

Schlumberger

6090 Greenwood Plaza Blvd
Englewood, CO 80111
(303) 486-3250

O-19-29N-
8W



30 045 30937
SRF 895/S 1660/E
BHL 2301/S 1785/E

SUB-SURFACE SURVEY CERTIFICATION REPORT

BP
Company

5/13/2002
Date

Lease

Hughes B 2B
Well Name

San Juan County, NM
County/State

Survey Depths

0 to 3617 ft

Type of Survey

Measurements While Drilling (MWD)

Survey Depths

3617 to 6064 ft

Type of Survey

Projection to TD

Survey Depths

to ft

Type of Survey

Site Supervisor

Greg Johnson

The data submitted in this report conforms to the standards and procedures as set forth by Schlumberger. This report represents a true and correct directional wellbore survey based on original survey data obtained at the well site.

A. Allen Starkey
A. Allen Starkey
Account Manager

This document has been subscribed and affirmed, or sworn before me in the county of Arapahoe in the state of Colorado, this 26th day of May, 2002.

Christine J. Wilson My commission expires: 12/12/05

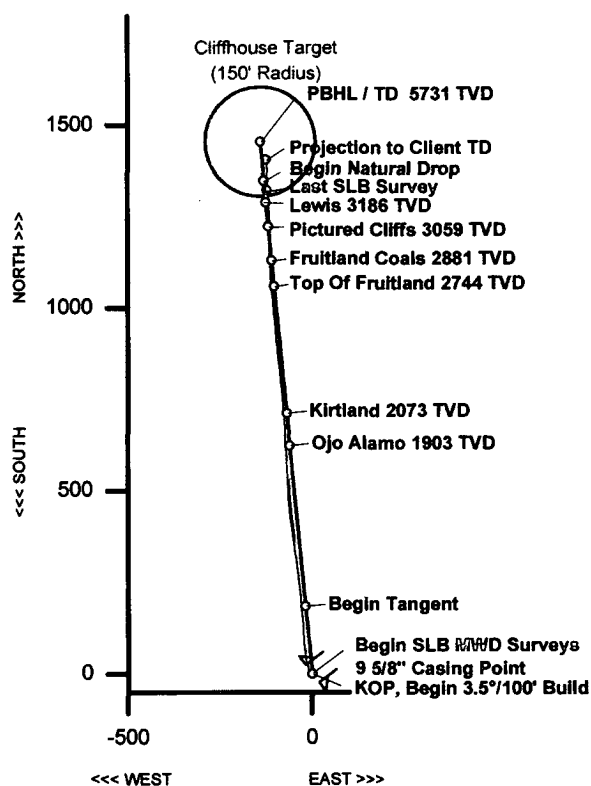
WELL Hughes B 2B (Rev6 jok 02-Apr-02)	FIELD San Juan County, New Mexico	RIG Aztec 184
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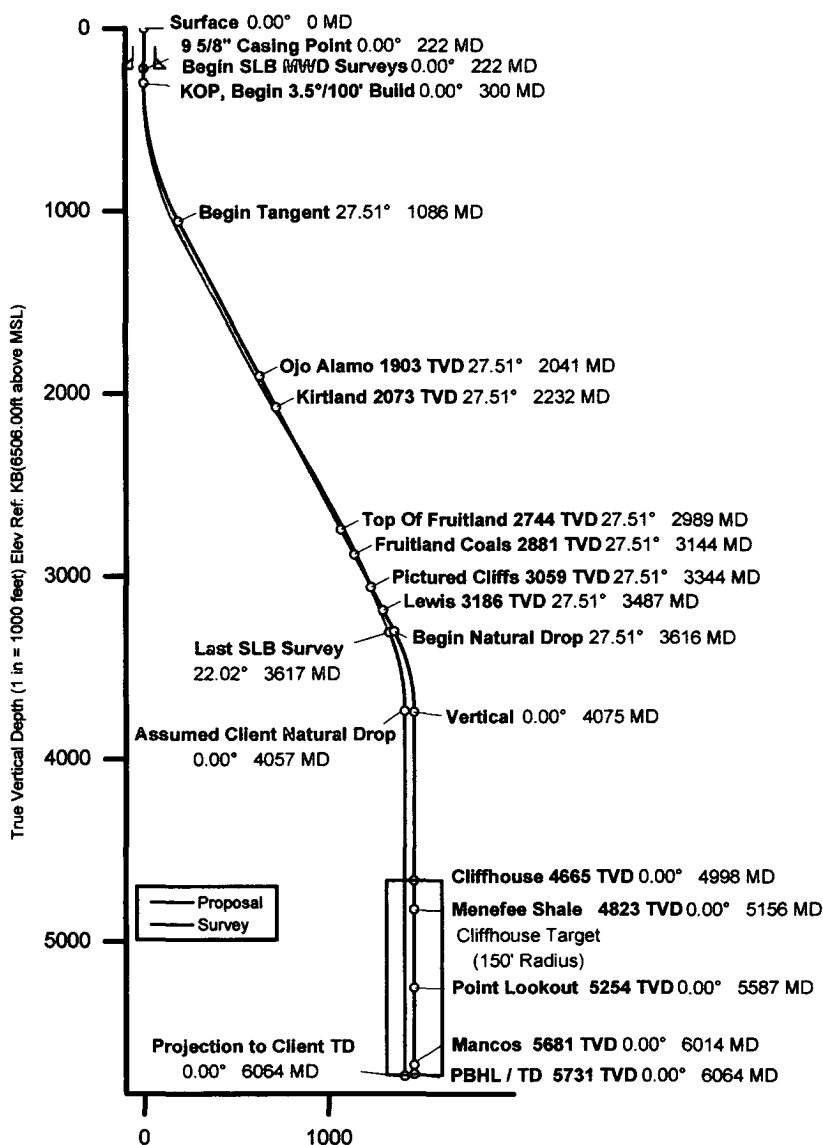
True North
Tot Corr (E 11.27°)
Mag Dec (E 11.27°)

No Certified Plat

PLAN VIEW Scale (1 in = 500 feet)



Vertical Section View



Vertical Section Departure at 354.50 deg from (0.0, 0.0). (1 in = 1000 feet)

Quality Control
Date Drawn: 13-May-2002
Drawn by: John O'Keefe
Checked by: Allen Starkey
Client OK: _____

Survey Report - Standard

Report Date: 13-May-2002	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: BP	Vertical Section Azimuth: 354.500°
Field: NM, San Juan County	Vertical Section Origin: N 0.000 ft, E 0.000 ft
Structure / Slot: BP 19 T29N R8W (Hughes B 2B) / Hughes B 2B	TVD Reference Datum: KB
Well: Hughes B 2B	TVD Reference Elevation: 6506.000 ft relative to MSL
Borehole: Original Hole	Sea Bed / Ground Level Elevation: 6492.000 ft relative to MSL
UWI / API#:	Magnetic Declination:
Survey Name / Date: Hughes B2B Final Surveys / May 5, 2002	Total Field Strength:
Tort / AHD / DDI / ERD ratio: 75.164° / 2412.81 ft / 5.282 / 0.420	Magnetic Dip:
Grid Coordinate System: NAD83 New Mexico State Planes, Western Zone, US Feet	Declination Date:
Location Lat / Long:	Magnetic Declination Model:
Location Grid N/E Y/X:	North Reference: True North
Grid Convergence Angle:	Total Corr Mag North -> True North:
Grid Scale Factor:	Local Coordinates Referenced To: Well Head

Station ID	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	VSec (ft)	N-S (ft)	E-W (ft)	Closure (ft)	at Azim (°)	DLS (°/100ft)	TF (°)
Tie-In	0.00	0.00	354.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-5.5 M
Begin SLB MWD Surveys	222.00	0.00	354.50	222.00	0.00	0.00	0.00	0.00	0.00	0.00	-127.3 M
	265.00	0.59	232.74	265.00	-0.12	-0.13	-0.18	0.22	232.74	1.37	-94.7 M
	296.00	0.72	265.29	296.00	-0.20	-0.25	-0.50	0.56	243.62	1.25	-62.6 M
	327.00	1.00	297.40	326.99	-0.05	-0.14	-0.93	0.94	261.56	1.76	-49.7 M
	358.00	1.57	310.32	357.99	0.40	0.26	-1.50	1.52	279.90	2.05	-38.6 M
	390.00	2.37	321.42	389.97	1.27	1.06	-2.24	2.48	295.34	2.76	-33.6 M
	422.00	3.24	326.41	421.93	2.62	2.33	-3.16	3.92	306.47	2.82	-28.7 M
	454.00	4.25	331.25	453.86	4.51	4.13	-4.23	5.91	314.31	3.30	-24.7 M
	486.00	5.25	335.31	485.75	6.98	6.50	-5.41	8.45	320.22	3.29	22.5 G
	517.00	6.16	338.78	516.60	9.92	9.33	-6.60	11.43	324.73	3.14	17.4 G

548.00	7.09	341.12	547.39	13.39	12.70	-7.82	14.91	328.36	3.12	8.6 G
580.00	8.19	342.28	579.10	17.54	16.74	-9.16	19.08	331.32	3.47	7.3 G
612.00	9.51	343.30	610.72	22.36	21.44	-10.61	23.92	333.67	4.15	25.1 G
644.00	10.64	346.14	642.23	27.87	26.84	-12.08	29.43	335.77	3.86	12.9 G
675.00	11.39	347.01	672.66	33.74	32.60	-13.45	35.27	337.58	2.48	26.6 G
706.00	12.61	349.78	702.98	40.15	38.91	-14.74	41.61	339.25	4.35	25.9 G
737.00	13.47	351.56	733.18	47.13	45.82	-15.87	48.49	340.89	3.06	7.0 G
769.00	14.49	352.06	764.23	54.85	53.47	-16.97	56.10	342.39	3.21	12.8 G
800.00	15.40	352.84	794.18	62.84	61.39	-18.02	63.98	343.64	3.01	42.9 G
832.00	16.13	355.24	824.98	71.53	70.04	-18.92	72.55	344.89	3.06	17.5 G
864.00	17.12	356.30	855.64	80.68	79.17	-19.59	81.56	346.10	3.24	3.7 G
895.00	18.12	356.51	885.19	90.06	88.53	-20.18	90.80	347.16	3.23	7.5 G
926.00	19.27	356.97	914.55	99.99	98.45	-20.74	100.61	348.10	3.74	-8.6 G
958.00	20.72	356.35	944.62	110.92	109.38	-21.38	111.45	348.94	4.58	-4.3 G
990.00	22.08	356.08	974.41	122.59	121.03	-22.15	123.04	349.63	4.26	0.0 G
1022.00	23.17	356.09	1003.95	134.90	133.31	-22.99	135.28	350.21	3.41	6.3 G
1053.00	24.29	356.39	1032.33	147.37	145.76	-23.81	147.69	350.72	3.63	-23.1 G
1083.00	25.40	355.29	1059.55	159.97	158.33	-24.73	160.25	351.12	4.01	-8.1 G
1113.00	26.40	354.97	1086.54	173.07	171.38	-25.84	173.32	351.43	3.37	-17.6 G
1145.00	26.93	354.60	1115.14	187.43	185.68	-27.15	187.66	351.68	1.74	-2.2 G
1208.00	27.92	354.52	1171.05	216.45	214.57	-29.90	216.64	352.07	1.57	-36.2 G
1303.00	28.45	353.71	1254.79	261.32	259.20	-34.50	261.49	352.42	0.69	-133.1 G
1398.00	27.84	352.30	1338.56	306.11	303.68	-39.95	306.30	352.51	0.95	7.3 G
1492.00	28.36	352.44	1421.48	350.35	347.56	-45.83	350.57	352.49	0.56	-119.4 G
1587.00	28.16	351.68	1505.15	395.29	392.11	-52.04	395.55	352.44	0.43	90.0 G
1651.00	28.16	352.95	1561.58	425.47	422.04	-56.08	425.75	352.43	0.94	134.1 G
1715.00	27.51	354.42	1618.17	455.35	451.74	-59.37	455.63	352.51	1.48	91.2 G
1810.00	27.52	357.91	1702.43	499.20	495.51	-62.31	499.41	352.83	1.70	-71.5 G
1905.00	27.70	356.78	1786.62	543.18	539.49	-64.35	543.32	353.20	0.58	3.5 G
1999.00	28.01	356.82	1869.73	587.06	583.34	-66.80	587.16	353.47	0.33	-5.2 G
2094.00	28.75	356.68	1953.31	632.18	628.43	-69.36	632.24	353.70	0.78	-17.2 G
2189.00	29.98	355.92	2036.10	678.74	674.91	-72.37	678.78	353.88	1.35	-33.8 G

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2284.00	30.45	355.30	2118.19	726.54	722.58	-76.03	726.57	353.99	0.59	-17.2 G
2348.00	30.88	355.04	2173.24	759.18	755.10	-78.78	759.20	354.04	0.70	-38.2 G
2442.00	31.19	354.57	2253.79	807.64	803.37	-83.17	807.66	354.09	0.42	-119.0 G
2537.00	30.92	353.61	2335.17	856.64	852.11	-88.21	856.67	354.09	0.59	170.6 G
2598.00	30.19	353.85	2387.70	887.65	882.94	-91.60	887.68	354.08	1.21	140.2 G
2662.00	29.56	354.92	2443.20	919.53	914.66	-94.72	919.55	354.09	1.29	174.0 G
2756.00	27.70	355.34	2525.70	964.56	959.54	-98.55	964.58	354.14	1.99	-36.3 G
2851.00	28.41	354.25	2609.54	1009.24	1004.03	-102.61	1009.26	354.16	0.92	153.5 G
2914.00	28.09	354.59	2665.03	1039.06	1033.71	-105.51	1039.08	354.17	0.57	148.0 G
3010.00	26.87	356.29	2750.20	1083.35	1077.86	-109.05	1083.36	354.22	1.51	170.0 G
3072.00	25.79	356.73	2805.77	1110.83	1105.31	-110.72	1110.84	354.28	1.77	124.2 G
3136.00	25.43	357.98	2863.48	1138.46	1132.94	-112.00	1138.46	354.35	1.01	151.5 G
3200.00	25.18	358.30	2921.34	1165.76	1160.28	-112.89	1165.76	354.44	0.45	-173.1 G
3294.00	23.07	357.65	3007.13	1204.11	1198.67	-114.24	1204.11	354.56	2.26	179.2 G
3388.00	22.54	357.67	3093.78	1240.48	1235.08	-115.72	1240.49	354.65	0.56	-89.3 G
3451.00	22.55	356.46	3151.96	1264.61	1259.20	-116.96	1264.62	354.69	0.74	-92.6 G
3514.00	22.53	354.81	3210.15	1288.76	1283.28	-118.80	1288.76	354.71	1.00	120.2 G
3568.00	22.02	357.23	3260.12	1309.21	1303.69	-120.22	1309.22	354.73	1.94	0.0 G
3617.00	22.02	357.23	3305.55	1327.56	1322.04	-121.11	1327.58	354.77	0.00	180.0 G
Assumed Client Natural Dr	4057.40	0.00	357.23	3735.19	1411.06	1405.54	1411.10	354.91	5.00	-2.8 M
Projection to Client TD	6064.00	0.00	357.23	5741.79	1411.06	1405.54	1411.10	354.91	0.00	---

Survey Error Model: Wolff & deWardt 1.0000 sigma

Surveying Programme:

MD From (ft)	MD To (ft)	EOU Freq	Survey Tool Type
0.00	6064.00	Act-Slrs	Anadrill MWD