

May 12, 2016

30-025-42945

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

HOBBS CCD

NOV 09 2016

RECEIVED

Attn: Kanicia Castillo

RE: **Vast State No 004H**

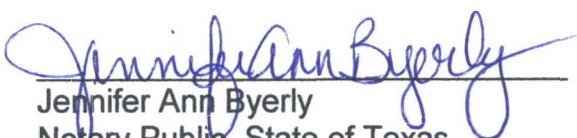
Please find enclosed a copy of the survey from 0' to 8660' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 12th day of May,
A.D., 2016, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



Company: Concho
Lease/Well: Vast State No/004H

Rig Name: Scan Freedom
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees

Latitude: 32.03671, Longitude: -103.59061
Grid North = True North -0.39 degs (NAD 27)
Grid Correction Applied = -0.39 degs



Depth Reference : RKB = 27.5 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: vast state 004h_gyro survey.ut
Minimum Curvature Method
Report Date/Time: 5/12/2016 / 10:19

VES Survey International
West Texas
(432) 563-5444

Surveyor: Gene Heiss
Vast State No 004H / API 30-025-42945

HOBBS OCD
NOV 09 2016
RECEIVED

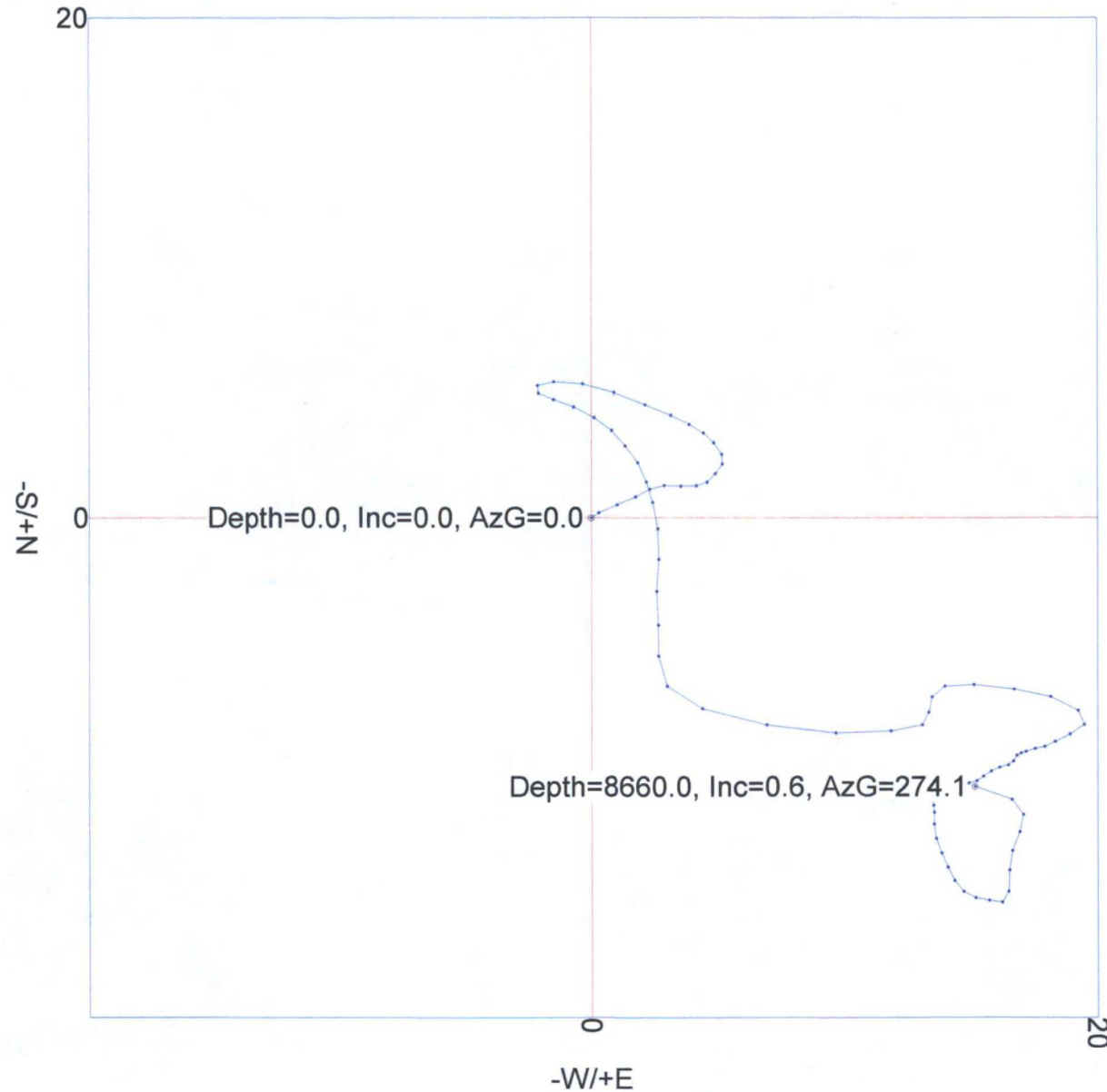
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.41	56.95	100.00	0.19	0.30	0.19	0.35	56.95	0.41
200.00	0.52	72.29	200.00	0.52	1.03	0.52	1.15	62.93	0.17
300.00	0.38	58.63	299.99	0.83	1.74	0.83	1.93	64.38	0.18
400.00	0.37	64.70	399.99	1.14	2.31	1.14	2.58	63.69	0.04
500.00	0.32	88.22	499.99	1.29	2.88	1.29	3.16	65.93	0.15
600.00	0.42	95.18	599.99	1.26	3.53	1.26	3.75	70.32	0.11
700.00	0.29	78.63	699.98	1.28	4.15	1.28	4.34	72.86	0.17
800.00	0.23	58.94	799.98	1.43	4.57	1.43	4.79	72.60	0.11
900.00	0.32	34.69	899.98	1.76	4.89	1.76	5.20	70.20	0.15
1000.00	0.23	36.91	999.98	2.15	5.17	2.15	5.60	67.41	0.09
1100.00	0.31	328.60	1099.98	2.54	5.15	2.54	5.75	63.77	0.31
1200.00	0.35	321.63	1199.98	3.00	4.83	3.00	5.69	58.12	0.06
1300.00	0.30	307.00	1299.98	3.40	4.43	3.40	5.58	52.52	0.09
1400.00	0.46	297.17	1399.98	3.74	3.87	3.74	5.38	45.98	0.17
1500.00	0.49	296.62	1499.97	4.11	3.13	4.11	5.17	37.32	0.03
1600.00	0.76	289.76	1599.97	4.53	2.13	4.53	5.00	25.18	0.28

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
1700.00	0.77	294.00	1699.96	5.02	0.89	5.02	5.10	10.07	0.06
1800.00	0.72	276.10	1799.95	5.36	-0.35	5.36	5.37	356.29	0.24
1900.00	0.58	271.76	1899.94	5.44	-1.49	5.44	5.64	344.72	0.15
2000.00	0.23	218.86	1999.94	5.30	-2.12	5.30	5.71	338.18	0.48
2100.00	0.27	133.93	2099.94	4.98	-2.08	4.98	5.40	337.34	0.34
2200.00	0.49	101.46	2199.94	4.74	-1.49	4.74	4.97	342.52	0.30
2300.00	0.49	120.17	2299.93	4.44	-0.70	4.44	4.49	351.07	0.16
2400.00	0.56	115.63	2399.93	4.01	0.12	4.01	4.01	1.66	0.08
2500.00	0.44	140.81	2499.93	3.50	0.80	3.50	3.59	12.83	0.25
2600.00	0.51	137.09	2599.92	2.88	1.34	2.88	3.18	24.97	0.08
2700.00	0.46	150.89	2699.92	2.21	1.84	2.21	2.87	39.79	0.13
2800.00	0.51	161.58	2799.91	1.44	2.17	1.44	2.60	56.48	0.10
2900.00	0.48	163.92	2899.91	0.61	2.43	0.61	2.50	75.81	0.03
3000.00	0.75	172.29	2999.91	-0.44	2.63	-0.44	2.67	99.44	0.28
3100.00	0.67	185.65	3099.90	-1.66	2.66	-1.66	3.14	122.01	0.18
3200.00	0.81	181.71	3199.89	-2.95	2.58	-2.95	3.92	138.79	0.15
3300.00	0.74	172.28	3299.88	-4.30	2.65	-4.30	5.05	148.34	0.14
3400.00	0.69	188.17	3399.87	-5.53	2.65	-5.53	6.14	154.41	0.20
3500.00	0.85	145.04	3499.86	-6.74	2.99	-6.74	7.37	156.08	0.58
3600.00	1.16	107.22	3599.85	-7.64	4.38	-7.64	8.81	150.19	0.71
3700.00	1.84	102.24	3699.82	-8.28	6.91	-8.28	10.79	140.15	0.69
3800.00	1.34	89.59	3799.78	-8.61	9.65	-8.61	12.94	131.74	0.60
3900.00	1.15	85.57	3899.75	-8.53	11.83	-8.53	14.58	125.79	0.21
4000.00	0.33	55.68	3999.74	-8.29	13.07	-8.29	15.48	122.38	0.88
4100.00	0.39	3.33	4099.74	-7.79	13.33	-7.79	15.43	120.30	0.32
4200.00	0.34	21.47	4199.74	-7.17	13.45	-7.17	15.25	118.05	0.12
4300.00	0.49	68.71	4299.74	-6.73	13.96	-6.73	15.50	115.74	0.36
4400.00	0.87	97.11	4399.73	-6.67	15.12	-6.67	16.53	113.81	0.50
4500.00	0.96	96.35	4499.72	-6.86	16.71	-6.86	18.06	112.32	0.09
4600.00	0.73	108.74	4599.71	-7.16	18.15	-7.16	19.51	111.52	0.30
4700.00	0.68	126.13	4699.70	-7.71	19.23	-7.71	20.71	111.85	0.22
4800.00	0.36	227.14	4799.70	-8.28	19.48	-8.28	21.16	113.02	0.83
4900.00	0.43	243.60	4899.69	-8.66	18.91	-8.66	20.80	114.60	0.13
5000.00	0.32	240.49	4999.69	-8.96	18.33	-8.96	20.40	116.05	0.11
5100.00	0.22	250.15	5099.69	-9.16	17.91	-9.16	20.12	117.09	0.11
5200.00	0.24	264.65	5199.69	-9.25	17.53	-9.25	19.82	117.81	0.06
5300.00	0.20	237.96	5299.69	-9.36	17.17	-9.36	19.55	118.60	0.11
5400.00	0.06	311.66	5399.69	-9.42	16.98	-9.42	19.42	119.02	0.20
5500.00	0.21	225.74	5499.69	-9.51	16.81	-9.51	19.32	119.50	0.21

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
5600.00	0.12	184.46	5599.69	-9.75	16.67	-9.75	19.31	120.31	0.14
5700.00	0.23	257.37	5699.69	-9.90	16.47	-9.90	19.21	121.00	0.23
5800.00	0.18	250.34	5799.69	-9.99	16.12	-9.99	18.97	121.79	0.06
5900.00	0.24	241.33	5899.69	-10.15	15.79	-10.15	18.77	122.73	0.07
6000.00	0.18	226.21	5999.69	-10.36	15.49	-10.36	18.64	123.76	0.09
6100.00	0.19	244.47	6099.69	-10.54	15.23	-10.54	18.52	124.67	0.06
6200.00	0.19	261.41	6199.69	-10.63	14.91	-10.63	18.32	125.48	0.06
6300.00	0.24	247.63	6299.68	-10.74	14.55	-10.74	18.08	126.42	0.07
6400.00	0.19	232.19	6399.68	-10.92	14.23	-10.92	17.93	127.51	0.08
6500.00	0.14	259.13	6499.68	-11.04	13.98	-11.04	17.81	128.31	0.09
6600.00	0.13	245.82	6599.68	-11.11	13.76	-11.11	17.69	128.92	0.03
6700.00	0.13	233.99	6699.68	-11.22	13.56	-11.22	17.61	129.61	0.03
6800.00	0.08	174.24	6799.68	-11.36	13.48	-11.36	17.63	130.12	0.11
6900.00	0.12	160.87	6899.68	-11.52	13.52	-11.52	17.76	130.44	0.05
7000.00	0.21	182.18	6999.68	-11.80	13.55	-11.80	17.97	131.07	0.11
7100.00	0.33	181.59	7099.68	-12.27	13.53	-12.27	18.27	132.21	0.12
7200.00	0.35	162.83	7199.68	-12.85	13.61	-12.85	18.72	133.36	0.11
7300.00	0.36	155.74	7299.68	-13.43	13.83	-13.43	19.28	134.16	0.04
7400.00	0.35	156.65	7399.68	-14.00	14.08	-14.00	19.86	134.83	0.01
7500.00	0.33	150.57	7499.67	-14.53	14.35	-14.53	20.42	135.37	0.04
7600.00	0.32	131.54	7599.67	-14.98	14.70	-14.98	20.99	135.53	0.11
7700.00	0.30	103.09	7699.67	-15.22	15.17	-15.22	21.49	135.10	0.16
7800.00	0.33	98.75	7799.67	-15.33	15.71	-15.33	21.95	134.28	0.04
7900.00	0.26	98.07	7899.67	-15.40	16.22	-15.40	22.37	133.52	0.07
8000.00	0.52	3.68	7999.67	-14.98	16.47	-14.98	22.26	132.28	0.60
8100.00	0.46	1.24	8099.66	-14.12	16.51	-14.12	21.72	130.53	0.06
8200.00	0.45	15.83	8199.66	-13.33	16.63	-13.33	21.31	128.73	0.12
8300.00	0.48	27.09	8299.66	-12.58	16.93	-12.58	21.09	126.62	0.10
8400.00	0.37	351.71	8399.65	-11.89	17.07	-11.89	20.80	124.85	0.28
8500.00	0.58	304.69	8499.65	-11.28	16.61	-11.28	20.08	124.18	0.42
8660.00	0.56	274.06	8659.64	-10.77	15.17	-10.77	18.60	125.37	0.19



VES Survey International
West Texas
(432) 563-5444
Surveyor: Gene Heiss
Vast State No 004H / API 30-025-42945



VES Survey Date: 5/4/2016



I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 05/04/16 through 05/04/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 8,660.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Vast State Well # 004H API # 30-026-42945 in Lea County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by VES Survey International.

A handwritten signature in blue ink, appearing to read "Gene Heiss", is written over a horizontal line.

Gene Heiss
Service Technician
VES Survey International

COG Production L L C

Lea County, NM (NAD27 NME)

Sec. 17, T 26 S. , R 33 E

Vast State 4H

Wellbore #1

Design: Final Surveys

Survey Report - Geographic

17 May, 2016

Integrity Directional Services, LLC

Survey Report - Geographic

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Vast State 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Well:	Vast State 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Multi User Db

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		Sec. 17, T 26 S. , R 33 E			
Site Position:		Northing:	377,872.30 usft	Latitude:	32° 2' 12.155 N
From:	Map	Easting:	730,181.40 usft	Longitude:	103° 35' 25.847 W
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.39 °

Well	Vast State 4H					
Well Position	+N/-S	0.00 ft	Northing:	377,871.90 usf	Latitude:	32° 2' 12.153 N
	+E/-W	0.00 ft	Easting:	730,151.50 usf	Longitude:	103° 35' 26.194 W
Position Uncertainty		5.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,263.01 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/10/2016	7.09	59.90	47,956

Design	Final Surveys				
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	359.55	

Survey Program	Date 5/17/2016				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
142.00	8,660.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard	
8,747.00	13,893.00	MWD (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	377,871.90	730,151.50	32° 2' 12.153 N	103° 35' 26.194 W	
142.00	0.50	45.70	142.00	0.43	0.44	377,872.33	730,151.94	32° 2' 12.157 N	103° 35' 26.189 W	
256.00	0.40	66.20	256.00	0.94	1.16	377,872.84	730,152.66	32° 2' 12.162 N	103° 35' 26.181 W	
373.00	0.60	67.50	372.99	1.34	2.10	377,873.24	730,153.60	32° 2' 12.166 N	103° 35' 26.170 W	
493.00	0.60	77.50	492.98	1.72	3.30	377,873.61	730,154.79	32° 2' 12.169 N	103° 35' 26.156 W	
554.00	0.60	92.60	553.98	1.77	3.93	377,873.67	730,155.42	32° 2' 12.170 N	103° 35' 26.148 W	
645.00	0.60	74.30	644.98	1.88	4.86	377,873.78	730,156.36	32° 2' 12.171 N	103° 35' 26.138 W	
735.00	0.40	103.40	734.97	1.93	5.62	377,873.83	730,157.12	32° 2' 12.171 N	103° 35' 26.129 W	
781.00	0.40	88.30	780.97	1.90	5.94	377,873.80	730,157.43	32° 2' 12.171 N	103° 35' 26.125 W	
922.00	0.30	30.60	921.97	2.23	6.62	377,874.13	730,158.11	32° 2' 12.174 N	103° 35' 26.117 W	
1,101.00	0.30	330.00	1,100.97	3.04	6.62	377,874.94	730,158.12	32° 2' 12.182 N	103° 35' 26.117 W	

Integrity Directional Services, LLC

Survey Report - Geographic

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Vast State 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Well:	Vast State 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,282.00	0.40	291.10	1,281.97	3.68	5.80	377,875.58	730,157.29	32° 2' 12.189 N	103° 35' 26.127 W
1,463.00	0.50	278.00	1,462.96	4.02	4.42	377,875.92	730,155.92	32° 2' 12.192 N	103° 35' 26.142 W
1,646.00	0.70	288.70	1,645.95	4.49	2.58	377,876.39	730,154.07	32° 2' 12.197 N	103° 35' 26.164 W
1,828.00	1.00	288.10	1,827.93	5.34	0.01	377,877.24	730,151.51	32° 2' 12.205 N	103° 35' 26.194 W
2,009.00	0.20	222.30	2,008.92	5.59	-1.70	377,877.49	730,149.79	32° 2' 12.208 N	103° 35' 26.214 W
2,189.00	0.60	101.40	2,188.92	5.18	-0.99	377,877.07	730,150.51	32° 2' 12.204 N	103° 35' 26.205 W
2,373.00	0.50	116.70	2,372.91	4.62	0.67	377,876.52	730,152.17	32° 2' 12.198 N	103° 35' 26.186 W
2,560.01	0.40	141.30	2,559.91	3.75	1.81	377,875.65	730,153.31	32° 2' 12.190 N	103° 35' 26.173 W
2,747.01	0.40	153.70	2,746.90	2.65	2.51	377,874.55	730,154.00	32° 2' 12.179 N	103° 35' 26.165 W
2,935.01	0.60	167.10	2,934.89	1.11	3.02	377,873.00	730,154.51	32° 2' 12.163 N	103° 35' 26.159 W
3,122.01	0.70	179.90	3,121.88	-0.99	3.24	377,870.91	730,154.73	32° 2' 12.143 N	103° 35' 26.157 W
3,309.01	0.80	187.10	3,308.87	-3.43	3.08	377,868.47	730,154.58	32° 2' 12.119 N	103° 35' 26.159 W
3,496.01	0.80	127.50	3,495.85	-5.52	3.95	377,866.38	730,155.45	32° 2' 12.098 N	103° 35' 26.149 W
3,683.01	1.80	99.40	3,682.80	-6.79	7.89	377,865.10	730,159.38	32° 2' 12.085 N	103° 35' 26.103 W
3,869.01	1.20	83.90	3,868.74	-7.06	12.71	377,864.83	730,164.20	32° 2' 12.082 N	103° 35' 26.047 W
4,056.01	0.40	351.40	4,055.73	-6.21	14.55	377,865.69	730,166.05	32° 2' 12.090 N	103° 35' 26.026 W
4,243.01	0.50	63.20	4,242.72	-5.20	15.19	377,866.70	730,166.68	32° 2' 12.100 N	103° 35' 26.018 W
4,431.01	1.10	93.10	4,430.70	-4.92	17.72	377,866.97	730,169.22	32° 2' 12.103 N	103° 35' 25.989 W
4,619.01	0.90	120.90	4,618.68	-5.78	20.79	377,866.12	730,172.28	32° 2' 12.094 N	103° 35' 25.953 W
4,807.01	0.40	238.00	4,806.67	-6.89	21.50	377,865.01	730,173.00	32° 2' 12.083 N	103° 35' 25.945 W
4,913.01	0.40	257.00	4,912.67	-7.17	20.82	377,864.73	730,172.32	32° 2' 12.080 N	103° 35' 25.953 W
5,007.01	0.30	260.00	5,006.67	-7.28	20.26	377,864.62	730,171.76	32° 2' 12.079 N	103° 35' 25.959 W
5,101.01	0.30	268.50	5,100.66	-7.33	19.77	377,864.57	730,171.27	32° 2' 12.079 N	103° 35' 25.965 W
5,194.01	0.40	240.30	5,193.66	-7.50	19.25	377,864.40	730,170.74	32° 2' 12.077 N	103° 35' 25.971 W
5,287.01	0.10	232.00	5,286.66	-7.71	18.90	377,864.19	730,170.40	32° 2' 12.075 N	103° 35' 25.975 W
5,381.01	0.10	313.30	5,380.66	-7.70	18.78	377,864.19	730,170.27	32° 2' 12.075 N	103° 35' 25.977 W
5,475.01	0.20	216.70	5,474.66	-7.78	18.62	377,864.12	730,170.12	32° 2' 12.074 N	103° 35' 25.979 W
5,568.01	0.10	222.40	5,567.66	-7.97	18.47	377,863.93	730,169.97	32° 2' 12.073 N	103° 35' 25.980 W
5,662.01	0.30	217.50	5,661.66	-8.22	18.26	377,863.67	730,169.76	32° 2' 12.070 N	103° 35' 25.983 W
5,755.01	0.20	227.70	5,754.66	-8.53	18.00	377,863.37	730,169.49	32° 2' 12.067 N	103° 35' 25.986 W
5,849.01	0.20	199.20	5,848.66	-8.79	17.82	377,863.11	730,169.32	32° 2' 12.064 N	103° 35' 25.988 W
5,942.01	0.20	222.50	5,941.66	-9.07	17.66	377,862.83	730,169.15	32° 2' 12.062 N	103° 35' 25.990 W
6,036.01	0.30	250.20	6,035.66	-9.27	17.31	377,862.63	730,168.81	32° 2' 12.060 N	103° 35' 25.994 W
6,129.01	0.10	239.60	6,128.66	-9.39	17.02	377,862.50	730,168.51	32° 2' 12.059 N	103° 35' 25.997 W
6,222.01	0.30	263.10	6,221.66	-9.46	16.70	377,862.43	730,168.20	32° 2' 12.058 N	103° 35' 26.001 W
6,316.01	0.10	260.10	6,315.66	-9.51	16.38	377,862.39	730,167.88	32° 2' 12.057 N	103° 35' 26.005 W
6,409.01	0.30	232.10	6,408.66	-9.67	16.11	377,862.23	730,167.60	32° 2' 12.056 N	103° 35' 26.008 W
6,503.01	0.00	207.30	6,502.66	-9.82	15.91	377,862.08	730,167.41	32° 2' 12.054 N	103° 35' 26.010 W
6,596.01	0.10	215.50	6,595.66	-9.89	15.87	377,862.01	730,167.36	32° 2' 12.054 N	103° 35' 26.011 W
6,689.01	0.20	283.90	6,688.66	-9.92	15.66	377,861.98	730,167.16	32° 2' 12.054 N	103° 35' 26.013 W
6,783.01	0.00	106.60	6,782.66	-9.88	15.50	377,862.02	730,167.00	32° 2' 12.054 N	103° 35' 26.015 W
6,876.01	0.20	116.90	6,875.66	-9.95	15.65	377,861.95	730,167.14	32° 2' 12.053 N	103° 35' 26.013 W
6,970.01	0.20	180.90	6,969.66	-10.19	15.79	377,861.71	730,167.29	32° 2' 12.051 N	103° 35' 26.012 W
7,064.01	0.30	159.90	7,063.66	-10.58	15.87	377,861.32	730,167.37	32° 2' 12.047 N	103° 35' 26.011 W
7,157.01	0.30	156.50	7,156.66	-11.03	16.05	377,860.86	730,167.55	32° 2' 12.042 N	103° 35' 26.009 W
7,251.01	0.30	154.60	7,250.65	-11.48	16.26	377,860.42	730,167.75	32° 2' 12.038 N	103° 35' 26.006 W
7,345.01	0.40	174.10	7,344.65	-12.03	16.40	377,859.87	730,167.89	32° 2' 12.033 N	103° 35' 26.005 W
7,440.02	0.40	152.90	7,439.65	-12.66	16.58	377,859.24	730,168.08	32° 2' 12.026 N	103° 35' 26.003 W
7,533.02	0.20	182.70	7,532.65	-13.11	16.72	377,858.79	730,168.22	32° 2' 12.022 N	103° 35' 26.001 W
7,627.02	0.10	143.40	7,626.65	-13.34	16.76	377,858.56	730,168.26	32° 2' 12.020 N	103° 35' 26.001 W
7,721.02	0.30	106.50	7,720.65	-13.47	17.05	377,858.43	730,168.54	32° 2' 12.018 N	103° 35' 25.997 W
7,816.00	0.40	127.70	7,815.63	-13.75	17.55	377,858.15	730,169.04	32° 2' 12.015 N	103° 35' 25.991 W
7,910.00	0.50	353.90	7,909.63	-13.54	17.76	377,858.36	730,169.26	32° 2' 12.017 N	103° 35' 25.989 W
8,004.00	0.40	352.50	8,003.63	-12.81	17.68	377,859.09	730,169.17	32° 2' 12.025 N	103° 35' 25.990 W
8,098.00	0.40	18.70	8,097.63	-12.17	17.74	377,859.73	730,169.24	32° 2' 12.031 N	103° 35' 25.989 W

Integrity Directional Services, LLC

Survey Report - Geographic

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Vast State 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Well:	Vast State 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,191.00	0.40	8.70	8,190.62	-11.54	17.89	377,860.36	730,169.39	32° 2' 12.037 N	103° 35' 25.987 W
8,285.00	0.40	32.10	8,284.62	-10.94	18.12	377,860.96	730,169.61	32° 2' 12.043 N	103° 35' 25.985 W
8,379.00	0.60	318.60	8,378.62	-10.29	17.97	377,861.61	730,169.46	32° 2' 12.050 N	103° 35' 25.986 W
8,473.00	0.60	300.20	8,472.61	-9.68	17.22	377,862.22	730,168.71	32° 2' 12.056 N	103° 35' 25.995 W
8,566.00	0.40	287.00	8,565.61	-9.34	16.48	377,862.56	730,167.98	32° 2' 12.059 N	103° 35' 26.003 W
8,660.00	0.30	269.60	8,659.61	-9.24	15.92	377,862.66	730,167.42	32° 2' 12.060 N	103° 35' 26.010 W
8,747.00	0.50	321.30	8,746.61	-8.95	15.46	377,862.95	730,166.96	32° 2' 12.063 N	103° 35' 26.015 W
First MWD @ 8747' MD/TVD									
8,779.00	4.00	7.70	8,778.58	-7.73	15.52	377,864.17	730,167.02	32° 2' 12.075 N	103° 35' 26.015 W
8,810.00	8.40	12.00	8,809.39	-4.44	16.14	377,867.46	730,167.63	32° 2' 12.108 N	103° 35' 26.007 W
8,841.00	11.30	12.10	8,839.93	0.74	17.24	377,872.64	730,168.74	32° 2' 12.159 N	103° 35' 25.994 W
8,872.00	14.30	9.60	8,870.15	7.49	18.52	377,879.39	730,170.02	32° 2' 12.226 N	103° 35' 25.978 W
8,919.00	18.00	5.50	8,915.29	20.44	20.18	377,892.34	730,171.68	32° 2' 12.354 N	103° 35' 25.958 W
8,966.00	24.00	3.20	8,959.15	37.23	21.42	377,909.13	730,172.91	32° 2' 12.520 N	103° 35' 25.942 W
9,013.00	30.00	0.40	9,001.01	58.55	22.03	377,930.44	730,173.53	32° 2' 12.731 N	103° 35' 25.934 W
9,059.00	33.70	1.30	9,040.08	82.81	22.40	377,954.71	730,173.90	32° 2' 12.971 N	103° 35' 25.927 W
9,106.00	36.80	3.60	9,078.46	109.90	23.58	377,981.80	730,175.08	32° 2' 13.239 N	103° 35' 25.911 W
9,152.00	40.90	3.20	9,114.28	138.70	25.29	378,010.60	730,176.78	32° 2' 13.524 N	103° 35' 25.889 W
9,199.00	46.90	3.10	9,148.13	171.23	27.08	378,043.13	730,178.57	32° 2' 13.845 N	103° 35' 25.866 W
9,245.00	52.10	2.70	9,177.99	206.15	28.84	378,078.05	730,180.34	32° 2' 14.191 N	103° 35' 25.843 W
9,292.00	57.80	1.50	9,204.97	244.59	30.24	378,116.48	730,181.73	32° 2' 14.571 N	103° 35' 25.823 W
9,338.00	63.50	1.50	9,227.51	284.65	31.29	378,156.55	730,182.78	32° 2' 14.967 N	103° 35' 25.808 W
9,385.00	66.90	2.30	9,247.22	327.29	32.70	378,199.18	730,184.20	32° 2' 15.389 N	103° 35' 25.788 W
9,432.00	73.70	0.20	9,263.06	371.50	33.65	378,243.39	730,185.15	32° 2' 15.827 N	103° 35' 25.774 W
9,479.00	80.30	357.10	9,273.63	417.25	32.56	378,289.14	730,184.05	32° 2' 16.279 N	103° 35' 25.783 W
9,526.00	85.90	357.20	9,279.27	463.83	30.24	378,335.73	730,181.73	32° 2' 16.741 N	103° 35' 25.806 W
9,559.00	89.10	357.50	9,280.71	496.76	28.71	378,368.66	730,180.21	32° 2' 17.067 N	103° 35' 25.821 W
9,652.00	92.40	357.90	9,279.49	589.66	24.98	378,461.56	730,176.48	32° 2' 17.986 N	103° 35' 25.857 W
9,745.00	89.70	357.40	9,277.79	682.56	21.17	378,554.46	730,172.67	32° 2' 18.906 N	103° 35' 25.894 W
9,839.00	90.40	358.00	9,277.71	776.48	17.40	378,648.38	730,168.89	32° 2' 19.835 N	103° 35' 25.930 W
9,932.00	90.80	358.00	9,276.73	869.42	14.15	378,741.32	730,165.65	32° 2' 20.755 N	103° 35' 25.960 W
10,026.00	91.30	357.90	9,275.01	963.35	10.79	378,835.24	730,162.29	32° 2' 21.685 N	103° 35' 25.992 W
10,119.00	91.40	357.90	9,272.82	1,056.26	7.38	378,928.15	730,158.88	32° 2' 22.605 N	103° 35' 26.024 W
10,213.00	91.60	357.60	9,270.36	1,150.15	3.69	379,022.05	730,155.19	32° 2' 23.534 N	103° 35' 26.059 W
10,307.00	92.20	357.50	9,267.24	1,244.01	-0.32	379,115.91	730,151.17	32° 2' 24.463 N	103° 35' 26.099 W
10,400.00	92.20	357.10	9,263.67	1,336.84	-4.70	379,208.74	730,146.80	32° 2' 25.382 N	103° 35' 26.142 W
10,495.00	94.10	357.50	9,258.45	1,431.59	-9.17	379,303.48	730,142.33	32° 2' 26.320 N	103° 35' 26.186 W
10,588.00	91.80	359.20	9,253.66	1,524.42	-11.84	379,396.31	730,139.66	32° 2' 27.239 N	103° 35' 26.210 W
10,683.00	93.40	359.50	9,249.36	1,619.31	-12.92	379,491.21	730,138.58	32° 2' 28.178 N	103° 35' 26.215 W
10,778.00	91.30	359.50	9,245.46	1,714.22	-13.75	379,586.12	730,137.75	32° 2' 29.117 N	103° 35' 26.217 W
10,872.00	92.50	359.60	9,242.34	1,808.17	-14.48	379,680.06	730,137.01	32° 2' 30.047 N	103° 35' 26.218 W
10,967.00	90.30	359.40	9,240.02	1,903.13	-15.31	379,775.02	730,136.18	32° 2' 30.987 N	103° 35' 26.220 W
11,061.00	90.20	358.40	9,239.61	1,997.11	-17.12	379,869.00	730,134.38	32° 2' 31.917 N	103° 35' 26.234 W
11,155.00	91.30	358.60	9,238.38	2,091.07	-19.58	379,962.96	730,131.92	32° 2' 32.847 N	103° 35' 26.255 W
11,250.00	92.70	359.00	9,235.07	2,185.99	-21.57	380,057.88	730,129.93	32° 2' 33.786 N	103° 35' 26.270 W
11,345.00	91.20	359.90	9,231.83	2,280.92	-22.48	380,152.82	730,129.02	32° 2' 34.726 N	103° 35' 26.273 W
11,440.00	92.50	0.30	9,228.77	2,375.87	-22.31	380,247.76	730,129.19	32° 2' 35.665 N	103° 35' 26.264 W
11,534.00	90.70	0.20	9,226.14	2,469.83	-21.90	380,341.72	730,129.60	32° 2' 36.595 N	103° 35' 26.251 W
11,627.00	92.20	0.50	9,223.79	2,562.79	-21.33	380,434.69	730,130.16	32° 2' 37.515 N	103° 35' 26.237 W
11,721.00	93.70	1.10	9,218.95	2,656.66	-20.02	380,528.55	730,131.47	32° 2' 38.444 N	103° 35' 26.215 W
11,814.00	92.10	359.50	9,214.25	2,749.53	-19.54	380,621.42	730,131.96	32° 2' 39.363 N	103° 35' 26.202 W
11,907.00	91.90	359.20	9,211.00	2,842.47	-20.59	380,714.36	730,130.90	32° 2' 40.283 N	103° 35' 26.206 W
12,001.00	93.10	359.60	9,206.90	2,936.37	-21.58	380,808.26	730,129.92	32° 2' 41.212 N	103° 35' 26.210 W
12,094.00	91.50	359.00	9,203.17	3,029.29	-22.71	380,901.18	730,128.79	32° 2' 42.132 N	103° 35' 26.216 W
12,188.00	89.80	358.00	9,202.10	3,123.24	-25.17	380,995.14	730,126.32	32° 2' 43.061 N	103° 35' 26.237 W

Integrity Directional Services, LLC

Survey Report - Geographic

Company:	COG Production L L C	Local Co-ordinate Reference:	Well Vast State 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=26' @ 3289.01ft (Scandril Freedom)
Well:	Vast State 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,282.00	91.40	358.10	9,201.12	3,217.18	-28.37	381,089.07	730,123.13	32° 2' 43.991 N	103° 35' 26.267 W
12,376.00	92.70	359.20	9,197.76	3,311.09	-30.58	381,182.98	730,120.91	32° 2' 44.921 N	103° 35' 26.285 W
12,469.00	93.80	359.00	9,192.48	3,403.93	-32.04	381,275.82	730,119.45	32° 2' 45.840 N	103° 35' 26.294 W
12,563.00	92.80	359.50	9,187.07	3,497.76	-33.27	381,369.65	730,118.23	32° 2' 46.768 N	103° 35' 26.301 W
12,657.00	90.50	359.50	9,184.37	3,591.71	-34.09	381,463.61	730,117.41	32° 2' 47.698 N	103° 35' 26.303 W
12,751.00	88.50	359.00	9,185.19	3,685.70	-35.32	381,557.59	730,116.18	32° 2' 48.628 N	103° 35' 26.310 W
12,844.00	89.20	359.30	9,187.05	3,778.67	-36.70	381,650.56	730,114.80	32° 2' 49.548 N	103° 35' 26.319 W
12,938.00	89.80	359.70	9,187.87	3,872.66	-37.52	381,744.55	730,113.98	32° 2' 50.478 N	103° 35' 26.321 W
13,032.03	90.00	359.40	9,188.04	3,966.68	-38.26	381,838.57	730,113.24	32° 2' 51.409 N	103° 35' 26.322 W
13,125.03	90.70	0.10	9,187.47	4,059.68	-38.66	381,931.57	730,112.83	32° 2' 52.329 N	103° 35' 26.319 W
13,219.03	91.80	3.00	9,185.42	4,153.61	-36.12	382,025.50	730,115.37	32° 2' 53.259 N	103° 35' 26.282 W
13,313.03	91.30	359.60	9,182.87	4,247.54	-33.99	382,119.43	730,117.50	32° 2' 54.188 N	103° 35' 26.250 W
13,407.00	92.20	0.10	9,180.00	4,341.47	-34.24	382,213.36	730,117.26	32° 2' 55.117 N	103° 35' 26.245 W
13,500.00	92.90	0.50	9,175.87	4,434.37	-33.75	382,306.26	730,117.75	32° 2' 56.037 N	103° 35' 26.232 W
13,593.00	92.60	359.90	9,171.41	4,527.26	-33.43	382,399.15	730,118.07	32° 2' 56.956 N	103° 35' 26.221 W
13,687.00	92.20	0.00	9,167.47	4,621.18	-33.51	382,493.07	730,117.99	32° 2' 57.885 N	103° 35' 26.214 W
13,781.00	93.30	1.00	9,162.96	4,715.07	-32.69	382,586.96	730,118.81	32° 2' 58.814 N	103° 35' 26.197 W
13,838.00	94.00	1.10	9,159.33	4,771.94	-31.65	382,643.83	730,119.85	32° 2' 59.377 N	103° 35' 26.181 W
Last MWD @ 13838' MD / 9159' TVD									
13,893.00	94.00	1.10	9,155.49	4,826.80	-30.59	382,698.69	730,120.90	32° 2' 59.920 N	103° 35' 26.164 W
Projection to TD @ 13893' MD / 9156' TVD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
8,747.00	8,746.61	-8.95	15.46	First MWD @ 8747' MD/TVD
13,838.00	9,159.33	4,771.94	-31.65	Last MWD @ 13838' MD / 9159' TVD
13,893.00	9,155.49	4,826.80	-30.59	Projection to TD @ 13893' MD / 9156' TVD

Checked By: _____	Approved By: _____	Date: _____
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