



July 18, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 02 2014

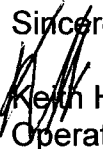
RECEIVED

30-015-41234

Attn: Kanicia Castillo

RE: **Honey Graham State Com No. 002H**

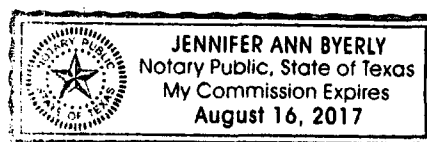
Please find enclosed a copy of the survey from 0.00' to 7184.00' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 18 day of July, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)
Lease/Well: Honey Graham State Com/No. 002H
Location: S29-T26S-R28E
Rig Name: Patterson #79
State/County: New Mexico/Eddy
Latitude: 32.02, Longitude: -104.11
GRID North is 0.12 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=17.5 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 7/18/2014 / 09:05

VES Survey International
Midland, TX
(432)-563-5444

Surveyor: Tim Dillon

Honey Graham State Com No. 002H / API 30-015-41234

NM OIL CONSERVATION
ARTESIA DISTRICT
DEC 02 2014
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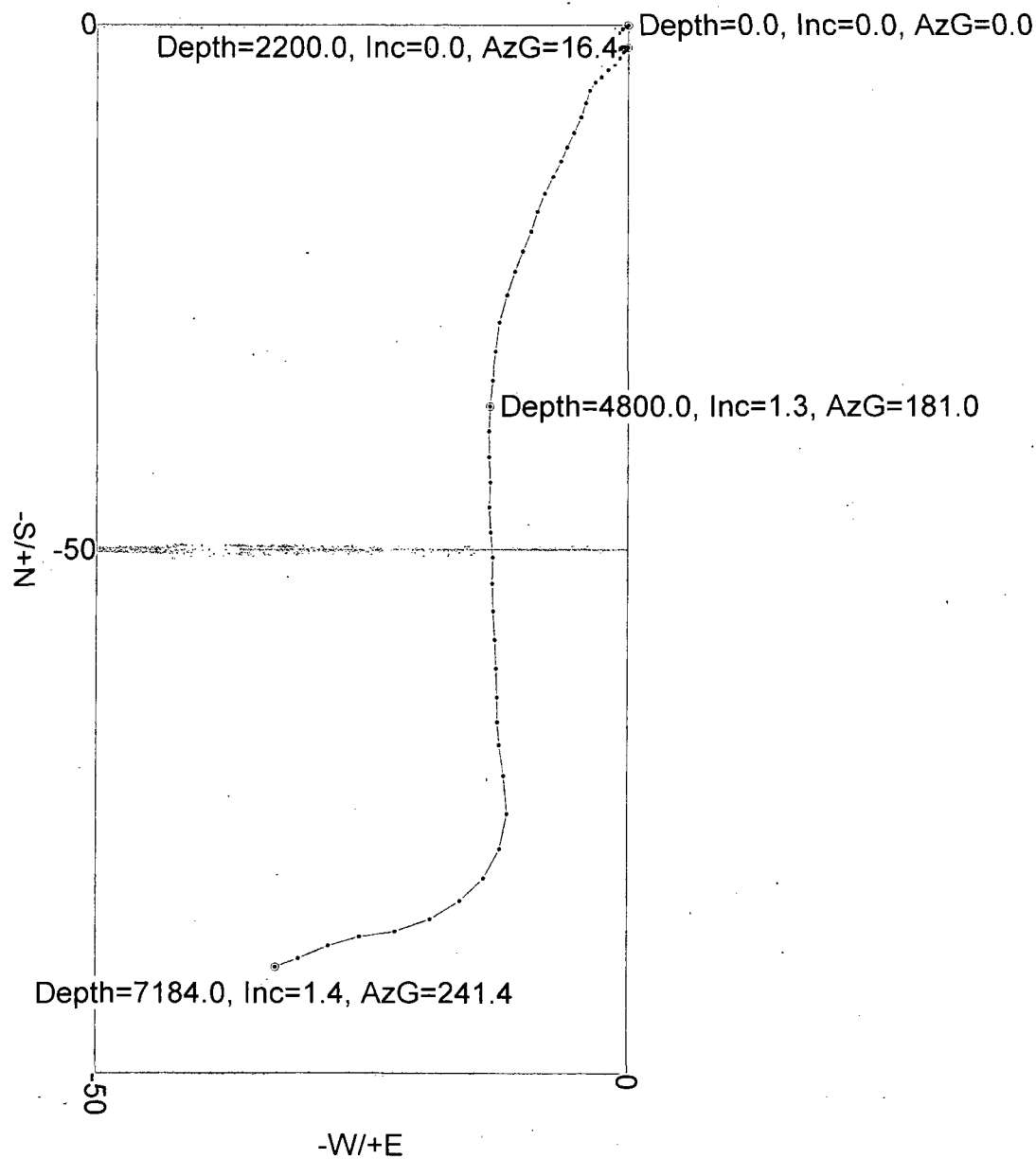
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.27	235.47	100.00	-0.13	-0.19	-0.13	0.23	235.47	0.27
200.00	0.25	236.11	200.00	-0.38	-0.56	-0.38	0.68	235.67	0.02
300.00	0.35	217.83	300.00	-0.75	-0.93	-0.75	1.20	231.21	0.14
400.00	0.60	220.45	399.99	-1.39	-1.46	-1.39	2.02	226.40	0.25
500.00	0.31	177.66	499.99	-2.06	-1.79	-2.06	2.73	221.03	0.43
600.00	0.09	112.65	599.99	-2.36	-1.71	-2.36	2.91	216.00	0.28
700.00	0.09	78.45	699.99	-2.37	-1.56	-2.37	2.84	213.42	0.05
800.00	0.06	99.21	799.99	-2.36	-1.43	-2.36	2.76	211.25	0.04
900.00	0.04	57.60	899.99	-2.35	-1.35	-2.35	2.71	209.93	0.04
1000.00	0.17	107.26	999.99	-2.38	-1.19	-2.38	2.66	206.54	0.15
1100.00	0.04	17.78	1099.99	-2.39	-1.04	-2.39	2.60	203.48	0.17
1200.00	0.18	66.82	1199.99	-2.30	-0.89	-2.30	2.46	201.10	0.15
1300.00	0.03	65.49	1299.99	-2.23	-0.72	-2.23	2.34	198.01	0.15
1400.00	0.06	13.71	1399.99	-2.17	-0.69	-2.17	2.27	197.67	0.05
1500.00	0.08	77.03	1499.99	-2.10	-0.61	-2.10	2.19	196.12	0.08
1600.00	0.02	223.84	1599.99	-2.09	-0.55	-2.09	2.16	194.60	0.10
1700.00	0.01	20.87	1699.99	-2.09	-0.55	-2.09	2.16	194.74	0.03
1800.00	0.02	199.90	1799.99	-2.10	-0.55	-2.10	2.17	194.76	0.03

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.03	102.17	1899.99	-2.12	-0.54	-2.12	2.19	194.21	0.04
2000.00	0.17	81.76	1999.99	-2.11	-0.37	-2.11	2.14	189.96	0.14
2100.00	0.12	119.49	2099.99	-2.14	-0.13	-2.14	2.14	183.51	0.10
2200.00	0.05	16.42	2199.99	-2.16	-0.03	-2.16	2.16	180.70	0.14
2300.00	0.10	215.38	2299.99	-2.19	-0.07	-2.19	2.19	181.77	0.15
2400.00	0.06	226.96	2399.99	-2.30	-0.16	-2.30	2.31	183.97	0.05
2500.00	0.02	218.79	2499.99	-2.36	-0.21	-2.36	2.37	185.16	0.04
2600.00	0.34	226.79	2599.99	-2.58	-0.44	-2.58	2.62	189.76	0.32
2700.00	0.50	202.39	2699.99	-3.18	-0.83	-3.18	3.29	194.55	0.23
2800.00	0.38	242.63	2799.98	-3.73	-1.29	-3.73	3.95	199.02	0.32
2900.00	0.59	219.75	2899.98	-4.28	-1.91	-4.28	4.69	204.08	0.28
3000.00	0.49	227.25	2999.97	-4.97	-2.56	-4.97	5.59	207.23	0.12
3100.00	0.40	227.91	3099.97	-5.49	-3.13	-5.49	6.32	209.66	0.09
3200.00	0.68	206.14	3199.97	-6.26	-3.65	-6.26	7.24	210.23	0.35
3300.00	0.78	191.94	3299.96	-7.46	-4.05	-7.46	8.49	208.49	0.21
3400.00	0.85	202.16	3399.95	-8.81	-4.47	-8.81	9.88	206.89	0.16
3500.00	1.04	206.73	3499.94	-10.31	-5.15	-10.31	11.52	206.57	0.20
3600.00	0.72	200.24	3599.92	-11.70	-5.78	-11.70	13.05	206.28	0.33
3700.00	0.91	205.71	3699.91	-13.01	-6.34	-13.01	14.47	205.99	0.21
3800.00	0.98	206.58	3799.90	-14.48	-7.07	-14.48	16.12	206.01	0.07
3900.00	1.05	206.12	3899.88	-16.07	-7.85	-16.07	17.88	206.04	0.08
4000.00	1.08	195.68	3999.87	-17.80	-8.51	-17.80	19.73	205.55	0.20
4100.00	1.18	200.34	4099.85	-19.68	-9.12	-19.68	21.69	204.87	0.13
4200.00	1.16	202.43	4199.83	-21.57	-9.86	-21.57	23.72	204.57	0.05
4300.00	1.19	199.72	4299.81	-23.48	-10.60	-23.48	25.76	204.29	0.07
4400.00	1.51	197.01	4399.78	-25.72	-11.34	-25.72	28.11	203.78	0.33
4500.00	1.57	193.69	4499.74	-28.32	-12.05	-28.32	30.77	203.05	0.10
4600.00	1.68	181.90	4599.70	-31.11	-12.42	-31.11	33.50	201.76	0.35
4700.00	1.50	190.39	4699.66	-33.87	-12.70	-33.87	36.17	200.56	0.30
4800.00	1.34	180.98	4799.63	-36.32	-12.96	-36.32	38.57	199.64	0.28
4900.00	1.37	183.66	4899.60	-38.68	-13.06	-38.68	40.83	198.65	0.07
5000.00	1.46	175.08	4999.57	-41.14	-13.02	-41.14	43.15	197.56	0.23
5100.00	1.31	180.71	5099.55	-43.56	-12.93	-43.56	45.44	196.53	0.21
5200.00	1.41	182.80	5199.52	-45.93	-13.00	-45.93	47.73	195.81	0.11
5300.00	1.38	170.83	5299.49	-48.35	-12.87	-48.35	50.03	194.91	0.29
5400.00	1.37	179.21	5399.46	-50.73	-12.66	-50.73	52.29	194.01	0.20
5500.00	1.49	182.49	5499.43	-53.22	-12.70	-53.22	54.72	193.42	0.15
5600.00	1.55	174.61	5599.39	-55.87	-12.63	-55.87	57.28	192.74	0.22
5700.00	1.56	178.53	5699.36	-58.58	-12.47	-58.58	59.89	192.02	0.11

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.59	175.40	5799.32	-61.32	-12.32	-61.32	62.55	191.36	0.09
5900.00	1.53	181.05	5899.28	-64.04	-12.24	-64.04	65.20	190.82	0.16
6000.00	1.20	175.69	5999.25	-66.42	-12.18	-66.42	67.53	190.39	0.36
6100.00	1.32	176.59	6099.23	-68.61	-12.04	-68.61	69.66	189.95	0.12
6200.00	2.12	167.93	6199.18	-71.57	-11.58	-71.57	72.50	189.19	0.84
6300.00	2.08	182.27	6299.12	-75.19	-11.27	-75.19	76.03	188.52	0.53
6400.00	1.89	201.68	6399.06	-78.54	-11.95	-78.54	79.45	188.65	0.70
6500.00	1.81	215.40	6499.01	-81.36	-13.47	-81.36	82.47	189.40	0.45
6600.00	1.82	236.29	6598.96	-83.53	-15.71	-83.53	84.99	190.65	0.66
6700.00	1.97	240.66	6698.90	-85.25	-18.52	-85.25	87.24	192.26	0.21
6800.00	2.06	258.99	6798.84	-86.44	-21.78	-86.44	89.14	194.15	0.65
6900.00	1.85	265.63	6898.78	-86.90	-25.16	-86.90	90.47	196.15	0.30
7000.00	1.77	240.63	6998.73	-87.78	-28.12	-87.78	92.18	197.76	0.79
7100.00	1.81	253.24	7098.69	-89.00	-30.97	-89.00	94.23	199.19	0.39
7184.00	1.36	241.41	7182.65	-89.86	-33.12	-89.86	95.76	200.23	0.65



VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Honey Graham State Com No. 002H / API 30-015-41234



V.E.S Survey Date: 07/11/2014



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 29, T26S, R28E

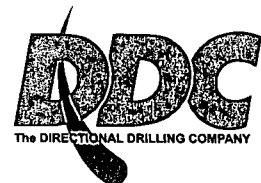
Honey Graham State Com #2H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

21 July, 2014





DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3019.0usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	Well @ 3019.0usft (Patterson #79)
Well:	Honey Graham State Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD 27)		
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	Sec 29, T26S, R28E		
Site Position:	Map	Northings:	371,191.10 usft
From:		Easting:	568,843.40 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 1' 13.166 N
		Longitude:	104° 6' 40.339 W
		Grid Convergence:	0.12 °

Well	Honey Graham State Com #2H		
Well Position	+N/-S	0.0 usft	Northings:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 1' 13.166 N
		Longitude:	104° 6' 40.339 W
		Ground Level:	3,001.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	6/26/2014	7.45
			Dip Angle
			(°)
			59.83
			Field Strength
			(nT)
			48,135

Design	Wellbore #1		
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
			(°)
			180.08

Survey Program	Date 7/21/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	7,184.0	VES Gyro (Wellbore #1)	Good_gyro
7,215.0	14,627.0	MWD Surveys (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map			
Depth	(°)	(°)	Depth	(usft)	(usft)	Northings	Easting	Latitude	Longitude	
(usft)			(usft)			(usft)	(usft)			
0.0	0.00	0.00	0.0	0.0	0.0	371,191.10	568,843.40	32° 1' 13.166 N	104° 6' 40.339 W	
100.0	0.27	235.47	100.0	-0.1	-0.2	371,190.96	568,843.21	32° 1' 13.165 N	104° 6' 40.341 W	
200.0	0.25	236.11	200.0	-0.4	-0.6	371,190.71	568,842.83	32° 1' 13.162 N	104° 6' 40.346 W	
300.0	0.35	217.83	300.0	-0.8	-0.9	371,190.35	568,842.46	32° 1' 13.159 N	104° 6' 40.350 W	
400.0	0.60	220.45	400.0	-1.4	-1.5	371,189.71	568,841.94	32° 1' 13.152 N	104° 6' 40.356 W	
500.0	0.31	177.66	500.0	-2.1	-1.8	371,189.04	568,841.61	32° 1' 13.146 N	104° 6' 40.360 W	
600.0	0.09	112.65	600.0	-2.4	-1.7	371,188.74	568,841.69	32° 1' 13.143 N	104° 6' 40.359 W	
700.0	0.09	78.45	700.0	-2.4	-1.6	371,188.72	568,841.84	32° 1' 13.143 N	104° 6' 40.357 W	
800.0	0.06	99.21	800.0	-2.4	-1.4	371,188.73	568,841.97	32° 1' 13.143 N	104° 6' 40.356 W	
900.0	0.04	57.60	900.0	-2.4	-1.4	371,188.74	568,842.05	32° 1' 13.143 N	104° 6' 40.355 W	
1,000.0	0.17	107.26	1,000.0	-2.4	-1.2	371,188.72	568,842.22	32° 1' 13.143 N	104° 6' 40.353 W	



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3019.0usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	Well @ 3019.0usft (Patterson #79)
Well:	Honey Graham State Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.04	17.78	1,100.0	-2.4	-1.0	371,188.70	568,842.38	32° 1' 13.142 N	104° 6' 40.351 W
1,200.0	0.18	66.82	1,200.0	-2.3	-0.9	371,188.80	568,842.53	32° 1' 13.143 N	104° 6' 40.349 W
1,300.0	0.03	65.49	1,300.0	-2.2	-0.7	371,188.87	568,842.70	32° 1' 13.144 N	104° 6' 40.347 W
1,400.0	0.06	13.71	1,400.0	-2.2	-0.7	371,188.93	568,842.74	32° 1' 13.145 N	104° 6' 40.347 W
1,500.0	0.08	77.03	1,500.0	-2.1	-0.6	371,189.00	568,842.82	32° 1' 13.145 N	104° 6' 40.346 W
1,600.0	0.02	223.84	1,600.0	-2.1	-0.5	371,189.00	568,842.87	32° 1' 13.145 N	104° 6' 40.345 W
1,700.0	0.01	20.87	1,700.0	-2.1	-0.5	371,189.00	568,842.86	32° 1' 13.145 N	104° 6' 40.345 W
1,800.0	0.02	199.90	1,800.0	-2.1	-0.5	371,188.99	568,842.86	32° 1' 13.145 N	104° 6' 40.345 W
1,900.0	0.03	102.17	1,900.0	-2.1	-0.5	371,188.97	568,842.88	32° 1' 13.145 N	104° 6' 40.345 W
2,000.0	0.17	81.76	2,000.0	-2.1	-0.4	371,188.98	568,843.05	32° 1' 13.145 N	104° 6' 40.343 W
2,100.0	0.12	119.49	2,100.0	-2.1	-0.1	371,188.95	568,843.29	32° 1' 13.145 N	104° 6' 40.340 W
2,200.0	0.05	16.42	2,200.0	-2.2	0.0	371,188.94	568,843.39	32° 1' 13.145 N	104° 6' 40.339 W
2,300.0	0.10	215.38	2,300.0	-2.2	0.0	371,188.92	568,843.35	32° 1' 13.145 N	104° 6' 40.340 W
2,400.0	0.06	226.96	2,400.0	-2.3	-0.1	371,188.81	568,843.27	32° 1' 13.144 N	104° 6' 40.341 W
2,500.0	0.02	218.79	2,500.0	-2.3	-0.2	371,188.76	568,843.22	32° 1' 13.143 N	104° 6' 40.341 W
2,600.0	0.34	226.79	2,600.0	-2.6	-0.4	371,188.54	568,842.99	32° 1' 13.141 N	104° 6' 40.344 W
2,700.0	0.50	202.39	2,700.0	-3.2	-0.8	371,187.94	568,842.61	32° 1' 13.135 N	104° 6' 40.348 W
2,800.0	0.38	242.63	2,800.0	-3.7	-1.3	371,187.38	568,842.15	32° 1' 13.129 N	104° 6' 40.354 W
2,900.0	0.59	219.75	2,900.0	-4.3	-1.9	371,186.83	568,841.52	32° 1' 13.124 N	104° 6' 40.361 W
3,000.0	0.49	227.25	3,000.0	-5.0	-2.5	371,186.15	568,840.88	32° 1' 13.117 N	104° 6' 40.368 W
3,100.0	0.40	227.91	3,100.0	-5.5	-3.1	371,185.62	568,840.31	32° 1' 13.112 N	104° 6' 40.375 W
3,200.0	0.68	206.14	3,200.0	-6.2	-3.6	371,184.85	568,839.79	32° 1' 13.104 N	104° 6' 40.381 W
3,300.0	0.78	191.94	3,300.0	-7.4	-4.0	371,183.66	568,839.38	32° 1' 13.093 N	104° 6' 40.386 W
3,400.0	0.85	202.16	3,399.9	-8.8	-4.4	371,182.30	568,838.96	32° 1' 13.079 N	104° 6' 40.391 W
3,500.0	1.04	206.73	3,499.9	-10.3	-5.1	371,180.81	568,838.28	32° 1' 13.064 N	104° 6' 40.399 W
3,600.0	0.72	200.24	3,599.9	-11.7	-5.8	371,179.41	568,837.65	32° 1' 13.051 N	104° 6' 40.406 W
3,700.0	0.91	205.71	3,699.9	-13.0	-6.3	371,178.10	568,837.09	32° 1' 13.038 N	104° 6' 40.413 W
3,800.0	0.98	206.58	3,799.9	-14.5	-7.0	371,176.62	568,836.36	32° 1' 13.023 N	104° 6' 40.421 W
3,900.0	1.05	206.12	3,899.9	-16.1	-7.8	371,175.03	568,835.57	32° 1' 13.007 N	104° 6' 40.430 W
4,000.0	1.08	195.68	3,999.9	-17.8	-8.5	371,173.30	568,834.92	32° 1' 12.990 N	104° 6' 40.438 W
4,100.0	1.18	200.34	4,099.8	-19.7	-9.1	371,171.43	568,834.30	32° 1' 12.972 N	104° 6' 40.445 W
4,200.0	1.16	202.43	4,199.8	-21.6	-9.8	371,169.53	568,833.56	32° 1' 12.953 N	104° 6' 40.454 W
4,300.0	1.19	199.72	4,299.8	-23.5	-10.6	371,167.62	568,832.82	32° 1' 12.934 N	104° 6' 40.462 W
4,400.0	1.51	197.01	4,399.8	-25.7	-11.3	371,165.38	568,832.09	32° 1' 12.912 N	104° 6' 40.471 W
4,500.0	1.57	193.69	4,499.7	-28.3	-12.0	371,162.79	568,831.38	32° 1' 12.886 N	104° 6' 40.479 W
4,600.0	1.68	181.90	4,599.7	-31.1	-12.4	371,159.99	568,831.01	32° 1' 12.859 N	104° 6' 40.484 W
4,700.0	1.50	190.39	4,699.7	-33.9	-12.7	371,157.24	568,830.72	32° 1' 12.831 N	104° 6' 40.487 W
4,800.0	1.34	180.98	4,799.6	-36.3	-12.9	371,154.78	568,830.46	32° 1' 12.807 N	104° 6' 40.490 W
4,900.0	1.37	183.66	4,899.6	-38.7	-13.0	371,152.42	568,830.37	32° 1' 12.784 N	104° 6' 40.491 W
5,000.0	1.46	175.08	4,999.6	-41.1	-13.0	371,149.96	568,830.40	32° 1' 12.759 N	104° 6' 40.491 W
5,100.0	1.31	180.71	5,099.5	-43.6	-12.9	371,147.55	568,830.50	32° 1' 12.735 N	104° 6' 40.490 W
5,200.0	1.41	182.80	5,199.5	-45.9	-13.0	371,145.17	568,830.42	32° 1' 12.712 N	104° 6' 40.491 W
5,300.0	1.38	170.83	5,299.5	-48.3	-12.8	371,142.76	568,830.55	32° 1' 12.688 N	104° 6' 40.489 W
5,400.0	1.37	179.21	5,399.5	-50.7	-12.6	371,140.37	568,830.76	32° 1' 12.664 N	104° 6' 40.487 W
5,500.0	1.49	182.49	5,499.4	-53.2	-12.7	371,137.88	568,830.72	32° 1' 12.640 N	104° 6' 40.488 W
5,600.0	1.55	174.61	5,599.4	-55.9	-12.6	371,135.23	568,830.79	32° 1' 12.614 N	104° 6' 40.487 W
5,700.0	1.56	178.53	5,699.4	-58.6	-12.4	371,132.53	568,830.95	32° 1' 12.587 N	104° 6' 40.485 W
5,800.0	1.59	175.40	5,799.3	-61.3	-12.3	371,129.78	568,831.10	32° 1' 12.560 N	104° 6' 40.483 W
5,900.0	1.53	181.05	5,899.3	-64.0	-12.2	371,127.06	568,831.19	32° 1' 12.533 N	104° 6' 40.482 W
6,000.0	1.20	175.69	5,999.3	-66.4	-12.2	371,124.69	568,831.24	32° 1' 12.509 N	104° 6' 40.482 W
6,100.0	1.32	176.59	6,099.2	-68.6	-12.0	371,122.49	568,831.39	32° 1' 12.487 N	104° 6' 40.480 W
6,200.0	2.12	167.93	6,199.2	-71.6	-11.6	371,119.53	568,831.84	32° 1' 12.458 N	104° 6' 40.475 W
6,300.0	2.08	182.27	6,299.1	-75.2	-11.2	371,115.91	568,832.16	32° 1' 12.422 N	104° 6' 40.471 W
6,400.0	1.89	201.68	6,399.1	-78.5	-11.9	371,112.57	568,831.48	32° 1' 12.389 N	104° 6' 40.479 W
6,500.0	1.81	215.40	6,499.0	-81.4	-13.4	371,109.75	568,829.95	32° 1' 12.361 N	104° 6' 40.497 W



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3019.0usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	Well @ 3019.0usft (Patterson #79)
Well:	Honey Graham State Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,600.0	1.82	236.29	6,599.0	-83.5	-15.7	371,107.58	568,827.72	32° 1' 12.340 N	104° 6' 40.523 W	
6,700.0	1.97	240.66	6,698.9	-85.2	-18.5	371,105.85	568,824.90	32° 1' 12.323 N	104° 6' 40.556 W	
6,800.0	2.06	258.99	6,798.8	-86.4	-21.8	371,104.67	568,821.64	32° 1' 12.311 N	104° 6' 40.594 W	
6,900.0	1.85	265.63	6,898.8	-86.9	-25.1	371,104.20	568,818.26	32° 1' 12.307 N	104° 6' 40.633 W	
7,000.0	1.77	240.63	6,998.7	-87.8	-28.1	371,103.32	568,815.31	32° 1' 12.298 N	104° 6' 40.667 W	
7,100.0	1.81	253.24	7,098.7	-89.0	-31.0	371,102.11	568,812.45	32° 1' 12.286 N	104° 6' 40.701 W	
7,184.0	1.36	241.41	7,182.7	-89.8	-33.1	371,101.25	568,810.30	32° 1' 12.278 N	104° 6' 40.726 W	
Tie In @ 7184' MD / 7182' TVD										
7,215.0	1.30	231.50	7,213.6	-90.2	-33.7	371,100.85	568,809.71	32° 1' 12.274 N	104° 6' 40.733 W	
7,246.0	3.00	177.10	7,244.6	-91.3	-33.9	371,099.82	568,809.47	32° 1' 12.264 N	104° 6' 40.735 W	
7,278.0	6.30	173.60	7,276.5	-93.9	-33.7	371,097.24	568,809.71	32° 1' 12.238 N	104° 6' 40.733 W	
7,309.0	10.00	182.40	7,307.2	-98.2	-33.6	371,092.86	568,809.79	32° 1' 12.195 N	104° 6' 40.732 W	
7,341.0	11.80	194.70	7,338.6	-104.2	-34.6	371,086.92	568,808.84	32° 1' 12.136 N	104° 6' 40.743 W	
7,372.0	12.50	207.40	7,368.9	-110.2	-36.9	371,080.87	568,806.49	32° 1' 12.076 N	104° 6' 40.770 W	
7,404.0	13.50	214.80	7,400.1	-116.4	-40.6	371,074.73	568,802.77	32° 1' 12.015 N	104° 6' 40.814 W	
7,435.0	16.00	216.90	7,430.1	-122.8	-45.3	371,068.34	568,798.13	32° 1' 11.952 N	104° 6' 40.868 W	
7,467.0	19.20	215.60	7,460.6	-130.6	-51.0	371,060.54	568,792.42	32° 1' 11.875 N	104° 6' 40.934 W	
7,498.0	22.30	212.80	7,489.6	-139.7	-57.1	371,051.44	568,786.27	32° 1' 11.785 N	104° 6' 41.006 W	
7,530.0	25.40	208.10	7,518.8	-150.8	-63.7	371,040.28	568,779.74	32° 1' 11.675 N	104° 6' 41.082 W	
7,561.0	28.40	206.00	7,546.5	-163.3	-70.0	371,027.79	568,773.38	32° 1' 11.551 N	104° 6' 41.156 W	
7,593.0	31.00	202.40	7,574.3	-177.8	-76.5	371,013.33	568,766.90	32° 1' 11.408 N	104° 6' 41.232 W	
7,625.0	33.40	198.40	7,601.4	-193.8	-82.4	370,997.35	568,760.98	32° 1' 11.250 N	104° 6' 41.301 W	
7,635.1	34.47	197.75	7,609.7	-199.1	-84.2	370,991.99	568,759.23	32° 1' 11.197 N	104° 6' 41.321 W	
CROSSED 330' HARD LINE @ 7635' MD / 7610' TVD										
7,656.0	36.70	196.50	7,626.7	-210.7	-87.8	370,980.36	568,755.65	32° 1' 11.082 N	104° 6' 41.363 W	
7,687.0	40.50	195.20	7,651.0	-229.3	-93.0	370,961.76	568,750.38	32° 1' 10.898 N	104° 6' 41.425 W	
7,719.0	44.00	194.20	7,674.6	-250.1	-98.5	370,940.95	568,744.93	32° 1' 10.693 N	104° 6' 41.489 W	
7,750.0	47.30	192.60	7,696.3	-271.7	-103.6	370,919.39	568,739.80	32° 1' 10.479 N	104° 6' 41.549 W	
7,782.0	50.30	190.10	7,717.4	-295.3	-108.3	370,895.79	568,735.07	32° 1' 10.246 N	104° 6' 41.604 W	
7,813.0	53.60	188.40	7,736.5	-319.4	-112.2	370,871.70	568,731.16	32° 1' 10.007 N	104° 6' 41.650 W	
7,845.0	57.30	187.50	7,754.6	-345.5	-115.9	370,845.60	568,727.52	32° 1' 9.749 N	104° 6' 41.693 W	
7,877.0	61.40	186.40	7,771.0	-372.8	-119.2	370,818.28	568,724.19	32° 1' 9.479 N	104° 6' 41.733 W	
7,908.0	66.30	184.20	7,784.6	-400.5	-121.8	370,790.58	568,721.64	32° 1' 9.205 N	104° 6' 41.763 W	
7,941.0	71.40	183.10	7,796.5	-431.2	-123.7	370,759.87	568,719.68	32° 1' 8.901 N	104° 6' 41.786 W	
7,978.0	77.40	181.00	7,806.5	-466.8	-125.0	370,724.28	568,718.42	32° 1' 8.549 N	104° 6' 41.802 W	
8,009.0	80.90	181.00	7,812.3	-497.3	-125.5	370,693.84	568,717.89	32° 1' 8.248 N	104° 6' 41.809 W	
8,041.0	83.60	180.60	7,816.6	-529.0	-126.0	370,662.14	568,717.44	32° 1' 7.934 N	104° 6' 41.815 W	
8,104.0	85.70	179.90	7,822.5	-591.7	-126.2	370,599.42	568,717.17	32° 1' 7.313 N	104° 6' 41.819 W	
8,136.0	86.20	179.90	7,824.7	-623.6	-126.2	370,567.50	568,717.23	32° 1' 6.997 N	104° 6' 41.819 W	
8,167.0	87.30	179.20	7,826.5	-654.5	-125.9	370,536.55	568,717.47	32° 1' 6.691 N	104° 6' 41.817 W	
8,199.0	88.70	179.20	7,827.6	-686.5	-125.5	370,504.57	568,717.92	32° 1' 6.374 N	104° 6' 41.813 W	
8,230.0	89.70	179.20	7,828.0	-717.5	-125.1	370,473.58	568,718.35	32° 1' 6.068 N	104° 6' 41.809 W	
8,324.0	91.10	179.90	7,827.4	-811.5	-124.3	370,379.59	568,719.09	32° 1' 5.137 N	104° 6' 41.802 W	
8,419.0	90.60	179.60	7,826.0	-906.5	-123.9	370,284.60	568,719.50	32° 1' 4.197 N	104° 6' 41.800 W	
8,513.0	89.60	178.50	7,825.8	-1,000.5	-122.3	370,190.62	568,721.06	32° 1' 3.267 N	104° 6' 41.784 W	
8,608.0	90.60	179.20	7,825.7	-1,095.5	-120.4	370,095.64	568,722.97	32° 1' 2.327 N	104° 6' 41.764 W	
8,702.0	89.70	177.80	7,825.4	-1,189.4	-118.0	370,001.67	568,725.43	32° 1' 1.397 N	104° 6' 41.738 W	
8,797.0	90.80	177.80	7,825.0	-1,284.4	-114.3	369,906.74	568,729.07	32° 1' 0.458 N	104° 6' 41.698 W	
8,892.0	89.90	177.50	7,824.4	-1,379.3	-110.4	369,811.83	568,732.97	32° 0' 59.518 N	104° 6' 41.655 W	
8,987.0	90.40	177.80	7,824.2	-1,474.2	-106.5	369,716.91	568,736.87	32° 0' 58.579 N	104° 6' 41.612 W	
9,083.0	89.70	178.20	7,824.1	-1,570.1	-103.2	369,620.97	568,740.22	32° 0' 57.629 N	104° 6' 41.575 W	
9,178.0	90.80	177.80	7,823.7	-1,665.1	-99.9	369,526.03	568,743.53	32° 0' 56.690 N	104° 6' 41.539 W	
9,273.0	90.10	177.50	7,822.9	-1,760.0	-96.0	369,431.11	568,747.43	32° 0' 55.750 N	104° 6' 41.496 W	
9,368.0	90.80	177.10	7,822.2	-1,854.9	-91.5	369,336.22	568,751.90	32° 0' 54.811 N	104° 6' 41.446 W	
9,464.0	89.60	177.10	7,821.8	-1,950.8	-86.6	369,240.35	568,756.76	32° 0' 53.862 N	104° 6' 41.392 W	



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3019.0usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	Well @ 3019.0usft (Patterson #79)
Well:	Honey Graham State Com #2H	North Reference:	Grid.
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,559.0	90.10	176.80	7,822.1	-2,045.6	-81.6	369,145.48	568,761.81	32° 0' 52.923 N	104° 6' 41.335 W
9,655.0	89.90	178.20	7,822.1	-2,141.5	-77.4	369,049.57	568,766.00	32° 0' 51.974 N	104° 6' 41.289 W
9,751.0	90.60	178.20	7,821.7	-2,237.5	-74.4	368,953.62	568,769.02	32° 0' 51.024 N	104° 6' 41.256 W
9,847.0	91.50	177.80	7,819.9	-2,333.4	-71.0	368,857.70	568,772.36	32° 0' 50.075 N	104° 6' 41.220 W
9,942.0	89.90	179.20	7,818.7	-2,428.4	-68.6	368,762.74	568,774.85	32° 0' 49.135 N	104° 6' 41.193 W
10,037.0	91.00	179.60	7,818.0	-2,523.3	-67.6	368,667.75	568,775.85	32° 0' 48.195 N	104° 6' 41.184 W
10,132.0	89.70	178.90	7,817.4	-2,618.3	-66.3	368,572.77	568,777.09	32° 0' 47.255 N	104° 6' 41.172 W
10,228.0	90.80	178.90	7,817.0	-2,714.3	-64.5	368,476.79	568,778.93	32° 0' 46.305 N	104° 6' 41.153 W
10,323.0	89.20	178.50	7,817.0	-2,809.3	-62.3	368,381.81	568,781.09	32° 0' 45.365 N	104° 6' 41.130 W
10,418.0	90.40	178.50	7,817.3	-2,904.2	-59.8	368,286.85	568,783.57	32° 0' 44.425 N	104° 6' 41.103 W
10,511.0	89.60	179.90	7,817.3	-2,997.2	-58.5	368,193.86	568,784.87	32° 0' 43.505 N	104° 6' 41.090 W
10,606.0	90.40	179.60	7,817.3	-3,092.2	-58.1	368,098.86	568,785.29	32° 0' 42.565 N	104° 6' 41.088 W
10,701.0	91.30	179.90	7,815.9	-3,187.2	-57.7	368,003.88	568,785.70	32° 0' 41.625 N	104° 6' 41.085 W
10,797.0	89.70	179.20	7,815.1	-3,283.2	-56.9	367,907.89	568,786.46	32° 0' 40.675 N	104° 6' 41.079 W
10,892.0	90.80	178.90	7,814.7	-3,378.2	-55.4	367,812.90	568,788.03	32° 0' 39.734 N	104° 6' 41.063 W
10,987.0	89.40	178.50	7,814.5	-3,473.2	-53.2	367,717.93	568,790.19	32° 0' 38.795 N	104° 6' 41.040 W
11,083.0	90.60	178.50	7,814.5	-3,569.1	-50.7	367,621.96	568,792.70	32° 0' 37.845 N	104° 6' 41.013 W
11,178.0	91.80	178.50	7,812.5	-3,664.1	-48.2	367,527.02	568,795.19	32° 0' 36.905 N	104° 6' 40.986 W
11,274.0	90.40	179.20	7,810.7	-3,760.0	-46.3	367,431.06	568,797.11	32° 0' 35.955 N	104° 6' 40.966 W
11,370.0	89.00	179.20	7,811.2	-3,856.0	-45.0	367,335.07	568,798.45	32° 0' 35.005 N	104° 6' 40.953 W
11,466.0	89.90	179.20	7,812.1	-3,952.0	-43.6	367,239.09	568,799.79	32° 0' 34.055 N	104° 6' 40.940 W
11,562.0	91.00	179.20	7,811.3	-4,048.0	-42.3	367,143.10	568,801.13	32° 0' 33.105 N	104° 6' 40.927 W
11,656.0	89.90	179.90	7,810.6	-4,142.0	-41.5	367,049.11	568,801.87	32° 0' 32.175 N	104° 6' 40.920 W
11,751.0	90.60	179.20	7,810.2	-4,237.0	-40.8	366,954.11	568,802.62	32° 0' 31.235 N	104° 6' 40.914 W
11,846.0	91.50	179.20	7,808.5	-4,332.0	-39.5	366,859.14	568,803.94	32° 0' 30.295 N	104° 6' 40.901 W
11,942.0	89.60	179.60	7,807.5	-4,427.9	-38.5	366,763.15	568,804.95	32° 0' 29.345 N	104° 6' 40.891 W
12,037.0	90.30	178.50	7,807.6	-4,522.9	-36.9	366,668.17	568,806.52	32° 0' 28.405 N	104° 6' 40.875 W
12,133.0	91.00	178.90	7,806.5	-4,618.9	-34.7	366,572.20	568,808.70	32° 0' 27.455 N	104° 6' 40.852 W
12,228.0	89.00	179.60	7,806.5	-4,713.9	-33.5	366,477.21	568,809.94	32° 0' 26.515 N	104° 6' 40.840 W
12,324.0	89.60	179.90	7,807.7	-4,809.9	-33.0	366,381.22	568,810.36	32° 0' 25.565 N	104° 6' 40.838 W
12,418.0	90.60	179.60	7,807.5	-4,903.9	-32.6	366,287.23	568,810.77	32° 0' 24.635 N	104° 6' 40.835 W
12,514.0	91.70	179.60	7,805.6	-4,999.8	-32.0	366,191.25	568,811.44	32° 0' 23.685 N	104° 6' 40.829 W
12,609.0	90.40	179.60	7,803.9	-5,094.8	-31.3	366,096.27	568,812.11	32° 0' 22.745 N	104° 6' 40.824 W
12,704.0	91.50	178.90	7,802.3	-5,189.8	-30.1	366,001.29	568,813.35	32° 0' 21.805 N	104° 6' 40.812 W
12,799.0	89.70	179.20	7,801.3	-5,284.8	-28.5	365,906.31	568,814.92	32° 0' 20.865 N	104° 6' 40.796 W
12,895.0	90.40	178.50	7,801.2	-5,380.8	-26.6	365,810.33	568,816.85	32° 0' 19.915 N	104° 6' 40.776 W
12,990.0	91.50	179.20	7,799.6	-5,475.7	-24.6	365,715.37	568,818.76	32° 0' 18.975 N	104° 6' 40.756 W
13,085.0	89.90	179.60	7,798.5	-5,570.7	-23.7	365,620.38	568,819.75	32° 0' 18.035 N	104° 6' 40.747 W
13,181.0	90.40	179.60	7,798.2	-5,666.7	-23.0	365,524.39	568,820.42	32° 0' 17.085 N	104° 6' 40.741 W
13,275.0	88.90	180.30	7,798.8	-5,760.7	-22.9	365,430.39	568,820.50	32° 0' 16.155 N	104° 6' 40.742 W
13,370.0	89.40	180.60	7,800.2	-5,855.7	-23.6	365,335.41	568,819.76	32° 0' 15.215 N	104° 6' 40.753 W
13,464.0	89.90	180.60	7,800.8	-5,949.7	-24.6	365,241.41	568,818.77	32° 0' 14.285 N	104° 6' 40.767 W
13,559.0	90.60	180.30	7,800.4	-6,044.7	-25.4	365,146.42	568,818.03	32° 0' 13.345 N	104° 6' 40.778 W
13,653.0	91.30	180.60	7,798.8	-6,138.7	-26.1	365,052.43	568,817.29	32° 0' 12.415 N	104° 6' 40.789 W
13,748.0	89.20	179.60	7,798.4	-6,233.7	-26.3	364,957.44	568,817.12	32° 0' 11.474 N	104° 6' 40.793 W
13,842.0	89.90	180.30	7,799.1	-6,327.7	-26.2	364,863.45	568,817.21	32° 0' 10.544 N	104° 6' 40.794 W
13,937.0	89.40	179.60	7,799.7	-6,422.6	-26.1	364,768.45	568,817.29	32° 0' 9.604 N	104° 6' 40.796 W
14,033.0	90.30	180.30	7,800.0	-6,518.6	-26.0	364,672.45	568,817.37	32° 0' 8.654 N	104° 6' 40.797 W
14,128.0	91.00	181.00	7,798.9	-6,613.6	-27.1	364,577.46	568,816.30	32° 0' 7.714 N	104° 6' 40.812 W
14,223.0	91.10	181.40	7,797.1	-6,708.6	-29.1	364,482.50	568,814.31	32° 0' 6.774 N	104° 6' 40.837 W
14,319.0	91.80	181.40	7,794.7	-6,804.5	-31.4	364,386.56	568,811.96	32° 0' 5.825 N	104° 6' 40.867 W
14,413.0	90.40	181.00	7,792.9	-6,898.5	-33.4	364,292.60	568,809.99	32° 0' 4.895 N	104° 6' 40.892 W
14,509.0	91.10	181.70	7,791.7	-6,994.5	-35.7	364,196.64	568,807.73	32° 0' 3.945 N	104° 6' 40.920 W
14,627.0	91.10	181.70	7,789.4	-7,112.4	-39.2	364,078.71	568,804.23	32° 0' 2.778 N	104° 6' 40.964 W

TD @ 14627' MD / 7789' TVD



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #2H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 3019.0usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	Well @ 3019.0usft (Patterson #79)
Well:	Honey Graham State Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,184.0	7,182.7	-89.8	-33.1	Tie In @ 7184' MD / 7182' TVD
7,635.1	7,609.7	-199.1	-84.2	CROSSED 330' HARD LINE @ 7635' MD / 7610' TVD
14,627.0	7,789.4	-7,112.4	-39.2	TD @ 14627' MD / 7789' TVD

Checked By: _____ Approved By: _____ Date: _____