

NEVIS ENERGY SERVICES



Survey Report

1724-B Townhurst Dr, Houston, Tx 77043
(713) 827-8302
www.nevisenergy.com

OPERATOR: Black Hills E & P
WELL: Jica ²⁸28-02-04 #31
LOCATION: Rio Arriba Co., NM

30-039-29310

START: 05/06/05
FINISH: 05/21/05

PROPOSED DIRECTION: 95.78

MIN. CURVATURE CALCULATIONS

SUR NUM	MD ft	INCL. °	AZM. °	TVD ft	N-S ft	E-W ft	SECT. ft	DLS %/100 ft	Gamma Ct.
94	6812.0	93.40	98.6	3625.6	-330.3	3380.0	3396.1	1.61	
95	6844.0	93.60	98.2	3623.6	-335.0	3411.6	3428.0	1.40	
96	6875.0	93.80	98.6	3621.6	-339.5	3442.2	3458.9	1.44	
bit	6978.0	93.80	98.6	3614.8	-354.9	3543.8	3561.6	0.00	

1945 FS

780 FW

-355

+3544'

1590 FS

4324' FWL

5273' (section)

949' FEL

2633' SW WIDTH
2640' SE WIDTH
5273' SECTION WIDTH

Surface 1945/S 780/W
BHL-origin 1912/S 1028/W MD 3645
TVD 3863
BHL-end 1680/S 949/E MD 6978
TVD 3644

Rec 7-13-06

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63	5241.0	92.20	93.3	3672.7	-171.3	1819.1	1827.1	0.97	
64	5273.0	91.10	92.9	3671.8	-173.0	1851.1	1859.1	3.66	
65	5336.0	91.10	92.2	3670.6	-175.8	1914.0	1922.0	1.11	
66	5399.0	91.30	92.2	3669.3	-178.2	1976.9	1984.8	0.32	
67	5462.0	91.80	95.0	3667.6	-182.2	2039.8	2047.8	4.51	
68	5588.0	92.40	95.0	3663.0	-193.2	2165.2	2173.7	0.48	
69	5651.0	92.60	94.0	3660.2	-198.1	2228.0	2236.6	1.62	
70	5683.0	92.90	93.6	3658.7	-200.2	2259.9	2268.5	1.56	
71	5714.0	91.70	95.4	3657.4	-202.7	2290.7	2299.5	6.97	
72	5804.0	93.80	95.7	3653.1	-211.3	2380.2	2389.4	2.36	
73	5867.0	92.00	94.0	3649.9	-216.7	2442.9	2452.3	3.93	
74	5930.0	92.40	93.6	3647.5	-220.8	2505.7	2515.2	0.90	
75	5961.0	90.10	94.7	3646.8	-223.1	2536.6	2546.2	8.22	
76	5993.0	89.90	94.7	3646.8	-225.7	2568.5	2578.2	0.63	
77	6024.0	89.60	94.3	3647.0	-228.1	2599.4	2609.2	1.61	
78	6055.0	89.40	94.3	3647.2	-230.5	2630.3	2640.2	0.65	
79	6087.0	89.60	95.7	3647.5	-233.2	2662.2	2672.2	4.42	
80	6118.0	89.70	95.7	3647.7	-236.3	2693.0	2703.2	0.32	
81	6150.0	89.90	96.4	3647.8	-239.7	2724.9	2735.2	2.28	
82	6182.0	89.90	96.4	3647.9	-243.3	2756.7	2767.2	0.00	
83	6213.0	90.10	96.8	3647.9	-246.8	2787.5	2798.1	1.44	
84	6276.0	89.90	97.8	3647.9	-254.8	2850.0	2861.1	1.62	
85	6339.0	89.90	97.8	3648.0	-263.4	2912.4	2924.1	0.00	
86	6402.0	92.00	97.8	3646.9	-271.9	2974.8	2987.0	3.33	
87	6465.0	92.40	97.8	3644.5	-280.5	3037.1	3050.0	0.63	
88	6528.0	92.70	97.8	3641.7	-289.0	3099.5	3112.8	0.48	
89	6591.0	93.30	98.2	3638.4	-297.8	3161.8	3175.7	1.14	
90	6654.0	93.40	98.6	3634.7	-307.0	3224.0	3238.5	0.65	
91	6717.0	93.40	98.6	3631.0	-316.4	3286.2	3301.4	0.03	
92	6749.0	93.30	98.6	3629.1	-321.2	3317.8	3333.3	0.32	
93	6781.0	93.10	98.2	3627.3	-325.8	3349.4	3365.2	1.40	

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SUR NUM	MD ft	INCL. °	AZM. °	TVD ft	N-S ft	E-W ft	SECT. ft	DLS %/100 ft	Gamma Ct.
32	4012.0	85.30	95.4	3657.8	-69.2	595.9	599.9	2.64	
33	4044.0	85.30	95.4	3660.4	-72.2	627.7	631.8	0.00	
34	4075.0	85.20	96.1	3663.0	-75.3	658.4	662.6	2.27	
35	4106.0	84.30	96.4	3665.8	-78.7	689.1	693.5	3.06	
36	4138.0	84.10	96.4	3669.1	-82.2	720.7	725.3	0.63	
37	4169.0	84.10	96.4	3672.3	-85.7	751.4	756.2	0.03	
38	4201.0	83.90	96.1	3675.6	-89.1	783.0	788.0	1.15	
39	4232.0	84.30	96.4	3678.8	-92.5	813.7	818.8	1.61	
40	4263.0	85.90	96.1	3681.4	-95.9	844.4	849.7	5.25	
41	4295.0	88.00	95.7	3683.1	-99.2	876.1	881.7	6.68	
42	4326.0	89.60	95.4	3683.8	-102.2	907.0	912.7	5.25	
43	4358.0	89.70	95.4	3684.0	-105.2	938.9	944.7	0.31	
44	4390.0	90.10	95.7	3684.1	-108.3	970.7	976.7	1.56	
45	4421.0	90.10	95.7	3684.0	-111.3	1001.5	1007.7	0.00	
46	4516.0	90.10	94.7	3683.8	-119.9	1096.2	1102.7	1.05	
47	4610.0	90.10	94.5	3683.7	-127.5	1189.9	1196.6	0.21	
48	4704.0	90.00	93.3	3683.6	-133.9	1283.6	1290.6	1.28	
49	4799.0	90.40	95.0	3683.3	-140.8	1378.4	1385.5	1.84	
50	4831.0	90.60	94.3	3683.0	-143.3	1410.3	1417.5	2.27	
51	4862.0	90.40	94.0	3682.7	-145.6	1441.2	1448.5	1.16	
52	4894.0	91.70	95.0	3682.1	-148.1	1473.1	1480.5	5.13	
53	4926.0	91.70	95.0	3681.2	-150.9	1504.9	1512.5	0.00	
54	4957.0	91.50	94.7	3680.3	-153.5	1535.8	1543.5	1.16	
55	4989.0	91.00	94.0	3679.6	-155.9	1567.7	1575.5	2.69	
56	5020.0	90.30	93.3	3679.3	-157.9	1598.7	1606.4	3.19	
57	5052.0	90.40	92.9	3679.1	-159.6	1630.6	1638.4	1.29	
58	5083.0	90.80	93.3	3678.7	-161.3	1661.6	1669.4	1.82	
59	5115.0	92.60	94.0	3677.8	-163.4	1693.5	1701.3	6.03	
60	5147.0	92.60	93.6	3676.3	-165.5	1725.4	1733.3	1.25	
61	5178.0	92.00	93.6	3675.1	-167.4	1756.3	1764.2	1.94	
62	5210.0	92.20	93.6	3673.9	-169.4	1788.2	1796.2	0.63	

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Tie in	3000.0	0.00	0.0	3000.0	0.0	0.0	0.0	0.00	
1	3059.0	0.90	14.5	3059.0	0.4	0.1	0.1	1.53	
2	3090.0	1.80	53.9	3090.0	1.0	0.6	0.5	4.01	
3	3121.0	3.70	77.8	3121.0	1.5	1.9	1.8	7.03	
4	3153.0	7.60	88.4	3152.8	1.7	5.1	4.9	12.57	
5	3184.0	11.60	91.9	3183.4	1.7	10.2	10.0	13.03	
6	3215.0	16.20	95.4	3213.4	1.2	17.7	17.4	15.08	
7	3247.0	20.20	98.6	3243.8	-0.1	27.6	27.4	12.88	
8	3277.0	22.40	99.6	3271.8	-1.8	38.3	38.3	7.43	
9	3308.0	22.70	99.6	3300.4	-3.8	50.0	50.2	0.97	
10	3338.0	22.70	99.3	3328.1	-5.7	61.5	61.7	0.39	
11	3370.0	23.80	100.7	3357.5	-7.9	73.9	74.3	3.85	
12	3401.0	27.10	102.1	3385.5	-10.5	87.0	87.6	10.82	
13	3431.0	31.00	102.1	3411.7	-13.6	101.2	102.1	13.00	
14	3463.0	35.20	100.3	3438.5	-16.9	118.3	119.4	13.48	
15	3494.0	39.80	98.6	3463.1	-20.0	137.0	138.3	15.21	
16	3524.0	44.20	96.1	3485.4	-22.6	156.9	158.3	15.69	
17	3554.0	46.50	95.4	3506.5	-24.7	178.1	179.7	7.84	
18	3583.0	48.60	95.7	3526.0	-26.8	199.4	201.1	7.28	
19	3613.0	52.60	96.4	3545.1	-29.2	222.4	224.2	13.45	
20	3645.0	57.00	97.0	3563.5	-32.3	248.4	250.4	13.83	
21	3677.0	60.70	97.8	3580.1	-35.8	275.5	277.8	11.76	
22	3708.0	64.60	98.2	3594.3	-39.6	302.8	305.3	12.63	
23	3740.0	66.50	98.6	3607.5	-43.9	331.6	334.4	6.05	
24	3772.0	69.00	97.8	3619.7	-48.1	360.9	364.0	8.15	
25	3804.0	72.80	96.8	3630.1	-52.0	390.9	394.2	12.24	
26	3833.0	77.20	96.1	3637.6	-55.1	418.8	422.2	15.35	
27	3864.0	81.80	94.7	3643.3	-58.0	449.1	452.6	15.49	
28	3896.0	83.60	94.3	3647.3	-60.5	480.7	484.4	5.76	
29	3927.0	84.50	94.0	3650.6	-62.7	511.5	515.2	3.06	
30	3959.0	85.20	94.0	3653.4	-64.9	543.3	547.1	2.19	