

30-015-39999

COG OPERATING LLC
RECEIVED

JUL 09 2012

ARTESIA WEST

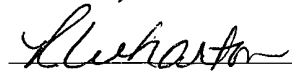
COG OPERATING

Hay Hollow
Eddy County, NM
SRO State Unit #18H
VH - Job #32K0512556

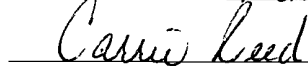
Survey: Gyro

SDI Standard Survey Report

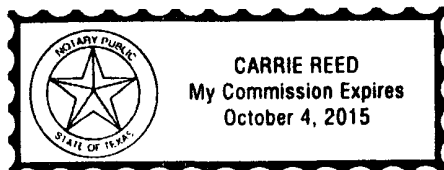
This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 15th of June, 2012.



Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO State Unit #18H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	SRO State Unit #18H	North Reference:	Grid
Wellbore:	VH - Job #32K0512556	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512556	Database:	EDM-Regulatory

Project	Hay Hollow		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Eddy County, NM		
Site Position:		Northing:	386,239 33 usft
From:	Lat/Long	Easting:	572,312 98 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 3' 42 020 N
		Longitude:	104° 5' 59 660 W
		Grid Convergence:	0 12 °

Well	SRO State Unit #18H, Directional (Crescent)		
Well Position	+N/-S	0 00 usft	Northing: 381,606 97 usft
	+E/-W	0 00 usft	Easting: 571,631 64 usft
Position Uncertainty	0 00 usft	Wellhead Elevation:	usft
		Latitude:	32° 2' 56 190 N
		Longitude:	104° 6' 7 693 W
		Ground Level:	0 00 usft

Wellbore	VH - Job #32K0512556				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	05/16/12	7 70	59 91	48,385

Design	VH - Job #32K0512556			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth: 0 00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 00	0 00	0 00	180 77

Survey Program	Date	06/18/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 00	7,375 00	Gyro (VH - Job #32K0512556)	Keeper	Keeper Gyro

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
100 00	0 25	238 84	100 00	-0 11	-0 19	238 84	0 22
200 00	0 44	223 47	200 00	-0 50	-0 64	231 65	0 81
300 00	0 89	175 53	299 99	-1 56	-0 84	208 37	1 77
400 00	0 94	187 90	399 98	-3 14	-0 89	195 86	3 27
500 00	1 03	175 59	499 96	-4 85	-0 94	190 93	4 94
600 00	0 99	177 99	599 95	-6 61	-0 84	187 22	6 67
700 00	1 04	147 33	699 93	-8 24	-0 32	182 21	8 25
800 00	0 86	136 60	799 92	-9 55	0 69	175 88	9 57
900 00	1 02	128 24	899 91	-10 64	1 90	169 87	10 81
1,000 00	1 09	115 77	999 89	-11 61	3 46	163 41	12 11
1,100 00	1 24	114 26	1,099 87	-12 47	5 30	156 96	13 55

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO State Unit #18H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	SRO State Unit #18H	North Reference:	Grid
Wellbore:	VH - Job #32K0512556	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512556	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,200 00	1 97	82 80	1,199 83	-12 70	7 99	147 81	15 00	
1,300 00	1 65	60 80	1,299 78	-11 78	10 96	137 07	16 09	
1,400 00	1 03	17 57	1,399 76	-10 22	12 48	129 31	16 13	
1,500 00	0 91	3 61	1,499 74	-8 57	12 80	123 79	15 41	
1,600 00	0 95	14 88	1,599 73	-6 98	13 07	118 10	14 81	
1,700 00	0 74	11 83	1,699 72	-5 54	13 41	112 45	14 51	
1,800 00	1 33	55.04	1,799 70	-4 25	14 50	106 33	15 11	
1,900 00	1 94	69 77	1,899 66	-3 00	17 04	99 97	17 30	
2,000 00	1 05	87 85	1,999 63	-2.38	19 54	96 93	19 68	
2,100 00	1 37	91 46	2,099 61	-2 37	21 65	96 25	21 78	
2,200 00	1 32	102 29	2,199.58	-2 65	23 97	96 30	24 12	
2,300 00	0 48	111 83	2,299 56	-3 05	25 49	96 82	25 67	
2,400 00	0 25	115 81	2,399 56	-3 30	26 07	97 21	26 28	
2,500 00	0 22	134 15	2,499 56	-3 53	26 40	97.61	26 64	
2,600 00	0 12	180 55	2,599 56	-3 77	26 54	98 08	26 81	
2,700 00	0 18	74 55	2,699 56	-3 83	26 69	98 16	26 97	
2,800 00	0 08	47 35	2,799 56	-3 74	26 89	97 92	27 15	
2,900 00	0 09	324 34	2,899 56	-3 63	26 90	97 68	27 14	
3,000 00	0 22	304 06	2,999 56	-3 46	26 70	97 38	26 92	
3,100 00	0 28	351 26	3,099 56	-3 11	26 50	96 69	26 68	
3,200 00	0 12	325 66	3,199 56	-2 78	26 40	96 01	26 55	
3,300 00	0 34	313 14	3,299 56	-2 49	26 13	95 45	26 25	
3,400 00	0.45	279 91	3,399 56	-2 22	25 52	94 97	25 62	
3,500 00	0 61	291 54	3,499 55	-1 96	24 64	94 54	24 72	
3,600 00	0 45	297 57	3,599 55	-1 58	23 80	93 80	23 85	
3,700 00	0 65	303 79	3,699 54	-1 08	22 98	92 70	23 00	
3,800 00	0 55	301 65	3,799 54	-0.52	22 10	91 34	22 11	
3,900 00	0 59	287 17	3,899 53	-0 11	21 20	90 30	21 20	
4,000.00	0 67	287 67	3,999 53	0 22	20 15	89 38	20.15	
4,100 00	0 49	271.66	4,099 52	0 41	19 17	88 78	19 17	
4,200 00	0 81	258 21	4,199 51	0 27	18 05	89 13	18 05	
4,300 00	0 49	258 14	4,299 51	0 04	16 94	89 86	16 94	
4,400 00	0 60	257 19	4,399 50	-0 16	16 01	90 58	16.01	
4,500 00	0 36	254 85	4,499 50	-0 36	15 19	91 36	15 20	
4,600 00	0 39	303 22	4,599 50	-0 26	14 60	91 00	14 61	
4,700 00	0 25	222 63	4,699 50	-0 23	14 17	90 93	14 17	
4,800 00	0 59	201 89	4,799 49	-0 87	13 83	93 59	13 86	
4,900 00	0 43	198 97	4,899 49	-1 70	13 52	97 17	13 63	
5,000 00	0 71	207 50	4,999 48	-2 60	13 11	101 24	13 37	
5,100 00	0 56	222 18	5,099 48	-3 52	12 50	105 72	12 98	
5,200 00	0 88	216 51	5,199 47	-4 50	11 71	111 00	12 54	
5,300 00	0 73	205 31	5,299 46	-5 69	10 98	117 39	12 37	
5,400 00	0 97	189 49	5,399 45	-7 10	10 57	123 89	12.73	
5,500 00	1 01	206 43	5,499.44	-8 72	10 04	130 99	13 30	

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO State Unit #18H
Project:	Hay Hollow	TVD Reference:	WELL @ 0 00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 00usft (Original Well Elev)
Well:	SRO State Unit #18H	North Reference:	Grid
Wellbore:	VH - Job #32K0512556	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0512556	Database:	EDM-Regulatory

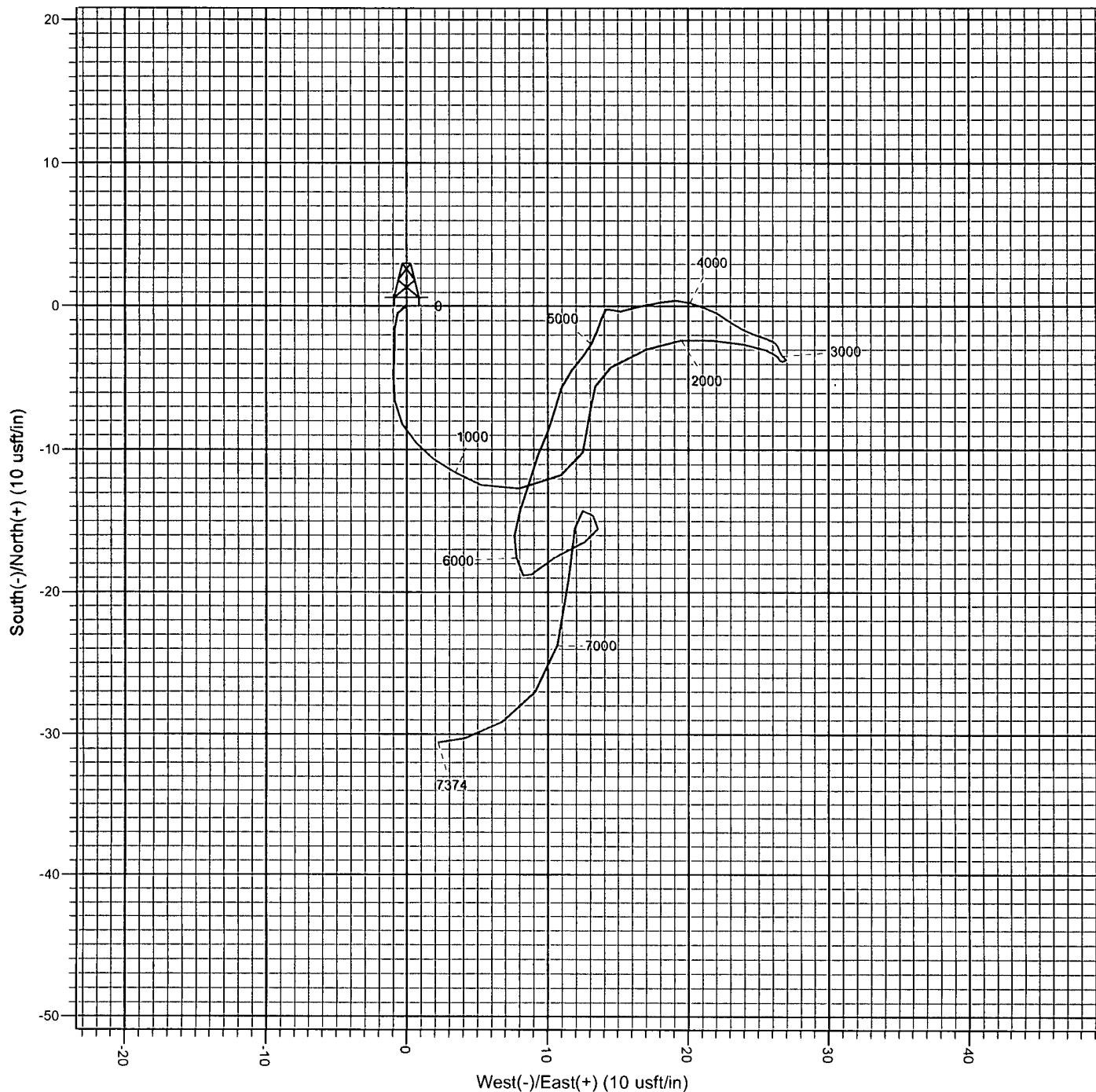
Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600 00	1 09	200 07	5,599 42	-10 41	9 32	138 15	13 97
5,700 00	1 10	197 70	5,699 40	-12 21	8 70	144 53	15 00
5,800 00	1 28	197 62	5,799 38	-14 19	8 07	150 37	16 33
5,900 00	0 88	187 22	5,899 36	-16 02	7 64	154 51	17 75
6,000 00	0 94	162 79	5,999 35	-17 56	7 78	156 10	19 21
6,100 00	0 62	152 79	6,099 34	-18 83	8 27	156 28	20 57
6,200 00	0 73	31 54	6,199 34	-18 77	8 85	154 74	20 75
6,300 00	1 65	63 45	6,299 31	-17 58	10 47	149 21	20 47
6,400 00	1 12	61 63	6,399 28	-16 47	12 62	142 54	20 75
6,500 00	0 54	9 53	6,499 27	-15 54	13 56	138 90	20 63
6,600 00	0 72	317 86	6,599 27	-14 61	13 22	137 87	19 70
6,700 00	0 36	250 47	6,699 27	-14 25	12 50	138 75	18 96
6,800 00	1 29	192 69	6,799 26	-15 46	11 96	142 28	19 54
6,900 00	2 91	185 07	6,899 18	-19 08	11 48	148 96	22 27
7,000 00	2 51	195 33	6,999 07	-23 72	10 68	155 76	26 02
7,100 00	1 83	219 90	7,099 00	-27 06	9 08	161 45	28 54
7,200 00	1 77	237 04	7,198 95	-29 13	6 76	166 94	29 90
7,300 00	1 56	257 40	7,298 91	-30 26	4 13	172 22	30 54
7,375 00	1 38	266 70	7,373 89	-30 54	2 24	175 81	30 62



Project: Hay Hollow
 Eddy County, NM
 Well: SRO State Unit #18H
 Wellbore: VH - Job #32K0512556
 Design: VH - Job #32K0512556

WELL DETAILS: SRO State Unit #18H
 WELL @ 0 00usft (Original Well Elev)
 Ground Level: 0 00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	381606.97	571631.64	32° 2' 56.190 N	104° 6' 7.693 W	



PROJECT DETAILS Hay Hollow		SITE DETAILS: Eddy County, NM	
Geodetic System	US State Plane 1927 (Exact solution)	Site Centre Latitude:	32° 3' 42.020 N
Datum:	NAD 1927 (NADCON CONUS)	Longitude:	104° 5' 59.660 W
Ellipsoid:	Clarke 1866	Positional Uncertainty:	0.00
Zone:	New Mexico East 3001	Convergence:	0.12
System Datum:	Mean Sea Level	Local North:	Grid

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site SRO State Unit
Project:	Eddy County, NM (NAD 83)	TVD Reference:	RKB @ 3091.00ft
Site:	SRO State Unit	MD Reference:	RKB @ 3091.00ft
Well:	#18H	North Reference:	Gnd
Wellbore:	SRO State Unit #18H	Survey Calculation Method:	Minimum Curvature
Design:	SRO State Unit #18H	Database:	R5000 Houston DB

Project	Eddy County, NM (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	SRO State Unit				
Site Position:		Northing:	381,619.45 ft	Latitude:	32.04893889
From:	Map	Easting:	612,967.08 ft	Longitude:	-104.10214263
Position Uncertainty:	0.00 ft	Slot Radius:	13 200 in	Grid Convergence:	0 12 °

Well	#18H					
Well Position	+N/-S	0.00 ft	Northing:	381,619.45 ft	Latitude:	32.04893889
	+E/-W	0.00 ft	Easting:	612,967.08 ft	Longitude:	-104.10214263
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,061.10 ft

Wellbore	SRO State Unit #18H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/4/2012	7.71	59.91	48,365

Design	SRO State Unit #18H			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth: 0 00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0 00	0 00	180.77

Survey Program	Date	6/4/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	7,375.00	Pilot Survey (SRO State Unit #18H)	Good_gyro	Good Gyro	
7,434.00	17,753.00	MWD Survey (SRO State Unit #18H)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.25	238.84	100.00	-0.11	-0.19	0.12	0.25	0.25	0.00	
200.00	0.44	223.47	200.00	-0.50	-0.64	0.51	0.21	0.19	-15.37	
300.00	0.89	175.53	299.99	-1.56	-0.84	1.57	0.68	0.45	-47.94	
400.00	0.94	187.90	399.98	-3.14	-0.89	3.16	0.20	0.05	12.37	
500.00	1.03	175.59	499.96	-4.85	-0.94	4.86	0.23	0.09	-12.31	
600.00	0.99	177.99	599.95	-6.61	-0.84	6.62	0.06	-0.04	2.40	
700.00	1.04	147.33	699.93	-8.24	-0.32	8.24	0.54	0.05	-30.66	
800.00	0.86	136.60	799.92	-9.55	0.69	9.54	0.25	-0.18	-10.73	
900.00	1.02	128.24	899.91	-10.64	1.90	10.62	0.21	0.16	-8.36	

Crescent Directional Drilling

Survey Report

Company: COG Operating LLC	Local Co-ordinate Reference: Site SRO State Unit
Project: Eddy County, NM (NAD 83)	TVD Reference: RKB @ 3091 00ft
Site: SRO State Unit	MD Reference: RKB @ 3091 00ft
Well: #18H	North Reference: Grid
Wellbore: SRO State Unit #18H	Survey Calculation Method: Minimum Curvature
Design: SRO State Unit #18H	Database: R5000 Houston DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,000.00	1.09	115.77	999.89	-11.61	3.46	11.56	0.24	0.07	-12.47
1,100.00	1.24	114.26	1,099.87	-12.47	5.30	12.40	0.15	0.15	-1.51
1,200.00	1.97	82.80	1,199.83	-12.70	7.99	12.59	1.12	0.73	-31.46
1,300.00	1.65	60.80	1,299.78	-11.78	10.96	11.63	0.76	-0.32	-22.00
1,400.00	1.03	17.57	1,399.76	-10.22	12.48	10.05	1.14	-0.62	-43.23
1,500.00	0.91	3.61	1,499.74	-8.57	12.80	8.40	0.26	-0.12	-13.96
1,600.00	0.95	14.88	1,599.73	-6.98	13.07	6.80	0.19	0.04	11.27
1,700.00	0.74	11.83	1,699.72	-5.54	13.41	5.36	0.21	-0.21	-3.05
1,800.00	1.33	55.04	1,799.70	-4.25	14.50	4.05	0.94	0.59	43.21
1,900.00	1.94	69.77	1,899.66	-3.00	17.04	2.77	0.74	0.61	14.73
2,000.00	1.05	87.85	1,999.63	-2.38	19.54	2.11	1.00	-0.89	18.08
2,100.00	1.37	91.46	2,099.61	-2.37	21.65	2.08	0.33	0.32	3.61
2,200.00	1.32	102.29	2,199.58	-2.65	23.97	2.33	0.26	-0.05	10.83
2,300.00	0.48	111.83	2,299.56	-3.05	25.49	2.71	0.85	-0.84	9.54
2,400.00	0.25	115.81	2,399.56	-3.30	26.07	2.95	0.23	-0.23	3.98
2,500.00	0.22	134.15	2,499.56	-3.53	26.40	3.17	0.08	-0.03	18.34
2,600.00	0.12	180.55	2,599.56	-3.77	26.54	3.41	0.16	-0.10	46.40
2,700.00	0.18	74.55	2,699.56	-3.83	26.69	3.47	0.24	0.06	-106.00
2,800.00	0.08	47.35	2,799.56	-3.74	26.89	3.38	0.11	-0.10	-27.20
2,900.00	0.09	324.34	2,899.56	-3.63	26.90	3.27	0.11	0.01	-83.01
3,000.00	0.22	304.06	2,999.56	-3.46	26.70	3.10	0.14	0.13	-20.28
3,100.00	0.28	351.26	3,099.56	-3.11	26.50	2.75	0.21	0.06	47.20
3,200.00	0.12	325.66	3,199.56	-2.78	26.40	2.43	0.18	-0.16	-25.60
3,300.00	0.34	313.14	3,299.56	-2.49	26.13	2.14	0.22	0.22	-12.52
3,400.00	0.45	279.91	3,399.56	-2.22	25.52	1.88	0.25	0.11	-33.23
3,500.00	0.61	291.54	3,499.55	-1.96	24.64	1.63	0.19	0.16	11.63
3,600.00	0.45	297.57	3,599.55	-1.58	23.80	1.26	0.17	-0.16	6.03
3,700.00	0.65	303.79	3,699.54	-1.08	22.98	0.77	0.21	0.20	6.22
3,800.00	0.55	301.65	3,799.54	-0.52	22.10	0.22	0.10	-0.10	-2.14
3,900.00	0.59	287.17	3,899.53	-0.11	21.20	-0.17	0.15	0.04	-14.48
4,000.00	0.67	287.67	3,999.53	0.22	20.15	-0.49	0.08	0.08	0.50
4,100.00	0.49	271.66	4,099.52	0.41	19.17	-0.66	0.24	-0.18	-16.01
4,200.00	0.81	258.21	4,199.51	0.27	18.05	-0.52	0.35	0.32	-13.45
4,300.00	0.49	258.14	4,299.51	0.04	16.94	-0.27	0.32	-0.32	-0.07
4,400.00	0.60	257.19	4,399.50	-0.16	16.01	-0.05	0.11	0.11	-0.95
4,500.00	0.36	254.85	4,499.50	-0.36	15.19	0.16	0.24	-0.24	-2.34
4,600.00	0.39	303.22	4,599.50	-0.26	14.60	0.06	0.31	0.03	48.37
4,700.00	0.25	222.63	4,699.50	-0.23	14.17	0.04	0.43	-0.14	-80.59
4,800.00	0.59	201.89	4,799.49	-0.87	13.83	0.68	0.37	0.34	-20.74
4,900.00	0.43	198.97	4,899.49	-1.70	13.52	1.52	0.16	-0.16	-2.92
5,000.00	0.71	207.50	4,999.49	-2.60	13.11	2.43	0.29	0.28	8.53
5,100.00	0.56	222.18	5,099.48	-3.52	12.50	3.35	0.22	-0.15	14.68
5,200.00	0.88	216.51	5,199.47	-4.50	11.71	4.34	0.33	0.32	-5.67

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site SRO State Unit
Project:	Eddy County, NM (NAD 83)	TVD Reference:	RKB @ 3091 00ft
Site:	SRO State Unit	MD Reference:	RKB @ 3091 00ft
Well:	#18H	North Reference:	Grd
Wellbore:	SRO State Unit #18H	Survey Calculation Method:	Minimum Curvature
Design:	SRO State Unit #18H	Database:	R5000 Houston DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,300.00	0.73	205.31	5,299.46	-5.69	10.98	5.54	0.22	-0.15	-11.20
5,400.00	0.97	189.49	5,399.45	-7.10	10.57	6.96	0.33	0.24	-15.82
5,500.00	1.01	206.43	5,499.44	-8.72	10.04	8.59	0.29	0.04	16.94
5,600.00	1.09	200.07	5,599.42	-10.41	9.32	10.28	0.14	0.08	-6.36
5,700.00	1.10	197.70	5,699.40	-12.21	8.70	12.10	0.05	0.01	-2.37
5,800.00	1.28	197.62	5,799.38	-14.19	8.07	14.08	0.18	0.18	-0.08
5,900.00	0.88	187.22	5,899.36	-16.02	7.64	15.92	0.44	-0.40	-10.40
6,000.00	0.94	162.79	5,999.35	-17.56	7.78	17.46	0.39	0.06	-24.43
6,100.00	0.62	152.79	6,099.34	-18.83	8.27	18.72	0.35	-0.32	-10.00
6,200.00	0.73	31.54	6,199.34	-18.77	8.85	18.65	1.18	0.11	-121.25
6,300.00	1.65	63.45	6,299.31	-17.58	10.47	17.44	1.10	0.92	31.91
6,400.00	1.12	61.63	6,399.28	-16.47	12.62	16.30	0.53	-0.53	-1.82
6,500.00	0.54	9.53	6,499.27	-15.54	13.56	15.36	0.90	-0.58	-52.10
6,600.00	0.72	317.86	6,599.27	-14.61	13.22	14.43	0.57	0.18	-51.67
6,700.00	0.36	250.47	6,699.27	-14.25	12.50	14.08	0.67	-0.36	-67.39
6,800.00	1.29	192.69	6,799.26	-15.46	11.96	15.29	1.14	0.93	-57.78
6,900.00	2.91	185.07	6,899.19	-19.08	11.48	18.93	1.64	1.62	-7.62
7,000.00	2.51	195.33	6,999.07	-23.72	10.68	23.58	0.63	-0.40	10.26
7,100.00	1.83	219.90	7,099.00	-27.06	9.08	26.94	1.14	-0.68	24.57
7,200.00	1.77	237.04	7,198.95	-29.13	6.76	29.03	0.54	-0.06	17.14
7,300.00	1.56	257.40	7,298.91	-30.26	4.13	30.20	0.62	-0.21	20.36
7,375.00	1.38	266.70	7,373.89	-30.54	2.24	30.50	0.40	-0.24	12.40
Tie in to Scientific Gyro Survey									
7,434.00	2.00	269.70	7,432.86	-30.58	0.50	30.57	1.06	1.05	5.08
7,529.00	7.90	197.10	7,527.52	-36.84	-3.09	36.88	7.94	6.21	-76.42
7,560.00	12.10	195.80	7,558.04	-42.01	-4.60	42.06	13.57	13.55	-4.19
7,624.00	13.90	199.50	7,620.40	-55.71	-8.99	55.82	3.10	2.81	5.78
7,655.00	18.50	199.70	7,650.16	-63.85	-11.89	64.01	14.84	14.84	0.65
7,687.00	22.30	201.10	7,680.15	-74.30	-15.79	74.51	11.97	11.88	4.38
7,719.00	25.60	202.00	7,709.39	-86.38	-20.57	86.65	10.38	10.31	2.81
7,750.00	29.40	199.40	7,736.88	-99.77	-25.61	100.11	12.85	12.26	-8.39
7,782.00	32.90	199.00	7,764.27	-115.40	-31.05	115.81	10.96	10.94	-1.25
7,813.00	34.10	199.40	7,790.12	-131.56	-36.67	132.04	3.94	3.87	1.29
7,845.00	37.70	196.50	7,816.03	-149.41	-42.43	149.96	12.44	11.25	-9.06
7,876.00	41.30	197.10	7,839.95	-168.28	-48.14	168.91	11.68	11.61	1.94
7,908.00	43.20	195.00	7,863.64	-188.96	-54.08	189.67	7.40	5.94	-6.56
7,940.00	46.70	195.70	7,886.28	-210.75	-60.07	211.54	11.05	10.94	2.19
7,971.00	48.00	200.40	7,907.29	-232.42	-67.14	233.30	11.91	4.19	15.16
8,003.00	49.80	203.60	7,928.33	-254.76	-76.17	255.77	9.40	5.63	10.00
8,035.00	49.50	210.30	7,949.06	-276.48	-87.21	277.63	15.98	-0.94	20.94
8,066.00	51.10	215.50	7,968.87	-296.49	-100.17	297.81	13.90	5.16	16.77
8,098.00	54.60	215.90	7,988.19	-317.20	-115.05	318.71	10.98	10.94	1.25
8,130.00	59.50	214.50	8,005.59	-339.14	-130.52	340.86	15.75	15.31	-4.38

Crescent Directional Drilling

Survey Report

Company:	C&G Operating LLC	Local Co-ordinate Reference:	Site SRO State Unit
Project:	Eddy County, NM (NAD 83)	TVD Reference:	RKB @ 3091 00ft
Site:	SRO State Unit	MD Reference:	RKB @ 3091 00ft
Well:	#18H	North Reference:	Grid
Wellbore:	SRO State Unit #18H	Survey Calculation Method:	Minimum Curvature
Design:	SRO State Unit #18H	Database:	R5000 Houston DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,161.00	63.70	215.20	8,020.33	-361.51	-146.10	363.44	13.69	13.55	2.26
8,193.00	67.60	213.90	8,033.53	-385.52	-162.63	387.67	12.74	12.19	-4.06
8,225.00	72.00	213.80	8,044.57	-410.45	-179.35	412.83	13.75	13.75	-0.31
8,256.00	76.70	213.20	8,052.93	-435.34	-195.82	437.93	15.28	15.16	-1.94
8,288.00	81.40	212.40	8,059.01	-461.74	-212.83	464.56	14.89	14.69	-2.50
8,319.00	85.30	210.90	8,062.60	-487.95	-228.98	490.98	13.47	12.58	-4.84
8,351.00	89.50	209.90	8,064.05	-515.51	-245.16	518.76	13.49	13.13	-3.13
8,383.00	90.30	208.10	8,064.11	-543.50	-260.67	546.95	6.16	2.50	-5.63
8,478.00	90.30	202.20	8,063.61	-629.45	-301.03	633.44	6.21	0.00	-6.21
8,572.00	88.70	195.80	8,064.43	-718.28	-331.61	722.67	7.02	-1.70	-6.81
8,667.00	90.60	190.60	8,065.01	-810.73	-353.30	815.41	5.83	2.00	-5.47
8,762.00	90.40	184.70	8,064.18	-904.84	-365.94	909.68	6.21	-0.21	-6.21
8,857.00	92.80	180.80	8,061.53	-999.67	-370.49	1,004.56	4.82	2.53	-4.11
8,952.00	93.30	181.40	8,056.47	-1,094.52	-372.31	1,099.42	0.82	0.53	0.63
9,047.00	91.60	180.80	8,052.41	-1,189.41	-374.14	1,194.33	1.90	-1.79	-0.63
9,142.00	91.80	181.10	8,049.59	-1,284.35	-375.71	1,289.29	0.38	0.21	0.32
9,237.00	90.70	179.80	8,047.52	-1,379.32	-376.46	1,384.26	1.79	-1.16	-1.37
9,332.00	89.80	179.00	8,047.11	-1,474.32	-375.46	1,479.23	1.27	-0.95	-0.84
9,427.00	90.40	179.40	8,046.94	-1,569.31	-374.13	1,574.19	0.76	0.63	0.42
9,522.00	88.80	178.80	8,047.60	-1,664.29	-372.64	1,669.15	1.80	-1.68	-0.63
9,617.00	89.00	179.60	8,049.43	-1,759.26	-371.32	1,764.09	0.87	0.21	0.84
9,712.00	88.70	180.10	8,051.33	-1,854.24	-371.07	1,859.06	0.61	-0.32	0.53
9,807.00	88.90	179.50	8,053.32	-1,949.22	-370.74	1,954.03	0.67	0.21	-0.63
9,903.00	88.50	180.30	8,055.50	-2,045.19	-370.57	2,049.99	0.93	-0.42	0.83
9,998.00	88.90	180.40	8,057.66	-2,140.17	-371.15	2,144.96	0.43	0.42	0.11
10,093.00	88.50	180.50	8,059.81	-2,235.14	-371.89	2,239.94	0.43	-0.42	0.11
10,188.00	90.00	180.20	8,061.06	-2,330.13	-372.47	2,334.92	1.61	1.58	-0.32
10,283.00	89.80	181.30	8,061.22	-2,425.12	-373.72	2,429.92	1.18	-0.21	1.16
10,377.00	91.00	180.40	8,060.57	-2,519.10	-375.11	2,523.92	1.60	1.28	-0.96
10,472.00	92.40	180.90	8,057.75	-2,614.05	-376.19	2,618.87	1.56	1.47	0.53
10,567.00	91.50	180.20	8,054.51	-2,708.99	-377.10	2,713.81	1.20	-0.95	-0.74
10,665.00	90.50	179.10	8,052.80	-2,806.97	-376.50	2,811.78	1.52	-1.02	-1.12
10,760.00	89.30	177.40	8,052.97	-2,901.92	-373.60	2,906.68	2.19	-1.26	-1.79
10,854.00	89.80	177.30	8,053.71	-2,995.82	-369.26	3,000.51	0.54	0.53	-0.11
10,948.00	90.10	176.90	8,053.79	-3,089.70	-364.50	3,094.32	0.53	0.32	-0.43
11,043.00	89.90	176.90	8,053.79	-3,184.56	-359.36	3,189.10	0.21	-0.21	0.00
11,137.00	89.40	176.30	8,054.36	-3,278.39	-353.79	3,282.85	0.83	-0.53	-0.64
11,231.00	89.20	176.40	8,055.51	-3,372.19	-347.80	3,376.56	0.24	-0.21	0.11
11,326.00	88.50	177.30	8,057.42	-3,467.03	-342.58	3,471.32	1.20	-0.74	0.95
11,421.00	87.80	177.30	8,060.49	-3,561.87	-338.11	3,566.09	0.74	-0.74	0.00
11,516.00	88.50	176.80	8,063.55	-3,656.70	-333.23	3,660.84	0.91	0.74	-0.53
11,610.00	88.10	177.20	8,066.34	-3,750.53	-328.31	3,754.60	0.60	-0.43	0.43
11,637.00	87.90	176.30	8,067.28	-3,777.47	-326.78	3,781.52	3.41	-0.74	-3.33
11,731.00	88.10	177.20	8,070.56	-3,871.26	-321.45	3,875.23	0.98	0.21	0.96

Crescent Directional Drilling

Survey Report

Company: COG Operating LLC	Local Co-ordinate Reference: Site SRO State Unit
Project: Eddy County, NM (NAD 83)	TVD Reference: RKB @ 3091 00ft
Site: SRO State Unit	MD Reference: RKB @ 3091 00ft
Well: #18H	North Reference: Grid
Wellbore: SRO State Unit #18H	Survey Calculation Method: Minimum Curvature
Design: SRO State Unit #18H	Database: R5000 Houston DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,826.00	89.20	176.50	8,072.80	-3,966.08	-316.23	3,969.98	1.37	1.16	-0.74
11,921.00	88.00	176.60	8,075.12	-4,060.88	-310.52	4,064.69	1.27	-1.26	0.11
12,015.00	89.70	176.60	8,077.01	-4,154.69	-304.94	4,158.42	1.81	1.81	0.00
12,110.00	89.00	176.30	8,078.09	-4,249.51	-299.06	4,253.14	0.80	-0.74	-0.32
12,204.00	88.90	176.90	8,079.81	-4,343.32	-293.49	4,346.88	0.65	-0.11	0.64
12,299.00	88.80	177.00	8,081.72	-4,438.17	-288.44	4,441.65	0.15	-0.11	0.11
12,393.00	88.70	177.60	8,083.77	-4,532.04	-284.01	4,535.45	0.65	-0.11	0.64
12,488.00	88.90	177.60	8,085.76	-4,626.94	-280.03	4,630.28	0.21	0.21	0.00
12,582.00	89.90	177.00	8,086.74	-4,720.83	-275.60	4,724.11	1.24	1.06	-0.64
12,677.00	89.30	177.40	8,087.41	-4,815.71	-270.96	4,818.92	0.76	-0.63	0.42
12,771.00	89.30	177.10	8,088.55	-4,909.60	-266.45	4,912.73	0.32	0.00	-0.32
12,865.00	89.90	179.20	8,089.21	-5,003.54	-263.42	5,006.63	2.32	0.64	2.23
12,959.00	89.20	178.40	8,089.95	-5,097.51	-261.45	5,100.57	1.13	-0.74	-0.85
13,054.00	89.10	179.10	8,091.36	-5,192.48	-259.38	5,195.50	0.74	-0.11	0.74
13,148.00	90.50	179.60	8,091.69	-5,286.47	-258.31	5,289.47	1.58	1.49	0.53
13,242.00	90.60	179.60	8,090.78	-5,380.46	-257.66	5,383.44	0.11	0.11	0.00
13,337.00	90.00	179.30	8,090.29	-5,475.46	-256.74	5,478.41	0.71	-0.63	-0.32
13,431.00	90.00	179.30	8,090.29	-5,569.45	-255.60	5,572.38	0.00	0.00	0.00
13,526.00	89.30	179.30	8,090.87	-5,664.44	-254.43	5,667.35	0.74	-0.74	0.00
13,621.00	90.00	180.00	8,091.45	-5,759.44	-253.85	5,762.33	1.04	0.74	0.74
13,716.00	90.00	179.60	8,091.45	-5,854.44	-253.52	5,857.31	0.42	0.00	-0.42
13,810.00	89.80	179.60	8,091.61	-5,948.43	-252.87	5,951.29	0.21	-0.21	0.00
13,905.00	89.30	179.70	8,092.36	-6,043.43	-252.29	6,046.27	0.54	-0.53	0.11
14,000.00	90.30	179.10	8,092.69	-6,138.42	-251.29	6,141.24	1.23	1.05	-0.63
14,094.00	90.40	179.20	8,092.11	-6,232.41	-249.90	6,235.20	0.15	0.11	0.11
14,189.00	90.00	178.50	8,091.78	-6,327.39	-247.99	6,330.15	0.85	-0.42	-0.74
14,283.00	90.40	178.50	8,091.45	-6,421.36	-245.53	6,424.08	0.43	0.43	0.00
14,377.00	90.60	178.60	8,090.63	-6,515.32	-243.15	6,518.00	0.24	0.21	0.11
14,471.00	90.50	177.90	8,089.73	-6,609.27	-240.28	6,611.91	0.75	-0.11	-0.74
14,565.00	89.10	177.90	8,090.06	-6,703.21	-236.84	6,705.78	1.49	-1.49	0.00
14,660.00	88.40	177.70	8,092.13	-6,798.11	-233.19	6,800.63	0.77	-0.74	-0.21
14,754.00	87.30	178.40	8,095.66	-6,891.99	-229.99	6,894.46	1.39	-1.17	0.74
14,849.00	88.00	178.80	8,099.55	-6,986.88	-227.68	6,989.31	0.85	0.74	0.42
14,944.00	88.40	179.30	8,102.54	-7,081.82	-226.10	7,084.22	0.67	0.42	0.53
15,038.00	88.70	179.10	8,104.92	-7,175.78	-224.79	7,178.16	0.38	0.32	-0.21
15,133.00	89.60	179.50	8,106.33	-7,270.76	-223.63	7,273.11	1.04	0.95	0.42
15,228.00	89.40	179.40	8,107.15	-7,365.76	-222.72	7,368.08	0.24	-0.21	-0.11
15,323.00	88.80	179.80	8,108.65	-7,460.74	-222.05	7,463.05	0.76	-0.63	0.42
15,418.00	89.20	180.40	8,110.31	-7,555.73	-222.22	7,558.03	0.76	0.42	0.63
15,512.00	89.20	180.70	8,111.62	-7,649.71	-223.12	7,652.02	0.32	0.00	0.32
15,607.00	89.40	181.10	8,112.78	-7,744.69	-224.61	7,747.01	0.47	0.21	0.42
15,702.00	88.90	181.70	8,114.19	-7,839.65	-226.93	7,842.00	0.82	-0.53	0.63
15,796.00	88.40	182.20	8,116.40	-7,933.57	-230.13	7,935.95	0.75	-0.53	0.53

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site SRO State Unit
Project:	Eddy County, NM (NAD 83)	TVD Reference:	RKB @ 3091 00ft
Site:	SRO State Unit	MD Reference:	RKB @ 3091 00ft
Well:	#18H	North Reference:	Gnd
Wellbore:	SRO State Unit #18H	Survey Calculation Method:	Minimum Curvature
Design:	SRO State Unit #18H	Database:	R5000 Houston DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,891.00	88 80	182.50	8,118 72	-8,028.46	-234 03	8,030.88	0 53	0.42	0.32
15,985.00	89.30	182 30	8,120 28	-8,122 37	-237.96	8,124 83	0.57	0 53	-0.21
16,079.00	89 20	182 00	8,121 51	-8,216 29	-241.49	8,218.80	0 34	-0 11	-0 32
16,174.00	88 50	182.00	8,123 42	-8,311 22	-244 80	8,313.76	0 74	-0 74	0 00
16,268 00	87 80	182.20	8,126 45	-8,405 10	-248 25	8,407.68	0 77	-0.74	0 21
16,363 00	88.90	182 00	8,129.19	-8,500.00	-251 73	8,502 61	1 18	1 16	-0 21
16,458.00	89.50	181 60	8,130.52	-8,594 94	-254.71	8,597 59	0.76	0 63	-0 42
16,552 00	89 80	180 90	8,131 09	-8,688 92	-256.76	8,691 58	0 81	0 32	-0.74
16,648 00	91.10	181 20	8,130 34	-8,784 90	-258.52	8,787.58	1.39	1 35	0 31
16,743 00	90.40	179 80	8,129 09	-8,879 88	-259.35	8,882 57	1 65	-0 74	-1 47
16,837.00	89.90	179.80	8,128.85	-8,973.88	-259 02	8,976.55	0 53	-0 53	0 00
16,932.00	90 10	179.70	8,128.85	-9,068 88	-258 60	9,071.54	0 24	0 21	-0 11
17,026 00	90.60	181 20	8,128 27	-9,162 87	-259 34	9,165.53	1 68	0 53	1 60
17,121 00	88 40	180 90	8,129 10	-9,257.85	-261 08	9,260 52	2.34	-2 32	-0.32
17,215 00	88.00	180 20	8,132.05	-9,351 79	-261.99	9,354 47	0.86	-0 43	-0.74
17,309 00	88.00	179 40	8,135 33	-9,445 74	-261.66	9,448 40	0.85	0.00	-0.85
17,404.00	88 40	179.70	8,138 32	-9,540 69	-260.91	9,543.33	0 53	0 42	0 32
17,498 00	88 40	179 40	8,140.94	-9,634 65	-260 17	9,637 27	0.32	0 00	-0 32
17,593 00	87.80	179.30	8,144.09	-9,729 59	-259 10	9,732.19	0.64	-0.63	-0 11
17,687 00	87 40	179 80	8,148 03	-9,823.50	-258 36	9,826.09	0 68	-0 43	0.53
17,753 00	87 40	179 80	8,151 02	-9,889.43	-258 13	9,892.01	0.00	0.00	0 00
Final Survey - 17753.00' MD - 8151.02' TVD - SRO State 18H PBHL									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,375.00	7,373 89	-30 54	2 24	Tie in to Scientific Gyro Survey
17,753.00	8,151.02	-9,889.43	-258 13	Final Survey - 17753.00' MD - 8151.02' TVD

Checked By: _____ Approved By: _____ Date: _____



Gyroscopic Survey Report
for
COG

Well Location	EDDY COUNTY, NEW MEXICO
Well Name	SRO STATE UNIT #18 H
Rig Name	PRECISION #77
Survey Date	5/17/2012
Latitude	32.0490000N
North Reference	Grid North
Grid Correction	0.12 deg
Depth Reference	RKB (30.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 180.77Azim (deg)
Definitive Survey	FINAL GYRO SURVEY
Operator(s)	DUSTIN FIGUEROA

Well Notes



Survey:		FINAL GYRO SURVEY							
Survey Date:		5/17/2012							
MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	Closure Direction	Dogleg Severity	Closure Distance
ft	deg	deg	ft	ft	ft	ft	deg	7100ft	ft
0 00	0 00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00
100.00	0.25	238.84	100.00	0.11	-0.11	-0.18	238.84	0.25	0.21
200.00	0.44	223.47	200.00	0.51	-0.50	-0.63	231.59	0.21	0.80
300.00	0.89	175.53	299.99	1.56	-1.55	-0.83	208.27	0.68	1.76
400.00	0.94	187.90	399.98	3.14	-3.13	-0.88	195.79	0.20	3.25
500.00	1.03	175.59	499.96	4.85	-4.84	-0.93	190.85	0.23	4.93
600.00	0.99	177.99	599.95	6.62	-6.61	-0.83	187.14	0.06	6.66
700.00	1.04	147.33	699.93	8.24	-8.24	-0.31	182.13	0.54	8.24
800.00	0.86	136.60	799.92	9.54	-9.55	0.70	175.82	0.26	9.57
900.00	1.02	128.24	899.91	10.62	-10.64	1.91	169.82	0.21	10.81
1000.00	1.09	115.77	999.89	11.56	-11.61	3.47	163.36	0.24	12.12
1100.00	1.24	114.26	1099.87	12.40	-12.47	5.31	156.92	0.15	13.55
1200.00	1.97	82.80	1199.83	12.59	-12.70	8.00	147.78	1.11	15.01
1300.00	1.65	60.80	1299.78	11.63	-11.78	10.96	137.07	0.76	16.09
1400.00	1.03	17.57	1399.76	10.05	-10.22	12.49	129.31	1.14	16.14
1500.00	0.91	3.61	1499.74	8.40	-8.58	12.81	123.81	0.27	15.41
1600.00	0.95	14.88	1599.73	6.81	-6.99	13.07	118.13	0.19	14.82
1700.00	0.74	11.83	1699.72	5.38	-5.56	13.41	112.50	0.22	14.52
1800.00	1.33	55.04	1799.70	4.07	-4.26	14.50	106.37	0.94	15.11
1900.00	1.94	69.77	1899.66	2.78	-3.01	17.04	100.02	0.73	17.30
2000.00	1.05	87.85	1999.63	2.13	-2.39	19.54	96.98	0.99	19.68
2100.00	1.37	91.46	2099.61	2.10	-2.39	21.64	96.30	0.33	21.77
2200.00	1.32	102.29	2199.58	2.34	-2.66	23.96	96.34	0.26	24.11
2300.00	0.48	111.83	2299.57	2.72	-3.07	25.48	96.86	0.85	25.67
2400.00	0.25	115.81	2399.56	2.97	-3.32	26.07	97.25	0.23	26.28
2500.00	0.22	134.15	2499.56	3.19	-3.54	26.40	97.64	0.08	26.64
2600.00	0.12	180.55	2599.56	3.42	-3.78	26.53	98.10	0.16	26.80
2700.00	0.18	74.55	2699.56	3.48	-3.84	26.68	98.19	0.24	26.96
2800.00	0.08	47.35	2799.56	3.39	-3.75	26.89	97.94	0.12	27.15
2900.00	0.09	324.34	2899.56	3.28	-3.64	26.89	97.72	0.11	27.14
3000.00	0.22	304.06	2999.56	3.12	-3.48	26.69	97.42	0.14	26.92
3100.00	0.28	351.26	3099.56	2.77	-3.13	26.50	96.73	0.21	26.68
3200.00	0.12	325.66	3199.56	2.45	-2.80	26.40	96.06	0.18	26.55
3300.00	0.34	313.14	3299.56	2.16	-2.52	26.13	95.50	0.23	26.25
3400.00	0.45	279.91	3399.56	1.90	-2.25	25.53	95.03	0.25	25.63
3500.00	0.61	291.54	3499.55	1.65	-1.98	24.65	94.60	0.19	24.73
3600.00	0.45	297.57	3599.55	1.29	-1.61	23.80	93.86	0.17	23.86
3700.00	0.65	303.79	3699.54	0.80	-1.11	22.98	92.76	0.21	23.01
3800.00	0.55	301.65	3799.54	0.24	-0.54	22.10	91.39	0.10	22.10
3900.00	0.59	287.17	3899.53	-0.15	-0.13	21.19	90.36	0.15	21.20



Survey:		FINAL GYRO SURVEY								
Survey Date:		5/17/2012								
MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	Closure Direction	Dogleg Severity	Closure Distance	
ft	deg	deg	ft	ft	ft	ft	deg	7100ft	ft	
4000.00	0.67	287.67	3999.53	-0.47	0.20	20.15	89.44	0.08	20.15	
4100.00	0.49	271.66	4099.52	-0.64	0.39	19.16	88.85	0.24	19.17	
4200.00	0.81	258.21	4199.52	-0.50	0.25	18.04	89.19	0.35	18.05	
4300.00	0.49	258.14	4299.51	-0.25	0.02	16.94	89.92	0.32	16.94	
4400.00	0.60	257.19	4399.50	-0.03	-0.18	16.01	90.64	0.11	16.01	
4500.00	0.36	254.85	4499.50	0.17	-0.38	15.20	91.42	0.24	15.21	
4600.00	0.39	303.22	4599.50	0.08	-0.27	14.61	91.07	0.31	14.62	
4700.00	0.25	222.63	4699.50	0.05	-0.24	14.18	90.99	0.43	14.18	
4800.00	0.59	201.89	4799.49	0.69	-0.88	13.84	93.63	0.37	13.87	
4900.00	0.43	198.97	4899.49	1.53	-1.71	13.53	97.21	0.16	13.64	
5000.00	0.71	207.50	4999.49	2.44	-2.62	13.12	101.29	0.29	13.38	
5100.00	0.56	222.18	5099.48	3.36	-3.53	12.51	105.76	0.22	13.00	
5200.00	0.88	216.51	5199.47	4.35	-4.51	11.72	111.03	0.32	12.56	
5300.00	0.73	205.31	5299.46	5.55	-5.70	11.00	117.39	0.21	12.38	
5400.00	0.97	189.49	5399.45	6.97	-7.11	10.58	123.90	0.33	12.75	
5500.00	1.01	206.43	5499.44	8.60	-8.74	10.05	131.01	0.30	13.32	
5600.00	1.09	200.07	5599.42	10.30	-10.42	9.33	138.16	0.14	13.99	
5700.00	1.10	197.70	5699.40	12.11	-12.23	8.71	144.53	0.05	15.02	
5800.00	1.28	197.62	5799.38	14.10	-14.21	8.08	150.37	0.18	16.35	
5900.00	0.88	187.22	5899.36	15.93	-16.03	7.65	154.50	0.44	17.76	
6000.00	0.94	162.79	5999.35	17.47	-17.58	7.80	156.08	0.39	19.23	
6100.00	0.62	152.79	6099.34	18.73	-18.85	8.29	156.26	0.35	20.59	
6200.00	0.73	31.54	6199.34	18.66	-18.78	8.87	154.73	1.18	20.77	
6300.00	1.65	63.45	6299.31	17.45	-17.60	10.49	149.21	1.10	20.48	
6400.00	1.12	61.63	6399.29	16.32	-16.49	12.63	142.56	0.53	20.77	
6500.00	0.54	9.53	6499.28	15.38	-15.56	13.56	138.93	0.89	20.64	
6600.00	0.72	317.86	6599.27	14.45	-14.63	13.22	137.89	0.57	19.72	
6700.00	0.36	250.47	6699.27	14.10	-14.27	12.50	138.78	0.67	18.97	
6800.00	1.29	192.69	6799.26	15.31	-15.48	11.95	142.32	1.14	19.55	
6900.00	2.91	185.07	6899.19	18.95	-19.11	11.48	149.00	1.64	22.29	
7000.00	2.51	195.33	6999.07	23.60	-23.75	10.68	155.80	0.63	26.04	
7100.00	1.83	219.90	7099.00	26.96	-27.09	9.07	161.48	1.14	28.57	
7200.00	1.77	237.04	7198.96	29.06	-29.15	6.75	166.96	0.54	29.93	
7300.00	1.56	257.40	7298.91	30.23	-30.29	4.13	172.24	0.62	30.57	
7375.00	1.38	266.70	7373.89	30.53	-30.57	2.23	175.82	0.40	30.65	