

Operator: XTO Energy
Well/Lease: Nash 45H
County: Eddy, NM

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 30 2015

STATE OF NEW MEXICO
DEVIATION REPORT

RECEIVED

30 015 42048

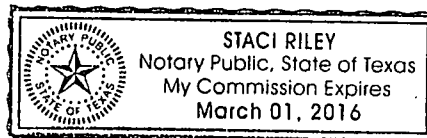
<u>Footage</u>	<u>Degree</u>
100	0.25
186	0.25
423	0.50
892	1.00
1361	1.75
1549	1.75
1739	1.00
2114	0.75
2489	2.50
2582	2.50
2675	1.75
2770	2.25
2864	1.75
2959	2.25
3053	2.25
3148	1.50
3343	1.00
3530	0.25
3911	0.75
4291	0.50
4573	0.25
4954	0.50
5330	0.00
5706	0.25
6097	5.70

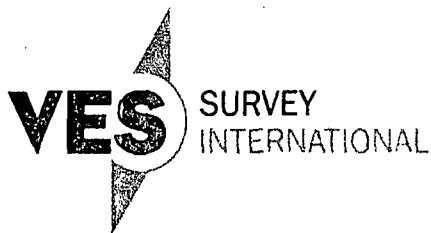
Signed By: Roger Dyer

Roger Dyer, Operations Manager
Pioneer Drilling Company

Appeared before me on Sept 4, 2014

Staci Riley
Notary Public





NM OIL CONSERVATION

ARTESIA DISTRICT

MAR 30 2015

RECEIVED

I JAVIER ESTRADA certify that I am employed by Vaughn Energy Services. That I did on the day(s) of 07/19/14 through 07/19/14 conduct or supervise the taking of a HA GYRO survey from a depth of 0 feet to a depth of 5960 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 XTO ENERGY for the NASH UNIT Well # 45H API # 30-015-42048 in EDDY 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 black ink, appearing to read "Javier Estrada", is written over a horizontal line.

JAVIER ESTRADA
Service Technician
Vaughn Energy Services

XTOENERGY

Company: XTO ENERGY
Lease/Well: NASH UNIT /45H

Rig Name: PIONEER 33
State/County: NEW MEXICO /EDDY
Latitude: 32.31, Longitude: -103.92
GRID North is 0.22 Degrees East of True North
VS-Azi: 3.66 Degrees



Depth Reference : R.K.B=17FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: nash unit 45h.ut
Minimum Curvature Method
Report Date/Time: 7/25/2014 / 16:20

VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Nash Unit 45H / API 30-015-42048

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 30 2015

RECEIVED

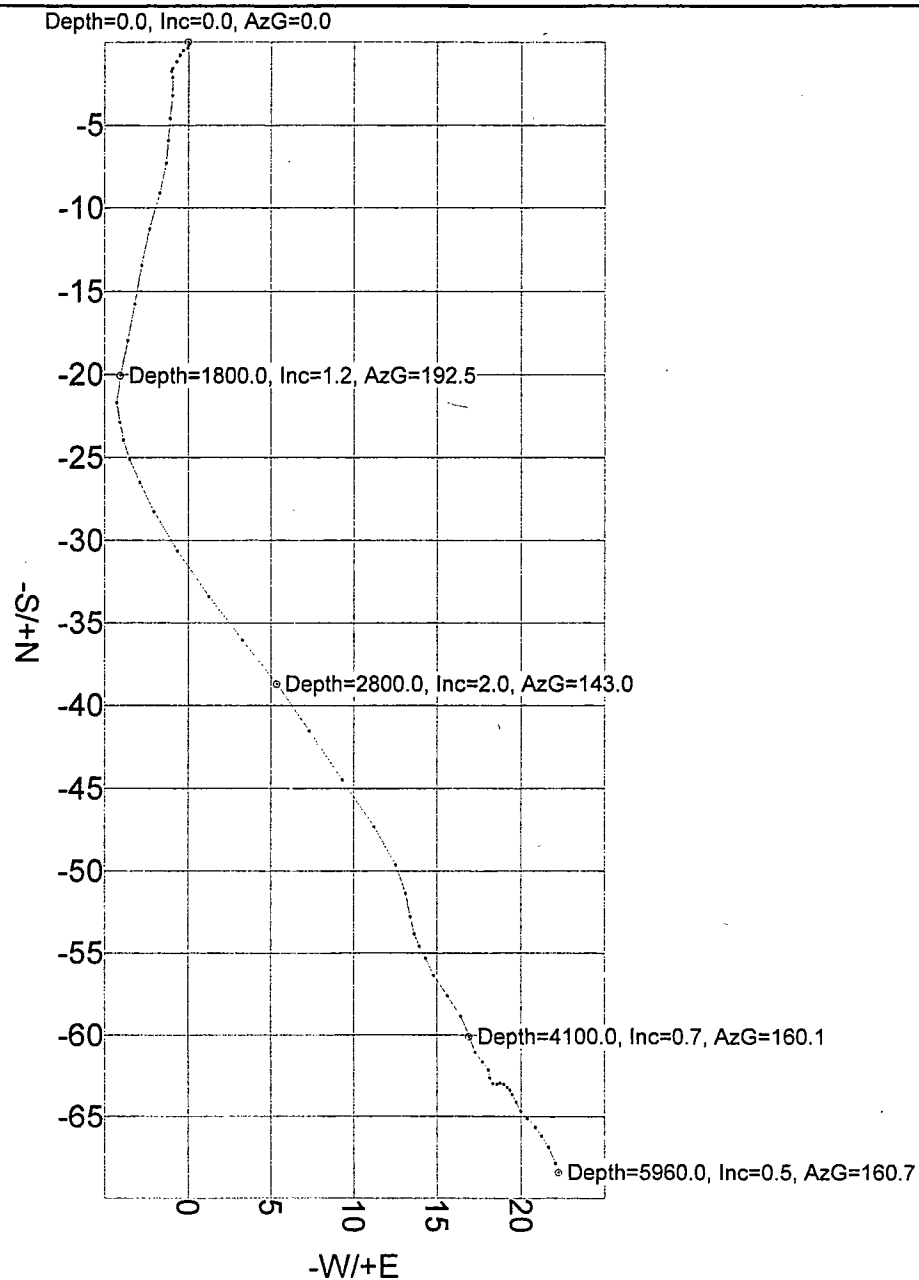
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.18	173.08	100.00	-0.16	0.02	-0.16	0.16	173.08	0.18
200.00	0.10	239.92	200.00	-0.36	-0.04	-0.36	0.36	186.06	0.17
300.00	0.25	242.34	300.00	-0.51	-0.31	-0.52	0.59	211.40	0.15
400.00	0.19	182.63	400.00	-0.77	-0.51	-0.80	0.93	213.48	0.23
500.00	0.35	219.77	500.00	-1.17	-0.71	-1.21	1.37	211.34	0.23
600.00	0.22	193.79	600.00	-1.59	-0.95	-1.65	1.85	210.90	0.18
700.00	0.03	286.90	700.00	-1.77	-1.02	-1.84	2.05	209.91	0.23
800.00	0.44	165.69	799.99	-2.14	-0.95	-2.20	2.34	203.81	0.46
900.00	0.77	189.07	899.99	-3.19	-0.96	-3.24	3.33	196.71	0.41
1000.00	0.82	183.60	999.98	-4.57	-1.11	-4.63	4.70	193.64	0.09
1100.00	0.74	184.85	1099.97	-5.92	-1.21	-5.98	6.04	191.53	0.08
1200.00	0.84	184.76	1199.96	-7.29	-1.32	-7.36	7.41	190.28	0.10
1300.00	1.28	196.74	1299.94	-9.09	-1.71	-9.18	9.25	190.62	0.49
1400.00	1.27	195.33	1399.92	-11.23	-2.32	-11.36	11.47	191.67	0.03
1500.00	1.33	188.98	1499.89	-13.45	-2.79	-13.60	13.74	191.74	0.16
1600.00	1.35	191.02	1599.87	-15.75	-3.20	-15.92	16.07	191.49	0.05
1700.00	1.21	190.61	1699.84	-17.95	-3.62	-18.14	18.31	191.41	0.13
1800.00	1.24	192.54	1799.82	-20.04	-4.05	-20.26	20.45	191.42	0.05

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.70	178.51	1899.80	-21.70	-4.27	-21.93	22.12	191.13	0.58
2000.00	0.66	163.95	1999.80	-22.86	-4.09	-23.08	23.23	190.15	0.18
2100.00	0.61	174.45	2099.79	-23.95	-3.88	-24.15	24.26	189.21	0.13
2200.00	0.78	153.36	2199.78	-25.09	-3.53	-25.26	25.33	188.00	0.30
2300.00	0.98	158.54	2299.77	-26.49	-2.91	-26.63	26.65	186.26	0.22
2400.00	1.27	151.30	2399.75	-28.26	-2.06	-28.34	28.34	184.17	0.32
2500.00	1.89	147.64	2499.71	-30.62	-0.65	-30.60	30.63	181.21	0.63
2600.00	1.93	143.38	2599.66	-33.37	1.24	-33.22	33.39	177.87	0.15
2700.00	1.90	141.41	2699.60	-36.02	3.28	-35.74	36.17	174.79	0.07
2800.00	1.99	142.99	2799.54	-38.70	5.36	-38.28	39.07	172.12	0.10
2900.00	1.95	147.65	2899.49	-41.52	7.31	-40.97	42.16	170.01	0.16
3000.00	2.15	143.94	2999.42	-44.46	9.32	-43.78	45.43	168.16	0.24
3100.00	1.79	147.96	3099.36	-47.30	11.25	-46.49	48.62	166.62	0.38
3200.00	1.23	154.73	3199.33	-49.60	12.54	-48.70	51.16	165.81	0.59
3300.00	0.91	170.56	3299.31	-51.36	13.13	-50.41	53.01	165.66	0.44
3400.00	0.75	167.46	3399.30	-52.78	13.40	-51.82	54.46	165.75	0.16
3500.00	0.47	167.96	3499.29	-53.83	13.63	-52.85	55.53	165.79	0.28
3600.00	0.47	147.71	3599.29	-54.58	13.94	-53.58	56.33	165.68	0.17
3700.00	0.49	158.67	3699.29	-55.32	14.31	-54.30	57.14	165.50	0.09
3800.00	0.84	152.89	3799.28	-56.37	14.80	-55.31	58.28	165.29	0.36
3900.00	0.87	140.90	3899.27	-57.61	15.61	-56.49	59.68	164.84	0.18
4000.00	0.82	154.86	3999.26	-58.84	16.39	-57.68	61.08	164.43	0.21
4100.00	0.72	160.10	4099.25	-60.08	16.91	-58.88	62.42	164.28	0.12
4200.00	0.46	161.62	4199.24	-61.06	17.25	-59.84	63.45	164.22	0.26
4300.00	0.45	129.48	4299.24	-61.69	17.68	-60.44	64.18	164.01	0.25
4400.00	0.32	166.89	4399.24	-62.21	18.05	-60.93	64.78	163.82	0.27
4500.00	0.26	178.51	4499.24	-62.71	18.12	-61.43	65.28	163.89	0.08
4600.00	0.25	122.84	4599.24	-63.06	18.31	-61.76	65.66	163.81	0.24
4700.00	0.11	33.61	4699.24	-63.10	18.55	-61.78	65.77	163.62	0.27
4800.00	0.15	97.90	4799.24	-63.03	18.73	-61.71	65.76	163.45	0.15
4900.00	0.14	114.82	4899.24	-63.10	18.97	-61.76	65.89	163.26	0.05
5000.00	0.18	146.26	4999.24	-63.28	19.17	-61.93	66.12	163.15	0.09
5100.00	0.10	120.08	5099.24	-63.45	19.33	-62.09	66.33	163.06	0.10
5200.00	0.24	159.32	5199.23	-63.69	19.47	-62.32	66.60	163.00	0.18
5300.00	0.35	148.75	5299.23	-64.14	19.70	-62.76	67.10	162.92	0.12
5400.00	0.34	155.34	5399.23	-64.67	19.98	-63.26	67.69	162.83	0.04
5500.00	0.38	125.97	5499.23	-65.13	20.38	-63.70	68.25	162.63	0.19
5600.00	0.46	150.08	5599.23	-65.67	20.84	-64.21	68.90	162.39	0.19
5700.00	0.29	136.44	5699.23	-66.20	21.22	-64.71	69.52	162.23	0.19

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.64	153.23	5799.22	-66.88	21.64	-65.36	70.30	162.07	0.37
5900.00	0.58	161.43	5899.22	-67.86	22.05	-66.31	71.35	162.00	0.10
5960.00	0.52	160.67	5959.21	-68.41	22.24	-66.85	71.93	161.99	0.10

XTO ENERGY

VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Nash Unit 45H / API 30-015-42048



VES Survey Date: 07/19/2014

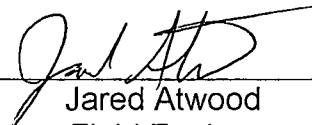
HALLIBURTON

3950 Interwood South Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

State of New Mexico, Eddy County

I, Jared Atwood, certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of 19-July-14 through 13-August- 14, I did conduct or supervise the taking of a MWD directional surveys for the well from a depth of 6028' MD to a depth of 17390' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling). I am authorized and qualified to make this report and this survey was conducted at the request of XTO Energy Inc., for the Nash Unit 45H well, API No. 30-015-42048-0000 in Eddy County, New Mexico. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling).



Jared Atwood
Field Engineer



DIRECTIONAL SURVEY DATA

Tie-in

0.00

0.00

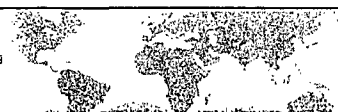
0.00

0.00

0.00 N

0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100)
100.00	0.18	173.08	100.00	0.16 S	0.02 E	-0.15	0.18
200.00	0.10	239.92	200.00	0.36 S	0.04 W	-0.36	0.17
300.00	0.25	242.34	300.00	0.50 S	0.31 W	-0.52	0.15
400.00	0.19	182.63	400.00	0.77 S	0.51 W	-0.80	0.23
500.00	0.35	219.77	500.00	1.17 S	0.71 W	-1.21	0.23
600.00	0.22	193.79	600.00	1.59 S	0.95 W	-1.65	0.18
700.00	0.03	286.90	700.00	1.77 S	1.02 W	-1.83	0.22
800.00	0.44	165.69	800.00	2.13 S	0.95 W	-2.19	0.46
900.00	0.77	189.07	899.99	3.17 S	0.96 W	-3.22	0.41
1000.00	0.82	183.60	999.98	4.55 S	1.11 W	-4.61	0.09
1100.00	0.74	184.85	1,099.97	5.90 S	1.21 W	-5.97	0.08
1200.00	0.84	184.76	1,199.96	7.28 S	1.33 W	-7.35	0.10
1300.00	1.28	196.74	1,299.94	9.08 S	1.71 W	-9.17	0.49
1400.00	1.27	195.33	1,399.92	11.22 S	2.33 W	-11.34	0.03
1500.00	1.33	188.98	1,499.89	13.43 S	2.80 W	-13.58	0.16
1600.00	1.35	191.02	1,599.87	15.73 S	3.21 W	-15.91	0.05
1700.00	1.21	190.61	1,699.84	17.93 S	3.63 W	-18.12	0.14
1800.00	1.24	192.54	1,799.82	20.02 S	4.06 W	-20.24	0.05
1900.00	0.70	178.51	1,899.80	21.69 S	4.27 W	-21.92	0.59
2000.00	0.66	163.95	1,999.80	22.85 S	4.10 W	-23.07	0.18
2100.00	0.61	174.45	2,099.79	23.94 S	3.89 W	-24.14	0.13
2200.00	0.78	153.36	2,199.78	25.07 S	3.53 W	-25.25	0.30
2300.00	0.98	158.54	2,299.77	26.48 S	2.91 W	-26.61	0.22
2400.00	1.27	151.30	2,399.75	28.25 S	2.07 W	-28.32	0.32
2500.00	1.89	147.64	2,499.71	30.61 S	0.65 W	-30.59	0.63
2600.00	1.93	143.38	2,599.66	33.36 S	1.23 E	-33.21	0.15
2700.00	1.90	141.41	2,699.60	36.00 S	3.27 E	-35.72	0.07
2800.00	1.99	142.99	2,799.55	38.69 S	5.35 E	-38.26	0.10
2900.00	1.95	147.65	2,899.49	41.51 S	7.31 E	-40.96	0.17
3000.00	2.15	143.94	2,999.42	44.46 S	9.32 E	-43.78	0.24
3100.00	1.79	147.96	3,099.36	47.30 S	11.25 E	-46.49	0.39
3200.00	1.23	154.73	3,199.33	49.60 S	12.54 E	-48.70	0.59
3300.00	0.91	170.56	3,299.31	51.35 S	13.13 E	-50.41	0.43
3400.00	0.75	167.46	3,399.30	52.77 S	13.40 E	-51.81	0.17
3500.00	0.47	167.96	3,499.29	53.81 S	13.63 E	-52.83	0.28
3600.00	0.47	147.71	3,599.29	54.56 S	13.93 E	-53.56	0.17
3700.00	0.49	158.67	3,699.29	55.31 S	14.31 E	-54.28	0.09
3800.00	0.84	152.89	3,799.28	56.36 S	14.80 E	-55.30	0.36
3900.00	0.87	140.90	3,899.27	57.60 S	15.61 E	-56.48	0.18
4000.00	0.82	154.86	3,999.26	58.84 S	16.39 E	-57.67	0.21
4100.00	0.72	160.10	4,099.25	60.07 S	16.91 E	-58.87	0.12



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
4200.00	0.46	161.62	4,199.24	61.05 S	17.25 E	-59.82	0.26
4300.00	0.45	129.48	4,299.24	61.68 S	17.68 E	-60.42	0.25
4400.00	0.32	166.89	4,399.24	62.20 S	18.05 E	-60.92	0.28
4500.00	0.26	178.51	4,499.24	62.70 S	18.12 E	-61.41	0.08
4600.00	0.25	122.84	4,599.24	63.04 S	18.31 E	-61.75	0.24
4700.00	0.11	33.61	4,699.24	63.08 S	18.54 E	-61.77	0.27
4800.00	0.15	97.90	4,799.24	63.02 S	18.72 E	-61.69	0.14
4900.00	0.14	114.82	4,899.24	63.09 S	18.97 E	-61.75	0.04
5000.00	0.18	146.26	4,999.24	63.27 S	19.16 E	-61.92	0.09
5100.00	0.10	120.08	5,099.24	63.44 S	19.33 E	-62.08	0.10
5200.00	0.24	159.32	5,199.23	63.68 S	19.48 E	-62.31	0.17
5300.00	0.35	148.75	5,299.23	64.14 S	19.71 E	-62.75	0.12
5400.00	0.34	155.34	5,399.23	64.67 S	19.99 E	-63.26	0.04
5500.00	0.38	125.97	5,499.23	65.14 S	20.38 E	-63.70	0.19
5600.00	0.46	150.08	5,599.23	65.68 S	20.85 E	-64.21	0.19
5700.00	0.29	136.44	5,699.23	66.21 S	21.23 E	-64.72	0.19
5800.00	0.64	153.23	5,799.22	66.89 S	21.65 E	-65.37	0.37
5900.00	0.58	161.43	5,899.22	67.87 S	22.06 E	-66.32	0.11
5960.00	0.52	160.67	5,959.21	68.42 S	22.25 E	-66.86	0.10
6028.00	0.22	167.95	6,027.21	68.84 S	22.38 E	-67.27	0.44
6059.00	1.57	39.48	6,058.21	68.57 S	22.66 E	-66.98	5.55
6091.00	5.70	36.68	6,090.14	66.95 S	23.89 E	-65.29	12.90
6123.00	9.59	30.38	6,121.85	63.38 S	26.19 E	-61.58	12.42
6154.00	12.93	24.50	6,152.25	57.99 S	28.94 E	-56.03	11.37
6186.00	14.94	19.41	6,183.31	50.85 S	31.79 E	-48.71	7.36
6218.00	18.37	15.36	6,213.96	42.09 S	34.50 E	-39.80	11.30
6249.00	21.36	11.50	6,243.11	31.85 S	36.92 E	-29.42	10.53
6281.00	24.60	8.18	6,272.57	19.54 S	39.03 E	-17.01	10.91
6312.00	28.01	6.00	6,300.36	5.91 S	40.71 E	-3.30	11.43
6343.00	30.74	4.24	6,327.37	9.24 N	42.06 E	11.90	9.24
6375.00	32.61	2.02	6,354.60	26.01 N	42.97 E	28.70	6.88
6406.00	34.06	0.71	6,380.50	43.04 N	43.37 E	45.72	5.23
6437.00	34.83	358.36	6,406.06	60.57 N	43.22 E	63.21	4.96
6469.00	34.40	357.08	6,432.40	78.74 N	42.50 E	81.29	2.63
6500.00	34.16	357.19	6,458.02	96.18 N	41.63 E	98.64	0.80
6532.00	34.31	357.35	6,484.47	114.16 N	40.77 E	116.53	0.55
6563.00	33.45	357.65	6,510.21	131.42 N	40.02 E	133.71	2.84
6595.00	33.56	357.88	6,536.89	149.07 N	39.33 E	151.28	0.52
6626.00	33.40	358.31	6,562.75	166.16 N	38.76 E	168.30	0.91
6657.00	33.22	358.31	6,588.65	183.18 N	38.26 E	185.25	0.57
6688.00	32.77	358.38	6,614.65	200.06 N	37.77 E	202.06	1.46
6719.00	33.05	358.14	6,640.68	216.89 N	37.26 E	218.83	0.99
6750.00	33.40	358.49	6,666.61	233.87 N	36.76 E	235.74	1.29
6781.00	36.30	359.90	6,692.05	251.58 N	36.52 E	253.40	9.71
6817.00	40.34	2.53	6,720.29	273.88 N	37.01 E	275.69	12.11



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (N)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100)
6846.00	43.24	3.76	6,741.91	293.18 N	38.08 E	295.01	10.39
6875.00	45.31	3.82	6,762.67	313.38 N	39.42 E	315.26	7.12
6907.00	48.60	3.76	6,784.51	336.71 N	40.97 E	338.64	10.30
6939.00	50.89	3.41	6,805.19	361.08 N	42.49 E	363.06	7.19
6970.00	54.83	2.90	6,823.90	385.75 N	43.85 E	387.76	12.77
7002.00	58.10	3.76	6,841.58	412.37 N	45.40 E	414.43	10.46
7033.00	61.79	3.59	6,857.11	439.14 N	47.12 E	441.26	11.92
7065.00	63.45	3.75	6,871.82	467.50 N	48.94 E	469.67	5.22
7096.00	66.62	3.41	6,884.91	495.55 N	50.70 E	497.77	10.28
7127.00	70.14	3.06	6,896.33	524.31 N	52.32 E	526.58	11.39
7159.00	71.81	2.71	6,906.76	554.53 N	53.84 E	556.83	5.32
7190.00	74.44	2.53	6,915.76	584.16 N	55.20 E	586.49	8.52
7222.00	76.46	3.06	6,923.79	615.09 N	56.71 E	617.46	6.52
7253.00	78.13	2.88	6,930.61	645.29 N	58.28 E	647.70	5.42
7285.00	80.16	3.06	6,936.64	676.68 N	59.91 E	679.12	6.34
7313.00	83.52	3.26	6,940.61	704.35 N	61.44 E	706.83	12.03
7412.00	90.86	4.85	6,945.46	802.91 N	68.43 E	805.64	7.59
7506.00	89.44	3.75	6,945.21	896.64 N	75.48 E	899.63	1.91
7602.00	88.33	8.37	6,947.07	992.06 N	85.61 E	995.50	4.96
7690.00	87.69	6.07	6,950.13	1,079.30 N	96.66 E	1083.27	2.72
7786.00	90.83	8.04	6,951.37	1,174.55 N	108.45 E	1179.08	3.87
7881.00	91.54	5.37	6,949.40	1,268.87 N	119.54 E	1273.91	2.91
7976.00	90.68	3.12	6,947.56	1,363.58 N	126.57 E	1368.88	2.53
8071.00	89.72	2.28	6,947.22	1,458.48 N	131.05 E	1463.87	1.34
8167.00	91.14	3.94	6,946.50	1,554.33 N	136.26 E	1559.85	2.27
8262.00	91.01	0.60	6,944.72	1,649.22 N	140.03 E	1654.80	3.52
8358.00	85.36	359.68	6,947.75	1,745.13 N	140.26 E	1750.53	5.97
8453.00	88.83	359.75	6,952.56	1,840.00 N	139.79 E	1845.17	3.65
8548.00	92.31	1.86	6,951.62	1,934.96 N	141.12 E	1940.02	4.28
8643.00	93.95	2.16	6,946.44	2,029.76 N	144.45 E	2034.84	1.76
8738.00	92.44	0.98	6,941.15	2,124.57 N	147.04 E	2129.62	2.02
8833.00	92.56	3.33	6,937.02	2,219.41 N	150.61 E	2224.50	2.48
8928.00	89.97	3.99	6,934.92	2,314.18 N	156.67 E	2319.46	2.81
9023.00	90.74	4.21	6,934.34	2,408.94 N	163.47 E	2414.46	0.84
9118.00	86.79	2.83	6,936.38	2,503.71 N	169.30 E	2509.41	4.40
9213.00	87.13	4.50	6,941.42	2,598.38 N	175.37 E	2604.28	1.79
9308.00	85.41	5.14	6,947.60	2,692.84 N	183.33 E	2699.05	1.93
9404.00	87.22	5.85	6,953.78	2,788.20 N	192.50 E	2794.80	2.03
9499.00	90.74	5.59	6,955.47	2,882.69 N	201.97 E	2889.71	3.71
9594.00	89.29	5.00	6,955.45	2,977.29 N	210.74 E	2984.67	1.65
9690.00	91.14	4.11	6,955.08	3,072.98 N	218.36 E	3080.65	2.14
9785.00	88.09	2.90	6,955.72	3,167.78 N	224.17 E	3175.63	3.45
9879.00	90.22	3.74	6,957.11	3,261.61 N	229.61 E	3269.62	2.43
9974.00	90.46	3.16	6,956.55	3,356.44 N	235.33 E	3364.61	0.66
10069.00	91.48	3.06	6,954.94	3,451.28 N	240.48 E	3459.59	1.08



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
10097.00	90.95	2.76	6,954.35	3,479.24 N	241.90 E	3487.58	2.16
10190.00	89.78	3.36	6,953.75	3,572.10 N	246.86 E	3580.58	1.41
10282.00	89.63	3.32	6,954.22	3,663.95 N	252.21 E	3672.57	0.17
10377.00	91.94	4.04	6,952.92	3,758.73 N	258.31 E	3767.56	2.55
10473.00	92.90	4.38	6,948.86	3,854.39 N	265.35 E	3863.47	1.06
10568.00	91.98	4.77	6,944.83	3,949.00 N	272.92 E	3958.37	1.05
10663.00	87.87	3.00	6,944.95	4,043.76 N	279.35 E	4053.34	4.70
10758.00	92.93	6.37	6,944.29	4,138.39 N	287.11 E	4148.28	6.40
10854.00	87.99	1.66	6,943.52	4,234.10 N	293.83 E	4244.22	7.11
10949.00	92.50	3.00	6,943.11	4,328.99 N	297.69 E	4339.17	4.95
11045.00	88.43	2.34	6,942.33	4,424.86 N	302.16 E	4435.13	4.29
11140.00	89.78	7.83	6,943.81	4,519.44 N	310.58 E	4530.05	5.96
11235.00	90.43	8.83	6,943.63	4,613.43 N	324.35 E	4624.73	1.25
11330.00	92.56	10.83	6,941.15	4,707.00 N	340.56 E	4719.14	3.07
11426.00	89.78	10.92	6,939.19	4,801.24 N	358.67 E	4814.35	2.89
11521.00	90.56	10.93	6,938.91	4,894.52 N	376.68 E	4908.58	0.81
11616.00	91.11	7.35	6,937.52	4,988.29 N	391.76 E	5003.12	3.81
11711.00	89.48	0.62	6,937.04	5,083.00 N	398.36 E	5098.06	7.29
11807.00	90.40	1.41	6,937.14	5,178.98 N	400.06 E	5193.96	1.26
11902.00	88.12	359.87	6,938.37	5,273.96 N	401.12 E	5288.81	2.90
11997.00	89.91	0.88	6,940.00	5,368.94 N	401.75 E	5383.63	2.16
12093.00	89.94	0.94	6,940.13	5,464.93 N	403.28 E	5479.52	0.06
12188.00	89.20	359.62	6,940.85	5,559.92 N	403.74 E	5574.35	1.59
12283.00	91.97	2.34	6,939.88	5,654.88 N	405.36 E	5669.23	4.09
12378.00	89.66	0.31	6,938.52	5,749.84 N	407.56 E	5764.13	3.24
12473.00	89.72	0.94	6,939.03	5,844.83 N	408.59 E	5858.99	0.66
12569.00	89.17	1.16	6,939.96	5,940.81 N	410.35 E	5954.89	0.62
12664.00	90.43	2.41	6,940.29	6,035.76 N	413.30 E	6049.83	1.88
12759.00	88.46	359.41	6,941.21	6,130.73 N	414.82 E	6144.70	3.78
12854.00	90.37	1.47	6,942.18	6,225.71 N	415.54 E	6239.54	2.95
12950.00	90.59	0.88	6,941.38	6,321.68 N	417.51 E	6335.44	0.65
13044.00	92.28	5.79	6,939.03	6,415.46 N	422.97 E	6429.38	5.53
13139.00	92.80	4.98	6,934.82	6,509.95 N	431.88 E	6524.24	1.02
13234.00	92.37	5.84	6,930.53	6,604.43 N	440.83 E	6619.10	1.01
13329.00	93.06	6.58	6,926.04	6,698.76 N	451.09 E	6713.90	1.06
13424.00	90.43	6.18	6,923.15	6,793.12 N	461.64 E	6808.74	2.79
13520.00	87.29	5.77	6,925.06	6,888.57 N	471.63 E	6904.63	3.30
13615.00	87.23	4.86	6,929.59	6,983.05 N	480.42 E	6999.48	0.96
13710.00	86.52	3.11	6,934.77	7,077.68 N	487.01 E	7094.33	1.98
13807.00	86.37	3.88	6,940.79	7,174.31 N	492.91 E	7191.15	0.81
13902.00	87.72	6.14	6,945.69	7,268.81 N	501.20 E	7285.98	2.76
13961.00	87.32	5.74	6,948.24	7,327.44 N	507.30 E	7344.88	0.95
14056.00	92.40	5.94	6,948.47	7,421.92 N	516.96 E	7439.78	5.36
14151.00	92.10	5.15	6,944.74	7,516.40 N	526.13 E	7534.66	0.88
14247.00	90.37	1.59	6,942.67	7,612.19 N	531.77 E	7630.61	4.13



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100')
14342.00	90.34	1.28	6,942.08	7,707.16 N	534.15 E	7725.54	0.32
14438.00	90.06	0.28	6,941.75	7,803.15 N	535.46 E	7821.42	1.09
14533.00	90.40	0.59	6,941.36	7,898.15 N	536.18 E	7916.27	0.49
14628.00	92.16	1.69	6,939.25	7,993.10 N	538.07 E	8011.15	2.18
14724.00	89.72	2.10	6,937.67	8,089.03 N	541.24 E	8107.08	2.57
14819.00	90.34	3.49	6,937.63	8,183.91 N	545.87 E	8202.06	1.60
14851.00	92.00	4.43	6,936.97	8,215.83 N	548.08 E	8234.06	5.96
14914.00	90.37	3.41	6,935.67	8,278.66 N	552.39 E	8297.04	3.05
15009.00	89.48	4.26	6,935.80	8,373.45 N	558.75 E	8392.04	1.30
15105.00	89.88	6.30	6,936.34	8,469.03 N	567.58 E	8487.99	2.16
15200.00	89.57	7.89	6,936.80	8,563.30 N	579.32 E	8582.82	1.71
15295.00	91.11	10.86	6,936.24	8,657.02 N	594.79 E	8677.33	3.52
15390.00	89.82	11.51	6,935.47	8,750.21 N	613.22 E	8771.51	1.53
15447.00	88.15	9.55	6,936.48	8,806.23 N	623.63 E	8828.08	4.52
15485.00	90.52	12.26	6,936.92	8,843.54 N	630.82 E	8865.77	9.48
15547.00	90.59	9.53	6,936.32	8,904.41 N	642.53 E	8927.27	4.41
15581.00	90.25	7.70	6,936.07	8,938.03 N	647.62 E	8961.14	5.47
15622.00	89.57	7.23	6,936.14	8,978.68 N	652.95 E	9002.05	2.01
15676.00	88.86	6.86	6,936.88	9,032.27 N	659.57 E	9055.95	1.47
15771.00	88.03	6.08	6,939.46	9,126.63 N	670.27 E	9150.80	1.20
15866.00	84.69	4.32	6,945.49	9,221.03 N	678.87 E	9245.56	3.97
15961.00	84.66	2.60	6,954.30	9,315.44 N	684.58 E	9340.14	1.81
16056.00	85.68	0.96	6,962.30	9,410.05 N	687.52 E	9434.75	2.03
16152.00	88.15	1.86	6,967.47	9,505.88 N	689.88 E	9530.53	2.74
16247.00	89.23	0.92	6,969.64	9,600.82 N	692.18 E	9625.43	1.51
16342.00	92.34	1.17	6,968.33	9,695.78 N	693.92 E	9720.31	3.29
16437.00	88.77	359.89	6,967.41	9,790.76 N	694.79 E	9815.14	4.00
16533.00	93.09	2.79	6,965.86	9,886.69 N	697.03 E	9911.02	5.42
16628.00	91.94	1.58	6,961.69	9,981.52 N	700.64 E	10005.89	1.76
16724.00	92.28	1.29	6,958.15	10,077.43 N	703.04 E	10101.75	0.46
16819.00	92.19	1.72	6,954.45	10,172.32 N	705.53 E	10196.61	0.46
16914.00	93.15	2.79	6,950.02	10,267.14 N	709.26 E	10291.48	1.51
17009.00	93.14	4.23	6,944.82	10,361.82 N	715.06 E	10386.33	1.52
17104.00	90.83	2.33	6,941.53	10,456.60 N	720.50 E	10481.26	3.14
17199.00	89.97	1.59	6,940.86	10,551.54 N	723.75 E	10576.22	1.20
17294.00	90.34	3.05	6,940.61	10,646.46 N	727.59 E	10671.19	1.58
17390.00	90.37	4.68	6,940.01	10,742.23 N	734.06 E	10767.18	1.70
17485.00	90.37	4.68	6,939.40	10,836.92 N	741.81 E	10862.17	0.00

SURVEY FOOTER

SURVEYS CALCULATED USING SHORT COLLAR METHOD.
WELL ASSUMED VERTICAL AT WELLHEAD.

SURVEYS FROM 100' MD TO 5960' MD PROVIDED BY VAUGHN ENERGY SERVICES.
SURVEYS FROM 6028' MD TO 17390' MD PROVIDED BY SPERRY DRILLING.
SURVEY AT 17390' MD IS PROJECTED TO TD AT 17485' MD.

**SURVEY FOOTER**

SPERRY DRILLING ENGINEERS: B. GERMAN, J. HUNT, J. ATWOOD, D. JETER

DIRECTIONAL SURVEY DATA NOTES

- Calculation based on minimum curvature method.
- Survey coordinates relative to well system reference point.
- TVD values given relative to drilling measurement point.
- Vertical section relative to well head.
- Vertical section is computed along a direction of 3.66 degrees (Grid)
- A total correction of 7.28 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 17,485.00 feet is 10,862.27 feet along 3.92 degrees (Grid)

WARRANTY

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HALLIBURTON

Sperry Drilling



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