

30-015-44539

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Directional Survey

DIRECTIONAL SURVEY REPORT

NM OIL CONSERVATION
ARTESIA DISTRICT

gyrodata

Report Date: 7/24/2018 Operator: Chisholm Energy Well Name: DARE CANYON 15-22 WCA BH RIG: Lashaw 7 Job Number: F00418DFM137 State: New Mexico County: Eddy Field: Eddy Co. NM Survey Correction Co.: Gyrodata Inc.	Job Start Date: 4/13/2018 Map System: US State Plane 1983 Map Ellipsoid: GRS 1980 Map Datum: North American Datum 1983 Map Zone: New Mexico Eastern Zone Well Longitude: 104° 17' 40.572" W Well Latitude: 32° 58' 40.572" N Well Northings: Well Eastings:	JUL 24 2018 RECEIVED	Time Zone: GMT -06:00 Reference Datum: RotaryTable Survey Calc. Method: Minimum Curvature Ground Elevation (ft.): 3326.3 ROD Above NSL (ft.): 26 Non Mag Above (ft.): 45 Non Mag Below (ft.): 15	North Reference: GridNorth Vertical Section Az (deg): 180 Magnetic Model: HGS-M Calc. Date: 4/9/2018 Field Strength (nT): 47999.7 Dip Angle (deg): 60.05 Mag. Declination (deg): 7.43 Grid Convergence (deg): 0.02 Total Correction (deg): 7.41
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										Accelerometer (g)			Magnetometer (nT)			Corrected Survey QC		Raw Survey QC								
Depth (ft.)	Inclination (°)	Azimuth (°)	DLS (°/100)	TVD (ft.)	N/S (°/-)	E/W (°/-)	Vertical Section (ft.)	Ax	Ay	Az	Hx	Hy	Hx	My	Mz	Magnetic Dip Angle (°)	Mag Field (nT)	Magnetic Dip Angle (°)	Mag Field (nT)	Gravity Total (g)	Temp (°F)	Mud Type	Survey Type	Survey #	Run #	Date & Time
0.00	0.00	0.00		0.00	0.00	0.00																				
154.00	0.69	35.97	0.45	154.00	0.75	0.54	-0.75	-0.003663	-0.011477	0.999023	-16941	-15879	45403	60.37	47852	62.31	50996	0.99891	66.20			MWD+HRGM+AX	1	1	4/13/18 17:55	
245.00	0.79	30.52	0.13	244.99	1.73	1.19	-1.73	0.011477	-0.007570	0.999023	12656	-19542	40971	60.21	47925	59.67	47124	0.99893	68.00			MWD+HRGM+AX	2	1	4/13/18 19:17	
335.00	1.03	23.81	0.29	334.98	3.01	1.83	-3.01	-0.002686	0.017827	0.999023	3388	23059	43169	59.98	48031	60.65	49058	0.99900	69.80			MWD+HRGM+AX	3	1	4/13/18 20:38	
373.00	1.10	22.23	0.20	372.97	3.66	2.10	-3.66	0.010012	0.016361	0.999023	16941	15916	43205	59.99	48027	60.66	49061	0.99902	69.80			MWD+HRGM+AX	4	1	4/13/18 21:29	
515.00	0.94	3.10	0.26	514.95	6.08	2.68	-6.08	-0.013919	0.008547	1.000000	-20641	10568	43425	60.15	47954	60.96	49229	0.99994	78.80	Water		MWD+HRGM+AX	5	2	4/15/18 16:42	
607.00	1.25	356.21	0.37	606.93	7.84	2.66	-7.84	-0.000733	0.021734	0.998535	-5440	22546	42385	59.92	48059	60.43	48843	0.99858	86.00	Water		MWD+HRGM+AX	6	2	4/15/18 19:34	
699.00	1.15	359.57	0.13	698.91	9.76	2.58	-9.76	-0.010012	0.017338	0.998535	-14304	18223	43169	60.01	48016	60.64	48992	0.99855	93.20	Water		MWD+HRGM+AX	7	2	4/15/18 22:45	
790.00	1.51	32.07	0.90	789.89	11.69	3.21	-11.69	-0.006105	0.025641	0.998535	4963	22546	43242	59.92	48058	60.54	49018	0.99869	96.80	Water		MWD+HRGM+AX	8	2	4/15/18 23:46	
881.00	2.85	60.37	1.85	880.82	13.83	5.82	-13.83	0.042247	0.026129	0.997558	20531	-9762	43462	60.09	47983	60.75	49048	0.99860	100.40	Water		MWD+HRGM+AX	9	2	4/16/18 0:54	
973.00	3.99	64.06	1.26	972.66	16.36	10.68	-16.36	-0.022711	0.065690	0.996581	15586	16245	43498	60.02	48011	60.62	48979	0.99881	105.80	Water		MWD+HRGM+AX	10	2	4/16/18 2:37	
1067.00	3.59	62.93	0.43	1066.45	19.13	16.24	-19.13	-0.062271	0.006593	0.997070	-8846	20897	43462	59.93	48054	60.53	49029	0.99884	113.00	Water		MWD+HRGM+AX	11	2	4/16/18 4:54	
1158.00	2.12	80.74	1.87	1157.34	20.70	20.44	-20.70	0.006105	-0.036386	0.998047	-21703	-9029	42876	60.11	47970	60.72	48897	0.99854	114.80	Water		MWD+HRGM+AX	12	2	4/16/18 6:09	
1251.00	0.60	161.14	2.26	1250.31	20.51	22.30	-20.51	0.005128	0.009035	0.999023	-1593	-24231	42399	60.12	47965	60.73	48861	0.99889	116.60	Water		MWD+HRGM+AX	13	2	4/16/18 7:24	
1345.00	1.40	220.94	1.29	1344.30	19.18	21.70	-19.18	0.012943	-0.020757	0.998535	128	24927	42216	59.93	48058	60.62	49026	0.99864	118.40	Water		MWD+HRGM+AX	14	2	4/16/18 8:38	
1439.00	0.47	286.96	1.36	1438.29	18.42	20.58	-18.42	-0.008059	-0.001221	0.999023	-55	-23828	42692	60.13	47959	60.76	48892	0.99887	118.40	Water		MWD+HRGM+AX	15	2	4/16/18 9:59	
1534.00	0.73	349.93	0.70	1533.28	19.13	20.10	-19.13	0.007082	-0.010501	0.999023	18407	-14451	42985	60.11	47971	60.74	48942	0.99891	120.20	Water		MWD+HRGM+AX	16	2	4/16/18 11:58	
1627.00	0.75	359.51	0.13	1626.28	20.32	20.00	-20.32	-0.007082	0.010589	0.999023	-15366	17747	42985	60.00	48025	60.62	48978	0.99892	123.80	Water		MWD+HRGM+AX	17	2	4/16/18 14:01	
1721.00	0.91	231.63	1.59	1720.27	20.48	19.40	-20.48	0.014896	0.005617	0.999023	-22619	9359	42363	60.01	48019	60.64	48926	0.99896	125.60	Water		MWD+HRGM+AX	18	2	4/16/18 16:19	
1815.00	2.94	217.09	2.20	1814.21	18.09	17.37	-18.09	-0.029060	-0.042247	0.997558	22802	12180	41557	60.01	48019	60.70	48941	0.99868	129.20	Water		MWD+HRGM+AX	19	2	4/16/18 17:53	
1903.00	3.14	222.91	0.42	1902.09	14.52	14.36	-14.52	-0.013919	0.052992	0.997558	-7894	-24487	41593	60.15	47945	60.87	48908	0.99887	129.20	Water		MWD+HRGM+AX	20	2	4/16/18 19:28	
2092.00	3.67	220.09	0.29	2090.76	6.11	6.94	-6.11	0.043224	-0.047131	0.997070	-5879	25586	40311	60.07	48106	60.07	48106	0.99893	93.20	Water		MWD+HRGM	21	3	4/18/18 0:31	
2184.00	3.73	221.47	0.12	2182.57	1.61	3.07	-1.61	-0.038339	0.052503	0.996581	2436	-25989	40202	60.16	47932	60.16	47932	0.99851	95.00	Water		MWD+HRGM	22	3	4/18/18 1:23	
2278.00	0.91	268.53	3.38	2276.48	-0.70	0.29	0.70	-0.006593	0.014408	0.999023	-19615	-13755	41960	60.43	48317	60.43	48317	0.99896	96.80	Water		MWD+HRGM	23	3	4/18/18 2:28	
2372.00	1.29	2.07	1.73	2370.47	0.34	-0.41	-0.34	-0.003663	-0.022222	0.999023	-1520	-2876	42546	60.40	48330	60.40	48330	0.99909	98.60	Water		MWD+HRGM	24	3	4/18/18 3:26	
2467.00	1.25	1.19	0.05	2465.45	2.44	-0.35	-2.44	-0.001709	-0.021734	0.999023	788	-2876	42473	60.44	48248	60.44	48248	0.99907	100.40	Water		MWD+HRGM	25	3	4/18/18 4:34	
2561.00	1.69	1.77	0.47	2559.42	4.85	-0.29	-4.85	-0.029060	0.005128	0.999023	-22949	1630	42363	59.81	48207	59.81	48207	0.99927	102.20	Water		MWD+HRGM	26	3	4/18/18 5:39	
2655.00	1.31	9.53	0.46	2653.39	7.30	-0.07	-7.30	-0.022222	0.005128	0.997558	-22180	6026	42473	60.27	48292	60.27	48292	0.99763	102.20	Water		MWD+HRGM	27	3	4/18/18 6:47	
2749.00	1.29	2.18	0.18	2747.36	9.42	0.15	-9.42	0.016850	0.014896	0.999023	15769	16868	42619	60.27	48472	60.27	48472	0.99909	104.00	Water		MWD+HRGM	28	3	4/18/18 7:43	
2843.00	1.50	6.69	0.25	2841.33	11.69	0.33	-11.69	-0.024176	0.010012	0.998535	-21264	8480	42509	60.20	48281	60.20	48281	0.99869	104.00	Water		MWD+HRGM	29	3	4/18/18 8:57	
2937.00	1.29	355.64	0.36	2935.31	13.97	0.40	-13.97	0.020757	-0.008547	0.999023	22656	-4048	42509	60.31	48339	60.31	48339	0.99909	104.00	Water		MWD+HRGM	30	3	4/18/18 9:59	
3032.00	1.33	346.13	0.23	3030.28	16.11	0.05	-16.11	0.001709	-0.023199	0.998535	10238	-20641	42436	60.26	48287	60.26	48287	0.99862	105.80	Water		MWD+HRGM	31	3	4/18/18 10:53	
3125.00	1.45	355.12	0.27	3123.25	18.33	-0.31	-18.33	-0.022711	0.010589	0.999512	-22363	5147	42436	60.19	48243	60.19	48243	0.99964	105.80	Water		MWD+HRGM	32	3	4/18/18 11:49	
3219.00	2.07	202.33	3.64	3217.24	17.94	-1.05	-17.94	0.021245	-0.029060	0.998047	-9579	23571	41191	60.30	48415	60.30	48415	0.99851	105.80	Water		MWD+HRGM	33	3	4/18/18 12:52	
3314.00	3.51	193.79	1.57	3312.12	13.53	-2.40	-13.53	0.059829	-0.012454	0.997558	-25220	7967	40604	60.41	48459	60.41	48459	0.99924	107.60	Water		MWD+HRGM	34	3	4/18/18 13:58	
3409.00	3.62	194.18	0.12	3406.94	7.80	-3.83	-7.80	0.040782	-0.048107	0.997070	-14890	21923	40348	60.30	48273	60.30	48273	0.99887	107.60	Water		MWD+HRGM	35	3	4/18/18 14:55	
3503.00	3.63	196.66	0.17	3500.75	2.07	-5.41	-2.07	0.034432	0.052992	0.996581	-17454	-19835	40604	60.53	48444	60.53	48444	0.99839	107.60	Water		MWD+HRGM	36	3	4/18/18 16:24	
3597.00	3.69	195.11	0.12	3594.56	-3.70	-7.05	-3.70	-0.030037	-0.056899	0.997070	15220	21923	40238	60.11	48284	60.11	48284	0.99895	109.40	Water		MWD+HRGM	37	3	4/18/18 17:53	
3723.00	1.95	286.64	3.35	3720.45	-7.00	-10.16	-7.00	-0.028571	0.018315	0.998047	-14744	-18553	42180	60.42	48381	60.42	48381	0.99843	109.40	Water		MWD+HRGM	38	3	4/18/18 20:07	
3786.00	0.90	355.78	2.91	3783.43	-6.20	-11.23	-6.20	-0.002686	0.015385	0.999023	-8736	21777	42436	60.18	48491	60.18	48491	0.99896	109.40	Water		MWD+HRGM	39	3	4/18/18 21:12	
3911.00	1.24	31.18	0.58	3908.41	-4.06	-10.60	-4.06	-0.013431	0.016850	0.999023	-20531	-10348	42729	60.59	48522	60.59	48522	0.99907	111.20	Water		MWD+HRGM	40	3	4/18/18 22:59	

DIRECTIONAL SURVEY REPORT

gyrodata

Report Date: 7/24/2018	Job Start Date: 4/13/2018	Time Zone: GMT -06:00	North Reference: GridNorth
Operator: Chicholen Energy	Map System: US State Plane 1983	Reference Datum: NotaryTable	Vertical Section Az (deg): 180
Well Name: DARE CANYON 15-22 WCA 3N	Map EID/Block: GRS 1980	Survey Calc. Method: Minimum Curvature	Magnetic Model: 4/7/2018
Rig: Latchaw 7	Map Datum: North American Datum 1983	Ground Elevation (ft.): 3326.3	Calc. Date: 4/7/2018
Job Number: F00118CPM137	Map Zone: New Mexico Eastern Zone	RSB Above NSL (ft.): 24	Field Strength (nT): 47999.7
State: New Mexico	Well Latitude: 32° 14' 40.572" N	Non Mag Above (ft.): 45	Dip Angle (deg): 60.05
County: Eddy	Well Longitude: 104° 17' 15.108" W	Non Mag Below (ft.): 15	Mag. Declination (deg): 7.43
Field: Eddy Co. NM	Well Northings:		Grid Convergence (deg): 0.02
Survey Correction Co.: Gyrodata Inc.	Well Eastings:		Total Correction (deg): 7.41

																							Accelerometer (g)			Magnetometer (nT)			Corrected Survey QC		Raw Survey QC							
Depth (ft.)	Inclination (°)	Azimuth (°)	DLS (°/100)	TVD (ft.)	N/S (°/ft.)	E/W (°/ft.)	Vertical Section (ft.)	Ax	Ay	Az	Mx	My	Mz	Magnetic Dip Angle (°)	Mag Field (nT)	Magnetic Dip Angle (°)	Mag Field (nT)	Gravity Total (g)	Temp (°F)	Mud Type	Survey Type	Survey #	Run #	Date & Time														
5294.00	2.48	147.50	3.05	5291.19	15.06	-3.49	-15.06	0.020757	-0.037851	0.998047	-23205	10311	41227	60.31	48420	60.31	48420	0.99879	111.20	Water	MWD+HRGM	55	3	4/19/18 23:31														
5389.00	3.33	152.38	0.93	5386.07	10.88	-1.10	-10.88	-0.057875	-0.005128	0.997070	20751	15659	40861	60.32	48430	60.32	48430	0.99857	109.40	Water	MWD+HRGM	56	3	4/20/18 3:39														
5483.00	3.32	151.76	0.04	5479.91	6.06	1.45	-6.06	-0.012943	-0.056410	0.997558	-8736	24487	40861	60.28	48431	60.28	48431	0.99905	105.80	Water	MWD+HRGM	57	3	4/20/18 7:02														
5579.00	4.44	150.74	1.17	5575.69	0.37	4.58	-0.37	0.072528	-0.026618	0.996093	-25916	-5696	40458	60.39	48383	60.39	48383	0.99889	109.40	Water	MWD+HRGM	58	3	4/20/18 9:41														
5673.00	2.47	146.76	2.11	5669.51	-4.50	7.47	4.50	0.021245	-0.037363	0.998047	-23352	9615	41337	60.49	48441	60.49	48441	0.99878	109.40	Water	MWD+HRGM	59	3	4/20/18 13:15														
5768.00	0.46	137.83	2.12	5764.48	-6.49	8.85	6.49	0.005128	-0.006105	0.999023	-24121	421	42033	60.44	48464	60.44	48464	0.99886	111.20	Water	MWD+HRGM	60	3	4/20/18 15:58														
5863.00	0.45	164.56	0.22	5859.47	-7.13	9.21	7.13	0.001709	0.007570	0.999023	4121	-23791	42033	60.54	48474	60.54	48474	0.99886	114.80	Water	MWD+HRGM	61	3	4/20/18 18:21														
5958.00	0.77	172.14	0.35	5954.47	-8.13	9.39	8.13	-0.011477	0.007082	0.999023	23425	-7051	41850	60.44	48475	60.44	48475	0.99892	116.60	Water	MWD+HRGM	62	3	4/20/18 21:08														
6053.00	1.19	179.70	0.46	6049.45	-9.75	9.48	9.75	-0.014408	-0.014896	0.999023	14817	19945	41593	60.33	48450	60.33	48450	0.99905	116.60	Water	MWD+HRGM	63	3	4/20/18 23:09														
6147.00	1.05	187.10	0.21	6143.44	-11.58	9.38	11.58	-0.00733	0.018315	0.999023	1117	-24634	41740	60.48	48480	60.48	48480	0.99900	116.60	Water	MWD+HRGM	64	3	4/21/18 0:58														
6241.00	0.79	251.09	1.06	6237.43	-12.64	8.66	12.64	-0.007570	-0.011477	0.999023	24084	-2473	42033	60.42	48507	60.42	48507	0.99893	118.40	Water	MWD+HRGM	65	3	4/21/18 3:29														
6335.00	0.96	271.94	0.38	6331.42	-12.82	7.26	12.82	-0.007570	-0.014896	0.999512	22546	-8114	42180	60.51	48510	60.51	48510	0.99946	120.20	Water	MWD+HRGM	66	3	4/21/18 5:26														
6429.00	0.72	294.94	0.44	6425.41	-12.55	5.94	12.55	0.012454	0.001709	0.999023	3535	23645	42216	60.27	48516	60.27	48516	0.99891	122.00	Water	MWD+HRGM	67	3	4/21/18 7:40														
6522.00	0.82	304.96	0.18	6518.40	-11.92	4.87	11.92	-0.013431	0.005128	0.999023	-17308	-16062	42363	60.49	48499	60.49	48499	0.99894	122.00	Water	MWD+HRGM	68	3	4/21/18 9:36														
6617.00	0.76	273.78	0.45	6613.39	-11.49	3.68	11.49	-0.005617	-0.011966	0.999023	22473	-8260	42216	60.50	48533	60.50	48533	0.99892	120.20	Water	MWD+HRGM	69	3	4/21/18 10:30														
6711.00	0.85	270.50	0.11	6707.38	-11.44	2.36	11.44	-0.010501	-0.010501	0.999023	19213	-14267	42143	60.52	48463	60.52	48463	0.99894	122.00	Water	MWD+HRGM	70	3	4/21/18 11:27														
6805.96	0.47	34.09	1.24	6802.34	-11.11	1.87	11.11	-0.004151	0.007082	0.999023	-1374	23681	42289	60.29	48488	60.29	48488	0.99887	122.00	Water	MWD+HRGM	71	3	4/21/18 13:04														
6900.00	0.47	44.59	0.09	6896.37	-10.52	2.36	10.52	-0.001709	0.008059	0.999023	10311	21410	42253	60.27	48477	60.27	48477	0.99887	122.00	Water	MWD+HRGM	72	3	4/21/18 15:02														
6995.00	0.13	256.43	0.62	6991.37	-10.27	2.53	10.27	0.000244	-0.002198	0.999023	21337	11117	42180	60.34	48559	60.34	48559	0.99884	123.80	Water	MWD+HRGM	73	3	4/21/18 16:23														
7088.00	0.52	244.54	0.42	7084.37	-10.47	2.05	10.47	0.007570	-0.005128	0.999023	202	24231	42070	60.35	48549	60.35	48549	0.99887	125.60	Water	MWD+HRGM	74	3	4/21/18 17:57														
7182.00	2.85	329.70	3.04	7178.33	-8.64	0.48	8.64	-0.034432	0.035897	0.998047	-22180	1996	43095	60.47	48509	60.47	48509	0.99910	127.40	Water	MWD+HRGM	75	3	4/21/18 20:44														
7276.00	2.76	323.86	0.32	7272.22	-4.79	-2.03	4.79	-0.029060	-0.038339	0.998047	3901	-22143	43022	60.47	48543	60.47	48543	0.99902	129.20	Water	MWD+HRGM	76	3	4/21/18 23:14														
7370.00	1.74	332.07	1.14	7366.14	-1.71	-4.03	1.71	0.028083	0.011477	0.999023	11740	19872	42766	60.24	48596	60.24	48596	0.99929	129.20	Water	MWD+HRGM	77	3	4/22/18 0:59														
7464.00	2.29	340.55	0.66	7460.09	1.33	-5.33	-1.33	-0.017338	0.035897	0.998047	-18370	13059	43022	60.33	48568	60.33	48568	0.99865	131.00	Water	MWD+HRGM	78	3	4/22/18 2:48														
7558.00	4.04	0.13	2.16	7553.94	6.41	-5.95	-6.41	0.069597	-0.010989	0.996581	21044	-238	43791	60.32	48586	60.32	48586	0.99888	131.00	Water	MWD+HRGM	79	3	4/22/18 4:25														
7653.00	3.11	355.11	1.03	7648.75	12.32	-6.16	-12.32	-0.038339	-0.038339	0.998047	-11300	-18517	43462	60.44	48574	60.44	48574	0.99933	131.00	Water	MWD+HRGM	80	3	4/22/18 6:09														
7747.00	1.70	349.38	1.52	7742.67	16.23	-6.63	-16.23	0.008059	0.028571	0.999023	-1300	22839	42876	60.30	48596	60.30	48596	0.99927	132.80	Water	MWD+HRGM	81	3	4/22/18 8:10														
7841.00	1.46	6.87	0.57	7836.63	18.79	-6.75	-18.79	0.024664	0.006105	0.999023	22216	5733	42802	60.35	48564	60.35	48564	0.99916	132.80	Water	MWD+HRGM	82	3	4/22/18 10:10														
7936.00	1.41	39.58	0.85	7931.61	20.90	-5.86	-20.90	0.008059	0.023199	0.999023	18443	14048	42692	60.31	48581	60.31	48581	0.99913	132.80	Water	MWD+HRGM	83	3	4/22/18 11:38														
8031.00	1.67	37.56	0.28	8026.57	22.89	-4.27	-22.89	-0.025641	0.013919	0.999023	-11447	19982	42729	60.24	48539	60.24	48539	0.99926	132.80	Water	MWD+HRGM	84	3	4/22/18 13:21														
8125.00	0.87	28.10	0.88	8120.55	24.61	-3.10	-24.61	0.007082	0.013431	0.999023	17747	15403	42546	60.27	48604	60.27	48604	0.99895	132.80	Water	MWD+HRGM	85	3	4/22/18 15:15														
8188.00	0.50	9.85	0.67	8183.54	25.30	-2.82	-25.30	0.008547	-0.001709	0.999023	22912	-5623	42473	60.45	48585	60.45	48585	0.99887	132.80	Water	MWD+HRGM	86	3	4/22/18 16:24														
8249.00	1.17	193.25	2.74	8244.54	24.96	-2.92	-24.96	-0.020269	-0.002198	0.999023	24854	238	41777	60.00	48026	60.41	48611	0.99904	123.80	Water	MWD+HRGM+AX	87	4	4/23/18 14:16														
8280.00	6.42	195.30	16.94	8275.46	22.98	-3.45	-22.98	-0.094994	-0.058852	0.992674	25806	12106	39762	59.98	48043	60.74	48924	0.99875	125.60	Water	MWD+HRGM+AX	88	4	4/23/18 15:40														
8312.00	11.78	194.74	16.75	8307.05	18.09	-4.76	-18.09	-0.177045	-0.101343	0.978510	29103	13132	37051	60.03	48017	60.95	48910	0.99936	129.20	Water	MWD+HRGM+AX	89	4	4/23/18 17:21														
8343.00	14.48	199.30	9.32	8337.24	11.37	-6.84	-11.37	0.226374	0.105739	0.967766	-32106	-9542	35659	60.03	48018	61.05	48923	0.99931	131.00	Water	MWD+HRGM+AX	90	4	4/23/18 18:17														
8375.00	17.48	197.54	9.50	8368.00	3.01	-9.61	-3.01	-0.038828	0.297680	0.953114	348	-35220	33865	60.07	47981	61.17	48861	0.99908	131.00	Water	MWD+HRGM+AX	91	4	4/23/18 20:29														
8406.00	20.12	193.51	9.49	8397.34	-6.62	-12.26	6.62	0.187302	-0.288400	0.938462	-17857	32180	32033	60.03	48024	61.09	48790	0.99929	131.00	Water	MWD+HRGM+AX	92	4	4/23/18 23:03														
8438.00	22.50	189.99	8.44	8427.15	-18.00	-14.61	18.00	-0.369963	0.096948	0.923321	36502	-10678	30495	60.06	47986	61.21	48747	0.99921	134.60	Water	MWD+HRGM+AX	93	4	4/24/18 1:39														
8469.00	25.74	188.34	10.67	8455.44	-30.51	-16.62	30.51	0.257631	0.348962	0.899878	-23865	-31667	28260	60.04	48006	61.21	48692	0.99877	134.60	Water	MWD+HRGM+AX	94	4	4/24/18 2:40														
8500.00	29.21	189.30	11.28	8482.94	-44.63	-18.82	44.63	0.229304	-0.430525	0.872528	-18700	36795	25769	60.01	48057	61.18	48658	0.99943	136.40	Water	MWD+HRGM+AX	95	4	4/24/18 3:53														
853																																						

DIRECTIONAL SURVEY REPORT



Report Date: 7/24/2018	Job Start Date: 4/13/2018	Time Zone: GMT -06:00	North Reference: GridNorth
Operator: Chisholm Energy	Map System: US State Plane 1983	Reference Datum: RotaryTable	Vertical Section Az (deg): 180
Well Name: DALL CANYON LS-22 WCA 3H	Map ID/Model: GRS 1980	Survey Calc. Method: Minimum Curvature	Magnetic Model: HGGM
Alg: Lachner 7	Map Datum: North American Datum 1983	Ground Elevation (ft): 3326.3	Calc. Date: 4/9/2018
Job Number: F00418DPM137	Map Zone: New Mexico Eastern Zone	RSS Above NSL (ft): 26	Field Strength (nT): 47999.7
State: New Mexico	Well Latitude: 32° 18' 40.572" N	Non Mag Above (ft): 45	Dip Angle (deg): 60.05
County: Eddy	Well Longitude: 104° 17' 15.108" W	Non Mag Below (ft): 15	Mag. Declination (deg): 7.43
Field: Eddy Co. NME	Well Northings:		Grid Convergence (deg): 0.02
Survey Correction Co.: Gyrodata Inc.	Well Eastings:		Total Correction (deg): 7.41

																							Accelerometer (g)			Magnetometer (nT)			Corrected Survey QC			Raw Survey QC								
Depth (ft.)	Inclination (°)	Azimuth (°)	DLS (°/100)	TVD (ft.)	N/S (°/-)	E/W (°/-)	Vertical Section (ft.)	Ax		Ay		Az		Mx		My		Mz		Magnetic Dip Angle (°)		Mag Field (nT)		Gravity Total (g)		Temp (°F)	Mud Type	Survey Type	Survey #	Run #	Date & Time									
								Ax	Ay	Az	Mx	My	Mz	Magnetic Dip Angle (°)	Mag Field (nT)	Magnetic Dip Angle (°)	Mag Field (nT)	Gravity Total (g)																						
8972.00	73.72	192.05	8.18	8777.90	-385.73	-98.14	385.73	-0.805617	-0.520879	0.280098	40018	23571	-10714	59.99	47792	60.64	47664	0.99920	141.80	Water	MWD+HRGM+AX	110	4	4/24/18 17:14																
9003.00	76.85	190.86	10.76	8785.78	-415.11	-104.09	415.11	0.945788	-0.228327	0.227351	-44158	12143	-13315	59.99	47839	60.58	47693	0.99898	141.80	Water	MWD+HRGM+AX	111	4	4/24/18 18:17																
9035.00	78.25	191.94	5.48	8792.68	-445.74	-110.27	445.74	-0.116483	0.971184	0.203419	3535	-45366	-14267	60.01	47887	60.75	47688	0.99888	141.80	Water	MWD+HRGM+AX	112	4	4/24/18 19:37																
9066.00	79.20	191.61	3.24	8798.74	-475.50	-116.47	475.50	0.230769	-0.954090	0.187302	-8919	44341	-15183	60.00	47870	60.56	47709	0.99912	141.80	Water	MWD+HRGM+AX	113	4	4/24/18 20:37																
9097.00	80.67	189.74	7.60	8804.16	-505.49	-122.13	505.49	0.609768	0.774359	0.161905	-28480	-34597	-16319	60.00	47887	60.64	47690	0.99864	141.80	Water	MWD+HRGM+AX	114	4	4/24/18 21:22																
9129.00	83.71	186.07	14.81	8808.50	-536.88	-126.48	536.88	-0.729914	0.674725	0.109646	32546	-29322	-18846	59.97	47851	60.42	47689	0.99984	141.80	Water	MWD+HRGM+AX	115	4	4/24/18 22:25																
9160.00	86.48	184.14	10.88	8811.16	-567.64	-129.23	567.64	0.942369	-0.327472	0.061294	-40897	12766	-20934	59.97	47859	60.39	47684	0.99934	141.80	Water	MWD+HRGM+AX	116	4	4/24/18 23:05																
9191.00	87.16	183.41	3.22	8812.87	-598.53	-131.26	598.53	0.842735	-0.536020	0.049573	-36832	21447	-21484	59.98	47879	60.33	47729	0.99980	140.00	Water	MWD+HRGM+AX	117	4	4/25/18 0:28																
9223.00	89.34	181.85	8.38	8813.85	-630.48	-132.73	630.48	0.751893	-0.659096	0.011477	-32876	25733	-23059	59.95	47846	60.27	47693	0.99975	140.00	Water	MWD+HRGM+AX	118	4	4/25/18 1:16																
9254.00	90.18	181.22	3.39	8813.98	-661.47	-133.56	661.47	0.835409	-0.549206	-0.003175	-35989	20568	-23571	59.96	47876	60.36	47685	0.99958	140.00	Water	MWD+HRGM+AX	119	4	4/25/18 2:02																
9286.00	90.24	181.02	0.65	8813.86	-693.46	-134.19	693.46	-0.702564	0.711355	-0.004151	31007	-27601	-23498	60.01	47944	60.52	47701	0.99963	140.00	Water	MWD+HRGM+AX	120	4	4/25/18 2:42																
9317.00	90.18	180.26	2.46	8813.75	-724.46	-134.53	724.46	0.014896	0.999023	-0.003175	2363	-41520	-23352	60.03	47970	60.60	47695	0.99895	140.00	Water	MWD+HRGM+AX	121	4	4/25/18 3:21																
9378.00	88.81	179.23	2.81	8814.29	-785.45	-134.26	785.45	0.864500	0.501950	0.020750	-34546	-23999	-23608	59.97	47870	59.19	48236	0.99968	132.80	Water	MWD+HRGM+AX	122	5	4/25/18 22:39																
9472.00	88.52	180.66	1.55	8816.48	-879.42	-134.17	879.42	0.760500	-0.647700	0.025880	-33838	25122	-23437	59.97	47875	59.22	48223	0.99908	134.60	Water	MWD+HRGM+AX	123	5	4/26/18 0:44																
9566.00	88.43	180.52	0.18	8818.98	-973.39	-135.14	973.39	0.816410	0.575930	0.027340	-32739	-26611	-23340	59.97	47883	59.25	48216	0.99929	136.40	Water	MWD+HRGM+AX	124	5	4/26/18 2:30																
9660.00	88.35	180.94	0.45	8821.62	-1067.34	-136.34	1067.34	-0.132080	0.990230	0.028810	8252	-41431	-23291	59.99	47911	59.28	48240	0.99923	138.20	Water	MWD+HRGM+AX	125	5	4/26/18 4:07																
9754.00	89.48	179.98	1.58	8823.40	-1161.32	-137.09	1161.32	-0.796140	0.604000	0.009030	35083	-22729	-24048	59.98	47899	59.30	48226	0.99918	138.20	Water	MWD+HRGM+AX	126	5	4/26/18 6:01																
9848.00	90.34	180.50	1.07	8823.55	-1255.32	-137.49	1255.32	0.770020	0.637450	-0.005860	-29980	-28564	-24731	59.96	47878	59.25	48232	0.99946	140.00	Water	MWD+HRGM+AX	127	5	4/26/18 7:04																
9941.00	90.42	181.10	0.65	8822.93	-1348.30	-138.78	1348.30	-0.341800	0.939210	-0.007320	16602	-37915	-24829	59.98	47907	59.27	48266	0.99931	141.80	Water	MWD+HRGM+AX	128	5	4/26/18 8:10																
10034.00	90.10	181.55	0.59	8822.51	-1441.28	-140.93	1441.28	0.676270	-0.735600	-0.001710	-29810	28809	-24683	59.95	47857	59.16	48248	0.99904	143.60	Water	MWD+HRGM+AX	129	5	4/26/18 9:20																
10128.00	90.50	181.53	0.43	8822.02	-1535.24	-143.46	1535.24	-0.247560	0.968510	-0.008790	12598	-39380	-24878	59.99	47909	59.30	48254	0.99950	143.60	Water	MWD+HRGM+AX	130	5	4/26/18 10:19																
10222.00	90.88	182.03	0.67	8820.89	-1629.19	-146.38	1629.19	-0.132810	0.990480	-0.015380	7690	-40454	-25171	59.99	47913	59.30	48262	0.99927	143.60	Water	MWD+HRGM+AX	131	5	4/26/18 11:18																
10317.00	89.71	179.59	2.85	8820.40	-1724.17	-147.72	1724.17	-0.509280	0.860110	0.005130	23999	-34131	-24219	59.98	47900	59.27	48244	0.99940	145.40	Water	MWD+HRGM+AX	132	5	4/26/18 13:05																
10411.00	89.15	179.54	0.60	8821.33	-1818.16	-147.01	1818.16	-0.859130	-0.510500	0.014890	34253	24170	-23877	59.97	47873	59.18	48245	0.99928	141.80	Water	MWD+HRGM+AX	133	5	4/26/18 14:38																
10505.00	89.22	179.57	0.08	8822.67	-1912.15	-146.28	1912.15	-0.915770	0.400390	0.013670	39600	-13745	-23877	59.98	47894	59.25	48241	0.99938	141.80	Water	MWD+HRGM+AX	134	5	4/26/18 16:46																
10600.00	90.90	178.70	1.99	8822.57	-2007.13	-144.85	2007.13	-0.777590	0.627440	-0.015620	34253	-22974	-25049	59.97	47888	59.25	48255	0.99910	141.80	Water	MWD+HRGM+AX	135	5	4/26/18 18:28																
10694.00	90.70	178.90	0.30	8821.26	-2101.11	-142.88	2101.11	-0.844480	0.534910	-0.012210	32837	-24951	-25000	59.94	47845	59.19	48227	0.99952	140.00	Water	MWD+HRGM+AX	136	5	4/26/18 20:32																
10788.00	90.52	179.66	0.83	8820.26	-2195.09	-141.70	2195.09	0.846190	-0.531980	-0.009030	-36597	19190	-24853	59.94	47847	59.20	48221	0.99937	141.80	Water	MWD+HRGM+AX	137	5	4/26/18 21:53																
10882.00	90.80	179.34	0.45	8819.17	-2289.08	-140.88	2289.08	0.218260	-0.975100	-0.013920	-32556	39356	-25073	59.94	47851	59.17	48247	0.99914	141.80	Water	MWD+HRGM+AX	138	5	4/26/18 23:37																
10977.00	91.06	179.47	0.31	8817.63	-2384.06	-139.89	2384.06	0.818600	0.573490	-0.018550	-31689	-26245	-25195	59.97	47888	59.27	48247	0.99948	141.80	Water	MWD+HRGM+AX	139	5	4/27/18 0:52																
11071.00	90.98	179.60	0.16	8815.96	-2478.05	-139.13	2478.05	0.945070	0.325200	-0.017090	-37744	-16431	-25122	59.96	47878	59.28	48226	0.99941	143.60	Water	MWD+HRGM+AX	140	5	4/27/18 2:01																
11165.00	91.06	179.85	0.28	8814.29	-2572.03	-138.68	2572.03	-0.983890	0.176270	-0.018550	40918	-4126	-25244	59.97	47882	59.24	48255	0.99954	143.60	Water	MWD+HRGM+AX	141	5	4/27/18 3:08																
11260.00	89.72	181.31	2.09	8813.64	-2667.02	-139.64	2667.02	0.095460	0.994870	0.004880	-1440	-41650	-24341	59.99	47905	59.25	48263	0.99926	143.60	Water	MWD+HRGM+AX	142	5	4/27/18 5:14																
11354.00	89.66	181.79	0.51	8814.15	-2760.98	-142.18	2760.98	-0.305660	0.951660	0.005860	14966	-38916	-24292	59.99	47912	59.28	48255	0.99937	143.60	Water	MWD+HRGM+AX	143	5	4/27/18 6:25																
11449.00	89.66	181.80	0.01	8814.71	-2855.93	-145.16	2855.93	-0.034670	0.998780	0.005860	3784	-41479	-24292	59.97	47875	59.26	48218	0.99921	143.60	Water	MWD+HRGM+AX	144	5	4/27/18 11:14																
11542.00	89.68	181.62	0.19	8815.25	-2948.89	-147.93	2948.89	0.475830	-0.878910	0.005620	-21899	35376	-24365	59.94	47836	59.16	48215	0.99927	145.40	Water	MWD+HRGM+AX	145	5	4/27/18 12:36																
11637.00	90.22	179.73	2.07	8815.33	-3043.88	-149.05	3043.88	-0.778810	-0.960200	-0.003910	8447	40576	-24658	59.94	47849	59.19	48226	0.99968	143.60	Water	MWD+HRGM+AX	146	5	4/27/18 14:48																
11731.00	90.77	180.30	0.84	8814.52	-3137.88	-149.07	3137.88	-0.999270	-0.024660	-0.013430	41040	3979	-25049	59.96	47879	59.24	48245	0.99947	145.40	Water	MWD+HRGM+AX	147	5	4/27/18 16:07																
11826.00	92.17	179.77	1.58	8812.08	-3232.84	-149.13	3232.84	-0.079350	0.995610	-0.037840	-40161	-25977	-25977	59.97	47899	59.31	48256	0.99929	143.60	Water	MWD+HRGM+AX	148	5	4/27/18 18:06																
11919.00	91.9																																							

DIRECTIONAL SURVEY REPORT

gyrodata

Report Date: 7/24/2018	Job Start Date: 4/13/2018	Time Zone: GMT-06:00	North Reference: GridNorth
Operator: Chisholm Energy	Map System: US State Plane 1983	Reference Datum: RotaryTable	Vertical Section Az (deg): 180
Well Name: DARK CANYON 15-22 WCA 1H	Map Ellipsoid: GRS 1980	Survey Calc. Method: Minimum Curvature	Magnetic Model: HDGM
Rig: Litchfield 7	Map Datum: North American Datum 1983	Ground Elevation (ft): 3326.3	Calc. Date: 4/9/2018
Job Number: F00418CPM137	Map Zone: New Mexico Eastern Zone	Rick Above MSL (ft): 24	Field Strength (nT): 47993.7
State: New Mexico	Well Latitude: 32° 18' 40.57" N	Non Mag Above (ft): 45	Dip Angle (deg): 60.05
County: Eddy	Well Longitude: 106° 17' 15.10" W	Non Mag Below (ft): 15	Mag. Declination (deg): 7.43
Field: Eddy Co. RM	Well Northings:		Grid Convergence (deg): 0.02
Survey Correction Co.: Gyrodata Inc.	Well Eastings:		Total Correction (deg): 7.41

Depth (ft.)	Inclination (°)	Azimuth (°)	DLS (°/100)	TVD (ft.)	N/S (°/-)	E/W (°/-)	Vertical Section (ft.)	Accelerometer (g)			Magnetometer (nT)			Corrected Survey QC		Raw Survey QC			Temp (°F)	Mud Type	Survey Type	Survey #	Run #	Date & Time
								Ax	Ay	Az	Mx	My	Mz	Magnetic Dip Angle (°)	Mag Field (nT)	Magnetic Dip Angle (°)	Mag Field (nT)	Gravity Total (g)						
13426.00	92.07	177.38	0.63	8800.03	-4832.17	-141.40	4832.17	-0.801270	0.596440	-0.036130	35034	-20874	-25781	59.96	47879	59.27	48247	0.99935	147.20	Water	MWD+HRGM+AX	165	5	4/30/18 16:33
13520.00	92.04	177.37	0.03	8796.66	-4926.02	-137.10	4926.02	0.705810	0.707030	-0.035650	-25732	-31689	-25732	59.98	47902	59.32	48254	0.99947	147.20	Water	MWD+HRGM+AX	166	5	4/30/18 19:51
13613.00	92.23	178.56	1.29	8793.19	-5018.89	-133.80	5018.89	0.993410	0.104000	-0.038820	-39893	-7886	-25977	59.96	47880	59.26	48254	0.99940	149.00	Water	MWD+HRGM+AX	167	5	4/30/18 23:37
13707.00	90.74	180.08	2.26	8790.76	-5112.85	-132.69	5112.85	0.449950	-0.892330	-0.012940	-21240	35327	-25049	59.94	47852	59.19	48235	0.99925	149.00	Water	MWD+HRGM+AX	168	5	5/1/18 3:34
13801.00	91.04	180.37	0.44	8789.30	-5206.83	-133.06	5206.83	0.570800	0.820310	-0.018070	-21020	-35352	-25195	59.97	47889	59.30	48233	0.99933	150.80	Water	MWD+HRGM+AX	169	5	5/1/18 5:44
13895.00	91.19	180.32	0.17	8787.47	-5300.81	-133.62	5300.81	-0.381100	-0.923580	-0.020750	12866	38940	-25391	59.94	47843	59.18	48234	0.99914	152.60	Water	MWD+HRGM+AX	170	5	5/1/18 10:04
13989.00	91.64	180.76	0.67	8785.15	-5394.78	-134.51	5394.78	-0.416990	0.907720	-0.028560	19531	-35864	-25684	59.96	47872	59.25	48243	0.99914	154.40	Water	MWD+HRGM+AX	171	5	5/1/18 12:19
14083.00	89.43	181.53	2.49	8784.27	-5488.75	-136.39	5488.75	0.643070	0.765140	0.010010	-24927	-33472	-24121	59.95	47856	59.23	48203	0.99935	154.40	Water	MWD+HRGM+AX	172	5	5/1/18 15:39
14177.00	89.44	181.59	0.06	8785.19	-5582.71	-138.94	5582.71	0.666020	0.745360	0.009770	-25952	-32690	-24121	59.96	47867	59.25	48208	0.99943	156.20	Water	MWD+HRGM+AX	173	5	5/1/18 17:36
14272.00	89.52	181.40	0.22	8786.06	-5677.68	-141.42	5677.68	0.605470	0.795170	0.008300	-23242	-34668	-24170	59.98	47892	59.27	48231	0.99929	158.00	Water	MWD+HRGM+AX	174	5	5/1/18 19:31
14366.00	89.93	181.53	0.46	8786.51	-5771.64	-143.83	5771.64	-0.539310	-0.842040	0.001220	20288	36231	-24536	59.95	47855	59.18	48232	0.99975	159.80	Water	MWD+HRGM+AX	175	5	5/1/18 21:35
14460.00	90.29	181.87	0.53	8786.33	-5865.60	-146.61	5865.60	0.909670	0.413820	-0.005130	-36645	-19214	-24756	59.96	47866	59.25	48217	0.99920	161.60	Water	MWD+HRGM+AX	176	5	5/1/18 23:32
14554.00	87.68	181.68	2.78	8787.99	-5959.53	-149.53	5959.53	-0.826660	-0.561030	0.040530	33691	25757	-22925	59.95	47839	59.13	48209	0.99969	161.60	Water	MWD+HRGM+AX	177	5	5/2/18 3:35
14649.00	87.40	181.28	0.51	8792.07	-6054.41	-151.98	6054.41	-0.684570	-0.727050	0.045410	27246	32666	-22681	59.96	47850	59.15	48206	0.99946	161.60	Water	MWD+HRGM+AX	178	5	5/2/18 6:42
14743.00	87.12	180.52	0.86	8796.56	-6148.30	-153.45	6148.30	0.940430	0.334960	0.050290	-39136	-16992	-22412	59.96	47852	59.18	48194	0.99938	159.80	Water	MWD+HRGM+AX	179	5	5/2/18 9:01
14837.00	88.00	179.77	1.23	8800.57	-6242.21	-153.69	6242.21	-0.773680	0.632080	0.034910	34741	-24268	-22974	59.97	47879	59.26	48205	0.99947	161.60	Water	MWD+HRGM+AX	180	5	5/2/18 11:29
14931.00	88.47	179.85	0.51	8803.46	-6336.16	-153.38	6336.16	0.225340	0.973630	0.026610	-6421	-41724	-23291	59.99	47903	59.31	48214	0.99953	163.40	Water	MWD+HRGM+AX	181	5	5/2/18 13:34
15025.00	89.02	180.14	0.66	8805.52	-6430.14	-153.37	6430.14	-0.029050	0.999020	0.017090	4248	-41748	-23730	59.97	47880	59.28	48208	0.99940	163.40	Water	MWD+HRGM+AX	182	5	5/2/18 15:28
15120.00	87.79	181.29	1.77	8808.16	-6525.09	-154.55	6525.09	0.679690	-0.731440	0.038570	-30664	29248	-22949	59.95	47841	59.17	48191	0.99905	163.40	Water	MWD+HRGM+AX	183	5	5/2/18 17:56
15214.00	87.61	181.46	0.26	8811.94	-6618.99	-156.81	6618.99	0.780270	-0.622800	0.041750	-34692	24512	-22803	59.97	47872	59.21	48212	0.99903	163.40	Water	MWD+HRGM+AX	184	5	5/2/18 20:05
15308.00	88.11	181.48	0.53	8815.45	-6712.89	-159.22	6712.89	-0.755130	0.654050	0.032960	33521	-25757	-23144	59.96	47866	59.24	48195	0.99935	165.20	Water	MWD+HRGM+AX	185	5	5/2/18 22:14
15403.00	86.68	180.90	1.62	8819.76	-6807.77	-161.19	6807.77	-0.147460	0.987060	0.057860	9009	-41919	-22046	59.99	47903	59.27	48212	0.99950	165.20	Water	MWD+HRGM+AX	186	5	5/3/18 0:59
15496.00	86.93	181.09	0.34	8824.95	-6900.61	-162.80	6900.61	0.738530	0.671880	0.053470	-29785	-30664	-22266	59.98	47877	59.23	48200	0.99966	165.20	Water	MWD+HRGM+AX	187	5	5/3/18 2:52
15590.00	87.40	181.10	0.50	8829.60	-6994.48	-164.60	6994.48	0.542970	0.838380	0.045410	-20858	-37109	-22583	59.98	47892	59.27	48206	0.99969	167.00	Water	MWD+HRGM+AX	188	5	5/3/18 5:05
15684.00	87.07	180.93	0.39	8834.13	-7088.36	-166.26	7088.36	0.997560	0.033940	0.051030	-42480	-4150	-22363	59.97	47862	59.22	48186	0.99925	167.00	Water	MWD+HRGM+AX	189	5	5/3/18 8:29
15778.00	87.02	180.73	0.22	8838.98	-7182.22	-167.62	7182.22	0.990970	0.122310	0.052000	-41943	-7983	-22290	59.96	47851	59.24	48164	0.99965	167.00	Water	MWD+HRGM+AX	190	5	5/3/18 11:01
15873.00	87.31	181.07	0.47	8843.68	-7277.09	-169.11	7277.09	-0.875730	-0.479740	0.046880	35986	22730	-22607	59.95	47840	59.15	48195	0.99944	167.00	Water	MWD+HRGM+AX	191	5	5/3/18 14:27
15967.00	87.56	181.19	0.29	8847.88	-7370.98	-170.96	7370.98	-0.562500	0.824950	0.042480	26050	-33594	-22705	59.98	47881	59.27	48194	0.99919	167.00	Water	MWD+HRGM+AX	192	5	5/3/18 17:57
16047.00	87.70	181.40	0.32	8851.19	-7450.89	-172.77	7450.89	0.324460	0.944580	0.040040	-11401	-40918	-22827	59.99	47903	59.28	48222	0.99936	168.80	Water	MWD+HRGM+AX	193	5	5/3/18 20:34
16109.00	87.70	181.40	0.00	8853.68	-7512.82	-174.28	7512.82	Projection To Bit																