

NEVIS ENERGY SERVICES



Survey Report

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

API# 30-039-27799

OPERATOR: Black Hills E & S

WELL: Jica 451-09 #11

LOCATION: Rio Arriba Co., N

JIC 451-9 #11 MP
SURF: 735 FN 705 FW
377 5279
4288
1112 FN 286 FE

TART: 08/23/05

NISH: 08/31/05

MIN. CURVATURE CALCULATION:

BH:

CTION: 95.93

SUR NUM	MD ft	INCL. °	AZM. °	TVD ft	N-S ft	E-W ft	SECT. ft	DLS %/100 ft	Gamma Ct.
31	5255.0	90.00	96.0	3716.3	-158.5	1485.5	1493.9	0.16	
32	5318.0	90.60	95.3	3716.0	-164.7	1548.2	1556.9	1.46	
33	5381.0	90.20	94.2	3715.6	-169.9	1610.9	1619.9	1.86	
34	5443.0	88.90	96.3	3716.0	-175.6	1672.7	1681.9	3.98	
35	5505.0	90.00	97.3	3716.6	-182.9	1734.2	1743.9	2.40	
36	5568.0	92.20	96.3	3715.4	-190.4	1796.8	1806.8	3.84	
37	5630.0	92.50	95.7	3712.9	-196.8	1858.4	1868.8	1.08	
38	5693.0	92.10	95.8	3710.4	-203.1	1921.0	1931.7	0.65	
39	5755.0	91.60	97.0	3708.4	-210.1	1982.6	1993.7	2.10	
40	5818.0	91.40	97.5	3706.7	-218.0	2045.1	2056.6	0.85	
41	5881.0	91.10	98.9	3705.3	-227.0	2107.4	2119.6	2.27	
42	5943.0	90.90	98.5	3704.3	-236.4	2168.7	2181.5	0.72	
43	6006.0	90.90	97.8	3703.3	-245.3	2231.0	2244.4	1.11	
45	6069.0	91.20	96.1	3702.1	-252.9	2293.6	2307.4	2.74	
46	6132.0	90.00	96.8	3701.5	-260.0	2356.2	2370.4	2.21	
47	6195.0	89.80	96.5	3701.6	-267.3	2418.7	2433.4	0.57	
48	6259.0	89.70	96.5	3701.8	-274.5	2482.3	2497.4	0.16	
49	6321.0	89.20	97.8	3702.4	-282.3	2543.8	2559.4	2.25	
50	6384.0	89.20	98.5	3703.3	-291.2	2606.2	2622.3	1.11	
51	6447.0	88.90	98.1	3704.4	-300.3	2668.5	2685.3	0.79	
52	6510.0	88.20	97.2	3706.0	-308.7	2730.9	2748.2	1.81	
53	6574.0	87.80	97.2	3708.2	-316.7	2794.4	2812.2	0.63	
54	6637.0	87.80	96.6	3710.6	-324.2	2856.9	2875.1	0.95	
55	6699.0	87.40	95.3	3713.2	-330.7	2918.5	2937.1	2.19	
56	6736.0	86.90	94.9	3715.0	-333.9	2955.3	2974.0	1.73	
57	6800.0	88.70	95.6	3717.5	-339.8	3019.0	3038.0	3.02	
58	6862.0	89.10	95.0	3718.7	-345.5	3080.7	3099.9	1.16	
59	6924.0	89.70	95.4	3719.3	-351.1	3142.5	3161.9	1.16	
60	6986.0	90.80	95.1	3719.1	-356.8	3204.2	3223.9	1.84	
61	7049.0	91.00	94.0	3718.1	-361.8	3267.0	3286.9	1.77	
62	7112.0	90.60	94.3	3717.2	-366.4	3329.8	3349.9	0.79	
63	7175.0	90.80	94.5	3716.4	-371.2	3392.6	3412.8	0.45	
64	7238.0	89.60	93.6	3716.2	-375.7	3455.5	3475.8	2.38	



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START: 08/23/05

FINISH: 08/31/05

PROPOSED DIRECTION: 95.93

MIN. CURVATURE CALCULATIONS

SUR NUM	MD ft	INCL. °	AZM. °	TVD ft	N-S ft	E-W ft	SECT. ft	DLS %/100 ft	Gamma Ct.
Tie in	3658.0	0.67	329.6	3656.4	-72.4	-32.2	-24.6	0.00	
1	3705.0	18.90	104.8	3702.5	-74.1	-24.9	-17.1	41.24	
2	3720.0	27.60	103.0	3716.3	-75.5	-19.2	-11.3	58.19	
3	3737.0	37.50	91.8	3730.6	-76.6	-10.1	-2.2	67.96	
4	3752.0	46.40	85.2	3741.8	-76.2	-0.1	7.8	66.16	
5	3768.0	57.10	81.2	3751.7	-74.7	12.3	20.0	69.67	
6	3788.0	70.10	81.5	3760.5	-72.0	30.0	37.3	65.01	
7	3799.0	77.30	81.6	3763.6	-70.5	40.4	47.5	65.46	
8	3828.0	94.10	83.3	3765.8	-66.7	69.0	75.5	58.22	
9	3859.0	97.10	89.6	3762.8	-64.8	99.8	105.9	22.42	
10	3891.0	100.00	94.2	3758.0	-65.8	131.4	137.5	16.86	
11	3922.0	104.20	98.5	3751.5	-69.2	161.5	167.8	19.17	
12	3985.0	101.50	98.9	3737.5	-78.5	222.2	229.1	4.33	
13	4048.0	95.00	99.6	3728.5	-88.5	283.7	291.3	10.38	
14	4111.0	88.70	99.2	3726.4	-98.8	345.8	354.2	10.02	
15	4174.0	85.00	96.2	3729.9	-107.2	408.1	417.0	7.56	
16	4236.0	86.60	95.0	3734.4	-113.2	469.7	478.8	3.22	
17	4278.0	86.30	93.1	3737.0	-116.2	511.5	520.7	4.57	
18	4363.0	88.00	92.3	3741.3	-120.2	596.3	605.5	2.21	
19	4426.0	90.20	90.2	3742.3	-121.6	659.2	668.3	4.83	
20	4502.0	89.10	88.9	3742.7	-121.0	735.2	743.8	2.24	
21	4564.0	92.20	87.5	3742.0	-119.0	797.2	805.2	5.49	
22	4626.0	94.40	88.3	3738.4	-116.7	859.0	866.5	3.77	
23	4689.0	95.00	90.9	3733.3	-116.3	921.8	928.9	4.22	
24	4752.0	94.40	91.4	3728.1	-117.6	984.6	991.5	1.24	
25	4814.0	93.20	93.0	3724.0	-119.9	1046.4	1053.2	3.22	
26	4877.0	92.70	92.3	3720.8	-122.9	1109.3	1116.0	1.36	
27	4940.0	92.00	95.5	3718.2	-127.1	1172.1	1178.9	5.20	
28	5002.0	90.30	95.4	3716.9	-133.0	1233.8	1240.9	2.75	
29	5065.0	90.10	95.4	3716.7	-139.0	1296.5	1303.9	0.32	
30	5129.0	90.20	96.0	3716.6	-145.3	1360.2	1367.9	0.95	

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65	7301.0	89.20	92.5	3716.9	-379.0	3518.4	3538.7	1.86	
66	7363.0	88.50	92.5	3718.1	-381.7	3580.3	3600.6	1.13	
67	7426.0	89.20	91.2	3719.4	-383.7	3643.3	3663.4	2.34	
68	7489.0	89.60	91.8	3720.0	-385.4	3706.2	3726.2	1.14	
69	7552.0	90.00	90.3	3720.3	-386.5	3769.2	3789.0	2.46	
70	7615.0	89.00	89.3	3720.8	-386.3	3832.2	3851.6	2.24	
71	7678.0	88.70	88.1	3722.1	-384.9	3895.2	3914.1	1.96	
72	7741.0	88.10	89.5	3723.8	-383.6	3958.1	3976.6	2.42	
73	7805.0	88.60	90.3	3725.7	-383.5	4022.1	4040.2	1.47	
74	7868.0	88.70	89.3	3727.2	-383.2	4085.1	4102.8	1.59	
75	7931.0	89.00	88.5	3728.4	-382.0	4148.1	4165.3	1.36	
76	8021.0	89.00	88.0	3730.0	-379.3	4238.0	4254.5	0.56	
tdpj.	8071.0	89.00	87.5	3730.9	-377.3	4288.0	4304.0	1.00	