



30-015-39127

Ryan Energy Directional Drilling Report

Field: Eddy Co, NM
Site: Burch keely Unit #696
Well: #696
Wellpath: OH

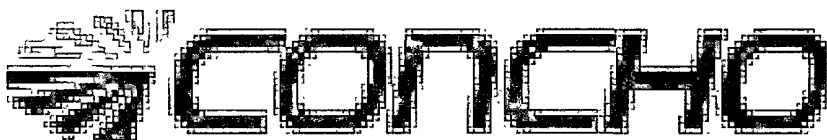
Prepared For:

COG Operating LLC

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OCT 03 2011

NMOCD ARTESIA



Ryan Energy Technology

19510 Oil Center Blvd
Houston, TX 77073
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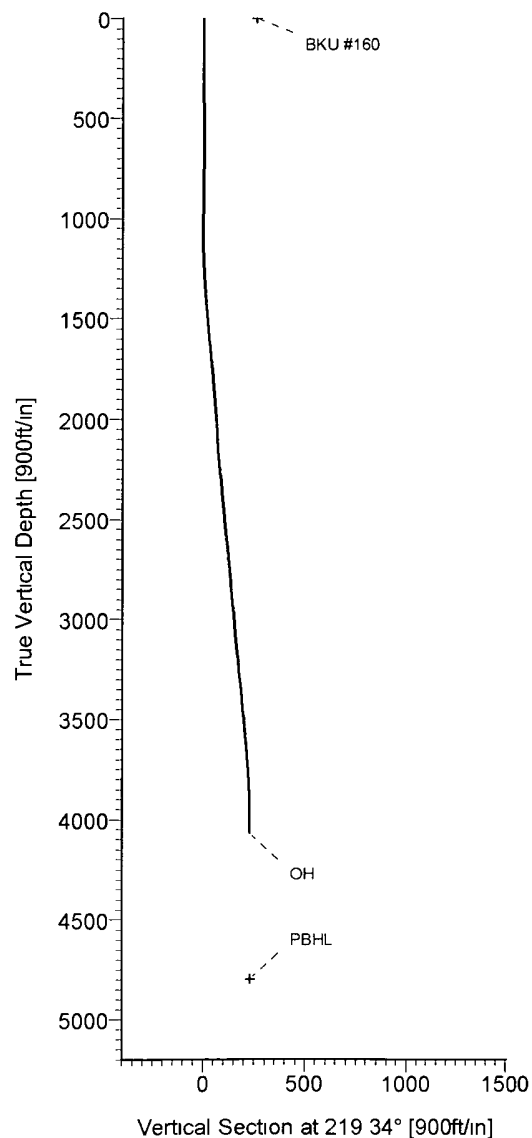
www.ryanenergy.com



COG Operating LLC
Field: Eddy Co, NM
Site: Burch keely Unit #696
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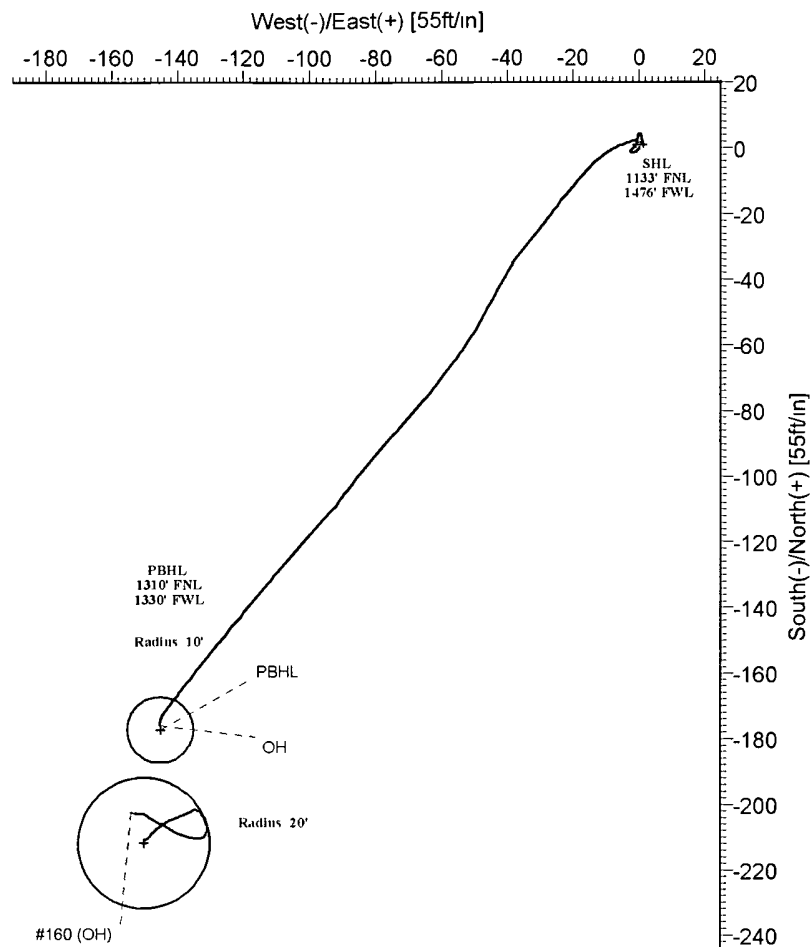
Azimuths to Grid North
 True North -0.16°
 Magnetic North 7.67°
 Magnetic Field
 Strength 48934nT
 Dip Angle 60.65°
 Date 7/21/2011
 Model IGRF2010



FIELD DETAILS
 Eddy Co, NM
 New Mexico
 U S A
 Geodetic System US State Plane Coordinate System 1927
 Ellipsoid NAD27 (Clarke 1866)
 Zone New Mexico Eastern Zone
 Magnetic Model IGRF2010
 System Datum Mean Sea Level
 Local North Grd North

WELLPATH DETAILS
 OH
 Rig Silver Oak 5
 Ref Datum SITE 3598 00ft
 V Section
 Angle
 219 34°
 Origin
 +N/-S
 0 00
 Origin
 +E/-W
 0 00
 Starting
 From TVD
 0 00

SITE DETAILS
 Burch keely Unit #696
 Eddy Co NM
 Site Centre Northing 658360 20
 Easting 592719 10
 Ground Level 3598 00
 Positional Uncertainty 0 00
 Convergence 0 16



TARGET DETAILS								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
BKU #160	0 00	-212 00	-150 25	658148 20	592568 85	32°48'32 312N	104°01'55 360W	Cirde (Radius 20)
PBHL	4800 00	-177 30	-145 30	658182 90	592573 80	32°48'32 655N	104°01'55 301W	Cirde (Radius 10)



Ryan Energy Technologies Survey Report



Company: COG Operating LLC
Field: Eddy Co, NM
Site: Burch keely Unit #696
Well: #696
Wellpath: OH

Date: 8/1/2011
Co-ordinate(NE) Reference: Site Burch keely Unit #696, Grid North
Vertical (TVD) Reference: SITE 3598 0
Section (VS) Reference: Well (0 00N,0 00E,219 34Azi)
Survey Calculation Method: Minimum Curvature
Db: Sybase

Time: 10 49 04
Page: 1

Field: Eddy Co, NM
 New Mexico
 U S A
Map System: US State Plane Coordinate System 1927
Geo Datum: NAD27 (Clarke 1866)
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Eastern Zone
Coordinate System: Site Centre
Geomagnetic Model: IGRF2010

Site: Burch keely Unit #696
 Eddy Co , NM

Site Position: Northing: 658360 20 ft Latitude: 32 48 34 405 N
From: Map Easting: 592719 10 ft Longitude: 104 1 53 592 W
Position Uncertainty: 0 00 ft North Reference: Grid
Ground Level: 3598 00 ft Grid Convergence: 0 16 deg

Well: #696
Slot Name:

Well Position: +N/-S 0 00 ft Northing: 658360 20 ft Latitude: 32 48 34 405 N
 +E/-W 0 00 ft Easting : 592719 10 ft Longitude: 104 1 53 592 W
Position Uncertainty: 0 00 ft

Wellpath OH
Drilled From: Surface
Current Datum: SITE Height 3598 00 ft **Tie-on Depth:** 0 00 ft
Magnetic Data: 7/21/2011 **Above System Datum:** Mean Sea Level
Field Strength: 48934 nT **Declination:** 7 83 deg
Vertical Section: Depth From (TVD) +N/-S +E/-W Mag Dip Angle: 60 65 deg
 ft ft ft Direction deg
 0 00 0 00 0 00 219 34

Survey Program for Definitive Wellpath

Date: 7/28/2011 **Validated:** No
Actual From **To** **Survey** **Version:** 0
 ft ft **Toolcode** **Tool Name**

100 00	895 00	Survey #1 (100 00-895 00)	Gyro	Gyro
1006 00	4033 00	Survey #2 (1006 00-4033 00)	Ryan MWD	Ryan MWD
4076 00	4076 00	Survey #3 (4076 00-4076 00)	Projection	Projection

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	TIE LINE
100 00	0 18	184 48	100 00	-0 16	-0 01	0 13	0 18	0 18	0 00	Gyro
200 00	0 71	219 63	200 00	-0 79	-0 42	0 88	0 57	0 53	35 15	Gyro
300 00	0 50	258 19	299 99	-1 36	-1 24	1 84	0 45	-0 21	38 56	Gyro
400 00	0 33	269 56	399 99	-1 45	-1 96	2 36	0 19	-0 17	11 37	Gyro
500 00	0 19	284 95	499 99	-1 41	-2 41	2 61	0 16	-0 14	15 39	Gyro
600 00	0 08	206 37	599 99	-1 43	-2 60	2 75	0 19	-0 11	-78 58	Gyro
700 00	0 33	332 27	699 99	-1 24	-2 76	2 71	0 38	0 25	125 90	Gyro
800 00	0 61	57 42	799 98	-0 69	-2 45	2 09	0 67	0 28	85 15	Gyro
895 00	0 85	32 41	894 98	0 17	-1 64	0 91	0 41	0 25	-26 33	Gyro
1006 00	1 40	42 80	1005 96	1 86	-0 28	-1 26	0 53	0 50	9 36	Ryan MWD
1070 00	0 30	315 70	1069 95	2 56	0 13	-2 06	2 21	-1 72	-136 09	Ryan MWD
1166 00	2 20	253 00	1165 92	2 20	-1 80	-0 56	2 17	1 98	-65 31	Ryan MWD
1261 00	3 10	246 50	1260 82	0 64	-5 90	3 25	1 00	0 95	-6 84	Ryan MWD
1357 00	4 00	234 40	1356 64	-2 34	-11 01	8 79	1 21	0 94	-12 60	Ryan MWD
1452 00	5 20	220 10	1451 33	-7 57	-16 47	16 29	1 74	1 26	-15 05	Ryan MWD
1548 00	4 70	220 20	1546 97	-13 90	-21 82	24 58	0 52	-0 52	0 10	Ryan MWD
1644 00	5 10	217 40	1642 62	-20 29	-26 95	32 77	0 49	0 42	-2 92	Ryan MWD
1739 00	4 70	218 20	1737 28	-26 70	-31 92	40 89	0 43	-0 42	0 84	Ryan MWD
1835 00	4 20	218 90	1832 99	-32 53	-36 56	48 33	0 52	-0 52	0 73	Ryan MWD
1930 00	4 90	208 10	1927 69	-38 82	-40 65	55 79	1 16	0 74	-11 37	Ryan MWD



Ryan Energy Technologies Survey Report



Company: COG Operating LLC
Field: Eddy Co, NM
Site: Burch keely Unit #696
Well: #696
Wellpath: OH

Date: 8/1/2011 **Time:** 10 49 04 **Page:** 2
Co-ordinate(NE) Reference: Site Burch keely Unit #696, Grid North
Vertical (TVD) Reference: SITE 3598 0
Section (VS) Reference: Well (0 00N,0 00E,219 34Azi)
Survey Calculation Method: Minimum Curvature **Db:** Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
2026 00	4 50	209 60	2023 36	-45 71	-44 44	63 53	0 44	-0 42	1 56	Ryan MWD
2121 00	4 40	208 00	2118 08	-52 17	-48 00	70 77	0 17	-0 11	-1 68	Ryan MWD
2217 00	4 80	213 10	2213 77	-58 78	-51 92	78 37	0 60	0 42	5 31	Ryan MWD
2312 00	5 10	217 60	2308 42	-65 46	-56 66	86 55	0 52	0 32	4 74	Ryan MWD
2408 00	5 00	216 90	2404 04	-72 18	-61 78	94 99	0 12	-0 10	-0 73	Ryan MWD
2504 00	5 40	221 10	2499 65	-78 93	-67 26	103 69	0 57	0 42	4 37	Ryan MWD
2599 00	5 40	221 70	2594 23	-85 64	-73 17	112 62	0 06	0 00	0 63	Ryan MWD
2695 00	5 30	220 20	2689 81	-92 40	-79 04	121 57	0 18	-0 10	-1 56	Ryan MWD
2790 00	5 10	219 10	2784 42	-99 03	-84 54	130 18	0 24	-0 21	-1 16	Ryan MWD
2886 00	4 90	216 50	2880 05	-105 63	-89 67	138 54	0 31	-0 21	-2 71	Ryan MWD
2981 00	5 80	221 70	2974 64	-112 48	-95 27	147 39	1 08	0 95	5 47	Ryan MWD
3173 00	5 90	220 20	3165 64	-127 26	-108 10	166 95	0 10	0 05	-0 78	Ryan MWD
3268 00	5 50	219 30	3260 17	-134 51	-114 13	176 38	0 43	-0 42	-0 95	Ryan MWD
3364 00	5 50	219 90	3355 73	-141 60	-120 00	185 58	0 06	0 00	0 62	Ryan MWD
3459 00	5 00	219 30	3450 33	-148 30	-125 54	194 28	0 53	-0 53	-0 63	Ryan MWD
3555 00	5 10	218 30	3545 95	-154 89	-130 83	202 73	0 14	0 10	-1 04	Ryan MWD
3651 00	4 90	217 80	3641 59	-161 47	-135 99	211 09	0 21	-0 21	-0 52	Ryan MWD
3746 00	3 70	217 90	3736 32	-167 10	-140 36	218 21	1 26	-1 26	0 11	Ryan MWD
3842 00	2 70	216 20	3832 17	-171 37	-143 60	223 56	1 05	-1 04	-1 77	Ryan MWD
3938 00	1 50	194 60	3928 10	-174 41	-145 25	226 96	1 48	-1 25	-22 50	Ryan MWD
4033 00	0 30	176 00	4023 09	-175 86	-145 55	228 27	1 28	-1 26	-19 58	Ryan MWD
4076 00	0 30	176 00	4066 09	-176 08	-145 53	228 44	0 00	0 00	0 00	Projection



Ryan Energy Technologies COMPLETION REPORT



Company: COG Operating LLC Date: 8/1/2011 Time: 10 50 45 Page: 1
 Field: Eddy Co, NM Co-ordinate(NE) Reference: Site Burch keely Unit #696, Grnd North
 Site: Burch keely Unit #696 Vertical (TVD) Reference: SITE 3598 0
 Well: #696 Section (VS) Reference: Well (0 00N,0 00E,219 34Azl)
 Wellpath: OH Survey Calculation Method: Minimum Curvature Db: Sybase

Field Eddy Co, NM
 New Mexico
 U S A
 Map System:US State Plane Coordinate System 1927 Map Zone: New Mexico, Eastern Zone
 Geo Datum: NAD27 (Clarke 1866) Coordinate System: Site Centre
 Sys Datum: Mean Sea Level Geomagnetic Model: IGRF2010

Site: Burch keely Unit #696

Eddy Co , NM

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Slot Name:

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 Vertical Section: Depth From (TVD) +N/-S Declination: 7 83 deg
 ft +E/-W Mag Dip Angle: 60 65 deg
 deg
 0 00 0 00 0 00 219 34

Survey

MD ft	Incl deg	TVD ft	VS ft	Azim deg	N/S ft	E/W ft	Clsr Dist. ft	Clsr Azi. deg	DLS deg/100ft	Tool
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	TIE LINE
100 00	0 18	100 00	0 13	184 48	-0 16	-0 01	0 16	184 48	0 18	Gyro
200 00	0 71	200 00	0 88	219 63	-0 79	-0 42	0 89	207 97	0 57	Gyro
300 00	0 50	299 99	1 84	258 19	-1 36	-1 24	1 84	222 47	0 45	Gyro
400 00	0 33	399 99	2 36	269 56	-1 45	-1 96	2 43	233 50	0 19	Gyro
500 00	0 19	499 99	2 61	284 95	-1 41	-2 41	2 79	239 66	0 16	Gyro
600 00	0 08	599 99	2 75	206 37	-1 43	-2 60	2 96	241 20	0 19	Gyro
700 00	0 33	699 99	2 71	332 27	-1 24	-2 76	3 03	245 90	0 38	Gyro
800 00	0 61	799 98	2 09	57 42	-0 69	-2 45	2 54	254 17	0 67	Gyro
895 00	0 85	894 98	0 91	32 41	0 17	-1 64	1 65	276 03	0 41	Gyro
1006 00	1 40	1005 96	-1 26	42 80	1 86	-0 28	1 88	351 44	0 53	Ryan MWD
1070 00	0 30	1069 95	-2 06	315 70	2 56	0 13	2 56	2 99	2 21	Ryan MWD
1166 00	2 20	1165 92	-0 56	253 00	2 20	-1 80	2 84	320 62	2 17	Ryan MWD
1261 00	3 10	1260 82	3 25	246 50	0 64	-5 90	5 94	276 19	1 00	Ryan MWD
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1548 00	4 70	1546 97	24 58	220 20	-13 90	-21 82	25 87	237 50	0 52	Ryan MWD
1644 00	5 10	1642 62	32 77	217 40	-20 29	-26 95	33 73	233 02	0 49	Ryan MWD
1739 00	4 70	1737 28	40 89	218 20	-26 70	-31 92	41 62	230 08	0 43	Ryan MWD
1835 00	4 20	1832 99	48 33	218 90	-32 53	-36 56	48 94	228 33	0 52	Ryan MWD
1930 00	4 90	1927 69	55 79	208 10	-38 82	-40 65	56 21	226 32	1 16	Ryan MWD
2026 00	4 50	2023 36	63 53	209 60	-45 71	-44 44	63 75	224 20	0 44	Ryan MWD
2121 00	4 40	2118 08	70 77	208 00	-52 17	-48 00	70 89	222 62	0 17	Ryan MWD
2217 00	4 80	2213 77	78 37	213 10	-58 78	-51 92	78 43	221 45	0 60	Ryan MWD
2312 00	5 10	2308 42	86 55	217 60	-65 46	-56 66	86 58	220 88	0 52	Ryan MWD
2408 00	5 00	2404 04	94 99	216 90	-72 18	-61 78	95 01	220 56	0 12	Ryan MWD
2504 00	5 40	2499 65	103 69	221 10	-78 93	-67 26	103 70	220 44	0 57	Ryan MWD
2599 00	5 40	2594 23	112 62	221 70	-85 64	-73 17	112 64	220 51	0 06	Ryan MWD



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Well: #696
Wellpath: OH

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2886 00	4 90	2880 05	138 54	216 50	-105 63	-89 67	138 56	220 33	0 31	Ryan MWD
2981 00	5 80	2974 64	147 39	221 70	-112 48	-95 27	147 41	220 27	1 08	Ryan MWD
3173 00	5 90	3165 64	166 95	220 20	-127 26	-108 10	166 97	220 34	0 10	Ryan MWD
3268 00	5 50	3260 17	176 38	219 30	-134 51	-114 13	176 41	220 31	0 43	Ryan MWD
3364 00	5 50	3355 73	185 58	219 90	-141 60	-120 00	185 61	220 28	0 06	Ryan MWD
3459 00	5 00	3450 33	194 28	219 30	-148 30	-125 54	194 30	220 25	0 53	Ryan MWD
3555 00	5 10	3545 95	202 73	218 30	-154 89	-130 83	202 75	220 19	0 14	Ryan MWD
3651 00	4 90	3641 59	211 09	217 80	-161 47	-135 99	211 11	220 10	0 21	Ryan MWD
3746 00	3 70	3736 32	218 21	217 90	-167 10	-140 36	218 23	220 03	1 26	Ryan MWD
3842 00	2 70	3832 17	223 56	216 20	-171 37	-143 60	223 58	219 96	1 05	Ryan MWD
3938 00	1 50	3928 10	226 96	194 60	-174 41	-145 25	226 97	219 79	1 48	Ryan MWD
4033 00	0 30	4023 09	228 27	176 00	-175 86	-145 55	228 28	219 61	1 28	Ryan MWD
4076 00	0 30	4066 09	228 44	176 00	-176 08	-145 53	228 44	219 57	0 00	Projection