



Scientific Drilling Survey



Company: Apache Corporation Date: 4/13/2005 Time: 07:22:04 Page: 1
Field: NEDU Co-ordinate(NE) Reference: Well: NEDU #421, Grid North
Site: Lea County, NM Vertical (TVD) Reference: SITE 0.0
Well: NEDU #421 Section (VS) Reference: Well (0.00N,0.00E,180.78Azi)
Wellpath: 1 Survey Calculation Method: Minimum Curvature Db: Sybase

Field: NEDU

Map System: US State Plane Coordinate System 1927
Geo Datum: NAD27 (Clarke 1866)
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Eastern Zone
Coordinate System: Well Centre
Geomagnetic Model: Wmm_2000

Site: Lea County, NM

Site Position: Northing: 544965.00 ft Latitude: 32 29 33.349 N
From: Map Easting: 866763.00 ft Longitude: 103 8 37.823 W
Position Uncertainty: 0.00 ft North Reference: Grid
Ground Level: 0.00 ft Grid Convergence: 0.64 deg

Well: NEDU #421

Slot Name:

Well Position: +N-S 2578.60 ft Northing: 547543.60 ft Latitude: 32 29 58.835 N
+E-W 243.30 ft Easting: 867006.30 ft Longitude: 103 8 34.647 W
Position Uncertainty: 0.00 ft

Wellpath: 1

Current Datum: SITE Height 0.00 ft
Magnetic Data: 12/9/2004
Field Strength: 49649 nT
Vertical Section: Depth From (TVD) +N-S
ft ft
0.00 0.00 0.00 180.78

Survey Program for Definitive Wellpath

Date: 4/13/2005 Validated: No
Actual From To Survey

Version: 2
Toolcode

Tool Name

100.00 2298.00 Gyro (100.00-2298.00)
2382.00 7050.00 MWD (2382.00-7050.00)

Keeper
MWD

Keeper Standard Rod Gyro
MWD - Standard ISCWSA

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsA deg	ClsD ft	Tool
0.00	0.00	359.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
100.00	0.13	219.56	100.00	-0.09	-0.07	0.09	0.13	0.13	0.00	219.56	0.11	Keeper
200.00	0.23	39.81	200.00	-0.02	-0.02	0.02	0.36	0.10	-179.75	217.64	0.03	Keeper
300.00	0.10	126.62	300.00	0.08	0.18	-0.08	0.25	-0.13	86.81	65.97	0.20	Keeper
400.00	0.27	128.48	400.00	-0.12	0.44	0.11	0.17	0.17	1.86	105.02	0.45	Keeper
500.00	0.61	154.66	500.00	-0.74	0.85	0.73	0.39	0.34	26.18	131.26	1.13	Keeper
600.00	0.85	161.35	599.99	-1.93	1.31	1.91	0.25	0.24	6.69	145.73	2.33	Keeper
700.00	0.77	175.52	699.98	-3.30	1.60	3.28	0.22	-0.08	14.17	154.09	3.67	Keeper
800.00	1.10	190.33	799.96	-4.92	1.48	4.90	0.41	0.33	14.81	163.20	5.13	Keeper
900.00	1.29	196.03	899.94	-6.94	1.00	6.93	0.22	0.19	5.70	171.79	7.01	Keeper
1000.00	1.20	207.64	999.92	-8.95	0.20	8.95	0.27	-0.09	11.61	178.69	8.95	Keeper
1100.00	0.92	209.81	1099.90	-10.58	-0.68	10.58	0.28	-0.28	2.17	183.68	10.60	Keeper
1200.00	1.10	215.77	1199.89	-12.05	-1.64	12.07	0.21	0.18	5.96	187.75	12.16	Keeper
1300.00	1.17	229.52	1299.87	-13.49	-2.98	13.53	0.28	0.07	13.75	192.45	13.82	Keeper
1400.00	0.71	220.41	1399.85	-14.63	-4.16	14.68	0.48	-0.46	-9.11	195.86	15.21	Keeper
1500.00	0.50	163.50	1499.85	-15.52	-4.43	15.58	0.61	-0.21	-56.91	195.95	16.14	Keeper
1600.00	0.21	180.20	1599.85	-16.12	-4.31	16.18	0.30	-0.29	16.70	194.97	16.69	Keeper
1700.00	0.10	220.29	1699.85	-16.37	-4.37	16.43	0.15	-0.11	40.09	194.94	16.94	Keeper
1800.00	0.19	80.09	1799.85	-16.41	-4.26	16.46	0.27	0.09	-140.20	194.56	16.95	Keeper
1900.00	0.31	53.34	1899.85	-16.22	-3.88	16.27	0.16	0.12	-26.75	193.46	16.67	Keeper
2000.00	0.50	20.41	1999.84	-15.65	-3.51	15.69	0.29	0.19	-32.93	192.65	16.04	Keeper
2100.00	0.68	82.92	2099.84	-15.16	-2.77	15.20	0.63	0.18	62.51	190.35	15.42	Keeper

SUR: A-10-21s-37e, 330/N & 330/E
BHL: A-10-21s-37e, 1289/N & 345/E
API # 30-025-37034



Scientific Drilling Survey

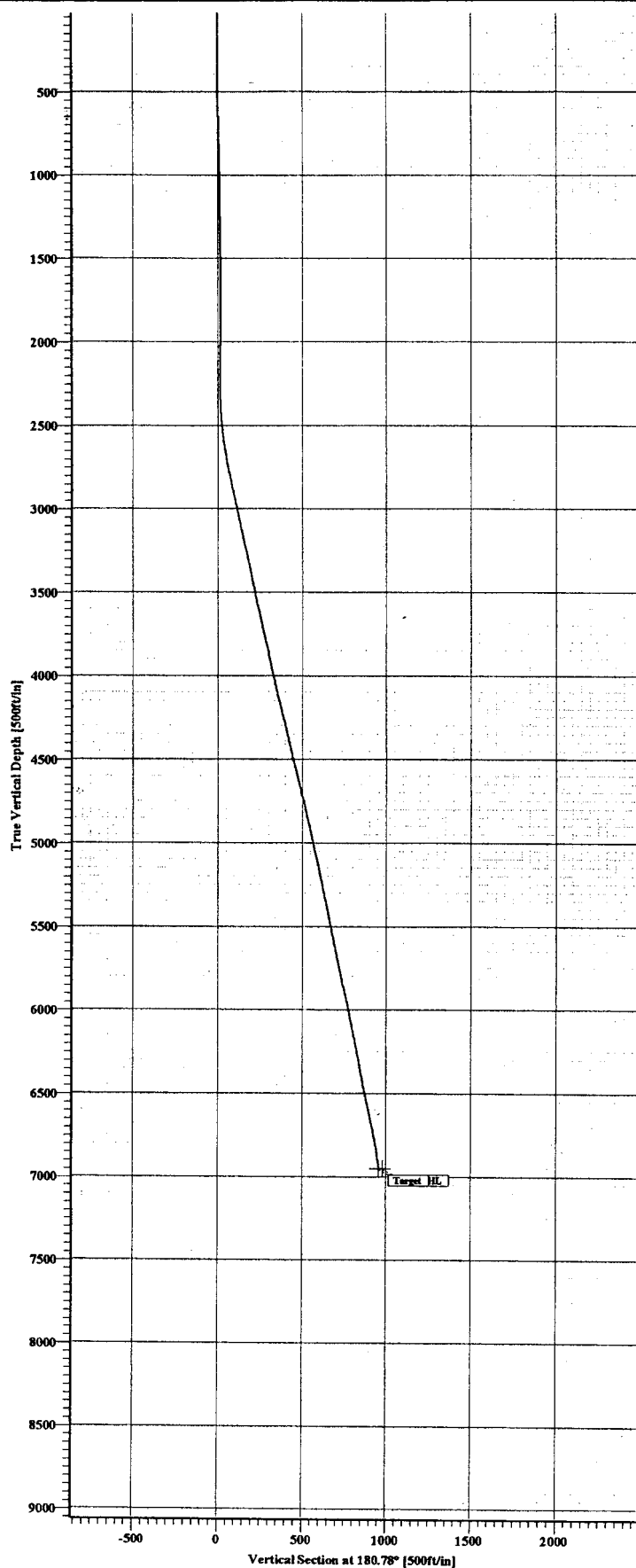


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Field: NEDU
Site: Lea County, NM
Well: NEDU #421
Wellpath: 1

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Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsA deg	ClsD ft	Tool
2200.00	1.07	77.67	2199.83	-14.89	-1.27	14.91	0.40	0.39	-5.25	184.87	14.95	Keeper
2298.00	0.78	104.51	2297.81	-14.86	0.27	14.86	0.52	-0.30	27.39	178.96	14.87	Keeper
2382.00	2.29	171.24	2381.79	-16.67	1.08	16.65	2.51	1.80	79.44	176.29	16.70	MWD
2476.00	4.57	179.40	2475.61	-22.27	1.41	22.25	2.47	2.43	8.68	176.39	22.31	MWD
2569.00	7.12	187.20	2568.12	-31.69	0.72	31.68	2.87	2.74	8.39	178.70	31.70	MWD
2665.00	9.15	185.25	2663.15	-45.20	-0.72	45.20	2.13	2.11	-2.03	180.92	45.20	MWD
2759.00	11.52	185.46	2755.62	-61.99	-2.30	62.01	2.52	2.52	0.22	182.13	62.03	MWD
2855.00	12.57	183.97	2849.51	-81.95	-3.94	82.00	1.14	1.09	-1.55	182.75	82.04	MWD
2949.00	12.22	181.86	2941.31	-102.10	-4.97	102.16	0.61	-0.37	-2.24	182.79	102.22	MWD
3042.00	11.52	180.72	3032.33	-121.22	-5.40	121.28	0.79	-0.75	-1.23	182.55	121.34	MWD
3136.00	11.96	188.01	3124.36	-140.25	-6.88	140.33	1.64	0.47	7.76	182.81	140.42	MWD
3228.00	12.75	183.44	3214.23	-159.83	-8.82	159.93	1.37	0.86	-4.97	183.16	160.07	MWD
3321.00	11.70	183.00	3305.12	-179.49	-9.92	179.61	1.13	-1.13	-0.47	183.16	179.76	MWD
3417.00	12.57	180.80	3398.98	-199.65	-10.58	199.78	1.03	0.91	-2.29	183.03	199.93	MWD
3541.00	10.64	177.55	3520.44	-224.59	-10.28	224.70	1.64	-1.56	-2.62	182.62	224.82	MWD
3634.00	12.66	184.50	3611.52	-243.33	-10.71	243.45	2.64	2.17	7.47	182.52	243.56	MWD
3726.00	12.31	186.34	3701.35	-263.12	-12.59	263.27	0.58	-0.38	2.00	182.74	263.42	MWD
3817.00	13.01	182.89	3790.14	-283.00	-14.17	283.16	1.13	0.77	-3.79	182.87	283.35	MWD
3910.00	12.56	182.39	3880.83	-303.55	-15.12	303.73	0.50	-0.48	-0.54	182.85	303.93	MWD
4004.00	12.13	182.30	3972.66	-323.63	-15.95	323.82	0.46	-0.46	-0.10	182.82	324.03	MWD
4097.00	11.87	179.66	4063.63	-342.96	-16.28	343.15	0.65	-0.28	-2.84	182.72	343.35	MWD
4191.00	13.89	181.07	4155.26	-363.91	-16.43	364.10	2.17	2.15	1.50	182.59	364.28	MWD
4283.00	14.07	180.98	4244.53	-386.13	-16.83	386.33	0.20	0.20	-0.10	182.50	386.50	MWD
4378.00	13.54	180.54	4336.79	-408.80	-17.13	409.00	0.57	-0.56	-0.46	182.40	409.16	MWD
4471.00	13.19	180.63	4427.27	-430.30	-17.35	430.49	0.38	-0.38	0.10	182.31	430.65	MWD
4566.00	13.19	181.16	4519.76	-451.97	-17.69	452.17	0.13	0.00	0.56	182.24	452.32	MWD
4660.00	13.28	180.72	4611.26	-473.49	-18.04	473.69	0.14	0.10	-0.47	182.18	473.83	MWD
4753.00	13.63	178.43	4701.71	-495.12	-17.88	495.32	0.69	0.38	-2.46	182.07	495.45	MWD
4847.00	13.54	178.70	4793.08	-517.20	-17.33	517.38	0.12	-0.10	0.29	181.92	517.49	MWD
4942.00	13.28	178.43	4885.49	-539.22	-16.77	539.40	0.28	-0.27	-0.28	181.78	539.48	MWD
5065.00	12.05	182.74	5005.50	-566.17	-17.00	566.35	1.26	-1.00	3.50	181.72	566.42	MWD
5159.00	11.87	183.27	5097.46	-585.62	-18.02	585.81	0.22	-0.19	0.56	181.76	585.90	MWD
5253.00	11.78	182.21	5189.46	-604.86	-18.94	605.06	0.25	-0.10	-1.13	181.79	605.16	MWD
5347.00	11.61	180.54	5281.51	-623.91	-19.40	624.11	0.40	-0.18	-1.78	181.78	624.21	MWD
5410.00	11.78	178.52	5343.21	-636.68	-19.30	636.88	0.70	0.27	-3.21	181.74	636.97	MWD
5504.00	11.70	178.43	5435.24	-655.79	-18.79	655.99	0.09	-0.09	-0.10	181.64	656.06	MWD
5597.00	10.73	179.57	5526.46	-673.88	-18.46	674.07	1.07	-1.04	1.23	181.57	674.13	MWD
5690.00	10.99	180.37	5617.80	-691.40	-18.46	691.59	0.32	0.28	0.86	181.53	691.65	MWD
5785.00	12.66	180.54	5710.78	-710.87	-18.61	711.05	1.76	1.76	0.18	181.50	711.11	MWD
5881.00	12.49	181.33	5804.47	-731.76	-18.95	731.95	0.25	-0.18	0.82	181.48	732.01	MWD
5973.00	12.05	180.28	5894.37	-751.31	-19.23	751.51	0.54	-0.48	-1.14	181.47	751.56	MWD
6067.00	11.96	180.37	5986.32	-770.86	-19.34	771.06	0.10	-0.10	0.10	181.44	771.11	MWD
6160.00	11.52	181.16	6077.37	-789.79	-19.59	789.98	0.50	-0.47	0.85	181.42	790.03	MWD
6255.00	10.99	181.51	6170.54	-808.32	-20.02	808.52	0.56	-0.56	0.37	181.42	808.57	MWD
6349.00	10.38	179.75	6262.91	-825.75	-20.22	825.95	0.74	-0.65	-1.87	181.40	825.99	MWD
6444.00	11.08	176.06	6356.25	-843.41	-19.56	843.60	1.03	0.74	-3.88	181.33	843.64	MWD
6536.00	12.22	176.50	6446.36	-861.95	-18.35	862.12	1.24	1.24	0.48	181.22	862.15	MWD
6631.00	11.96	178.87	6539.25	-881.83	-17.55	881.99	0.59	-0.27	2.49	181.14	882.00	MWD
6725.00	11.43	178.34	6631.30	-900.88	-17.08	901.03	0.58	-0.56	-0.56	181.09	901.04	MWD
6819.00	10.99	178.17	6723.51	-919.14	-16.53	919.28	0.47	-0.47	-0.18	181.03	919.29	MWD
6913.00	10.20	176.76	6815.90	-936.41	-15.77	936.54	0.88	-0.84	-1.50	180.96	936.54	MWD
7010.00	9.15	178.96	6911.52	-952.69	-15.15	952.81	1.15	-1.08	2.27	180.91	952.81	MWD
7050.00	9.15	179.31	6951.01	-959.05	-15.05	959.17	0.14	0.00	0.87	180.90	959.17	MWD



South(-)/North(+) [100ft/in]

