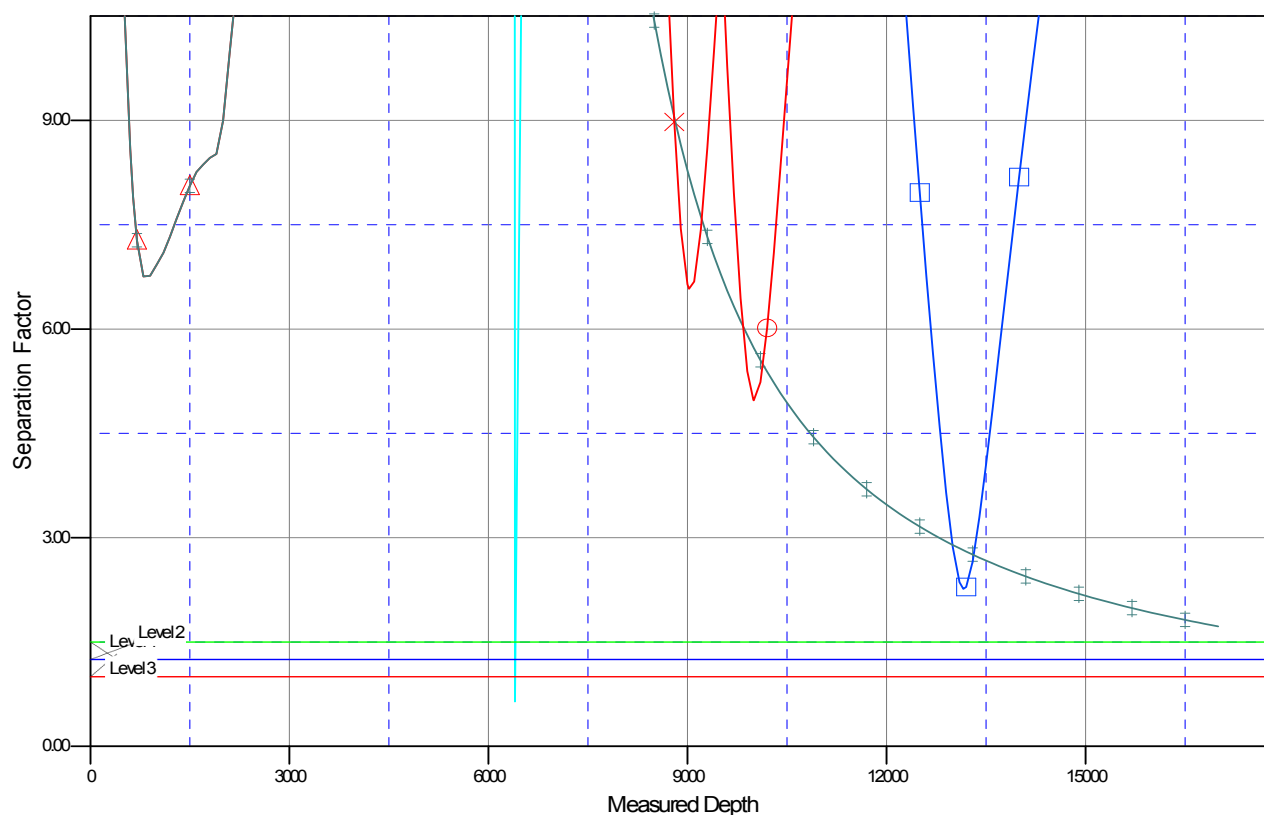
Central Meridian is -105.5000000

Coordinates are relative to: SPARBOE 1N-26HZ







Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.57°

## Separation Factor Plot



### LEGEND

- |  |   |  |
|--|---|--|
|  SPARBOE 1N-26HZ, OH, OH V0         |  SPARBOE 26C-26HZ, OH, OH V0     |  SPARBOE 8-35, OH, OH V0  |
|  SHAKLEE GAS UNIT-TRUE 1, OH, OH V0 |  SPARBOE 26C-26HZ, OH, PLAN#6 V0 |  SPARBOE 9-35A, OH, OH V0 |