

Schlumberger Drilling and Measurements
Drilling Group
Geo Market Area: South West Texas Basin
7220 W I-H 20
Midland, Texas 79706
Phone : (432) 742-5400 (Main)
Fax : (432) 742-5606 (Shared)

Schlumberger

February 13, 2017

OXY USA INC.

Re:

29, 24S, 29E, Eddy NM
-32.19008 -103.99817

CLIENT: OXY USA INC.
WELL: Cedar Canyon 28-27 Federal 5H
FIELD: Pierce Crossing BN SPRG E

RIG: H&P639
COUNTY: Eddy
API NO: 30-015-43645
JOB NO: 16MLD2196

Enclosed, please find the original copy of the survey performed on the referenced well by Drilling & Measurements, a division of Schlumberger Technology Corporation (P-5 No. 754900). Other information required by your office is as follows.

<u>Name & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Kalu Uga FS	Cedar Canyon 28-27 Federal 5H Original Hole	8250.00 Ft to 9002.00 Ft	December 21, 2016 to January 26, 2017	SlimPulse

If any other information is required, please contact the undersigned at the above letterhead and phone number.
Sincerely,

Cody Nelms
Field Service Manager

Schlumberger

Reservoir Development
Schlumberger Drilling and Measurements
9200 West Reno Avenue
Oklahoma City, Oklahoma 73127 USA
Phone: (405) 789-1515
Fax: (405) 789-1519

Well Reference:
29, 24S, 29E, Eddy NM
-32.19008 -103.99817

I, Kalu Uga certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of December 21, 2016 through January 26, 2017, conduct or supervise the taking of the SlimPulse surveys from a depth of 8250.00 feet to a depth of 9002.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I am authorized and qualified to make this report; that this survey was conducted at the request of OXY USA INC. for the Cedar Canyon 28-27 Federal 5H Well (Original Hole) API No. 30-015-43645 in New Mexico; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation.

By
Kalu Uga
FS



Subscribed and Sworn to before me this 20 day of February (month) 2017 (yr)

My Commission expires:

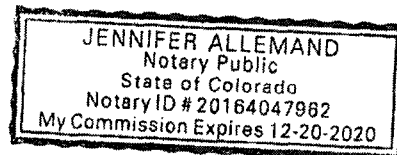
12-20-2020



Notary Public

(signature)

Adams, Colorado
(County State)





Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update Survey

Geodetic Report

(Non-Def Survey)

Report Date: February 07, 2017 - 02:54 PM Client: OXY Field: NM Eddy County (NAD 27) Structure / Slot: Oxy Cedar Canyon 28-27 Federal Com 5H / Oxy Cedar Canyon 28-27 Federal Com 5H Well: Oxy Cedar Canyon 28-27 Federal Com 5H Borehole: Original Borehole UWI / API#: Unknown / Unknown Survey Name: Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update Survey Date: January 03, 2017 Tort / AHD / DOI / ERD Ratio: 142.812' / 1585.027 ft / 5.370 / 0.180 Coordinate Reference System: NAD27 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 11' 24.30151" W 103° 59' 53.40953" Location Grid N/E Y/X: N 433034.130 ftUS, E 603684.410 ftUS CRS Grid Convergence Angle: 0.1786° Grid Scale Factor: 0.9999214 Version / Patch: 2.10.254.0	Survey / DLS Computation: Minimum Curvature / Lubinski Vertical Section Azimuth: 93.876° (Grid North) Vertical Section Origin: 0.000 ft, 0.000 ft TVD Reference Datum: RKB=26.5 TVD Reference Elevation: 2974.500 ft above MSL Seabed / Ground Elevation: 2948.000 ft above MSL Magnetic Declination: 7.203° Total Gravity Field Strength: 998.4641mgN (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 48164.947 nT Magnetic Dip Angle: 60.034° Declination Date: January 03, 2017 Magnetic Declination Model: HDGM 2016 North Reference: Grid North Grid Convergence Used: 0.1786° Total Corr Mag North->Grid North: 7.0242° Local Coord Referenced To: Well Head	
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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	433034.13	603684.41	N 32 11 24.30 W 103 59 53.41	
RKB	26.50	0.00	0.00	26.50	0.00	0.00	0.00	0.00	433034.13	603684.41	N 32 11 24.30 W 103 59 53.41	
	107.00	0.55	146.86	107.00	0.23	-0.32	0.21	0.68	433033.81	603684.62	N 32 11 24.30 W 103 59 53.41	
	198.00	0.68	146.46	197.99	0.79	-1.14	0.72	0.13	433032.99	603685.13	N 32 11 24.29 W 103 59 53.40	
	289.00	0.72	146.29	288.99	1.44	-2.07	1.30	0.08	433032.06	603685.71	N 32 11 24.28 W 103 59 53.39	
	880.00	0.70	144.85	379.98	2.14	-3.00	1.94	0.03	433031.13	603686.35	N 32 11 24.27 W 103 59 53.39	
	470.00	0.69	143.48	469.97	2.84	-3.88	2.58	0.02	433030.25	603686.99	N 32 11 24.26 W 103 59 53.38	
	561.00	0.68	144.57	560.97	3.53	-4.76	3.22	0.02	433029.37	603687.63	N 32 11 24.25 W 103 59 53.37	
	651.00	0.69	145.64	650.96	4.21	-5.64	3.83	0.02	433028.49	603688.24	N 32 11 24.25 W 103 59 53.37	
	741.00	0.79	140.23	740.95	4.97	-6.57	4.54	0.14	433027.56	603688.95	N 32 11 24.24 W 103 59 53.36	
	832.00	0.88	140.93	831.94	5.88	-7.59	5.38	0.10	433026.54	603689.79	N 32 11 24.23 W 103 59 53.35	
	922.00	0.43	137.84	921.94	6.59	-8.38	6.04	0.50	433025.75	603690.45	N 32 11 24.22 W 103 59 53.34	
	1012.00	0.04	130.19	1011.94	6.86	-8.65	6.29	0.43	433025.48	603690.70	N 32 11 24.22 W 103 59 53.34	
	1106.00	0.05	130.57	1105.94	6.92	-8.70	6.35	0.01	433025.43	603690.76	N 32 11 24.22 W 103 59 53.34	
	1201.00	0.03	121.67	1200.94	6.98	-8.74	6.40	0.02	433025.39	603690.81	N 32 11 24.21 W 103 59 53.34	
	1295.00	0.03	33.04	1294.94	7.01	-8.73	6.43	0.04	433025.40	603690.84	N 32 11 24.21 W 103 59 53.33	
	1389.00	0.02	45.40	1388.94	7.03	-8.70	6.46	0.01	433025.43	603690.87	N 32 11 24.22 W 103 59 53.33	
	1483.00	0.02	62.74	1482.94	7.06	-8.68	6.49	0.01	433025.45	603690.89	N 32 11 24.22 W 103 59 53.33	
	1578.00	0.02	51.62	1577.94	7.08	-8.66	6.51	0.00	433025.47	603690.92	N 32 11 24.22 W 103 59 53.33	
	1672.00	0.02	42.35	1671.94	7.11	-8.64	6.54	0.00	433025.49	603690.95	N 32 11 24.22 W 103 59 53.33	
	1766.00	0.02	5.24	1765.94	7.12	-8.61	6.55	0.01	433025.52	603690.96	N 32 11 24.22 W 103 59 53.33	
	1860.00	0.02	30.80	1859.94	7.12	-8.58	6.58	0.01	433025.55	603690.97	N 32 11 24.22 W 103 59 53.33	
	1955.00	0.02	28.97	1954.94	7.14	-8.55	6.58	0.00	433025.58	603690.99	N 32 11 24.22 W 103 59 53.33	
	2049.00	0.01	145.44	2048.94	7.15	-8.54	6.59	0.03	433025.59	603691.00	N 32 11 24.22 W 103 59 53.33	
	2143.00	0.04	166.13	2142.94	7.17	-8.58	6.60	0.03	433025.55	603691.01	N 32 11 24.22 W 103 59 53.33	
	2237.00	0.03	169.13	2236.94	7.18	-8.64	6.61	0.01	433025.49	603691.02	N 32 11 24.22 W 103 59 53.33	
	2331.00	0.04	189.39	2330.94	7.19	-8.70	6.61	0.02	433025.44	603691.02	N 32 11 24.22 W 103 59 53.33	
	2426.00	0.03	209.88	2425.94	7.17	-8.75	6.60	0.02	433025.38	603691.00	N 32 11 24.21 W 103 59 53.33	
	2520.00	0.04	201.80	2519.94	7.15	-8.80	6.57	0.01	433025.33	603690.98	N 32 11 24.21 W 103 59 53.33	
	2614.00	0.09	211.50	2613.94	7.11	-8.89	6.52	0.05	433025.24	603690.93	N 32 11 24.21 W 103 59 53.33	
	2708.00	0.03	189.65	2707.94	7.07	-8.98	6.48	0.07	433025.15	603690.89	N 32 11 24.21 W 103 59 53.33	
	2803.00	0.02	175.42	2802.94	7.07	-9.02	6.47	0.01	433025.11	603690.88	N 32 11 24.21 W 103 59 53.33	
	2897.00	0.01	185.33	2896.94	7.07	-9.05	6.47	0.01	433025.08	603690.88	N 32 11 24.21 W 103 59 53.33	
	2991.00	0.12	164.30	2990.94	7.10	-9.15	6.50	0.12	433024.98	603690.91	N 32 11 24.21 W 103 59 53.33	
	3085.00	1.15	177.01	3084.93	7.25	-10.19	6.58	1.10	433023.94	603690.99	N 32 11 24.20 W 103 59 53.33	
	3180.00	3.39	177.83	3179.85	7.66	-13.95	6.73	2.36	433020.18	603691.14	N 32 11 24.16 W 103 59 53.33	
	3274.00	5.88	176.26	3273.55	8.57	-21.37	7.14	2.44	433012.77	603691.55	N 32 11 24.09 W 103 59 53.33	
	3368.00	7.97	178.17	3368.88	9.83	-32.52	7.65	2.45	433001.61	603692.06	N 32 11 23.98 W 103 59 53.32	
	3462.00	10.23	177.34	3459.69	11.43	-47.38	8.25	2.41	432996.76	603692.66	N 32 11 23.83 W 103 59 53.32	
	3556.00	12.43	176.48	3551.85	13.68	-65.81	9.28	2.35	432988.32	603693.67	N 32 11 23.65 W 103 59 53.30	
	3651.00	13.86	174.48	3644.36	18.86	-87.35	10.98	1.58	432946.79	603695.39	N 32 11 23.44 W 103 59 53.28	
	3745.00	13.93	172.01	3735.61	21.02	-109.78	13.64	0.64	432924.38	603698.04	N 32 11 23.21 W 103 59 53.25	
	3839.00	14.33	170.67	3826.76	26.01	-132.44	17.09	0.55	432901.70	603701.50	N 32 11 22.99 W 103 59 53.22	
	3933.00	14.82	169.37	3917.74	31.68	-155.74	21.20	0.63	432878.41	603705.61	N 32 11 22.76 W 103 59 53.17	
	4028.00	15.19	168.48	4009.50	38.02	-179.87	25.92	0.46	432854.27	603710.33	N 32 11 22.52 W 103 59 53.11	
	4122.00	15.58	166.91	4100.13	44.98	-204.24	31.24	0.81	432829.91	603715.65	N 32 11 22.28 W 103 59 53.05	
	4216.00	15.82	165.89	4190.62	52.62	-228.96	37.23	0.39	432805.19	603721.63	N 32 11 22.03 W 103 59 52.98	
	4310.00	15.99	164.59	4281.03	60.85	-253.87	43.79	0.42	432780.28	603728.20	N 32 11 21.79 W 103 59 52.91	
	4404.00	15.39	164.15	4371.52	69.34	-278.35	50.84	0.65	432755.81	603735.04	N 32 11 21.55 W 103 59 52.83	
	4498.00	14.51	163.98	4463.31	77.64	-301.91	57.36	0.93	432732.24	603741.77	N 32 11 21.31 W 103 59 52.75	
	4593.00	13.87	163.52	4554.44	85.57	-324.04	63.81	0.69	432710.12	603748.21	N 32 11 21.09 W 103 59 52.68	
	4687.00	13.40	163.12	4645.79	93.35	-345.26	70.17	0.51	432688.90	603754.57	N 32 11 20.88 W 103 59 52.61	
	4781.00	13.52	162.97	4737.21	101.13	-366.19	76.55	0.13	432667.97	603760.95	N 32 11 20.68 W 103 59 52.53	
	4876.00	13.55	162.93	4829.57	109.07	-387.45	83.07	0.03	432646.71	603767.47	N 32 11 20.46 W 103 59 52.46	
	4970.00	13.44	162.62	4920.97	116.97	-408.40	89.56	0.14	432625.76	603773.97	N 32 11 20.26 W 103 59 52.38	
	5064.00	12.84	162.87	5012.51	124.67	-428.81	95.90	0.64	432605.36	603780.31	N 32 11 20.06 W 103 59 52.31	
	5158.00	12.06	162.95	5104.30	131.92	-448.18	101.86	0.83	432585.99	603786.26	N 32 11 19.86 W 103 59 52.24	
	5253.00	11.39	163.20	5197.32	138.78	-466.65	107.48	0.71	432567.52	603791.88	N 32 11 19.68 W 103 59 52.18	
	5347.00	10.98	163.56	5289.53	145.16	-484.12	112.70	0.44	432550.05	603797.10	N 32 11 19.51 W 103 59 52.12	
	5441.00	10.05	162.96	5381.95	151.20	-500.55	117.83	1.00	432533.62	603802.03	N 32 11 19.34 W 103 59 52.06	
	5535.00	9.28	162.24	5474.62	156.92	-515.61	122.35	0.83	432518.57	603806.75	N 32 11 19.20 W 103 59 52.00	
	5629.00	9.13	161.75	5567.41	162.53	-529.91	127.00	0.18	432504.27	603811.40	N 32 11 19.05 W 103 59 51.95	
	5724.00	8.93	162.32	5661.23	168.07	-544.09	131.60	0.23	432490.08	603816.00	N 32 11 18.91 W 103 59 51.90	
	5818.00	9.33	165.63	5754.04	173.14	-558.42	135.70	0.70	432475.75	603820.10	N 32 11 18.77 W 103 59 51.85	
	5912.00	9.91	168.73	5846.72	177.64	-573.74	139.18	0.83	432460.44	603823.57	N 32 11 18.62 W 103 59 51.81	
	6006.00	10.37	170.76	5939.25	181.67	-590.02	142.11	0.62	432444.16	603826.51	N 32 11 18.46 W 103 59 51.78	
	6101.00	10.29	169.74	6032.71	185.69	-606.81	145.00	0.21	432427.37	603829.40	N 32 11 18.29 W 103 59 51.74	
	6195.00	10.31	168.45	6125.20	189.97	-623.31	148.18	0.25	432410.87	603832.58	N 32 11 18.13 W 103 59 51.71	
	6289.00	10.00	166.10	6217.72	194.70	-639.47	151.82	0.55	432394.71	603836.22	N 32 11 17.97 W 103 59 51.67	
	6383.00	10.03	164.99	6310.29	199.84	-655.30	155.90	0.21	432378.88	603840.30	N 32 11 17.81 W 103 59 51.62	
	6478.00	9.80	164.55	6403.87	205.20	-671.09	160.20	0.25	432363.10	603844.60	N 32 11 17.66 W 103 59 51.57	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6572.00	9.87	164.23	6496.49	210.55	-688.55	164.52	0.09	432347.63	603848.92	N 32 11 17.50	W 103 59 51.52
	6666.00	9.95	163.61	6589.09	216.08	-702.10	169.00	0.14	432332.09	603853.40	N 32 11 17.35	W 103 59 51.47
	6760.00	9.48	160.80	6681.74	221.92	-717.20	173.84	0.71	432316.99	603858.24	N 32 11 17.20	W 103 59 51.41
	6854.00	9.24	157.68	6774.49	228.29	-731.49	179.25	0.60	432302.70	603863.65	N 32 11 17.06	W 103 59 51.35
	6949.00	8.85	154.72	6868.31	235.22	-745.15	185.27	0.64	432289.04	603869.66	N 32 11 16.92	W 103 59 51.28
	7043.00	8.42	150.54	6961.24	242.52	-757.68	191.74	0.81	432276.51	603876.14	N 32 11 16.80	W 103 59 51.21
	7137.00	8.60	143.44	7054.21	250.86	-769.32	199.31	1.13	432264.87	603883.71	N 32 11 16.68	W 103 59 51.12
	7231.00	8.63	138.66	7147.15	260.43	-780.26	208.16	0.76	432253.93	603892.55	N 32 11 16.57	W 103 59 51.02
	7326.00	8.42	135.47	7241.10	270.69	-790.57	217.74	0.54	432243.62	603902.14	N 32 11 16.47	W 103 59 50.90
	7420.00	7.33	128.89	7334.22	280.74	-799.24	227.24	1.50	432234.95	603911.63	N 32 11 16.39	W 103 59 50.79
	7514.00	7.13	123.35	7427.47	290.73	-806.21	236.78	0.77	432227.98	603921.17	N 32 11 16.32	W 103 59 50.68
	7608.00	7.51	120.31	7520.70	301.31	-812.52	246.95	0.58	432221.67	603931.34	N 32 11 16.25	W 103 59 50.57
	7703.00	8.22	115.77	7614.81	313.17	-818.61	258.43	0.99	432215.59	603942.82	N 32 11 16.19	W 103 59 50.43
	7797.00	8.34	108.62	7707.83	326.00	-823.71	270.94	1.10	432210.49	603955.33	N 32 11 16.14	W 103 59 50.29
Last Gyro	7891.00	8.10	99.88	7800.87	339.18	-827.02	283.93	1.35	432207.18	603968.31	N 32 11 16.11	W 103 59 50.14
	7933.00	7.76	94.21	7842.47	344.96	-827.74	289.67	2.03	432206.46	603974.06	N 32 11 16.10	W 103 59 50.07
	8027.00	9.47	85.23	7935.41	358.95	-827.56	303.71	2.31	432206.84	603988.09	N 32 11 16.10	W 103 59 49.91
	8091.00	10.28	84.57	7998.46	369.78	-826.58	314.63	1.25	432207.62	603999.01	N 32 11 16.11	W 103 59 49.78
	8250.00	15.76	98.85	8153.37	405.27	-828.94	350.04	4.05	432205.26	604034.42	N 32 11 16.09	W 103 59 49.37
	8344.00	23.34	118.32	8241.97	434.99	-839.98	379.08	10.31	432194.22	604063.46	N 32 11 15.98	W 103 59 49.03
	8438.00	28.86	96.92	8326.53	474.71	-851.58	418.10	11.52	432182.62	604102.48	N 32 11 15.86	W 103 59 48.58
	8532.00	33.65	80.97	8407.01	522.86	-850.22	466.46	10.13	432183.97	604150.83	N 32 11 15.87	W 103 59 48.01
	8628.00	41.95	76.35	8481.23	578.32	-838.70	522.82	9.32	432185.50	604207.19	N 32 11 15.99	W 103 59 47.36
	8720.00	51.43	70.05	8545.67	642.07	-818.69	588.08	11.19	432215.50	604272.44	N 32 11 16.18	W 103 59 46.60
	8814.00	59.12	78.30	8599.24	714.74	-797.92	662.31	10.90	432236.28	604346.67	N 32 11 16.39	W 103 59 45.73
	8908.00	67.97	83.06	8641.09	796.59	-784.44	745.27	10.45	432249.75	604429.62	N 32 11 16.52	W 103 59 44.77
	9002.00	78.86	82.42	8667.88	884.84	-773.06	834.50	11.60	432261.13	604518.84	N 32 11 16.63	W 103 59 43.73
Projection	9099.00	89.50	82.00	8677.71	979.21	-759.99	929.97	10.98	432274.20	604614.30	N 32 11 16.75	W 103 59 42.62

Survey Type: Non-Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	26.500	1/98.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update
	1	26.500	26.500	Act Sins	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update
	1	26.500	7891.000	Act Sins	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro +
	1	7891.000	9099.000	Act Sins	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro +

Schlumberger Drilling and Measurements
Drilling Group
Geo Market Area: South West Texas Basin
7220 W I-H 20
Midland, Texas 79706
Phone : (432) 742-5400 (Main)
Fax : (432) 742-5606 (Shared)

Schlumberger

February 11, 2017

OXY USA INC.

Re:

29, 24S, 29E, Eddy NM
-32.19008 -103.99817

CLIENT: OXY USA INC.
WELL: Cedar Canyon 28-27 Federal 5H
FIELD: Pierce Crossing BN SPRG E

RIG: H&P639
COUNTY: Eddy
API NO: 30-015-43645
JOB NO: 16MLD2196

Enclosed, please find the original copy of the survey performed on the referenced well by Drilling & Measurements, a division of Schlumberger Technology Corporation (P-5 No. 754900). Other information required by your office is as follows.

<u>Name & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Kalu Uga FS	Cedar Canyon 28-27 Federal 5H Side Track	8239.00 Ft to 18674.00 Ft	December 21, 2016 to February 5, 2017	SlimPulse

If any other information is required, please contact the undersigned at the above letterhead and phone number.
Sincerely,

Cody Nelms
Field Service Manager

Schlumberger

Reservoir Development
Schlumberger Drilling and Measurements
9200 West Reno Avenue
Oklahoma City, Oklahoma 73127 USA
Phone: (405) 789-1515
Fax: (405) 789-1519

Well Reference:
29, 24S, 29E, Eddy NM
-32.19008 -103.99817

I, Kalu Uga certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of December 21, 2016 through February 05, 2017, conduct or supervise the taking of the SlimPulse surveys from a depth of 8239.00 feet to a depth of 18674.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I am authorized and qualified to make this report; that this survey was conducted at the request of OXY USA INC. for the Cedar Canyon 28-27 Federal 5H Well (Side Track) API No. 30-015-43645 in New Mexico; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation.

By
Kalu Uga
FS



Subscribed and Sworn to before me this 20 day of February (month) 2017 (yr)

My Commission expires:

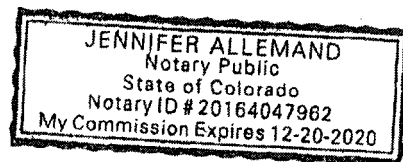
12-20-2020

J. Allemand

Notary Public

Adams, Colorado
(County State)

(signature)





Cedar Canyon 28-27 Federal Com 5H ST01 Gyro+ MWD 0-18714 ft MD

Survey Geodetic Report

(Def Survey)

Report Date:	February 06, 2017 - 04:20 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	OXY	Vertical Section Azimuth:	83.876 ° (Grid North)
Field:	NM Eddy County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Oxy Cedar Canyon 28-27 Federal Com 5H / Oxy Cedar Canyon 28-27 Federal Com 5H	TVD Reference Datum:	RKB
Well:	Oxy Cedar Canyon 28-27 Federal Com 5H	TVD Reference Elevation:	2974.500 ft above MSL
Borehole:	ST01	Seabed / Ground Elevation:	2948.000 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.196 °
Survey Name:	Cedar Canyon 28-27 Federal Com 5H ST01 Gyro+ MWD 0-18714 ft MD	Total Gravity Field Strength:	998.4641mgn (9.80665 Based)
Survey Date:	January 27, 2017	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	209.027 ° / 11217.724 ft / 6.701 / 1.285	Total Magnetic Field Strength:	48157.797 nT
Coordinate Reference System:	NAD27 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	60.033 °
Location Lat / Long:	N 32° 11' 24.30151", W 103° 59' 53.40953"	Declination Date:	January 27, 2017
Location Grid N/E Y/X:	N 433034.130 ftUS, E 603684.410 ftUS	Magnetic Declination Model:	HDGM 2016
CRS Grid Convergence Angle:	0.1786 °	North Reference:	Grid North
Grid Scale Factor:	0.9999214	Grid Convergence Used:	0.1786 °
Version / Patch:	2.10.254.0	Total Corr Mag North->Grid North:	7.0178 °

Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	433034.13	603684.41	N 32 11 24.30	W 103 59 53.41
RKB	26.50	0.00	0.00	26.50	0.00	0.00	0.00	0.00	433034.13	603684.41	N 32 11 24.30	W 103 59 53.41
	107.00	0.55	146.66	107.00	0.23	-0.32	0.21	0.68	433033.81	603684.62	N 32 11 24.30	W 103 59 53.41
	198.00	0.66	146.46	197.99	0.79	-1.14	0.72	0.13	433032.99	603685.13	N 32 11 24.29	W 103 59 53.40
	289.00	0.72	146.29	288.99	1.44	-2.07	1.30	0.08	433032.06	603685.71	N 32 11 24.28	W 103 59 53.39
	380.00	0.70	144.85	379.98	2.14	-3.00	1.94	0.03	433031.13	603686.35	N 32 11 24.27	W 103 59 53.39
	470.00	0.69	143.48	469.97	2.84	-3.88	2.58	0.02	433030.25	603686.99	N 32 11 24.26	W 103 59 53.38
	561.00	0.68	144.57	560.97	3.53	-4.76	3.22	0.02	433029.37	603687.63	N 32 11 24.25	W 103 59 53.37
	651.00	0.69	145.64	650.96	4.21	-5.64	3.83	0.02	433028.49	603688.24	N 32 11 24.25	W 103 59 53.37
	741.00	0.79	140.23	740.95	4.97	-6.57	4.54	0.14	433027.56	603688.95	N 32 11 24.24	W 103 59 53.36
	832.00	0.88	140.93	831.94	5.88	-7.59	5.38	0.10	433026.54	603689.79	N 32 11 24.23	W 103 59 53.35
	922.00	0.43	137.84	921.94	6.59	-8.38	6.04	0.50	433025.75	603690.45	N 32 11 24.22	W 103 59 53.34
	1012.00	0.04	130.19	1011.94	6.86	-8.65	6.29	0.43	433025.48	603690.70	N 32 11 24.22	W 103 59 53.34
	1108.00	0.05	130.57	1105.94	6.82	-8.70	6.35	0.01	433025.43	603690.76	N 32 11 24.22	W 103 59 53.34
	1201.00	0.03	121.67	1200.94	6.98	-8.74	6.40	0.02	433025.39	603690.81	N 32 11 24.21	W 103 59 53.34
	1295.00	0.03	133.04	1294.94	7.01	-8.73	6.43	0.04	433025.40	603690.84	N 32 11 24.21	W 103 59 53.33
	1399.00	0.02	45.40	1388.94	7.03	-8.70	6.46	0.01	433025.43	603690.87	N 32 11 24.22	W 103 59 53.33
	1483.00	0.02	62.74	1482.94	7.06	-8.68	6.49	0.01	433025.45	603690.89	N 32 11 24.22	W 103 59 53.33
	1578.00	0.02	51.62	1577.94	7.08	-8.66	6.51	0.00	433025.47	603690.92	N 32 11 24.22	W 103 59 53.33
	1672.00	0.02	42.35	1671.94	7.11	-8.64	6.54	0.00	433025.49	603690.95	N 32 11 24.22	W 103 59 53.33
	1768.00	0.02	5.24	1765.94	7.12	-8.61	6.55	0.01	433025.52	603690.98	N 32 11 24.22	W 103 59 53.33
	1860.00	0.02	30.80	1859.94	7.12	-8.58	6.56	0.01	433025.55	603690.97	N 32 11 24.22	W 103 59 53.33
	1955.00	0.02	28.97	1954.94	7.14	-8.55	6.58	0.00	433025.58	603690.99	N 32 11 24.22	W 103 59 53.33
	2049.00	0.01	145.44	2048.94	7.15	-8.54	6.59	0.03	433025.59	603691.00	N 32 11 24.22	W 103 59 53.33
	2143.00	0.04	166.13	2142.94	7.17	-8.58	6.60	0.03	433025.55	603691.01	N 32 11 24.22	W 103 59 53.33
	2237.00	0.03	169.13	2236.94	7.18	-8.64	6.61	0.01	433025.49	603691.02	N 32 11 24.22	W 103 59 53.33
	2331.00	0.04	189.39	2330.94	7.19	-8.70	6.61	0.02	433025.44	603691.02	N 32 11 24.22	W 103 59 53.33
	2426.00	0.03	208.88	2425.94	7.17	-8.75	6.60	0.02	433025.38	603691.00	N 32 11 24.21	W 103 59 53.33
	2520.00	0.04	201.80	2519.94	7.15	-8.80	6.57	0.01	433025.33	603690.98	N 32 11 24.21	W 103 59 53.33
	2614.00	0.09	211.50	2613.94	7.11	-8.89	6.52	0.05	433025.24	603690.93	N 32 11 24.21	W 103 59 53.33
	2708.00	0.03	189.65	2707.94	7.07	-8.98	6.48	0.07	433025.15	603690.89	N 32 11 24.21	W 103 59 53.33
	2803.00	0.02	175.42	2802.94	7.07	-9.02	6.47	0.01	433025.11	603690.88	N 32 11 24.21	W 103 59 53.33
	2897.00	0.01	185.33	2896.94	7.07	-9.05	6.47	0.01	433025.08	603690.88	N 32 11 24.21	W 103 59 53.33
	2991.00	0.12	164.30	2990.94	7.10	-9.15	6.50	0.12	433024.98	603690.91	N 32 11 24.21	W 103 59 53.33
	3085.00	1.15	177.01	3084.93	7.25	-10.19	6.58	1.10	433023.94	603690.99	N 32 11 24.20	W 103 59 53.33
	3180.00	3.39	177.83	3179.85	7.66	-13.95	6.73	2.36	433020.18	603691.14	N 32 11 24.16	W 103 59 53.33
	3274.00	5.98	176.26	3273.55	8.57	-21.37	7.14	2.44	433012.77	603691.55	N 32 11 24.09	W 103 59 53.33
	3368.00	7.97	178.17	3366.88	9.83	-32.52	7.65	2.45	433001.61	603692.06	N 32 11 23.98	W 103 59 53.32
	3462.00	10.23	177.34	3459.69	11.43	-47.38	8.25	2.41	432988.76	603692.68	N 32 11 23.83	W 103 59 53.32
	3556.00	12.43	176.48	3551.85	13.68	-65.81	9.26	2.35	432968.32	603693.67	N 32 11 23.65	W 103 59 53.30
	3651.00	13.86	174.48	3644.36	16.86	-87.35	10.98	1.58	432946.79	603695.39	N 32 11 23.44	W 103 59 53.28
	3745.00	13.93	172.01	3735.61	21.02	-109.76	13.64	0.64	432924.38	603698.04	N 32 11 23.21	W 103 59 53.25
	3839.00	14.33	170.67	3826.79	26.01	-132.44	17.09	0.55	432901.70	603701.50	N 32 11 22.99	W 103 59 53.22
	3933.00	14.82	169.37	3917.74	31.68	-155.74	21.20	0.63	432878.41	603705.81	N 32 11 22.76	W 103 59 53.17
	4028.00	15.19	168.48	4009.50	38.02	-178.87	25.92	0.46	432854.27	603710.33	N 32 11 22.52	W 103 59 53.11
	4122.00	15.58	166.91	4100.13	44.98	-204.24	31.24	0.61	432829.91	603715.65	N 32 11 22.28	W 103 59 53.05
	4216.00	15.82	165.89	4190.62	52.62	-228.96	37.23	0.39	432805.19	603721.63	N 32 11 22.03	W 103 59 52.98
	4310.00	15.99	164.59	4281.03	60.85	-253.87	43.79	0.42	432780.28	603728.20	N 32 11 21.79	W 103 59 52.91
	4404.00	15.39	164.15	4371.52	69.34	-278.35	50.64	0.65	432755.81	603735.04	N 32 11 21.55	W 103 59 52.83
	4499.00	14.51	163.98	4463.31	77.64	-301.91	57.36	0.93	432732.24	603741.77	N 32 11 21.31	W 103 59 52.75
	4593.00	13.87	163.52	4554.44	85.57	-324.04	63.81	0.89	432710.12	603748.21	N 32 11 21.09	W 103 59 52.68
	4687.00	13.40	163.12	4645.79	93.35	-345.26	70.17	0.51	432688.90	603754.57	N 32 11 20.88	W 103 59 52.61
	4781.00	13.52	162.97	4737.21	101.13	-368.19	76.55	0.13	432667.97	603760.95	N 32 11 20.68	W 103 59 52.53
	4876.00	13.55	162.93	4829.57	109.07	-387.45	83.07	0.03	432646.71	603767.47	N 32 11 20.46	W 103 59 52.46
	4970.00	13.44	162.82	4920.97	116.97	-408.40	89.56	0.14	432625.76	603773.97	N 32 11 20.26	W 103 59 52.38
	5064.00	12.84	162.87	5012.51	124.67	-428.81	95.90	0.64	432605.36	603780.31	N 32 11 20.06	W 103 59 52.31
	5158.00	12.06	162.95	5104.30	131.92	-448.18	101.86	0.83	432585.99	603786.26	N 32 11 19.86	W 103 59 52.24
	5253.00	11.39	163.20	5197.32	138.78	-466.65	107.48	0.71	432567.52	603791.88	N 32 11 19.68	W 103 59 52.18
	5347.00	10.98	163.56	5289.53	145.16	-484.12	112.70	0.44	432550.05	603797.10	N 32 11 19.51	W 103 59 52.12
	5441.00	10.05	162.96	5381.95	151.20	-500.55	117.83	1.00	432533.62	603802.03	N 32 11 19.34	W 103 59 52.06
	5535.00	9.28	162.24	5474.62	158.92	-515.61	122.35	0.83	432518.57	603806.75	N 32 11 19.20	W 103 59 52.00
	5629.00	9.13	161.75	5567.41	162.53	-529.91	127.00	0.18	432504.27	603811.40	N 32 11 19.05	W 103 59 51.95
	5724.00	8.93	162.32	5661.23	168.07	-544.09	131.60	0.23	432490.08	603816.00	N 32 11 18.91	W 103 59 51.90
	5818.00	9.33	165.63	5754.04	173.14	-558.42	135.70	0.70	432475.75	603820.10	N 32 11 18.77	W 103 59 51.85
	5912.00	9.91	168.73	5846.72	177.64	-573.74	139.18	0.83	432460.44	603823.57	N 32 11 18.62	W 103 59 51.81
	6006.00	10.37	170.76	5939.25	181.67	-590.02	142.11	0.62	432444.16	603826.51	N 32 11 18.46	W 103 59 51.78
	6101.00	10.29	169.74	6032.71	185.69	-606.81	145.00	0.21	432427.37	603829.40	N 32 11 18.29	W 103 59 51.74
	6195.00	10.31	168.45	6125.20	189.97	-623.31	148.18	0.25	432410.87	603832.58	N 32 11 18.13	W 103 59 51.71

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
	6288.00	10.00	166.10	6217.72	194.70	-639.47	151.82	0.55	432384.71	603836.22	N 32 11 17.97	W 103 59 51.67
	6383.00	10.03	164.99	6310.29	199.84	-655.30	155.90	0.21	432378.88	603840.30	N 32 11 17.81	W 103 59 51.62
	6478.00	9.80	164.55	6403.87	205.20	-671.09	160.20	0.25	432363.10	603844.80	N 32 11 17.66	W 103 59 51.57
	6572.00	9.87	164.23	6498.49	210.55	-686.55	164.52	0.09	432347.63	603848.92	N 32 11 17.50	W 103 59 51.52
	6666.00	9.95	163.81	6589.09	216.08	-702.10	169.00	0.14	432332.09	603853.40	N 32 11 17.35	W 103 59 51.47
	6760.00	9.48	160.80	6681.74	221.92	-717.20	173.84	0.71	432316.99	603858.24	N 32 11 17.20	W 103 59 51.41
	6854.00	9.24	157.68	6774.49	228.29	-731.49	179.25	0.60	432302.70	603863.85	N 32 11 17.06	W 103 59 51.35
	6949.00	8.85	154.72	6868.31	235.22	-745.15	185.27	0.64	432289.04	603869.66	N 32 11 16.92	W 103 59 51.29
	7043.00	8.42	150.54	6961.24	242.52	-757.68	191.74	0.81	432276.51	603876.14	N 32 11 16.80	W 103 59 51.21
	7137.00	8.60	143.44	7054.21	250.88	-769.32	199.31	1.13	432264.87	603883.71	N 32 11 16.68	W 103 59 51.12
	7231.00	8.63	138.86	7147.15	260.43	-780.26	208.16	0.76	432253.93	603892.55	N 32 11 16.57	W 103 59 51.02
	7326.00	8.42	135.47	7241.10	270.69	-790.57	217.74	0.54	432243.62	603902.14	N 32 11 16.47	W 103 59 50.90
	7420.00	7.33	128.89	7334.22	280.74	-799.24	227.24	1.50	432234.95	603911.63	N 32 11 16.39	W 103 59 50.79
	7514.00	7.13	123.35	7427.47	290.73	-806.21	236.78	0.77	432227.98	603921.17	N 32 11 16.32	W 103 59 50.68
	7608.00	7.51	120.31	7520.70	301.31	-812.52	246.95	0.58	432221.67	603931.34	N 32 11 16.25	W 103 59 50.57
	7703.00	8.22	115.77	7614.81	313.17	-818.61	258.43	0.99	432215.59	603942.82	N 32 11 16.19	W 103 59 50.43
	7797.00	8.34	108.62	7707.83	326.00	-823.71	270.94	1.10	432210.49	603955.33	N 32 11 16.14	W 103 59 50.29
Last Gyro	7891.00	8.10	99.88	7800.87	339.18	-827.02	283.93	1.35	432207.18	603968.31	N 32 11 16.11	W 103 59 50.14
	7933.00	7.76	94.21	7842.47	344.96	-827.74	289.67	2.03	432206.46	603974.06	N 32 11 16.10	W 103 59 50.07
	8027.00	9.47	85.23	7935.41	358.95	-827.56	303.71	2.31	432206.84	603988.09	N 32 11 16.10	W 103 59 49.91
Tie-In	8091.00	10.26	84.57	7998.46	369.78	-826.58	314.63	1.25	432207.62	603999.01	N 32 11 16.11	W 103 59 49.78
	8239.00	12.13	82.55	8143.64	398.04	-823.32	343.17	1.29	432210.88	604027.55	N 32 11 16.14	W 103 59 49.45
	8302.00	19.08	85.30	8204.31	413.60	-818.15	359.12	13.15	432216.05	604043.50	N 32 11 16.19	W 103 59 49.26
	8334.00	23.45	85.65	8234.13	423.81	-813.33	369.67	13.66	432220.86	604054.05	N 32 11 16.24	W 103 59 49.14
	8428.00	30.83	87.23	8317.72	461.87	-796.28	408.98	7.89	432237.92	604093.36	N 32 11 16.41	W 103 59 48.68
	8522.00	38.29	70.71	8395.09	510.24	-777.31	458.75	8.20	432258.89	604143.12	N 32 11 16.60	W 103 59 48.10
	8616.00	51.88	81.82	8461.41	573.57	-762.33	523.23	16.67	432271.86	604207.80	N 32 11 16.74	W 103 59 47.35
	8710.00	60.20	84.82	8513.88	650.15	-753.37	600.80	9.24	432280.82	604284.86	N 32 11 16.83	W 103 59 46.45
	8804.00	67.92	88.66	8554.97	733.77	-747.14	684.83	8.40	432287.05	604369.18	N 32 11 16.89	W 103 59 45.47
	8898.00	74.54	88.90	8585.21	822.21	-743.73	773.71	7.39	432290.46	604458.05	N 32 11 16.92	W 103 59 44.43
	8992.00	82.44	89.94	8603.95	913.97	-742.81	865.74	8.47	432291.38	604550.08	N 32 11 16.92	W 103 59 43.36
	9048.00	88.69	90.38	8608.28	969.66	-742.97	921.54	11.19	432291.22	604605.88	N 32 11 16.92	W 103 59 42.71
	9096.00	88.62	90.75	8609.41	1017.56	-743.44	969.53	0.78	432290.75	604653.86	N 32 11 16.91	W 103 59 42.16
	9190.00	88.86	90.58	8611.47	1111.39	-744.53	1063.50	0.31	432289.66	604747.82	N 32 11 16.90	W 103 59 41.08
	9284.00	87.97	90.49	8614.07	1205.20	-745.41	1157.46	0.95	432288.78	604841.77	N 32 11 16.89	W 103 59 39.97
	9378.00	88.11	90.50	8617.29	1298.98	-748.22	1251.40	0.15	432287.97	604935.71	N 32 11 16.88	W 103 59 38.88
	9472.00	88.49	90.42	8620.08	1392.77	-746.98	1345.35	0.41	432287.21	605029.65	N 32 11 16.87	W 103 59 37.78
	9567.00	89.07	90.81	8622.10	1487.59	-748.00	1440.32	0.74	432286.20	605124.62	N 32 11 16.86	W 103 59 36.68
	9661.00	89.69	90.53	8623.12	1581.44	-749.09	1534.31	0.72	432285.10	605218.60	N 32 11 16.84	W 103 59 35.58
	9755.00	90.03	90.97	8623.35	1675.30	-750.32	1628.30	0.59	432283.87	605312.58	N 32 11 16.83	W 103 59 34.49
	9849.00	90.38	90.73	8623.01	1769.17	-751.72	1722.29	0.45	432282.47	605406.56	N 32 11 16.81	W 103 59 33.40
	9943.00	90.14	90.44	8622.58	1863.01	-752.68	1816.29	0.40	432281.51	605500.55	N 32 11 16.80	W 103 59 32.30
	10037.00	90.03	90.38	8622.44	1958.84	-753.35	1910.28	0.13	432280.84	605594.54	N 32 11 16.79	W 103 59 31.21
	10131.00	89.86	90.44	8622.53	2050.67	-754.02	2004.28	0.19	432280.17	605688.53	N 32 11 16.78	W 103 59 30.12
	10225.00	89.45	90.02	8623.10	2144.47	-754.40	2098.28	0.62	432279.79	605782.52	N 32 11 16.77	W 103 59 29.02
	10320.00	89.59	90.35	8623.90	2239.27	-754.71	2193.27	0.38	432279.48	605877.51	N 32 11 16.76	W 103 59 27.92
	10414.00	89.76	89.45	8624.43	2332.98	-753.72	2287.26	2.03	432280.47	605971.49	N 32 11 16.77	W 103 59 26.82
	10508.00	89.90	88.53	8624.71	2426.57	-751.25	2381.23	0.17	432282.94	606065.45	N 32 11 16.79	W 103 59 25.73
	10602.00	89.72	88.39	8625.02	2520.15	-748.72	2475.20	0.24	432285.47	606159.41	N 32 11 16.82	W 103 59 24.64
	10696.00	88.69	88.12	8626.32	2613.68	-745.86	2569.14	1.13	432288.33	606253.34	N 32 11 16.84	W 103 59 23.54
	10790.00	88.90	88.22	8628.30	2707.20	-742.86	2663.07	0.25	432291.33	606347.27	N 32 11 16.87	W 103 59 22.45
	10884.00	90.03	88.66	8629.18	2800.77	-740.30	2757.03	1.29	432293.89	606441.22	N 32 11 16.89	W 103 59 21.36
	10979.00	88.42	88.30	8630.46	2895.42	-738.70	2852.01	1.87	432295.49	606536.19	N 32 11 16.90	W 103 59 20.25
	11073.00	89.72	90.60	8631.98	2989.19	-738.71	2945.99	1.87	432295.48	606630.16	N 32 11 16.90	W 103 59 19.16
	11167.00	89.35	90.81	8632.75	3083.04	-739.86	3039.98	0.45	432294.33	606724.14	N 32 11 16.89	W 103 59 18.06
	11261.00	90.58	90.37	8632.81	3176.88	-740.83	3133.97	1.39	432293.36	606818.13	N 32 11 16.87	W 103 59 16.97
	11355.00	90.55	90.10	8631.88	3270.69	-741.22	3227.97	0.29	432292.97	606912.12	N 32 11 16.87	W 103 59 15.88
	11449.00	90.69	90.99	8630.86	3364.52	-742.11	3321.96	0.96	432292.08	607006.10	N 32 11 16.85	W 103 59 14.78
	11543.00	89.86	90.72	8630.41	3458.39	-743.51	3415.94	0.93	432290.68	607100.08	N 32 11 16.84	W 103 59 13.69
	11637.00	88.93	91.06	8631.41	3552.28	-744.97	3509.93	1.05	432289.22	607194.05	N 32 11 16.82	W 103 59 12.60
	11731.00	89.31	90.49	8632.85	3646.11	-746.25	3603.91	0.73	432287.95	607288.03	N 32 11 16.80	W 103 59 11.50
	11825.00	90.58	90.72	8632.94	3739.95	-747.24	3697.90	1.37	432286.95	607382.01	N 32 11 16.79	W 103 59 10.41
	12013.00	89.35	90.24	8633.05	3827.62	-748.81	3885.89	0.70	432285.38	607569.98	N 32 11 16.77	W 103 59 8.22
	12107.00	89.90	89.94	8633.67	4021.41	-748.96	3979.89	0.67	432285.23	607663.97	N 32 11 16.77	W 103 59 7.13
	12295.00	90.17	90.38	8633.56	4209.01	-749.49	4167.88	0.27	432284.71	607851.96	N 32 11 16.75	W 103 59 4.94
	12390.00	89.55	90.05	8633.79	4303.82	-749.84	4262.88	0.74	432284.35	607946.95	N 32 11 16.75	W 103 59 3.83
	12484.00	90.55	88.92	8633.71	4397.54	-749.00	4356.88	1.61	432285.19	608040.93	N 32 11 16.75	W 103 59 2.74
	12578.00	89.52	88.41	8633.65	4491.15	-746.81	4450.85	1.22	432287.38	608134.90	N 32 11 16.77	W 103 59 1.65
	12672.00	89.21	88.12	8634.69	4584.69	-743.96	4544.80	0.45	432290.23	608228.84	N 32 11 16.80	W 103 59 0.55
	12766.00	88.04	87.49	8636.95	4678.14	-740.35	4638.70	1.42	432293.94	608322.74	N 32 11 16.83	W 103 58 58.46
	12860.00	89.42	88.04	8639.03	4771.66	-737.50	4732.63	2.22	432296.69	608416.66	N 32 11 16.85	W 103 58 58.37
	12954.00	90.10	90.37	8639.42	4865.41	-737.02	4826.63	1.59	432297.17	608510.65	N 32 11 16.86	W 103 58 57.27
	13049.00	89.66	90.46	8639.82	4959.23	-737.70	4921.62	0.47	432296.48	608605.84	N 32 11 16.85	W 103 58 56.17
	13143.00	89.45	90.47	8641.17	5054.05	-738.47	5015.80	1.29	432295.72	608699.81	N 32 11 16.84	W 103 58 55.08
	13237.00	88.45	90.71	8643.71	5147.88	-739.44	5109.57	0.26	432294.75	608793.58	N 32 11 16.82	W 103 58 53.98
	13331.00	88.52	90.83	8646.20	5241.69	-740.70	5203.52	0.15	432293.49	608887.51	N 32 11 16.81	W 103 58 52.89

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	15685.00	89.66	90.70	8687.60	7588.28	-733.32	7556.00	0.75	432300.87	611230.80	N 32 11 16.80	W 103 58 25.52
	15779.00	89.35	89.97	8688.41	7682.10	-733.67	7649.99	0.84	432300.32	611333.78	N 32 11 16.79	W 103 58 24.42
	15873.00	89.90	88.52	8689.85	7775.78	-732.63	7743.97	1.61	432301.56	611427.75	N 32 11 16.80	W 103 58 23.33
	15968.00	88.45	88.75	8692.04	7870.36	-730.37	7838.91	0.53	432303.82	611522.69	N 32 11 16.82	W 103 58 22.22
	16062.00	88.49	88.70	8694.55	7963.94	-728.28	7932.86	0.07	432305.91	611616.63	N 32 11 16.84	W 103 58 21.13
	16156.00	88.45	88.52	8697.06	8057.51	-726.00	8026.80	0.20	432308.19	611710.56	N 32 11 16.86	W 103 58 20.04
	16345.00	88.42	89.15	8702.23	8245.71	-722.16	8215.89	0.33	432312.03	611899.43	N 32 11 16.89	W 103 58 17.84
	16533.00	88.80	91.04	8706.79	8433.24	-722.47	8403.62	1.03	432311.72	612087.35	N 32 11 16.88	W 103 58 15.65
	16722.00	89.21	91.01	8710.07	8621.97	-725.85	8592.56	0.22	432308.34	612276.28	N 32 11 16.84	W 103 58 13.45
	16910.00	89.17	91.20	8712.73	8809.74	-729.48	8780.51	0.10	432304.71	612464.21	N 32 11 16.80	W 103 58 11.27
	17099.00	89.69	90.88	8714.61	8998.48	-732.91	8969.47	0.32	432301.28	612653.15	N 32 11 16.78	W 103 58 9.07
	17287.00	89.62	91.80	8715.74	9186.30	-737.30	9157.41	0.49	432296.89	612841.08	N 32 11 16.71	W 103 58 6.88
	17476.00	90.86	92.30	8714.95	9375.20	-744.06	9346.28	0.71	432290.13	613029.94	N 32 11 16.64	W 103 58 4.69
	17570.00	92.58	92.64	8712.13	9489.13	-748.11	9440.15	1.87	432286.08	613123.80	N 32 11 16.59	W 103 58 3.59
	17664.00	92.82	92.58	8707.70	9563.00	-752.39	9533.95	0.26	432281.80	613217.59	N 32 11 16.55	W 103 58 2.50
	17854.00	91.17	88.73	8701.08	9752.54	-754.55	9723.78	2.20	432279.64	613407.41	N 32 11 16.52	W 103 58 0.29
	18042.00	87.52	86.72	8703.23	9939.41	-747.09	9911.58	2.22	432287.10	613595.19	N 32 11 16.59	W 103 57 58.11
	18199.00	87.76	87.19	8709.70	10095.13	-738.76	10068.22	0.34	432295.43	613751.82	N 32 11 16.67	W 103 57 56.28
	18325.00	87.39	87.26	8715.03	10220.17	-732.67	10193.96	0.30	432301.52	613877.55	N 32 11 16.72	W 103 57 54.82
	18482.00	87.70	87.78	8721.75	10376.06	-725.88	10350.67	0.39	432308.31	614034.25	N 32 11 16.78	W 103 57 53.00
Last MWD Survey	18674.00	86.94	89.65	8730.73	10567.06	-721.58	10542.40	1.05	432312.61	614225.96	N 32 11 16.82	W 103 57 50.77
Projection to bit	18714.00	86.94	89.85	8732.86	10606.80	-721.33	10582.34	0.00	432312.85	614265.90	N 32 11 16.82	W 103 57 50.30

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7855 sigma

Survey Program:

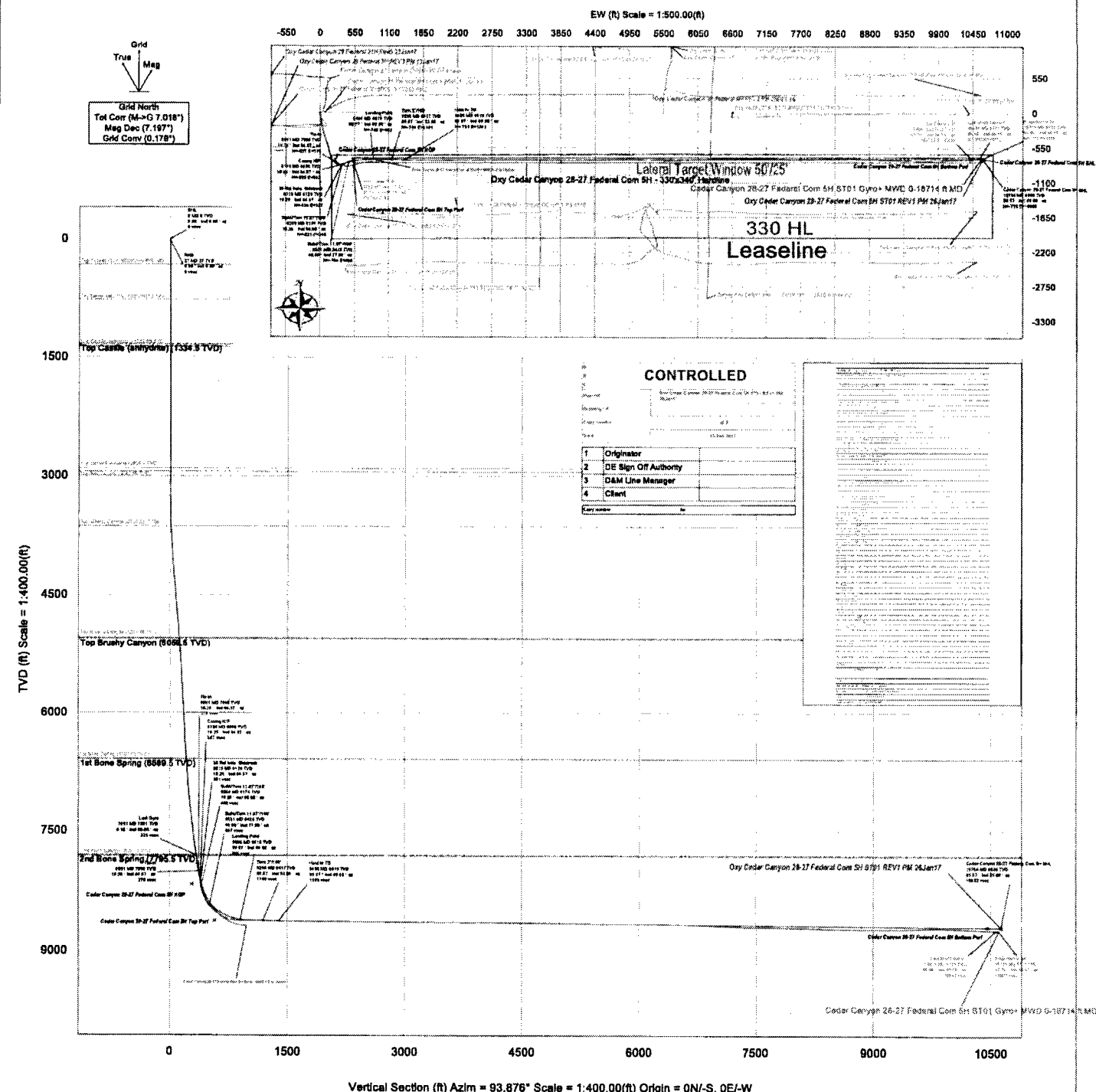
Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	26.500	1/98.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update
	1	26.500	26.500	Act Stns	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro + MWD 0 ft to Update
	1	26.500	7891.000	Act Stns	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro +
	1	7891.000	8091.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cedar Canyon 28-27 Federal Com 5H Gyro +
	1	8091.000	18714.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	ST01 / Cedar Canyon 28-27 Federal Com 5H ST01 Gyro+



Borehole: ST01			Well: Oxy Cedar Canyon 28-27 Federal Com 5H			Field: NM Eddy County (NAD 27)			Structure: Oxy Cedar Canyon 28-27 Federal Com 5H		
Gravity & Magnetic Parameters				Surface Location				Structure			
Model: HQGM 2018		CR: 68.833°	Date: 25-Jan-2017	Lat: N 32 11 24.30		Northing: 433854.130US		Grid Conv: 0.1786°	Station: Oxy Cedar Canyon		TVD Ref: RKB(274.5ft above MSL)
MagDec: 7.18°	PR: 48159.33mT	Gravity PS: 988.65m/s² (9.80665 Based)	Long: W 103 59 53.41	Easting: 683884.110US		Scale Fact: 0.9999214		Plan: Oxy Cedar Canyon 28-27 Federal Com 5H ST01 REV1 PM 26-Jan-17			

Critical Points

Comments	Survey MD (ft)	Inclination (deg)	Azimuth (deg)	IVD (ft)	Sub-Seq IVD	VS (ft)	HS (ft)	FW (ft)	Latitude (deg)	Longitude (deg)	Easting (ftUS)	Northing (ftUS)	DL S (°100h)	Tool Face (deg)
Tie-In	8091.00	10.26	84.57	7998.46	5023.96	369.78	-826.58	314.63	N 32 11 16.112	W 103 59 49.779	603999.01	432207.62	1.25	0.00
Casing ICP	8190.00	10.26	84.57	8095.88	5121.38	387.18	-824.91	332.18	N 32 11 16.128	W 103 59 49.574	604016.57	432209.28	0.00	0.00
30 Rat hole, Sidetrack	8214.51	10.26	84.57	8120.00	5145.50	391.49	-824.50	336.53	N 32 11 16.132	W 103 59 49.524	604020.91	432209.70	0.00	-90.00
Build/Turn 11.07°/100'	8269.32	10.26	50.00	8173.98	5199.48	399.84	-820.90	345.14	N 32 11 16.168	W 103 59 49.423	604029.52	432213.30	11.07	34.34
Build/Turn 11.07°/100'	8550.72	40.00	77.00	8426.47	5451.97	507.10	-783.52	455.18	N 32 11 16.534	W 103 59 48.142	604139.55	432250.68	11.07	14.33
Landing Point	9006.48	89.57	88.00	8615.09	5640.59	899.65	-739.75	851.60	N 32 11 16.955	W 103 59 43.527	604535.94	432294.44	11.07	90.00
Turn 2°/100'	9296.48	89.57	93.80	8617.27	5642.77	1189.12	-744.30	1141.42	N 32 11 16.901	W 103 59 40.155	604825.74	432289.89	2.00	-89.97
Hold to TD	9456.29	89.57	89.80	8618.77	5644.27	1388.76	-750.58	1341.09	N 32 11 16.833	W 103 59 37.832	605025.39	432283.61	2.00	0.00
Cedar Canyon 28-27 Federal Com 5H BHL	18764.47	89.57	89.80	8687.80	5713.30	10633.28	-718.81	10608.96	N 32 11 16.845	W 103 57 49.992	614292.51	432315.38	0.00	0.00



OXY

SURVEY REPORT

Cedar Canyon 28-27 Federal Com #5H

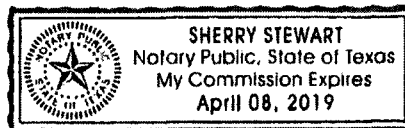
H & P 639

12/30/2016

This survey is correct to the best of my knowledge and is supported by actual field data.

Notarized this date 19th of April, 2017.

Sherry Stewart
Notary Signature
County of Midland
State of Texas



Scientific Drilling

The Ultimate Partner In Wellbore Placement

SURVEY REPORT

Cedar Canyon 28-27 Federal Com #5H

COMPUTED OUTFRAN KEEPER GYRO SURVE

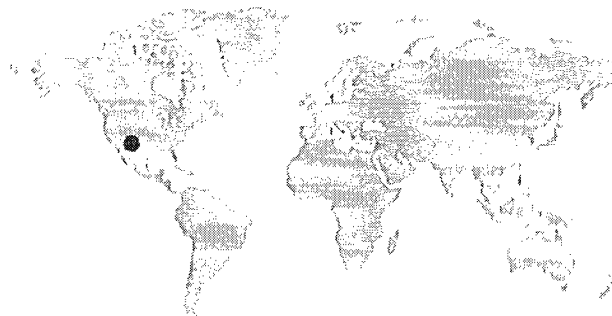
CUSTOMER	OXY	SDI JOB NO.	407536
PROJECT	Cedar Canyon 28-27 Federal Com #5H	SDI DISTRICT	Midland
FIELD	CEDAR CANYON 28 FED	SDI KIT/UNIT	

SITE INFORMATION

Site Name	CEDAR CANYON 28 FED	Section	
Lat/Long	32.1900837° N, 103.9981693° W	Township	
Northing	433,034.13 ft	Range	
Easting	603,684.41 ft		

MAP INFORMATION

North Reference	Grid North
Grid Correction	-0.18 deg
System	US State Plane 1927
Datum	North American Datum 1927 (Clarke 1866)
Map Zone	New Mexico East: 3001

**WELL INFORMATION**

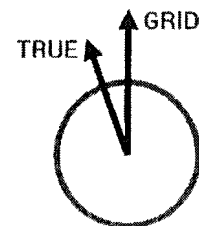
Lat/Long	32.1900838° N, 103.9981693° W
Northing	433,034.13 ft
Easting	603,684.41 ft
UWI	30-015-43645

DEPTH AND ELEVATION REFERENCE

Ground Level	2948 ft above Mean Sea Level
Reference Datum	KB
Reference Height	26.5 ft above G.L.
Reference Elevation	2974.5 ft

VERTICAL SECTION REFERENCE

+N/-S	0 ft
+E/-W	0 ft
Proposal Direction	93.88°
Calculation Method	Minimum Curvature

**LOCAL GRAVITY REFERENCE INFORMATION**

Local Gravity	998.541 mG [computed]
True to Grid	subtract 0.18°

WELL NOTES**OPERATORS**

H.SANGHOTT

SDI Operator Name (Printed)

SIGNATURE

DATE

SURVEY REPORT

Cedar Canyon 28-27 Federal Com #5H

COMPUTED OUTRUN KEEPER GYRO SURVE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	%/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
107.00	0.55	146.66	107.00	0.31	-0.43	0.28	0.52	0.52	146.66
198.00	0.66	149.46	197.99	0.88	-1.25	0.79	0.12	1.48	147.65
289.00	0.72	146.29	288.99	1.52	-2.18	1.37	0.08	2.57	147.72
380.00	0.70	144.85	379.98	2.22	-3.11	2.01	0.03	3.70	147.06
470.00	0.69	143.48	469.97	2.92	-3.99	2.65	0.02	4.79	146.40
561.00	0.68	144.57	560.97	3.62	-4.88	3.29	0.02	5.89	145.96
651.00	0.69	145.64	650.96	4.29	-5.76	3.91	0.02	6.96	145.83
741.00	0.79	140.23	740.95	5.06	-6.69	4.62	0.13	8.13	145.39
832.00	0.88	140.93	831.94	5.97	-7.71	5.46	0.10	9.45	144.72
922.00	0.43	137.84	921.94	6.68	-8.50	6.12	0.50	10.47	144.25
1012.00	0.04	130.19	1011.94	6.95	-8.77	6.37	0.43	10.84	144.00
1106.00	0.05	130.57	1105.94	7.01	-8.82	6.43	0.00	10.91	143.91
1201.00	0.03	121.67	1200.94	7.06	-8.85	6.47	0.02	10.97	143.83
1295.00	0.03	33.04	1294.94	7.08	-8.85	6.50	0.04	10.98	143.68
1389.00	0.02	45.40	1388.94	7.11	-8.81	6.53	0.01	10.97	143.48
1483.00	0.02	62.74	1482.94	7.14	-8.79	6.56	0.01	10.97	143.29
1578.00	0.02	51.62	1577.94	7.16	-8.78	6.58	0.01	10.97	143.12
1672.00	0.02	42.35	1671.94	7.18	-8.75	6.60	0.00	10.97	142.97
1766.00	0.02	5.24	1765.94	7.19	-8.73	6.62	0.01	10.95	142.84
1860.00	0.02	30.80	1859.94	7.20	-8.70	6.62	0.01	10.94	142.72
1955.00	0.02	28.97	1954.94	7.21	-8.68	6.64	0.00	10.93	142.57
2049.00	0.01	145.44	2048.94	7.22	-8.67	6.65	0.03	10.93	142.50
2143.00	0.04	166.13	2142.94	7.24	-8.70	6.66	0.03	10.96	142.57
2237.00	0.03	169.13	2236.94	7.25	-8.76	6.68	0.01	11.02	142.69
2331.00	0.04	189.39	2330.94	7.26	-8.82	6.68	0.02	11.06	142.88
2426.00	0.03	209.88	2425.94	7.24	-8.87	6.66	0.02	11.09	143.12
2520.00	0.04	201.80	2519.94	7.22	-8.93	6.63	0.01	11.12	143.40
2614.00	0.09	211.50	2613.94	7.17	-9.02	6.58	0.05	11.17	143.90
2708.00	0.03	189.65	2707.94	7.14	-9.11	6.54	0.07	11.21	144.33
2803.00	0.02	175.42	2802.94	7.14	-9.15	6.54	0.01	11.24	144.46
2897.00	0.01	185.33	2896.94	7.14	-9.18	6.54	0.01	11.27	144.54

SURVEY REPORT

Cedar Canyon 28-27 Federal Com #5H

COMPUTED OUTRUN KEEPER GYRO SURVE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	%/100ft	ft	deg
2991.00	0.12	164.30	2990.94	7.17	-9.28	6.56	0.11	11.36	144.73
3085.00	1.15	177.01	3084.93	7.32	-10.31	6.64	1.10	12.26	147.23
3180.00	3.39	177.83	3179.85	7.73	-14.07	6.79	2.36	15.62	154.23
3274.00	5.68	176.26	3273.55	8.64	-21.49	7.20	2.44	22.66	161.47
3368.00	7.97	178.17	3366.88	9.90	-32.64	7.71	2.44	33.54	166.71
3462.00	10.23	177.34	3459.69	11.50	-47.49	8.31	2.42	48.21	170.08
3556.00	12.43	176.48	3551.85	13.75	-65.93	9.31	2.34	66.59	171.96
3651.00	13.86	174.48	3644.36	16.92	-87.47	11.04	1.58	88.16	172.81
3745.00	13.93	172.01	3735.61	21.09	-109.88	13.69	0.64	110.73	172.90
3839.00	14.33	170.67	3826.76	26.07	-132.56	17.15	0.55	133.66	172.63
3933.00	14.82	169.37	3917.74	31.74	-155.85	21.25	0.63	157.29	172.23
4028.00	15.19	168.48	4009.50	38.09	-179.98	25.98	0.45	181.85	171.79
4122.00	15.58	166.91	4100.13	45.04	-204.34	31.30	0.61	206.72	171.29
4216.00	15.82	165.89	4190.63	52.68	-229.06	37.28	0.39	232.08	170.76
4310.00	15.99	164.59	4281.03	60.91	-253.97	43.84	0.42	257.73	170.21
4404.00	15.39	164.15	4371.53	69.40	-278.45	50.69	0.65	283.03	169.68
4499.00	14.51	163.98	4463.31	77.70	-302.02	57.41	0.93	307.43	169.24
4593.00	13.87	163.52	4554.44	85.62	-324.14	63.86	0.69	330.37	168.85
4687.00	13.40	163.12	4645.79	93.40	-345.37	70.22	0.51	352.44	168.51
4781.00	13.52	162.97	4737.21	101.18	-366.30	76.60	0.13	374.22	168.19
4876.00	13.55	162.93	4829.57	109.12	-387.55	83.11	0.04	396.36	167.90
4970.00	13.44	162.62	4920.98	117.02	-408.49	89.61	0.14	418.21	167.63
5064.00	12.84	162.87	5012.52	124.72	-428.90	95.95	0.64	439.50	167.39
5158.00	12.06	162.95	5104.31	131.97	-448.27	101.90	0.82	459.70	167.19
5253.00	11.39	163.20	5197.32	138.83	-466.74	107.53	0.72	478.96	167.03
5347.00	10.98	163.56	5289.54	145.21	-484.20	112.74	0.44	497.16	166.89
5441.00	10.05	162.96	5381.96	151.25	-500.63	117.68	0.99	514.28	166.77
5535.00	9.28	162.24	5474.62	156.97	-515.70	122.39	0.84	530.02	166.65
5629.00	9.13	161.75	5567.42	162.58	-529.99	127.04	0.18	545.01	166.52
5724.00	8.93	162.32	5661.24	168.12	-544.17	131.64	0.22	559.87	166.40
5818.00	9.33	165.63	5754.05	173.19	-558.50	135.75	0.70	574.77	166.34
5912.00	9.91	168.73	5846.73	177.69	-573.81	139.22	0.83	590.46	166.36

MD	INC	AZIM	TVD	VS	+N/S	+E/W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	%/100ft	ft	deg
6006.00	10.37	170.76	5939.26	181.72	-590.10	142.16	0.62	606.98	166.46
6101.00	10.29	169.74	6032.72	185.73	-606.88	145.04	0.21	623.98	166.56
6195.00	10.31	168.45	6125.21	190.02	-623.38	148.22	0.25	640.76	166.63
6289.00	10.00	166.10	6217.73	194.75	-639.54	151.87	0.55	657.33	166.64
6383.00	10.03	164.99	6310.30	199.89	-655.37	155.95	0.21	673.67	166.62
6478.00	9.80	164.55	6403.88	205.25	-671.16	160.24	0.25	690.02	166.57
6572.00	9.87	164.23	6496.50	210.60	-686.63	164.57	0.09	706.07	166.52
6666.00	9.95	163.61	6589.10	216.13	-702.17	169.05	0.14	722.23	166.46
6760.00	9.48	160.80	6681.75	221.97	-717.27	173.88	0.71	738.04	166.37
6854.00	9.24	157.68	6774.50	228.33	-731.56	179.29	0.60	753.21	166.23
6949.00	8.85	154.72	6868.32	235.26	-745.22	185.31	0.64	767.91	166.04
7043.00	8.42	150.54	6961.25	242.57	-757.75	191.78	0.81	781.64	165.80
7137.00	8.60	143.44	7054.22	250.91	-769.39	199.36	1.13	794.80	165.47
7231.00	8.63	138.66	7147.16	260.47	-780.33	208.20	0.76	807.63	165.06
7326.00	8.42	135.47	7241.11	270.73	-790.64	217.78	0.54	820.09	164.60
7420.00	7.33	128.89	7334.23	280.79	-799.31	227.28	1.51	831.00	164.13
7514.00	7.13	123.35	7427.48	290.78	-806.29	236.82	0.77	840.35	163.63
7608.00	7.51	120.31	7520.71	301.36	-812.59	247.00	0.57	849.30	163.09
7703.00	8.22	115.77	7614.82	313.22	-818.68	258.47	1.00	858.51	162.48
7797.00	8.34	108.62	7707.84	326.06	-823.78	270.99	1.10	867.21	161.79
7891.00	8.10	99.88	7800.88	339.24	-827.10	283.98	1.35	874.49	161.05