

EIDER FEDERAL #2H

30-025-41813

Sec 26-T24S-R32E

HOBBS OCD

MAY 04 2016

RECEIVED

<u>Perfs</u>	<u>7 1/2%(Gal)</u>	<u>Sand(#)</u>	<u>Fluid(Gal)</u>
1	4032	312353	379176
2	3024	309675	345450
3	3024	308993	338058
4	3066	311861	345786
5	3024	310880	340158
6	3024	309119	335580
7	3024	313757	336000
8	3024	309289	340830
9	3024	358047	367206
10	3024	308978	330876
11	3024	310491	331002
12	3024	311846	339318
13	3066	311268	338352
14	3024	310312	331968
15	3024	309982	322644
16	3024	309961	324996
17	3024	310381	319326
18	3012	311441	325866
19	3012	310396	321624
20	3012	311033	323820
21	3024	310967	318738
22	3024	311941	319074
23	3024	311351	321510
24	2982	310479	320418
25	3012	311079	328218
26	3024	310193	320124
27	3024	310820	313782
28	3024	311162	316554
29	3024	311176	320376
30	2982	311061	321552
31	3012	310786	321204
32	3024	310787	315126
33	3024	310454	314370
34	3024	311296	319452
35	2982	310716	315168
36	3024	310725	314916
37	2982	311700	316050
38	3024	310780	312648
39	3024	310087	314790
40	3024	311337	311220
41	3066	311125	312438
42	2982	310829	312270
43	3024	309829	313320
44	3024	310429	312102
45	4494	309954	327684
46	3024	310176	312270
47	2478	310253	308826
48	3024	311331	314538
49	3276	326128	318990
Totals	150215	15289014	15925763

MAY 10 2016

(entered data to be carried to each stage)										Fluid Database			Proppant Database			Chemical Database		
Date		2/3/2016						1		Treated Water				1		FR-66		
Pressure test		9500						2		7.5 % Acid				2		BC-140 X2		
Well Name/number		Elder Fed. #2H						3		Slickwater				3		MO-87		
Casing 1 size		5 1/2		Casing 2 size				4		Water Frac G -R(11)				4		BE-9W		
Capacity-bbls/lin. ft.		0.0232		Capacity-bbls/lin. ft.				5		SilverStim LT -R(11)				5		Clay Web-2		
Top of Casing		0		Top of Casing				6						6		Losurf-360W		
TD of casing		20,720		TD of casing				7						7		Scaletrol		
TVD		10901						8						8		N-Zyme 3 Breaker		
AFE		4762						9						9		Optiflo H TE		
Shallowest Plug		11,253						10						10		Optikleen-WF		
								11										
								12										
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			
	20,620	65	14	20,424	65	14	20,228	66	14	20,033	65	14	19,839	63	14			
	20,555	66	12	20,359	65	12	20,163	65	12	19,967	65	12	19,771	61	12			
	20,489		10	20,284		10	20,088		10	19,902		10	19,710		10			
	Plug to Plug	179	36	Plug to Plug	207	36	Plug to Plug	185	36	Plug to Plug	199	36	Plug to Plug	192	36			
	Frac Plug	20,638	Total Shots	Frac Plug	20,457	Total Shots	Frac Plug	20,260	Total Shots	Frac Plug	20,065	Total Shots	Frac Plug	19,866	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			
	19,841	69	14	19,442	68	14	19,249	66	14	19,053	66	14	18,858	65	14			
	19,577	67	12	19,380	65	12	19,184	65	12	18,988	65	12	18,792	62	12			
	19,510		10	19,316		10	19,119		10	18,923		10	18,730		10			
	Plug to Plug	200	36	Plug to Plug	186	36	Plug to Plug	202	36	Plug to Plug	205	36	Plug to Plug	187	36			
	Frac Plug	19,874	Total Shots	Frac Plug	19,474	Total Shots	Frac Plug	19,288	Total Shots	Frac Plug	19,088	Total Shots	Frac Plug	18,881	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		
18,862		68	14	18,470	61	14	18,270	60	14	18,077	63	14	17,878	63	14			
18,599		68	12	18,401	71	12	18,207	67	12	18,009	68	12	17,811	63	12			
18,531			10	18,330		10	18,140		10	17,941		10	17,748		10			
Plug to Plug		197	36	Plug to Plug	194	36	Plug to Plug	197	36	Plug to Plug	193	36	Plug to Plug	198	36			
Frac Plug		18,694	Total Shots	Frac Plug	18,497	Total Shots	Frac Plug	18,303	Total Shots	Frac Plug	18,106	Total Shots	Frac Plug	17,913	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		
	17,883	65	14	17,480	63	14	17,291	65	14	17,094	66	14	16,899	63	14			
	17,017	65	12	17,422	66	12	17,223	63	12	17,030	66	12	16,838	69	12			
	17,552		10	17,358		10	17,160		10	16,962		10	16,769		10			
	Plug to Plug	200	36	Plug to Plug	188	36	Plug to Plug	199	36	Plug to Plug	194	36	Plug to Plug	198	36			
	Frac Plug	17,715	Total Shots	Frac Plug	17,515	Total Shots	Frac Plug	17,327	Total Shots	Frac Plug	17,128	Total Shots	Frac Plug	16,934	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		
16,708		61	14	16,508	61	14	16,312	65	14	16,113	68	14	15,920	66	14			
16,638		69	12	16,441	64	12	16,247	66	12	16,051	65	12	15,855	61	12			
16,569			10	16,377		10	16,181		10	15,986		10	15,794		10			
Plug to Plug		194	36	Plug to Plug	197	36	Plug to Plug	196	36	Plug to Plug	203	36	Plug to Plug	189	36			
Frac Plug		16,736	Total Shots	Frac Plug	16,542	Total Shots	Frac Plug	16,345	Total Shots	Frac Plug	16,149	Total Shots	Frac Plug	15,946	Total Shots			
From Bottom to Top		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		
	15,724	70	14	15,525	69	14	15,333	65	14	15,137	65	14	14,941	65	14			
	15,650	62	12	15,463	65	12	15,268	66	12	15,072	66	12	14,877	66	12			
	15,594		10	15,398		10	15,202		10	15,006		10	14,811		10			
	Plug to Plug	196	36	Plug to Plug	193	36	Plug to Plug	198	36	Plug to Plug	196	36	Plug to Plug	198	36			
	Frac Plug	15,757	Total Shots	Frac Plug	15,561	Total Shots	Frac Plug	15,368	Total Shots	Frac Plug	15,170	Total Shots	Frac Plug	14,974	Total Shots			
	From Bottom to Top	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		
14,747		64	14	14,550	69	14	14,354	65	14	14,159	70	14	13,962	69	14			
14,680		61	12	14,484	65	12	14,288	65	12	14,093	62	12	13,892	60	12			
14,619			10	14,419		10	14,223		10	14,031		10	13,832		10			
Plug to Plug		192	36	Plug to Plug	198	36	Plug to Plug	198	36	Plug to Plug	193	36	Plug to Plug	196	36			
Frac Plug		14,778	Total Shots	Frac Plug	14,584	Total Shots	Frac Plug	14,386	Total Shots	Frac Plug	14,188	Total Shots	Frac Plug	13,995	Total Shots			
From Bottom to Top		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		
	13,765	67	14	13,570	66	14	13,375	65	14	13,178	66	14	12,983	65	14			
	13,701	65	12	13,505	65	12	13,313	69	12	13,113	65	12	12,918	66	12			
	13,638		10	13,440		10	13,244		10	13,048		10	12,852		10			
	Plug to Plug	193	36	Plug to Plug	199	36	Plug to Plug	198	36	Plug to Plug	187	36	Plug to Plug	202	36			
	Frac Plug	13,799	Total Shots	Frac Plug	13,606	Total Shots	Frac Plug	13,407	Total Shots	Frac Plug	13,211	Total Shots	Frac Plug	13,024	Total Shots			
	From Bottom to Top	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		
12,787		65	14	12,591	66	14	12,395	66	14	12,200	60	14	11,980	89	14			
12,720		63	12	12,626	65	12	12,330	70	12	12,131	62	12	11,925	53	12			
12,657			10	12,461		10	12,260		10	12,069		10	11,872		10			
Plug to Plug		198	36	Plug to Plug	204	36	Plug to Plug	188	36	Plug to Plug	232	36	Plug to Plug	156	36			
Frac Plug		12,822	Total Shots	Frac Plug	12,624	Total Shots	Frac Plug	12,420	Total Shots	Frac Plug	12,232	Total Shots	Frac Plug	12,000	Total Shots			
From Bottom to Top		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		
	11,808	64	14	11,612	65	14	11,416	66	14	11,221	65	14		11090				
	11,743	66	12	11,547	65	12	11,351	65	12	11,155	65	12						
	11,677		10	11,482		10	11,286		10	11,090		10						
	Plug to Plug	199	36	Plug to Plug	188	36	Plug to Plug	204	36	Plug to Plug	163	36	Plug to Plug	0				
	Frac Plug	11,844	Total Shots	Frac Plug	11,645	Total Shots	Frac Plug	11,437	Total Shots	Frac Plug	11,283	Total Shots	Frac Plug		0			



August 25, 2015

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

Attn: Kanicia Castillo

RE: **Eider Federal No 002H**

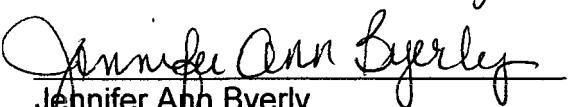
Please find enclosed a copy of the survey from 0' to 10,200' ran on the above referenced well.

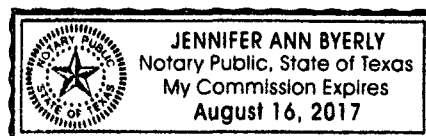
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 25 day of August,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho

Lease/Well: Eider Federal No/002H

Rig Name: Ensign 772

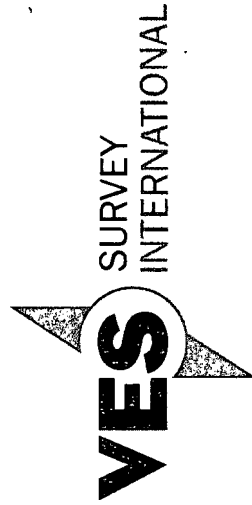
State/County: New Mexico/Lea

VS-Azi: 0.00 Degrees

Latitude: 32.16723, Longitude: -103.64225

Grid North = True North -0.37 degs (NAD 27)

Grid Correction Applied = -0.37 degs



Depth Reference : RKB = 31 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: eider federal 2h_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 8/25/2015 / 10:33

VES Survey International
Midland, TX

(432) 563-5444

Surveyor: Gene Heiss

Eider Federal No 002H / API 30-025-41813

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	0.34	161.66	100.00	-0.28	0.09	-0.28	0.30	161.66	0.34
200.00	0.37	156.69	200.00	-0.86	0.32	-0.86	0.92	159.92	0.04
300.00	0.41	169.47	300.00	-1.51	0.51	-1.51	1.60	161.42	0.10
400.00	0.87	160.01	399.99	-2.58	0.83	-2.58	2.71	162.10	0.46
500.00	0.48	152.53	499.98	-3.66	1.28	-3.66	3.88	160.67	0.40
600.00	0.78	163.99	599.98	-4.68	1.66	-4.68	4.97	160.44	0.32
700.00	1.04	176.88	699.96	-6.24	1.90	-6.24	6.52	163.06	0.33
800.00	1.08	182.48	799.95	-8.08	1.91	-8.08	8.31	166.72	0.11
900.00	1.56	194.84	899.92	-10.34	1.52	-10.34	10.45	171.65	0.56
1000.00	1.73	201.68	999.88	-13.06	0.61	-13.06	13.07	177.31	0.26
1100.00	1.77	196.02	1099.83	-15.94	-0.37	-15.94	15.95	181.33	0.18
1200.00	1.98	214.34	1199.78	-18.86	-1.77	-18.86	18.94	185.37	0.63
1300.00	1.60	192.39	1299.73	-21.64	-3.05	-21.64	21.86	188.01	0.78
1400.00	1.44	175.84	1399.70	-24.26	-3.25	-24.26	24.48	187.64	0.46
1500.00	1.67	181.39	1499.66	-26.97	-3.20	-26.97	27.15	186.76	0.27
1600.00	1.56	173.09	1599.62	-29.77	-3.07	-29.77	29.93	185.89	0.26

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	0.59	150.09	1699.60	-31.57	-2.65	-31.57	31.68	184.80	1.04
1800.00	0.52	126.18	1799.60	-32.28	-2.03	-32.28	32.35	183.59	0.24
1900.00	0.65	116.45	1899.59	-32.80	-1.15	-32.80	32.82	182.01	0.17
2000.00	0.67	142.03	1999.59	-33.52	-0.28	-33.52	33.52	180.48	0.29
2100.00	0.93	161.41	2099.58	-34.75	0.34	-34.75	34.75	179.44	0.37
2200.00	1.13	158.51	2199.56	-36.44	0.96	-36.44	36.45	178.49	0.21
2300.00	1.04	147.53	2299.54	-38.13	1.81	-38.13	38.17	177.28	0.23
2400.00	1.57	141.80	2399.52	-39.97	3.15	-39.97	40.10	175.50	0.54
2500.00	1.61	143.52	2499.48	-42.18	4.83	-42.18	42.46	173.47	0.06
2600.00	1.11	162.67	2599.45	-44.23	5.95	-44.23	44.63	172.34	0.67
2700.00	1.14	153.90	2699.43	-46.04	6.68	-46.04	46.52	171.75	0.17
2800.00	1.06	128.37	2799.41	-47.51	7.84	-47.51	48.15	170.63	0.49
2900.00	1.27	156.60	2899.39	-49.10	9.01	-49.10	49.92	169.61	0.60
3000.00	1.47	135.40	2999.36	-51.03	10.35	-51.03	52.07	168.54	0.54
3100.00	0.39	142.40	3099.35	-52.21	11.45	-52.21	53.46	167.63	1.08
3200.00	0.30	139.57	3199.35	-52.69	11.84	-52.69	54.00	167.34	0.09
3300.00	0.37	132.13	3299.35	-53.11	12.25	-53.11	54.50	167.01	0.08
3400.00	0.62	121.59	3399.34	-53.61	12.95	-53.61	55.15	166.42	0.26
3500.00	0.47	114.38	3499.34	-54.06	13.78	-54.06	55.79	165.70	0.16
3600.00	0.59	114.77	3599.33	-54.44	14.62	-54.44	56.37	164.97	0.12
3700.00	0.91	103.74	3699.32	-54.85	15.86	-54.85	57.09	163.88	0.35
3800.00	1.09	110.84	3799.31	-55.37	17.51	-55.37	58.08	162.45	0.22
3900.00	1.17	109.95	3899.29	-56.06	19.36	-56.06	59.31	160.94	0.08
4000.00	1.29	84.79	3999.27	-56.30	21.44	-56.30	60.25	159.15	0.55
4100.00	1.17	81.23	4099.24	-56.05	23.57	-56.05	60.80	157.19	0.14
4200.00	1.74	98.86	4199.21	-56.12	26.08	-56.12	61.89	155.08	0.71
4300.00	1.33	106.38	4299.18	-56.68	28.69	-56.68	63.53	153.16	0.46
4400.00	0.86	111.85	4399.16	-57.29	30.49	-57.29	64.90	151.97	0.48
4500.00	1.49	123.58	4499.14	-58.29	32.27	-58.29	66.63	151.03	0.67
4600.00	1.21	134.61	4599.11	-59.75	34.11	-59.75	68.80	150.28	0.37
4700.00	1.27	125.49	4699.09	-61.13	35.76	-61.13	70.83	149.67	0.20
4800.00	1.36	112.80	4799.06	-62.24	37.76	-62.24	72.79	148.76	0.30
4900.00	1.41	120.20	4899.03	-63.31	39.91	-63.31	74.84	147.77	0.18
5000.00	1.17	107.95	4999.01	-64.25	41.94	-64.25	76.73	146.86	0.36
5100.00	1.01	108.69	5098.99	-64.84	43.75	-64.84	78.22	145.99	0.16
5200.00	1.27	129.77	5198.97	-65.83	45.43	-65.83	79.99	145.39	0.49
5300.00	1.15	124.70	5298.95	-67.12	47.11	-67.12	82.00	144.93	0.16
5400.00	0.82	147.02	5398.93	-68.29	48.33	-68.29	83.66	144.71	0.50
5500.00	0.38	139.15	5498.93	-69.15	48.94	-69.15	84.71	144.71	0.45

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5600.00	0.72	138.67	5598.92	-69.86	49.56	-69.86	85.66	144.65	0.34
5700.00	0.90	126.16	5698.91	-70.80	50.61	-70.80	87.03	144.44	0.26
5800.00	0.73	112.84	5798.90	-71.51	51.84	-71.51	88.32	144.06	0.26
5900.00	0.72	116.17	5898.89	-72.03	52.99	-72.03	89.42	143.66	0.04
6000.00	0.68	117.45	5998.89	-72.59	54.08	-72.59	90.52	143.31	0.05
6100.00	0.58	114.72	6098.88	-73.07	55.07	-73.07	91.50	143.00	0.10
6200.00	0.33	108.38	6198.88	-73.38	55.81	-73.38	92.19	142.74	0.26
6300.00	0.52	102.68	6298.87	-73.57	56.53	-73.57	92.78	142.46	0.20
6400.00	0.20	123.53	6398.87	-73.76	57.12	-73.76	93.29	142.25	0.35
6500.00	0.57	95.48	6498.87	-73.90	57.76	-73.90	93.80	141.99	0.41
6600.00	0.30	105.52	6598.87	-74.02	58.51	-74.02	94.35	141.68	0.29
6700.00	0.28	118.65	6698.86	-74.21	58.97	-74.21	94.79	141.53	0.07
6800.00	0.05	121.81	6798.86	-74.35	59.23	-74.35	95.06	141.46	0.23
6900.00	0.29	140.49	6898.86	-74.57	59.43	-74.57	95.35	141.45	0.24
7000.00	0.49	172.52	6998.86	-75.19	59.64	-75.19	95.97	141.58	0.29
7100.00	0.20	187.15	7098.86	-75.79	59.68	-75.79	96.46	141.78	0.30
7200.00	0.32	180.67	7198.86	-76.24	59.65	-76.24	96.81	141.96	0.12
7300.00	0.57	162.64	7298.85	-77.00	59.80	-77.00	97.49	142.17	0.29
7400.00	0.86	171.01	7398.85	-78.22	60.07	-78.22	98.62	142.48	0.31
7500.00	0.57	158.72	7498.84	-79.43	60.37	-79.43	99.77	142.77	0.33
7600.00	0.56	106.72	7598.83	-80.04	61.01	-80.04	100.64	142.68	0.49
7700.00	0.43	130.35	7698.83	-80.42	61.76	-80.42	101.40	142.48	0.24
7800.00	0.52	108.73	7798.83	-80.81	62.48	-80.81	102.15	142.29	0.20
7900.00	0.57	127.29	7898.82	-81.26	63.31	-81.26	103.01	142.08	0.18
8000.00	0.46	165.67	7998.82	-81.95	63.81	-81.95	103.86	142.09	0.35
8100.00	0.60	198.01	8098.82	-82.83	63.74	-82.83	104.52	142.42	0.33
8200.00	0.70	167.73	8198.81	-83.93	63.71	-83.93	105.37	142.80	0.35
8300.00	0.74	189.11	8298.80	-85.16	63.74	-85.16	106.37	143.19	0.27
8400.00	1.24	222.64	8398.79	-86.59	62.90	-86.59	107.03	144.00	0.75
8500.00	1.00	188.84	8498.77	-88.25	62.04	-88.25	107.87	144.89	0.69
8600.00	0.81	198.81	8598.76	-89.78	61.67	-89.78	108.92	145.51	0.25
8700.00	1.16	180.39	8698.74	-91.46	61.44	-91.46	110.18	146.11	0.47
8800.00	1.21	177.41	8798.72	-93.53	61.48	-93.53	111.92	146.68	0.08
8900.00	0.59	190.42	8898.71	-95.09	61.44	-95.09	113.21	147.13	0.65
9000.00	0.48	248.63	8998.70	-95.75	60.95	-95.75	113.50	147.52	0.53
9100.00	0.59	269.82	9098.70	-95.90	60.05	-95.90	113.15	147.95	0.22
9200.00	0.87	266.46	9198.69	-95.95	58.78	-95.95	112.52	148.51	0.29
9300.00	0.64	275.38	9298.68	-95.94	57.47	-95.94	111.84	149.08	0.26
9400.00	0.83	307.69	9398.68	-95.45	56.34	-95.45	110.84	149.45	0.45

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	0.47	350.95	9498.67	-94.60	55.71	-94.60	109.78	149.51	0.58
9600.00	0.93	67.89	9598.66	-93.89	56.39	-93.89	109.52	149.01	0.94
9700.00	1.46	60.95	9698.64	-92.97	58.26	-92.97	109.71	147.93	0.55
9800.00	1.48	73.95	9798.61	-91.99	60.61	-91.99	110.16	146.62	0.33
9900.00	0.55	98.96	9898.59	-91.71	62.33	-91.71	110.88	145.80	1.01
10000.00	0.51	105.69	9998.59	-91.90	63.23	-91.90	111.55	145.47	0.07
10100.00	0.67	128.39	10098.58	-92.39	64.11	-92.39	112.45	145.24	0.28
10200.00	0.79	121.97	10198.57	-93.11	65.15	-93.11	113.64	145.02	0.15



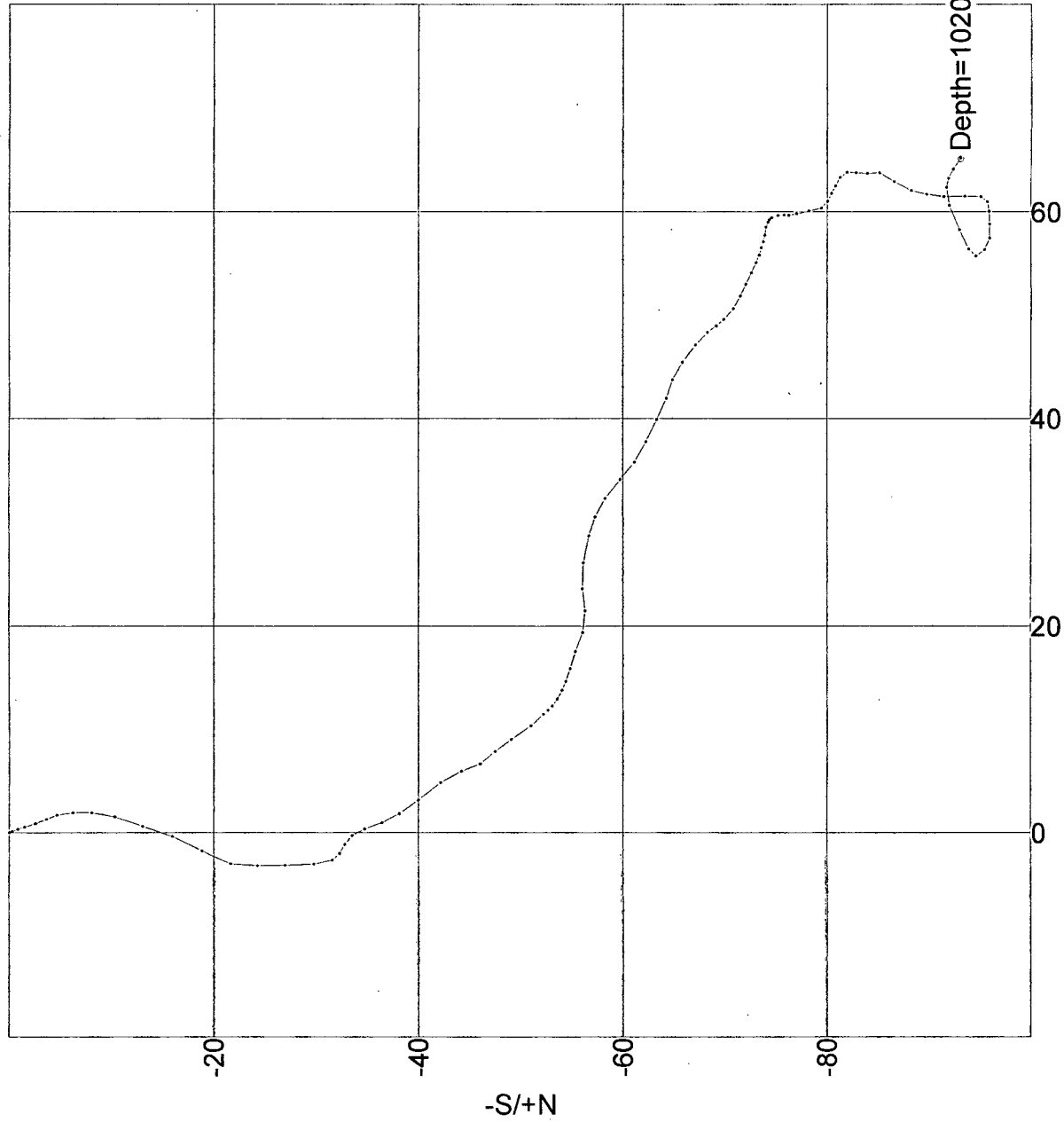
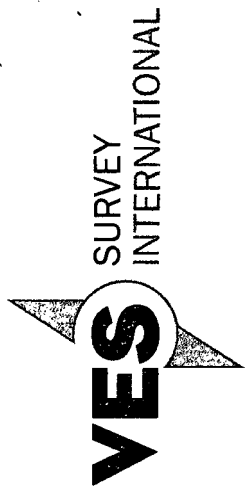
VES Survey International

Midland, TX

(432) 563-5444

Surveyor: Gene Heiss

Eider Federal No 002H / API 30-025-41813



-W/+E

VES Survey Date: 8/19/2015



I Gene Heiss certify that I am employed by Vaughn Energy Services. That I did on the day(s) of 08/19/15 through 08/19/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0 feet to a depth of 10200 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 Eider Federal No Well # 002H API # 30-025-41813 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 dark ink, appearing to be "Gene Heiss", written over a horizontal line.

Gene Heiss
Service Technician
Vaughn Energy Services

HOBBS OCD

MAY 04 2016

RECEIVED

COG Operating, LLC

Lea County, NM
Sec 35, T24S, R32E
Eider Federal #2H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

10 September, 2015



HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35, T24S, R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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 35, T24S, R32E				
Site Position:		Northing:	425,247.30 usft	Latitude:	32° 10' 2.043 N	
From:	Map	Easting:	713,845.80 usft	Longitude:	103° 38' 32.087 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	Eider Federal #2H					
Well Position	+N/-S	0.0 usft	Northing:	425,247.30 usft	Latitude:	32° 10' 2.043 N
	+E/-W	0.0 usft	Easting:	713,845.80 usft	Longitude:	103° 38' 32.087 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,577.0 usft	

Wellbore:	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/10/2015	7.19	60.02	48,095

Design:	Wellbore #1
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.71

Survey Program		Date: 9/10/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,200.0	GYRO (Wellbore #1)	MWD default	MWD - Standard
10,302.0	20,769.0	MWD (Wellbore #1)	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	425,247.30	713,845.80	32° 10' 2.043 N	103° 38' 32.087 W
	100.0	0.34	161.66	100.0	-0.3	0.1	425,247.02	713,845.89	32° 10' 2.040 N	103° 38' 32.086 W
	200.0	0.37	156.69	200.0	-0.9	0.3	425,246.44	713,846.11	32° 10' 2.035 N	103° 38' 32.083 W
	300.0	0.41	169.47	300.0	-1.5	0.5	425,245.79	713,846.30	32° 10' 2.028 N	103° 38' 32.081 W
	400.0	0.87	160.01	400.0	-2.6	0.8	425,244.73	713,846.63	32° 10' 2.018 N	103° 38' 32.078 W
	500.0	0.48	152.53	500.0	-3.7	1.3	425,243.64	713,847.08	32° 10' 2.007 N	103° 38' 32.072 W
	600.0	0.78	163.99	600.0	-4.7	1.7	425,242.62	713,847.46	32° 10' 1.997 N	103° 38' 32.068 W
	700.0	1.04	176.88	700.0	-6.2	1.9	425,241.05	713,847.70	32° 10' 1.981 N	103° 38' 32.065 W
	800.0	1.08	182.48	799.9	-8.1	1.9	425,239.21	713,847.71	32° 10' 1.963 N	103° 38' 32.065 W
	900.0	1.56	194.84	899.9	-10.3	1.5	425,236.95	713,847.32	32° 10' 1.941 N	103° 38' 32.070 W
	1,000.0	1.73	201.68	999.9	-13.1	0.6	425,234.23	713,846.41	32° 10' 1.914 N	103° 38' 32.081 W

HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35, T24S, R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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	1.77	196.02	1,099.8	-16.0	-0.4	425,231.34	713,845.43	32° 10' 1.885 N	103° 38' 32.092 W
1,200.0	1.98	214.34	1,199.8	-18.9	-1.8	425,228.43	713,844.03	32° 10' 1.857 N	103° 38' 32.109 W
1,300.0	1.60	192.39	1,299.7	-21.7	-3.0	425,225.64	713,842.75	32° 10' 1.829 N	103° 38' 32.124 W
1,400.0	1.44	175.84	1,399.7	-24.3	-3.3	425,223.03	713,842.55	32° 10' 1.803 N	103° 38' 32.127 W
1,500.0	1.67	181.39	1,499.7	-27.0	-3.2	425,220.32	713,842.60	32° 10' 1.776 N	103° 38' 32.126 W
1,600.0	1.56	173.09	1,599.6	-29.8	-3.1	425,217.51	713,842.73	32° 10' 1.748 N	103° 38' 32.125 W
1,700.0	0.59	150.09	1,699.6	-31.6	-2.6	425,215.71	713,843.15	32° 10' 1.731 N	103° 38' 32.120 W
1,800.0	0.52	126.18	1,799.6	-32.3	-2.0	425,215.00	713,843.77	32° 10' 1.724 N	103° 38' 32.113 W
1,900.0	0.65	116.45	1,899.6	-32.8	-1.1	425,214.48	713,844.65	32° 10' 1.718 N	103° 38' 32.103 W
2,000.0	0.67	142.03	1,999.6	-33.5	-0.3	425,213.76	713,845.51	32° 10' 1.711 N	103° 38' 32.093 W
2,100.0	0.93	161.41	2,099.6	-34.8	0.3	425,212.53	713,846.13	32° 10' 1.699 N	103° 38' 32.086 W
2,200.0	1.13	158.51	2,199.6	-36.5	1.0	425,210.85	713,846.75	32° 10' 1.682 N	103° 38' 32.079 W
2,300.0	1.04	147.53	2,299.5	-38.1	1.8	425,209.16	713,847.60	32° 10' 1.666 N	103° 38' 32.069 W
2,400.0	1.57	141.80	2,399.5	-40.0	3.1	425,207.32	713,848.94	32° 10' 1.647 N	103° 38' 32.053 W
2,500.0	1.61	143.52	2,499.5	-42.2	4.8	425,205.11	713,850.62	32° 10' 1.625 N	103° 38' 32.034 W
2,600.0	1.11	162.67	2,599.4	-44.2	5.9	425,203.06	713,851.74	32° 10' 1.605 N	103° 38' 32.021 W
2,700.0	1.14	153.90	2,699.4	-46.1	6.7	425,201.24	713,852.47	32° 10' 1.587 N	103° 38' 32.013 W
2,800.0	1.06	128.37	2,799.4	-47.5	7.8	425,199.77	713,853.63	32° 10' 1.572 N	103° 38' 31.999 W
2,900.0	1.27	156.60	2,899.4	-49.1	9.0	425,198.18	713,854.80	32° 10' 1.556 N	103° 38' 31.986 W
3,000.0	1.47	135.40	2,999.4	-51.0	10.3	425,196.25	713,856.14	32° 10' 1.537 N	103° 38' 31.971 W
3,100.0	0.39	142.40	3,099.3	-52.2	11.4	425,195.07	713,857.25	32° 10' 1.526 N	103° 38' 31.958 W
3,200.0	0.30	139.57	3,199.3	-52.7	11.8	425,194.60	713,857.62	32° 10' 1.521 N	103° 38' 31.953 W
3,300.0	0.37	132.13	3,299.3	-53.1	12.2	425,194.19	713,858.03	32° 10' 1.517 N	103° 38' 31.949 W
3,400.0	0.62	121.59	3,399.3	-53.6	12.9	425,193.69	713,858.73	32° 10' 1.512 N	103° 38' 31.941 W
3,500.0	0.47	114.38	3,499.3	-54.1	13.8	425,193.23	713,859.57	32° 10' 1.507 N	103° 38' 31.931 W
3,600.0	0.59	114.77	3,599.3	-54.5	14.6	425,192.85	713,860.41	32° 10' 1.503 N	103° 38' 31.921 W
3,700.0	0.91	103.74	3,699.3	-54.9	15.9	425,192.44	713,861.65	32° 10' 1.499 N	103° 38' 31.907 W
3,800.0	1.09	110.84	3,799.3	-55.4	17.5	425,191.92	713,863.31	32° 10' 1.494 N	103° 38' 31.887 W
3,900.0	1.17	109.95	3,899.3	-56.1	19.4	425,191.23	713,865.16	32° 10' 1.487 N	103° 38' 31.866 W
4,000.0	1.29	84.79	3,999.3	-56.3	21.4	425,190.98	713,867.24	32° 10' 1.484 N	103° 38' 31.842 W
4,100.0	1.17	81.23	4,099.2	-56.1	23.6	425,191.24	713,869.37	32° 10' 1.487 N	103° 38' 31.817 W
4,200.0	1.74	98.86	4,199.2	-56.1	26.1	425,191.16	713,871.88	32° 10' 1.486 N	103° 38' 31.788 W
4,300.0	1.33	106.38	4,299.2	-56.7	28.7	425,190.60	713,874.49	32° 10' 1.480 N	103° 38' 31.757 W
4,400.0	0.86	111.85	4,399.2	-57.3	30.5	425,190.00	713,876.30	32° 10' 1.474 N	103° 38' 31.736 W
4,500.0	1.49	123.58	4,499.1	-58.3	32.3	425,189.00	713,878.08	32° 10' 1.464 N	103° 38' 31.716 W
4,600.0	1.21	134.61	4,599.1	-59.8	34.1	425,187.54	713,879.91	32° 10' 1.450 N	103° 38' 31.695 W
4,700.0	1.27	125.49	4,699.1	-61.1	35.8	425,186.15	713,881.57	32° 10' 1.436 N	103° 38' 31.675 W
4,800.0	1.36	112.80	4,799.1	-62.3	37.8	425,185.05	713,883.56	32° 10' 1.425 N	103° 38' 31.652 W
4,900.0	1.41	120.20	4,899.0	-63.3	39.9	425,183.97	713,885.72	32° 10' 1.414 N	103° 38' 31.627 W
5,000.0	1.17	107.95	4,999.0	-64.3	42.0	425,183.04	713,887.76	32° 10' 1.405 N	103° 38' 31.604 W
5,100.0	1.01	108.69	5,099.0	-64.9	43.8	425,182.44	713,889.56	32° 10' 1.398 N	103° 38' 31.583 W
5,200.0	1.27	129.77	5,199.0	-65.9	45.5	425,181.45	713,891.25	32° 10' 1.389 N	103° 38' 31.563 W
5,300.0	1.15	124.70	5,298.9	-67.1	47.1	425,180.17	713,892.93	32° 10' 1.376 N	103° 38' 31.544 W
5,400.0	0.82	147.02	5,398.9	-68.3	48.3	425,179.00	713,894.14	32° 10' 1.364 N	103° 38' 31.530 W
5,500.0	0.38	139.15	5,498.9	-69.2	49.0	425,178.14	713,894.75	32° 10' 1.356 N	103° 38' 31.523 W
5,600.0	0.72	138.67	5,598.9	-69.9	49.6	425,177.42	713,895.38	32° 10' 1.348 N	103° 38' 31.515 W
5,700.0	0.90	126.16	5,698.9	-70.8	50.6	425,176.49	713,896.43	32° 10' 1.339 N	103° 38' 31.503 W
5,800.0	0.73	112.84	5,798.9	-71.5	51.9	425,175.78	713,897.65	32° 10' 1.332 N	103° 38' 31.489 W
5,900.0	0.72	116.17	5,898.9	-72.0	53.0	425,175.25	713,898.80	32° 10' 1.327 N	103° 38' 31.476 W
6,000.0	0.68	117.45	5,998.9	-72.6	54.1	425,174.70	713,899.89	32° 10' 1.321 N	103° 38' 31.463 W
6,100.0	0.58	114.72	6,098.9	-73.1	55.1	425,174.22	713,900.88	32° 10' 1.316 N	103° 38' 31.452 W
6,200.0	0.33	108.38	6,198.9	-73.4	55.8	425,173.91	713,901.61	32° 10' 1.313 N	103° 38' 31.443 W
6,300.0	0.52	102.68	6,298.9	-73.6	56.5	425,173.72	713,902.33	32° 10' 1.311 N	103° 38' 31.435 W
6,400.0	0.20	123.53	6,398.9	-73.8	57.1	425,173.53	713,902.91	32° 10' 1.309 N	103° 38' 31.428 W
6,500.0	0.57	95.48	6,498.9	-73.9	57.8	425,173.38	713,903.55	32° 10' 1.308 N	103° 38' 31.421 W

HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35, T24S, R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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	0.30	105.52	6,598.9	-74.0	58.5	425,173.27	713,904.30	32° 10' 1.307 N	103° 38' 31.412 W
6,700.0	0.28	118.65	6,698.9	-74.2	59.0	425,173.08	713,904.77	32° 10' 1.305 N	103° 38' 31.406 W
6,800.0	0.05	121.81	6,798.9	-74.4	59.2	425,172.94	713,905.02	32° 10' 1.303 N	103° 38' 31.404 W
6,900.0	0.29	140.49	6,898.9	-74.6	59.4	425,172.72	713,905.22	32° 10' 1.301 N	103° 38' 31.401 W
7,000.0	0.49	172.52	6,998.9	-75.2	59.6	425,172.10	713,905.43	32° 10' 1.295 N	103° 38' 31.399 W
7,100.0	0.20	187.15	7,098.9	-75.8	59.7	425,171.50	713,905.47	32° 10' 1.289 N	103° 38' 31.398 W
7,200.0	0.32	180.67	7,198.9	-76.2	59.6	425,171.05	713,905.44	32° 10' 1.285 N	103° 38' 31.399 W
7,300.0	0.57	162.64	7,298.9	-77.0	59.8	425,170.30	713,905.59	32° 10' 1.277 N	103° 38' 31.397 W
7,400.0	0.86	171.01	7,398.8	-78.2	60.1	425,169.08	713,905.85	32° 10' 1.265 N	103° 38' 31.394 W
7,500.0	0.57	158.72	7,498.8	-79.4	60.4	425,167.88	713,906.15	32° 10' 1.253 N	103° 38' 31.391 W
7,600.0	0.56	106.72	7,598.8	-80.0	61.0	425,167.27	713,906.80	32° 10' 1.247 N	103° 38' 31.383 W
7,700.0	0.43	130.35	7,698.8	-80.4	61.8	425,166.89	713,907.55	32° 10' 1.243 N	103° 38' 31.375 W
7,800.0	0.52	108.73	7,798.8	-80.8	62.5	425,166.50	713,908.27	32° 10' 1.240 N	103° 38' 31.366 W
7,900.0	0.57	127.29	7,898.8	-81.2	63.3	425,166.05	713,909.10	32° 10' 1.235 N	103° 38' 31.357 W
8,000.0	0.46	165.67	7,998.8	-81.9	63.8	425,165.36	713,909.59	32° 10' 1.228 N	103° 38' 31.351 W
8,100.0	0.60	198.01	8,098.8	-82.8	63.7	425,164.48	713,909.53	32° 10' 1.219 N	103° 38' 31.352 W
8,200.0	0.70	167.73	8,198.8	-83.9	63.7	425,163.38	713,909.50	32° 10' 1.209 N	103° 38' 31.352 W
8,300.0	0.74	189.11	8,298.8	-85.2	63.7	425,162.15	713,909.52	32° 10' 1.196 N	103° 38' 31.352 W
8,400.0	1.24	222.64	8,398.8	-86.6	62.9	425,160.71	713,908.69	32° 10' 1.182 N	103° 38' 31.362 W
8,500.0	1.00	188.84	8,498.8	-88.2	62.0	425,159.05	713,907.82	32° 10' 1.166 N	103° 38' 31.372 W
8,600.0	0.81	198.81	8,598.8	-89.8	61.7	425,157.52	713,907.46	32° 10' 1.151 N	103° 38' 31.376 W
8,700.0	1.16	180.39	8,698.7	-91.5	61.4	425,155.84	713,907.22	32° 10' 1.134 N	103° 38' 31.379 W
8,800.0	1.21	177.41	8,798.7	-93.5	61.5	425,153.78	713,907.27	32° 10' 1.114 N	103° 38' 31.379 W
8,900.0	0.59	190.42	8,898.7	-95.1	61.4	425,152.21	713,907.22	32° 10' 1.098 N	103° 38' 31.380 W
9,000.0	0.48	248.63	8,998.7	-95.7	60.9	425,151.56	713,906.74	32° 10' 1.092 N	103° 38' 31.385 W
9,100.0	0.59	269.82	9,098.7	-95.9	60.0	425,151.40	713,905.83	32° 10' 1.090 N	103° 38' 31.396 W
9,200.0	0.87	266.46	9,198.7	-95.9	58.8	425,151.35	713,904.56	32° 10' 1.090 N	103° 38' 31.411 W
9,300.0	0.64	275.38	9,298.7	-95.9	57.4	425,151.36	713,903.25	32° 10' 1.090 N	103° 38' 31.426 W
9,400.0	0.83	307.69	9,398.7	-95.4	56.3	425,151.85	713,902.12	32° 10' 1.095 N	103° 38' 31.439 W
9,500.0	0.47	350.95	9,498.7	-94.6	55.7	425,152.70	713,901.48	32° 10' 1.103 N	103° 38' 31.446 W
9,600.0	0.93	67.89	9,598.7	-93.9	56.4	425,153.41	713,902.17	32° 10' 1.110 N	103° 38' 31.438 W
9,700.0	1.46	60.95	9,698.6	-93.0	58.2	425,154.34	713,904.03	32° 10' 1.119 N	103° 38' 31.416 W
9,800.0	1.48	73.95	9,798.6	-92.0	60.6	425,155.31	713,906.39	32° 10' 1.129 N	103° 38' 31.389 W
9,900.0	0.55	98.96	9,898.6	-91.7	62.3	425,155.59	713,908.10	32° 10' 1.132 N	103° 38' 31.369 W
10,000.0	0.51	105.69	9,998.6	-91.9	63.2	425,155.40	713,909.00	32° 10' 1.130 N	103° 38' 31.359 W
10,100.0	0.67	128.39	10,098.6	-92.4	64.1	425,154.91	713,909.89	32° 10' 1.125 N	103° 38' 31.348 W
10,200.0	0.79	121.97	10,198.6	-93.1	65.1	425,154.19	713,910.93	32° 10' 1.118 N	103° 38' 31.336 W
Gyro Tie-in @ 10200' MD / 10199' TVD									
10,302.0	1.40	5.60	10,300.6	-92.2	65.9	425,155.05	713,911.65	32° 10' 1.126 N	103° 38' 31.328 W
10,334.0	4.00	355.80	10,332.5	-90.7	65.8	425,156.56	713,911.61	32° 10' 1.141 N	103° 38' 31.328 W
10,365.0	6.80	2.30	10,363.4	-87.8	65.8	425,159.47	713,911.60	32° 10' 1.170 N	103° 38' 31.328 W
10,396.0	9.60	5.80	10,394.1	-83.4	66.1	425,163.88	713,911.94	32° 10' 1.213 N	103° 38' 31.324 W
10,428.0	12.10	6.30	10,425.5	-77.4	66.8	425,169.87	713,912.58	32° 10' 1.273 N	103° 38' 31.316 W
10,459.0	15.00	4.00	10,455.6	-70.2	67.4	425,177.10	713,913.21	32° 10' 1.344 N	103° 38' 31.308 W
10,490.0	18.80	3.30	10,485.3	-61.2	68.0	425,186.09	713,913.78	32° 10' 1.433 N	103° 38' 31.301 W
10,522.0	22.20	3.70	10,515.2	-50.0	68.7	425,197.27	713,914.47	32° 10' 1.544 N	103° 38' 31.292 W
10,554.0	24.60	4.20	10,544.6	-37.3	69.5	425,209.95	713,915.35	32° 10' 1.669 N	103° 38' 31.281 W
10,585.0	27.60	1.90	10,572.5	-23.7	70.3	425,223.57	713,916.06	32° 10' 1.804 N	103° 38' 31.271 W
10,617.0	30.30	358.60	10,600.5	-8.2	70.3	425,239.05	713,916.10	32° 10' 1.957 N	103° 38' 31.270 W
10,648.0	32.80	357.50	10,626.9	8.0	69.8	425,255.26	713,915.55	32° 10' 2.117 N	103° 38' 31.275 W
10,680.0	35.70	357.00	10,653.3	25.9	68.9	425,273.25	713,914.68	32° 10' 2.295 N	103° 38' 31.284 W
10,711.0	39.00	358.20	10,678.0	44.7	68.1	425,292.03	713,913.90	32° 10' 2.481 N	103° 38' 31.291 W
10,742.0	41.70	359.10	10,701.6	64.8	67.6	425,312.10	713,913.43	32° 10' 2.680 N	103° 38' 31.295 W
10,774.0	44.70	358.60	10,724.9	86.7	67.2	425,333.99	713,912.99	32° 10' 2.897 N	103° 38' 31.299 W
10,805.0	47.70	1.00	10,746.4	109.1	67.1	425,356.36	713,912.92	32° 10' 3.118 N	103° 38' 31.298 W

HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider-Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35, T24S, R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,837.0	50.00	1.90	10,767.4	133.1	67.7	425,380.45	713,913.54	32° 10' 3.356 N	103° 38' 31.289 W	
10,846.2	50.62	2.32	10,773.3	140.2	68.0	425,387.52	713,913.80	32° 10' 3.426 N	103° 38' 31.285 W	
Crossed Hard Line @ 10846' MD / 10773' TVD										
10,868.0	52.10	3.30	10,786.9	157.2	68.8	425,404.53	713,914.63	32° 10' 3.595 N	103° 38' 31.274 W	
10,900.0	55.30	1.40	10,805.8	183.0	69.9	425,430.29	713,915.68	32° 10' 3.850 N	103° 38' 31.260 W	
10,931.0	58.70	358.90	10,822.7	209.0	69.9	425,456.29	713,915.74	32° 10' 4.107 N	103° 38' 31.258 W	
10,963.0	62.70	357.50	10,838.4	236.9	69.1	425,484.17	713,914.86	32° 10' 4.383 N	103° 38' 31.266 W	
10,995.0	66.70	357.30	10,852.1	265.8	67.7	425,513.07	713,913.54	32° 10' 4.669 N	103° 38' 31.279 W	
11,026.0	69.60	357.50	10,863.6	294.5	66.4	425,541.81	713,912.24	32° 10' 4.953 N	103° 38' 31.292 W	
11,058.0	72.50	358.00	10,874.0	324.7	65.3	425,572.04	713,911.05	32° 10' 5.253 N	103° 38' 31.304 W	
11,090.0	74.60	358.90	10,883.0	355.4	64.4	425,602.72	713,910.22	32° 10' 5.556 N	103° 38' 31.311 W	
11,121.0	76.20	359.40	10,890.9	385.4	64.0	425,632.72	713,909.78	32° 10' 5.853 N	103° 38' 31.314 W	
11,153.0	80.50	359.60	10,897.3	416.7	63.7	425,664.05	713,909.51	32° 10' 6.163 N	103° 38' 31.315 W	
11,197.0	84.90	359.40	10,902.9	460.4	63.3	425,707.68	713,909.12	32° 10' 6.595 N	103° 38' 31.316 W	
11,229.0	86.10	359.40	10,905.4	492.3	63.0	425,739.58	713,908.79	32° 10' 6.911 N	103° 38' 31.317 W	
11,260.0	88.10	359.40	10,907.0	523.2	62.7	425,770.54	713,908.47	32° 10' 7.217 N	103° 38' 31.319 W	
11,292.0	90.50	359.30	10,907.4	555.2	62.3	425,802.53	713,908.10	32° 10' 7.534 N	103° 38' 31.321 W	
11,355.0	92.20	359.30	10,905.9	618.2	61.5	425,865.50	713,907.33	32° 10' 8.157 N	103° 38' 31.325 W	
11,447.0	92.10	359.10	10,902.4	710.1	60.3	425,957.43	713,906.05	32° 10' 9.067 N	103° 38' 31.333 W	
11,541.0	90.90	358.70	10,900.0	804.1	58.5	426,051.38	713,904.25	32° 10' 9.996 N	103° 38' 31.347 W	
11,635.0	89.70	358.00	10,899.5	898.0	55.7	426,145.34	713,901.54	32° 10' 10.926 N	103° 38' 31.371 W	
11,730.0	88.40	357.50	10,901.1	992.9	52.0	426,240.25	713,897.81	32° 10' 11.866 N	103° 38' 31.408 W	
11,825.0	89.70	357.00	10,902.6	1,087.8	47.5	426,335.12	713,893.25	32° 10' 12.805 N	103° 38' 31.454 W	
11,919.0	91.00	356.80	10,902.1	1,181.7	42.4	426,428.98	713,888.17	32° 10' 13.734 N	103° 38' 31.506 W	
12,014.0	90.90	358.40	10,900.5	1,276.6	38.4	426,523.88	713,884.19	32° 10' 14.673 N	103° 38' 31.545 W	
12,109.0	89.70	358.70	10,900.0	1,371.5	36.0	426,618.85	713,881.79	32° 10' 15.613 N	103° 38' 31.566 W	
12,203.0	90.90	358.70	10,899.5	1,465.5	33.9	426,712.82	713,879.66	32° 10' 16.543 N	103° 38' 31.584 W	
12,298.0	90.00	358.60	10,898.8	1,560.5	31.6	426,807.79	713,877.42	32° 10' 17.483 N	103° 38' 31.603 W	
12,392.0	91.30	358.40	10,897.7	1,654.5	29.2	426,901.75	713,874.96	32° 10' 18.413 N	103° 38' 31.624 W	
12,487.0	90.10	358.60	10,896.5	1,749.4	26.7	426,996.71	713,872.47	32° 10' 19.353 N	103° 38' 31.646 W	
12,581.0	89.00	358.60	10,897.3	1,843.4	24.4	427,090.68	713,870.17	32° 10' 20.283 N	103° 38' 31.666 W	
12,675.0	90.50	358.70	10,897.7	1,937.3	22.2	427,184.65	713,867.96	32° 10' 21.213 N	103° 38' 31.684 W	
12,770.0	89.60	0.10	10,897.6	2,032.3	21.2	427,279.64	713,866.97	32° 10' 22.153 N	103° 38' 31.689 W	
12,865.0	91.00	0.30	10,897.1	2,127.3	21.5	427,374.63	713,867.30	32° 10' 23.093 N	103° 38' 31.678 W	
12,959.0	90.00	0.00	10,896.3	2,221.3	21.7	427,468.63	713,867.54	32° 10' 24.023 N	103° 38' 31.668 W	
13,054.0	88.80	359.40	10,897.3	2,316.3	21.3	427,563.62	713,867.05	32° 10' 24.963 N	103° 38' 31.667 W	
13,149.0	89.30	359.30	10,898.8	2,411.3	20.2	427,658.60	713,865.97	32° 10' 25.903 N	103° 38' 31.672 W	
13,244.0	90.40	359.60	10,899.1	2,506.3	19.3	427,753.59	713,865.06	32° 10' 26.844 N	103° 38' 31.676 W	
13,338.0	91.30	359.60	10,897.7	2,600.3	18.6	427,847.58	713,864.40	32° 10' 27.774 N	103° 38' 31.676 W	
13,432.0	89.80	359.60	10,896.8	2,694.3	17.9	427,941.57	713,863.74	32° 10' 28.704 N	103° 38' 31.677 W	
13,527.0	88.70	0.00	10,898.0	2,789.3	17.6	428,036.56	713,863.41	32° 10' 29.644 N	103° 38' 31.674 W	
13,621.0	89.20	359.80	10,899.8	2,883.2	17.5	428,130.55	713,863.25	32° 10' 30.574 N	103° 38' 31.669 W	
13,715.0	90.20	359.40	10,900.3	2,977.2	16.8	428,224.54	713,862.59	32° 10' 31.504 N	103° 38' 31.669 W	
13,809.0	88.70	359.80	10,901.2	3,071.2	16.1	428,318.53	713,861.94	32° 10' 32.434 N	103° 38' 31.670 W	
13,903.0	90.20	359.40	10,902.1	3,165.2	15.5	428,412.52	713,861.28	32° 10' 33.364 N	103° 38' 31.670 W	
13,997.0	90.40	359.80	10,901.6	3,259.2	14.8	428,506.52	713,860.62	32° 10' 34.295 N	103° 38' 31.671 W	
14,092.0	89.80	0.00	10,901.4	3,354.2	14.7	428,601.52	713,860.46	32° 10' 35.235 N	103° 38' 31.666 W	
14,187.0	89.10	359.80	10,902.3	3,449.2	14.5	428,696.51	713,860.29	32° 10' 36.175 N	103° 38' 31.661 W	
14,281.0	90.00	359.30	10,903.1	3,543.2	13.8	428,790.50	713,859.55	32° 10' 37.105 N	103° 38' 31.662 W	
14,376.0	91.40	358.60	10,901.9	3,638.2	12.0	428,885.48	713,857.81	32° 10' 38.045 N	103° 38' 31.675 W	
14,470.0	90.30	358.70	10,900.5	3,732.1	9.8	428,979.44	713,855.60	32° 10' 38.975 N	103° 38' 31.694 W	
14,564.0	89.80	358.70	10,900.4	3,826.1	7.7	429,073.42	713,853.47	32° 10' 39.905 N	103° 38' 31.712 W	
14,658.0	88.70	358.20	10,901.6	3,920.1	5.1	429,167.37	713,850.92	32° 10' 40.835 N	103° 38' 31.734 W	
14,752.0	89.30	357.50	10,903.3	4,014.0	1.6	429,261.29	713,847.40	32° 10' 41.764 N	103° 38' 31.768 W	
14,846.0	91.00	357.00	10,903.0	4,107.9	-2.9	429,355.18	713,842.89	32° 10' 42.694 N	103° 38' 31.814 W	

HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35, T24S, R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,941.0	89.60	357.30	10,902.5	4,202.8	-7.6	429,450.06	713,838.16	32° 10' 43.633 N	103° 38' 31.862 W	
15,035.0	91.30	356.80	10,901.8	4,296.6	-12.5	429,543.93	713,833.33	32° 10' 44.562 N	103° 38' 31.911 W	
15,129.0	90.80	357.10	10,900.1	4,390.5	-17.5	429,637.78	713,828.33	32° 10' 45.491 N	103° 38' 31.962 W	
15,224.0	90.80	358.20	10,898.8	4,485.4	-21.4	429,732.69	713,824.43	32° 10' 46.431 N	103° 38' 32.000 W	
15,318.0	89.70	358.40	10,898.3	4,579.3	-24.2	429,826.64	713,821.64	32° 10' 47.361 N	103° 38' 32.026 W	
15,412.0	89.10	359.60	10,899.3	4,673.3	-25.8	429,920.62	713,820.00	32° 10' 48.291 N	103° 38' 32.038 W	
15,506.0	89.60	359.30	10,900.4	4,767.3	-26.7	430,014.61	713,819.10	32° 10' 49.221 N	103° 38' 32.041 W	
15,601.0	91.60	359.80	10,899.4	4,862.3	-27.4	430,109.60	713,818.35	32° 10' 50.161 N	103° 38' 32.043 W	
15,696.0	92.60	0.00	10,895.9	4,957.2	-27.6	430,204.53	713,818.19	32° 10' 51.100 N	103° 38' 32.038 W	
15,790.0	90.00	0.50	10,893.8	5,051.2	-27.2	430,298.50	713,818.60	32° 10' 52.030 N	103° 38' 32.026 W	
15,884.0	90.40	359.80	10,893.5	5,145.2	-27.0	430,392.50	713,818.85	32° 10' 52.960 N	103° 38' 32.016 W	
15,979.0	89.70	0.30	10,893.4	5,240.2	-26.9	430,487.50	713,818.93	32° 10' 53.900 N	103° 38' 32.008 W	
16,074.0	89.30	1.20	10,894.2	5,335.2	-25.6	430,582.48	713,820.17	32° 10' 54.840 N	103° 38' 31.986 W	
16,169.0	88.40	1.40	10,896.1	5,430.1	-23.5	430,677.44	713,822.33	32° 10' 55.780 N	103° 38' 31.954 W	
16,263.0	89.30	1.40	10,898.0	5,524.1	-21.2	430,771.39	713,824.62	32° 10' 56.709 N	103° 38' 31.921 W	
16,358.0	88.50	1.50	10,899.8	5,619.0	-18.8	430,866.34	713,827.03	32° 10' 57.649 N	103° 38' 31.885 W	
16,452.0	89.40	1.00	10,901.5	5,713.0	-16.7	430,960.30	713,829.08	32° 10' 58.579 N	103° 38' 31.855 W	
16,547.0	90.20	1.00	10,901.9	5,808.0	-15.1	431,055.29	713,830.73	32° 10' 59.518 N	103° 38' 31.828 W	
16,642.0	88.70	1.20	10,902.8	5,903.0	-13.2	431,150.26	713,832.56	32° 11' 0.458 N	103° 38' 31.800 W	
16,736.0	89.60	0.70	10,904.2	5,996.9	-11.7	431,244.24	713,834.12	32° 11' 1.388 N	103° 38' 31.775 W	
16,830.0	90.40	0.70	10,904.2	6,090.9	-10.5	431,338.23	713,835.26	32° 11' 2.318 N	103° 38' 31.754 W	
16,925.0	89.60	0.70	10,904.2	6,185.9	-9.4	431,433.22	713,836.42	32° 11' 3.258 N	103° 38' 31.734 W	
17,020.0	90.10	0.80	10,904.4	6,280.9	-8.1	431,528.21	713,837.67	32° 11' 4.198 N	103° 38' 31.712 W	
17,113.0	89.30	0.50	10,904.9	6,373.9	-7.1	431,621.20	713,838.72	32° 11' 5.118 N	103° 38' 31.693 W	
17,207.0	90.10	0.00	10,905.4	6,467.9	-6.7	431,715.20	713,839.13	32° 11' 6.048 N	103° 38' 31.681 W	
17,301.0	90.50	0.10	10,904.9	6,561.9	-6.6	431,809.20	713,839.22	32° 11' 6.978 N	103° 38' 31.673 W	
17,396.0	88.70	0.10	10,905.6	6,656.9	-6.4	431,904.19	713,839.38	32° 11' 7.918 N	103° 38' 31.664 W	
17,490.0	89.30	359.80	10,907.2	6,750.9	-6.5	431,998.18	713,839.30	32° 11' 8.848 N	103° 38' 31.658 W	
17,585.0	90.20	359.80	10,907.6	6,845.9	-6.8	432,093.18	713,838.97	32° 11' 9.789 N	103° 38' 31.655 W	
17,679.0	91.20	359.60	10,906.5	6,939.9	-7.3	432,187.17	713,838.48	32° 11' 10.719 N	103° 38' 31.653 W	
17,775.0	90.30	359.30	10,905.2	7,035.9	-8.2	432,283.15	713,837.55	32° 11' 11.669 N	103° 38' 31.657 W	
17,867.0	89.60	358.20	10,905.3	7,127.8	-10.2	432,375.13	713,835.55	32° 11' 12.579 N	103° 38' 31.673 W	
17,961.0	90.30	358.40	10,905.4	7,221.8	-13.0	432,469.09	713,832.76	32° 11' 13.509 N	103° 38' 31.699 W	
18,056.0	89.50	358.60	10,905.6	7,316.8	-15.5	432,564.05	713,830.27	32° 11' 14.449 N	103° 38' 31.721 W	
18,150.0	90.00	358.00	10,906.0	7,410.7	-18.3	432,658.01	713,827.48	32° 11' 15.379 N	103° 38' 31.746 W	
18,244.0	89.70	358.00	10,906.2	7,504.7	-21.6	432,751.95	713,824.20	32° 11' 16.309 N	103° 38' 31.777 W	
18,338.0	90.70	358.00	10,905.9	7,598.6	-24.9	432,845.89	713,820.92	32° 11' 17.238 N	103° 38' 31.808 W	
18,433.0	91.40	358.40	10,904.2	7,693.5	-27.9	432,940.83	713,817.94	32° 11' 18.178 N	103° 38' 31.836 W	
18,528.0	91.00	358.00	10,902.2	7,788.5	-30.8	433,035.76	713,814.96	32° 11' 19.118 N	103° 38' 31.864 W	
18,622.0	90.10	357.00	10,901.3	7,882.4	-34.9	433,129.67	713,810.86	32° 11' 20.047 N	103° 38' 31.904 W	
18,716.0	90.30	357.10	10,900.9	7,976.2	-39.8	433,223.54	713,806.02	32° 11' 20.976 N	103° 38' 31.954 W	
18,811.0	89.90	358.40	10,900.8	8,071.2	-43.5	433,318.46	713,802.29	32° 11' 21.916 N	103° 38' 31.990 W	
18,905.0	88.40	358.60	10,902.2	8,165.1	-46.0	433,412.42	713,799.83	32° 11' 22.846 N	103° 38' 32.012 W	
19,000.0	89.00	357.90	10,904.3	8,260.0	-48.9	433,507.35	713,796.93	32° 11' 23.785 N	103° 38' 32.038 W	
19,094.0	90.00	358.00	10,905.1	8,354.0	-52.2	433,601.28	713,793.57	32° 11' 24.715 N	103° 38' 32.070 W	
19,188.0	90.60	359.30	10,904.6	8,448.0	-54.4	433,695.25	713,791.35	32° 11' 25.645 N	103° 38' 32.089 W	
19,283.0	89.60	359.60	10,904.5	8,542.9	-55.4	433,790.25	713,790.44	32° 11' 26.585 N	103° 38' 32.093 W	
19,377.0	90.30	359.40	10,904.6	8,636.9	-56.2	433,884.24	713,789.62	32° 11' 27.516 N	103° 38' 32.095 W	
19,472.0	90.90	359.10	10,903.6	8,731.9	-57.4	433,979.23	713,788.37	32° 11' 28.456 N	103° 38' 32.102 W	
19,566.0	90.10	359.10	10,902.7	8,825.9	-58.9	434,073.21	713,786.90	32° 11' 29.386 N	103° 38' 32.113 W	
19,660.0	88.60	358.90	10,903.8	8,919.9	-60.5	434,167.19	713,785.26	32° 11' 30.316 N	103° 38' 32.125 W	
19,755.0	89.40	358.60	10,905.5	9,014.9	-62.6	434,262.15	713,783.19	32° 11' 31.256 N	103° 38' 32.142 W	
19,849.0	89.30	358.90	10,906.5	9,108.8	-64.7	434,356.13	713,781.14	32° 11' 32.186 N	103° 38' 32.158 W	
19,943.0	89.70	0.10	10,907.4	9,202.8	-65.5	434,450.12	713,780.32	32° 11' 33.116 N	103° 38' 32.161 W	
20,038.0	90.90	359.30	10,906.9	9,297.8	-66.0	434,545.11	713,779.82	32° 11' 34.056 N	103° 38' 32.160 W	

HP

Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Eider Federal #2H
Project:	Lea County, NM	TVD Reference:	Well @ 3608.0usft (Ensign #772)
Site:	Sec 35 T24S R32E	MD Reference:	Well @ 3608.0usft (Ensign #772)
Well:	Eider Federal #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
20,131.0	90.20	357.70	10,906.0	9,390.8	-68.4	434,638.07	713,777.38	32° 11' 34.976 N	103° 38' 32.181 W	
20,227.0	90.80	358.70	10,905.1	9,486.7	-71.4	434,734.02	713,774.37	32° 11' 35.926 N	103° 38' 32.209 W	
20,321.0	90.00	358.00	10,904.5	9,580.7	-74.1	434,827.98	713,771.66	32° 11' 36.856 N	103° 38' 32.233 W	
20,416.0	91.10	357.90	10,903.6	9,675.6	-77.5	434,922.91	713,768.26	32° 11' 37.795 N	103° 38' 32.266 W	
20,509.0	90.20	359.30	10,902.5	9,768.6	-79.8	435,015.87	713,765.99	32° 11' 38.715 N	103° 38' 32.285 W	
20,603.0	91.00	359.40	10,901.5	9,862.6	-80.9	435,109.86	713,764.93	32° 11' 39.645 N	103° 38' 32.291 W	
20,697.0	92.20	359.60	10,898.9	9,956.5	-81.7	435,203.82	713,764.11	32° 11' 40.575 N	103° 38' 32.293 W	
20,769.0	92.20	359.60	10,896.1	10,028.5	-82.2	435,275.76	713,763.60	32° 11' 41.287 N	103° 38' 32.294 W	
TD @ 20769' MD / 10896' TVD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,200.0	10,198.6	-93.1	65.1	Gyro Tie-in @ 10200' MD / 10199' TVD
10,846.2	10,773.3	140.2	68.0	Crossed Hard Line @ 10846' MD / 10773' TVD
20,769.0	10,896.1	10,028.5	-82.2	TD @ 20769' MD / 10896' TVD

Checked By: _____	Approved By: _____	Date: _____
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