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COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 18, T 20 S. , R 32 E

Blue Jay Federal Com #2H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

09 February, 2017





Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Blue Jay Federal Com #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Site:	Sec. 18, T 20 S. , R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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. 18, T 20 S. , R 32 E				
Site Position:		Northing:	570,786.2000 usft	Latitude:	32° 33' 58.920 N
From:	Map	Easting:	759,910.8000 usft	Longitude:	103° 29' 22.859 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.45 °

Well	Blue Jay Federal Com #2H					
Well Position	+N/-S	0.00 ft	Northing:	570,786.2000 usft	Latitude:	32° 33' 58.920 N
	+E/-W	0.00 ft	Easting:	759,910.8000 usft	Longitude:	103° 29' 22.859 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,685.00 ft	

Wellbore	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/25/2017	6.98	60.40	48,189

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	3.45	

Survey Program	Date 2/9/2017				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	10,875.00	Gyras (Wellbore #1)	Gyro	Gyro Survey	
10,951.00	16,178.00	IDS MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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	570,786.2000	759,910.8000	32° 33' 58.920 N	103° 29' 22.859 W
25.00	0.31	270.18	25.00	0.00	-0.07	570,786.2002	759,910.7324	32° 33' 58.920 N	103° 29' 22.860 W
50.00	0.25	296.82	50.00	0.03	-0.18	570,786.2251	759,910.6161	32° 33' 58.921 N	103° 29' 22.861 W
75.00	0.34	324.62	75.00	0.11	-0.28	570,786.3101	759,910.5244	32° 33' 58.921 N	103° 29' 22.862 W
100.00	0.62	301.51	100.00	0.24	-0.43	570,786.4413	759,910.3662	32° 33' 58.923 N	103° 29' 22.864 W
125.00	0.57	294.23	125.00	0.36	-0.66	570,786.5630	759,910.1375	32° 33' 58.924 N	103° 29' 22.867 W
150.00	0.56	309.06	150.00	0.49	-0.87	570,786.6911	759,909.9292	32° 33' 58.925 N	103° 29' 22.869 W
175.00	0.59	309.82	174.99	0.65	-1.06	570,786.8505	759,909.7355	32° 33' 58.927 N	103° 29' 22.871 W
200.00	0.55	307.12	199.99	0.81	-1.26	570,787.0053	759,909.5409	32° 33' 58.928 N	103° 29' 22.874 W
225.00	0.62	288.72	224.99	0.92	-1.48	570,787.1211	759,909.3172	32° 33' 58.930 N	103° 29' 22.876 W
250.00	0.61	285.94	249.99	1.00	-1.74	570,787.2011	759,909.0611	32° 33' 58.930 N	103° 29' 22.879 W



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Site:	Sec. 18, T 20 S. , R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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	
275.00	0.57	300.31	274.99	1.10	-1.97	570,787.3004	759,908.8258	32° 33' 58.931 N	103° 29' 22.882 W	
300.00	0.37	298.68	299.99	1.20	-2.15	570,787.4019	759,908.6476	32° 33' 58.932 N	103° 29' 22.884 W	
325.00	0.35	288.03	324.99	1.26	-2.30	570,787.4643	759,908.5042	32° 33' 58.933 N	103° 29' 22.886 W	
350.00	0.33	274.76	349.99	1.29	-2.44	570,787.4939	759,908.3598	32° 33' 58.933 N	103° 29' 22.887 W	
375.00	0.38	295.76	374.99	1.34	-2.59	570,787.5359	759,908.2134	32° 33' 58.934 N	103° 29' 22.889 W	
400.00	0.34	284.39	399.99	1.39	-2.73	570,787.5903	759,908.0669	32° 33' 58.934 N	103° 29' 22.891 W	
425.00	0.33	304.79	424.99	1.45	-2.86	570,787.6499	759,907.9359	32° 33' 58.935 N	103° 29' 22.892 W	
450.00	0.38	324.70	449.99	1.56	-2.97	570,787.7586	759,907.8289	32° 33' 58.936 N	103° 29' 22.893 W	
475.00	0.42	340.49	474.99	1.71	-3.05	570,787.9126	759,907.7504	32° 33' 58.938 N	103° 29' 22.894 W	
500.00	0.53	337.39	499.98	1.91	-3.12	570,788.1057	759,907.6753	32° 33' 58.939 N	103° 29' 22.895 W	
525.00	0.46	344.03	524.98	2.11	-3.20	570,788.3089	759,907.6033	32° 33' 58.941 N	103° 29' 22.896 W	
550.00	0.31	354.24	549.98	2.27	-3.23	570,788.4727	759,907.5689	32° 33' 58.943 N	103° 29' 22.896 W	
575.00	0.42	342.86	574.98	2.43	-3.26	570,788.6276	759,907.5351	32° 33' 58.945 N	103° 29' 22.897 W	
600.00	0.47	342.53	599.98	2.61	-3.32	570,788.8129	759,907.4773	32° 33' 58.946 N	103° 29' 22.897 W	
625.00	0.49	340.29	624.98	2.81	-3.39	570,789.0114	759,907.4105	32° 33' 58.948 N	103° 29' 22.898 W	
650.00	0.51	330.40	649.98	3.01	-3.48	570,789.2089	759,907.3194	32° 33' 58.950 N	103° 29' 22.899 W	
675.00	0.42	339.40	674.98	3.19	-3.57	570,789.3913	759,907.2323	32° 33' 58.952 N	103° 29' 22.900 W	
700.00	0.50	332.00	699.98	3.37	-3.65	570,789.5734	759,907.1488	32° 33' 58.954 N	103° 29' 22.901 W	
725.00	0.58	330.46	724.98	3.58	-3.76	570,789.7798	759,907.0352	32° 33' 58.956 N	103° 29' 22.903 W	
750.00	0.49	334.97	749.98	3.79	-3.87	570,789.9867	759,906.9276	32° 33' 58.958 N	103° 29' 22.904 W	
775.00	0.57	321.23	774.97	3.98	-4.00	570,790.1805	759,906.8045	32° 33' 58.960 N	103° 29' 22.905 W	
800.00	0.50	340.12	799.97	4.18	-4.11	570,790.3800	759,906.6895	32° 33' 58.962 N	103° 29' 22.907 W	
825.00	0.52	318.69	824.97	4.37	-4.22	570,790.5678	759,906.5775	32° 33' 58.964 N	103° 29' 22.908 W	
850.00	0.58	322.77	849.97	4.55	-4.37	570,790.7538	759,906.4261	32° 33' 58.966 N	103° 29' 22.910 W	
875.00	0.57	316.11	874.97	4.74	-4.54	570,790.9442	759,906.2633	32° 33' 58.968 N	103° 29' 22.911 W	
900.00	0.53	307.29	899.97	4.90	-4.71	570,791.1038	759,906.0851	32° 33' 58.969 N	103° 29' 22.914 W	
925.00	0.53	290.39	924.97	5.01	-4.92	570,791.2142	759,905.8848	32° 33' 58.970 N	103° 29' 22.916 W	
950.00	0.53	301.72	949.97	5.12	-5.12	570,791.3153	759,905.6780	32° 33' 58.971 N	103° 29' 22.918 W	
975.00	0.60	306.07	974.97	5.25	-5.33	570,791.4531	759,905.4739	32° 33' 58.973 N	103° 29' 22.921 W	
1,000.00	0.55	303.67	999.96	5.40	-5.53	570,791.5967	759,905.2682	32° 33' 58.974 N	103° 29' 22.923 W	
1,025.00	0.51	304.62	1,024.96	5.53	-5.72	570,791.7264	759,905.0768	32° 33' 58.975 N	103° 29' 22.925 W	
1,050.00	0.58	314.08	1,049.96	5.68	-5.91	570,791.8777	759,904.8943	32° 33' 58.977 N	103° 29' 22.927 W	
1,075.00	0.60	323.68	1,074.96	5.87	-6.07	570,792.0712	759,904.7259	32° 33' 58.979 N	103° 29' 22.929 W	
1,100.00	0.62	328.91	1,099.96	6.09	-6.22	570,792.2925	759,904.5785	32° 33' 58.981 N	103° 29' 22.931 W	
1,125.00	0.55	332.43	1,124.96	6.31	-6.35	570,792.5147	759,904.4531	32° 33' 58.983 N	103° 29' 22.932 W	
1,150.00	0.54	340.55	1,149.96	6.53	-6.44	570,792.7321	759,904.3584	32° 33' 58.985 N	103° 29' 22.934 W	
1,175.00	0.54	330.07	1,174.96	6.75	-6.54	570,792.9453	759,904.2604	32° 33' 58.988 N	103° 29' 22.935 W	
1,200.00	0.55	350.82	1,199.95	6.97	-6.62	570,793.1658	759,904.1824	32° 33' 58.990 N	103° 29' 22.936 W	
1,225.00	0.60	332.32	1,224.95	7.20	-6.70	570,793.4002	759,904.1025	32° 33' 58.992 N	103° 29' 22.936 W	
1,250.00	0.43	350.77	1,249.95	7.41	-6.77	570,793.6087	759,904.0266	32° 33' 58.994 N	103° 29' 22.937 W	
1,275.00	0.31	341.65	1,274.95	7.57	-6.81	570,793.7655	759,903.9903	32° 33' 58.996 N	103° 29' 22.938 W	
1,300.00	0.52	333.15	1,299.95	7.73	-6.88	570,793.9309	759,903.9178	32° 33' 58.997 N	103° 29' 22.939 W	
1,325.00	0.54	321.76	1,324.95	7.92	-7.01	570,794.1247	759,903.7936	32° 33' 58.999 N	103° 29' 22.940 W	
1,350.00	0.56	319.24	1,349.95	8.11	-7.16	570,794.3097	759,903.6409	32° 33' 59.001 N	103° 29' 22.942 W	
1,375.00	0.58	316.67	1,374.95	8.29	-7.33	570,794.4943	759,903.4743	32° 33' 59.003 N	103° 29' 22.944 W	
1,400.00	0.54	308.49	1,399.95	8.46	-7.50	570,794.6597	759,903.2953	32° 33' 59.005 N	103° 29' 22.946 W	
1,425.00	0.63	292.20	1,424.95	8.58	-7.72	570,794.7849	759,903.0758	32° 33' 59.006 N	103° 29' 22.948 W	
1,450.00	0.61	306.92	1,449.94	8.72	-7.96	570,794.9168	759,902.8422	32° 33' 59.007 N	103° 29' 22.951 W	
1,475.00	0.73	306.00	1,474.94	8.89	-8.19	570,795.0903	759,902.6070	32° 33' 59.009 N	103° 29' 22.954 W	
1,500.00	0.65	324.96	1,499.94	9.10	-8.40	570,795.3001	759,902.3967	32° 33' 59.011 N	103° 29' 22.956 W	
1,525.00	0.66	325.33	1,524.94	9.33	-8.57	570,795.5346	759,902.2334	32° 33' 59.013 N	103° 29' 22.958 W	
1,550.00	0.68	315.69	1,549.94	9.56	-8.75	570,795.7592	759,902.0479	32° 33' 59.016 N	103° 29' 22.960 W	
1,575.00	0.57	311.26	1,574.94	9.75	-8.95	570,795.9473	759,901.8507	32° 33' 59.017 N	103° 29' 22.963 W	
1,600.00	0.63	320.98	1,599.93	9.94	-9.13	570,796.1361	759,901.6707	32° 33' 59.019 N	103° 29' 22.965 W	
1,625.00	0.54	328.31	1,624.93	10.14	-9.28	570,796.3431	759,901.5223	32° 33' 59.021 N	103° 29' 22.966 W	



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Site:	Sec. 18, T 20 S., R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
1,650.00	0.54	337.13	1,649.93	10.35	-9.39	570,796.5519	759,901.4146	32° 33' 59.024 N	103° 29' 22.968 W
1,675.00	0.55	353.84	1,674.93	10.58	-9.44	570,796.7798	759,901.3560	32° 33' 59.026 N	103° 29' 22.968 W
1,700.00	0.53	339.74	1,699.93	10.81	-9.50	570,797.0075	759,901.3031	32° 33' 59.028 N	103° 29' 22.969 W
1,725.00	0.58	341.58	1,724.93	11.04	-9.58	570,797.2361	759,901.2230	32° 33' 59.030 N	103° 29' 22.970 W
1,750.00	0.57	337.30	1,749.93	11.27	-9.66	570,797.4708	759,901.1351	32° 33' 59.033 N	103° 29' 22.971 W
1,775.00	0.63	319.02	1,774.93	11.49	-9.80	570,797.6893	759,900.9970	32° 33' 59.035 N	103° 29' 22.972 W
1,800.00	0.39	307.57	1,799.93	11.64	-9.96	570,797.8449	759,900.8394	32° 33' 59.036 N	103° 29' 22.974 W
1,825.00	0.62	310.14	1,824.92	11.78	-10.13	570,797.9840	759,900.6685	32° 33' 59.038 N	103° 29' 22.976 W
1,850.00	0.69	306.16	1,849.92	11.96	-10.36	570,798.1600	759,900.4436	32° 33' 59.040 N	103° 29' 22.979 W
1,875.00	0.34	300.38	1,874.92	12.09	-10.54	570,798.2864	759,900.2581	32° 33' 59.041 N	103° 29' 22.981 W
1,900.00	0.73	303.50	1,899.92	12.21	-10.74	570,798.4118	759,900.0613	32° 33' 59.042 N	103° 29' 22.983 W
1,925.00	0.69	308.66	1,924.92	12.39	-10.99	570,798.5937	759,899.8109	32° 33' 59.044 N	103° 29' 22.986 W
1,950.00	0.77	307.37	1,949.92	12.59	-11.24	570,798.7897	759,899.5599	32° 33' 59.046 N	103° 29' 22.989 W
1,975.00	0.66	312.32	1,974.91	12.79	-11.48	570,798.9886	759,899.3199	32° 33' 59.048 N	103° 29' 22.992 W
2,000.00	0.53	327.19	1,999.91	12.98	-11.65	570,799.1827	759,899.1508	32° 33' 59.050 N	103° 29' 22.994 W
2,025.00	0.66	339.67	2,024.91	13.21	-11.76	570,799.4149	759,899.0381	32° 33' 59.052 N	103° 29' 22.995 W
2,050.00	0.64	326.47	2,049.91	13.47	-11.89	570,799.6663	759,898.9110	32° 33' 59.055 N	103° 29' 22.997 W
2,075.00	0.69	311.55	2,074.91	13.68	-12.08	570,799.8826	759,898.7212	32° 33' 59.057 N	103° 29' 22.999 W
2,100.00	0.62	318.60	2,099.91	13.88	-12.28	570,800.0839	759,898.5191	32° 33' 59.059 N	103° 29' 23.001 W
2,125.00	0.56	326.55	2,124.91	14.09	-12.44	570,800.2873	759,898.3623	32° 33' 59.061 N	103° 29' 23.003 W
2,150.00	0.58	326.68	2,149.90	14.29	-12.57	570,800.4949	759,898.2255	32° 33' 59.063 N	103° 29' 23.004 W
2,175.00	0.63	334.73	2,174.90	14.52	-12.70	570,800.7250	759,898.0973	32° 33' 59.065 N	103° 29' 23.006 W
2,200.00	0.79	326.20	2,199.90	14.79	-12.86	570,800.9925	759,897.9427	32° 33' 59.068 N	103° 29' 23.008 W
2,225.00	0.65	311.98	2,224.90	15.03	-13.06	570,801.2305	759,897.7414	32° 33' 59.070 N	103° 29' 23.010 W
2,250.00	0.59	316.92	2,249.90	15.22	-13.25	570,801.4194	759,897.5481	32° 33' 59.072 N	103° 29' 23.012 W
2,275.00	0.66	302.86	2,274.90	15.39	-13.46	570,801.5915	759,897.3393	32° 33' 59.074 N	103° 29' 23.015 W
2,300.00	0.74	303.97	2,299.89	15.56	-13.72	570,801.7599	759,897.0844	32° 33' 59.075 N	103° 29' 23.018 W
2,325.00	0.72	316.46	2,324.89	15.76	-13.96	570,801.9639	759,896.8423	32° 33' 59.077 N	103° 29' 23.021 W
2,350.00	0.42	317.27	2,349.89	15.95	-14.13	570,802.1451	759,896.6720	32° 33' 59.079 N	103° 29' 23.022 W
2,375.00	0.70	332.75	2,374.89	16.15	-14.26	570,802.3482	759,896.5399	32° 33' 59.081 N	103° 29' 23.024 W
2,400.00	0.75	325.21	2,399.89	16.42	-14.42	570,802.6183	759,896.3766	32° 33' 59.084 N	103° 29' 23.026 W
2,425.00	0.54	330.96	2,424.89	16.66	-14.57	570,802.8557	759,896.2260	32° 33' 59.086 N	103° 29' 23.028 W
2,450.00	0.78	332.26	2,449.88	16.91	-14.71	570,803.1093	759,896.0896	32° 33' 59.089 N	103° 29' 23.029 W
2,475.00	0.73	326.40	2,474.88	17.19	-14.88	570,803.3925	759,895.9223	32° 33' 59.092 N	103° 29' 23.031 W
2,500.00	0.73	331.23	2,499.88	17.46	-15.04	570,803.6648	759,895.7575	32° 33' 59.094 N	103° 29' 23.033 W
2,525.00	0.71	318.30	2,524.88	17.72	-15.22	570,803.9200	759,895.5778	32° 33' 59.097 N	103° 29' 23.035 W
2,550.00	0.81	334.84	2,549.88	18.00	-15.40	570,804.1956	759,895.3997	32° 33' 59.100 N	103° 29' 23.037 W
2,575.00	0.80	324.74	2,574.87	18.30	-15.58	570,804.4981	759,895.2238	32° 33' 59.103 N	103° 29' 23.039 W
2,600.00	0.66	319.65	2,599.87	18.55	-15.77	570,804.7503	759,895.0298	32° 33' 59.105 N	103° 29' 23.041 W
2,625.00	0.75	338.42	2,624.87	18.81	-15.92	570,805.0122	759,894.8764	32° 33' 59.108 N	103° 29' 23.043 W
2,650.00	0.78	334.07	2,649.87	19.12	-16.06	570,805.3174	759,894.7418	32° 33' 59.111 N	103° 29' 23.045 W
2,675.00	0.80	331.89	2,674.87	19.42	-16.21	570,805.6244	759,894.5852	32° 33' 59.114 N	103° 29' 23.047 W
2,700.00	0.85	353.35	2,699.86	19.76	-16.32	570,805.9625	759,894.4815	32° 33' 59.117 N	103° 29' 23.048 W
2,725.00	0.66	332.55	2,724.86	20.07	-16.41	570,806.2745	759,894.3936	32° 33' 59.120 N	103° 29' 23.049 W
2,750.00	0.79	338.22	2,749.86	20.36	-16.54	570,806.5623	759,894.2633	32° 33' 59.123 N	103° 29' 23.050 W
2,775.00	0.80	342.96	2,774.86	20.69	-16.65	570,806.8892	759,894.1482	32° 33' 59.126 N	103° 29' 23.052 W
2,800.00	0.92	336.06	2,799.85	21.04	-16.78	570,807.2395	759,894.0156	32° 33' 59.130 N	103° 29' 23.053 W
2,825.00	0.88	322.76	2,824.85	21.38	-16.98	570,807.5758	759,893.8180	32° 33' 59.133 N	103° 29' 23.055 W
2,850.00	0.77	322.67	2,849.85	21.66	-17.20	570,807.8622	759,893.6000	32° 33' 59.136 N	103° 29' 23.058 W
2,875.00	0.82	334.66	2,874.85	21.96	-17.38	570,808.1574	759,893.4215	32° 33' 59.139 N	103° 29' 23.060 W
2,900.00	0.85	355.38	2,899.84	22.30	-17.47	570,808.5039	759,893.3300	32° 33' 59.142 N	103° 29' 23.061 W
2,925.00	0.94	345.43	2,924.84	22.69	-17.54	570,808.8872	759,893.2635	32° 33' 59.146 N	103° 29' 23.062 W
2,950.00	0.88	342.94	2,949.84	23.07	-17.64	570,809.2692	759,893.1556	32° 33' 59.150 N	103° 29' 23.063 W
2,975.00	0.73	1.10	2,974.83	23.41	-17.70	570,809.6120	759,893.1023	32° 33' 59.153 N	103° 29' 23.064 W
3,000.00	0.95	353.95	2,999.83	23.78	-17.72	570,809.9773	759,893.0836	32° 33' 59.157 N	103° 29' 23.064 W



Integrity Directional Services, LLC

Survey Report - Geographic



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 18, T 20 S., R 32 E
Well: Blue Jay Federal Com #2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Blue Jay Federal Com #2H
TVD Reference: KB=26' @ 3711.00ft (Patriot 2)
MD Reference: KB=26' @ 3711.00ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
3,025.00	1.06	6.20	3,024.83	24.21	-17.71	570,810.4133	759,893.0867	32° 33' 59.161 N	103° 29' 23.064 W
3,050.00	1.11	0.75	3,049.82	24.69	-17.69	570,810.8853	759,893.1148	32° 33' 59.166 N	103° 29' 23.063 W
3,075.00	1.02	8.92	3,074.82	25.15	-17.65	570,811.3473	759,893.1525	32° 33' 59.171 N	103° 29' 23.063 W
3,100.00	1.01	13.53	3,099.81	25.58	-17.56	570,811.7813	759,893.2386	32° 33' 59.175 N	103° 29' 23.062 W
3,125.00	1.14	19.01	3,124.81	26.03	-17.43	570,812.2307	759,893.3711	32° 33' 59.179 N	103° 29' 23.060 W
3,150.00	0.74	17.92	3,149.81	26.42	-17.30	570,812.6194	759,893.5018	32° 33' 59.183 N	103° 29' 23.059 W
3,175.00	1.11	10.63	3,174.80	26.81	-17.20	570,813.0110	759,893.5961	32° 33' 59.187 N	103° 29' 23.057 W
3,200.00	1.11	13.78	3,199.80	27.28	-17.10	570,813.4842	759,893.6985	32° 33' 59.192 N	103° 29' 23.056 W
3,225.00	1.15	22.33	3,224.79	27.75	-16.95	570,813.9514	759,893.8515	32° 33' 59.196 N	103° 29' 23.054 W
3,250.00	1.30	29.36	3,249.79	28.23	-16.71	570,814.4306	759,894.0858	32° 33' 59.201 N	103° 29' 23.052 W
3,275.00	1.40	31.94	3,274.78	28.74	-16.41	570,814.9370	759,894.3865	32° 33' 59.206 N	103° 29' 23.048 W
3,300.00	1.42	30.34	3,299.77	29.26	-16.10	570,815.4635	759,894.7045	32° 33' 59.211 N	103° 29' 23.044 W
3,325.00	1.44	34.61	3,324.77	29.79	-15.76	570,815.9894	759,895.0394	32° 33' 59.216 N	103° 29' 23.040 W
3,350.00	1.40	33.34	3,349.76	30.30	-15.41	570,816.5030	759,895.3857	32° 33' 59.221 N	103° 29' 23.036 W
3,375.00	1.41	31.94	3,374.75	30.82	-15.08	570,817.0192	759,895.7162	32° 33' 59.226 N	103° 29' 23.032 W
3,400.00	1.47	36.28	3,399.74	31.34	-14.73	570,817.5387	759,896.0687	32° 33' 59.232 N	103° 29' 23.028 W
3,425.00	1.15	27.37	3,424.74	31.82	-14.43	570,818.0200	759,896.3738	32° 33' 59.236 N	103° 29' 23.025 W
3,450.00	1.35	15.45	3,449.73	32.33	-14.23	570,818.5266	759,896.5676	32° 33' 59.241 N	103° 29' 23.022 W
3,475.00	1.12	28.92	3,474.72	32.82	-14.04	570,819.0244	759,896.7642	32° 33' 59.246 N	103° 29' 23.020 W
3,500.00	1.12	30.54	3,499.72	33.25	-13.79	570,819.4487	759,897.0065	32° 33' 59.250 N	103° 29' 23.017 W
3,525.00	1.17	26.71	3,524.72	33.69	-13.55	570,819.8871	759,897.2454	32° 33' 59.255 N	103° 29' 23.014 W
3,550.00	1.00	14.63	3,549.71	34.13	-13.38	570,820.3262	759,897.4152	32° 33' 59.259 N	103° 29' 23.012 W
3,575.00	0.92	14.06	3,574.71	34.53	-13.28	570,820.7320	759,897.5190	32° 33' 59.263 N	103° 29' 23.011 W
3,600.00	1.02	20.24	3,599.70	34.94	-13.16	570,821.1354	759,897.6448	32° 33' 59.267 N	103° 29' 23.009 W
3,625.00	0.89	359.41	3,624.70	35.34	-13.08	570,821.5383	759,897.7198	32° 33' 59.271 N	103° 29' 23.008 W
3,650.00	1.17	9.38	3,649.70	35.78	-13.04	570,821.9843	759,897.7594	32° 33' 59.275 N	103° 29' 23.008 W
3,675.00	0.97	10.45	3,674.69	36.24	-12.96	570,822.4442	759,897.8393	32° 33' 59.280 N	103° 29' 23.007 W
3,700.00	0.93	12.52	3,699.69	36.65	-12.88	570,822.8504	759,897.9217	32° 33' 59.284 N	103° 29' 23.006 W
3,725.00	1.11	8.50	3,724.68	37.09	-12.80	570,823.2880	759,898.0015	32° 33' 59.288 N	103° 29' 23.005 W
3,750.00	1.08	16.69	3,749.68	37.55	-12.70	570,823.7531	759,898.1049	32° 33' 59.293 N	103° 29' 23.004 W
3,775.00	1.21	21.85	3,774.67	38.02	-12.53	570,824.2238	759,898.2708	32° 33' 59.298 N	103° 29' 23.002 W
3,800.00	0.92	11.95	3,799.67	38.47	-12.39	570,824.6652	759,898.4106	32° 33' 59.302 N	103° 29' 23.000 W
3,825.00	0.94	13.15	3,824.67	38.86	-12.30	570,825.0612	759,898.4989	32° 33' 59.306 N	103° 29' 22.999 W
3,850.00	0.83	29.90	3,849.66	39.22	-12.16	570,825.4179	759,898.6358	32° 33' 59.309 N	103° 29' 22.997 W
3,875.00	1.00	16.05	3,874.66	39.58	-12.01	570,825.7845	759,898.7863	32° 33' 59.313 N	103° 29' 22.996 W
3,900.00	1.08	9.30	3,899.66	40.03	-11.92	570,826.2266	759,898.8847	32° 33' 59.317 N	103° 29' 22.994 W
3,925.00	1.09	9.02	3,924.65	40.49	-11.84	570,826.6940	759,898.9601	32° 33' 59.322 N	103° 29' 22.993 W
3,950.00	0.72	12.16	3,949.65	40.88	-11.77	570,827.0824	759,899.0305	32° 33' 59.326 N	103° 29' 22.993 W
3,975.00	0.76	8.17	3,974.65	41.20	-11.71	570,827.4001	759,899.0871	32° 33' 59.329 N	103° 29' 22.992 W
4,000.00	0.95	1.60	3,999.64	41.57	-11.68	570,827.7714	759,899.1165	32° 33' 59.333 N	103° 29' 22.992 W
4,025.00	0.67	5.15	4,024.64	41.92	-11.66	570,828.1241	759,899.1354	32° 33' 59.336 N	103° 29' 22.991 W
4,050.00	0.92	14.12	4,049.64	42.26	-11.60	570,828.4643	759,899.1974	32° 33' 59.339 N	103° 29' 22.991 W
4,075.00	0.74	29.02	4,074.64	42.60	-11.48	570,828.8001	759,899.3247	32° 33' 59.343 N	103° 29' 22.989 W
4,100.00	0.74	30.98	4,099.63	42.88	-11.31	570,829.0797	759,899.4861	32° 33' 59.346 N	103° 29' 22.987 W
4,125.00	0.94	27.62	4,124.63	43.20	-11.14	570,829.3998	759,899.6643	32° 33' 59.349 N	103° 29' 22.985 W
4,150.00	1.02	15.24	4,149.63	43.60	-10.98	570,829.7962	759,899.8179	32° 33' 59.353 N	103° 29' 22.983 W
4,175.00	0.98	18.72	4,174.62	44.01	-10.86	570,830.2134	759,899.9450	32° 33' 59.357 N	103° 29' 22.982 W
4,200.00	1.02	21.59	4,199.62	44.42	-10.70	570,830.6228	759,900.0955	32° 33' 59.361 N	103° 29' 22.980 W
4,225.00	1.04	26.00	4,224.62	44.83	-10.52	570,831.0336	759,900.2768	32° 33' 59.365 N	103° 29' 22.978 W
4,250.00	1.18	36.49	4,249.61	45.24	-10.27	570,831.4445	759,900.5293	32° 33' 59.369 N	103° 29' 22.975 W
4,275.00	1.05	53.53	4,274.61	45.59	-9.93	570,831.7876	759,900.8666	32° 33' 59.372 N	103° 29' 22.971 W
4,300.00	0.99	54.44	4,299.60	45.85	-9.57	570,832.0493	759,901.2265	32° 33' 59.375 N	103° 29' 22.967 W
4,325.00	0.98	38.58	4,324.60	46.14	-9.26	570,832.3421	759,901.5355	32° 33' 59.378 N	103° 29' 22.963 W
4,350.00	1.06	59.76	4,349.60	46.43	-8.93	570,832.6256	759,901.8686	32° 33' 59.380 N	103° 29' 22.959 W
4,375.00	0.81	63.29	4,374.59	46.62	-8.57	570,832.8215	759,902.2263	32° 33' 59.382 N	103° 29' 22.955 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Blue Jay Federal Corn #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Site:	Sec. 18, T 20 S., R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Corn #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
4,400.00	1.18	71.12	4,399.59	46.78	-8.17	570,832.9843	759,902.6277	32° 33' 59.384 N	103° 29' 22.950 W
4,425.00	1.13	71.42	4,424.58	46.95	-7.70	570,833.1461	759,903.1049	32° 33' 59.385 N	103° 29' 22.944 W
4,450.00	1.13	57.57	4,449.58	47.16	-7.25	570,833.3568	759,903.5467	32° 33' 59.388 N	103° 29' 22.939 W
4,475.00	1.17	71.36	4,474.57	47.37	-6.80	570,833.5706	759,903.9966	32° 33' 59.390 N	103° 29' 22.934 W
4,500.00	1.20	57.04	4,499.57	47.59	-6.34	570,833.7946	759,904.4581	32° 33' 59.392 N	103° 29' 22.929 W
4,525.00	1.20	66.84	4,524.56	47.84	-5.88	570,834.0400	759,904.9184	32° 33' 59.394 N	103° 29' 22.923 W
4,550.00	0.96	70.69	4,549.56	48.01	-5.44	570,834.2122	759,905.3567	32° 33' 59.396 N	103° 29' 22.918 W
4,575.00	1.40	71.75	4,574.55	48.18	-4.96	570,834.3771	759,905.8444	32° 33' 59.397 N	103° 29' 22.912 W
4,600.00	1.54	69.05	4,599.55	48.39	-4.35	570,834.5929	759,906.4482	32° 33' 59.400 N	103° 29' 22.905 W
4,625.00	1.64	53.29	4,624.54	48.73	-3.75	570,834.9268	759,907.0487	32° 33' 59.403 N	103° 29' 22.898 W
4,650.00	1.46	60.42	4,649.53	49.10	-3.19	570,835.2979	759,907.6125	32° 33' 59.406 N	103° 29' 22.892 W
4,675.00	1.70	63.39	4,674.52	49.42	-2.58	570,835.6212	759,908.2210	32° 33' 59.410 N	103° 29' 22.884 W
4,700.00	1.86	59.54	4,699.51	49.79	-1.90	570,835.9930	759,908.9023	32° 33' 59.413 N	103° 29' 22.876 W
4,725.00	1.94	62.97	4,724.49	50.19	-1.17	570,836.3910	759,909.6289	32° 33' 59.417 N	103° 29' 22.868 W
4,750.00	1.80	61.20	4,749.48	50.57	-0.45	570,836.7724	759,910.3499	32° 33' 59.421 N	103° 29' 22.859 W
4,775.00	1.90	63.00	4,774.46	50.95	0.26	570,837.1497	759,911.0633	32° 33' 59.424 N	103° 29' 22.851 W
4,800.00	1.63	63.38	4,799.45	51.30	0.95	570,837.4972	759,911.7504	32° 33' 59.428 N	103° 29' 22.843 W
4,825.00	1.50	64.57	4,824.44	51.60	1.56	570,837.7970	759,912.3638	32° 33' 59.431 N	103° 29' 22.836 W
4,850.00	1.57	72.29	4,849.43	51.84	2.19	570,838.0417	759,912.9856	32° 33' 59.433 N	103° 29' 22.829 W
4,875.00	1.54	65.22	4,874.43	52.09	2.82	570,838.2867	759,913.6168	32° 33' 59.436 N	103° 29' 22.821 W
4,900.00	1.36	62.17	4,899.42	52.37	3.38	570,838.5660	759,914.1842	32° 33' 59.438 N	103° 29' 22.814 W
4,925.00	1.05	67.75	4,924.41	52.59	3.86	570,838.7912	759,914.6585	32° 33' 59.440 N	103° 29' 22.809 W
4,950.00	1.32	50.80	4,949.41	52.86	4.29	570,839.0600	759,915.0937	32° 33' 59.443 N	103° 29' 22.804 W
4,975.00	1.42	69.69	4,974.40	53.15	4.81	570,839.3495	759,915.6074	32° 33' 59.446 N	103° 29' 22.798 W
5,000.00	1.13	65.36	4,999.39	53.36	5.32	570,839.5598	759,916.1219	32° 33' 59.448 N	103° 29' 22.792 W
5,025.00	1.23	76.09	5,024.39	53.53	5.81	570,839.7270	759,916.6064	32° 33' 59.450 N	103° 29' 22.786 W
5,050.00	1.29	78.18	5,049.38	53.65	6.34	570,839.8492	759,917.1423	32° 33' 59.451 N	103° 29' 22.780 W
5,075.00	1.29	85.15	5,074.38	53.73	6.90	570,839.9306	759,917.6982	32° 33' 59.451 N	103° 29' 22.773 W
5,100.00	1.35	79.32	5,099.37	53.81	7.47	570,840.0090	759,918.2680	32° 33' 59.452 N	103° 29' 22.767 W
5,125.00	1.13	63.69	5,124.36	53.97	7.98	570,840.1728	759,918.7784	32° 33' 59.454 N	103° 29' 22.761 W
5,150.00	1.09	88.23	5,149.36	54.09	8.44	570,840.2894	759,919.2370	32° 33' 59.455 N	103° 29' 22.755 W
5,175.00	1.15	97.52	5,174.35	54.06	8.92	570,840.2640	759,919.7234	32° 33' 59.455 N	103° 29' 22.750 W
5,200.00	1.06	95.15	5,199.35	54.01	9.40	570,840.2104	759,920.2024	32° 33' 59.454 N	103° 29' 22.744 W
5,225.00	1.06	101.11	5,224.35	53.95	9.86	570,840.1451	759,920.6596	32° 33' 59.453 N	103° 29' 22.739 W
5,250.00	0.87	99.97	5,249.34	53.87	10.27	570,840.0676	759,921.0735	32° 33' 59.453 N	103° 29' 22.734 W
5,275.00	0.76	90.66	5,274.34	53.83	10.63	570,840.0329	759,921.4262	32° 33' 59.452 N	103° 29' 22.730 W
5,300.00	0.78	84.17	5,299.34	53.85	10.96	570,840.0482	759,921.7613	32° 33' 59.452 N	103° 29' 22.726 W
5,325.00	0.77	85.09	5,324.33	53.88	11.30	570,840.0799	759,922.0979	32° 33' 59.453 N	103° 29' 22.722 W
5,350.00	0.76	90.36	5,349.33	53.89	11.63	570,840.0932	759,922.4311	32° 33' 59.453 N	103° 29' 22.718 W
5,375.00	0.76	103.15	5,374.33	53.85	11.96	570,840.0545	759,922.7583	32° 33' 59.452 N	103° 29' 22.714 W
5,400.00	0.49	117.86	5,399.33	53.77	12.21	570,839.9668	759,923.0143	32° 33' 59.451 N	103° 29' 22.711 W
5,425.00	0.58	120.48	5,424.33	53.65	12.42	570,839.8527	759,923.2179	32° 33' 59.450 N	103° 29' 22.709 W
5,450.00	0.32	139.74	5,449.33	53.54	12.57	570,839.7352	759,923.3720	32° 33' 59.449 N	103° 29' 22.707 W
5,475.00	0.70	129.82	5,474.33	53.38	12.73	570,839.5841	759,923.5344	32° 33' 59.448 N	103° 29' 22.705 W
5,500.00	0.28	114.53	5,499.32	53.26	12.91	570,839.4610	759,923.7073	32° 33' 59.446 N	103° 29' 22.703 W
5,525.00	0.45	135.23	5,524.32	53.17	13.03	570,839.3659	759,923.8320	32° 33' 59.445 N	103° 29' 22.702 W
5,550.00	0.46	127.41	5,549.32	53.04	13.18	570,839.2353	759,923.9809	32° 33' 59.444 N	103° 29' 22.700 W
5,575.00	0.63	131.20	5,574.32	52.88	13.36	570,839.0838	759,924.1640	32° 33' 59.443 N	103° 29' 22.698 W
5,600.00	0.71	116.05	5,599.32	52.73	13.61	570,838.9252	759,924.4066	32° 33' 59.441 N	103° 29' 22.695 W
5,625.00	0.25	95.33	5,624.32	52.65	13.80	570,838.8521	759,924.6000	32° 33' 59.440 N	103° 29' 22.693 W
5,650.00	0.43	91.36	5,649.32	52.64	13.95	570,838.8448	759,924.7481	32° 33' 59.440 N	103° 29' 22.691 W
5,675.00	0.14	103.32	5,674.32	52.64	14.07	570,838.8356	759,924.8716	32° 33' 59.440 N	103° 29' 22.690 W
5,700.00	0.47	148.39	5,699.32	52.54	14.16	570,838.7412	759,924.9551	32° 33' 59.439 N	103° 29' 22.689 W
5,725.00	0.51	131.59	5,724.32	52.38	14.29	570,838.5800	759,925.0920	32° 33' 59.438 N	103° 29' 22.687 W
5,750.00	0.24	89.71	5,749.32	52.31	14.43	570,838.5064	759,925.2276	32° 33' 59.437 N	103° 29' 22.685 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Blue Jay Federal Com #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Site:	Sec. 18, T 20 S., R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
5,775.00	0.51	135.49	5,774.32	52.23	14.56	570,838.4273	759,925.3580	32° 33' 59.436 N	103° 29' 22.684 W
5,800.00	0.47	151.41	5,799.32	52.06	14.69	570,838.2580	759,925.4850	32° 33' 59.434 N	103° 29' 22.682 W
5,825.00	0.44	140.11	5,824.32	51.89	14.80	570,838.0943	759,925.5957	32° 33' 59.433 N	103° 29' 22.681 W
5,850.00	0.48	102.65	5,849.31	51.80	14.96	570,837.9977	759,925.7594	32° 33' 59.432 N	103° 29' 22.679 W
5,875.00	0.42	159.86	5,874.31	51.69	15.09	570,837.8887	759,925.8931	32° 33' 59.431 N	103° 29' 22.678 W
5,900.00	0.50	146.60	5,899.31	51.51	15.18	570,837.7116	759,925.9847	32° 33' 59.429 N	103° 29' 22.677 W
5,925.00	0.41	149.49	5,924.31	51.34	15.29	570,837.5435	759,926.0902	32° 33' 59.427 N	103° 29' 22.675 W
5,950.00	0.70	116.75	5,949.31	51.20	15.47	570,837.3977	759,926.2720	32° 33' 59.426 N	103° 29' 22.673 W
5,975.00	0.67	103.31	5,974.31	51.10	15.75	570,837.2953	759,926.5506	32° 33' 59.425 N	103° 29' 22.670 W
6,000.00	0.43	105.72	5,999.31	51.04	15.98	570,837.2363	759,926.7831	32° 33' 59.424 N	103° 29' 22.667 W
6,025.00	0.61	109.98	6,024.31	50.97	16.20	570,837.1654	759,926.9985	32° 33' 59.423 N	103° 29' 22.665 W
6,050.00	0.62	107.21	6,049.31	50.88	16.45	570,837.0799	759,927.2528	32° 33' 59.423 N	103° 29' 22.662 W
6,075.00	0.61	103.53	6,074.30	50.81	16.71	570,837.0087	759,927.5114	32° 33' 59.422 N	103° 29' 22.659 W
6,100.00	0.63	99.90	6,099.30	50.75	16.98	570,836.9540	759,927.7761	32° 33' 59.421 N	103° 29' 22.656 W
6,125.00	0.45	110.17	6,124.30	50.70	17.20	570,836.8965	759,928.0037	32° 33' 59.421 N	103° 29' 22.653 W
6,150.00	0.71	131.08	6,149.30	50.56	17.41	570,836.7608	759,928.2126	32° 33' 59.419 N	103° 29' 22.651 W
6,175.00	0.57	105.59	6,174.30	50.43	17.65	570,836.6256	759,928.4491	32° 33' 59.418 N	103° 29' 22.648 W
6,200.00	0.62	107.01	6,199.30	50.35	17.90	570,836.5527	759,928.6983	32° 33' 59.417 N	103° 29' 22.645 W
6,225.00	0.73	121.72	6,224.30	50.23	18.16	570,836.4294	759,928.9631	32° 33' 59.416 N	103° 29' 22.642 W
6,250.00	0.64	129.62	6,249.29	50.06	18.41	570,836.2566	759,929.2061	32° 33' 59.414 N	103° 29' 22.639 W
6,275.00	0.72	156.21	6,274.29	49.82	18.58	570,836.0238	759,929.3770	32° 33' 59.412 N	103° 29' 22.637 W
6,300.00	0.70	143.30	6,299.29	49.56	18.73	570,835.7576	759,929.5316	32° 33' 59.409 N	103° 29' 22.635 W
6,325.00	0.83	121.10	6,324.29	49.34	18.98	570,835.5417	759,929.7779	32° 33' 59.407 N	103° 29' 22.633 W
6,350.00	0.61	113.96	6,349.29	49.19	19.25	570,835.3941	759,930.0546	32° 33' 59.406 N	103° 29' 22.629 W
6,375.00	0.57	92.79	6,374.28	49.13	19.50	570,835.3340	759,930.3004	32° 33' 59.405 N	103° 29' 22.626 W
6,400.00	0.51	111.19	6,399.28	49.09	19.73	570,835.2877	759,930.5284	32° 33' 59.405 N	103° 29' 22.624 W
6,425.00	0.79	113.46	6,424.28	48.98	19.99	570,835.1789	759,930.7902	32° 33' 59.403 N	103° 29' 22.621 W
6,450.00	0.76	125.71	6,449.28	48.81	20.28	570,835.0135	759,931.0829	32° 33' 59.402 N	103° 29' 22.617 W
6,475.00	0.80	127.29	6,474.28	48.61	20.56	570,834.8110	759,931.3564	32° 33' 59.400 N	103° 29' 22.614 W
6,500.00	0.57	106.60	6,499.28	48.47	20.81	570,834.6697	759,931.6144	32° 33' 59.398 N	103° 29' 22.611 W
6,525.00	0.44	132.16	6,524.27	48.37	21.00	570,834.5698	759,931.8047	32° 33' 59.397 N	103° 29' 22.609 W
6,550.00	0.81	125.80	6,549.27	48.20	21.22	570,834.4020	759,932.0192	32° 33' 59.396 N	103° 29' 22.606 W
6,575.00	0.81	137.21	6,574.27	47.97	21.48	570,834.1689	759,932.2826	32° 33' 59.393 N	103° 29' 22.603 W
6,600.00	0.81	125.26	6,599.27	47.74	21.75	570,833.9373	759,932.5469	32° 33' 59.391 N	103° 29' 22.600 W
6,625.00	0.82	132.91	6,624.27	47.51	22.02	570,833.7134	759,932.8222	32° 33' 59.389 N	103° 29' 22.597 W
6,650.00	0.85	126.09	6,649.26	47.28	22.30	570,833.4824	759,933.1031	32° 33' 59.386 N	103° 29' 22.594 W
6,675.00	0.92	118.08	6,674.26	47.08	22.63	570,833.2787	759,933.4300	32° 33' 59.384 N	103° 29' 22.590 W
6,700.00	0.53	125.60	6,699.26	46.92	22.90	570,833.1169	759,933.7011	32° 33' 59.383 N	103° 29' 22.587 W
6,725.00	0.75	131.48	6,724.26	46.74	23.12	570,832.9413	759,933.9177	32° 33' 59.381 N	103° 29' 22.584 W
6,750.00	0.81	110.46	6,749.25	46.57	23.41	570,832.7711	759,934.2059	32° 33' 59.379 N	103° 29' 22.581 W
6,775.00	0.75	116.09	6,774.25	46.44	23.72	570,832.6374	759,934.5184	32° 33' 59.378 N	103° 29' 22.577 W
6,800.00	1.02	120.79	6,799.25	46.25	24.06	570,832.4515	759,934.8565	32° 33' 59.376 N	103° 29' 22.574 W
6,825.00	1.03	124.77	6,824.24	46.01	24.43	570,832.2095	759,935.2322	32° 33' 59.374 N	103° 29' 22.569 W
6,850.00	0.84	132.01	6,849.24	45.76	24.75	570,831.9587	759,935.5530	32° 33' 59.371 N	103° 29' 22.565 W
6,875.00	0.80	118.09	6,874.24	45.55	25.04	570,831.7539	759,935.8431	32° 33' 59.369 N	103° 29' 22.562 W
6,900.00	0.80	123.57	6,899.24	45.38	25.34	570,831.5752	759,936.1425	32° 33' 59.367 N	103° 29' 22.559 W
6,925.00	1.05	131.83	6,924.23	45.13	25.66	570,831.3259	759,936.4586	32° 33' 59.365 N	103° 29' 22.555 W
6,950.00	0.95	138.31	6,949.23	44.82	25.97	570,831.0184	759,936.7671	32° 33' 59.362 N	103° 29' 22.551 W
6,975.00	0.86	149.33	6,974.23	44.50	26.20	570,830.7022	759,937.0006	32° 33' 59.359 N	103° 29' 22.549 W
7,000.00	0.91	139.54	6,999.22	44.19	26.43	570,830.3898	759,937.2252	32° 33' 59.356 N	103° 29' 22.546 W
7,025.00	0.96	135.43	7,024.22	43.89	26.70	570,830.0896	759,937.5010	32° 33' 59.353 N	103° 29' 22.543 W
7,050.00	0.98	140.90	7,049.22	43.57	26.98	570,829.7745	759,937.7828	32° 33' 59.349 N	103° 29' 22.540 W
7,075.00	0.94	138.02	7,074.21	43.26	27.25	570,829.4561	759,938.0548	32° 33' 59.346 N	103° 29' 22.536 W
7,100.00	0.83	140.45	7,099.21	42.96	27.51	570,829.1641	759,938.3072	32° 33' 59.343 N	103° 29' 22.534 W
7,125.00	0.98	144.32	7,124.21	42.65	27.75	570,828.8508	759,938.5472	32° 33' 59.340 N	103° 29' 22.531 W



Integrity Directional Services, LLC

Survey Report - Geographic



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 18, T 20 S., R 32 E
Well: Blue Jay Federal Com #2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Blue Jay Federal Com #2H
TVD Reference: KB=26' @ 3711.00ft (Patriot 2)
MD Reference: KB=26' @ 3711.00ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
7,150.00	0.94	146.92	7,149.20	42.31	27.98	570,828.5053	759,938.7838	32° 33' 59.337 N	103° 29' 22.528 W
7,175.00	1.04	159.18	7,174.20	41.92	28.18	570,828.1214	759,938.9764	32° 33' 59.333 N	103° 29' 22.526 W
7,200.00	0.92	165.17	7,199.20	41.52	28.31	570,827.7153	759,939.1084	32° 33' 59.329 N	103° 29' 22.524 W
7,225.00	0.89	173.04	7,224.19	41.13	28.38	570,827.3286	759,939.1833	32° 33' 59.325 N	103° 29' 22.523 W
7,250.00	1.10	184.64	7,249.19	40.70	28.39	570,826.8967	759,939.1874	32° 33' 59.321 N	103° 29' 22.523 W
7,275.00	1.02	194.34	7,274.18	40.24	28.31	570,826.4419	759,939.1129	32° 33' 59.316 N	103° 29' 22.524 W
7,300.00	1.16	182.76	7,299.18	39.77	28.25	570,825.9735	759,939.0456	32° 33' 59.312 N	103° 29' 22.525 W
7,325.00	1.15	178.33	7,324.18	39.27	28.24	570,825.4700	759,939.0407	32° 33' 59.307 N	103° 29' 22.525 W
7,350.00	1.17	173.03	7,349.17	38.77	28.28	570,824.9659	759,939.0790	32° 33' 59.302 N	103° 29' 22.525 W
7,375.00	1.16	170.66	7,374.17	38.26	28.35	570,824.4628	759,939.1511	32° 33' 59.297 N	103° 29' 22.524 W
7,400.00	1.21	171.03	7,399.16	37.75	28.43	570,823.9524	759,939.2333	32° 33' 59.292 N	103° 29' 22.523 W
7,425.00	1.34	166.57	7,424.15	37.21	28.54	570,823.4074	759,939.3423	32° 33' 59.286 N	103° 29' 22.522 W
7,450.00	1.25	159.25	7,449.15	36.67	28.71	570,822.8680	759,939.5068	32° 33' 59.281 N	103° 29' 22.520 W
7,475.00	1.23	163.77	7,474.14	36.16	28.88	570,822.3554	759,939.6784	32° 33' 59.276 N	103° 29' 22.518 W
7,500.00	1.25	160.72	7,499.14	35.64	29.04	570,821.8404	759,939.8435	32° 33' 59.271 N	103° 29' 22.516 W
7,525.00	1.32	163.76	7,524.13	35.11	29.21	570,821.3065	759,940.0140	32° 33' 59.265 N	103° 29' 22.514 W
7,550.00	1.07	169.52	7,549.12	34.60	29.34	570,820.8005	759,940.1370	32° 33' 59.260 N	103° 29' 22.513 W
7,575.00	1.34	179.68	7,574.12	34.08	29.38	570,820.2787	759,940.1811	32° 33' 59.255 N	103° 29' 22.512 W
7,600.00	1.22	183.63	7,599.11	33.52	29.37	570,819.7208	759,940.1659	32° 33' 59.250 N	103° 29' 22.513 W
7,625.00	1.30	180.15	7,624.11	32.97	29.35	570,819.1716	759,940.1483	32° 33' 59.244 N	103° 29' 22.513 W
7,650.00	1.28	177.83	7,649.10	32.41	29.36	570,818.6090	759,940.1581	32° 33' 59.239 N	103° 29' 22.513 W
7,675.00	1.22	167.62	7,674.09	31.87	29.43	570,818.0700	759,940.2258	32° 33' 59.233 N	103° 29' 22.512 W
7,700.00	1.29	181.47	7,699.09	31.33	29.48	570,817.5287	759,940.2756	32° 33' 59.228 N	103° 29' 22.512 W
7,725.00	1.29	188.41	7,724.08	30.77	29.43	570,816.9690	759,940.2272	32° 33' 59.222 N	103° 29' 22.512 W
7,750.00	1.34	176.71	7,749.07	30.20	29.40	570,816.3988	759,940.2028	32° 33' 59.217 N	103° 29' 22.513 W
7,775.00	1.26	168.26	7,774.07	29.64	29.48	570,815.8378	759,940.2756	32° 33' 59.211 N	103° 29' 22.512 W
7,800.00	1.24	172.65	7,799.06	29.10	29.57	570,815.3004	759,940.3661	32° 33' 59.206 N	103° 29' 22.511 W
7,825.00	1.21	180.85	7,824.05	28.57	29.60	570,814.7682	759,940.3968	32° 33' 59.201 N	103° 29' 22.510 W
7,850.00	1.24	160.79	7,849.05	28.05	29.68	570,814.2488	759,940.4819	32° 33' 59.196 N	103° 29' 22.509 W
7,875.00	1.44	164.66	7,874.04	27.49	29.85	570,813.6905	759,940.6540	32° 33' 59.190 N	103° 29' 22.508 W
7,900.00	1.30	178.33	7,899.04	26.90	29.95	570,813.1041	759,940.7453	32° 33' 59.184 N	103° 29' 22.507 W
7,925.00	1.21	168.15	7,924.03	26.36	30.01	570,812.5623	759,940.8078	32° 33' 59.179 N	103° 29' 22.506 W
7,950.00	1.33	175.43	7,949.03	25.81	30.09	570,812.0147	759,940.8851	32° 33' 59.173 N	103° 29' 22.505 W
7,975.00	1.29	174.82	7,974.02	25.25	30.13	570,811.4452	759,940.9336	32° 33' 59.168 N	103° 29' 22.504 W
8,000.00	1.11	171.21	7,999.01	24.73	30.20	570,810.9257	759,940.9961	32° 33' 59.163 N	103° 29' 22.504 W
8,025.00	1.37	166.52	8,024.01	24.20	30.30	570,810.3957	759,941.1027	32° 33' 59.157 N	103° 29' 22.503 W
8,050.00	1.41	183.26	8,049.00	23.60	30.35	570,809.7980	759,941.1549	32° 33' 59.151 N	103° 29' 22.502 W
8,075.00	1.52	169.51	8,073.99	22.96	30.40	570,809.1649	759,941.1978	32° 33' 59.145 N	103° 29' 22.502 W
8,100.00	1.64	176.34	8,098.98	22.28	30.48	570,808.4819	759,941.2810	32° 33' 59.138 N	103° 29' 22.501 W
8,125.00	1.61	171.78	8,123.97	21.58	30.55	570,807.7773	759,941.3540	32° 33' 59.131 N	103° 29' 22.500 W
8,150.00	1.79	186.64	8,148.96	20.84	30.56	570,807.0418	759,941.3591	32° 33' 59.124 N	103° 29' 22.500 W
8,175.00	1.64	182.97	8,173.95	20.10	30.50	570,806.2967	759,941.2954	32° 33' 59.117 N	103° 29' 22.501 W
8,200.00	1.68	170.89	8,198.94	19.38	30.53	570,805.5776	759,941.3349	32° 33' 59.110 N	103° 29' 22.500 W
8,225.00	1.58	170.81	8,223.93	18.68	30.65	570,804.8755	759,941.4480	32° 33' 59.103 N	103° 29' 22.499 W
8,250.00	1.47	169.67	8,248.92	18.02	30.76	570,804.2198	759,941.5605	32° 33' 59.096 N	103° 29' 22.498 W
8,275.00	1.76	171.60	8,273.91	17.32	30.87	570,803.5246	759,941.6741	32° 33' 59.089 N	103° 29' 22.497 W
8,300.00	1.63	178.43	8,298.90	16.59	30.94	570,802.7893	759,941.7399	32° 33' 59.082 N	103° 29' 22.496 W
8,325.00	1.58	180.49	8,323.89	15.89	30.95	570,802.0893	759,941.7467	32° 33' 59.075 N	103° 29' 22.496 W
8,350.00	1.57	182.20	8,348.88	15.20	30.93	570,801.4024	759,941.7306	32° 33' 59.068 N	103° 29' 22.496 W
8,375.00	1.70	181.71	8,373.87	14.49	30.91	570,800.6895	759,941.7064	32° 33' 59.061 N	103° 29' 22.496 W
8,400.00	1.64	185.51	8,398.86	13.76	30.86	570,799.9628	759,941.6610	32° 33' 59.054 N	103° 29' 22.497 W
8,425.00	1.61	179.33	8,423.85	13.06	30.83	570,799.2555	759,941.6308	32° 33' 59.047 N	103° 29' 22.497 W
8,450.00	1.43	185.51	8,448.84	12.39	30.80	570,798.5938	759,941.6049	32° 33' 59.041 N	103° 29' 22.498 W
8,475.00	1.25	167.74	8,473.83	11.82	30.83	570,798.0168	759,941.6329	32° 33' 59.035 N	103° 29' 22.498 W
8,500.00	1.20	172.44	8,498.83	11.29	30.93	570,797.4909	759,941.7252	32° 33' 59.030 N	103° 29' 22.497 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 18, T 20 S., R 32 E
Well: Blue Jay Federal Com #2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Blue Jay Federal Com #2H
TVD Reference: KB=26' @ 3711.00ft (Patriot 2)
MD Reference: KB=26' @ 3711.00ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
8,525.00	0.78	187.00	8,523.83	10.86	30.94	570,797.0625	759,941.7389	32° 33' 59.025 N	103° 29' 22.496 W
8,550.00	0.98	192.73	8,548.82	10.49	30.87	570,796.6850	759,941.6711	32° 33' 59.022 N	103° 29' 22.497 W
8,575.00	0.72	200.16	8,573.82	10.13	30.77	570,796.3290	759,941.5698	32° 33' 59.018 N	103° 29' 22.498 W
8,600.00	0.76	205.76	8,598.82	9.83	30.64	570,796.0323	759,941.4436	32° 33' 59.015 N	103° 29' 22.500 W
8,625.00	0.53	174.08	8,623.82	9.57	30.58	570,795.7679	759,941.3835	32° 33' 59.013 N	103° 29' 22.501 W
8,650.00	0.57	175.20	8,648.81	9.33	30.61	570,795.5290	759,941.4058	32° 33' 59.010 N	103° 29' 22.500 W
8,675.00	0.31	163.50	8,673.81	9.14	30.64	570,795.3402	759,941.4354	32° 33' 59.008 N	103° 29' 22.500 W
8,700.00	0.43	183.59	8,698.81	8.98	30.65	570,795.1818	759,941.4488	32° 33' 59.007 N	103° 29' 22.500 W
8,725.00	0.39	207.53	8,723.81	8.81	30.60	570,795.0127	759,941.4036	32° 33' 59.005 N	103° 29' 22.500 W
8,750.00	0.36	221.62	8,748.81	8.68	30.51	570,794.8785	759,941.3121	32° 33' 59.004 N	103° 29' 22.502 W
8,775.00	0.33	220.66	8,773.81	8.57	30.41	570,794.7652	759,941.2130	32° 33' 59.003 N	103° 29' 22.503 W
8,800.00	0.32	265.70	8,798.81	8.51	30.30	570,794.7054	759,941.0965	32° 33' 59.002 N	103° 29' 22.504 W
8,825.00	0.41	281.60	8,823.81	8.52	30.14	570,794.7181	759,940.9392	32° 33' 59.002 N	103° 29' 22.506 W
8,850.00	0.35	225.49	8,848.81	8.48	30.00	570,794.6826	759,940.7972	32° 33' 59.002 N	103° 29' 22.508 W
8,875.00	0.52	286.40	8,873.81	8.46	29.83	570,794.6611	759,940.6339	32° 33' 59.002 N	103° 29' 22.510 W
8,900.00	0.20	314.42	8,898.81	8.52	29.69	570,794.7236	759,940.4939	32° 33' 59.002 N	103° 29' 22.511 W
8,925.00	0.41	286.45	8,923.81	8.58	29.58	570,794.7795	759,940.3769	32° 33' 59.003 N	103° 29' 22.513 W
8,950.00	0.48	274.65	8,948.81	8.61	29.39	570,794.8133	759,940.1868	32° 33' 59.003 N	103° 29' 22.515 W
8,975.00	0.54	260.66	8,973.81	8.60	29.17	570,794.8027	759,939.9662	32° 33' 59.003 N	103° 29' 22.517 W
9,000.00	0.52	277.38	8,998.81	8.60	28.94	570,794.7981	759,939.7374	32° 33' 59.003 N	103° 29' 22.520 W
9,025.00	0.89	289.77	9,023.80	8.68	28.64	570,794.8784	759,939.4422	32° 33' 59.004 N	103° 29' 22.523 W
9,050.00	0.78	291.61	9,048.80	8.81	28.30	570,795.0067	759,939.1013	32° 33' 59.005 N	103° 29' 22.527 W
9,075.00	0.90	262.34	9,073.80	8.84	27.95	570,795.0432	759,938.7485	32° 33' 59.006 N	103° 29' 22.532 W
9,100.00	0.87	263.99	9,098.80	8.80	27.57	570,794.9972	759,938.3651	32° 33' 59.005 N	103° 29' 22.536 W
9,125.00	1.02	266.23	9,123.79	8.76	27.15	570,794.9627	759,937.9543	32° 33' 59.005 N	103° 29' 22.541 W
9,150.00	1.09	284.50	9,148.79	8.81	26.70	570,795.0076	759,937.5021	32° 33' 59.005 N	103° 29' 22.546 W
9,175.00	1.13	276.09	9,173.78	8.89	26.23	570,795.0933	759,937.0268	32° 33' 59.006 N	103° 29' 22.552 W
9,200.00	1.27	280.55	9,198.78	8.97	25.71	570,795.1702	759,936.5093	32° 33' 59.007 N	103° 29' 22.558 W
9,225.00	1.42	285.11	9,223.77	9.10	25.14	570,795.3016	759,935.9379	32° 33' 59.008 N	103° 29' 22.564 W
9,250.00	1.35	289.89	9,248.76	9.28	24.56	570,795.4826	759,935.3619	32° 33' 59.010 N	103° 29' 22.571 W
9,275.00	1.32	294.22	9,273.76	9.50	24.02	570,795.7009	759,934.8223	32° 33' 59.012 N	103° 29' 22.577 W
9,300.00	1.31	281.49	9,298.75	9.68	23.48	570,795.8760	759,934.2797	32° 33' 59.014 N	103° 29' 22.584 W
9,325.00	1.20	271.40	9,323.74	9.74	22.94	570,795.9393	759,933.7379	32° 33' 59.015 N	103° 29' 22.590 W
9,350.00	1.22	260.77	9,348.74	9.70	22.41	570,795.9030	759,933.2135	32° 33' 59.015 N	103° 29' 22.596 W
9,375.00	1.19	264.62	9,373.73	9.64	21.89	570,795.8360	759,932.6924	32° 33' 59.014 N	103° 29' 22.602 W
9,400.00	1.01	276.01	9,398.73	9.63	21.41	570,795.8347	759,932.2148	32° 33' 59.014 N	103° 29' 22.608 W
9,425.00	1.05	281.32	9,423.73	9.70	20.97	570,795.9027	759,931.7711	32° 33' 59.015 N	103° 29' 22.613 W
9,450.00	1.08	297.96	9,448.72	9.86	20.54	570,795.0581	759,931.3384	32° 33' 59.016 N	103° 29' 22.618 W
9,475.00	1.10	308.93	9,473.72	10.12	20.14	570,796.3194	759,930.9436	32° 33' 59.019 N	103° 29' 22.623 W
9,500.00	1.01	310.79	9,498.71	10.41	19.79	570,796.6141	759,930.5901	32° 33' 59.022 N	103° 29' 22.627 W
9,525.00	0.83	295.28	9,523.71	10.64	19.46	570,796.8354	759,930.2595	32° 33' 59.024 N	103° 29' 22.631 W
9,550.00	1.00	298.75	9,548.71	10.82	19.10	570,797.0176	759,929.9046	32° 33' 59.026 N	103° 29' 22.635 W
9,575.00	1.06	300.06	9,573.70	11.04	18.71	570,797.2384	759,929.5131	32° 33' 59.028 N	103° 29' 22.639 W
9,600.00	1.05	301.59	9,598.70	11.27	18.32	570,797.4742	759,929.1179	32° 33' 59.030 N	103° 29' 22.644 W
9,625.00	1.02	311.39	9,623.69	11.54	17.96	570,797.7413	759,928.7558	32° 33' 59.033 N	103° 29' 22.648 W
9,650.00	1.00	306.56	9,648.69	11.82	17.61	570,798.0184	759,928.4137	32° 33' 59.036 N	103° 29' 22.652 W
9,675.00	1.15	308.14	9,673.69	12.10	17.24	570,798.3033	759,928.0411	32° 33' 59.039 N	103° 29' 22.656 W
9,700.00	1.14	295.22	9,698.68	12.36	16.82	570,798.5642	759,927.6188	32° 33' 59.041 N	103° 29' 22.661 W
9,725.00	1.05	298.15	9,723.68	12.58	16.39	570,798.7782	759,927.1919	32° 33' 59.044 N	103° 29' 22.666 W
9,750.00	1.14	309.92	9,748.67	12.85	16.00	570,799.0459	759,926.7992	32° 33' 59.046 N	103° 29' 22.671 W
9,775.00	1.08	293.15	9,773.67	13.10	15.59	570,799.2981	759,926.3918	32° 33' 59.049 N	103° 29' 22.675 W
9,800.00	1.11	305.61	9,798.66	13.33	15.18	570,799.5317	759,925.9783	32° 33' 59.051 N	103° 29' 22.680 W
9,825.00	1.29	323.40	9,823.66	13.70	14.81	570,799.8986	759,925.6136	32° 33' 59.055 N	103° 29' 22.685 W
9,850.00	1.23	321.20	9,848.65	14.13	14.48	570,800.3337	759,925.2777	32° 33' 59.059 N	103° 29' 22.688 W
9,875.00	1.11	307.23	9,873.65	14.49	14.12	570,800.6893	759,924.9168	32° 33' 59.063 N	103° 29' 22.693 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Blue Jay Federal Com #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Site:	Sec. 18, T 20 S., R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
9,900.00	0.99	319.04	9,898.64	14.80	13.78	570,800.9989	759,924.5824	32° 33' 59.066 N	103° 29' 22.696 W
9,925.00	1.03	337.42	9,923.64	15.17	13.55	570,801.3695	759,924.3546	32° 33' 59.069 N	103° 29' 22.699 W
9,950.00	0.88	331.76	9,948.63	15.55	13.38	570,801.7461	759,924.1774	32° 33' 59.073 N	103° 29' 22.701 W
9,975.00	0.77	303.22	9,973.63	15.81	13.15	570,802.0072	759,923.9461	32° 33' 59.076 N	103° 29' 22.704 W
10,000.00	0.63	321.03	9,998.63	16.01	12.92	570,802.2061	759,923.7191	32° 33' 59.078 N	103° 29' 22.706 W
10,025.00	0.50	337.75	10,023.63	16.21	12.79	570,802.4139	759,923.5914	32° 33' 59.080 N	103° 29' 22.708 W
10,050.00	0.60	314.72	10,048.63	16.41	12.66	570,802.6070	759,923.4571	32° 33' 59.082 N	103° 29' 22.709 W
10,075.00	0.61	314.60	10,073.63	16.59	12.47	570,802.7926	759,923.2693	32° 33' 59.084 N	103° 29' 22.712 W
10,100.00	0.61	311.46	10,098.62	16.77	12.27	570,802.9741	759,923.0748	32° 33' 59.085 N	103° 29' 22.714 W
10,125.00	0.53	311.67	10,123.62	16.94	12.09	570,803.1391	759,922.8887	32° 33' 59.087 N	103° 29' 22.716 W
10,150.00	0.48	314.88	10,148.62	17.09	11.93	570,803.2899	759,922.7281	32° 33' 59.089 N	103° 29' 22.718 W
10,175.00	0.71	288.71	10,173.62	17.21	11.71	570,803.4134	759,922.5072	32° 33' 59.090 N	103° 29' 22.721 W
10,200.00	0.80	302.41	10,198.62	17.36	11.41	570,803.5567	759,922.2132	32° 33' 59.091 N	103° 29' 22.724 W
10,225.00	0.82	309.78	10,223.62	17.56	11.13	570,803.7647	759,921.9283	32° 33' 59.093 N	103° 29' 22.727 W
10,250.00	0.63	284.94	10,248.61	17.71	10.86	570,803.9146	759,921.6581	32° 33' 59.095 N	103° 29' 22.730 W
10,275.00	0.93	273.84	10,273.61	17.76	10.52	570,803.9636	759,921.3228	32° 33' 59.095 N	103° 29' 22.734 W
10,300.00	0.97	287.27	10,298.61	17.84	10.12	570,804.0400	759,920.9183	32° 33' 59.096 N	103° 29' 22.739 W
10,325.00	1.14	272.73	10,323.60	17.91	9.67	570,804.1147	759,920.4679	32° 33' 59.097 N	103° 29' 22.744 W
10,350.00	0.97	272.99	10,348.60	17.94	9.21	570,804.1375	759,920.0081	32° 33' 59.097 N	103° 29' 22.750 W
10,375.00	1.20	282.13	10,373.60	18.00	8.74	570,804.2036	759,919.5409	32° 33' 59.098 N	103° 29' 22.755 W
10,400.00	1.39	285.63	10,398.59	18.14	8.19	570,804.3403	759,918.9929	32° 33' 59.099 N	103° 29' 22.761 W
10,425.00	1.47	283.32	10,423.58	18.30	7.59	570,804.4959	759,918.3889	32° 33' 59.101 N	103° 29' 22.769 W
10,450.00	1.35	276.48	10,448.57	18.40	6.98	570,804.6030	759,917.7842	32° 33' 59.102 N	103° 29' 22.776 W
10,475.00	1.56	285.87	10,473.57	18.53	6.36	570,804.7293	759,917.1643	32° 33' 59.103 N	103° 29' 22.783 W
10,500.00	1.52	281.99	10,498.56	18.69	5.71	570,804.8912	759,916.5126	32° 33' 59.105 N	103° 29' 22.790 W
10,525.00	1.61	269.35	10,523.55	18.76	5.04	570,804.9561	759,915.8371	32° 33' 59.106 N	103° 29' 22.798 W
10,550.00	1.53	281.16	10,548.54	18.82	4.36	570,805.0167	759,915.1585	32° 33' 59.106 N	103° 29' 22.806 W
10,575.00	1.79	274.73	10,573.53	18.91	3.64	570,805.1135	759,914.4419	32° 33' 59.107 N	103° 29' 22.815 W
10,600.00	1.66	280.62	10,598.52	19.01	2.90	570,805.2124	759,913.6969	32° 33' 59.108 N	103° 29' 22.823 W
10,625.00	2.00	281.12	10,623.50	19.16	2.11	570,805.3633	759,912.9129	32° 33' 59.110 N	103° 29' 22.832 W
10,650.00	1.77	275.22	10,648.49	19.28	1.30	570,805.4826	759,912.1004	32° 33' 59.111 N	103° 29' 22.842 W
10,675.00	1.81	268.24	10,673.48	19.31	0.52	570,805.5056	759,911.3212	32° 33' 59.111 N	103° 29' 22.851 W
10,700.00	1.84	272.59	10,698.47	19.31	-0.27	570,805.5116	759,910.5257	32° 33' 59.111 N	103° 29' 22.860 W
10,725.00	1.53	266.46	10,723.45	19.31	-1.01	570,805.5091	759,909.7916	32° 33' 59.111 N	103° 29' 22.869 W
10,750.00	1.41	264.82	10,748.45	19.26	-1.65	570,805.4607	759,909.1522	32° 33' 59.111 N	103° 29' 22.876 W
10,775.00	1.67	269.70	10,773.44	19.23	-2.32	570,805.4311	759,908.4816	32° 33' 59.111 N	103° 29' 22.884 W
10,800.00	1.33	267.74	10,798.43	19.22	-2.97	570,805.4177	759,907.8274	32° 33' 59.111 N	103° 29' 22.892 W
10,825.00	1.53	283.23	10,823.42	19.28	-3.59	570,805.4827	759,907.2126	32° 33' 59.111 N	103° 29' 22.899 W
10,850.00	1.13	289.67	10,848.41	19.44	-4.14	570,805.6420	759,906.6555	32° 33' 59.113 N	103° 29' 22.906 W
10,875.00	1.06	290.63	10,873.41	19.61	-4.59	570,805.8065	759,906.2070	32° 33' 59.115 N	103° 29' 22.911 W
10,951.00	1.10	298.60	10,949.40	20.20	-5.89	570,806.4034	759,904.9086	32° 33' 59.121 N	103° 29' 22.926 W
First IDS MWD Survey									
10,982.00	2.50	346.90	10,980.38	21.00	-6.31	570,807.2044	759,904.4941	32° 33' 59.129 N	103° 29' 22.931 W
11,014.00	6.30	0.80	11,012.28	23.44	-6.44	570,809.6406	759,904.3604	32° 33' 59.153 N	103° 29' 22.932 W
11,045.00	9.80	6.00	11,042.97	27.77	-6.14	570,813.9665	759,904.6600	32° 33' 59.196 N	103° 29' 22.928 W
11,077.00	13.10	10.00	11,074.33	34.05	-5.23	570,820.2481	759,905.5746	32° 33' 59.258 N	103° 29' 22.917 W
11,108.00	16.60	8.80	11,104.29	41.89	-3.94	570,828.0863	759,906.8625	32° 33' 59.335 N	103° 29' 22.901 W
11,140.00	20.10	8.30	11,134.66	51.85	-2.44	570,838.0476	759,908.3560	32° 33' 59.434 N	103° 29' 22.883 W
11,171.00	23.30	7.90	11,163.46	63.19	-0.83	570,849.3942	759,909.9681	32° 33' 59.546 N	103° 29' 22.863 W
11,203.00	26.60	10.30	11,192.47	76.52	1.32	570,862.7156	759,912.1195	32° 33' 59.677 N	103° 29' 22.836 W
11,235.00	30.00	14.70	11,220.64	91.31	4.63	570,877.5084	759,915.4319	32° 33' 59.823 N	103° 29' 22.796 W
11,266.00	32.40	18.80	11,247.16	106.67	9.28	570,892.8709	759,920.0762	32° 33' 59.975 N	103° 29' 22.741 W
11,298.00	34.90	22.40	11,273.80	123.25	15.53	570,909.4546	759,926.3291	32° 34' 0.139 N	103° 29' 22.666 W
11,330.00	37.80	24.50	11,299.57	140.65	23.09	570,926.8461	759,933.8862	32° 34' 0.310 N	103° 29' 22.576 W
11,361.00	40.80	24.80	11,323.56	158.49	31.28	570,944.6888	759,942.0759	32° 34' 0.486 N	103° 29' 22.479 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 18, T 20 S. , R 32 E
Well: Blue Jay Federal Com #2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Blue Jay Federal Com #2H
TVD Reference: KB=26' @ 3711.00ft (Patriot 2)
MD Reference: KB=26' @ 3711.00ft (Patriot 2)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
11,393.00	44.40	25.10	11,347.11	178.12	40.41	570,964.3233	759,951.2129	32° 34' 0.680 N	103° 29' 22.370 W
11,425.00	47.60	25.40	11,369.33	198.94	50.23	570,985.1394	759,961.0321	32° 34' 0.885 N	103° 29' 22.254 W
11,456.00	51.20	25.30	11,389.51	220.21	60.31	571,006.4071	759,971.1074	32° 34' 1.095 N	103° 29' 22.134 W
11,488.00	54.20	25.10	11,408.89	243.24	71.14	571,029.4373	759,981.9436	32° 34' 1.322 N	103° 29' 22.005 W
11,519.00	57.00	24.50	11,426.41	266.46	81.87	571,052.6553	759,992.6694	32° 34' 1.550 N	103° 29' 21.878 W
11,551.00	60.70	23.50	11,442.96	291.47	93.00	571,077.6707	760,003.8019	32° 34' 1.797 N	103° 29' 21.745 W
11,582.00	64.70	22.60	11,457.17	316.82	103.78	571,103.0146	760,014.5816	32° 34' 2.047 N	103° 29' 21.617 W
11,614.00	68.50	22.40	11,469.88	343.94	115.02	571,130.1424	760,025.8175	32° 34' 2.315 N	103° 29' 21.483 W
11,646.00	71.40	22.20	11,480.85	371.75	126.42	571,157.9519	760,037.2225	32° 34' 2.589 N	103° 29' 21.347 W
11,677.00	74.40	22.20	11,489.96	399.18	137.62	571,185.3819	760,048.4165	32° 34' 2.859 N	103° 29' 21.214 W
11,709.00	78.30	21.20	11,497.51	428.07	149.11	571,214.2692	760,059.9097	32° 34' 3.144 N	103° 29' 21.077 W
11,740.00	82.10	20.20	11,502.79	456.64	159.90	571,242.8396	760,070.7039	32° 34' 3.426 N	103° 29' 20.948 W
11,772.00	84.80	19.70	11,506.44	486.52	170.75	571,272.7202	760,081.5497	32° 34' 3.721 N	103° 29' 20.819 W
11,804.00	87.50	19.10	11,508.59	516.63	181.35	571,302.8323	760,092.1535	32° 34' 4.018 N	103° 29' 20.692 W
11,835.00	90.50	18.70	11,509.13	545.95	191.39	571,332.1531	760,102.1922	32° 34' 4.307 N	103° 29' 20.572 W
11,867.00	92.30	17.70	11,508.35	576.34	201.38	571,362.5414	760,112.1835	32° 34' 4.607 N	103° 29' 20.452 W
11,898.00	92.90	17.20	11,506.94	605.89	210.67	571,392.0840	760,121.4699	32° 34' 4.899 N	103° 29' 20.341 W
11,993.00	91.40	13.40	11,503.38	697.43	235.71	571,483.6332	760,146.5134	32° 34' 5.803 N	103° 29' 20.040 W
12,088.00	91.30	11.50	11,501.14	790.17	256.19	571,576.3690	760,166.9875	32° 34' 6.719 N	103° 29' 19.792 W
12,183.00	91.40	9.60	11,498.90	883.53	273.58	571,669.7327	760,184.3757	32° 34' 7.641 N	103° 29' 19.580 W
12,277.00	90.80	5.30	11,497.09	976.70	285.76	571,762.8996	760,196.5583	32° 34' 8.562 N	103° 29' 19.429 W
12,407.00	90.90	1.80	11,495.16	1,106.42	293.81	571,892.6154	760,204.6058	32° 34' 9.845 N	103° 29' 19.323 W
12,502.00	91.20	2.00	11,493.42	1,201.35	296.96	571,987.5469	760,207.7550	32° 34' 10.784 N	103° 29' 19.278 W
12,597.00	91.30	0.90	11,491.35	1,296.29	299.36	572,082.4921	760,210.1583	32° 34' 11.723 N	103° 29' 19.241 W
12,691.00	91.60	1.20	11,488.97	1,390.25	301.08	572,176.4458	760,211.8803	32° 34' 12.653 N	103° 29' 19.212 W
12,786.00	92.30	359.50	11,485.74	1,485.19	301.66	572,271.3847	760,212.4605	32° 34' 13.592 N	103° 29' 19.196 W
12,880.00	91.00	358.60	11,483.03	1,579.13	300.10	572,365.3297	760,210.9025	32° 34' 14.522 N	103° 29' 19.206 W
12,974.00	91.10	358.60	11,481.31	1,673.09	297.81	572,459.2856	760,208.6062	32° 34' 15.452 N	103° 29' 19.224 W
13,069.00	91.20	358.60	11,479.40	1,768.04	295.49	572,554.2380	760,206.2856	32° 34' 16.391 N	103° 29' 19.242 W
13,163.00	91.20	358.40	11,477.44	1,861.99	293.03	572,648.1849	760,203.8256	32° 34' 17.321 N	103° 29' 19.262 W
13,258.00	91.40	359.00	11,475.28	1,956.94	290.87	572,743.1353	760,201.6708	32° 34' 18.261 N	103° 29' 19.279 W
13,352.00	91.30	358.70	11,473.07	2,050.89	288.99	572,837.0900	760,199.7848	32° 34' 19.191 N	103° 29' 19.292 W
13,447.00	91.70	359.00	11,470.58	2,145.84	287.08	572,932.0378	760,197.8788	32° 34' 20.130 N	103° 29' 19.306 W
13,542.00	92.30	359.10	11,467.26	2,240.77	285.51	573,026.9663	760,196.3046	32° 34' 21.070 N	103° 29' 19.315 W
13,636.00	92.70	359.20	11,463.16	2,334.67	284.11	573,120.8661	760,194.9115	32° 34' 21.999 N	103° 29' 19.323 W
13,731.00	93.20	359.20	11,458.27	2,429.54	282.79	573,215.7305	760,193.5868	32° 34' 22.938 N	103° 29' 19.329 W
13,826.00	92.20	0.60	11,453.80	2,524.43	282.62	573,310.6211	760,193.4217	32° 34' 23.877 N	103° 29' 19.323 W
13,921.00	92.80	0.60	11,449.65	2,619.33	283.62	573,405.5249	760,194.4156	32° 34' 24.816 N	103° 29' 19.302 W
14,015.00	91.50	0.50	11,446.13	2,713.26	284.52	573,499.4521	760,195.3172	32° 34' 25.745 N	103° 29' 19.283 W
14,110.00	91.80	0.60	11,443.39	2,808.21	285.43	573,594.4081	760,196.2287	32° 34' 26.684 N	103° 29' 19.263 W
14,204.00	91.90	0.60	11,440.36	2,902.16	286.41	573,688.3537	760,197.2126	32° 34' 27.614 N	103° 29' 19.243 W
14,298.00	92.50	1.00	11,436.75	2,996.08	287.72	573,782.2745	760,198.5240	32° 34' 28.543 N	103° 29' 19.219 W
14,393.00	91.80	359.50	11,433.19	3,091.01	288.14	573,877.2032	760,198.9379	32° 34' 29.482 N	103° 29' 19.206 W
14,487.00	91.50	359.30	11,430.48	3,184.97	287.15	573,971.1587	760,197.9539	32° 34' 30.412 N	103° 29' 19.208 W
14,582.00	91.50	359.20	11,427.99	3,279.92	285.91	574,066.1178	760,196.7108	32° 34' 31.352 N	103° 29' 19.214 W
14,676.00	91.70	358.40	11,425.37	3,373.87	283.94	574,160.0596	760,194.7431	32° 34' 32.282 N	103° 29' 19.228 W
14,771.00	91.60	358.40	11,422.63	3,468.79	281.29	574,254.9830	760,192.0916	32° 34' 33.221 N	103° 29' 19.251 W
14,865.00	92.40	358.40	11,419.35	3,562.70	278.67	574,348.8881	760,189.4686	32° 34' 34.150 N	103° 29' 19.272 W
14,960.00	92.90	358.50	11,414.96	3,657.56	276.10	574,443.7513	760,186.9017	32° 34' 35.089 N	103° 29' 19.294 W
15,054.00	91.40	358.50	11,411.43	3,751.46	273.64	574,537.6501	760,184.4429	32° 34' 36.019 N	103° 29' 19.314 W
15,149.00	91.60	358.50	11,408.95	3,846.39	271.16	574,632.5848	760,181.9569	32° 34' 36.958 N	103° 29' 19.334 W
15,244.00	92.00	358.40	11,405.96	3,941.31	268.59	574,727.5027	760,179.3885	32° 34' 37.897 N	103° 29' 19.355 W
15,338.00	92.10	358.20	11,402.60	4,035.21	265.80	574,821.4010	760,176.6017	32° 34' 38.827 N	103° 29' 19.379 W
15,433.00	91.10	358.60	11,399.95	4,130.13	263.15	574,916.3253	760,173.9503	32° 34' 39.766 N	103° 29' 19.401 W
15,527.00	91.30	358.70	11,397.98	4,224.09	260.94	575,010.2784	760,171.7362	32° 34' 40.696 N	103° 29' 19.418 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Blue Jay Federal Com #2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Site:	Sec. 18, T 20 S., R 32 E	MD Reference:	KB=26' @ 3711.00ft (Patriot 2)
Well:	Blue Jay Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
15,622.00	91.80	358.60	11,395.41	4,319.03	258.70	575,105.2168	760,169.4988	32° 34' 41.636 N	103° 29' 19.436 W
15,717.00	92.30	358.40	11,392.01	4,413.93	256.21	575,200.1229	760,167.0136	32° 34' 42.575 N	103° 29' 19.456 W
15,811.00	92.40	358.60	11,388.16	4,507.82	253.76	575,294.0114	760,164.5551	32° 34' 43.504 N	103° 29' 19.476 W
15,906.00	92.70	358.40	11,383.93	4,602.69	251.27	575,388.8845	760,162.0708	32° 34' 44.443 N	103° 29' 19.496 W
16,000.00	93.30	358.40	11,379.01	4,696.53	248.65	575,482.7185	760,159.4497	32° 34' 45.372 N	103° 29' 19.518 W
16,120.00	92.30	359.50	11,373.15	4,816.36	246.45	575,602.5515	760,157.2539	32° 34' 46.558 N	103° 29' 19.533 W
Final IDS MWD Survey									
16,178.00	92.30	359.50	11,370.82	4,874.31	245.95	575,660.5024	760,156.7482	32° 34' 47.131 N	103° 29' 19.533 W
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,951.00	10,949.40	20.20	-5.89	First IDS MWD Survey
16,120.00	11,373.15	4,816.36	246.45	Final IDS MWD Survey
16,178.00	11,370.82	4,874.31	245.95	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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From Bottom to Top	Stage 1	Distance Between Perfs	Shots	Stage 2	Distance Between Perfs	Shots	Stage 3	Distance Between Perfs	Shots	Stage 4	Distance Between Perfs	Shots	Stage 5	Distance Between Perfs	Shots
	15,963	20	6	15,767	36	6	15,644	20	6	15,458	48	6	15,325	20	6
	15,943	20	6	15,772	18	6	15,624	20	6	15,439	15	6	15,305	20	6
	15,923	20	6	15,754	16	6	15,604	19	6	15,424	16	6	15,285	23	6
	15,903	20	6	15,738	14	6	15,585	21	6	15,408	16	6	15,262	17	6
	15,883	20	5	15,724	20	5	15,564		5	15,392	16	5	15,245	16	5
	15,823		5	15,684		5	15,504		5	15,345		5	15,188		5
Plug to Plug	85		44	Plug to Plug	56		44	Plug to Plug	66		55		44	Plug to Plug	70
Frac Plug	15,988	Total Shots		Frac Plug	15,794	Total Shots		Frac Plug	15,651	Total Shots		Frac Plug	15,483	Total Shots	

From Bottom to Top	Stage 6	Distance Between Perfs	Shots	Stage 7	Distance Between Perfs	Shots	Stage 8	Distance Between Perfs	Shots	Stage 9	Distance Between Perfs	Shots	Stage 10	Distance Between Perfs	Shots
	15,151	25	6	15,007	19	6	14,847	20	6	14,686	22	6	14,511	37	6
	15,146	20	6	14,986	20	6	14,827	20	6	14,667	20	6	14,494	17	6
	15,126	20	6	14,966	20	6	14,807	15	6	14,647	20	6	14,477	17	6
	15,106	20	6	14,946	20	6	14,792	25	6	14,627	20	6	14,460	22	6
	15,086	20	5	14,926	20	5	14,767	25	5	14,607	20	5	14,438	17	5
	15,026		5	14,867		5	14,708		5	14,548		5	14,388		5
Plug to Plug	62		44	Plug to Plug	68		44	Plug to Plug	62		44		67		44
Frac Plug	15,158	Total Shots		Frac Plug	15,014	Total Shots		Frac Plug	14,854	Total Shots		Frac Plug	14,694	Total Shots	

From Bottom to Top	Stage 11	Distance Between Perfs	Shots	Stage 12	Distance Between Perfs	Shots	Stage 13	Distance Between Perfs	Shots	Stage 14	Distance Between Perfs	Shots	Stage 15	Distance Between Perfs	Shots
	14,368	20	6	14,203	22	6	14,038	31	6	13,890	20	6	13,729	21	6
	14,348	20	6	14,191	22	6	14,020	18	6	13,870	20	6	13,707	17	6
	14,328	20	6	14,169	20	6	14,002	18	6	13,850	20	6	13,690	16	6
	14,308	20	6	14,149	20	6	13,984	20	6	13,830	20	6	13,674	23	6
	14,288	21	5	14,129	20	5	13,964	16	5	13,810	20	5	13,651	20	5
	14,225		5	14,069		5	13,910		5	13,750		5	13,591		5
Plug to Plug	67		44	Plug to Plug	61		44	Plug to Plug	61		44		67		44
Frac Plug	14,375	Total Shots		Frac Plug	14,210	Total Shots		Frac Plug	14,045	Total Shots		Frac Plug	13,897	Total Shots	

From Bottom to Top	Stage 16	Distance Between Perfs	Shots	Stage 17	Distance Between Perfs	Shots	Stage 18	Distance Between Perfs	Shots	Stage 19	Distance Between Perfs	Shots	Stage 20	Distance Between Perfs	Shots
	13,562	29	6	13,411	20	6	13,251	22	6	13,093	19	6	12,933	28	6
	13,546	17	6	13,391	20	6	13,232	20	6	13,072	20	6	12,915	22	6
	13,529	18	6	13,371	19	6	13,212	20	6	13,052	19	6	12,893	20	6
	13,511	24	6	13,352	20	6	13,192	20	6	13,033	20	6	12,873	20	6
	13,487	16	5	13,332	24	5	13,172	20	5	13,013	20	5	12,853	20	5
	13,431		5	13,273		5	13,112		5	12,961		5	12,793		5
Plug to Plug	58		44	Plug to Plug	66		44	Plug to Plug	66		44		67		44
Frac Plug	13,569	Total Shots		Frac Plug	13,418	Total Shots		Frac Plug	13,258	Total Shots		Frac Plug	13,100	Total Shots	

From Bottom to Top	Stage 21	Distance Between Perfs	Shots	Stage 22	Distance Between Perfs	Shots	Stage 23	Distance Between Perfs	Shots	Stage 24	Distance Between Perfs	Shots	Stage 25	Distance Between Perfs	Shots
	12,760	33	6	12,614	20	6	12,449	25	6	12,275	40	6	12,135	19	6
	12,744	18	6	12,591	17	6	12,430	19	6	12,258	17	6	12,113	17	6
	12,726	18	6	12,574	16	6	12,411	19	6	12,241	17	6	12,096	18	6
	12,708	16	6	12,558	24	6	12,392	20	6	12,224	15	6	12,078	22	6
	12,692	20	5	12,534	20	5	12,372	17	5	12,209	19	5	12,056	20	5
	12,634		5	12,474		5	12,315		5	12,154		5	11,996		5
Plug to Plug	59		44	Plug to Plug	63		44	Plug to Plug	64		44		58		44
Frac Plug	12,767	Total Shots		Frac Plug	12,621	Total Shots		Frac Plug	12,459	Total Shots		Frac Plug	12,292	Total Shots	

From Bottom to Top	Stage 26	Distance Between Perfs	Shots	Stage 27	Distance Between Perfs	Shots									
	11,966	30	6	11,813	23	6									
	11,948	18	6	11,797	20	6									
	11,930	18	6	11,777	20	6									
	11,912	13	6	11,757	20	6									
	11,899	23	5	11,737	26	5									
	11,836		5	11,684		5									
Plug to Plug	61		44	Plug to Plug	63		44	Plug to Plug	0		0		0		0
Frac Plug	11,973	Total Shots		Frac Plug	11,820	Total Shots		Frac Plug		Total Shots		Frac Plug		Total Shots	

HOBBS OCD

SEP 19 2017

RECEIVED



February 6, 2017

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

Attn: Kanicia Castillo

RE: Blue Jay Federal Com No. 002H

Please find enclosed a copy of the survey from 0' to 10,875' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

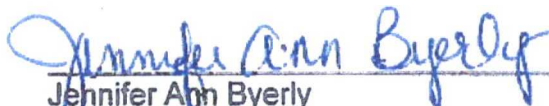
HOBBS OCD

SEP 19 2017

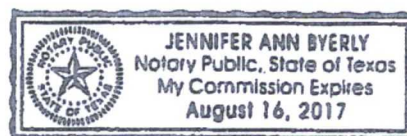
RECEIVED

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 6th day of February, A.D., 2017, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas

VES Survey International
P.O. Box 261021, Corpus Christi, Texas 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com





Company: COG Operating
Lease/Well: Blue Jay Federal Com No./002H

Rig Name: Patriot 2
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.56649, Longitude: -103.49017
Grid North = True North -0.45 degs (NAD 27)
Grid Correction Applied = -0.45 degs



Depth Reference : RKB = 20 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey-de_01.ut
Minimum Curvature Method
Report Date/Time: 2/6/2017 / 14:10

VES Survey International
Midland Tx
(432) 563-5444
Surveyor: Gene Heiss
Blue Jay Federal Com No. 002H / API 30-025-43533

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	****
25.00	0.31	270.18	25.00	0.00	-0.07	0.00	0.07	270.18	1.25
50.00	0.25	296.82	50.00	0.03	-0.19	0.03	0.19	277.78	0.57
75.00	0.34	324.62	75.00	0.11	-0.28	0.11	0.30	291.83	0.67
100.00	0.62	301.51	100.00	0.24	-0.44	0.24	0.50	299.12	1.35
125.00	0.57	294.23	125.00	0.37	-0.67	0.37	0.76	298.75	0.38
150.00	0.56	309.06	150.00	0.49	-0.87	0.49	1.00	299.44	0.58
175.00	0.59	309.82	174.99	0.65	-1.07	0.65	1.26	301.43	0.12
200.00	0.55	307.12	199.99	0.81	-1.26	0.81	1.50	302.60	0.18
225.00	0.62	288.72	224.99	0.92	-1.48	0.92	1.75	301.85	0.79
250.00	0.61	285.94	249.99	1.00	-1.74	1.00	2.01	299.93	0.12
275.00	0.57	300.31	274.99	1.10	-1.98	1.10	2.26	299.13	0.61
300.00	0.37	298.68	299.99	1.20	-2.16	1.20	2.47	299.18	0.82
325.00	0.35	288.03	324.99	1.27	-2.30	1.27	2.62	298.84	0.28
350.00	0.33	274.76	349.99	1.30	-2.44	1.30	2.77	297.94	0.32
375.00	0.38	295.76	374.99	1.34	-2.59	1.34	2.91	297.32	0.55
400.00	0.34	284.39	399.99	1.39	-2.73	1.39	3.07	296.97	0.32

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
425.00	0.33	304.79	424.99	1.45	-2.86	1.45	3.21	296.85	0.47
450.00	0.38	324.70	449.99	1.56	-2.97	1.56	3.35	297.68	0.53
475.00	0.42	340.49	474.99	1.71	-3.05	1.71	3.50	299.32	0.48
500.00	0.53	337.39	499.98	1.91	-3.12	1.91	3.66	301.38	0.43
525.00	0.46	344.03	524.98	2.11	-3.20	2.11	3.83	303.41	0.35
550.00	0.31	354.24	549.98	2.27	-3.23	2.27	3.95	305.11	0.68
575.00	0.42	342.86	574.98	2.43	-3.26	2.43	4.07	306.61	0.55
600.00	0.47	342.53	599.98	2.61	-3.32	2.61	4.23	308.17	0.20
625.00	0.49	340.29	624.98	2.81	-3.39	2.81	4.40	309.66	0.10
650.00	0.51	330.40	649.98	3.01	-3.48	3.01	4.60	310.82	0.35
675.00	0.42	339.40	674.98	3.19	-3.57	3.19	4.78	311.79	0.46
700.00	0.50	332.00	699.98	3.37	-3.65	3.37	4.97	312.71	0.40
725.00	0.58	330.46	724.98	3.57	-3.76	3.57	5.19	313.53	0.33
750.00	0.49	334.97	749.98	3.78	-3.87	3.78	5.41	314.33	0.39
775.00	0.57	321.23	774.97	3.98	-3.99	3.98	5.63	314.87	0.60
800.00	0.50	340.12	799.97	4.17	-4.11	4.17	5.86	315.46	0.75
825.00	0.52	318.69	824.97	4.36	-4.22	4.36	6.07	315.95	0.76
850.00	0.58	322.77	849.97	4.55	-4.37	4.55	6.31	316.13	0.28
875.00	0.57	316.11	874.97	4.74	-4.53	4.74	6.56	316.26	0.27
900.00	0.53	307.29	899.97	4.90	-4.71	4.90	6.80	316.11	0.38
925.00	0.53	290.39	924.97	5.01	-4.91	5.01	7.01	316.55	0.62
950.00	0.53	301.72	949.97	5.11	-5.12	5.11	7.23	314.94	0.42
975.00	0.60	306.07	974.97	5.25	-5.32	5.25	7.47	314.58	0.32
1000.00	0.55	303.67	999.96	5.39	-5.53	5.39	7.72	314.27	0.23
1025.00	0.51	304.62	1024.96	5.52	-5.72	5.52	7.95	313.98	0.17
1050.00	0.58	314.08	1049.96	5.67	-5.90	5.67	8.19	313.85	0.46
1075.00	0.60	323.68	1074.96	5.86	-6.07	5.86	8.44	314.01	0.41
1100.00	0.62	328.91	1099.96	6.09	-6.22	6.09	8.70	314.38	0.23
1125.00	0.55	332.43	1124.96	6.31	-6.34	6.31	8.95	314.84	0.30
1150.00	0.54	340.55	1149.96	6.53	-6.44	6.53	9.17	315.39	0.31
1175.00	0.54	330.07	1174.96	6.74	-6.54	6.74	9.39	315.88	0.40
1200.00	0.55	350.82	1199.95	6.96	-6.62	6.96	9.60	316.46	0.79
1225.00	0.60	332.32	1224.95	7.20	-6.70	7.20	9.83	317.06	0.76
1250.00	0.43	350.77	1249.95	7.40	-6.77	7.40	10.03	317.55	0.94
1275.00	0.31	341.65	1274.95	7.56	-6.81	7.56	10.17	318.00	0.50
1300.00	0.52	333.15	1299.95	7.73	-6.88	7.73	10.35	318.31	0.87
1325.00	0.54	321.76	1324.95	7.92	-7.00	7.92	10.57	318.51	0.43
1350.00	0.56	319.24	1349.95	8.11	-7.16	8.11	10.81	318.55	0.13
1375.00	0.58	316.67	1374.95	8.29	-7.32	8.29	11.06	318.54	0.14

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
1400.00	0.54	308.49	1399.95	8.45	-7.50	8.45	11.30	318.42	0.37
1425.00	0.63	292.20	1424.95	8.58	-7.72	8.58	11.54	318.01	0.76
1450.00	0.61	306.92	1449.94	8.71	-7.96	8.71	11.80	317.60	0.64
1475.00	0.73	306.00	1474.94	8.89	-8.19	8.89	12.09	317.33	0.50
1500.00	0.65	324.96	1499.94	9.10	-8.40	9.10	12.38	317.27	0.97
1525.00	0.66	325.33	1524.94	9.33	-8.57	9.33	12.67	317.45	0.02
1550.00	0.68	315.69	1549.94	9.56	-8.75	9.56	12.96	317.51	0.46
1575.00	0.57	311.26	1574.94	9.74	-8.95	9.74	13.23	317.43	0.47
1600.00	0.63	320.98	1599.93	9.93	-9.13	9.93	13.49	317.41	0.48
1625.00	0.54	328.31	1624.93	10.14	-9.28	10.14	13.75	317.54	0.48
1650.00	0.54	337.13	1649.93	10.35	-9.39	10.35	13.97	317.79	0.33
1675.00	0.55	353.84	1674.93	10.58	-9.45	10.58	14.18	318.23	0.63
1700.00	0.53	339.74	1699.93	10.80	-9.50	10.80	14.39	318.68	0.53
1725.00	0.58	341.58	1724.93	11.03	-9.58	11.03	14.61	319.03	0.22
1750.00	0.57	337.30	1749.93	11.27	-9.67	11.27	14.84	319.37	0.18
1775.00	0.63	319.02	1774.93	11.49	-9.80	11.49	15.10	319.51	0.81
1800.00	0.39	307.57	1799.93	11.64	-9.96	11.64	15.32	319.44	1.06
1825.00	0.62	310.14	1824.92	11.78	-10.13	11.78	15.54	319.30	0.93
1850.00	0.69	306.16	1849.92	11.96	-10.36	11.96	15.82	319.10	0.34
1875.00	0.34	300.38	1874.92	12.08	-10.54	12.08	16.04	318.89	1.41
1900.00	0.73	303.50	1899.92	12.21	-10.74	12.21	16.26	318.66	1.54
1925.00	0.69	308.66	1924.92	12.39	-10.99	12.39	16.56	318.42	0.29
1950.00	0.77	307.37	1949.92	12.59	-11.24	12.59	16.88	318.23	0.30
1975.00	0.66	312.32	1974.91	12.78	-11.48	12.78	17.18	318.07	0.50
2000.00	0.63	327.19	1999.91	12.98	-11.65	12.98	17.44	318.09	0.80
2025.00	0.66	339.67	2024.91	13.21	-11.76	13.21	17.69	318.32	0.73
2050.00	0.64	326.47	2049.91	13.46	-11.89	13.46	17.96	318.55	0.60
2075.00	0.69	311.55	2074.91	13.68	-12.08	13.68	18.25	318.55	0.71
2100.00	0.62	318.60	2099.91	13.88	-12.28	13.88	18.53	318.49	0.41
2125.00	0.56	326.55	2124.91	14.08	-12.44	14.08	18.79	318.55	0.42
2150.00	0.58	326.68	2149.90	14.29	-12.57	14.29	19.03	318.65	0.11
2175.00	0.63	334.73	2174.90	14.52	-12.70	14.52	19.29	318.82	0.40
2200.00	0.79	326.20	2199.90	14.79	-12.86	14.79	19.60	318.99	0.75
2225.00	0.65	311.98	2224.90	15.03	-13.06	15.03	19.91	319.00	0.89
2250.00	0.59	316.92	2249.90	15.22	-13.26	15.22	20.18	318.94	0.32
2275.00	0.66	302.86	2274.90	15.39	-13.46	15.39	20.45	318.82	0.66
2300.00	0.74	303.97	2299.89	15.56	-13.72	15.56	20.74	318.59	0.35
2325.00	0.72	316.46	2324.89	15.76	-13.96	15.76	21.06	318.47	0.64
2350.00	0.42	317.27	2349.89	15.94	-14.13	15.94	21.30	318.45	1.21

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
2375.00	0.70	332.75	2374.89	16.14	-14.26	16.14	21.54	318.54	1.26
2400.00	0.75	325.21	2399.89	16.41	-14.43	16.41	21.85	318.69	0.43
2425.00	0.54	330.96	2424.89	16.65	-14.58	16.65	22.13	318.80	0.88
2450.00	0.78	332.26	2449.88	16.91	-14.71	16.91	22.41	318.97	0.99
2475.00	0.73	326.40	2474.88	17.19	-14.88	17.19	22.74	319.12	0.37
2500.00	0.73	331.23	2499.88	17.46	-15.05	17.46	23.05	319.25	0.25
2525.00	0.71	318.30	2524.88	17.72	-15.23	17.72	23.36	319.33	0.66
2550.00	0.81	334.84	2549.88	17.99	-15.40	17.99	23.69	319.44	0.96
2575.00	0.80	324.74	2574.87	18.29	-15.58	18.29	24.03	319.59	0.57
2600.00	0.66	319.65	2599.87	18.55	-15.77	18.55	24.35	319.62	0.61
2625.00	0.75	338.42	2624.87	18.81	-15.93	18.81	24.65	319.74	0.98
2650.00	0.78	334.07	2649.87	19.11	-16.06	19.11	24.97	319.96	0.27
2675.00	0.80	331.89	2674.87	19.42	-16.22	19.42	25.30	320.14	0.13
2700.00	0.85	353.35	2699.86	19.76	-16.32	19.76	25.63	320.44	1.24
2725.00	0.66	332.55	2724.86	20.07	-16.41	20.07	25.92	320.73	1.32
2750.00	0.79	338.22	2749.86	20.36	-16.54	20.36	26.23	320.91	0.59
2775.00	0.80	342.96	2774.86	20.68	-16.65	20.68	26.55	321.16	0.27
2800.00	0.92	336.06	2799.85	21.03	-16.79	21.03	26.91	321.41	0.63
2825.00	0.88	322.76	2824.85	21.37	-16.98	21.37	27.29	321.52	0.85
2850.00	0.77	322.67	2849.85	21.65	-17.20	21.65	27.65	321.54	0.43
2875.00	0.82	334.66	2874.85	21.95	-17.38	21.95	28.00	321.63	0.69
2900.00	0.85	355.38	2899.84	22.29	-17.47	22.29	28.32	321.92	1.20
2925.00	0.94	345.43	2924.84	22.68	-17.54	22.68	28.67	322.29	0.73
2950.00	0.88	342.94	2949.84	23.06	-17.64	23.06	29.04	322.58	0.30
2975.00	0.73	1.10	2974.83	23.40	-17.70	23.40	29.34	322.90	1.18
3000.00	0.95	353.95	2999.83	23.77	-17.72	23.77	29.64	323.30	0.98
3025.00	1.06	6.20	3024.83	24.20	-17.71	24.20	29.99	323.80	0.96
3050.00	1.11	0.75	3049.82	24.68	-17.69	24.68	30.36	324.37	0.46
3075.00	1.02	8.92	3074.82	25.14	-17.65	25.14	30.71	324.93	0.71
3100.00	1.01	13.53	3099.81	25.57	-17.56	25.57	31.02	325.52	0.33
3125.00	1.14	19.01	3124.81	26.02	-17.43	26.02	31.32	326.19	0.64
3150.00	0.74	17.92	3149.81	26.41	-17.30	26.41	31.57	326.78	1.59
3175.00	1.11	10.63	3174.80	26.80	-17.20	26.80	31.85	327.30	1.56
3200.00	1.11	13.78	3199.80	27.28	-17.10	27.28	32.20	327.91	0.25
3225.00	1.15	22.33	3224.79	27.75	-16.95	27.75	32.51	328.58	0.69
3250.00	1.30	29.36	3249.79	28.22	-16.71	28.22	32.80	329.36	0.85
3275.00	1.40	31.94	3274.78	28.73	-16.41	28.73	33.09	330.26	0.48
3300.00	1.42	30.34	3299.77	29.26	-16.10	29.26	33.39	331.18	0.17
3325.00	1.44	34.61	3324.77	29.78	-15.76	29.78	33.70	332.11	0.44
3350.00	1.40	33.34	3349.76	30.30	-15.41	30.30	33.99	333.04	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
3375.00	1.41	31.94	3374.75	30.81	-15.08	30.81	34.31	333.92	0.14
3400.00	1.47	36.28	3399.74	31.33	-14.73	31.33	34.62	334.82	0.51
3425.00	1.15	27.37	3424.74	31.81	-14.43	31.81	34.93	335.81	1.52
3450.00	1.35	15.45	3449.73	32.32	-14.23	32.32	35.32	336.24	1.31
3475.00	1.12	28.92	3474.72	32.82	-14.03	32.82	35.70	336.85	1.48
3500.00	1.12	30.54	3499.72	33.25	-13.79	33.25	35.99	337.47	0.13
3525.00	1.17	26.71	3524.71	33.68	-13.55	33.68	36.31	338.08	0.36
3550.00	1.00	14.63	3549.71	34.13	-13.38	34.13	36.66	338.59	1.13
3575.00	0.92	14.06	3574.71	34.53	-13.28	34.53	37.00	338.97	0.33
3600.00	1.02	20.24	3599.70	34.94	-13.15	34.94	37.33	339.37	0.58
3625.00	0.89	359.41	3624.70	35.34	-13.08	35.34	37.68	339.69	1.48
3650.00	1.17	9.38	3649.70	35.79	-13.04	35.79	38.09	339.98	1.35
3675.00	0.97	10.45	3674.69	36.25	-12.96	36.25	38.49	340.33	0.81
3700.00	0.93	12.52	3699.69	36.66	-12.87	36.66	38.85	340.65	0.21
3725.00	1.11	8.50	3724.68	37.09	-12.79	37.09	39.24	340.97	0.75
3750.00	1.08	16.69	3749.68	37.56	-12.69	37.56	39.64	341.33	0.63
3775.00	1.21	21.85	3774.67	38.03	-12.53	38.03	40.04	341.77	0.65
3800.00	0.92	11.95	3799.67	38.47	-12.39	38.47	40.41	342.15	1.34
3825.00	0.94	13.15	3824.67	38.87	-12.30	38.87	40.77	342.44	0.10
3850.00	0.83	29.90	3849.66	39.22	-12.16	39.22	41.06	342.78	1.11
3875.00	1.00	18.05	3874.66	39.59	-12.01	39.59	41.37	343.13	1.10
3900.00	1.08	9.30	3899.66	40.03	-11.91	40.03	41.76	343.43	0.58
3925.00	1.09	9.02	3924.65	40.50	-11.84	40.50	42.19	343.71	0.05
3950.00	0.72	12.16	3949.65	40.88	-11.77	40.88	42.54	343.94	1.49
3975.00	0.76	8.17	3974.65	41.20	-11.71	41.20	42.83	344.13	0.26
4000.00	0.95	1.60	3999.64	41.57	-11.68	41.57	43.18	344.31	0.87
4025.00	0.67	5.15	4024.64	41.92	-11.66	41.92	43.51	344.45	1.16
4050.00	0.92	14.12	4049.64	42.26	-11.60	42.26	43.82	344.65	1.12
4075.00	0.74	29.02	4074.64	42.60	-11.47	42.80	44.11	344.93	1.11
4100.00	0.74	30.98	4099.63	42.88	-11.31	42.88	44.34	345.22	0.10
4125.00	0.94	27.62	4124.63	43.20	-11.13	43.20	44.61	345.55	0.80
4150.00	1.02	15.24	4149.63	43.59	-10.98	43.59	44.95	345.86	0.90
4175.00	0.98	18.72	4174.62	44.01	-10.85	44.01	45.33	346.15	0.28
4200.00	1.02	21.59	4199.62	44.42	-10.70	44.42	45.69	346.45	0.25
4225.00	1.04	26.00	4224.62	44.83	-10.52	44.83	46.05	346.79	0.33
4250.00	1.18	36.49	4249.61	45.24	-10.27	45.24	46.39	347.21	0.97
4275.00	1.05	53.53	4274.61	45.58	-9.93	45.58	46.65	347.71	1.41
4300.00	0.99	54.44	4299.60	45.85	-9.57	45.85	46.83	348.21	0.22
4325.00	0.98	38.58	4324.60	46.14	-9.26	46.14	47.06	348.65	1.09
4350.00	1.06	59.76	4349.60	46.42	-8.93	46.42	47.27	349.11	1.53

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
4375.00	0.81	63.29	4374.59	46.62	-8.57	46.62	47.40	349.58	1.04
4400.00	1.18	71.12	4399.59	46.78	-8.17	46.78	47.49	350.09	1.59
4425.00	1.13	71.42	4424.58	46.94	-7.89	46.94	47.57	350.89	0.21
4450.00	1.13	57.57	4449.58	47.15	-7.25	47.15	47.71	351.26	1.09
4475.00	1.17	71.36	4474.57	47.37	-6.80	47.37	47.85	351.83	1.12
4500.00	1.20	57.04	4499.57	47.59	-6.34	47.59	48.01	352.41	1.19
4525.00	1.20	66.84	4524.56	47.84	-5.88	47.84	48.20	352.99	0.82
4550.00	0.96	70.69	4549.56	48.01	-5.44	48.01	48.32	353.54	1.03
4575.00	1.40	71.75	4574.55	48.17	-4.95	48.17	48.43	354.13	1.78
4600.00	1.54	69.05	4599.55	48.39	-4.35	48.39	48.59	354.87	0.60
4625.00	1.64	53.29	4624.54	48.72	-3.75	48.72	48.87	355.60	1.79
4650.00	1.46	60.42	4649.53	49.09	-3.19	49.09	49.20	356.29	1.04
4675.00	1.70	63.39	4674.52	49.42	-2.58	49.42	49.49	357.02	1.01
4700.00	1.86	59.54	4699.50	49.79	-1.89	49.79	49.83	357.82	0.80
4725.00	1.94	62.97	4724.49	50.19	-1.17	50.19	50.20	358.67	0.55
4750.00	1.80	61.20	4749.48	50.57	-0.45	50.57	50.57	359.49	0.58
4775.00	1.90	63.00	4774.46	50.95	0.27	50.95	50.95	0.30	0.45
4800.00	1.63	63.38	4799.45	51.29	0.95	51.29	51.30	1.07	1.08
4825.00	1.50	64.57	4824.44	51.59	1.57	51.59	51.62	1.74	0.54
4850.00	1.57	72.29	4849.43	51.84	2.19	51.84	51.89	2.42	0.87
4875.00	1.54	65.22	4874.43	52.08	2.82	52.08	52.16	3.10	0.77
4900.00	1.36	62.17	4899.42	52.36	3.39	52.36	52.47	3.70	0.78
4925.00	1.05	67.75	4924.41	52.59	3.86	52.59	52.73	4.20	1.32
4950.00	1.32	50.80	4949.41	52.86	4.30	52.86	53.03	4.65	1.75
4975.00	1.42	69.69	4974.40	53.15	4.81	53.15	53.37	5.18	1.84
5000.00	1.13	65.36	4999.39	53.36	5.33	53.36	53.62	5.70	1.24
5025.00	1.23	76.09	5024.39	53.53	5.81	53.53	53.84	6.20	0.98
5050.00	1.29	78.18	5049.38	53.65	6.35	53.65	54.02	6.75	0.30
5075.00	1.29	85.15	5074.38	53.73	6.90	53.73	54.17	7.32	0.63
5100.00	1.35	79.32	5099.37	53.81	7.47	53.81	54.32	7.91	0.59
5125.00	1.13	63.69	5124.36	53.97	7.98	53.97	54.56	8.42	1.60
5150.00	1.09	88.23	5149.36	54.09	8.44	54.09	54.74	8.87	1.89
5175.00	1.15	97.52	5174.35	54.06	8.93	54.06	54.80	9.38	0.77
5200.00	1.06	95.15	5199.35	54.01	9.41	54.01	54.82	9.88	0.39
5225.00	1.06	101.11	5224.34	53.94	9.87	53.94	54.84	10.36	0.44
5250.00	0.87	99.97	5249.34	53.87	10.28	53.87	54.84	10.80	0.73
5275.00	0.76	90.66	5274.34	53.83	10.63	53.83	54.87	11.17	0.70
5300.00	0.78	84.17	5299.34	53.85	10.97	53.85	54.95	11.51	0.36
5325.00	0.77	85.09	5324.33	53.88	11.30	53.88	55.05	11.85	0.06
5350.00	0.78	90.36	5349.33	53.89	11.64	53.89	55.13	12.18	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
5375.00	0.76	103.15	5374.33	53.85	11.96	53.85	55.17	12.52	0.68
5400.00	0.49	117.86	5399.33	53.77	12.22	53.77	55.14	12.80	1.25
5425.00	0.58	120.48	5424.33	53.65	12.42	53.65	55.07	13.03	0.40
5450.00	0.32	139.74	5449.33	53.53	12.67	53.53	54.99	13.22	1.19
5475.00	0.70	129.82	5474.33	53.38	12.74	53.38	54.88	13.42	1.53
5500.00	0.28	114.53	5499.32	53.26	12.91	53.26	54.80	13.63	1.72
5525.00	0.45	135.23	5524.32	53.16	13.04	53.16	54.74	13.78	0.82
5550.00	0.46	127.41	5549.32	53.03	13.18	53.03	54.65	13.96	0.26
5575.00	0.63	131.20	5574.32	52.88	13.37	52.88	54.55	14.19	0.69
5600.00	0.71	116.05	5599.32	52.72	13.61	52.72	54.45	14.48	0.76
5625.00	0.25	95.33	5624.32	52.65	13.80	52.65	54.43	14.69	1.91
5650.00	0.43	91.36	5649.32	52.64	13.95	52.64	54.46	14.85	0.72
5675.00	0.14	103.32	5674.32	52.63	14.08	52.63	54.48	14.97	1.19
5700.00	0.47	148.39	5699.32	52.54	14.16	52.54	54.41	15.08	1.54
5725.00	0.51	131.59	5724.32	52.38	14.30	52.38	54.29	15.27	0.60
5750.00	0.24	89.71	5749.32	52.31	14.43	52.31	54.26	15.42	1.48
5775.00	0.51	135.49	5774.32	52.23	14.56	52.23	54.22	15.58	1.52
5800.00	0.47	151.41	5799.32	52.06	14.69	52.06	54.09	15.76	0.56
5825.00	0.44	140.11	5824.31	51.89	14.80	51.89	53.96	15.92	0.38
5850.00	0.48	102.65	5849.31	51.80	14.96	51.80	53.91	16.11	1.19
5875.00	0.42	159.86	5874.31	51.69	15.10	51.69	53.85	16.28	1.73
5900.00	0.50	146.60	5899.31	51.51	15.19	51.51	53.70	16.43	0.52
5925.00	0.41	149.49	5924.31	51.34	15.29	51.34	53.57	16.59	0.35
5950.00	0.70	118.75	5949.31	51.20	15.47	51.20	53.48	16.82	1.66
5975.00	0.67	103.31	5974.31	51.09	15.75	51.09	53.47	17.13	0.65
6000.00	0.43	105.72	5999.31	51.03	15.98	51.03	53.48	17.39	0.96
6025.00	0.61	109.98	6024.31	50.96	16.20	50.96	53.48	17.63	0.76
6050.00	0.62	107.21	6049.31	50.88	16.45	50.88	53.47	17.92	0.12
6075.00	0.61	103.53	6074.30	50.81	16.71	50.81	53.48	18.21	0.16
6100.00	0.63	99.90	6099.30	50.75	16.98	50.75	53.52	18.50	0.17
6125.00	0.45	110.17	6124.30	50.69	17.20	50.69	53.53	18.75	0.82
6150.00	0.71	131.08	6149.30	50.56	17.41	50.56	53.47	19.00	1.32
6175.00	0.57	105.59	6174.30	50.42	17.65	50.42	53.42	19.29	1.25
6200.00	0.62	107.01	6199.30	50.35	17.90	50.35	53.44	19.57	0.22
6225.00	0.73	121.72	6224.30	50.23	18.16	50.23	53.41	19.88	0.81
6250.00	0.64	129.62	6249.29	50.06	18.40	50.06	53.33	20.19	0.51
6275.00	0.72	156.21	6274.29	49.82	18.57	49.82	53.17	20.45	1.28
6300.00	0.70	143.30	6299.29	49.56	18.73	49.56	52.98	20.70	0.64
6325.00	0.83	121.10	6324.29	49.34	18.97	49.34	52.87	21.03	1.29
6350.00	0.61	113.96	6349.29	49.20	19.25	49.20	52.83	21.37	0.94

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
6375.00	0.57	92.79	6374.28	49.13	19.50	49.13	52.86	21.65	0.89
6400.00	0.51	111.19	6399.28	49.09	19.73	49.09	52.90	21.89	0.74
6425.00	0.79	113.48	6424.28	48.98	19.99	48.98	52.90	22.20	1.15
6450.00	0.76	125.71	6449.28	48.81	20.28	48.81	52.86	22.56	0.68
6475.00	0.80	127.29	6474.28	48.61	20.56	48.61	52.78	22.92	0.17
6500.00	0.57	106.60	6499.28	48.47	20.81	48.47	52.75	23.24	1.32
6525.00	0.44	132.16	6524.27	48.37	21.00	48.37	52.74	23.47	1.04
6550.00	0.81	125.80	6549.27	48.21	21.22	48.21	52.67	23.76	1.50
6575.00	0.81	137.21	6574.27	47.97	21.48	47.97	52.56	24.12	0.64
6600.00	0.81	125.26	6599.27	47.74	21.74	47.74	52.46	24.49	0.67
6625.00	0.82	132.91	6624.27	47.52	22.02	47.52	52.37	24.86	0.44
6650.00	0.85	126.09	6649.26	47.29	22.30	47.29	52.28	25.25	0.41
6675.00	0.92	118.08	6674.26	47.08	22.63	47.08	52.24	25.67	0.57
6700.00	0.53	125.60	6699.26	46.92	22.90	46.92	52.21	26.01	1.61
6725.00	0.75	131.48	6724.26	46.75	23.11	46.75	52.15	26.31	0.93
6750.00	0.81	110.46	6749.25	46.58	23.40	46.58	52.12	26.68	1.16
6775.00	0.75	116.09	6774.25	46.44	23.71	46.44	52.15	27.05	0.37
6800.00	1.02	120.79	6799.25	46.26	24.05	46.26	52.14	27.47	1.10
6825.00	1.03	124.77	6824.24	46.01	24.43	46.01	52.10	27.96	0.29
6850.00	0.84	132.01	6849.24	45.76	24.75	45.76	52.03	28.40	0.90
6875.00	0.80	118.09	6874.24	45.56	25.04	45.56	51.99	28.79	0.81
6900.00	0.80	123.57	6899.24	45.38	25.34	45.38	51.97	29.18	0.31
6925.00	1.05	131.83	6924.23	45.13	25.65	45.13	51.91	29.62	1.12
6950.00	0.95	138.31	6949.23	44.82	25.96	44.82	51.80	30.08	0.60
6975.00	0.86	149.33	6974.23	44.51	26.20	44.51	51.64	30.48	0.78
7000.00	0.91	139.54	6999.22	44.20	26.42	44.20	51.49	30.87	0.63
7025.00	0.96	135.43	7024.22	43.90	26.69	43.90	51.38	31.30	0.34
7050.00	0.98	140.90	7049.22	43.58	26.98	43.58	51.25	31.76	0.38
7075.00	0.94	138.02	7074.21	43.26	27.25	43.26	51.13	32.20	0.27
7100.00	0.83	140.45	7099.21	42.97	27.50	42.97	51.02	32.62	0.45
7125.00	0.98	144.32	7124.21	42.66	27.74	42.66	50.88	33.04	0.65
7150.00	0.94	146.92	7149.20	42.31	27.98	42.31	50.72	33.48	0.24
7175.00	1.04	159.18	7174.20	41.93	28.17	41.93	50.51	33.90	0.94
7200.00	0.92	165.17	7199.20	41.52	28.30	41.52	50.25	34.28	0.63
7225.00	0.89	173.04	7224.19	41.13	28.38	41.13	49.97	34.60	0.52
7250.00	1.10	184.64	7249.19	40.70	28.38	40.70	49.62	34.89	1.17
7275.00	1.02	194.34	7274.18	40.25	28.31	40.25	49.20	35.12	0.78
7300.00	1.16	182.76	7299.18	39.78	28.24	39.78	48.78	35.37	1.03
7325.00	1.15	178.33	7324.18	39.27	28.24	39.27	48.37	35.71	0.36
7350.00	1.17	173.03	7349.17	38.77	28.27	38.77	47.98	36.10	0.44

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
7375.00	1.16	170.66	7374.16	38.27	28.35	38.27	47.62	36.53	0.20
7400.00	1.21	171.03	7399.16	37.76	28.43	37.76	47.26	36.98	0.22
7425.00	1.34	166.57	7424.15	37.21	28.54	37.21	46.89	37.49	0.64
7450.00	1.25	159.25	7449.15	36.67	28.70	36.67	46.57	38.05	0.75
7475.00	1.23	163.77	7474.14	36.16	28.87	36.16	46.27	38.61	0.40
7500.00	1.25	160.72	7499.14	35.64	29.04	35.64	45.98	39.17	0.28
7525.00	1.32	163.76	7524.13	35.11	29.21	35.11	45.67	39.76	0.39
7550.00	1.07	169.52	7549.12	34.60	29.33	34.60	45.36	40.29	1.10
7575.00	1.34	179.68	7574.12	34.08	29.38	34.08	44.99	40.76	1.35
7600.00	1.22	183.63	7599.11	33.52	29.36	33.52	44.56	41.22	0.57
7625.00	1.30	180.15	7624.11	32.97	29.34	32.97	44.14	41.67	0.43
7650.00	1.28	177.83	7649.10	32.41	29.35	32.41	43.73	42.17	0.22
7675.00	1.22	167.62	7674.09	31.87	29.42	31.87	43.37	42.71	0.92
7700.00	1.29	181.47	7699.09	31.33	29.47	31.33	43.01	43.25	1.25
7725.00	1.29	188.41	7724.08	30.77	29.42	30.77	42.57	43.72	0.63
7750.00	1.34	176.71	7749.07	30.20	29.40	30.20	42.14	44.23	1.10
7775.00	1.26	168.26	7774.07	29.63	29.47	29.63	41.79	44.84	0.84
7800.00	1.24	172.65	7799.06	29.10	29.56	29.10	41.48	45.46	0.39
7825.00	1.21	180.85	7824.06	28.56	29.59	28.56	41.13	46.01	0.71
7850.00	1.24	160.79	7849.05	28.04	29.68	28.04	40.83	46.62	1.71
7875.00	1.44	164.66	7874.04	27.49	29.85	27.49	40.58	47.36	0.88
7900.00	1.30	178.33	7899.04	26.90	29.94	26.90	40.25	48.06	1.42
7925.00	1.21	168.15	7924.03	26.36	30.00	26.36	39.94	48.70	0.96
7950.00	1.33	175.43	7949.02	25.81	30.08	25.81	39.64	49.37	0.81
7975.00	1.29	174.82	7974.02	25.24	30.13	25.24	39.30	50.05	0.16
8000.00	1.11	171.21	7999.01	24.72	30.19	24.72	39.02	50.69	0.78
8025.00	1.37	166.52	8024.01	24.19	30.30	24.19	38.77	51.40	1.11
8050.00	1.41	183.26	8049.00	23.59	30.35	23.59	38.44	52.15	1.63
8075.00	1.52	169.51	8073.99	22.96	30.39	22.96	38.09	52.94	1.46
8100.00	1.64	176.34	8098.98	22.27	30.48	22.27	37.75	53.84	0.89
8125.00	1.61	171.78	8123.97	21.57	30.55	21.57	37.40	54.77	0.53
8150.00	1.79	186.64	8148.96	20.84	30.55	20.84	36.98	55.71	1.90
8175.00	1.64	182.97	8173.95	20.09	30.49	20.09	36.52	56.62	0.75
8200.00	1.68	170.89	8198.94	19.37	30.53	19.37	36.16	57.60	1.40
8225.00	1.58	170.81	8223.93	18.67	30.64	18.67	35.88	58.64	0.38
8250.00	1.47	169.67	8248.92	18.01	30.76	18.01	35.64	59.64	0.45
8275.00	1.76	171.60	8273.91	17.32	30.87	17.32	35.40	60.71	1.17
8300.00	1.63	178.43	8298.90	16.58	30.94	16.58	35.10	61.81	0.96
8325.00	1.58	180.49	8323.89	15.88	30.94	15.88	34.78	62.83	0.32
8350.00	1.57	182.20	8348.88	15.19	30.93	15.19	34.46	63.83	0.19

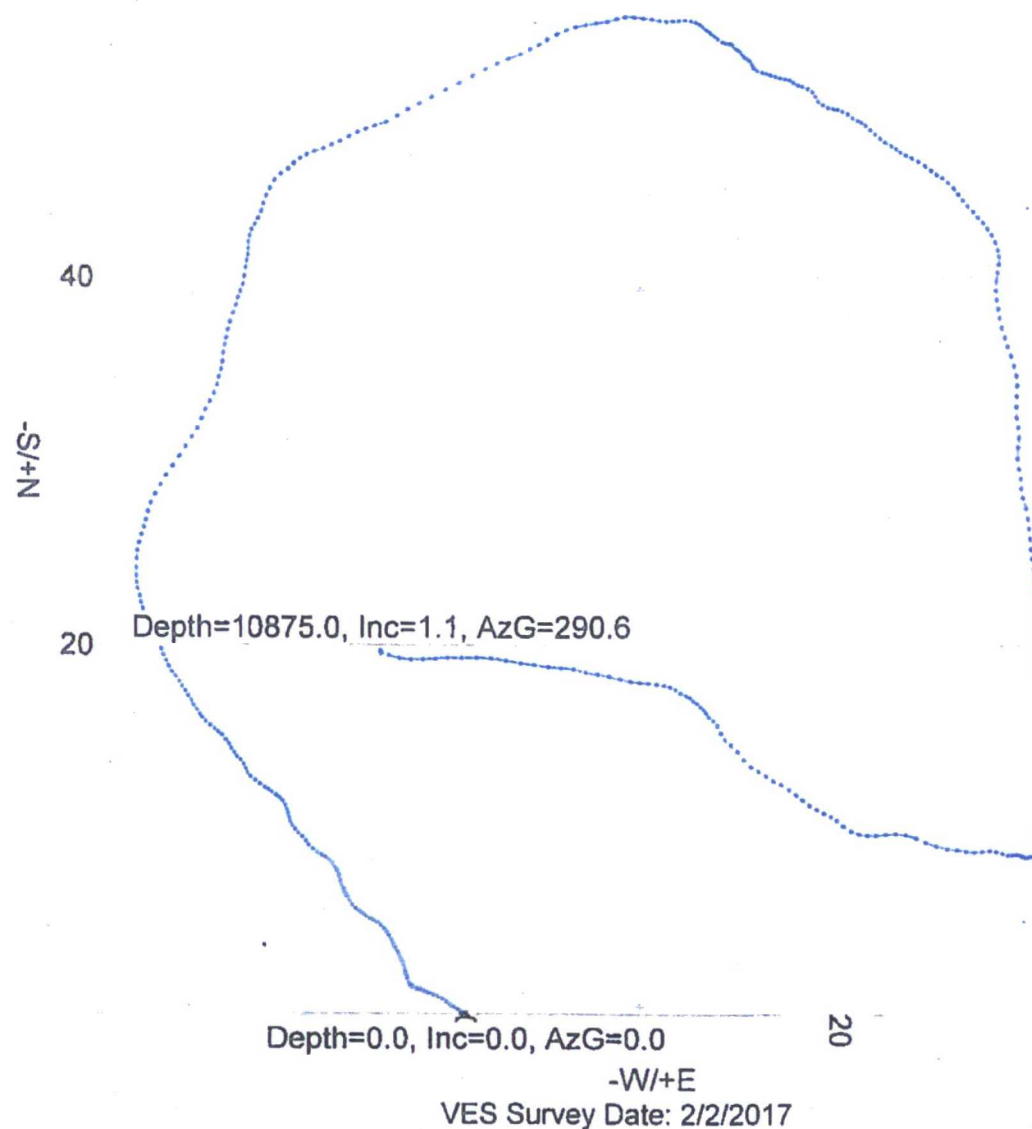
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
8375.00	1.70	181.71	8373.87	14.48	30.90	14.48	34.13	64.89	0.51
8400.00	1.64	185.51	8398.86	13.76	30.86	13.76	33.78	65.97	0.51
8425.00	1.61	179.33	8423.85	13.05	30.83	13.05	33.48	67.06	0.71
8450.00	1.43	185.51	8448.84	12.39	30.80	12.39	33.20	68.09	0.98
8475.00	1.25	167.74	8473.83	11.81	30.83	11.81	33.02	69.03	1.79
8500.00	1.20	172.44	8498.83	11.29	30.92	11.29	32.92	69.95	0.46
8525.00	0.78	187.00	8523.82	10.86	30.94	10.86	32.79	70.66	1.93
8550.00	0.98	192.73	8548.82	10.48	30.87	10.48	32.60	71.24	0.88
8575.00	0.72	200.16	8573.82	10.13	30.77	10.13	32.39	71.78	1.15
8600.00	0.76	205.76	8598.82	9.83	30.64	9.83	32.18	72.21	0.34
8625.00	0.53	174.08	8623.82	9.57	30.58	9.57	32.04	72.63	1.66
8650.00	0.57	175.20	8648.81	9.33	30.60	9.33	31.99	73.05	0.17
8675.00	0.31	163.50	8673.81	9.14	30.63	9.14	31.97	73.39	1.11
8700.00	0.43	183.59	8698.81	8.98	30.65	8.98	31.93	73.67	0.68
8725.00	0.39	207.53	8723.81	8.81	30.60	8.81	31.85	73.94	0.69
8750.00	0.36	221.62	8748.81	8.68	30.51	8.68	31.72	74.12	0.38
8775.00	0.33	220.66	8773.81	8.56	30.41	8.56	31.60	74.27	0.09
8800.00	0.32	265.70	8798.81	8.50	30.29	8.50	31.47	74.32	1.01
8825.00	0.41	281.60	8823.81	8.52	30.14	8.52	31.32	74.22	0.52
8850.00	0.35	225.49	8848.81	8.48	30.00	8.48	31.17	74.21	1.44
8875.00	0.52	286.40	8873.81	8.46	29.83	8.46	31.01	74.17	1.85
8900.00	0.20	314.42	8898.81	8.52	29.69	8.52	30.89	73.99	1.43
8925.00	0.41	286.45	8923.81	8.58	29.58	8.58	30.80	73.83	1.03
8950.00	0.48	274.65	8948.81	8.61	29.39	8.61	30.62	73.67	0.46
8975.00	0.54	260.66	8973.81	8.60	29.16	8.60	30.41	73.57	0.54
9000.00	0.52	277.38	8998.81	8.60	28.94	8.60	30.19	73.45	0.62
9025.00	0.89	289.77	9023.80	8.68	28.64	8.68	29.92	73.14	1.59
9050.00	0.78	291.61	9048.80	8.81	28.30	8.81	29.64	72.71	0.46
9075.00	0.90	262.34	9073.80	8.84	27.94	8.84	29.31	72.44	1.76
9100.00	0.87	263.99	9098.80	8.80	27.56	8.80	28.93	72.30	0.14
9125.00	1.02	266.23	9123.79	8.76	27.15	8.76	28.53	72.11	0.61
9150.00	1.09	284.50	9148.79	8.81	26.70	8.81	28.11	71.74	1.37
9175.00	1.13	276.09	9173.78	8.89	26.22	8.89	27.69	71.27	0.66
9200.00	1.27	280.55	9198.78	8.97	25.70	8.97	27.22	70.76	0.69
9225.00	1.42	285.11	9223.77	9.10	25.13	9.10	26.73	70.09	0.75
9250.00	1.35	289.89	9248.76	9.28	24.56	9.28	26.25	69.29	0.54
9275.00	1.32	294.22	9273.76	9.50	24.02	9.50	25.83	68.42	0.42
9300.00	1.31	281.49	9298.75	9.68	23.47	9.68	25.39	67.60	1.17
9325.00	1.20	271.40	9323.74	9.74	22.93	9.74	24.92	66.99	0.98
9350.00	1.22	260.77	9348.74	9.70	22.41	9.70	24.42	66.59	0.90

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
9375.00	1.19	264.62	9373.73	9.63	21.89	9.63	23.91	66.24	0.35
9400.00	1.01	276.01	9398.73	9.63	21.41	9.63	23.48	65.77	1.14
9425.00	1.05	281.32	9423.72	9.70	20.97	9.70	23.10	65.17	0.42
9450.00	1.08	297.96	9448.72	9.86	20.53	9.86	22.78	64.36	1.24
9475.00	1.10	308.93	9473.72	10.12	20.14	10.12	22.54	63.33	0.83
9500.00	1.01	310.79	9498.71	10.41	19.79	10.41	22.36	62.25	0.36
9525.00	0.83	295.28	9523.71	10.63	19.46	10.63	22.17	61.34	1.24
9550.00	1.00	298.75	9548.71	10.81	19.10	10.81	21.95	60.49	0.72
9575.00	1.06	300.06	9573.70	11.03	18.71	11.03	21.72	59.47	0.27
9600.00	1.05	301.59	9598.70	11.27	18.32	11.27	21.51	58.40	0.12
9625.00	1.02	311.39	9623.69	11.54	17.96	11.54	21.34	57.28	0.72
9650.00	1.00	308.56	9648.69	11.82	17.61	11.82	21.21	56.15	0.35
9675.00	1.15	308.14	9673.68	12.10	17.24	12.10	21.06	54.93	0.60
9700.00	1.14	295.22	9698.68	12.36	16.82	12.36	20.87	53.68	1.03
9725.00	1.05	298.15	9723.68	12.58	16.39	12.58	20.66	52.51	0.40
9750.00	1.14	309.92	9748.67	12.84	16.00	12.84	20.52	51.25	0.96
9775.00	1.08	293.15	9773.67	13.09	15.59	13.09	20.36	49.98	1.31
9800.00	1.11	305.61	9798.66	13.33	15.18	13.33	20.20	48.72	0.96
9825.00	1.29	323.40	9823.66	13.69	14.82	13.69	20.17	47.26	1.64
9850.00	1.23	321.20	9848.65	14.13	14.48	14.13	20.23	45.71	0.30
9875.00	1.11	307.23	9873.65	14.48	14.12	14.48	20.23	44.28	1.24
9900.00	0.99	319.04	9898.64	14.79	13.79	14.79	20.22	42.99	0.98
9925.00	1.03	337.42	9923.64	15.16	13.56	15.16	20.34	41.81	1.30
9950.00	0.88	331.76	9948.63	15.54	13.38	15.54	20.51	40.74	0.72
9975.00	0.77	303.22	9973.63	15.80	13.15	15.80	20.56	39.78	1.68
10000.00	0.63	321.03	9998.63	16.00	12.92	16.00	20.57	38.94	1.03
10025.00	0.50	337.75	10023.63	16.20	12.80	16.20	20.65	38.30	0.85
10050.00	0.60	314.72	10048.63	16.40	12.66	16.40	20.72	37.68	0.96
10075.00	0.61	314.60	10073.63	16.58	12.48	16.58	20.75	36.96	0.04
10100.00	0.61	311.46	10098.62	16.76	12.28	16.76	20.78	36.23	0.14
10125.00	0.53	311.67	10123.62	16.93	12.10	16.93	20.81	35.55	0.33
10150.00	0.48	314.88	10148.62	17.08	11.93	17.08	20.84	34.94	0.23
10175.00	0.71	288.71	10173.62	17.20	11.71	17.20	20.81	34.25	1.41
10200.00	0.80	302.41	10198.62	17.35	11.42	17.35	20.77	33.35	0.80
10225.00	0.82	309.78	10223.62	17.55	11.13	17.55	20.79	32.38	0.42
10250.00	0.63	284.94	10248.61	17.70	10.86	17.70	20.77	31.54	1.44
10275.00	0.93	273.84	10273.61	17.75	10.53	17.75	20.64	30.68	1.34
10300.00	0.97	287.27	10298.61	17.83	10.13	17.83	20.50	29.59	0.91
10325.00	1.14	272.73	10323.60	17.90	9.67	17.90	20.35	28.38	1.27
10350.00	0.97	272.99	10348.60	17.93	9.21	17.93	20.16	27.20	0.70

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
10375.00	1.20	282.13	10373.60	17.99	8.75	17.99	20.01	25.92	1.14
10400.00	1.39	285.63	10398.59	18.13	8.20	18.13	19.90	24.33	0.84
10425.00	1.47	283.32	10423.58	18.28	7.59	18.28	19.80	22.55	0.40
10450.00	1.35	276.48	10448.57	18.39	6.99	18.39	19.68	20.81	0.83
10475.00	1.56	285.87	10473.57	18.52	6.37	18.52	19.58	18.98	1.25
10500.00	1.52	281.99	10498.56	18.68	5.72	18.68	19.54	17.02	0.44
10525.00	1.61	269.35	10523.55	18.74	5.04	18.74	19.41	15.06	1.43
10550.00	1.53	281.16	10548.54	18.81	4.36	18.81	19.30	13.06	1.33
10575.00	1.79	274.73	10573.53	18.90	3.65	18.90	19.25	10.92	1.29
10600.00	1.66	280.62	10598.52	19.00	2.90	19.00	19.22	8.67	0.88
10625.00	2.00	281.12	10623.50	19.15	2.11	19.15	19.27	6.30	1.36
10650.00	1.77	275.22	10648.49	19.27	1.30	19.27	19.32	3.86	1.22
10675.00	1.81	268.24	10673.48	19.30	0.52	19.30	19.30	1.55	0.89
10700.00	1.84	272.59	10698.46	19.30	-0.27	19.30	19.30	359.19	0.57
10725.00	1.53	266.46	10723.45	19.30	-1.01	19.30	19.32	357.01	1.43
10750.00	1.41	264.82	10748.45	19.25	-1.65	19.25	19.32	355.11	0.51
10775.00	1.67	269.70	10773.44	19.22	-2.32	19.22	19.36	353.12	1.17
10800.00	1.33	267.74	10798.43	19.21	-2.97	19.21	19.44	351.20	1.40
10825.00	1.53	283.23	10823.42	19.27	-3.59	19.27	19.60	349.45	1.73
10850.00	1.13	289.67	10848.41	19.43	-4.14	19.43	19.87	347.96	1.70
10875.00	1.06	290.63	10873.41	19.60	-4.59	19.60	20.13	346.81	0.31



VES Survey International
Midland Tx
(432) 563-5444
Surveyor: Gene Heiss
Blue Jay Federal Com No. 002H / API 30-025-43533





I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 02/02/17 through 02/02/17 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 10,875.00 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 COG Operating for the Blue Jay Federal Com Well # 2H API # 30-025-43533 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 black ink, appearing to read "Gene Heiss", is written over a horizontal line.

Gene Heiss
Service Technician
VES Survey International