

Northwest Natural Gas Company
Mist Gas Storage Field
IW 23a-22-65
Mist Gas Field
Columbia Co., Oregon

S U R V E Y L I S T I N G

Well name : IW 23A-22-65

Your ref : Survey 10/7/97
Our ref : svy3388

Date printed : 19-Jan-98
Date created : 24-Sep-97
Last revised : 7-Oct-97

Field is centred on n45 35 51.576,w123 9 14.292

Structure is centred on 1288888.450,862154.820

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/100Ft	Vert Sect
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	0.00
350.00	0.00	0.00	350.00	0.00 N	0.00 E	0.00	0.00
448.00	0.70	200.00	448.00	0.56 S	0.20 W	0.71	0.06
476.00	1.00	169.90	475.99	0.96 S	0.22 W	1.89	0.23
507.00	1.40	155.80	506.99	1.58 S	0.02 W	1.59	0.68
568.00	2.60	145.30	567.95	3.39 S	1.08 E	2.05	2.46
604.00	3.60	138.20	603.90	4.91 S	2.29 E	2.97	4.21
635.00	5.10	123.50	634.81	6.39 S	4.09 E	5.99	6.48
728.00	11.30	103.80	726.83	10.85 S	16.40 E	7.22	19.50
790.00	17.40	101.70	786.87	14.18 S	31.39 E	9.87	34.43
884.00	25.70	103.50	874.22	21.81 S	65.03 E	8.86	68.00
944.00	29.60	102.40	927.36	28.03 S	92.17 E	6.56	95.12
1038.00	32.20	111.50	1008.05	42.20 S	138.18 E	5.68	142.68
1131.00	32.60	121.10	1086.63	64.24 S	182.71 E	5.54	192.37
1273.00	32.30	120.40	1206.46	103.20 S	248.19 E	0.34	268.30
1677.00	31.50	119.00	1549.44	208.99 S	433.61 E	0.27	481.34
2298.00	35.00	118.00	2068.70	371.31 S	732.85 E	0.57	821.45

All data is in feet unless otherwise stated
Coordinates are from IW 23a-22-65 and TVDs are from wellhead.
Vertical section is from wellhead on azimuth 116.04 degrees.
Calculation uses the minimum curvature method.

Targets associated with this wellpath

=====

Target name	Position	T.V.D.	Local rectangular coords.	Date revised
Target1 IW23a	1291090.000, 858938.000	1306.50	142.82S 292.35E	5-Aug-97

All data is in feet unless otherwise stated
Coordinates are from IW 23a-22-65 and TVDs are from wellhead.
Vertical section is from wellhead on azimuth 116.04 degrees.
Calculation uses the minimum curvature method.

Northwest Natural Gas Company

Schlumberger Anadrill

WELL IW-23a-22-65

FIELD Mist Gas Field

RC Taylor #4

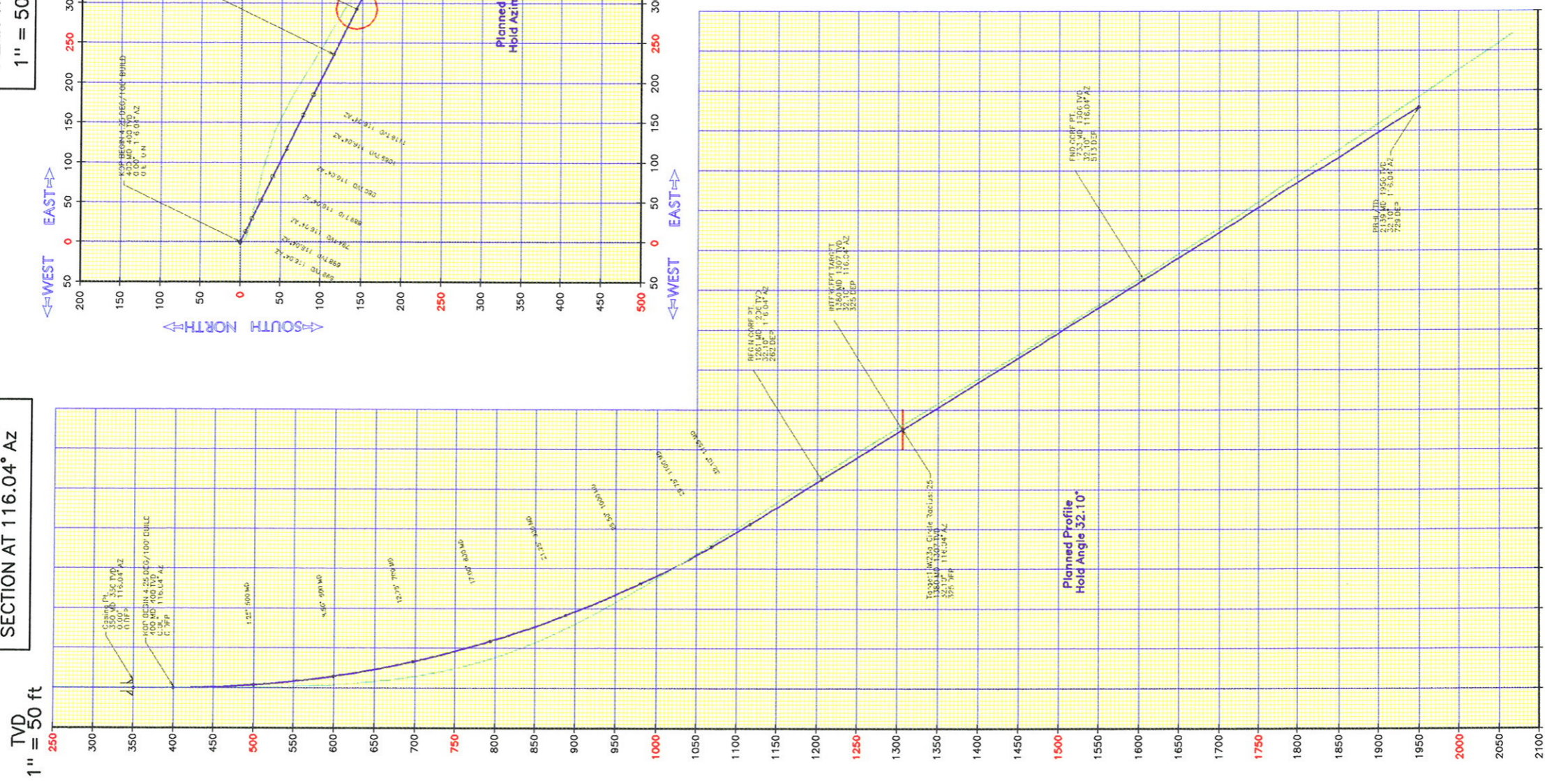
Magnetic Declination Angle: 18.6438° FS: 54.382.66
Model: BGS Date: 16 Sep 97

Let: M45°59'21.855" Surface Columbia Co Grid Corr: 1.97" W
Lon: W123°17'25.789" Or-N. Zn. X: 1290797.650 Legal: W.M. T6N R5W Sec. 22
Scale Fact.: Or-N. Zn. Y: 859080.820 KE Elevation: 596.5 Ft.

Drawn: 07-Oct-97
Proj: Prop 1 Rev 3

VERTICAL SECTION VIEW
SECTION AT 116.04° Az

PLAN VIEW
1" = 50 ft



SECTION DEPARTURE 1" = 50 ft

Aradigm Quality Control

Date: 07 Oct 97
Drawn by: Thomas A. Sundberg
Checked by: Dennis Lee
Client OK: Jack Meyer