

dk
14902 Henry Rd. • Houston, TX 77060
Telex 792699 • Fax 713-820-9341
Tel. 713-820-5908

Geoservices, Inc.

6-24N-1E

December 2, 1991

Mr. Don Snyder
Drilling Engineer
American Hunter
435 4th Ave. SW
Calgary, Alberta
Canada T2P 3A8

RECEIVED
MAR 5 1992
OIL CON. DIV.
DIST. 3

Dear Mr. Snyder:

Please find enclosed one copies of our final report for your JICARILLA #6A-1. Also included is a notarized copy of the surveys taken. If you have any questions or comments regarding this report, or require any additional copies, please feel free to contact me.

Again we thank you for allowing us to demonstrate Electromagnetic MWD to you.

Sincerely,
GEOSERVICES, INC.



Jeffry Wilson
Operations Manger

JW/c
w:\dir\mwd\ah12021

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Tel. 713-820-5908

Geoservices, Inc.

TO: MR. DON SNYDMILLER / DRILLING ENGINEER

FM: JEFF WILSON

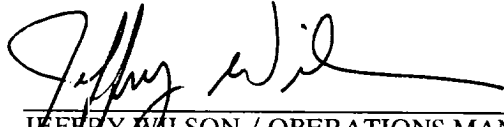
DATE: DECEMBER 2, 1991

RE: NOTARIZED COPY OF DIRECTIONAL SURVEYS

JICARILLA #6A-1 6-27N-1E

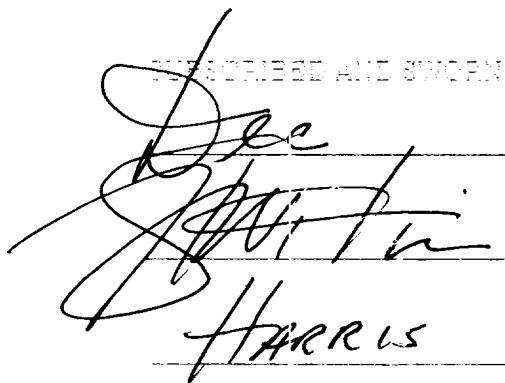
THE FOLLOWING SURVEYS WERE TAKEN WITH GEOSERVICES, INC. MWD
AND VERIFIED TO BE TRUE AND CORRECT TO THE BEST OF OUR
KNOWLEDGE:

SURVEY NUMBER 11 AT 1,724 FEET MEASURED DEPTH THROUGH SURVEY
NUMBER 115 AT 4,979 FEET MEASURED DEPTH.


JEFFREY WILSON / OPERATIONS MANAGER

SUBSCRIBED AND SWORN TO BEFORE ME THIS 02 DAY OF

Dec 19 91


NOTARY PUBLIC

HARRIS
COUNTY TEXAS

Geoservices-Directional

Deviation report

Well : JICARILLA #6A-1
 Field : WILDCAT
 Company : AMERICAN HUNTER

Coordinates

Well head : Target : Impact :
 X = 0.0 X = 0.0 X = 0.0
 Y = 0.0 Y = 0.0 Y = 0.0
 Z = 0.0 Z = 0.0 Z = 0.0

Horizontal displacement 0.00 ft
 Total vertical depth 0.00 ft Kick off point 1721.00 ft
 Magnetic declination 12.25 deg Convergence 0.00 deg
 Horizontal projection computed in azimuth North 270.00 deg. (SW 90.00)

Surv no	Measured depth feet	Drift angle degree	Azimuth magnt. degree	Azimuth geogr. degree	Vertical depth feet	Horizntl prjction feet	Horizntl displcat feet	Average Az(geo) degree	.Relative East/West feet	Coordinates. Nor/South feet	Dog leg /100f
Computation method : Radius of curvature											
1	546.0	2.50	106.00	118.25	545.8	-10.5	11.9	118.25	10.5 E	5.6 S	0.5
2	680.0	3.25	70.00	82.25	679.7	-17.1	18.3	111.84	17.0 E	6.8 S	1.4
3	805.0	3.25	65.00	77.25	804.5	-24.1	24.6	103.04	24.0 E	5.6 S	0.2
4	994.0	3.25	220.00	232.25	993.2	-28.6	30.0	114.71	27.3 E	12.5 S	3.4
5	1122.0	3.00	63.00	75.25	1121.0	-31.7	34.0	120.01	29.5 E	17.0 S	4.8
6	1315.0	3.50	59.00	71.25	1313.7	-42.2	42.3	109.15	39.9 E	13.9 S	0.3
7	1492.0	4.00	59.00	71.25	1490.3	-53.2	51.9	101.27	50.9 E	10.1 S	0.3
8	1617.0	4.50	53.75	66.00	1614.9	-61.8	59.9	96.49	59.5 E	6.8 S	0.5
9	1680.0	4.25	54.00	66.25	1677.7	-66.2	64.1	94.32	63.9 E	4.8 S	0.4
10	1693.0	4.12	55.50	67.75	1690.7	-67.1	65.0	93.94	64.8 E	4.5 S	1.3
11	1724.0	3.25	31.50	43.75	1721.6	-68.7	66.5	92.88	66.4 E	3.3 S	5.6
12	1755.0	4.37	339.00	351.25	1752.6	-69.3	67.1	91.24	67.0 E	1.4 S	11.3
13	1786.0	7.37	320.50	332.75	1783.4	-68.4	66.1	88.65	66.1 E	1.6 N	11.3
14	1818.0	10.62	319.00	331.25	1815.0	-66.0	64.0	84.65	63.7 E	6.0 N	10.2
15	1849.0	13.75	319.50	331.75	1845.3	-62.9	61.7	79.05	60.6 E	11.7 N	10.1
16	1881.0	16.87	319.50	331.75	1876.2	-58.9	59.7	71.29	56.6 E	19.2 N	9.7
17	1912.0	19.12	315.00	327.25	1905.7	-54.0	58.5	62.08	51.7 E	27.4 N	8.5
18	1944.0	20.50	307.50	319.75	1935.8	-47.6	57.9	51.42	45.3 E	36.1 N	9.0
19	1975.0	22.50	301.00	313.25	1964.6	-39.8	58.1	40.19	37.5 E	44.4 N	10.0
20	2007.0	25.50	298.50	310.75	1993.8	-30.1	59.9	27.65	27.8 E	53.1 N	9.9
21	2038.0	28.62	299.00	311.25	2021.4	-19.4	64.6	15.39	17.2 E	62.3 N	10.1
22	2070.0	31.37	296.00	308.25	2049.1	-7.1	72.7	3.83	4.9 E	72.5 N	9.8
23	2101.0	33.62	291.00	303.25	2075.3	6.4	82.7	354.00	8.7 W	82.3 N	11.3
24	2132.0	35.00	285.50	297.75	2100.9	21.4	94.2	345.42	23.7 W	91.1 N	10.9
25	2163.0	36.25	280.00	292.25	2126.1	37.8	106.6	337.92	40.1 W	98.8 N	11.1
26	2195.0	37.00	274.00	286.25	2151.8	55.8	120.0	331.07	58.1 W	105.1 N	11.4
27	2226.0	38.25	269.00	281.25	2176.3	74.2	133.6	325.09	76.5 W	109.6 N	10.6
28	2256.0	40.62	266.50	278.75	2199.5	93.0	147.7	319.85	95.2 W	112.9 N	9.5
29	2287.0	43.62	265.00	277.25	2222.5	113.5	163.7	314.99	115.8 W	115.8 N	10.2
30	2318.0	46.62	263.50	275.75	2244.4	135.4	181.4	310.67	137.6 W	118.2 N	10.3
31	2349.0	48.87	260.50	272.75	2265.2	158.3	200.4	306.77	160.5 W	119.9 N	10.2
32	2380.0	51.25	258.00	270.25	2285.1	182.0	220.2	303.20	184.3 W	120.6 N	9.8
33	2446.0	55.50	255.50	267.75	2324.5	235.0	265.7	296.77	237.2 W	119.6 N	7.1
34	2475.0	55.75	254.00	266.25	2340.8	258.9	286.7	294.39	261.1 W	118.4 N	4.3
35	2507.0	56.75	254.00	266.25	2358.6	285.4	310.4	292.07	287.7 W	116.6 N	3.1

Geoservices-Directional

Deviation report

Well :
Field :
Company :

JICARILLA #6A-1
WILDCAT
AMERICAN HUNTER

Surv no	Measured depth feet	Drift angle degree	Azinut magnt. degree	Azinut geogr. degree	Vertical depth feet	Horizntl prjction feet	Horizntl displcat feet	Average Az(geo) degree	Relative East/West feet	Coordinates. Nor/South feet	Dog leg /100f
Computation method : Radius of curvature											
36	2537.0	58.50	254.50	266.75	2374.7	310.7	333.4	290.19	312.9 W	115.1 N	6.0
37	2570.0	60.12	255.00	267.25	2391.5	339.0	359.7	288.41	341.3 W	113.6 N	5.1
38	2602.0	61.87	255.00	267.25	2407.0	367.0	385.9	286.91	369.2 W	112.3 N	5.5
39	2632.0	63.62	255.00	267.25	2420.8	393.6	411.1	285.66	395.9 W	111.0 N	5.8
40	2662.0	66.25	255.00	267.25	2433.5	420.8	437.0	284.54	423.0 W	109.7 N	8.7
41	2693.0	68.62	254.00	266.25	2445.4	449.3	464.3	283.46	451.6 W	108.1 N	8.2
42	2723.0	71.50	254.00	266.25	2455.6	477.5	491.3	282.48	479.7 W	106.2 N	9.6
43	2754.0	74.87	254.00	266.25	2464.6	507.1	519.9	281.57	509.3 W	104.3 N	10.8
44	2784.0	78.12	254.50	266.75	2471.6	536.2	548.1	280.78	538.4 W	102.5 N	10.9
45	2814.0	81.75	255.00	267.25	2476.8	565.7	576.8	280.08	567.9 W	101.0 N	12.2
46	2870.0	86.87	255.50	267.75	2482.4	621.4	631.3	278.98	623.6 W	98.5 N	9.2
47	2901.0	86.87	255.50	267.75	2484.1	652.3	661.7	278.46	654.5 W	97.3 N	0.0
48	2932.0	87.12	255.50	267.75	2485.7	683.2	692.2	277.98	685.5 W	96.1 N	0.8
49	2962.0	87.12	255.50	267.75	2487.2	713.2	721.7	277.56	715.4 W	94.9 N	0.0
50	2992.0	87.25	255.00	267.25	2488.7	743.1	751.2	277.16	745.3 W	93.6 N	1.7
51	3022.0	86.87	254.50	266.75	2490.2	773.0	780.7	276.77	775.2 W	92.0 N	2.1
52	3053.0	86.37	254.50	266.75	2492.0	803.9	811.2	276.39	806.1 W	90.3 N	1.6
53	3083.0	84.87	254.00	266.25	2494.3	833.8	840.7	276.04	836.0 W	88.5 N	5.3
54	3113.0	84.00	253.00	265.25	2497.2	863.5	870.1	275.69	865.8 W	86.2 N	4.4
55	3143.0	82.75	252.50	264.75	2500.7	893.2	899.4	275.34	895.5 W	83.7 N	4.5
56	3174.0	82.62	252.50	264.75	2504.6	923.8	929.6	274.99	926.1 W	80.8 N	0.4
57	3204.0	81.75	252.50	264.75	2508.7	953.4	958.9	274.67	955.7 W	78.1 N	2.9
58	3234.0	79.00	251.50	263.75	2513.7	982.9	988.0	274.36	985.1 W	75.2 N	9.7
59	3265.0	77.25	251.50	263.75	2520.1	1013.0	1017.8	274.05	1015.3 W	71.9 N	5.6
60	3295.0	77.00	251.50	263.75	2526.8	1042.1	1046.6	273.76	1044.3 W	68.7 N	0.8
61	3326.0	76.37	251.50	263.75	2533.9	1072.1	1076.3	273.48	1074.3 W	65.4 N	2.0
62	3355.0	75.87	251.50	263.75	2540.9	1100.1	1104.1	273.24	1102.3 W	62.3 N	1.7
63	3385.0	75.25	251.50	263.75	2548.4	1128.9	1132.7	272.99	1131.2 W	59.2 N	2.0
64	3416.0	75.12	252.00	264.25	2556.3	1158.7	1162.3	272.76	1161.0 W	56.0 N	1.6
65	3446.0	75.25	253.00	265.25	2564.0	1187.6	1191.1	272.57	1189.9 W	53.4 N	3.2
66	3477.0	75.62	253.50	265.75	2571.8	1217.5	1220.8	272.39	1219.8 W	51.0 N	1.9
67	3508.0	76.25	254.00	266.25	2579.3	1247.5	1250.7	272.24	1249.8 W	48.9 N	2.5
68	3540.0	76.62	253.50	265.75	2586.8	1278.6	1281.7	272.09	1280.8 W	46.7 N	1.9
69	3571.0	79.37	254.00	266.25	2593.3	1308.8	1311.8	271.95	1311.1 W	44.6 N	9.0
70	3601.0	82.75	254.50	266.75	2597.9	1338.4	1341.3	271.83	1340.6 W	42.8 N	11.4
71	3632.0	83.12	254.50	266.75	2601.7	1369.1	1372.0	271.72	1371.3 W	41.1 N	1.2
72	3663.0	83.63	254.50	266.75	2605.3	1399.8	1402.6	271.61	1402.1 W	39.3 N	1.6
73	3693.0	85.12	254.00	266.25	2608.3	1429.6	1432.4	271.50	1431.9 W	37.5 N	5.2
74	3723.0	86.75	254.50	266.75	2610.4	1459.5	1462.2	271.40	1461.8 W	35.7 N	5.7
75	3754.0	87.62	254.50	266.75	2611.9	1490.4	1493.1	271.30	1492.7 W	33.9 N	2.8
76	3783.0	87.25	254.50	266.75	2613.2	1519.4	1521.9	271.22	1521.6 W	32.3 N	1.2
77	3813.0	86.37	254.50	266.75	2614.9	1549.3	1551.8	271.13	1551.5 W	30.6 N	2.9
78	3845.0	86.62	254.50	266.75	2616.8	1581.1	1583.6	271.04	1583.4 W	28.8 N	0.7

Geoservices-Directional

Deviation report

Well : JICARILLA #6A-1
 Field : WILDCAT
 Company : AMERICAN HUNTER

Surv no	Measured depth feet	Drift angle degree	Azinut magnt. degree	Azinut geogr. degree	Vertical depth feet	Horizntl prjction feet	Horizntl dispicat feet	Average Az(geo) degree	.Relative East/West feet	Coordinates. Nor/South feet	Dog leg /100f
Computation method : Radius of curvature											
79	3876.0	88.12	254.50	266.75	2618.2	1612.1	1614.5	270.96	1614.3 W	27.0 N	4.8
80	3906.0	89.12	255.00	267.25	2619.0	1642.0	1644.4	270.89	1644.3 W	25.5 N	3.7
81	3936.0	88.25	255.00	267.25	2619.7	1672.0	1674.4	270.82	1674.2 W	24.0 N	2.9
82	3965.0	86.87	255.00	267.25	2620.9	1700.9	1703.3	270.76	1703.1 W	22.6 N	4.7
83	3996.0	87.25	255.00	267.25	2622.5	1731.8	1734.2	270.70	1734.1 W	21.1 N	1.2
84	4027.0	87.75	255.00	267.25	2623.8	1762.8	1765.1	270.64	1765.0 W	19.7 N	1.6
85	4058.0	86.37	254.50	266.75	2625.4	1793.7	1796.0	270.58	1795.9 W	18.0 N	4.7
86	4089.0	85.25	255.00	267.25	2627.7	1824.6	1826.9	270.51	1826.8 W	16.4 N	3.9
87	4120.0	84.37	254.50	266.75	2630.5	1855.4	1857.7	270.46	1857.6 W	14.8 N	3.3
88	4150.0	83.75	254.50	266.75	2633.6	1885.2	1887.5	270.40	1887.4 W	13.1 N	2.0
89	4181.0	82.25	254.50	266.75	2637.4	1915.9	1918.2	270.34	1918.1 W	11.4 N	4.8
90	4211.0	82.00	255.00	267.25	2641.5	1945.6	1947.8	270.29	1947.8 W	9.8 N	1.8
91	4241.0	81.75	254.50	266.75	2645.7	1975.2	1977.5	270.24	1977.5 W	8.3 N	1.8
92	4273.0	80.62	254.00	266.25	2650.6	2006.8	2009.0	270.18	2009.0 W	6.3 N	3.8
93	4304.0	79.50	253.50	265.75	2656.0	2037.3	2039.5	270.12	2039.5 W	4.2 N	3.9
94	4334.0	79.00	253.50	265.75	2661.6	2066.6	2068.9	270.06	2068.9 W	2.0 N	1.7
95	4364.0	78.87	253.50	265.75	2667.3	2096.0	2098.2	270.00	2098.2 W	0.2 S	0.4
96	4395.0	79.37	253.50	265.75	2673.2	2126.4	2128.6	269.93	2128.6 W	2.4 S	1.6
97	4425.0	79.75	254.00	266.25	2678.6	2155.8	2158.0	269.88	2158.0 W	4.5 S	2.1
98	4456.0	79.50	254.00	266.25	2684.2	2186.2	2188.5	269.83	2188.5 W	6.5 S	0.8
99	4487.0	80.25	254.00	266.25	2689.7	2216.7	2218.9	269.78	2218.9 W	8.5 S	2.4
100	4517.0	81.12	254.50	266.75	2694.5	2246.2	2248.5	269.74	2248.5 W	10.3 S	3.3
101	4549.0	82.25	254.50	266.75	2699.1	2277.8	2280.1	269.70	2280.1 W	12.1 S	3.5
102	4579.0	83.37	254.50	266.75	2702.9	2307.6	2309.8	269.66	2309.8 W	13.8 S	3.7
103	4610.0	84.00	254.50	266.75	2706.3	2338.3	2340.6	269.62	2340.6 W	15.5 S	2.0
104	4640.0	84.75	255.00	267.25	2709.2	2368.1	2370.4	269.59	2370.4 W	17.1 S	3.0
105	4671.0	84.62	254.50	266.75	2712.1	2399.0	2401.3	269.55	2401.2 W	18.7 S	1.6
106	4701.0	85.00	255.00	267.25	2714.8	2428.8	2431.1	269.52	2431.0 W	20.3 S	2.1
107	4731.0	85.50	255.00	267.25	2717.3	2458.7	2461.0	269.50	2460.9 W	21.7 S	1.7
108	4762.0	85.25	255.50	267.75	2719.8	2489.5	2491.9	269.47	2491.8 W	23.0 S	1.8
109	4794.0	85.12	255.50	267.75	2722.5	2521.4	2523.7	269.45	2523.6 W	24.3 S	0.4
110	4825.0	86.00	256.00	268.25	2724.9	2552.3	2554.6	269.43	2554.5 W	25.4 S	3.3
111	4856.0	87.25	256.50	268.75	2726.7	2583.2	2585.6	269.42	2585.4 W	26.2 S	4.3
112	4887.0	88.50	256.50	268.75	2727.9	2614.2	2616.6	269.41	2616.4 W	26.9 S	4.0
113	4918.0	89.50	256.50	268.75	2728.4	2645.2	2647.5	269.40	2647.4 W	27.5 S	3.2
114	4949.0	90.62	257.00	269.25	2728.4	2676.2	2678.5	269.40	2678.4 W	28.1 S	3.9
115	4979.0	91.00	257.00	269.25	2728.0	2706.2	2708.5	269.40	2708.4 W	28.5 S	1.3