

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

HOBBS OCD**JUL 13 2016****RECEIVED**

Well Name and Num: Stove Pipe Federal Com 2H
Location: Sec. 6, T25S, R35E
Operator: COG
Drilling Contractor: McVay Drilling Company

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

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.73	423	1.70	5937	0.90	10559	90.40	14218
1.08	794	1.20	6315	0.30	10842	91.50	14504
0.95	871	0.70	6690	2.40	11314	89.40	14789
0.50	1214	0.60	6972	2.40	11594	89.90	14979
0.30	1590	0.40	7447	1.70	11880	90.80	15170
0.20	1968	0.40	7635	0.90	12352	91.10	15265
0.30	2345	0.60	8013	0.30	12632	90.10	15455
0.40	2723	1.40	8485	0.07	12822	89.70	15551
0.80	3100	1.50	8671	4.40	11912	90.10	16027
0.70	3477	1.30	9047	20.10	12104	89.20	18215
0.10	3855	1.50	9236	39.80	12339	90.6	18691
0.60	4233	2.00	9422	55.30	12528	90.1	18976
1.70	4610	1.60	9613	73.00	12717	92.7	19357
2.30	4988	1.50	9709	78.30	12791	91	19548
2.50	5176	1.50	9898	89.70	13171		
2.20	5365	0.10	10087	88.90	13674		
2.00	5559	0.90	10559	94.70	13933		

By: *Mark A. Brown*

Subscribed and sworn to before me this 31st day of December, 2015

Tina Flemens
Notary Public, Lea County, New Mexico



December 9, 2015

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

HOBBS OCD
JUL 13 2016
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Attn: Kanicia Castillo

RE: Stove Pipe Federal Com No 002H

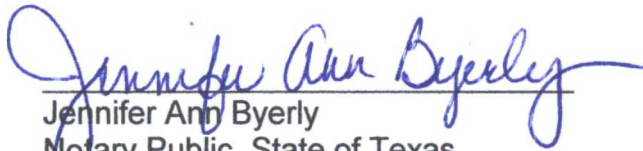
Please find enclosed a copy of the survey from 0' to 12,600' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 9 day of December
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Stove Pipe Federal Com No/002H
Location: 11 Miles from Jal
Rig Name: McVay 8
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.16598, Longitude: -103.40373
Grid North = True North -0.49 degs (NAD 27)
Grid Correction Applied = -0.49 degs



Depth Reference : RKB = 26 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...federal com 2h_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 12/9/2015 / 14:19

VES Survey International

West Texas

(432) 563-5444

Surveyor: Gene Heiss

Stove Pipe Federal Com No 002H / API 30-025-42926

HOBBS OCD

JUL 13 2016

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Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.22	53.12	100.00	0.11	0.15	0.11	0.19	53.12	0.22
200.00	0.53	103.62	200.00	0.12	0.75	0.12	0.76	80.99	0.42
300.00	0.72	80.43	299.99	0.12	1.82	0.12	1.82	86.36	0.32
400.00	0.56	76.81	399.99	0.33	2.91	0.33	2.93	83.51	0.17
500.00	0.45	87.93	499.98	0.46	3.78	0.46	3.81	83.11	0.14
600.00	0.27	100.78	599.98	0.43	4.41	0.43	4.43	84.47	0.20
700.00	0.50	102.32	699.98	0.29	5.07	0.29	5.08	86.73	0.24
800.00	0.64	78.48	799.97	0.31	6.04	0.31	6.05	87.10	0.27
900.00	0.59	108.69	899.97	0.25	7.08	0.25	7.08	87.97	0.32
1000.00	0.59	103.52	999.96	-0.03	8.07	-0.03	8.07	90.24	0.05
1100.00	0.52	121.81	1099.96	-0.39	8.95	-0.39	8.96	92.52	0.19
1200.00	0.49	102.07	1199.95	-0.72	9.76	-0.72	9.78	94.25	0.18
1300.00	0.51	116.59	1299.95	-1.01	10.58	-1.01	10.62	95.48	0.13
1400.00	0.42	119.28	1399.95	-1.39	11.30	-1.39	11.38	97.04	0.09
1500.00	0.31	136.51	1499.94	-1.77	11.81	-1.77	11.94	98.54	0.16
1600.00	0.29	112.92	1599.94	-2.07	12.23	-2.07	12.40	99.60	0.12

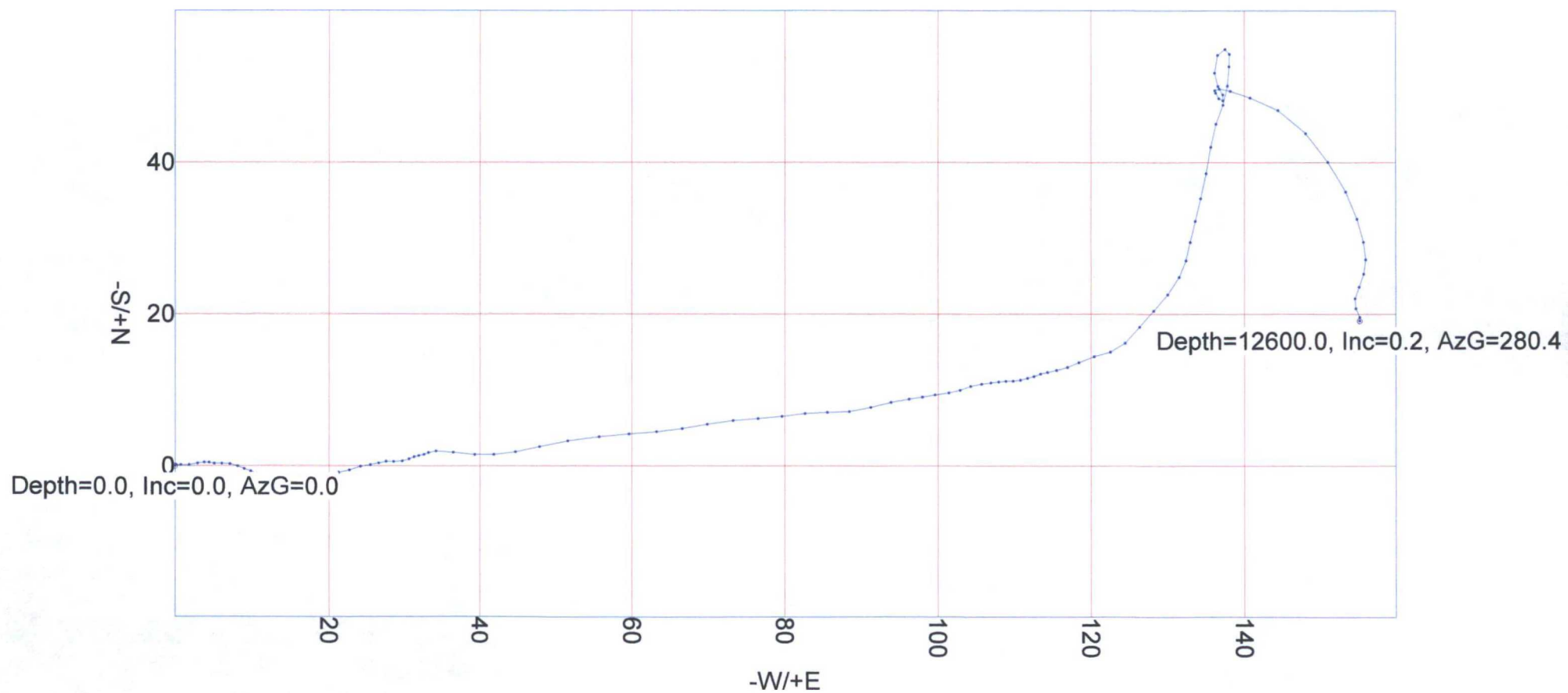
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	0.35	99.51	1699.94	-2.22	12.76	-2.22	12.95	99.86	0.09
1800.00	0.24	82.88	1799.94	-2.24	13.27	-2.24	13.45	99.59	0.13
1900.00	0.10	77.46	1899.94	-2.20	13.56	-2.20	13.73	99.20	0.14
2000.00	0.15	129.20	1999.94	-2.26	13.74	-2.26	13.92	99.33	0.11
2100.00	0.21	109.14	2099.94	-2.40	14.01	-2.40	14.22	99.72	0.09
2200.00	0.22	59.13	2199.94	-2.36	14.35	-2.36	14.54	99.35	0.18
2300.00	0.17	109.10	2299.94	-2.31	14.66	-2.31	14.84	98.97	0.17
2400.00	0.19	86.17	2399.94	-2.35	14.96	-2.35	15.14	98.94	0.07
2500.00	0.26	94.91	2499.94	-2.36	15.35	-2.36	15.54	98.74	0.08
2600.00	0.38	68.98	2599.93	-2.26	15.89	-2.26	16.05	98.10	0.18
2700.00	0.35	75.37	2699.93	-2.07	16.50	-2.07	16.63	97.14	0.05
2800.00	0.37	70.84	2799.93	-1.88	17.09	-1.88	17.20	96.29	0.03
2900.00	0.44	79.39	2899.93	-1.71	17.77	-1.71	17.85	95.49	0.09
3000.00	0.68	84.10	2999.92	-1.58	18.74	-1.58	18.80	94.81	0.25
3100.00	0.79	65.77	3099.92	-1.23	19.96	-1.23	20.00	93.53	0.26
3200.00	0.79	85.36	3199.91	-0.89	21.27	-0.89	21.29	92.40	0.27
3300.00	0.89	70.53	3299.90	-0.58	22.69	-0.58	22.69	91.46	0.24
3400.00	0.91	72.18	3399.88	-0.08	24.17	-0.08	24.17	90.19	0.03
3500.00	0.62	95.89	3499.87	0.11	25.46	0.11	25.46	89.76	0.42
3600.00	0.74	62.68	3599.87	0.35	26.58	0.35	26.58	89.25	0.41
3700.00	0.48	99.91	3699.86	0.57	27.57	0.57	27.58	88.81	0.46
3800.00	0.70	86.30	3799.86	0.54	28.59	0.54	28.60	88.92	0.26
3900.00	0.57	85.25	3899.85	0.62	29.70	0.62	29.70	88.80	0.13
4000.00	0.50	61.23	3999.85	0.87	30.58	0.87	30.59	88.36	0.23
4100.00	0.35	73.53	4099.84	1.17	31.26	1.17	31.28	87.85	0.17
4200.00	0.40	78.00	4199.84	1.33	31.90	1.33	31.93	87.60	0.06
4300.00	0.39	79.02	4299.84	1.47	32.58	1.47	32.61	87.41	0.01
4400.00	0.31	51.42	4399.84	1.71	33.13	1.71	33.17	87.05	0.19
4500.00	0.94	86.50	4499.83	1.93	34.16	1.93	34.22	86.77	0.71
4600.00	1.65	98.63	4599.81	1.76	36.41	1.76	36.45	87.23	0.76
4700.00	1.62	92.50	4699.76	1.48	39.25	1.48	39.28	87.84	0.18
4800.00	1.48	86.89	4799.73	1.49	41.95	1.49	41.98	87.97	0.21
4900.00	1.76	79.85	4899.69	1.83	44.75	1.83	44.78	87.66	0.34
5000.00	1.93	75.70	4999.64	2.52	47.89	2.52	47.95	86.99	0.22
5100.00	2.40	80.88	5099.56	3.26	51.58	3.26	51.69	86.38	0.51
5200.00	2.35	84.20	5199.48	3.80	55.69	3.80	55.82	86.09	0.14
5300.00	2.14	85.01	5299.40	4.17	59.59	4.17	59.74	85.99	0.22
5400.00	2.01	85.44	5399.34	4.47	63.20	4.47	63.36	85.95	0.13
5500.00	1.87	80.57	5499.28	4.88	66.55	4.88	66.73	85.81	0.22

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5600.00	1.95	79.18	5599.22	5.47	69.83	5.47	70.04	85.52	0.10
5700.00	1.96	84.16	5699.17	5.96	73.20	5.96	73.45	85.35	0.17
5800.00	1.80	86.48	5799.11	6.23	76.47	6.23	76.72	85.34	0.18
5900.00	1.81	83.52	5899.06	6.51	79.61	6.51	79.87	85.33	0.09
6000.00	1.67	81.86	5999.02	6.89	82.62	6.89	82.91	85.23	0.15
6100.00	1.68	92.39	6098.97	7.04	85.53	7.04	85.82	85.30	0.31
6200.00	1.65	83.42	6198.93	7.14	88.42	7.14	88.71	85.38	0.26
6300.00	1.61	73.90	6298.89	7.70	91.20	7.70	91.53	85.18	0.27
6400.00	1.51	78.42	6398.85	8.35	93.85	8.35	94.22	84.91	0.16
6500.00	1.26	80.52	6498.82	8.80	96.23	8.80	96.63	84.78	0.26
6600.00	0.77	82.84	6598.81	9.06	97.98	9.06	98.39	84.72	0.49
6700.00	1.12	77.62	6698.80	9.36	99.60	9.36	100.04	84.63	0.36
6800.00	0.98	86.65	6798.78	9.62	101.41	9.62	101.86	84.58	0.22
6900.00	0.77	65.50	6898.77	9.95	102.87	9.95	103.35	84.48	0.38
7000.00	0.94	72.57	6998.76	10.47	104.27	10.47	104.80	84.26	0.20
7100.00	0.75	86.29	7098.74	10.76	105.71	10.76	106.26	84.19	0.27
7200.00	0.64	77.49	7198.74	10.92	106.91	10.92	107.47	84.17	0.16
7300.00	0.54	88.67	7298.73	11.06	107.93	11.06	108.50	84.15	0.15
7400.00	0.57	84.20	7398.73	11.12	108.90	11.12	109.47	84.17	0.05
7500.00	0.52	90.90	7498.72	11.16	109.84	11.16	110.41	84.20	0.08
7600.00	0.58	73.05	7598.72	11.30	110.78	11.30	111.36	84.18	0.18
7700.00	0.51	80.80	7698.71	11.52	111.71	11.52	112.30	84.11	0.10
7800.00	0.47	67.52	7798.71	11.75	112.53	11.75	113.14	84.04	0.12
7900.00	0.60	69.43	7898.71	12.09	113.40	12.09	114.04	83.92	0.13
8000.00	0.51	84.89	7998.70	12.31	114.32	12.31	114.98	83.85	0.17
8100.00	0.88	73.97	8098.69	12.56	115.50	12.56	116.18	83.79	0.39
8200.00	0.81	75.15	8198.68	12.95	116.91	12.95	117.63	83.68	0.07
8300.00	1.07	60.53	8298.67	13.60	118.41	13.60	119.19	83.45	0.35
8400.00	1.40	74.19	8398.65	14.39	120.41	14.39	121.26	83.19	0.44
8500.00	1.11	74.50	8498.62	14.98	122.52	14.98	123.43	83.03	0.29
8600.00	1.54	46.88	8598.60	16.16	124.44	16.16	125.48	82.60	0.76
8700.00	1.73	36.73	8698.56	18.29	126.32	18.29	127.64	81.76	0.34
8800.00	1.49	45.49	8798.52	20.41	128.15	20.41	129.76	80.95	0.34
8900.00	1.78	36.24	8898.48	22.57	129.99	22.57	131.93	80.15	0.39
9000.00	1.38	28.73	8998.44	24.88	131.49	24.88	133.82	79.29	0.44
9100.00	1.31	16.00	9098.41	27.03	132.38	27.03	135.12	78.46	0.31
9200.00	1.58	10.23	9198.38	29.49	132.94	29.49	136.17	77.49	0.31
9300.00	1.67	15.36	9298.34	32.26	133.57	32.26	137.41	76.42	0.17
9400.00	1.86	11.92	9398.29	35.25	134.30	35.25	138.85	75.29	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
9500.00	2.02	12.41	9498.23	38.56	135.01	38.56	140.41	74.06	0.17
9600.00	2.03	8.10	9598.17	42.04	135.64	42.04	142.01	72.78	0.15
9700.00	1.55	18.54	9698.12	45.07	136.32	45.07	143.58	71.70	0.58
9800.00	1.50	21.13	9798.09	47.58	137.22	47.58	145.24	70.88	0.08
9900.00	1.49	4.58	9898.05	50.10	137.80	50.10	146.62	70.02	0.43
10000.00	1.42	5.62	9998.02	52.62	138.02	52.62	147.72	69.13	0.07
10100.00	0.46	347.60	10098.01	54.25	138.06	54.25	148.34	68.55	1.00
10200.00	0.63	298.81	10198.00	54.91	137.49	54.91	148.05	68.23	0.48
10300.00	1.32	205.15	10297.99	54.13	136.52	54.13	146.86	68.37	1.50
10400.00	1.48	175.03	10397.96	51.80	136.14	51.80	145.67	69.17	0.75
10500.00	0.64	145.96	10497.95	50.05	136.57	50.05	145.45	69.87	0.97
10600.00	0.83	152.46	10597.94	48.94	137.22	48.94	145.68	70.37	0.21
10700.00	0.40	243.85	10697.93	48.15	137.24	48.15	145.44	70.67	0.93
10800.00	0.59	332.41	10797.93	48.45	136.68	48.45	145.01	70.48	0.71
10900.00	0.36	328.81	10897.93	49.17	136.28	49.17	144.88	70.16	0.24
11000.00	0.07	37.71	10997.93	49.49	136.16	49.49	144.88	70.03	0.34
11100.00	0.63	73.04	11097.92	49.70	136.73	49.70	145.48	70.02	0.57
11200.00	1.16	116.68	11197.91	49.41	138.16	49.41	146.73	70.32	0.83
11300.00	2.01	104.65	11297.87	48.51	140.76	48.51	148.89	70.99	0.90
11400.00	2.65	120.50	11397.79	46.89	144.45	46.89	151.87	72.02	0.91
11500.00	2.81	139.25	11497.68	43.86	148.05	43.86	154.41	73.50	0.90
11600.00	2.71	146.11	11597.56	40.04	150.96	40.04	156.18	75.15	0.35
11700.00	2.51	152.04	11697.46	36.14	153.31	36.14	157.51	76.73	0.33
11800.00	2.00	162.63	11797.38	32.54	154.86	32.54	158.24	78.13	0.66
11900.00	1.59	166.94	11897.33	29.52	155.69	29.52	158.47	79.26	0.43
12000.00	1.12	181.46	11997.31	27.19	155.98	27.19	158.33	80.11	0.58
12100.00	1.07	195.07	12097.29	25.31	155.71	25.31	157.76	80.77	0.26
12200.00	1.02	202.87	12197.27	23.59	155.12	23.59	156.91	81.35	0.15
12300.00	0.84	194.14	12297.26	22.05	154.60	22.05	156.16	81.88	0.23
12400.00	0.76	154.76	12397.25	20.74	154.70	20.74	156.08	82.36	0.54
12500.00	0.65	158.91	12497.24	19.61	155.19	19.61	156.42	82.80	0.12
12600.00	0.22	280.44	12597.24	19.11	155.20	19.11	156.37	82.98	0.79



VES Survey International
West Texas
(432) 563-5444
Surveyor: Gene Heiss
Stove Pipe Federal Com No 002H / API 30-025-42926





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I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 12/06/15 through 12/06/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 12,600.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Stove Pipe Federal Com Well # 2H API # 30-025-42926 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 Vaughn Energy Services

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

Gene Heiss
Service Technician
Vaughn Energy Services



COG Operating, LLC

Lea County, NM

Sec 6, T25-S, R35-E

Stove Pipe Federal Com #2H

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Curve & Lateral

Design: Curve & Lateral

Survey Report - Geographic

22 December, 2015



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Stove Pipe Federal Com #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3336.0usft (McVay #8)
Site:	Sec 6, T25-S, R35-E	MD Reference:	WELL @ 3336.0usft (McVay #8)
Well:	Stove Pipe Federal Com #2H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM		
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 6, T25-S, R35-E				
Site Position:		Northing:	425,345.30 usft	Latitude:	32° 9' 57.513 N
From:	Map	Easting:	787,658.50 usft	Longitude:	103° 24' 13.414 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.49 °

Well	Stove Pipe Federal Com #2H					
Well Position	+N/-S	0.0 usft	Northing:	425,345.30 usft	Latitude:	32° 9' 57.513 N
	+E/-W	0.0 usft	Easting:	787,658.50 usft	Longitude:	103° 24' 13.414 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,310.0 usft

Wellbore	Curve & Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/19/2015	7.04	60.06	48,084

Design	Curve & Lateral				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	11,900.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	180.26	

Survey Program	Date	12/22/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	11,900.0	Gyro (Pilot Hole)	Good_gyro	Good Gyro	
11,962.0	19,693.0	MWD (Curve & Lateral)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	425,345.30	787,658.50	32° 9' 57.513 N	103° 24' 13.414 W
100.0	0.22	53.12	100.0	0.1	0.2	425,345.41	787,658.65	32° 9' 57.514 N	103° 24' 13.412 W
200.0	0.53	103.62	200.0	0.1	0.8	425,345.42	787,659.25	32° 9' 57.514 N	103° 24' 13.405 W
300.0	0.72	80.43	300.0	0.1	1.8	425,345.42	787,660.32	32° 9' 57.514 N	103° 24' 13.393 W
400.0	0.56	76.81	400.0	0.3	2.9	425,345.63	787,661.42	32° 9' 57.516 N	103° 24' 13.380 W
500.0	0.45	87.93	500.0	0.5	3.8	425,345.76	787,662.29	32° 9' 57.517 N	103° 24' 13.370 W
600.0	0.27	100.78	600.0	0.4	4.4	425,345.73	787,662.91	32° 9' 57.517 N	103° 24' 13.363 W
700.0	0.50	102.32	700.0	0.3	5.1	425,345.59	787,663.57	32° 9' 57.515 N	103° 24' 13.355 W
800.0	0.64	78.48	800.0	0.3	6.0	425,345.61	787,664.54	32° 9' 57.515 N	103° 24' 13.344 W
900.0	0.59	108.69	900.0	0.3	7.1	425,345.56	787,665.58	32° 9' 57.515 N	103° 24' 13.332 W
1,000.0	0.59	103.52	1,000.0	0.0	8.1	425,345.27	787,666.57	32° 9' 57.512 N	103° 24' 13.320 W



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Stove Pipe Federal Com #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3336.0usft (McVay #8)
Site:	Sec 6, T25-S, R35-E	MD Reference:	WELL @ 3336.0usft (McVay #8)
Well:	Stove Pipe Federal Com #2H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.52	121.81	1,100.0	-0.4	9.0	425,344.91	787,667.45	32° 9' 57.508 N	103° 24' 13.310 W
1,200.0	0.49	102.07	1,200.0	-0.7	9.8	425,344.58	787,668.26	32° 9' 57.505 N	103° 24' 13.301 W
1,300.0	0.51	116.59	1,299.9	-1.0	10.6	425,344.29	787,669.07	32° 9' 57.502 N	103° 24' 13.291 W
1,400.0	0.42	119.28	1,399.9	-1.4	11.3	425,343.92	787,669.79	32° 9' 57.498 N	103° 24' 13.283 W
1,500.0	0.31	136.51	1,499.9	-1.8	11.8	425,343.54	787,670.29	32° 9' 57.494 N	103° 24' 13.277 W
1,600.0	0.29	112.92	1,599.9	-2.1	12.2	425,343.25	787,670.71	32° 9' 57.491 N	103° 24' 13.272 W
1,700.0	0.35	99.51	1,699.9	-2.2	12.8	425,343.10	787,671.25	32° 9' 57.490 N	103° 24' 13.266 W
1,800.0	0.24	82.88	1,799.9	-2.2	13.3	425,343.07	787,671.76	32° 9' 57.490 N	103° 24' 13.260 W
1,900.0	0.10	77.46	1,899.9	-2.2	13.6	425,343.12	787,672.05	32° 9' 57.490 N	103° 24' 13.257 W
2,000.0	0.15	129.20	1,999.9	-2.2	13.7	425,343.05	787,672.24	32° 9' 57.489 N	103° 24' 13.254 W
2,100.0	0.21	109.14	2,099.9	-2.4	14.0	425,342.91	787,672.51	32° 9' 57.488 N	103° 24' 13.251 W
2,200.0	0.22	59.13	2,199.9	-2.4	14.4	425,342.95	787,672.85	32° 9' 57.488 N	103° 24' 13.247 W
2,300.0	0.17	109.10	2,299.9	-2.3	14.7	425,343.00	787,673.15	32° 9' 57.489 N	103° 24' 13.244 W
2,400.0	0.19	86.17	2,399.9	-2.3	15.0	425,342.96	787,673.46	32° 9' 57.488 N	103° 24' 13.240 W
2,500.0	0.26	94.91	2,499.9	-2.3	15.4	425,342.95	787,673.85	32° 9' 57.488 N	103° 24' 13.236 W
2,600.0	0.38	68.98	2,599.9	-2.2	15.9	425,343.05	787,674.39	32° 9' 57.489 N	103° 24' 13.229 W
2,700.0	0.35	75.37	2,699.9	-2.1	16.5	425,343.25	787,674.99	32° 9' 57.491 N	103° 24' 13.222 W
2,800.0	0.37	70.84	2,799.9	-1.9	17.1	425,343.43	787,675.59	32° 9' 57.493 N	103° 24' 13.215 W
2,900.0	0.44	79.39	2,899.9	-1.7	17.8	425,343.61	787,676.28	32° 9' 57.495 N	103° 24' 13.207 W
3,000.0	0.68	84.10	2,999.9	-1.6	18.7	425,343.74	787,677.24	32° 9' 57.496 N	103° 24' 13.196 W
3,100.0	0.79	65.77	3,099.9	-1.2	20.0	425,344.08	787,678.46	32° 9' 57.499 N	103° 24' 13.182 W
3,200.0	0.79	85.36	3,199.9	-0.9	21.3	425,344.42	787,679.78	32° 9' 57.502 N	103° 24' 13.167 W
3,300.0	0.89	70.53	3,299.9	-0.6	22.7	425,344.74	787,681.20	32° 9' 57.505 N	103° 24' 13.150 W
3,400.0	0.91	72.18	3,399.9	-0.1	24.2	425,345.24	787,682.69	32° 9' 57.510 N	103° 24' 13.133 W
3,500.0	0.62	95.89	3,499.9	0.1	25.5	425,345.43	787,683.98	32° 9' 57.512 N	103° 24' 13.118 W
3,600.0	0.74	62.68	3,599.9	0.4	26.6	425,345.67	787,685.09	32° 9' 57.514 N	103° 24' 13.105 W
3,700.0	0.48	99.91	3,699.9	0.6	27.6	425,345.89	787,686.08	32° 9' 57.516 N	103° 24' 13.093 W
3,800.0	0.70	86.30	3,799.9	0.6	28.6	425,345.86	787,687.10	32° 9' 57.516 N	103° 24' 13.081 W
3,900.0	0.57	85.25	3,899.9	0.6	29.7	425,345.94	787,688.21	32° 9' 57.517 N	103° 24' 13.068 W
4,000.0	0.50	61.23	3,999.8	0.9	30.6	425,346.19	787,689.08	32° 9' 57.519 N	103° 24' 13.058 W
4,100.0	0.35	73.53	4,099.8	1.2	31.3	425,346.49	787,689.76	32° 9' 57.522 N	103° 24' 13.050 W
4,200.0	0.40	78.00	4,199.8	1.3	31.9	425,346.65	787,690.39	32° 9' 57.523 N	103° 24' 13.043 W
4,300.0	0.39	79.02	4,299.8	1.5	32.6	425,346.78	787,691.07	32° 9' 57.525 N	103° 24' 13.035 W
4,400.0	0.31	51.42	4,399.8	1.7	33.1	425,347.02	787,691.61	32° 9' 57.527 N	103° 24' 13.029 W
4,500.0	0.94	86.50	4,499.8	1.9	34.1	425,347.24	787,692.64	32° 9' 57.529 N	103° 24' 13.017 W
4,600.0	1.65	98.63	4,599.8	1.8	36.4	425,347.07	787,694.89	32° 9' 57.527 N	103° 24' 12.991 W
4,700.0	1.62	92.50	4,699.8	1.5	39.2	425,346.79	787,697.72	32° 9' 57.524 N	103° 24' 12.958 W
4,800.0	1.48	86.89	4,799.7	1.5	41.9	425,346.80	787,700.42	32° 9' 57.524 N	103° 24' 12.926 W
4,900.0	1.76	79.85	4,899.7	1.8	44.7	425,347.14	787,703.23	32° 9' 57.527 N	103° 24' 12.894 W
5,000.0	1.93	75.70	4,999.6	2.5	47.9	425,347.83	787,706.37	32° 9' 57.534 N	103° 24' 12.857 W
5,100.0	2.40	80.88	5,099.6	3.3	51.6	425,348.58	787,710.07	32° 9' 57.541 N	103° 24' 12.814 W
5,200.0	2.35	84.20	5,199.5	3.8	55.7	425,349.11	787,714.17	32° 9' 57.546 N	103° 24' 12.766 W
5,300.0	2.14	85.01	5,299.4	4.2	59.6	425,349.48	787,718.07	32° 9' 57.549 N	103° 24' 12.721 W
5,400.0	2.01	85.44	5,399.3	4.5	63.2	425,349.79	787,721.68	32° 9' 57.552 N	103° 24' 12.679 W
5,500.0	1.87	80.57	5,499.3	4.9	66.5	425,350.19	787,725.04	32° 9' 57.555 N	103° 24' 12.639 W
5,600.0	1.95	79.18	5,599.2	5.5	69.8	425,350.78	787,728.32	32° 9' 57.561 N	103° 24' 12.601 W
5,700.0	1.96	84.16	5,699.2	6.0	73.2	425,351.27	787,731.69	32° 9' 57.566 N	103° 24' 12.562 W
5,800.0	1.80	86.48	5,799.1	6.2	76.5	425,351.54	787,734.96	32° 9' 57.568 N	103° 24' 12.524 W
5,900.0	1.81	83.52	5,899.1	6.5	79.6	425,351.82	787,738.10	32° 9' 57.570 N	103° 24' 12.487 W
6,000.0	1.67	81.86	5,999.0	6.9	82.6	425,352.20	787,741.11	32° 9' 57.574 N	103° 24' 12.452 W
6,100.0	1.68	92.39	6,099.0	7.0	85.5	425,352.35	787,744.02	32° 9' 57.575 N	103° 24' 12.419 W
6,200.0	1.65	83.42	6,198.9	7.2	88.4	425,352.45	787,746.91	32° 9' 57.576 N	103° 24' 12.385 W
6,300.0	1.61	73.90	6,298.9	7.7	91.2	425,353.01	787,749.69	32° 9' 57.581 N	103° 24' 12.352 W
6,400.0	1.51	78.42	6,398.9	8.4	93.8	425,353.66	787,752.33	32° 9' 57.587 N	103° 24' 12.322 W
6,500.0	1.26	80.52	6,498.8	8.8	96.2	425,354.11	787,754.71	32° 9' 57.592 N	103° 24' 12.294 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Stove Pipe Federal Com #2H
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Well:	Stove Pipe Federal Com #2H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.0	0.77	82.84	6,598.8	9.1	98.0	425,354.37	787,756.46	32° 9' 57.594 N	103° 24' 12.274 W
6,700.0	1.12	77.62	6,698.8	9.4	99.6	425,354.66	787,758.08	32° 9' 57.597 N	103° 24' 12.255 W
6,800.0	0.98	86.65	6,798.8	9.6	101.4	425,354.92	787,759.89	32° 9' 57.599 N	103° 24' 12.234 W
6,900.0	0.77	65.50	6,898.8	10.0	102.9	425,355.25	787,761.35	32° 9' 57.602 N	103° 24' 12.217 W
7,000.0	0.94	72.57	6,998.8	10.5	104.3	425,355.78	787,762.75	32° 9' 57.608 N	103° 24' 12.200 W
7,100.0	0.75	86.29	7,098.7	10.8	105.7	425,356.06	787,764.18	32° 9' 57.610 N	103° 24' 12.184 W
7,200.0	0.64	77.49	7,198.7	10.9	106.9	425,356.23	787,765.38	32° 9' 57.612 N	103° 24' 12.170 W
7,300.0	0.54	88.67	7,298.7	11.1	107.9	425,356.36	787,766.40	32° 9' 57.613 N	103° 24' 12.158 W
7,400.0	0.57	84.20	7,398.7	11.1	108.9	425,356.42	787,767.36	32° 9' 57.614 N	103° 24' 12.147 W
7,500.0	0.52	90.90	7,498.7	11.2	109.8	425,356.46	787,768.31	32° 9' 57.614 N	103° 24' 12.135 W
7,600.0	0.58	73.05	7,598.7	11.3	110.8	425,356.60	787,769.25	32° 9' 57.615 N	103° 24' 12.125 W
7,700.0	0.51	80.80	7,698.7	11.5	111.7	425,356.82	787,770.17	32° 9' 57.617 N	103° 24' 12.114 W
7,800.0	0.47	67.52	7,798.7	11.8	112.5	425,357.05	787,770.99	32° 9' 57.619 N	103° 24' 12.104 W
7,900.0	0.60	69.43	7,898.7	12.1	113.4	425,357.39	787,771.86	32° 9' 57.623 N	103° 24' 12.094 W
8,000.0	0.51	84.89	7,998.7	12.3	114.3	425,357.62	787,772.79	32° 9' 57.625 N	103° 24' 12.083 W
8,100.0	0.88	73.97	8,098.7	12.6	115.5	425,357.87	787,773.98	32° 9' 57.627 N	103° 24' 12.069 W
8,200.0	0.81	75.15	8,198.7	13.0	116.9	425,358.26	787,775.40	32° 9' 57.631 N	103° 24' 12.053 W
8,300.0	1.07	60.53	8,298.7	13.6	118.4	425,358.90	787,776.89	32° 9' 57.637 N	103° 24' 12.035 W
8,400.0	1.40	74.19	8,398.6	14.4	120.4	425,359.69	787,778.88	32° 9' 57.645 N	103° 24' 12.012 W
8,500.0	1.11	74.50	8,498.6	15.0	122.5	425,360.29	787,780.99	32° 9' 57.651 N	103° 24' 11.988 W
8,600.0	1.54	46.88	8,598.6	16.2	124.4	425,361.46	787,782.90	32° 9' 57.662 N	103° 24' 11.965 W
8,700.0	1.73	36.73	8,698.6	18.3	126.3	425,363.59	787,784.79	32° 9' 57.683 N	103° 24' 11.943 W
8,800.0	1.49	45.49	8,798.5	20.4	128.1	425,365.71	787,786.62	32° 9' 57.704 N	103° 24' 11.922 W
8,900.0	1.78	36.24	8,898.5	22.6	130.0	425,367.88	787,788.46	32° 9' 57.725 N	103° 24' 11.900 W
9,000.0	1.38	28.73	8,998.4	24.9	131.5	425,370.18	787,789.96	32° 9' 57.748 N	103° 24' 11.882 W
9,100.0	1.31	16.00	9,098.4	27.0	132.4	425,372.34	787,790.85	32° 9' 57.769 N	103° 24' 11.872 W
9,200.0	1.58	10.23	9,198.4	29.5	132.9	425,374.79	787,791.41	32° 9' 57.793 N	103° 24' 11.865 W
9,300.0	1.67	15.36	9,298.3	32.3	133.5	425,377.56	787,792.05	32° 9' 57.821 N	103° 24' 11.857 W
9,400.0	1.86	11.92	9,398.3	35.3	134.3	425,380.55	787,792.77	32° 9' 57.850 N	103° 24' 11.849 W
9,500.0	2.02	12.41	9,498.2	38.6	135.0	425,383.86	787,793.48	32° 9' 57.883 N	103° 24' 11.840 W
9,600.0	2.03	8.10	9,598.2	42.0	135.6	425,387.33	787,794.11	32° 9' 57.917 N	103° 24' 11.832 W
9,700.0	1.55	18.54	9,698.1	45.1	136.3	425,390.37	787,794.79	32° 9' 57.947 N	103° 24' 11.824 W
9,800.0	1.50	21.13	9,798.1	47.6	137.2	425,392.87	787,795.69	32° 9' 57.972 N	103° 24' 11.813 W
9,900.0	1.49	4.58	9,898.1	50.1	137.8	425,395.39	787,796.27	32° 9' 57.997 N	103° 24' 11.806 W
10,000.0	1.42	5.62	9,998.0	52.6	138.0	425,397.92	787,796.49	32° 9' 58.022 N	103° 24' 11.804 W
10,100.0	0.46	347.60	10,098.0	54.2	138.0	425,399.54	787,796.53	32° 9' 58.038 N	103° 24' 11.803 W
10,200.0	0.63	298.81	10,198.0	54.9	137.5	425,400.20	787,795.96	32° 9' 58.044 N	103° 24' 11.810 W
10,300.0	1.32	205.15	10,298.0	54.1	136.5	425,399.42	787,794.99	32° 9' 58.037 N	103° 24' 11.821 W
10,400.0	1.48	175.03	10,398.0	51.8	136.1	425,397.09	787,794.61	32° 9' 58.014 N	103° 24' 11.826 W
10,500.0	0.64	145.96	10,497.9	50.0	136.5	425,395.34	787,795.03	32° 9' 57.996 N	103° 24' 11.821 W
10,600.0	0.83	152.46	10,597.9	48.9	137.2	425,394.24	787,795.68	32° 9' 57.985 N	103° 24' 11.813 W
10,700.0	0.40	243.85	10,697.9	48.1	137.2	425,393.44	787,795.70	32° 9' 57.977 N	103° 24' 11.813 W
10,800.0	0.59	332.41	10,797.9	48.4	136.7	425,393.75	787,795.15	32° 9' 57.980 N	103° 24' 11.820 W
10,900.0	0.36	328.81	10,897.9	49.2	136.3	425,394.47	787,794.75	32° 9' 57.988 N	103° 24' 11.824 W
11,000.0	0.07	37.71	10,997.9	49.5	136.1	425,394.79	787,794.62	32° 9' 57.991 N	103° 24' 11.826 W
11,100.0	0.63	73.04	11,097.9	49.7	136.7	425,395.00	787,795.19	32° 9' 57.993 N	103° 24' 11.819 W
11,200.0	1.16	116.68	11,197.9	49.4	138.1	425,394.70	787,796.62	32° 9' 57.990 N	103° 24' 11.802 W
11,300.0	2.01	104.65	11,297.9	48.5	140.7	425,393.80	787,799.22	32° 9' 57.981 N	103° 24' 11.772 W
11,400.0	2.65	120.50	11,397.8	46.9	144.4	425,392.19	787,802.91	32° 9' 57.964 N	103° 24' 11.729 W
11,500.0	2.81	139.25	11,497.7	43.9	148.0	425,389.16	787,806.50	32° 9' 57.934 N	103° 24' 11.688 W
11,600.0	2.71	146.11	11,597.6	40.0	150.9	425,385.34	787,809.42	32° 9' 57.896 N	103° 24' 11.654 W
11,700.0	2.51	152.04	11,697.5	36.1	153.3	425,381.44	787,811.76	32° 9' 57.857 N	103° 24' 11.628 W
11,800.0	2.00	162.63	11,797.4	32.5	154.8	425,377.84	787,813.31	32° 9' 57.822 N	103° 24' 11.610 W
11,900.0	1.59	166.94	11,897.3	29.5	155.6	425,374.82	787,814.15	32° 9' 57.792 N	103° 24' 11.600 W
11,962.0	4.40	193.90	11,959.2	26.4	155.3	425,371.68	787,813.77	32° 9' 57.760 N	103° 24' 11.605 W

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,009.0	10.70	197.80	12,005.8	20.5	153.5	425,365.77	787,812.00	32° 9' 57.702 N	103° 24' 11.626 W
12,056.0	15.70	199.90	12,051.6	10.3	150.0	425,355.63	787,808.50	32° 9' 57.602 N	103° 24' 11.668 W
12,104.0	20.10	199.60	12,097.2	-3.6	145.0	425,341.74	787,803.52	32° 9' 57.465 N	103° 24' 11.727 W
12,151.0	24.60	196.80	12,140.7	-20.5	139.5	425,324.76	787,797.98	32° 9' 57.298 N	103° 24' 11.794 W
12,198.0	28.50	197.10	12,182.7	-40.6	133.4	425,304.67	787,791.85	32° 9' 57.099 N	103° 24' 11.867 W
12,245.0	31.00	201.00	12,223.5	-62.7	125.7	425,282.65	787,784.22	32° 9' 56.882 N	103° 24' 11.958 W
12,292.0	35.70	204.80	12,262.8	-86.4	115.6	425,258.88	787,774.12	32° 9' 56.648 N	103° 24' 12.078 W
12,324.0	38.49	203.82	12,288.3	-104.0	107.7	425,241.30	787,766.18	32° 9' 56.474 N	103° 24' 12.172 W
Crossed 330' Hardline @ 12324' MD / 12288' TVD									
12,339.0	39.80	203.40	12,299.9	-112.7	103.9	425,232.62	787,762.39	32° 9' 56.389 N	103° 24' 12.217 W
12,387.0	43.10	204.80	12,335.9	-141.7	90.9	425,203.62	787,749.40	32° 9' 56.103 N	103° 24' 12.371 W
12,434.0	47.50	203.10	12,369.0	-172.2	77.4	425,173.10	787,735.86	32° 9' 55.802 N	103° 24' 12.531 W
12,481.0	51.90	201.70	12,399.4	-205.3	63.7	425,139.96	787,722.22	32° 9' 55.475 N	103° 24' 12.693 W
12,528.0	55.30	202.40	12,427.2	-240.4	49.5	425,104.90	787,708.02	32° 9' 55.130 N	103° 24' 12.862 W
12,576.0	59.50	204.50	12,453.1	-277.5	33.4	425,067.82	787,691.91	32° 9' 54.764 N	103° 24' 13.053 W
12,623.0	64.10	204.10	12,475.3	-315.2	16.4	425,030.08	787,674.88	32° 9' 54.392 N	103° 24' 13.255 W
12,670.0	69.00	200.60	12,494.0	-355.1	0.0	424,990.21	787,658.51	32° 9' 53.999 N	103° 24' 13.450 W
12,717.0	73.00	197.10	12,509.3	-397.1	-14.3	424,948.17	787,644.17	32° 9' 53.584 N	103° 24' 13.621 W
12,791.0	78.30	191.50	12,527.7	-466.6	-32.0	424,878.74	787,626.52	32° 9' 52.899 N	103° 24' 13.833 W
12,838.0	79.90	188.00	12,536.5	-512.0	-39.8	424,833.27	787,618.71	32° 9' 52.450 N	103° 24' 13.928 W
12,886.0	83.10	183.40	12,543.6	-559.3	-44.5	424,786.05	787,614.01	32° 9' 51.983 N	103° 24' 13.988 W
12,933.0	86.00	179.90	12,548.1	-606.0	-45.8	424,739.29	787,612.66	32° 9' 51.520 N	103° 24' 14.008 W
12,981.0	86.60	178.10	12,551.2	-653.9	-45.0	424,691.40	787,613.50	32° 9' 51.046 N	103° 24' 14.003 W
13,076.0	87.10	176.70	12,556.4	-748.7	-40.7	424,596.65	787,617.80	32° 9' 50.108 N	103° 24' 13.963 W
13,171.0	89.70	178.50	12,559.1	-843.5	-36.7	424,501.78	787,621.78	32° 9' 49.169 N	103° 24' 13.926 W
13,267.0	91.00	179.20	12,558.5	-939.5	-34.8	424,405.80	787,623.70	32° 9' 48.219 N	103° 24' 13.913 W
13,362.0	90.40	178.80	12,557.3	-1,034.5	-33.1	424,310.82	787,625.36	32° 9' 47.279 N	103° 24' 13.903 W
13,457.0	88.70	178.10	12,558.1	-1,129.4	-30.6	424,215.87	787,627.93	32° 9' 46.339 N	103° 24' 13.883 W
13,552.0	90.40	177.40	12,558.8	-1,224.4	-26.8	424,120.95	787,631.66	32° 9' 45.400 N	103° 24' 13.849 W
13,647.0	88.90	176.70	12,559.4	-1,319.2	-21.9	424,026.08	787,636.55	32° 9' 44.461 N	103° 24' 13.802 W
13,742.0	89.20	176.70	12,561.0	-1,414.1	-16.5	423,931.25	787,642.02	32° 9' 43.522 N	103° 24' 13.748 W
13,837.0	91.80	178.50	12,560.1	-1,509.0	-12.5	423,836.35	787,645.99	32° 9' 42.582 N	103° 24' 13.711 W
13,933.0	94.70	180.90	12,554.7	-1,604.8	-12.0	423,740.52	787,646.50	32° 9' 41.634 N	103° 24' 13.715 W
14,028.0	92.20	179.20	12,549.0	-1,699.6	-12.1	423,645.70	787,646.42	32° 9' 40.696 N	103° 24' 13.725 W
14,123.0	91.80	179.50	12,545.7	-1,794.5	-11.0	423,550.77	787,647.50	32° 9' 39.756 N	103° 24' 13.722 W
14,218.0	90.40	179.90	12,543.9	-1,889.5	-10.5	423,455.79	787,647.99	32° 9' 38.817 N	103° 24' 13.726 W
14,314.0	89.60	179.90	12,543.9	-1,985.5	-10.3	423,359.79	787,648.16	32° 9' 37.867 N	103° 24' 13.734 W
14,408.0	90.40	178.80	12,543.9	-2,079.5	-9.3	423,265.80	787,649.23	32° 9' 36.937 N	103° 24' 13.731 W
14,503.0	91.50	177.40	12,542.3	-2,174.4	-6.1	423,170.87	787,652.38	32° 9' 35.997 N	103° 24' 13.704 W
14,599.0	92.00	176.00	12,539.3	-2,270.2	-0.6	423,075.07	787,657.90	32° 9' 35.049 N	103° 24' 13.649 W
14,694.0	91.70	178.10	12,536.3	-2,365.0	4.3	422,980.25	787,662.79	32° 9' 34.110 N	103° 24' 13.602 W
14,789.0	89.40	178.10	12,535.4	-2,460.0	7.4	422,885.32	787,665.93	32° 9' 33.170 N	103° 24' 13.575 W
14,884.0	87.10	177.10	12,538.3	-2,554.8	11.4	422,790.45	787,669.91	32° 9' 32.231 N	103° 24' 13.538 W
14,979.0	89.90	178.50	12,540.8	-2,649.7	15.1	422,695.57	787,673.55	32° 9' 31.292 N	103° 24' 13.505 W
15,075.0	91.00	179.90	12,540.0	-2,745.7	16.4	422,599.58	787,674.89	32° 9' 30.342 N	103° 24' 13.499 W
15,170.0	90.80	179.50	12,538.5	-2,840.7	16.9	422,504.60	787,675.39	32° 9' 29.402 N	103° 24' 13.503 W
15,265.0	91.10	179.90	12,536.9	-2,935.7	17.4	422,409.61	787,675.89	32° 9' 28.462 N	103° 24' 13.507 W
15,360.0	90.10	181.60	12,535.9	-3,030.7	16.1	422,314.63	787,674.65	32° 9' 27.522 N	103° 24' 13.531 W
15,455.0	90.10	181.60	12,535.8	-3,125.6	13.5	422,219.67	787,671.99	32° 9' 26.583 N	103° 24' 13.571 W
15,551.0	89.70	181.30	12,535.9	-3,221.6	11.1	422,123.70	787,669.56	32° 9' 25.633 N	103° 24' 13.609 W
15,646.0	89.90	181.30	12,536.3	-3,316.6	8.9	422,028.72	787,667.41	32° 9' 24.694 N	103° 24' 13.644 W
15,741.0	90.40	181.60	12,536.0	-3,411.5	6.5	421,933.75	787,665.01	32° 9' 23.754 N	103° 24' 13.681 W
15,836.0	90.10	182.00	12,535.6	-3,506.5	3.5	421,838.80	787,662.02	32° 9' 22.815 N	103° 24' 13.725 W
15,931.0	90.60	182.30	12,535.0	-3,601.4	0.0	421,743.87	787,658.46	32° 9' 21.876 N	103° 24' 13.776 W
16,027.0	90.10	181.30	12,534.4	-3,697.4	-3.1	421,647.92	787,655.44	32° 9' 20.927 N	103° 24' 13.821 W



DDC
Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Stove Pipe Federal Com #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3336.0usft (McVay #8)
Site:	Sec 6, T25-S, R35-E	MD Reference:	WELL @ 3336.0usft (McVay #8)
Well:	Stove Pipe Federal Com #2H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,122.0	90.60	182.00	12,533.9	-3,792.3	-5.8	421,552.96	787,652.71	32° 9' 19.987 N	103° 24' 13.862 W
16,217.0	90.80	182.00	12,532.7	-3,887.3	-9.1	421,458.03	787,649.39	32° 9' 19.048 N	103° 24' 13.910 W
16,312.0	90.60	182.30	12,531.5	-3,982.2	-12.7	421,363.10	787,645.83	32° 9' 18.109 N	103° 24' 13.961 W
16,407.0	89.70	181.30	12,531.3	-4,077.1	-15.7	421,268.15	787,642.84	32° 9' 17.170 N	103° 24' 14.006 W
16,502.0	90.10	182.30	12,531.5	-4,172.1	-18.6	421,173.20	787,639.86	32° 9' 16.231 N	103° 24' 14.050 W
16,597.0	88.90	182.00	12,532.3	-4,267.0	-22.2	421,078.27	787,636.30	32° 9' 15.292 N	103° 24' 14.101 W
16,692.0	88.70	182.30	12,534.3	-4,361.9	-25.8	420,983.36	787,632.73	32° 9' 14.353 N	103° 24' 14.152 W
16,787.0	88.50	182.30	12,536.6	-4,456.8	-29.6	420,888.46	787,628.92	32° 9' 13.414 N	103° 24' 14.206 W
16,883.0	88.30	182.00	12,539.3	-4,552.7	-33.2	420,792.57	787,625.32	32° 9' 12.466 N	103° 24' 14.257 W
16,978.0	90.10	180.90	12,540.6	-4,647.7	-35.6	420,697.61	787,622.92	32° 9' 11.526 N	103° 24' 14.295 W
17,073.0	90.60	180.90	12,540.0	-4,742.7	-37.1	420,602.63	787,621.43	32° 9' 10.586 N	103° 24' 14.322 W
17,168.0	89.90	181.30	12,539.6	-4,837.7	-38.9	420,507.65	787,619.60	32° 9' 9.647 N	103° 24' 14.352 W
17,263.0	90.60	179.90	12,539.2	-4,932.6	-39.9	420,412.66	787,618.61	32° 9' 8.707 N	103° 24' 14.374 W
17,358.0	90.80	180.60	12,538.0	-5,027.6	-40.3	420,317.67	787,618.19	32° 9' 7.767 N	103° 24' 14.388 W
17,454.0	90.60	180.20	12,536.9	-5,123.6	-41.0	420,221.68	787,617.52	32° 9' 6.817 N	103° 24' 14.405 W
17,549.0	90.60	180.20	12,535.9	-5,218.6	-41.3	420,126.68	787,617.19	32° 9' 5.877 N	103° 24' 14.419 W
17,644.0	90.40	180.60	12,535.0	-5,313.6	-42.0	420,031.69	787,616.53	32° 9' 4.937 N	103° 24' 14.436 W
17,739.0	90.10	180.60	12,534.6	-5,408.6	-43.0	419,936.69	787,615.53	32° 9' 3.997 N	103° 24' 14.457 W
17,834.0	90.10	180.90	12,534.5	-5,503.6	-44.2	419,841.70	787,614.29	32° 9' 3.057 N	103° 24' 14.481 W
17,929.0	88.30	179.50	12,535.8	-5,598.6	-44.5	419,746.72	787,613.96	32° 9' 2.118 N	103° 24' 14.494 W
18,024.0	87.40	178.50	12,539.3	-5,693.5	-42.9	419,651.80	787,615.61	32° 9' 1.178 N	103° 24' 14.485 W
18,119.0	89.20	178.50	12,542.2	-5,788.4	-40.4	419,556.88	787,618.10	32° 9' 0.239 N	103° 24' 14.465 W
18,215.0	89.20	179.90	12,543.5	-5,884.4	-39.1	419,460.90	787,619.44	32° 8' 59.289 N	103° 24' 14.459 W
18,310.0	90.30	178.50	12,543.9	-5,979.4	-37.7	419,365.91	787,620.77	32° 8' 58.349 N	103° 24' 14.453 W
18,405.0	90.10	178.10	12,543.6	-6,074.3	-34.9	419,270.96	787,623.58	32° 8' 57.409 N	103° 24' 14.430 W
18,500.0	90.60	178.50	12,543.0	-6,169.3	-32.1	419,176.00	787,626.40	32° 8' 56.469 N	103° 24' 14.407 W
18,595.0	90.60	178.80	12,542.0	-6,264.3	-29.9	419,081.03	787,628.64	32° 8' 55.529 N	103° 24' 14.390 W
18,691.0	90.60	179.50	12,541.0	-6,360.2	-28.4	418,985.05	787,630.06	32° 8' 54.579 N	103° 24' 14.384 W
18,786.0	90.10	179.20	12,540.4	-6,455.2	-27.4	418,890.06	787,631.14	32° 8' 53.639 N	103° 24' 14.381 W
18,881.0	89.40	179.20	12,540.8	-6,550.2	-26.0	418,795.07	787,632.47	32° 8' 52.699 N	103° 24' 14.375 W
18,976.0	90.10	179.20	12,541.3	-6,645.2	-24.7	418,700.08	787,633.80	32° 8' 51.759 N	103° 24' 14.369 W
19,072.0	91.50	179.20	12,539.9	-6,741.2	-23.4	418,604.10	787,635.14	32° 8' 50.809 N	103° 24' 14.363 W
19,167.0	92.60	180.20	12,536.5	-6,836.1	-22.9	418,509.17	787,635.63	32° 8' 49.870 N	103° 24' 14.367 W
19,262.0	92.40	180.20	12,532.4	-6,931.0	-23.2	418,414.26	787,635.30	32° 8' 48.931 N	103° 24' 14.380 W
19,357.0	92.70	180.90	12,528.1	-7,025.9	-24.1	418,319.36	787,634.39	32° 8' 47.992 N	103° 24' 14.400 W
19,453.0	90.80	181.30	12,525.2	-7,121.9	-25.9	418,223.42	787,632.55	32° 8' 47.043 N	103° 24' 14.431 W
19,548.0	91.00	180.90	12,523.7	-7,216.8	-27.8	418,128.45	787,630.72	32° 8' 46.103 N	103° 24' 14.462 W
19,693.0	91.00	180.90	12,521.2	-7,361.8	-30.0	417,983.49	787,628.45	32° 8' 44.669 N	103° 24' 14.503 W

TD @ 19693' MD / 12521' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
12,324.0	12,288.3	-104.0	107.7	Crossed 330' Hardline @ 12324' MD / 12288' TVD
19,693.0	12,521.2	-7,361.8	-30.0	TD @ 19693' MD / 12521' TVD

Checked By: _____ Approved By: _____ Date: _____

Stove Pipe Federal Com #2H

30-025-42926

Sec 6-T25S-R35E

<u>Perfs</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
1	2520	199091	257796
2	3024	197889	211932
3	3024	198825	217392
4	3024	200250	261828
5	3066	200712	214872
6	3024	200291	218526
7	3024	200511	219576
8	3024	199948	216720
9	3024	200087	215754
10	3024	201221	217938
11	3024	201144	216552
12	3024	198897	213402
13	3024	198697	213108
14	3024	200475	214032
15	3024	200205	216972
16	3024	200907	214158
17	3024	200972	213108
18	3024	199591	252756
19	3024	199151	214914
20	2982	200778	214956
21	3276	200021	216090
22	3024	199758	213108
23	3024	199592	210882
24	3024	199015	212226
25	3024	300604	297654
26	3024	299570	295008
27	3024	300280	296898
28	3024	300124	445200
29	3024	300460	297444
30	3024	300416	297906
31	3024	299448	295680
32	3024	300870	296142
33	3024	298867	297612
34	2520	303006	293496
35	2520	301705	286902
36	2520	298217	292068
37	2520	300482	294462
38	2520	300395	295764
39	2520	300485	297696
40	2520	301063	292362
41	2520	300664	297444
42	2520	300954	291186
43	2520	301521	294210
44	2478	300370	295386
45	2520	301417	294672
46	2520	300520	311052
47	3024	299746	336294
48	1512	301313	293664
49	2772	300075	292068
50	3024	299038	292320
51	3024	300450	291606
52	3024	299482	292362
53	3024	299957	293244
Totals	151,662	13,509,527	14,036,400

Data	(entered date to be carried to each stage)		
Pressure test	5/11/2016		
Well	9500		
Name/number	Stove Pipe Fed Com #2H		
Casing 1 size	7	4 1/2	Casing 2 size
Capacity-bbls/lin. ft.	0.0371	0.0149	Capacity-bbls/lin. ft.
Top of Casing	0	11852	Top of Casing
TD of casing	11,852	19,611	TD of casing
TVD	12540		
AFE	6625		
Shallowest Plug	12,917		

Fluid Database

1	Treated Water
2	7.5 % Acid
3	AquaSim UR
4	Water Frac G-R(11)
5	Hybor G-R(15)
6	Water Frac G-R(15)
7	Hybor-R(11)
8	22 % Acid
9	15 % Acid
10	Water Frac R-5
11	Water Frac R-9
12	

Proppant Database

1	100 Mesh
2	40/70 CRC-P
3	
4	
5	
6	
7	
8	

Chemical Database

1	DCA
2	CL-28
3	CL-31
4	MO-67
5	Clay Web
6	FDP
7	Scaletrol
8	Sp Breaker
9	Optikleen-WF
10	Optiflo

	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
From Bottom to Top	19,536	50	14	19,435	51	14	19,335	50	14	19,232	56	14	19,133	51	14
	19,485		10	19,385		10	19,288		10	19,184		10	19,083		10
	Plug to Plug	95	24	Plug to Plug	106	24	Plug to Plug	97	24	Plug to Plug	95	24	Plug to Plug	106	24
	Frac Plug	19,557	Total Shots	Frac Plug	19,462	Total Shots	Frac Plug	19,356	Total Shots	Frac Plug	19,259	Total Shots	Frac Plug	19,164	Total Shots

	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
From Bottom to Top	19,033	50	14	18,928	54	14	18,831	51	14	18,731	50	14	18,630	52	14
	18,982		10	18,882		10	18,781		10	18,682		10	18,580		10
	Plug to Plug	101	24	Plug to Plug	101	24	Plug to Plug	102	24	Plug to Plug	99	24	Plug to Plug	97	24
	Frac Plug	19,058	Total Shots	Frac Plug	18,957	Total Shots	Frac Plug	18,858	Total Shots	Frac Plug	18,754	Total Shots	Frac Plug	18,655	Total Shots

	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
From Bottom to Top	18,529	51	14	18,429	50	14	18,326	54	14	18,227	51	14	18,127	50	14
	18,479		10	18,380		10	18,278		10	18,177		10	18,077		10
	Plug to Plug	101	24	Plug to Plug	104	24	Plug to Plug	98	24	Plug to Plug	103	24	Plug to Plug	101	24
	Frac Plug	18,558	Total Shots	Frac Plug	18,457	Total Shots	Frac Plug	18,353	Total Shots	Frac Plug	18,255	Total Shots	Frac Plug	18,152	Total Shots

	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
From Bottom to Top	18,021	56	14	17,925	51	14	17,825	50	14	17,721	58	14	17,623	51	14
	17,976		10	17,875		10	17,779		10	17,674		10	17,573		10
	Plug to Plug	101	24	Plug to Plug	100	24	Plug to Plug	101	24	Plug to Plug	101	24	Plug to Plug	100	24
	Frac Plug	18,051	Total Shots	Frac Plug	17,950	Total Shots	Frac Plug	17,850	Total Shots	Frac Plug	17,749	Total Shots	Frac Plug	17,648	Total Shots

	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
From Bottom to Top	17,524	49	14	17,422	49	14	17,321	51	14	17,221	50	14	17,120	50	14
	17,471		10	17,372		10	17,271		10	17,170		10	17,070	55	12
													17,015		10
	Plug to Plug	101	24	Plug to Plug	111	24	Plug to Plug	90	24	Plug to Plug	101	24	Plug to Plug	151	36
	Frac Plug	17,548	Total Shots	Frac Plug	17,447	Total Shots	Frac Plug	17,338	Total Shots	Frac Plug	17,248	Total Shots	Frac Plug	17,145	Total Shots

	Stage 26	Distance Between Perfs	Shots	Stage 27	Distance Between Perfs	Shots	Stage 28	Distance Between Perfs	Shots	Stage 29	Distance Between Perfs	Shots	Stage 30	Distance Between Perfs	Shots
From Bottom to Top	16,969	46	14	16,819	49	14	16,667	50	14	16,516	50	14	16,361	54	14
	16,919	51	12	16,768	51	12	16,617	51	12	16,466	51	12	16,314	50	12
	16,868		10	16,717		10	16,566		10	16,415		10	16,264		10
	Plug to Plug	151	36	Plug to Plug	161	36	Plug to Plug	138	36	Plug to Plug	156	36	Plug to Plug	151	36
	Frac Plug	16,994	Total Shots	Frac Plug	16,843	Total Shots	Frac Plug	16,692	Total Shots	Frac Plug	16,546	Total Shots	Frac Plug	16,390	Total Shots

	Stage 31	Distance Between Perfs	Shots	Stage 32	Distance Between Perfs	Shots	Stage 33	Distance Between Perfs	Shots	Stage 34	Distance Between Perfs	Shots	Stage 35	Distance Between Perfs	Shots
From Bottom to Top	16,210	54	14	16,063	50	14	15,912	50	14	15,761	50	14	15,610	50	14
	16,163	50	12	16,012	50	12	15,861	50	12	15,707	47	12	15,550	50	12
	16,113		10	15,962		10	15,811		10	15,660		10	15,509		10
	Plug to Plug	153	36	Plug to Plug	147	36	Plug to Plug	153	36	Plug to Plug	151	36	Plug to Plug	151	36
	Frac Plug	16,239	Total Shots	Frac Plug	16,086	Total Shots	Frac Plug	15,939	Total Shots	Frac Plug	15,786	Total Shots	Frac Plug	15,635	Total Shots

	Stage 36	Distance Between Perfs	Shots	Stage 37	Distance Between Perfs	Shots	Stage 38	Distance Between Perfs	Shots	Stage 39	Distance Between Perfs	Shots	Stage 40	Distance Between Perfs	Shots
From Bottom to Top	15,459	50	14	15,308	50	14	15,161	46	14	15,006	50	14	14,855	50	14
	15,408	50	12	15,257	50	12	15,108	50	12	14,955	50	12	14,808	55	12
	15,358		10	15,207		10	15,058		10	14,905		10	14,753		10
	Plug to Plug	160	36	Plug to Plug	142	36	Plug to Plug	151	36	Plug to Plug	151	36	Plug to Plug	151	36
	Frac Plug	15,484	Total Shots	Frac Plug	15,324	Total Shots	Frac Plug	15,182	Total Shots	Frac Plug	15,031	Total Shots	Frac Plug	14,880	Total Shots

	Stage 41	Distance Between Perfs	Shots	Stage 42	Distance Between Perfs	Shots	Stage 43	Distance Between Perfs	Shots	Stage 44	Distance Between Perfs	Shots	Stage 45	Distance Between Perfs	Shots
From Bottom to Top	14,704	49	14	14,553	50	14	14,400	53	14	14,251	50	14	14,096	54	14
	14,653	50	12	14,502	49	12	14,351	50	12	14,200	50	12	14,049	50	12
	14,603		10	14,453		10	14,301		10	14,150		10	13,999		10
	Plug to Plug	157	36	Plug to Plug	145	36	Plug to Plug	145	36	Plug to Plug	157	36	Plug to Plug	145	36
	Frac Plug	14,729	Total Shots	Frac Plug	14,572	Total Shots	Frac Plug	14,427	Total Shots	Frac Plug	14,282	Total Shots	Frac Plug	14,125	Total Shots

	Stage 46	Distance Between Perfs	Shots	Stage 47	Distance Between Perfs	Shots	Stage 48	Distance Between Perfs	Shots	Stage 49	Distance Between Perfs	Shots	Stage 50	Distance Between Perfs	Shots
From Bottom to Top	13,949	50	14	13,798	50	14	13,647	50	14	13,496	50	14	13,340	56	14
	13,898	50	12	13,742	45	12	13,596	50	12	13,445	49	12	13,294	50	12
	13,848		10	13,697		10	13,546		10	13,396		10	13,244		10
	Plug to Plug	157	36	Plug to Plug	151	36	Plug to Plug	156	36	Plug to Plug	146	36	Plug to Plug	151	36
	Frac Plug	13,880	Total Shots	Frac Plug	13,823	Total Shots	Frac Plug	13,672	Total Shots	Frac Plug	13,516	Total Shots	Frac Plug	13,370	Total Shots

	Stage 51	Distance Between Perfs	Shots	Stage 52	Distance Between Perfs	Shots	Stage 53	Distance Between Perfs	Shots						
From Bottom to Top	13,194	50	14	13,043	50	14	12,892	48	14						
	13,143	50	12	12,994	54	12	12,841	50	12						
	13,093		10	12,940		10	12,791		10						
	Plug to Plug	153	36	Plug to Plug	149	36	Plug to Plug	151	36						
	Frac Plug	13,219	Total Shots	Frac Plug	13,066	Total Shots	Frac Plug	12,917	Total Shots						