

Results of Directional Survey

API number:	30-025-39475	DD
OGRID:		Operator: COG OPERATING LLC
		Property: GC FEDERAL # 62

surface	ULSTR:	K	20	T	17S	R	32E
				2425	FSL	1855	FWL

BH Loc	ULSTR:	K	20	T	17S	R	32E
7120	MD	7092.1	TVD	2298	FSL	2304	FWL

Top Perf/OH	ULSTR:	K	20	T	17S	R	32E
5400	MD	5375.3	TVD	2302	FSL	2202	FWL

Bot Perf/OH	ULSTR:	K	20	T	17S	R	32E
6780	MD	6752.8	TVD	2301	FSL	2284	FWL

	MD	N/S	E/W	VD
	5331	-123.20	340.80	5306.5
TOP PERFS/OH	5400	-123.49	346.68	5375.28
	5426	-123.60	348.90	5401.20
	6755	-123.80	427.50	6727.80
BOT PERFS/OH	6780	-123.96	428.92	6752.77
	6850	-124.40	432.90	6822.70

NEXT TO LAST	6946	-124.90	438.70	6918.50
LAST READING	7081	-126.20	446.60	7053.20
TD	7120	-126.58	448.88	7092.11

Surface Location	2425	FS	1855	FW
Projected BHL	2298	FS	2304	FW
Location of				
Top Perfs/OH	2302	FS	2202	FW
Bottom Perfs/OH	2301	FS	2284	FW

SUMMARY of Subsurface Locations

Surface Location	K-20-17S-32E	2425	FS	1855	FW	Vert. Depth
Top Perfs/OH	K-20-17S-32E	2302	FS	2202	FW	5375.28
Bottom Perfs/OH	K-20-17S-32E	2301	FS	2284	FW	6752.77
Projected TD	K-20-17S-32E	2298	FS	2304	FW	7092.11

AUG 30 2011

SUR: K-20-17s-32e, 2425/S & 1855/W
BHL: K-20-17s-32e, 2298/S & 2304/W
API # 30-025-39475

WELL NAME AND NUMBER GC Federal No. 62

LOCATION Section 20, T17S, R32E, 2425 FSL, 1855 FWL, Lea County

OPERATOR COG Operating LLC

DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
1° @ 200'		
4° @ 354'		
5 1/2° @ 418'		
6° @ 520'		
6 1/2° @ 578'		
6 1/4° @ 639'		
6° @ 689'		
4° @ 858'		
3.50° @ 1016'		
2.50° @ 1300'		
1° @ 1711'		
3/4° @ 2075'		

HOBBS OCD Drilling Contractor-

UNITED DRILLING, INC.

AUG 08 2011

By:

Luisa Noriega
(Luisa Noriega)

RECEIVED

Title:

Assistant Office Manager

Subscribed and sworn to before me this 20th day of June, 2011.

Carline Martin
Notary Public

Charles New Mexico
County State

My Commission Expires:

10/8/12



COG OPERATING LLC

Lea County, NM (NAD27 NME)

GC Federal #62

GC Federal #62

OH - Job #32D0611518

HOBBS OCD

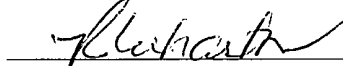
AUG 08 ;

RECEIVED

Survey: MWD Survey

SDI Standard Survey Report

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



Notarized this date 22nd of July, 2011.



Notary Signature
County of Midland
State of Texas

SUR: K-20-17s-32e, 2425/S & 1855/W
BHL: K-20-17s-32e, 2298/S & 2304/W
API # 30-025-39475





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Well GC Federal #62
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Site:	GC Federal #62	MD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Well:	GC Federal #62	North Reference:	Grid
Wellbore:	OH - Job #32D0611518	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Lea County, NM (NAD27 NME)		
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	GC Federal #62		
Site Position:		Northing:	662,253 00 usft
From:	Map	Easting:	666,714 70 usft
Position Uncertainty:	0 0 usft	Slot Radius:	0"
		Latitude:	32° 49' 10 001 N
		Longitude:	103° 47' 26 363 W
		Grid Convergence:	0 29 °

Well	GC Federal #62		
Well Position	+N/-S	0 0 usft	Northing:
	+E/-W	0 0 usft	Easting:
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 10 001 N
		Longitude:	103° 47' 26 363 W
		Ground Level:	3,976 0 usft

Wellbore	OH - Job #32D0611518		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	5/27/2011	7 74
			Dip Angle
			(°)
			60 70
			Field Strength
			(nT)
			48,952

Design	Actual		
Audit Notes:			
Version:	1 0	Phase:	ACTUAL
		Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0 0	0 0	0 0
			Direction
			(°)
			105 39

Survey Program	Date 7/22/2011		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100 0	2,009 0	Gyro Survey (OH - Job #32D0611518)	Keeper
2,135 0	7,130 0	MWD Survey (OH - Job #32D0611518)	MWD
			Description
			Standard Wireline Keeper ver 1 0 2
			MWD - Standard

Survey							
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0
100 0	0 79	166 62	100 0	-0 7	0 2	166 62	0 7
200 0	2 00	168 66	200 0	-3 1	0 7	167 76	3 1
300 0	3 99	175 36	299 8	-8 2	1 3	171 11	8 3
400 0	6 76	180 64	399 4	-17 6	1 5	175 12	17 7
500 0	7 83	183 00	498 6	-30 3	1 1	177 96	30 3
600 0	6 54	187 43	597 8	-42 7	0 0	180 02	42 7
700 0	5 62	190 81	697 2	-53 2	-1 7	181 80	53 2
800 0	4 36	193 69	796 8	-61 7	-3 5	183 23	61 8
900 0	3 95	199 39	896 6	-68 6	-5 5	184 61	68 8
1,000 0	3 47	200 36	996 4	-74 7	-7 7	185 90	75 1



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Site:	GC Federal #62	MD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Well:	GC Federal #62	North Reference:	Grid
Wellbore:	OH - Job #32D0611518	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,100 0	3 00	198 83	1,096 2	-80 0	-9 6	186 86	80 6
1,200 0	2 71	190 35	1,196 1	-84 8	-10 9	187 32	85 5
1,300 0	2 43	192 63	1,296 0	-89 2	-11 8	187 52	90 0
1,400 0	1 90	187 98	1,395 9	-92 9	-12 5	187 64	93 8
1,500 0	1 79	177 99	1,495 9	-96 1	-12 6	187 50	97 0
1,600 0	1 33	162 02	1,595 8	-98 8	-12 2	187 06	99 6
1,700 0	0 82	141 78	1,695 8	-100 5	-11 4	186 49	101 1
1,800 0	1 08	95 48	1,795 8	-101 1	-10 1	185 68	101 6
1,900 0	1 09	83 59	1,895 8	-101 1	-8 2	184 62	101 4
2,000 0	1 18	87 25	1,995 7	-100 9	-6 2	183 51	101 1
2,009 0	1 04	87 07	2,004 7	-100 9	-6 0	183 41	101 1



Scientific Drilling International, Inc.

SDI Standard Survey Report



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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Site:	GC Federal #62	MD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Well:	GC Federal #62	North Reference:	Grid
Wellbore:	OH - Job #32D0611518	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Lea County, NM (NAD27 NME)		
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	GC Federal #62				
Site Position:		Northing:	662,253 00 usft	Latitude:	32° 49' 10 001 N
From:	Map	Easting:	666,714 70 usft	Longitude:	103° 47' 26 363 W
Position Uncertainty:	0 0 usft	Slot Radius:	0"	Grid Convergence:	0 29 °

Well	GC Federal #62					
Well Position	+N/-S	0 0 usft	Northing:	662,253 00 usft	Latitude:	32° 49' 10 001 N
	+E/-W	0 0 usft	Easting:	666,714 70 usft	Longitude:	103° 47' 26 363 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	3,976 0 usft

Wellbore	OH - Job #32D0611518				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/27/2011	7 74	60 70	48,952

Design	Actual				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0 0	0 0	0 0	105 39	

Survey Program	Date 7/22/2011			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	2,009 0	Gyro Survey (OH - Job #32D0611518)	Keeper	Standard Wireline Keeper ver 1 0 2
2,135 0	7,130 0	MWD Survey (OH - Job #32D0611518)	MWD	MWD - Standard

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
2,009 0	1 04	87 07	2,004 7	-100 9	-6 0	183 41	101 1
Gyro Tie-in							
2,135 0	0 79	72 29	2,130 7	-100 6	-4 1	182 31	100 7
2,199 0	1 13	84 90	2,194 7	-100 4	-3 0	181 71	100 5
2,262 0	1 72	119 12	2,257 7	-100 8	-1 6	180 89	100 8
2,325 0	2 10	97 57	2,320 7	-101 4	0 4	179 77	101 4
2,388 0	2 73	98 35	2,383 6	-101 8	3 0	178 29	101 9
2,451 0	3 72	93 79	2,446 5	-102 2	6 6	176 32	102 4
2,514 0	4 41	91 75	2,509 4	-102 4	11 0	173 85	103 0
2,578 0	5 00	90 30	2,573 1	-102 5	16 3	170 98	103 7
2,641 0	5 66	88 06	2,635 9	-102 4	22 1	167 81	104 7



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Site:	GC Federal #62	MD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Well:	GC Federal #62	North Reference:	Grid
Wellbore:	OH - Job #32D0611518	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
2,704 0	6 26	87 89	2,698 5	-102 1	28 7	164 33	106 1
2,767 0	7 04	92 16	2,761 1	-102 2	35 9	160 61	108 3
2,831 0	6 80	91 89	2,824 6	-102 4	43 7	156.92	111 3
2,926 0	6 04	90 72	2,919 0	-102 7	54 3	152 14	116 1
3,021 0	6 93	93 24	3,013 4	-103.1	65 0	147 76	121 9
3,116 0	7 75	87 78	3,107 7	-103 1	77 1	143 22	128 8
3,211 0	7 18	92 52	3,201 8	-103 2	89 4	139 07	136 5
3,306 0	6 32	90 99	3,296 2	-103 5	100 6	135 81	144 3
3,400 0	6 80	93 98	3,389 6	-104 0	111 3	133 05	152 3
3,495 0	8 04	94 95	3,483 8	-104 9	123 6	130 34	162 1
3,597 0	7 94	93 95	3,584 8	-106 0	137 7	127 60	173 8
3,692 0	7 57	94 77	3,678 9	-107 0	150 5	125 42	184 7
3,786 0	7 74	94 01	3,772 1	-108 0	163 0	123 53	195 5
3,882 0	7 81	92 93	3,867 2	-108 8	175 9	121 73	206 8
3,977 0	7 56	88 70	3,961 3	-109 0	188 6	120 01	217 8
4,072 0	7 56	91 71	4,055 5	-109 0	201 1	118 46	228 8
4,167 0	7 81	92 24	4,149 7	-109 4	213 8	117 10	240 2
4,262 0	7 10	95 15	4,243 9	-110 2	226 1	115 99	251 5
4,357 0	6 96	93 45	4,338 1	-111 1	237 7	115 05	262 4
4,483 0	7 47	94 68	4,463 1	-112 2	253 5	113 88	277 2
4,578 0	6.60	97 26	4,557 4	-113 4	265 1	113 16	288 3
4,673 0	6 11	97 95	4,651 8	-114 8	275 5	112 62	298 4
4,768 0	5 80	98.65	4,746 3	-116 2	285 2	112 17	308 0
4,856.0	6 29	98 23	4,833 8	-117.6	294 4	111 77	317 0
4,951 0	5 94	101 90	4,928 3	-119 3	304 4	111 41	326 9
5,046 0	5 30	99 39	5,022 8	-121 1	313 5	111 12	336 1
5,141 0	5 34	91 73	5,117 4	-121 9	322 2	110 72	344 5
5,236 0	5 86	93 47	5,212 0	-122 3	331 5	110 26	353 4
5,331 0	5 40	97 34	5,306 5	-123 2	340 8	109 88	362 4
5,426 0	4 44	86 86	5,401 2	-123 6	348 9	109 50	370 1
5,521 0	3 41	79 64	5,496 0	-122 9	355 3	109 07	376 0
5,615 0	3 36	76 11	5,589 8	-121 7	360 8	108 64	380 7
5,710 0	3 84	89 87	5,684 6	-121 0	366 6	108 27	386 1
5,805 0	3 49	83 34	5,779 4	-120 7	372 7	107 94	391 8
5,900 0	3.70	87 46	5,874 2	-120 2	378 6	107 61	397 3
5,995 0	3 68	86 26	5,969 0	-119 9	384 7	107 31	403 0
6,090 0	3 51	100 38	6,063 8	-120 2	390 6	107 10	408 7
6,185 0	3 17	94 54	6,158 7	-120 9	396 1	106 98	414 2
6,280 0	3 05	94 19	6,253 5	-121 3	401 3	106.82	419 2
6,375 0	3 06	94 46	6,348 4	-121 7	406 3	106 68	424 1
6,470 0	3 34	92.73	6,443 3	-122 0	411 6	106 52	429 3
6,565.0	3 10	96 09	6,538 1	-122 4	416 9	106 37	434 5
6,660 0	3 31	96 80	6,633 0	-123 0	422 2	106 25	439 8
6,755 0	3 16	98 70	6,727 8	-123 8	427 5	106 15	445 1
6,850 0	3 46	95.27	6,822 7	-124 4	432 9	106 03	450 5



Scientific Drilling International, Inc.
SDI Standard Survey Report



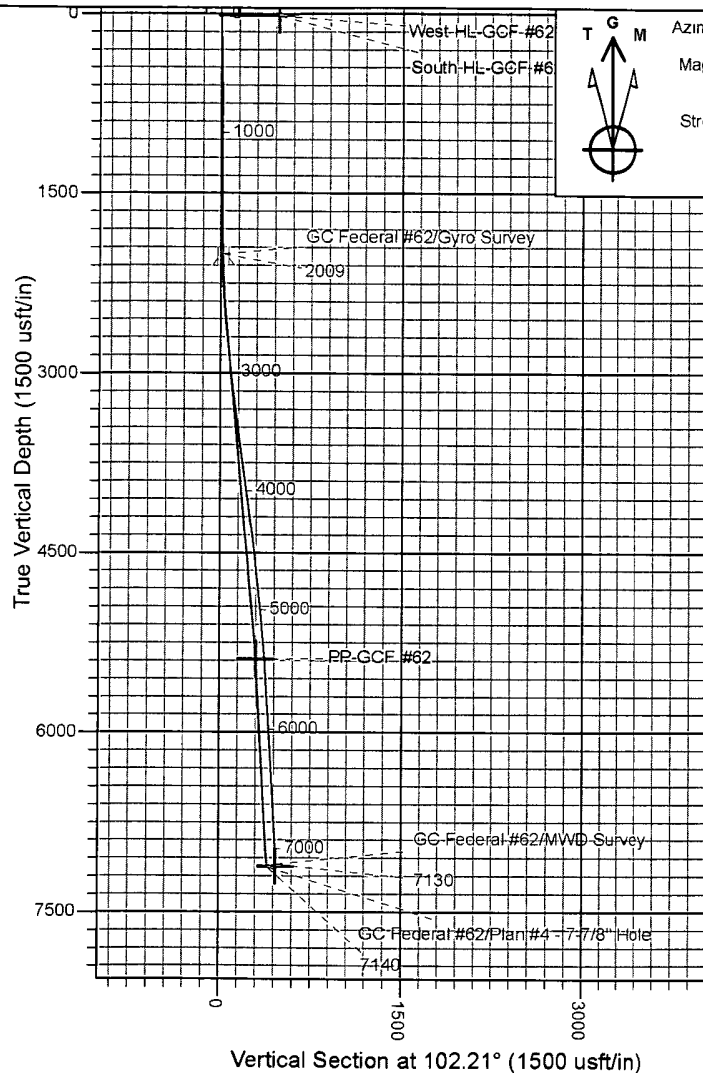
Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Well GC Federal #62
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Site:	GC Federal #62	MD Reference:	KB Elev (20') @ 3996 0usft (UDI #42)
Well:	GC Federal #62	North Reference:	Grid
Wellbore:	OH - Job #32D0611518	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
6,946 0	3 39	95 23	6,918 5	-124 9	438 7	105 90	456 1
7,081 0	3 45	102 07	7,053 2	-126 2	446 6	105 77	464 1
Last MWD Survey							
7,130 0	3 45	102 07	7,102 2	-126 8	449 5	105 75	467 0
Projection to Bit							

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,009 0	2,004 7	-100 9	-6 0	Gyro Tie-in
7,081 0	7,053 2	-126 2	446 6	Last MWD Survey
7,130 0	7,102 2	-126 8	449 5	Projection to Bit



Project: Lea County, NM (NAD27 NME)
 Site: GC Federal #62
 Well: GC Federal #62
 Wellbore: OH - Job #32D0611518
 Design: Plan #4 - 7-7/8" Hole

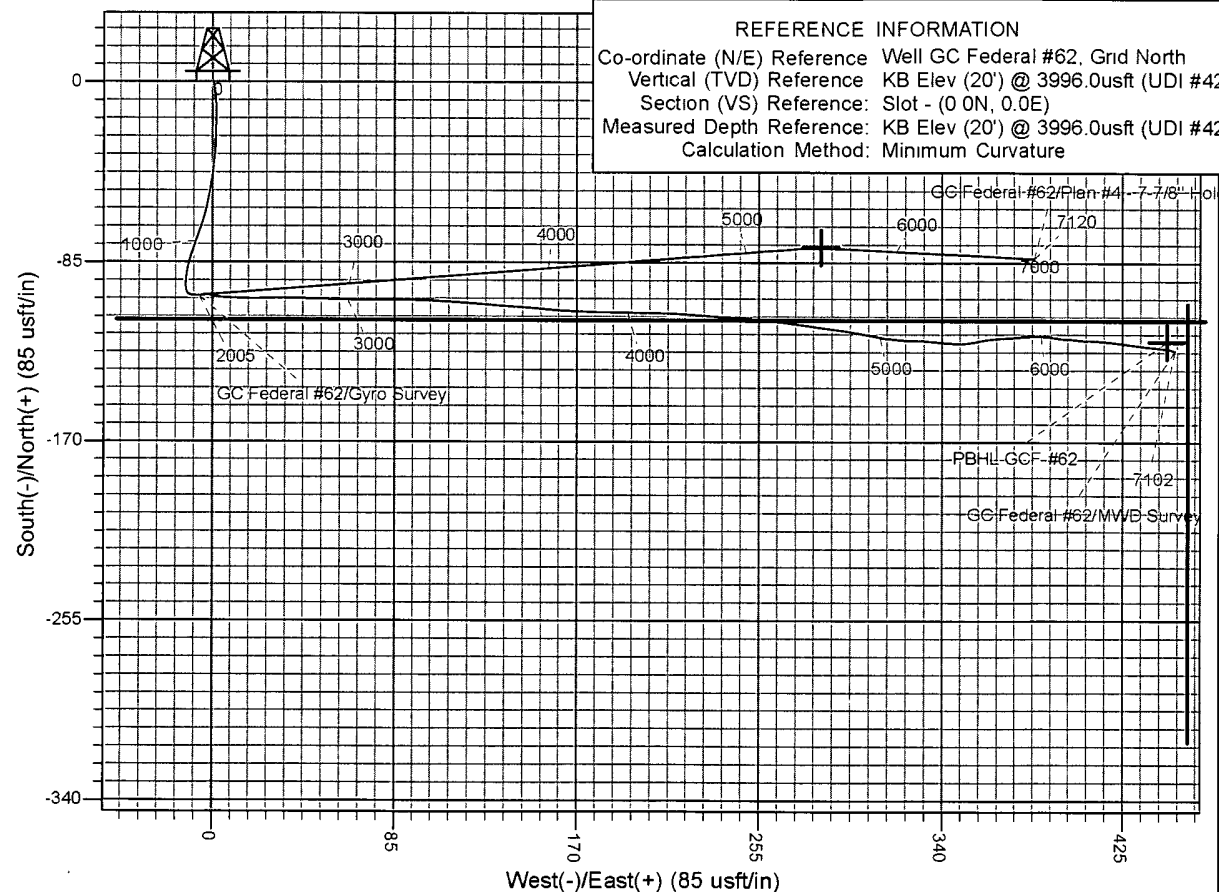


Azimuths to Grid North
 True North -0 29°
 Magnetic North 7 45°
 Magnetic Field
 Strength 48952 3snT
 Dip Angle 60 70°
 Date 5/27/2011

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	662253.00	666714.70	32° 49' 10.001 N	103° 47' 26.363 W	

WELL DETAILS: GC Federal #62
 KB Elev (20') @ 3996.0usft (UDI #42)
 Ground Level: 3976.0

REFERENCE INFORMATION
 Co-ordinate (N/E) Reference Well GC Federal #62, Grid North
 Vertical (TVD) Reference KB Elev (20') @ 3996.0usft (UDI #42)
 Section (VS) Reference: Slot - (0 0N, 0.0E)
 Measured Depth Reference: KB Elev (20') @ 3996.0usft (UDI #42)
 Calculation Method: Minimum Curvature



COMPANY DETAILS: COG OPERATING LLC
 223032

Calculation Method: Minimum Curvature
 Error System: ISCWSA
 Scan Method: Closest Approach 3D
 Error Surface: Elliptical Conic
 Warning Method: Error Ratio

PROJECT DETAILS: Lea County, NM (NAD27 NME)
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level

SITE DETAILS GC Federal #62
 Site Centre Latitude 32° 49' 10.001 N
 Longitude: 103° 47' 26.363 W
 Positional Uncertainty: 0.0
 Convergence: 0.29
 Local North: Grid