30015-44133

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

Well Reference:

32.20050 -103.99683

I, Rasheed Atanda certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of May 11, 2017 through June 22, 2017, conduct or supervise the taking of the TelePacer & SlimPulse surveys from a depth of 152.00 feet to a depth of 19912.00 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 21-22 Federal Com 33H Well (Original Hole) API No. 30-015-44133 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
Rasheed Atanda
FE

JENNIFER ALLEMAND
Notary Public
State of Colorado
Notary ID # 20164047962
My Commission Expires 12-20-2020

Subscribed and Sworn to before me this 5 day of July (month) 2017 (yr)

My Commission expires: 12-20-2020

Jallemand

(signature)

Notary Public

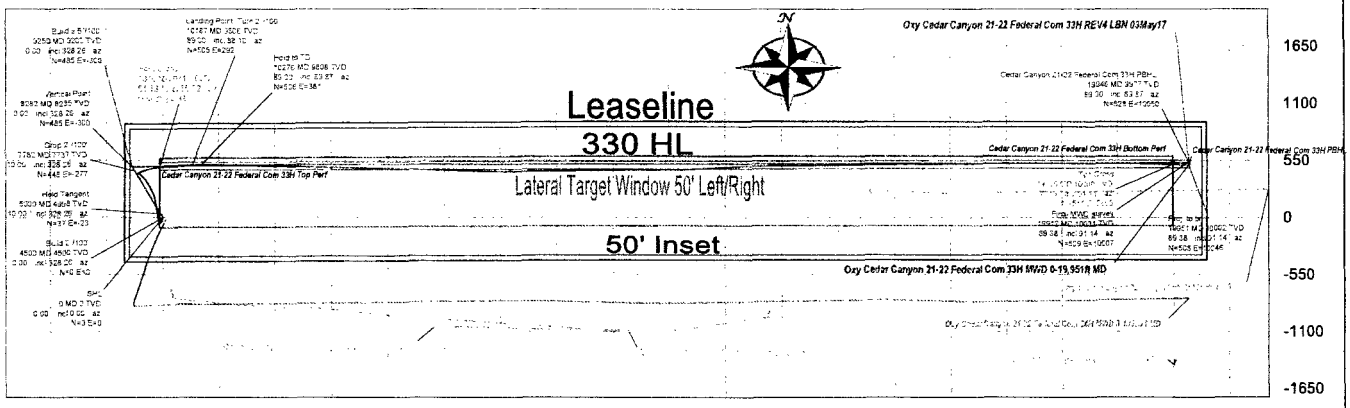
Adams County Colorado
(County State)

Schlumberger **OXY**

Borehole:	Well:	Field:	Structure:
Original Borehole	Oxy Cedar Canyon 21-22 Federal Com 33H	NM Eddy County (NAD 83)	Oxy Cedar Canyon 21-22 Federal Com 33H

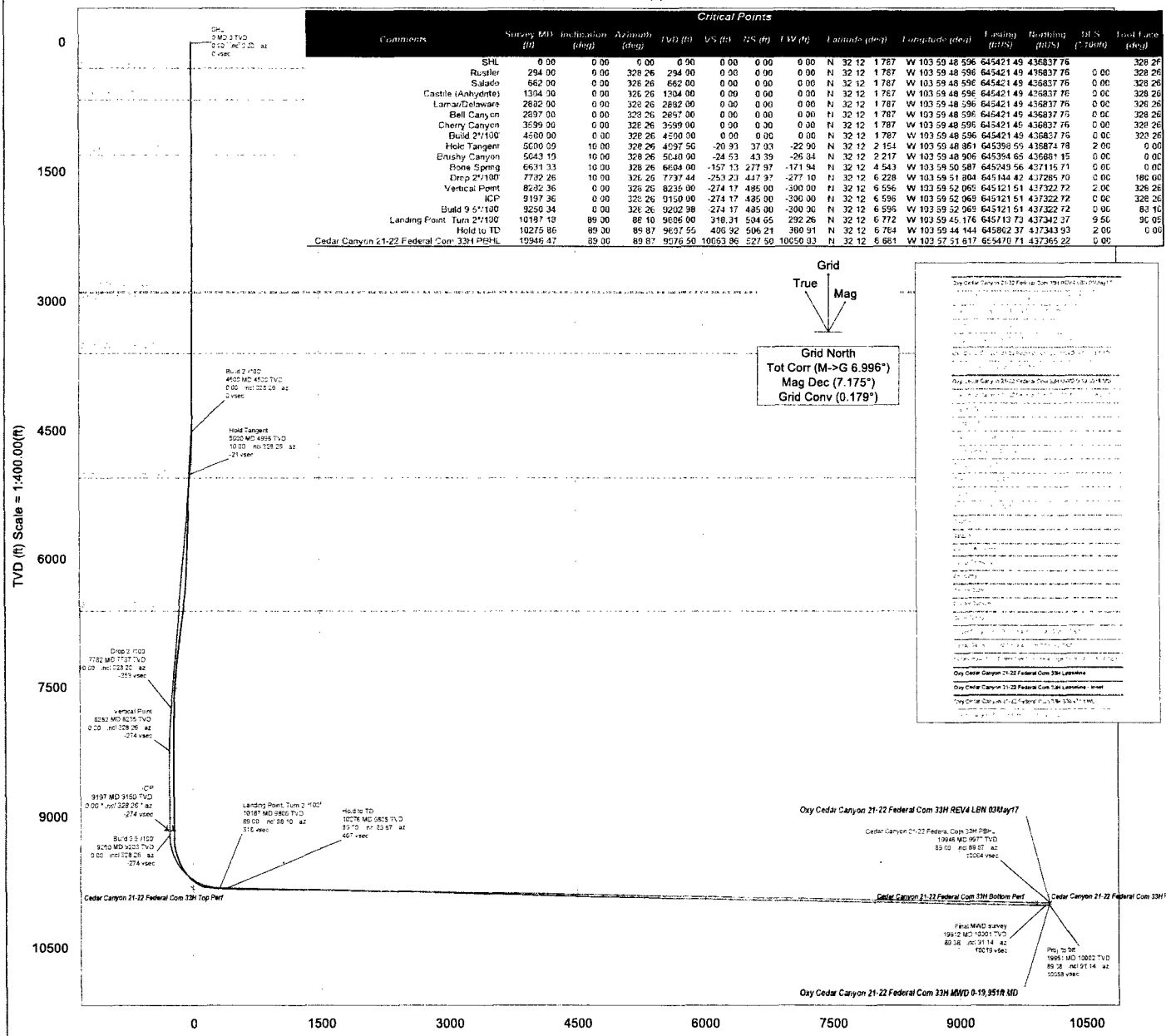
Gravity & Magnetic Parameters						Surface Location						Miscellaneous			
Model:	HDGM 2016	Dip:	60.043°	Date:	04-May-2017	Lat.:	N 32 12 1.79	Northing:	436837.76ftUS	Grid Conv:	0.1793°	Slot:	21-22 Federal Com 33H	TVD Ref:	RKB=26.5'(2954.5ft above MSL)
MagDec:	7.175°	FS:	48132.167nT	Gravity FS:	998.467mgn (9.80665 Based)	Lon:	W 103 59 48.60	Easting:	645421.49ftUS	Scale Fact:	0.9999215	Plan:	Oxy Cedar Canyon 21-22 Federal Com 33H REV4 LBN 03May17		

NAD83 New Mexico State Plane, Eastern Zone, US Feet



EW (ft) Scale = 1:400.00(ft)

Comments	Survey MD (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	Latitude (deg)	Longitude (deg)	Easting (ftUS)	Northing (ftUS)	DLS (°/100ft)	Tool Face (deg)
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76		328.26
Rustler	294.00	0.00	328.26	294.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Salado	662.00	0.00	328.26	662.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Castile (Anhydrite)	1304.00	0.00	328.26	1304.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Lamar/Delaware	2882.00	0.00	328.26	2882.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Bell Canyon	2897.00	0.00	328.26	2897.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Cherry Canyon	3599.00	0.00	328.26	3599.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Build 2°/100	4500.00	0.00	328.26	4500.00	0.00	0.00	0.00	N 32 12 1.787	W 103 59 48.596	645421.49	436837.76	0.00	328.26
Hold Tangent	5000.00	10.00	328.26	4997.56	-20.93	37.03	-22.90	N 32 12 2.154	W 103 59 48.861	645398.59	436874.78	2.00	0.00
Brushy Canyon	5043.19	10.00	328.26	5040.00	-24.53	43.39	-26.84	N 32 12 2.217	W 103 59 48.906	645394.65	436881.15	0.00	0.00
Bone Spring	6631.33	10.00	328.26	6604.00	-157.13	277.97	-171.94	N 32 12 4.543	W 103 59 50.587	645249.56	437115.71	0.00	0.00
Drop 2°/100	7732.26	10.00	328.26	7737.44	-253.23	447.97	-277.10	N 32 12 6.228	W 103 59 51.804	645144.42	437285.70	0.00	180.00
Vertical Point	8282.36	0.00	328.26	8236.00	-274.17	485.00	-300.00	N 32 12 6.596	W 103 59 52.069	645121.51	437322.72	2.00	328.26
KOP	9197.36	0.00	328.26	9150.00	-274.17	485.00	-300.00	N 32 12 6.596	W 103 59 52.069	645121.51	437322.72	0.00	328.26
Build 9.5°/100	9250.34	0.00	328.26	9202.98	-274.17	485.00	-300.00	N 32 12 6.596	W 103 59 52.069	645121.51	437322.72	0.00	88.10
Landing Point Turn 2°/100	10197.18	89.00	88.10	9806.00	318.31	504.65	292.26	N 32 12 6.772	W 103 59 45.176	645713.73	437342.37	9.50	90.05
Hold to TD	10275.86	89.00	89.87	9807.55	406.92	506.21	380.91	N 32 12 6.784	W 103 59 44.144	645802.37	437343.93	2.00	0.00
Cedar Canyon 21-22 Federal Com 33H PBHL	19946.47	89.00	89.87	9976.50	10063.86	527.50	10050.03	N 32 12 6.881	W 103 57 51.617	655470.71	437365.22	0.00	



Vertical Section (ft) Azim = 86.995° Scale = 1:400.00(ft) Origin = 0N/-S, 0E/-W

Schlumberger

Oxy Cedar Canyon 21-22 Federal Com 33H MWD 0-19,951ft MD Survey
Geodetic Report
(Def Survey)

Report Date:	June 21, 2017 - 09:29 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	OXY	**Vertical Section Azimuth:**	86.995 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Oxy Cedar Canyon 21-22 Federal Com 33H / Oxy Cedar Canyon 21-22 Federal Com 33H	**TVD Reference Datum:**	RKB=26.5'
Well:	Oxy Cedar Canyon 21-22 Federal Com 33H	**TVD Reference Elevation:**	2954.500 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	2928.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.175 °
Survey Name:	Oxy Cedar Canyon 21-22 Federal Com 33H MWD 0-19,951ft MD	**Total Gravity Field Strength:**	998.4674mgn (9.80665 Based)
Survey Date:	May 04, 2017	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	216.715 ° / 10930.722 ft / 6.674 / 1.093	**Total Magnetic Field Strength:**	48132.167 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.043 °
Location Lat / Long:	N 32° 12' 1.78714", W 103° 59' 48.59567"	**Declination Date:**	May 04, 2017
Location Grid N/E Y/X:	N 436837.760 ftUS, E 645421.490 ftUS	**Magnetic Declination Model:**	HDGM 2016
CRS Grid Convergence Angle:	0.1793 °	**North Reference:**	Grid North
Grid Scale Factor:	0.9999215	**Grid Convergence Used:**	0.1793 °
Version / Patch:	2.10.302.0	**Total Corr Mag North->Grid North:**	6.9960 °
		Local Coord Referenced To:	Well Head

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	436837.76	645421.49	N 32 12 1.79	W 103 59 48.60
	152.00	0.24	291.49	152.00	-0.29	0.12	-0.30	0.16	436837.88	645421.19	N 32 12 1.79	W 103 59 48.60
	272.00	0.49	11.63	272.00	-0.39	0.71	-0.43	0.42	436838.47	645421.06	N 32 12 1.79	W 103 59 48.60
	393.00	0.55	31.99	392.99	0.08	1.71	-0.01	0.16	436839.47	645421.48	N 32 12 1.80	W 103 59 48.60
	473.00	0.59	48.29	472.99	0.62	2.31	0.50	0.21	436840.07	645421.99	N 32 12 1.81	W 103 59 48.59
	571.00	0.13	29.13	570.99	1.07	2.74	0.93	0.48	436840.50	645422.42	N 32 12 1.81	W 103 59 48.58
	670.00	0.10	27.36	669.99	1.17	2.92	1.02	0.03	436840.68	645422.51	N 32 12 1.82	W 103 59 48.58
	823.00	0.13	267.42	822.99	1.07	3.03	0.91	0.13	436840.79	645422.40	N 32 12 1.82	W 103 59 48.58
	945.00	0.08	158.23	944.99	0.96	2.94	0.80	0.14	436840.70	645422.29	N 32 12 1.82	W 103 59 48.59
	1005.00	0.06	218.31	1004.99	0.95	2.88	0.80	0.12	436840.64	645422.29	N 32 12 1.82	W 103 59 48.59
	1150.00	0.13	30.13	1149.99	0.99	2.96	0.83	0.13	436840.72	645422.32	N 32 12 1.82	W 103 59 48.59
	1341.00	0.18	338.26	1340.99	1.01	3.43	0.83	0.07	436841.19	645422.32	N 32 12 1.82	W 103 59 48.59
	1531.00	0.08	95.29	1530.99	1.05	3.69	0.85	0.12	436841.45	645422.34	N 32 12 1.82	W 103 59 48.59
	1626.00	0.08	272.00	1625.99	1.05	3.69	0.85	0.17	436841.45	645422.34	N 32 12 1.82	W 103 59 48.59
	1721.00	0.18	187.88	1720.98	0.95	3.54	0.77	0.20	436841.30	645422.26	N 32 12 1.82	W 103 59 48.59
	1815.00	0.06	133.20	1814.98	0.96	3.36	0.78	0.16	436841.12	645422.27	N 32 12 1.82	W 103 59 48.59
	1909.00	0.16	5.45	1908.98	1.01	3.46	0.83	0.22	436841.22	645422.32	N 32 12 1.82	W 103 59 48.59
	2004.00	0.20	151.48	2003.98	1.10	3.45	0.92	0.36	436841.21	645422.41	N 32 12 1.82	W 103 59 48.58
	2098.00	0.13	99.11	2097.98	1.28	3.29	1.11	0.17	436841.05	645422.60	N 32 12 1.82	W 103 59 48.58
	2193.00	0.08	173.90	2192.98	1.39	3.20	1.22	0.14	436840.96	645422.71	N 32 12 1.82	W 103 59 48.58
	2288.00	0.00	319.12	2287.98	1.39	3.14	1.23	0.08	436840.90	645422.72	N 32 12 1.82	W 103 59 48.58
	2383.00	0.18	74.56	2382.98	1.53	3.18	1.37	0.19	436840.94	645422.86	N 32 12 1.82	W 103 59 48.58
	2477.00	0.24	266.93	2476.98	1.48	3.21	1.32	0.44	436840.97	645422.81	N 32 12 1.82	W 103 59 48.58
	2667.00	0.20	230.34	2666.98	0.82	2.97	0.66	0.08	436840.73	645422.15	N 32 12 1.82	W 103 59 48.59
	2761.00	0.08	125.71	2760.98	0.74	2.83	0.59	0.25	436840.59	645422.08	N 32 12 1.82	W 103 59 48.59
	2856.00	0.13	47.95	2855.98	0.87	2.86	0.72	0.14	436840.62	645422.21	N 32 12 1.82	W 103 59 48.59
	2950.00	0.13	1.48	2949.98	0.96	3.04	0.81	0.11	436840.80	645422.30	N 32 12 1.82	W 103 59 48.59
	3045.00	0.08	107.92	3044.98	1.03	3.13	0.87	0.18	436840.89	645422.36	N 32 12 1.82	W 103 59 48.59
	3139.00	0.08	88.35	3138.98	1.16	3.11	1.00	0.03	436840.87	645422.49	N 32 12 1.82	W 103 59 48.58
	3233.00	0.18	62.50	3232.98	1.36	3.18	1.20	0.12	436840.94	645422.69	N 32 12 1.82	W 103 59 48.58
	3423.00	0.20	46.74	3422.98	1.89	3.55	1.70	0.03	436841.31	645423.19	N 32 12 1.82	W 103 59 48.58
	3516.00	0.18	332.03	3515.98	1.95	3.79	1.75	0.25	436841.55	645423.24	N 32 12 1.82	W 103 59 48.58
	3611.00	0.20	220.52	3610.98	1.77	3.79	1.57	0.33	436841.55	645423.06	N 32 12 1.82	W 103 59 48.58
	3705.00	0.11	156.12	3704.98	1.69	3.58	1.50	0.19	436841.34	645422.99	N 32 12 1.82	W 103 59 48.58
	3797.00	0.06	307.96	3796.98	1.69	3.53	1.50	0.18	436841.29	645422.99	N 32 12 1.82	W 103 59 48.58
	3989.00	0.08	230.34	3988.98	1.50	3.51	1.32	0.05	436841.27	645422.81	N 32 12 1.82	W 103 59 48.58
	4083.00	0.11	196.42	4082.98	1.42	3.38	1.24	0.07	436841.14	645422.73	N 32 12 1.82	W 103 59 48.58
	4275.00	0.00	161.80	4274.98	1.36	3.20	1.19	0.06	436840.96	645422.68	N 32 12 1.82	W 103 59 48.58
	4465.00	4.58	201.75	4464.78	-1.82	-3.84	-1.62	2.41	436833.92	645419.87	N 32 12 1.75	W 103 59 48.61
	4560.00	7.88	201.82	4559.20	-6.14	-13.42	-5.45	3.47	436824.35	645416.04	N 32 12 1.65	W 103 59 48.66
	4655.00	8.41	201.18	4653.24	-11.72	-25.94	-10.38	0.57	436811.82	645411.11	N 32 12 1.53	W 103 59 48.72
	4750.00	6.76	206.88	4747.41	-17.36	-37.41	-15.42	1.91	436800.36	645406.07	N 32 12 1.42	W 103 59 48.78
	4845.00	4.98	213.25	4841.91	-22.58	-45.84	-20.21	1.99	436791.92	645401.29	N 32 12 1.33	W 103 59 48.83
	4941.00	3.15	230.27	4937.67	-27.16	-51.01	-24.52	2.26	436786.75	645396.97	N 32 12 1.28	W 103 59 48.88
	5035.00	2.54	288.99	5031.57	-31.16	-51.99	-28.48	3.02	436785.78	645393.02	N 32 12 1.27	W 103 59 48.93
	5130.00	4.35	323.83	5126.40	-35.09	-48.39	-32.59	2.83	436789.37	645388.90	N 32 12 1.31	W 103 59 48.98
	5224.00	6.67	336.53	5219.97	-38.94	-40.51	-36.87	2.77	436797.26	645384.62	N 32 12 1.39	W 103 59 49.03
	5319.00	9.04	342.32	5314.07	-42.77	-28.33	-41.34	2.63	436809.43	645380.16	N 32 12 1.51	W 103 59 49.08
	5414.00	11.06	358.92	5407.63	-44.35	-12.11	-43.78	3.70	436825.66	645377.72	N 32 12 1.67	W 103 59 49.11
	5509.00	11.81	346.88	5500.75	-45.75	6.48	-46.16	2.63	436844.24	645375.34	N 32 12 1.85	W 103 59 49.13
	5603.00	12.35	347.01	5592.67	-49.18	25.64	-50.60	0.58	436863.40	645370.90	N 32 12 2.04	W 103 59 49.18
	5697.00	12.85	348.37	5684.41	-52.50	45.67	-54.97	0.62	436883.43	645366.53	N 32 12 2.24	W 103 59 49.23
	5792.00	13.45	349.87	5776.92	-55.45	66.90	-59.04	0.73	436904.65	645362.46	N 32 12 2.45	W 103 59 49.28
	5887.00	13.90	350.42	5869.22	-58.13	89.02	-62.88	0.49	436926.78	645358.61	N 32 12 2.67	W 103 59 49.32
	5982.00	14.40	351.20	5961.34	-60.63	111.95	-66.59	0.56	436949.70	645354.91	N 32 12 2.90	W 103 59 49.37
	6072.00	14.69	350.96	6048.46	-62.96	134.28	-70.09	0.33	436972.03	645351.40	N 32 12 3.12	W 103 59 49.41
	6166.00	14.56	350.50	6139.41	-65.55	157.70	-73.91	0.19	436995.45	645347.58	N 32 12 3.35	W 103 59 49.45
	6261.00	14.88	347.23	6231.29	-68.97	181.38	-78.58	0.94	437019.12	645342.91	N 32 12 3.58	W 103 59 49.50
	6360.00	15.85	340.80	6326.76	-74.89	206.54	-85.84	1.98	437044.29	645335.66	N 32 12 3.83	W 103 59 49.59
	6455.00	17.17	335.42	6417.85	-83.67	231.55	-95.94	2.12	437069.29	645325.56	N 32 12 4.08	W 103 59 49.70
	6550.00	17.84	332.39	6508.45	-94.89	257.20	-108.52	1.19	437094.94	645312.98	N 32 12 4.34	W 103 59 49.85
	6645.00	17.03	330.41	6599.09	-107.17	282.19	-122.13	1.06	437119.93	645299.37	N 32 12 4.58	W 103 59 50.01
	6739.00	16.50	328.62	6689.09	-119.67	305.56	-135.88	0.79	437143.29	645285.62	N 32 12 4.81	W 103 59 50.17
	6836.00	15.86	327.49	6782.25	-132.75	328.49	-150.17	0.74	437166.23	645271.33	N 32 12 5.04	W 103 59 50.33
	6930.00	13.94	325.27	6873.08	-145.03	348.63	-163.53	2.13	437186.37	645257.97	N 32 12 5.24	W 103 59 50.49
	7025.00	12.35	323.85	6965.59	-156.60	366.24	-176.04	1.71	437203.97	645245.46	N 32 12 5.42	W 103 59 50.63
	7120.00	10.60	317.95	7058.69	-167.66	380.94	-187.89	2.22	437218.67	645233.62	N 32 12 5.56	W 103 59 50.77
	7216.00	9.14	312.83	7153.27	-178.54	392.68	-199.40	1.77	437230.41	645222.11	N 32 12 5.68	W 103 59 50.90
	7311.00	7.78	310.90	7247.24	-188.43	402.02	-209.79	1.46	437239.74	645211.72	N 32 12 5.77	W 103 59 51.02
	7408.00	6.37	308.73	7343.49	-197.18	409.68	-218.95	1.48	437247.41	645202.56	N 32 12 5.85	W 103 59 51.13
	7504.00	5.47	303.63	7438.98	-204.82	415.55	-226.91	1.08	437253.28	645194.59	N 32 12 5.91	W 103 59 51.22

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 ° ' ")
	7599.00	4.96	301.79	7533.59	-211.83	420.22	-234.18	0.56	437257.95	645187.33	N 32 12 5.95	W 103 59 51.31
	7791.00	2.03	283.21	7725.22	-221.91	425.37	-244.54	1.62	437263.10	645176.97	N 32 12 6.00	W 103 59 51.43
	7982.00	0.27	157.32	7916.18	-225.01	425.73	-247.66	1.15	437263.45	645173.85	N 32 12 6.01	W 103 59 51.46
	8078.00	0.33	280.85	8012.18	-225.20	425.57	-247.85	0.55	437263.30	645173.66	N 32 12 6.01	W 103 59 51.46
	8172.00	0.31	159.86	8106.18	-225.39	425.38	-248.03	0.59	437263.11	645173.48	N 32 12 6.00	W 103 59 51.47
	8267.00	0.19	74.39	8201.18	-225.16	425.19	-247.79	0.37	437262.91	645173.72	N 32 12 6.00	W 103 59 51.46
	8362.00	0.33	312.07	8296.18	-225.20	425.41	-247.84	0.48	437263.14	645173.67	N 32 12 6.00	W 103 59 51.46
	8457.00	0.40	102.10	8391.17	-225.07	425.53	-247.72	0.74	437263.25	645173.79	N 32 12 6.01	W 103 59 51.46
	8551.00	0.07	114.74	8485.17	-224.70	425.43	-247.34	0.35	437263.16	645174.17	N 32 12 6.00	W 103 59 51.46
	8742.00	0.18	271.57	8676.17	-224.90	425.39	-247.54	0.13	437263.12	645173.97	N 32 12 6.00	W 103 59 51.46
	8838.00	0.30	94.61	8772.17	-224.80	425.38	-247.44	0.50	437263.10	645174.07	N 32 12 6.00	W 103 59 51.46
	8932.00	0.35	340.81	8866.17	-224.64	425.63	-247.29	0.58	437263.35	645174.22	N 32 12 6.01	W 103 59 51.46
	9076.00	0.93	203.65	9010.17	-225.28	424.97	-247.90	0.84	437262.70	645173.61	N 32 12 6.00	W 103 59 51.47
	9248.00	0.80	61.68	9182.16	-224.83	424.26	-247.40	0.95	437261.99	645174.11	N 32 12 5.99	W 103 59 51.46
	9343.00	2.22	60.63	9277.12	-222.58	425.48	-245.22	1.49	437263.21	645176.29	N 32 12 6.00	W 103 59 51.43
	9437.00	15.99	64.88	9369.72	-208.89	431.90	-231.84	14.66	437269.63	645189.67	N 32 12 6.07	W 103 59 51.28
	9531.00	20.56	69.15	9458.96	-181.16	443.28	-204.68	5.06	437281.00	645216.83	N 32 12 6.18	W 103 59 50.96
	9622.00	28.51	70.49	9541.67	-145.07	456.24	-169.22	8.76	437293.96	645252.29	N 32 12 6.31	W 103 59 50.55
	9716.00	37.07	77.29	9620.65	-95.53	469.99	-120.33	9.90	437307.72	645301.17	N 32 12 6.44	W 103 59 49.98
	9774.00	41.14	80.55	9665.65	-59.32	476.98	-84.44	7.86	437314.70	645337.06	N 32 12 6.51	W 103 59 49.56
	9868.00	54.28	86.75	9728.80	9.90	484.25	-15.50	14.79	437321.97	645405.99	N 32 12 6.58	W 103 59 48.76
	9962.00	65.59	87.19	9775.81	91.13	488.53	65.61	12.04	437326.25	645487.09	N 32 12 6.62	W 103 59 47.81
	10056.00	80.87	86.94	9802.86	180.86	493.13	155.23	16.26	437330.85	645576.70	N 32 12 6.66	W 103 59 46.77
	10150.00	87.65	90.06	9812.25	274.29	495.56	248.66	7.93	437333.28	645670.13	N 32 12 6.68	W 103 59 45.68
	10196.00	87.04	90.84	9814.38	320.16	495.20	294.61	2.15	437332.92	645716.07	N 32 12 6.68	W 103 59 45.15
	10290.00	89.76	89.55	9817.01	413.96	494.88	388.56	3.20	437332.60	645810.02	N 32 12 6.67	W 103 59 44.06
	10384.00	88.90	88.52	9818.11	507.89	496.47	482.54	1.43	437334.19	645903.99	N 32 12 6.68	W 103 59 42.96
	10479.00	89.66	89.86	9819.30	602.81	497.81	577.52	1.62	437335.53	645998.96	N 32 12 6.70	W 103 59 41.86
	10573.00	89.38	89.43	9820.09	696.71	498.39	671.51	0.55	437336.11	646092.95	N 32 12 6.70	W 103 59 40.76
	10667.00	89.07	89.13	9821.36	790.63	499.57	765.49	0.46	437337.29	646186.92	N 32 12 6.71	W 103 59 39.67
	10761.00	89.04	90.71	9822.91	884.49	499.70	859.48	1.68	437337.42	646280.90	N 32 12 6.71	W 103 59 38.58
	10856.00	89.49	91.44	9824.13	979.24	497.92	954.45	0.90	437335.64	646375.87	N 32 12 6.68	W 103 59 37.47
	10950.00	89.59	91.72	9824.88	1072.94	495.33	1048.41	0.32	437333.05	646469.82	N 32 12 6.66	W 103 59 36.38
	11044.00	89.31	91.28	9825.79	1166.64	492.87	1142.38	0.55	437330.59	646563.78	N 32 12 6.63	W 103 59 35.28
	11139.00	89.28	91.21	9826.96	1261.37	490.80	1237.35	0.08	437328.52	646658.74	N 32 12 6.61	W 103 59 34.18
	11233.00	89.49	91.55	9827.96	1355.09	488.54	1331.31	0.43	437326.26	646752.70	N 32 12 6.58	W 103 59 33.08
	11328.00	88.83	91.30	9829.36	1449.80	486.18	1426.27	0.74	437323.90	646847.65	N 32 12 6.55	W 103 59 31.98
	11423.00	89.00	91.12	9831.16	1544.52	484.17	1521.24	0.26	437321.89	646942.60	N 32 12 6.53	W 103 59 30.87
	11517.00	88.97	91.29	9832.82	1638.25	482.20	1615.20	0.18	437319.92	647036.56	N 32 12 6.51	W 103 59 29.78
	11612.00	89.04	91.53	9834.47	1732.96	479.86	1710.16	0.26	437317.58	647131.51	N 32 12 6.48	W 103 59 28.68
	11707.00	88.80	91.38	9836.26	1827.65	477.45	1805.11	0.30	437315.17	647226.45	N 32 12 6.46	W 103 59 27.57
	11802.00	88.94	91.14	9838.14	1922.37	475.36	1900.07	0.29	437313.08	647321.41	N 32 12 6.43	W 103 59 26.47
	11899.00	89.07	91.47	9839.82	2019.08	473.15	1997.03	0.37	437310.87	647418.36	N 32 12 6.41	W 103 59 25.34
	11992.00	89.11	91.52	9841.30	2111.79	470.72	2089.99	0.07	437308.45	647511.31	N 32 12 6.38	W 103 59 24.26
	12087.00	88.93	91.25	9842.92	2206.49	468.43	2184.94	0.34	437306.15	647606.26	N 32 12 6.35	W 103 59 23.15
	12182.00	89.18	91.41	9844.49	2301.21	466.22	2279.90	0.31	437303.95	647701.21	N 32 12 6.33	W 103 59 22.05
	12276.00	89.00	91.68	9845.98	2394.90	463.69	2373.86	0.35	437301.41	647795.16	N 32 12 6.30	W 103 59 20.95
	12371.00	88.80	91.36	9847.80	2489.59	461.17	2468.81	0.40	437298.89	647890.10	N 32 12 6.27	W 103 59 19.85
	12466.00	88.80	91.38	9849.79	2584.29	458.90	2563.76	0.02	437296.62	647985.04	N 32 12 6.25	W 103 59 18.74
	12560.00	88.49	91.33	9852.02	2677.99	456.68	2657.71	0.33	437294.40	648078.98	N 32 12 6.22	W 103 59 17.65
	12655.00	88.76	91.78	9854.30	2772.66	454.10	2752.64	0.55	437291.82	648173.91	N 32 12 6.19	W 103 59 16.54
	12749.00	88.59	91.62	9856.47	2866.32	451.31	2846.58	0.25	437289.04	648267.84	N 32 12 6.16	W 103 59 15.45
	12845.00	88.32	91.18	9859.06	2962.00	448.97	2942.51	0.54	437286.69	648363.77	N 32 12 6.14	W 103 59 14.34
	12940.00	88.39	91.05	9861.79	3056.72	447.12	3037.46	0.16	437284.84	648458.70	N 32 12 6.12	W 103 59 13.23
	13035.00	88.76	91.88	9864.15	3151.40	444.69	3132.40	0.96	437282.42	648553.63	N 32 12 6.09	W 103 59 12.13
	13130.00	88.39	91.04	9866.51	3246.08	442.27	3227.33	0.97	437280.00	648648.56	N 32 12 6.06	W 103 59 11.02
	13319.00	88.21	88.91	9872.12	3434.73	442.35	3416.24	1.13	437280.08	648837.45	N 32 12 6.06	W 103 59 8.82
	13414.00	88.39	88.99	9874.94	3529.63	444.09	3511.18	0.21	437281.82	648932.39	N 32 12 6.07	W 103 59 7.72
	13508.00	88.38	89.20	9877.59	3623.53	445.58	3605.13	0.22	437283.30	649026.33	N 32 12 6.08	W 103 59 6.62
	13603.00	88.45	89.00	9880.21	3718.43	447.07	3700.08	0.22	437284.79	649121.28	N 32 12 6.09	W 103 59 5.52
	13697.00	88.73	89.76	9882.53	3812.32	448.09	3794.05	0.86	437285.81	649215.23	N 32 12 6.10	W 103 59 4.43
	13792.00	88.49	89.28	9884.83	3907.20	448.88	3889.02	0.56	437286.61	649310.20	N 32 12 6.11	W 103 59 3.32
	13886.00	88.52	89.65	9887.28	4001.08	449.76	3982.98	0.39	437287.48	649404.15	N 32 12 6.11	W 103 59 2.23
	13981.00	88.35	88.93	9889.88	4095.97	450.94	4077.94	0.78	437288.66	649499.10	N 32 12 6.12	W 103 59 1.12
	14076.00	88.66	89.20	9892.36	4190.87	452.49	4172.89	0.43	437290.21	649594.05	N 32 12 6.13	W 103 59 0.02
	14171.00	88.87	89.32	9894.40	4285.78	453.71	4267.86	0.25	437291.44	649689.01	N 32 12 6.14	W 103 58 58.91
	14266.00	88.63	88.89	9896.48	4380.69	455.20	4362.83	0.52	437292.92	649783.97	N 32 12 6.15	W 103 58 57.81
	14360.00	89.04	89.54	9898.39	4474.60	456.48	4456.80	0.82	437294.21	649877.93	N 32 12 6.16	W 103 58 56.71
	14454.00	88.63	89.32	9900.30	4568.50	457.42	4550.78	0.49	437295.14	649971.90	N 32 12 6.17	W 103 58 55.62
	14644.00	88.94	89.47	9904.33	4758.29	459.42	4740.72	0.18	437297.15	650161.83	N 32 12 6.18	W 103 58 53.41
	14740.00	89.14	89.71	9905.94	4854.17	460.11	4836.71	0.33	437297.83	650257.81	N 32 12 6.19	W 103 58 52.29
	14835.00	88.94	89.59	9907.53	4949.06	460.69	4931.69	0.25	437298.41	650352.78	N 32 12 6.19	W 103 58 51.19
	15024.00	89.11	88.76	9910.74	5137.89	463.41	5120.64	0.45	437301.13	650541.72	N 32 12 6.21	W 103 58 48.99
	15119.00	88.94	87.33	9912.36	5232.86	466.65	5215.57	1.52	437304.37	650636.64	N 32 12 6.24	W 103 58 47.88
	15214.00	88.76	86.71	9914.27	5327.84	471.59	5310.42	0.68	437309.31	650731.49	N 32 12 6.28	W 103 58 46.78
	15309.00	88.80	87.18	9916.29	5422.82	476.65	5405.27	0.50	437314.37	650826.32	N 32 12 6.33	W 103 58 45.67
	15403.00	88.66	86.75	9918.37	5516.80	481.63	5499.11	0.48	437319.35	650920.16	N 32 12 6.38	W 103 58 44.58
	15498.00	88.69	87.23	9920.57	5611.77	486.61	5593.95	0.51	437324.34	651014.99	N 32 12 6.42	W 103 58 43.48
	15593.00	88.76	87.05	9922.68	5706.75	491.35	5688.81	0.20	437329.07	651109.84	N 32 12 6.47	W 103 58 42.37
	15688.00	88.45	87.70	9925.00	5801.72	495.70	5783.68	0.76	437333.42	651204.71	N 32 12 6.51	W 103 58 41.27
	15783.00	89.21	89.81	9926.94	5896.64	497.77	5878.64	2.36	437335.49	651299.65	N 32 12 6.53	W 103 58 40.16
	15877.00	89.04	89.70	9928.37	5990.52	498.17	5972.62	0.22	437335.89	651393.63	N 32 12 6.53	W 103 58 39.07
	15973.00	88.80	88.53	9930.18	6086.44	499.65	6068.59	1.24	437337.37	651489.59	N 32 12 6.54	W 103 58 37.95
	16069.00	88.97	89.14	9932.05	6182.37	501.60	6164.55	0.66	437339.32	651585.55	N 32 12 6.55	W 103 58 36.84
	16164.00	89.14	89.69	9933.62	6277.27	502.57	6259.54	0.61	437340.29	651680.52	N 32 12 6.56	W 103 58 35.73
	16353.00	88.76	88.85	9937.08	6466.09	504.98	6448.49	0.49	437342.70	651869.46	N 32 12 6.58	W 103 58 33.53
	16448.00	88.97	89.20	9938.96	6561.01	506.60	6543.45	0.43	437344.31	651964.42	N 32 12 6.59	W 103 58 32.43
	16542.00	89.00	89.25	9940.63	6654.93	507.87	6637.43	0.06	437345.59	652058.39	N 32 12 6.60	W 103 58 31.33
	16637.00	89.00	89.30	9942.29	6749.84	509.07	6732.41	0.05	437346.79	652153.36	N 32 12 6.61	W 103 58 30.23
	16827.00	89.18	89.37	9945.30	6939.66	511.27	6922.37	0.10	437348.99	652343.31	N 32 12 6.62	W 103 58 28.02
	17018.00	89.18	89.84	9948.04	7130.44	512.59	7113.35	0.25	437350.31	652534.27	N 32 12 6.63	W 103 58 25.79
	17113.00	88.69	89.27	9949.80	7225.33	513.33	7208.33	0.79	437351.05	652629.24	N 32 12 6.64	W 103 58 24.69
	17207.00	88.52	89.33	9952.09	7319.22	514.48	7302.29	0.19	437352.19	652723.20	N 32 12 6.64	W 103 58 23.59
	17303.00	89.49	90.46	9953.76	7415.08	514.65	7398.28	1.55	437352.37	652819.17	N 32 12 6.64	W 103 58 22.48
	17398.00	89.11	89.13	9954.92	7509.96	514.99	7493.27	1.46	437352.71	652914.15	N 32 12 6.64	W 103 58 21.37
	17493.00	88.80	89.46	9956.65	7604.87	516.16	7588.24	0.48	437353.88	653009.12	N 32 12 6.65	W 103 58 20.27
	17588.00	88.87	89.54	9958.58	7699.76	516.99	7683.22	0.11	437354.71	653104.09	N 32 12 6.66	W 103 58 19.16
	17683.00	88.66	89.37	9960.63	7794.65	517.89	7778.19	0.28	437355.61	653199.06	N 32 12 6.66	W 103 58 18.06
	17778.00	88.49	89.87	9962.99	7889.52	518.52	7873.16	0.56	437356.24	653294.02	N 32 12 6.66	W 103 58 16.95
	17875.00	88.94	88.97	9965.17	7986.40	519.50	7970.13	1.04	437357.22	653390.98	N 32 12 6.67	W 103 58 15.82
	17971.00	88.80	89.34	9967.06	8082.32	520.92	8066.10	0.41	437358.64	653486.94	N 32 12 6.68	W 103 58 14.71

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 ° ' ")
	18066.00	89.11	89.73	9968.79	8177.21	521.69	8161.08	0.52	437359.41	653581.91	N 32 12 6.69	W 103 58 13.60
	18255.00	89.04	89.59	9971.84	8365.98	522.81	8350.05	0.08	437360.53	653770.87	N 32 12 6.69	W 103 58 11.40
	18350.00	88.76	89.60	9973.67	8460.86	523.48	8445.03	0.29	437361.20	653865.84	N 32 12 6.69	W 103 58 10.30
	18446.00	88.87	90.03	9975.65	8556.73	523.79	8541.01	0.46	437361.51	653961.81	N 32 12 6.69	W 103 58 9.18
	18541.00	89.04	90.15	9977.39	8651.57	523.64	8636.00	0.22	437361.36	654056.79	N 32 12 6.69	W 103 58 8.07
	18730.00	88.94	89.96	9980.72	8840.27	523.46	8824.97	0.11	437361.18	654245.75	N 32 12 6.68	W 103 58 5.87
	18825.00	88.90	89.30	9982.51	8935.16	524.08	8919.95	0.70	437361.79	654340.72	N 32 12 6.68	W 103 58 4.77
	19015.00	88.76	89.58	9986.39	9124.94	525.93	9109.90	0.16	437363.65	654530.66	N 32 12 6.70	W 103 58 2.56
	19203.00	88.56	90.75	9990.78	9312.60	525.39	9297.84	0.63	437363.11	654718.58	N 32 12 6.69	W 103 58 0.37
	19394.00	88.87	91.57	9995.07	9503.05	521.53	9488.75	0.46	437359.24	654909.48	N 32 12 6.64	W 103 57 58.15
	19583.00	89.62	91.64	9997.56	9691.42	516.23	9677.66	0.40	437353.95	655098.37	N 32 12 6.58	W 103 57 55.95
	19677.00	89.52	91.36	9998.26	9785.12	513.77	9771.63	0.32	437351.49	655192.33	N 32 12 6.55	W 103 57 54.86
	19771.00	89.07	90.99	9999.42	9878.87	511.84	9865.60	0.62	437349.56	655286.30	N 32 12 6.53	W 103 57 53.76
	19859.00	89.28	91.43	10000.69	9966.62	509.99	9953.57	0.55	437347.71	655374.26	N 32 12 6.51	W 103 57 52.74
Final MWD survey	19912.00	89.38	91.14	10001.31	10019.47	508.80	10006.55	0.58	437346.52	655427.24	N 32 12 6.50	W 103 57 52.12
Proj. to bit	19951.00	89.38	91.14	10001.73	10058.36	508.02	10045.54	0.00	437345.74	655466.23	N 32 12 6.49	W 103 57 51.67

Survey Type: 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_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Oxy Cedar Canyon 21-22 Federal Com 33H MWD 0-19,951ft MD
	1	26.500	26.500	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Oxy Cedar Canyon 21-22 Federal Com 33H MWD 0-19,951ft MD
	1	26.500	19951.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Cedar Canyon 21-22 Federal Com 33H