

Survey File: SAHARA1

Date: 3-11-98

Time: 18:27:35

SAHARA OPERATING COMPANY

STAR 24 #1

LEA CO., NEW MEXICO

NORTON DRILLING RIG #7

SURVEY FROM 0' - 4070'

B. CONKMAN

IMPERIAL WIRELINE TRUCK #1

Unit N 990/S & 1850/W
24 - 19s - 36e
30.025 - 34304

Survey Reference Point : 71.0

Local Grid Offset : 10.0

Drift Correction Method: Variable Rate from linear least square fit

Survey Computation Method: Minimum Curvature

Target Direction: 0.00

FINAL DATA (INRUN)

Measured Depth (feet)	Course Inclination	Course Direction	Vertical Depth (feet)	Rectangular Coordinates N/S E/W		Vertical Section (per100)	Dogleg Severity (per100)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.27	152.79	100.00	-0.21	0.11	-0.21	0.27
200.00	0.47	167.84	200.00	-0.82	0.30	-0.82	0.22
300.00	0.44	168.97	299.99	-1.60	0.46	-1.60	0.04
400.00	0.48	162.40	399.99	-2.37	0.66	-2.37	0.07
500.00	0.64	196.92	499.99	-3.30	0.62	-3.30	0.37
600.00	0.28	166.49	599.98	-4.07	0.52	-4.07	0.43
700.00	0.48	220.91	699.98	-4.62	0.30	-4.62	0.39
800.00	0.79	218.68	799.97	-5.47	-0.40	-5.47	0.32
900.00	1.07	228.81	899.96	-6.63	-1.54	-6.63	0.32
1000.00	0.85	239.80	999.95	-7.62	-2.88	-7.62	0.28
1100.00	0.54	253.47	1099.94	-8.12	-3.98	-8.12	0.35
1200.00	0.44	233.59	1199.93	-8.49	-4.74	-8.49	0.19
1300.00	0.42	264.49	1299.93	-8.75	-5.42	-8.75	0.23
1400.00	0.32	240.36	1399.93	-8.93	-6.03	-8.93	0.18
1500.00	0.35	267.84	1499.93	-9.08	-6.59	-9.08	0.16
1600.00	0.36	237.83	1599.93	-9.26	-7.16	-9.26	0.18
1700.00	0.30	277.31	1699.92	-9.39	-7.68	-9.39	0.23
1800.00	0.41	262.90	1799.92	-9.40	-8.30	-9.40	0.14
1900.00	0.63	219.83	1899.92	-9.87	-9.01	-9.87	0.43
2000.00	0.33	221.96	1999.91	-10.50	-9.55	-10.50	0.30
2100.00	0.45	228.34	2099.91	-10.97	-10.03	-10.97	0.13
2200.00	0.41	147.87	2199.91	-11.54	-10.13	-11.54	0.56
2300.00	0.70	137.68	2299.90	-12.30	-9.53	-12.30	0.30
2400.00	0.93	107.06	2399.89	-12.99	-8.35	-12.99	0.49
2500.00	1.10	96.28	2499.88	-13.33	-6.62	-13.33	0.25
2600.00	1.40	107.19	2599.85	-13.80	-4.49	-13.80	0.39
2700.00	1.50	101.62	2699.82	-14.42	-2.04	-14.42	0.17
2800.00	1.46	101.73	2799.79	-14.94	0.49	-14.94	0.04
2900.00	1.11	90.08	2899.76	-15.20	2.71	-15.20	0.43
3000.00	1.17	107.74	2999.74	-15.52	4.65	-15.52	0.36

Measured Depth (feet)	Course Inclination	Course Direction	Vertical Depth (feet)	Rectangular Coordinates		Vertical Section	Dogleg Severity (per100)
				N/S	E/W		
3100.00	0.89	100.74	3099.73	-15.97	6.39	-15.97	0.31
3200.00	0.98	97.54	3199.71	-16.23	8.00	-16.23	0.11
3300.00	0.92	97.62	3299.70	-16.45	9.64	-16.45	0.06
3400.00	0.75	94.13	3399.69	-16.60	11.09	-16.60	0.17
3500.00	0.62	102.88	3499.68	-16.77	12.27	-16.77	0.17
3600.00	0.79	93.79	3599.67	-16.94	13.48	-16.94	0.21
3700.00	0.52	69.10	3699.67	-16.82	14.59	-16.82	0.38
3800.00	0.70	80.79	3799.66	-16.56	15.62	-16.56	0.22
3900.00	0.58	40.62	3899.65	-16.08	16.55	-16.08	0.46
4000.00	0.55	39.40	3999.65	-15.32	17.19	-15.32	0.03
4070.00	0.75	24.14	4069.65	-14.64	17.59	-14.64	0.37

Final Closure - Direction: 129.77 degrees
 - Distance: 22.89 feet

DIG Drilling Systems

DIG Survey Report

Company: SHAWA OPERATIONS	Date: 03-23-98	Time: 09:48	Run: 1
Field: LEA COUNTY, NEW MEXICO	Calculation: 023	Section: 023	Run: LEA COUNTY, PROSPECT, True North
Map: LEA COUNTY, PROSPECT	Y-axis (LYD) Reference:	Site: 023 above Mean Sea Level	
Well: LEA COUNTY, PROSPECT	Section (VS) Reference:	Site: 023.0N 238.3Az	
Wellbore: DIG STEERING TOOL AD	Survey Calculation Method:	Minimum Curvature	

Annotation

5606.0	5588.1	PROJECTION TO TD
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Survey

Station	Delta	True	Delta	True	Delta	True	Delta	True	Delta	True
100'	100'	100'	100'	100'	100'	100'	100'	100'	100'	100'
4000.0	0.55	39.40	3999.6	-15.3	17.2	-5.8	0.00	23.0	131.71	
4070.0	0.30	257.70	4069.6	-15.1	17.2	-8.0	1.15	22.9	131.24	
4102.0	0.70	277.00	4101.6	-15.1	16.9	-5.7	1.34	22.7	131.69	
4133.0	1.90	237.30	4132.6	-15.3	16.3	-5.1	4.62	22.4	133.23	
4164.0	2.20	260.70	4163.6	-15.7	15.3	-4.0	2.84	21.9	135.76	
4196.0	2.10	259.30	4195.6	-15.9	14.1	-2.9	0.35	21.3	138.43	
4226.0	3.10	261.90	4225.6	-16.1	12.8	-1.7	3.36	20.6	141.63	
4257.0	3.50	255.10	4256.5	-16.5	11.0	0.0	1.80	19.9	146.23	
4289.0	4.10	246.70	4288.4	-17.2	9.0	2.0	2.55	19.4	152.28	
4320.0	5.20	252.90	4319.3	-18.1	6.7	4.5	3.90	19.3	159.70	
4383.0	5.80	251.30	4382.1	-19.9	0.9	10.3	0.98	19.9	177.30	
4446.0	6.30	257.70	4444.7	-21.7	-5.5	16.6	1.33	22.4	194.12	
4509.0	7.00	248.00	4507.3	-23.9	-12.4	23.5	2.10	26.9	207.45	
4541.0	7.60	253.00	4539.0	-25.2	-16.2	27.5	2.73	30.0	212.77	
4571.0	8.10	246.10	4568.7	-26.6	-20.1	31.5	3.55	33.3	216.97	
4602.0	8.80	246.30	4599.4	-28.5	-24.2	35.9	2.26	37.4	220.38	
4632.0	9.40	252.50	4629.0	-30.1	-28.7	40.6	3.83	41.6	223.56	
4663.0	9.70	247.00	4659.6	-31.9	-33.5	45.6	3.10	46.3	226.36	
4695.0	10.50	250.00	4691.1	-34.0	-38.7	51.0	2.99	51.5	228.72	
4727.0	11.00	243.00	4722.5	-36.4	-44.2	56.9	4.37	57.2	230.54	
4850.0	10.75	242.00	4843.3	-47.1	-64.7	80.0	0.25	80.0	233.98	
5016.0	11.00	240.00	5006.4	-62.3	-92.1	111.2	0.27	111.2	235.95	
5171.0	10.50	242.00	5158.6	-76.3	-117.4	140.0	0.40	140.0	236.99	
5318.0	10.75	244.00	5303.1	-88.6	-141.6	166.9	0.30	167.0	237.98	
5483.0	10.50	247.00	5485.3	-101.2	-169.2	196.9	0.37	197.2	239.12	
5588.0	10.75	242.00	5568.5	-109.5	-186.7	216.1	0.91	216.4	239.60	
5608.0	10.75	242.00	5588.1	-111.3	-190.0	219.8	0.00	220.2	239.64	