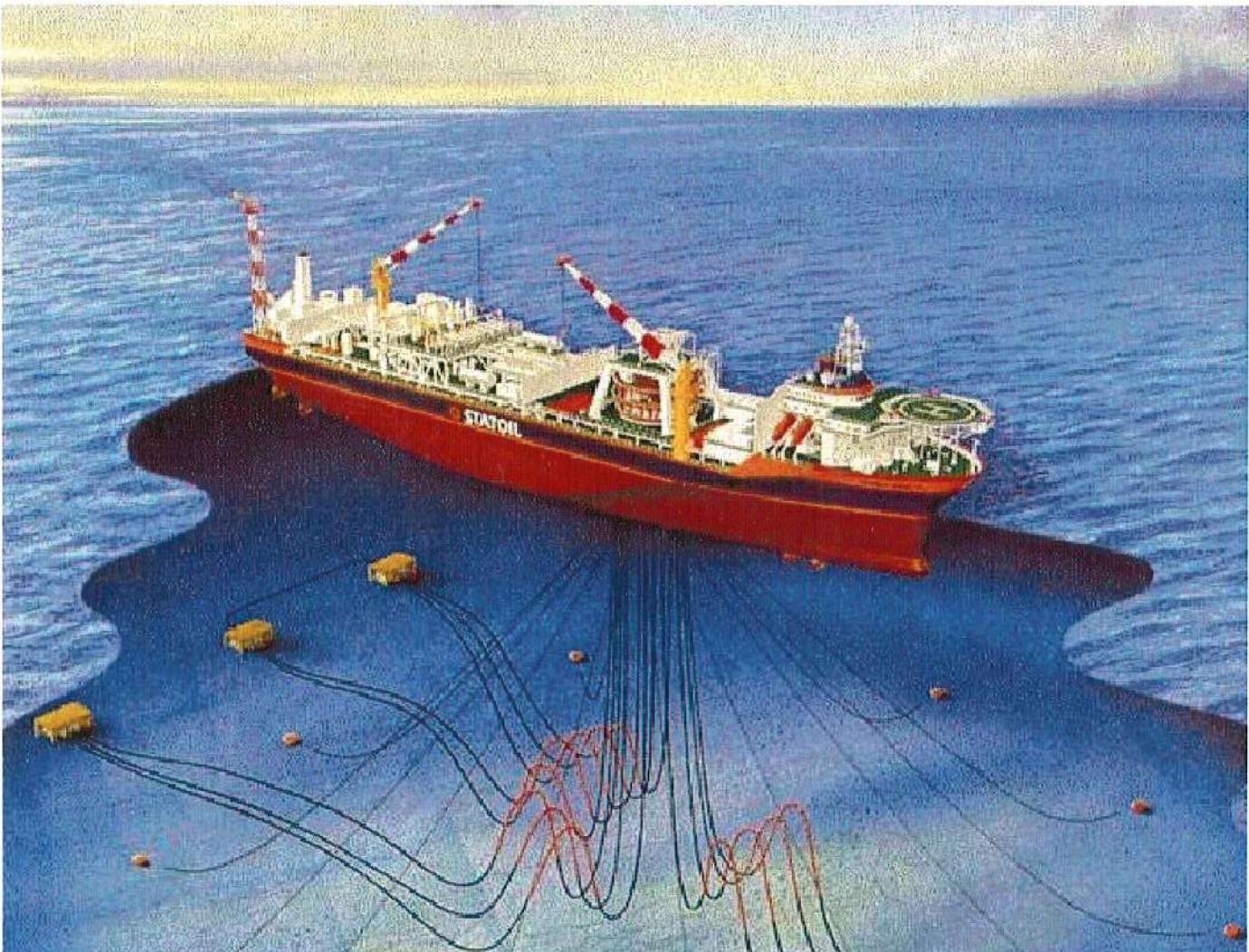


Norne



Geological and Petrophysical Report Norne Field **PL 128, WELL 6608/10-C-4 AH**

Harstad October 2004

**Geological and Petrophysical Report
Norne Field
PL 128
Wells 6608/10-C-4 AH**

RA-U-NOR 0289

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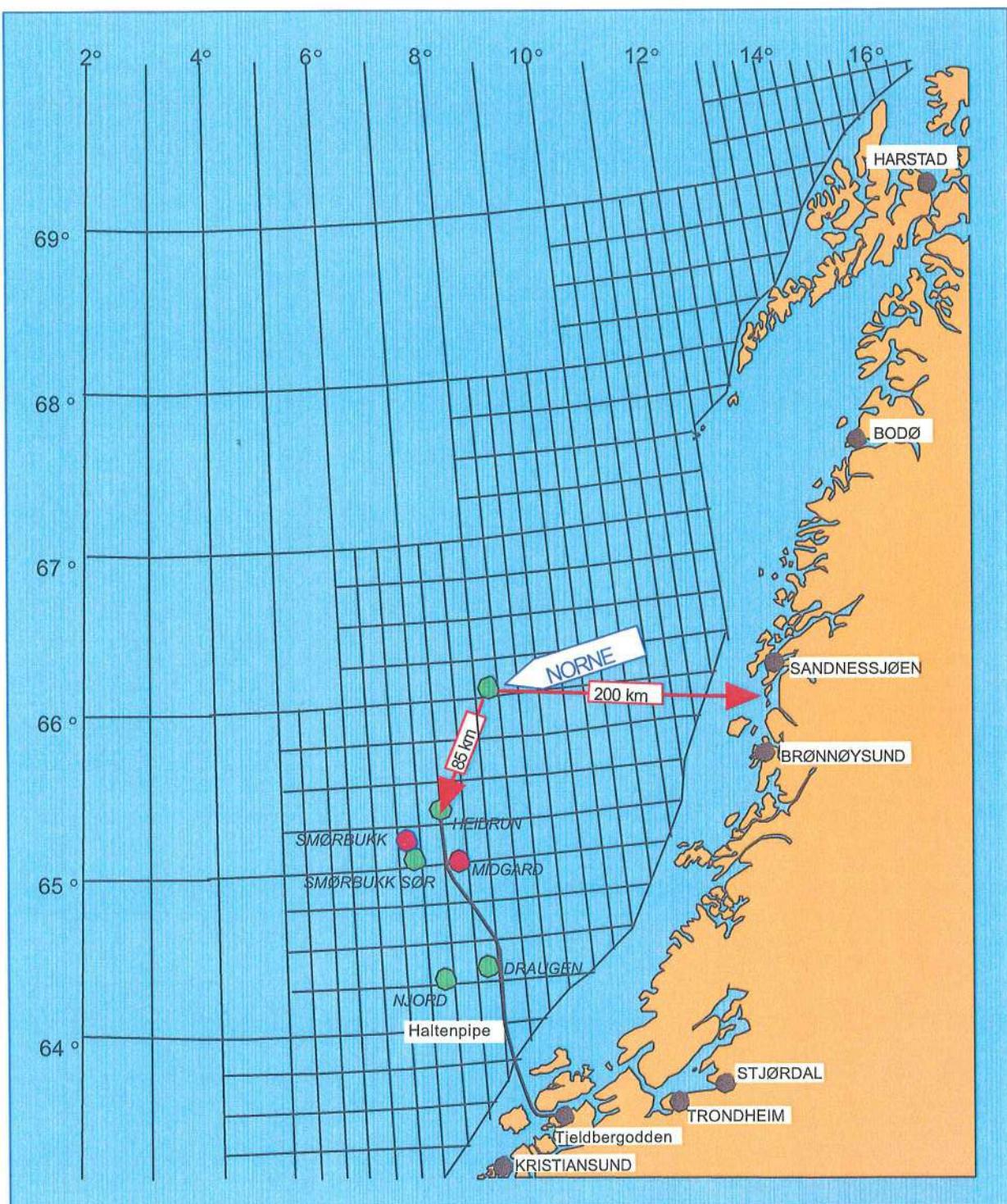
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Enclosures

Enclosure 1.....	Completion Log
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1 Summary

Well 6608/10-C-4 AH was planned as the first Ile Formation injector on the C-segment in order to provide pressure support and enhance the oil sweep in the Ile Formation. The secondary goal for the well was to verify the OWC in the Garn Formation, estimated to be deeper than 2660 m TVD MSL. Note: the reservoir zonation for Norne has been updated since the planning of this well; this is relevant for the Ile and Tofte Formations.

The well was sidetracked from the existing injection well C-4 H that is closed due to it contributing to a high gas-oil ratio and water cut in the neighbouring producers because of an unfavourable location. The well was sidetracked through a window in the 20" casing at a depth of 645 m MD. The well was drilled with an inclination of less than 20° through the reservoir section to TD in the Åre Formation at a depth of 3638 m MD/2898 m TVD MSL. The well is completed with a perforated cemented liner; the well is perforated in the Ile Formation from 3420 – 3458 m MD (2696 – 2732 m TVD MSL), a total perforation interval of 38 m MD. The well is also designed for perforation in the entire reservoir section from Garn to Tilje Formation at a later stage. All injection wells on the C-template can easily be converted from water injection to gas injection. Well C-4 AH can therefore be used for WAG purposes.

Prior to drilling the well, new seismic data resulted in a new structural map for the top Garn Formation. The original target of the well was moved approximately 100 m SW in order to penetrate Top Garn Formation at 2650 m TVD MSL and thus verify the OWC in the Garn Formation, the secondary goal for this well. The well penetrated the top Garn Formation at a depth of 2654.5 m TVD MSL (3379 m MD), 4.5 m deeper than prognosed. The OWC was not proven in the well due to an oil-down-to situation at a depth of 2684.6 m TVD MSL (3411.3 m MD). This corresponds to the original oil water contact at 2692 m TVD MSL.

The well was logged with LWD and wireline logs. The well was drilled with oil based mud to ensure optimum hole condition and data quality.

2 Drilling Results

2.1 17 ½ " section

The 17 ½" section commenced by milling a window through the 20" casing from 638 - 645 m MD on 13.11.2003. The section was drilled from 657 m, initially with a mud weight of 1.18 sg. Due to mud losses the mud weight was reduced first to 1.15 sg and then further to 1.06 sg. Severe losses were experienced throughout the section. The losses were thought to be through a previously detected leak in the 20" casing. In order to achieve a sufficient build rate the entire section was drilled in sliding mode, well inclination was built from 4° to 43°. Section TD was reached at 1174 m MD, and the 13 3/8" casing shoe was set at 1167 m MD.

2.2 12 1/4" section

This section was drilled from 1177 m MD – 3350 m MD using Powerdrive. An FIT to 1.58 sg was performed at the start of the section beneath the 13 3/8" casing shoe. The 12 1/4" section was drilled with seawater and high viscosity pills down to 1409 m MD where the well was displaced to 1.42 sg OBM, the mud weight was then gradually increased up to 1.50 sg. One bit trip was necessary during the section. The 9 5/8" casing was set at 3344 m MD, mud losses were experienced whilst running casing.

2.3 8 1/2" section 6608/10-C-4 AH

This section was drilled from 3350 m MD to well TD 3638 m MD (2898 m TVD MSL). The TD was 22 m shallower than planned due to upcoming bad weather, this has no implications for the well performance. TD for the well was reached on 03.12.2003. The section was drilled with 1.20 sg OBM, no FIT was performed. Several attempts were made to drop the hole inclination above the Ile Formation, these were unsuccessful due to too much torque. Several intervals were drilled in sliding mode in attempts to steer, these were unsuccessful due to the motor stalling whilst in sliding mode. Low ROP's were experienced whilst drilling the Ile and Tilje Formations, these correlate to carbonate cemented stringers. Lower ROP's were also noted in the shales compared to the sandy sequences. One tight spot was observed whilst POOH at 3391 m MD, after sliding over the zone once the obstruction was not seen again.

2.4 Geosteering summary

The 17 1/2" and 8 1/2" sections were drilled using motors. The 12 1/4" section was drilled with Powerdrive, the section was drilled as planned. Gyros were run down to 2756 m MD, after this depth the tool failed. To reduce the risk of getting differential stuck with the drill string drilling continued and a gyro was run after running the 9 5/8" casing.

3 Petrophysical Evaluation

3.1 General well and mud data

NORNE	6608/10-C-4 AH	13.11.2003 – 08.12.2003
OPERATION TYPE	Measurement while drilling (MWD) / Wireline Logging (EWL)	
STATOIL ENGINEERS	P. Skillingstad/John Martin Østby	
LOGGING COMPANY	Schlumberger (MWD)	

LOGGING ENGINEERS	Roy Nordstokke, Mats Hoffmann, Carlos Venegas, Gwawr Evans, Frode Sunde, Robert Darlington, Colin Rawson (MWD) Jacqui Cowap, Jorge De Morais (EWL)
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WELL DATA		MUD DATA
Well Type	Ile Fm. Injector	Type CARBO SEA OBM
Block	6608/10	Density 1.20 g/cc
Template Slot	C-4 AH	Funnel Viscosity 75 mPa s
Rig	Stena Don	Fluid Loss [HTHP] 2.8 ml
UTM East	457 180.08 m E	Salinity 96 280 mg/l
UTM North	7 322 034.17 m N	Barite -
Geo East	8° 3' 21.724" E	Other, KCl -
Geo North	66° 0' 52.205" N	Ca++ -
RT	24 m	Mg++ -
Water Depth	375 m	Oil /Water ratio 77 / 23
Max Deviation	51°	Solids 12.8 %
@ Depth	2530 m MD 2030 m TVD MSL	Rm n/a
Avg Dev in Reservoir	~20°	Rmf n/a
Avg Azim in Reservoir	~88°	Rmc n/a
TD driller	3638 m	
TD logger	3642	
Csg shoe Driller	3344.6 m MD 2620.4 m TVD MSL	
Csg shoe Logger	3345 m MD	
Csg	9 5/8"	

Bottomhole Temperature (From MDT)	
T [deg C]	102.8
Depth	3623.5 m
Time	08.12.2004

Table 3-1 General well and mud data.

3.2 Log Evaluation

Date		MWD				Interval in MD RT	
Start	Stop	Tool Combination	Company	Run	Bit size	Top	Bot
15.11.03	16.11.03	GR-DIR	Schlumberger	1	17 1/4"	657	1174
18.11.03	27.11.03	GR-RES (CDR)	Schlumberger	2,3	12 1/4"	1174	3350
01.12.2003	03.12.03	GR-RES-DEN-NEUT (Vision 675)	Schlumberger	4	8 1/2"	3350	3638

Table 3-2 Logging While Drilling runs.

Date		Wireline logging				Interval in MD RT	
Start	Stop	Tool Combination		Company	Run	Top	Bot
06.12.2004	06.12.2004	DSI-AIT-PEX-CMR_200-GR	Schlumberger	1	3158	3642	
08.12.2004	08.12.2004	GR-MDT	Schlumberger	2	3421	3613.5	

Table 3-3 Wireline logging runs.

Spliced curve	Original curve	Depth interval in MD RT	Comments
GR	CDR_GR	1121-3335	Schlumberger MWD CDR
	GR	3335-3678	Schlumberger PEX
RT	CDR_PSR	1121-3345	Schlumberger MWD CDR
	RT	3345-3678	Schlumberger AIT RT
RM	AHT60	3347-3645	Schlumberger AIT Two foot resistivity AHT60
RS	AHT10	3347-3645	Schlumberger AIT Two foot resistivity AHT10
DT	DTCO:r3:v2	3158-3356.3	Schlumberger DSI in casing
	DTCO:r1:v3	3356.3-3678	Schlumberger DSI in open hole
DTS	DTSM:r3:v2	3158-3356.3	Schlumberger DSI in casing
	DTSM:r1:v3	3356.3-3678	Schlumberger DSI in open hole
CALI	HCAL	3347-3688	Schlumberger PEX
RHOB	RHOZ	3347-3644	Schlumberger PEX
NPHI	TNPH	3309-3644	Schlumberger PEX
DRHO	DRHZ	3347-3644	Schlumberger PEX
PEF	PEFZ	3347-3644	Schlumberger PEX
BFV	BFV	3389.8-3446.5	Schlumberger CMR200

Table 3-4 Log splice, OpenWorks database.

Whilst running in hole with the open hole logging string #1, a tension shear bolt failed on the heave compensation system. After logging, it was found that this failure caused a -9.6 m shift in depth. To ensure a proper depth reference, the wireline-logging run from the perforation run is used as a reference for C-4 AH. This, in addition to a significant yo-yo effect on the cable during logging of run #1, has resulted in significant work to depth-shift all wireline logs.

Porosity calculations on Norne are based on the density log by using following equation:

$$\phi_{density} = \frac{\rho_{Matrix} - \rho_{Bulk}}{\rho_{Matrix} - \rho_{Fluid}}$$

This formula gives total porosity, based on correlation from overburden corrected helium core porosity from cored wells.

Table 3-6 shows the parameters used for the equations below.

ρ_{fluid} is iterated from SXO, mud weight and salinity using the formula:

$$\rho_{fluid} = S_{XO} \cdot \rho_{formationwater} + (1 - S_{XO}) \cdot \rho_{mudfiltrate}$$

Permeability was calculated from a log-linear correlation of porosity and permeability from the following equation:

$$K_{log} = 10^{(a \cdot \phi_{density} + b)}$$

Water saturation is calculated using Archie's equation. RT is taken from the Schlumberger AIT.

$$SW = \left(\frac{a}{(\phi_{density})^m} \cdot \frac{R_w}{R_t} \right)^{\left(\frac{1}{n} \right)}$$

Shale volume (VSH) is estimated from either Gamma ray, Density-Neutron or the minimum method, based on clean sand and shale picks.

$$VSH = MIN \left\{ \frac{NPHI_{env} - \phi \cdot H_f}{\phi_{shale}}, \frac{GR - GR_{min}}{GR_{max} - GR_{min}} \right\}$$

Parameters listed in Table 3-5 are used in calculation of net sand from permeability and shale volume.

Fluid	Permeability cut-off (mD)	Shale content cut-off (frac.)
Oil/ Water	1.0	0.4

Table 3-5 Cut-off values.

Run #2 comprised a MDT tool with both pressure and sampling modules. Table 3-7 shows the pressure points (WFT), and Figure 3-1 shows comparison of pressure to the exploration wells. This plot shows that the Garn and Åre Formations are almost at initial pressure, while the Ile, Tofte and Tilje Formations are pressurised.

A CMR200 was run in the Upper Ile to Garn 2 Formations in bound fluid volume mode. This log was run to divide between free and bound water in the shaly Lower Garn/Not Formations. This information was used to find an oil-water contact in the Garn Formation in this segment of Norne. From this log an oil-down-to contact was found at 2684.6 m TVD MSL (3411.3 m MD RT), which correspond to the original oil-water contact at 2692 m TVD MSL. This depth is also confirmed by a high quality fluid sample at 2675.9 m TVD MSL (3402.0 m MD RT). Results from PVT analyses of these samples showed oil only, as shown in Table 3-8.

Statistics for the evaluation are shown in Table 3-9. From the statistics and logs, some reduction in net gross and porosity/permeability are found compared to other wells in the area. Some of this reduction, especially in the Ile and Tilje Formations, is related to the significant amount of carbonate cement.

Zone	Fluid Phase	A	M	N	GR MIN	GR MAX	PHIN SH	RHO MA	RHO FL	KA KLOG H	KB KLOG H	KA KLOG V	KB KLOG V
GARN 3	OIL	1	1.84	2.20	21	147	0.45	2.67	0.819	-0.611	11.14	-0.823	-0.611
GARN 2	OIL	1	1.84	2.20	21	147	0.45	2.67	0.854	-3.518	21.69	-5.42	-3.518
GARN 1	OIL	1	1.84	1.84	21	147	0.45	2.67	0.858	-3.518	21.69	-5.42	-3.518
NOT	WATER	1	1.84	1.84	21	147	0.45	2.67	1.015	-3.518	21.69	-5.42	-3.518
ILE 3	WATER	1	1.84	1.84	15	153	0.45	2.65	1.03	-3.518	21.69	-6.281	-3.518
ILE 2	WATER	1	1.84	2.20	15	153	0.45	2.65	1.03	-0.898	13.43	-6.281	-0.898
ILE 1	WATER	1	1.84	1.84	15	153	0.45	2.67	1.03	-0.898	13.43	-6.281	-0.898
TOFTE 4	WATER	1	1.84	2.02	15	153	0.45	2.67	1.029	-2.026	15.99	-6.281	-2.026
TOFTE 3	WATER	1	1.84	2.02	15	153	0.45	2.65	1.029	-4.37	25.07	-6.281	-4.37
TOFTE 2	WATER	1	1.84	2.02	15	153	0.45	2.65	1.029	-4.37	25.07	-6.281	-4.37
TOFTE 1	WATER	1	1.84	2.02	15	153	0.45	2.71	1.028	-2.536	19.49	-4.67	-2.536
TILJE 3	WATER	1	1.84	2.20	15	153	0.45	2.65	1.028	-1.946	16.44	-4.67	-1.946
TILJE 2	WATER	1	1.84	2.20	15	153	0.45	2.65	1.027	-2.536	19.49	-4.67	-2.536
TILJE 1	WATER	1	1.84	2.20	15	153	0.45	2.65	1.026	-2.536	19.49	-4.67	-2.536
ÅRE	WATER	1	1.84	2.20	15	153	0.45	2.65	1.025	-2.536	19.49	-4.67	-2.536

Table 3-6 Parameters used in petrophysical calculations

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Depth (m MD RT)	Depth (m TVD MST)	Zone	FORM (Barg)	QUAL (%)	HDR A (Barg)	HDR B (Barg)	MOBL (mD/cP)	TEMP (DegC)	Comment
3381.0	2656.2	Garn 3 NO 2002	269.185	3	312.400	312.500	94.4	97.2	
3385.5	2660.4	Garn 3 NO 2002	269.497	4	313.000	313.110	332.9	97.2	
3388.0	2662.7	Garn 3 NO 2002	269.670	4	313.500	313.400	432.6	97.1	
3395.8	2670.0	Garn 2 NO 2002	271.582	3	314.500	314.620	17.3	97.2	
3400.0	2674.0	Garn 2 NO 2002	271.791	4	314.900	314.900	11775.0	97.5	Sampling failed
3402.0	2675.9	Garn 1 NO 2002	271.792	4	314.800	315.200	4269.0	98.0	Sampling point
3412.5	2685.7	Garn 1 NO 2002	316.000	0	316.000	316.260		101.3	Lost Seal
3427.5	2699.8	Ile 2.2 NO 2002	298.642	2	318.800	318.000	2.0	95.7	
3432.0	2704.1	Ile 2.2 NO 2002	298.820	3	318.970	319.020	23.4	96.2	
3440.8	2712.3	Ile 2.1 NO 2002	299.770	2	320.100	320.080	1.9	96.8	
3444.5	2715.8	Ile 2.1 NO 2002		0	320.600	320.450		97.5	Tight
3449.8	2720.8	Ile 1.3 NO 2002	300.044	4	321.300	321.340	189.7	97.8	
3456.0	2726.6	Ile 1.2 NO 2002	300.600	4	322.100	322.120	223.9	98.0	
3458.3	2728.8	Ile 1.2 NO 2002	300.880	2	322.400	322.570	8.0	98.3	
3462.8	2733.0	Ile 1.1 NO 2002		0	322.970	322.960		98.7	Tight
3468.5	2738.4	Tofte 2.1 NO 2002	301.534	4	323.700	323.700	164.6	98.9	
3476.5	2745.9	Tofte 2.1 NO 2002	302.345	3	324.770	324.780	73.0	99.0	
3486.7	2755.5	Tofte 2.1 NO 2002	303.368	3	326.050	326.120	10.3	99.4	
3496.7	2764.9	Tofte 2.1 NO 2002	304.464	1	327.130	327.289	0.9	99.3	
3504.0	2771.8	Tofte 1.2 NO 2002	301.542	2	328.090	328.150	2.9	99.4	
3510.0	2777.5	Tofte 1.1 NO 2002	302.104	2	328.700	328.930	1.7	99.8	
3517.8	2784.8	Tilje 4 NO 2002	329.900	0	329.600	329.910		100.2	
3532.5	2798.6	Tilje 3 NO 2002	303.865	3	331.000	331.890	45.1	100.4	
3538.0	2803.8	Tilje 3 NO 2002	304.354	4	332.500	332.570	113.1	100.6	
3556.0	2820.8	Tilje 2 NO 2002	300.356	3	334.410	334.981	17.2	100.8	
3582.0	2845.2	Tilje 1 NO 2002	303.684	4	338.400	338.398	1060.7	101.2	
3596.0	2858.4	Tilje 1 NO 2002	304.585	4	340.800	340.162	893.8	101.7	
3614.5	2875.8	Åre NO 2002	300.740	1	342.500	342.740	0.2	102.7	

Table 3-7 WFT for C-4 AH, sampled 8th December 2003.

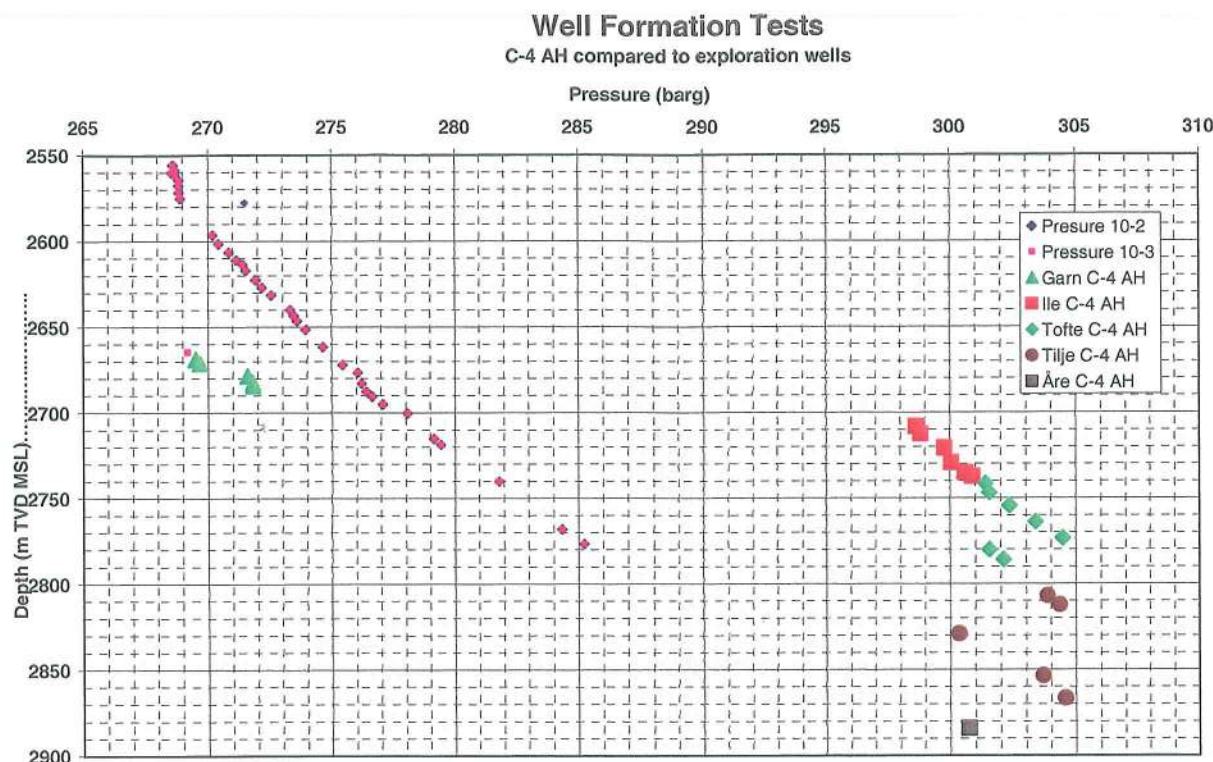


Figure 3-1 WFT for C-4 AH compared to exploration wells 10-2 and 10-3.

Bottle no.	GOR (Sm ³ /Sm ³)	Density at 15°C (kg/Sm ³)	Gas gravity (air = 1)	Mean molecular weight of C ₁₀₊ (stock tank)	Density of C ₁₀₊ kg/Sm ³ (stock tank)
C-18902	101.9	850	0.688	272	871
C-18703	104.3	858.4	0.691	268	870
TS-23614	103.8	859.2	0.7	270	872
TS-23701	105	848.7	0.71	271	872

Table 3-8 Results from PVT-analysis of oil samples from 2575.9 m TVD MSL (3402.0 m MD RT)

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Zone	Top Fm. (m TVD MSE)	Bot Fm. (m TVD MSE)	Thickness (meters)	PHIE (frac.)	NET GROSS (frac.)	SW (frac.)	VSH (frac.)	KEOGH (mD)
Garn3	2654.5	2664.5	10.0	0.254	0.975	0.205	0.279	230.4
Garn2	2664.5	2674.0	9.5	0.253	0.435	0.346	0.317	140.9
Garn1	2674.0	2686.0	11.9	0.268	0.217	0.363	0.288	406.6
Not	2686.0	2695.0	9.0	-----	0.000	-----	-----	-----
Ile2.2	2695.0	2705.5	10.4	0.249	0.759	0.784	0.252	195.3
Ile2.1	2705.5	2717.0	11.8	0.237	0.861	0.955	0.229	192.8
Ile1.3	2717.0	2721.0	3.7	0.139	0.768	1.000	0.334	12.3
Ile1.2	2721.0	2731.0	10.1	0.213	0.951	0.967	0.190	279.7
Ile1.1	2731.0	2734.5	3.4	0.235	1.000	0.904	0.237	302.6
Tofte2.2	2734.5	2738.5	3.8	0.199	1.000	0.965	0.266	47.8
Tofte2.1	2738.5	2771.5	33.0	0.246	0.985	0.953	0.221	244.9
Tofte1.2.2	2771.5	2775.0	3.3	0.192	0.938	0.745	0.201	73.3
Tofte1.2.1	2775.0	2776.5	1.7	-----	0.000	-----	-----	-----
Tofte1.1	2776.5	2782.5	5.9	0.239	0.807	0.877	0.198	1020.6
Tilje4	2782.5	2791.5	8.6	0.141	0.260	0.950	0.206	2.6
Tilje3	2791.5	2811.0	19.8	0.216	0.582	0.944	0.194	148.2
Tilje2	2811.0	2842.5	31.8	0.197	0.306	0.914	0.290	162.7
Tilje1	2842.5	2869.0	26.2	0.247	0.661	0.908	0.158	715.5

Table 3-9 Statistics from Petrophysical Evaluation

4 Stratigraphic Tops

Stratigraphic Top	Depth m MD	Prognosis m TVD MSL	Actual m TVD MSL	Difference m TVD	UTM E	UTM N
Kai Fm.	1507.0	1331.0	1332.0	+ 1.0	457 608	7 322 077
Brygge Fm.	1821.0	1550.0	1548.0	- 2.0	457 835	7 322 083
Brygge Tuff Mbr.	1982.0	1654.0	1655.0	+ 1.0	457 956	7 322 085
Tare Fm.	2247.0	1836.0	1838.0	+ 2.0	458 147	7 322 101
Tang Fm.	2324.0	1895.0	1893.0	- 2.0	458 201	7 322 101
Springar Fm.	2382.0	1930.0	1933.5	+ 3.5	458 242	7 322 100
Lyr Fm.	2874.0	2248.0	2260.5	+ 12.5	458 608	7 322 114
Spekk Fm.	3100.0	2385.0	2417.0	+ 32.0	458 770	7 322 128
Melke Fm	3145.0	2395.0	2449.0	+ 54.0	458 800	7 322 139
Garn Fm. 3	3379.0	2650.0	2654.5	+ 4.5	458 906	7 322 157
Garn Fm. 2	3390.0	2661.0	2664.5	+ 3.5	458 910	7 322 157
Garn Fm. 1	3400.0	2670.0	2674.0	+ 4.0	458 913	7 322 157
Not Fm.	3413.0	2681.0	2686.0	+ 5.0	458 918	7 322 158
Ile Fm. 3	-	2688.0	-	-	-	-
Ile Fm. 2	-	2704.0	-	-	-	-
Ile Fm. 1	-	2718.0	-	-	-	-
OWC*	3415.5	-	2692.0	-	458 919	7 322 158
Ile Fm. 2.2	3422.5	-	2695.0	-	458 921	7 322 158
Ile Fm. 2.1	3433.5	-	2705.5	-	458 925	7 322 158
Ile Fm. 1.3	3446.0	-	2717.0	-	458 929	7 322 158
Ile Fm. 1.2	3450.0	-	2721.0	-	458 930	7 322 158
Ile Fm. 1.1	3460.5	-	2731.0	-	458 934	7 322 158
Tofte Fm. 4	-	2720.0	-	-	-	-
Tofte Fm. 3	-	2726.0	-	-	-	-
Tofte Fm. 2	-	2750.0	-	-	-	-
Tofte Fm. 1	-	2755.0	-	-	-	-
Tofte Fm. 2.2	3464.5	-	2734.5	-	458 935	7 322 158
Tofte Fm. 2.1	3468.5	-	2738.5	-	458 937	7 322 158
Tofte Fm. 1.2	3503.5	-	2771.5	-	458 948	7 322 159
Tofte Fm. 1.1	3509.0	-	2776.5	-	458 950	7 322 159
Tilje Fm. 4	3515.5	<i>eroded</i>	2782.5	-	458 953	7 322 159
Tilje Fm. 3	3524.5	2769.0	2791.5	+ 22.0	458 956	7 322 159
Tilje Fm. 2	3545.5	2783.0	2811.0	+ 28.0	458 963	7 322 159
Tilje Fm. 1	3579.5	2816.0	2842.5	+ 26.0	458 974	7 322 159
Åre Fm.	3607.0	2839.0	2869.0	+ 30.0	458 984	7 322 160
Total Depth	3638.0	2943.0	2898.0	-45.0	458995	7322160

Table 4-1 Stratigraphic tops

* OWC estimated from oil-down-to contact proven in well.

The stratigraphic zonation for the Norne reservoir has been updated since the RTD was issued. This is relevant for the Ile and Tofte Formations. The old zonations given in the prognosis are shaded grey in the above table.

5 Geological Summary

5.1 NORDLAND GROUP

Kai Formation

The Kai Formation is comprised of silty and sandy claystone.

The claystone is generally medium grey to olive grey, becoming pale yellowish brown. It is firm, occasionally hard and sub-blocky to blocky. The claystone is generally slightly calcareous, sometimes non calcareous or moderately calcareous. It is silty and contains very fine to fine and occasionally medium sized quartz grains. It is partly micromicaceous and contains traces of pyrite.

5.2 HORDALAND GROUP

Brygge Formation

The Brygge Formation consists of a silty claystone that is brownish black to olive grey, moderately firm and sub-blocky to blocky. It is dominantly non-calcareous, although minor zones contained slightly calcareous claystone. Traces of micro-mica and carbonaceous material are mainly seen in the upper part. Pyrite nodules are also present together with micro-mica.

Brygge Tuff Member

The Brygge Tuff Member forms the lower part of the Hordaland Group and consists of tuffaceous claystones interbedded with occasional siltstones, claystones and limestone stringers. The tuffaceous claystones are light greyish green to pale green, firm, blocky to sub-blocky, waxy, slightly glauconitic in parts, occasionally silty and non calcareous.

The claystones are brown to reddish brown and bluish grey to dark grey. They are firm to moderately hard, sub-blocky, and non to slightly calcareous.

The limestone stringers are white to light brown, moderately hard, blocky to amorphous, and argillaceous in parts.

5.3 ROGALAND GROUP

Tare Formation

The Tare Formation consists of olive grey to dark grey claystone and limestone stringers. The dark grey claystone is soft, amorphous, slightly silty, non to slightly calcareous and contains traces of pyrite and carbonaceous material.

Tang Formation

The Tang Formation consists of dark grey to dark greenish grey claystone with limestone stringers. The claystone is soft to firm, occasionally hard, subfissile and non to slightly calcareous.

5.4 SHETLAND GROUP

Springar Formation

The Springar Formation consists of claystone with limestone stringers.

The claystone varies from olive grey to olive black, medium grey to greenish grey and light brown to medium brown. It is soft to firm, soft and sticky in parts, blocky to amorphous, non to slightly calcareous, and contains traces of pyrite and glauconite.

The limestone stringers are white to off white to light grey, yellow brown in parts, soft to moderately hard, amorphous to blocky, argillaceous in part, cryptocrystalline to microcrystalline.

5.5 CROMER KNOLL GROUP

Lyr Formation

The Lyr Formation consists of claystones with limestone stringers as in the overlying Springar Formation. The claystones are predominantly medium grey, olive grey, olive black, occasionally light grey, firm to moderately hard, sub-fissile to sub-blocky, non calcareous with traces of pyrite.

The limestone is white to grey white to brownish white, firm to hard, microcrystalline, arenaceous and argillaceous in places and containing traces of glauconite.

5.6 VIKING GROUP

Spekk Formation

The Spekk Formation consists of brownish black to greyish black, organic rich claystones. The cuttings are firm, sticky and blocky.

Melke Formation

The Melke Formation comprises organic-rich claystones with limestone stringers. The bottom section of this unit can be characteristically divided into three coarsening-upward sequences.

The claystones are brownish grey to brownish black to olive grey to medium dark grey, soft to firm, amorphous to blocky, slightly silty, non to slightly to moderately calcareous, with traces of pyrite and micro-mica.

The sandy units contain clear quartz, which is coarse to very fine to fine in parts, moderately sorted, subangular to subrounded and only seen as loose grains.

Limestone stringers are white to light grey to yellow grey or pale brown, firm to moderately hard, blocky, argillaceous in part, and occasionally cryptocrystalline.

5.7 FANGST GROUP

Garn Formation

The sandstone cuttings are milky white to light brown and consisted predominantly of fine loose clear quartz grains. These are very fine to fine, moderately sorted and subangular to subrounded.

Traces of limestone and claystone are also present in the samples. The limestone is white to light grey, soft and amorphous. The claystone is light grey to grey, soft and sub-blocky.

Not Formation

The claystone is moderate to dark brownish grey, firm to moderately hard, blocky to platy. It contains calcite rich zones, traces of mica and carbonaceous materials. The claystone is silty in places.

Ile Formation

The Ile Formation consists of sandstone with occasional limestone and claystone interbeds. The sandstone consists of clear to light brown transparent quartz grains with a very fine to fine grain size. The grains are moderately to well sorted and are subrounded in most samples. The sandstone varies from loose to firm blocks and lumps. Calcite cementation is seen in some samples, as is a moderate grey clay matrix. Silica cement is also occasionally observed generating hard aggregates. Traces of mica, pyrite and glauconite are occasionally seen.

The claystone is multi-colored, grey, brownish grey and brownish black. Claystone fragments are blocky to platy, firm, in places hard and in places crumbly. The claystone is calcareous. It contains traces of mica, pyrite and glauconite. Silty developments are seen throughout the samples.

The limestone is grey to bluish grey and occasionally brownish in colour. The limestone is firm to hard, microcrystalline and argillaceous.

5.8 BÅT GROUP

Tofte Formation

The Tofte Formation consists of sandstone and claystone interbeds with occasional limestone stringers. The sandstone consists of light grey to clear quartz grains in a grey clay matrix. Large amounts of calcite cementation are seen in some of the samples. The grains are fine to medium sized and moderately to well sorted. There is often an abundance of loose, clear, fine to medium quartz grains seen in the samples.

The claystone is moderately to dark brownish grey, firm, platy occasionally blocky. It contains calcite and traces of mica, silt and sand.

The limestone is light grey to blue grey, brown grey on occasions. It is crumbly to firm, hard in places, microcrystalline and locally sacroidal. The limestone is locally very arenaceous and argillaceous grading to cemented sandstones of marly clays.

Tilje Formation

The Tilje Fm consists of sandstone and claystone interbeds with occasional limestone stringers. Occasional carbonaceous layers are observed. These are thin and rarely developed into coal.

The sandstone consists of moderately grey, brownish grey to transparent quartz grains. The grains are very fine to medium and occasionally coarse to very coarse. The sand is moderately sorted, subangular to angular and situated in a light grey clay matrix. Loose clear to translucent quartz grains are frequently observed in the samples.

The claystone is moderately to dark greenish grey, with local traces of bluish grey layers. It is blocky to platy, dominantly non-calcareous but with local occurrences of calcite. Micropyrite and pyritic nodules were also observed in the samples.

The limestone is light grey to bluish grey, brown grey on occasions. It is firm, hard in places, microcrystalline and laminated. The limestone is locally very arenaceous and argillaceous grading to cemented sandstones of marly clays.

Åre Formation

The Åre Formation consists of clean to silty sandstones interbedded with layers of claystone and occasional limestone stringers. The top of the Åre Formation is characterised by thin coal beds.

The sandstone is light grey to off white, frequently light brown and commonly contains loose, clear quartz grains. The sandstone is predominantly fine though occasionally very fine to medium in grain size, it is moderately sorted, subrounded to subangular and non to slightly calcareous. Traces of mica and pyrite are common.

The claystones are dark grey, dark olive grey and dark brownish grey, they are firm, blocky, micro-micaceous, carbonaceous, with a common earthy texture. They slightly to moderately calcareous.

The limestone stringers are white to off white, soft to firm, amorphous to blocky, micritic and argillaceous in part.

TD 3638 m MD / 2922 m TVD RKB / 2898 m TVD MSL

6 Pore Pressure and Hole Stability

6.1 Pore Pressure

6.1.1 *17 ½" section*

This section was drilled with seawater and high viscosity sweeps. The pore pressure in this section is considered to be at or close to hydrostatic.

6.1.2 *12 ¼" section*

The $12 \frac{1}{4}$ " section was drilled using seawater and high viscosity pills down to 1409 m MD where the well was displaced to 1.42 sg OBM. A maximum pore pressure of 1.41 sg EMW was expected at 1926 m TVD MSL. Based on this prognosis the mud was weighed up from 1.42 sg at 1409 m MD to 1.50 sg by 1924 m MD. The mud weight was reduced to 1.48 sg at section TD due to losses thought to be caused by surge effects whilst running casing.

Pore pressure in this section is considered to be as prognosed.

6.1.3 *8 ½" section*

The $8 \frac{1}{2}$ " section was drilled using a 1.20 sg OBM. Gas readings indicate a good overbalance in place whilst drilling through the reservoir and no pressure related problems were encountered in this section.

MDT logs were run in this section, see Chapter 3 Petrophysical Evaluation for more details.

6.2 Formation Strength/Mud Losses

6.2.1 *17 ½" section*

Mud losses to the formation were experienced at 1007 m MD with a mud weight of 1.18 sg. The mud weight was reduced to 1.15 sg and the losses stabilised. The problem continued throughout the section, even when the mud weight was reduced to 1.06 sg. The losses are thought to be due to a previously detected leak in the 20" casing.

6.2.2 *12 ¼" section*

An FIT was performed to 1.58 sg. The FIT was approved.

Mud losses were experienced whilst circulating the 9 5/8" casing prior to cementing. This is thought to be due to surge effects during the latter part of the casing run. No mud losses occurred during drilling of this section.

6.2.3 8 ½" section

No FIT/LOT was taken in this section. No mud losses were experienced in this section.

6.3 Hole Stability

No significant cavings were seen in any sections of this well. A minimal amount of cavings were present in the 12 ¼" section, though were not problematic.

**Geological and Petrophysical
Report**
Norne Field - PL 128
Wells 6608/10-C-4 AH

Doc. no.
RA-U-NOR 0289
Date
4-Oct-04



Rev. no. 21 of 21

App A Final Directional Survey

C4 AH Definitive Survey Survey Report

Report Date:	December 5, 2003
Client:	Statoil
Field:	NORNE
Structure / Slot:	NORNE C Template / Template C Slot #4
Well:	6608/10-C-4 H
Borehole:	C-4 AH
UWI/API#:	
Survey Name / Date:	C4 AH Definitive Survey / December 2, 2003
Tort / AHD / DDI / ERD ratio:	147.104° / 26386377332.81 m / 13.200 / 9029033.549
Grid Coordinate System:	UTM Zone 32 on ED50 Datum
Location Lat/Long:	N 66 0 52.205, E 8 3 21.724
Location Grid N/E Y/X:	N 7322034.167 m, E 457180.081 m
Grid Convergence Angle:	-0.86246542°
Grid Scale Factor:	0.99962244

Survey / DLS Computation Method:	Minimum Curvature / Lubinski
Vertical Section Azimuth:	87.160°
Vertical Section Origin:	N 7.470 m, W 2.520 m
TVD Reference Datum:	Stena Don RKB
TVD Reference Elevation:	24.0 m relative to MSL
Sea Bed / Ground Level Elevation:	-375.000 m relative to MSL
Magnetic Declination:	-0.775°
Total Field Strength:	51900.745 nT
Magnetic Dip:	76.073°
Declination Date:	November 05, 2003
Magnetic Declination Model:	BGGM 2003
North Reference:	Grid North
Total Corr Mag North -> Grid North:	+0.087°
Local Coordinates Referenced To:	Structure Reference Point

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	DLS (deg/30 m)	Northing (m)	Eastng (m)	Latitude	Longitude
"ie-In	0.00	0.00	0.00	0.00	0.00	7.47	-2.52	0.00	7322034.17	457180.08	N 66 0 52.205	E 8 3 21.724
Survey Datum	395.70	0.00	0.00	395.70	0.00	7.47	-2.52	0.00	7322034.17	457180.08	N 66 0 52.205	E 8 3 21.724
	420.00	0.23	344.28	420.00	-0.01	7.52	-2.53	0.28	7322034.21	457180.07	N 66 0 52.206	E 8 3 21.723
	450.00	0.46	25.77	450.00	0.03	7.68	-2.50	0.33	7322034.38	457180.10	N 66 0 52.211	E 8 3 21.726
	480.00	0.85	51.16	480.00	0.27	7.93	-2.27	0.48	7322034.63	457180.33	N 66 0 52.220	E 8 3 21.744
	510.00	0.96	51.17	509.99	0.65	8.23	-1.90	0.11	7322034.93	457180.70	N 66 0 52.229	E 8 3 21.773
	540.00	1.13	48.24	539.99	1.09	8.58	-1.49	0.18	7322035.28	457181.11	N 66 0 52.241	E 8 3 21.805
	570.00	1.39	38.38	569.98	1.56	9.07	-1.04	0.34	7322035.76	457181.56	N 66 0 52.257	E 8 3 21.840
	600.00	2.24	30.69	599.97	2.12	9.85	-0.51	0.88	7322036.55	457182.09	N 66 0 52.282	E 8 3 21.881
	630.00	3.43	34.79	629.93	2.99	11.10	0.30	1.21	7322037.79	457182.90	N 66 0 52.323	E 8 3 21.944
	660.00	5.27	36.48	659.84	4.41	12.94	1.63	1.84	7322039.64	457184.23	N 66 0 52.383	E 8 3 22.047
	690.00	6.28	42.34	689.69	6.45	15.26	3.55	1.17	7322041.96	457186.15	N 66 0 52.459	E 8 3 22.197
	720.00	7.94	50.28	719.46	9.27	17.80	6.25	1.93	7322044.49	457188.85	N 66 0 52.542	E 8 3 22.408
	750.00	9.27	58.74	749.12	13.06	20.38	9.91	1.83	7322047.07	457192.51	N 66 0 52.627	E 8 3 22.695
	780.00	10.91	69.72	778.66	17.89	22.62	14.64	2.52	7322049.31	457197.24	N 66 0 52.702	E 8 3 23.068
	810.00	12.20	80.24	808.05	23.75	24.14	20.43	2.47	7322050.83	457203.02	N 66 0 52.754	E 8 3 23.525
	840.00	14.31	89.33	837.26	30.60	24.72	27.26	2.96	7322051.41	457209.85	N 66 0 52.776	E 8 3 24.066
	870.00	16.32	93.41	866.19	38.50	24.51	35.18	2.28	7322051.20	457217.76	N 66 0 52.773	E 8 3 24.694
	880.00	17.60	93.83	875.75	41.39	24.33	38.09	3.86	7322051.02	457220.67	N 66 0 52.768	E 8 3 24.925
	890.00	18.47	93.76	885.26	44.47	24.12	41.18	2.61	7322050.81	457223.76	N 66 0 52.763	E 8 3 25.171
	900.00	19.42	93.06	894.72	47.70	23.93	44.42	2.93	7322050.62	457227.00	N 66 0 52.759	E 8 3 25.428
	910.00	20.31	91.88	904.13	51.08	23.78	47.81	2.93	7322050.47	457230.40	N 66 0 52.756	E 8 3 25.697
	920.00	20.90	91.10	913.49	54.59	23.69	51.33	1.95	7322050.38	457233.91	N 66 0 52.754	E 8 3 25.976
	930.00	21.36	90.05	922.81	58.19	23.66	54.94	1.79	7322050.35	457237.51	N 66 0 52.755	E 8 3 26.262
	940.00	22.05	88.68	932.10	61.88	23.70	58.63	2.57	7322050.39	457241.21	N 66 0 52.758	E 8 3 26.556
	950.00	22.80	87.29	941.35	65.70	23.83	62.45	2.76	7322050.52	457245.02	N 66 0 52.764	E 8 3 26.858
	960.00	23.75	85.70	950.53	69.65	24.07	66.39	3.42	7322050.77	457248.96	N 66 0 52.774	E 8 3 27.170
	970.00	24.60	84.92	959.66	73.74	24.41	70.47	2.72	7322051.10	457253.04	N 66 0 52.787	E 8 3 27.494
	980.00	25.32	84.63	968.72	77.96	24.79	74.67	2.19	7322051.49	457257.24	N 66 0 52.801	E 8 3 27.827
	990.00	26.23	84.28	977.73	82.30	25.21	79.00	2.77	7322051.91	457261.57	N 66 0 52.817	E 8 3 28.169
	1000.00	27.40	84.19	986.65	86.80	25.67	83.49	3.51	7322052.36	457266.06	N 66 0 52.834	E 8 3 28.525
	1010.00	28.64	84.23	995.48	91.50	26.14	88.16	3.72	7322052.83	457270.73	N 66 0 52.851	E 8 3 28.895
	1020.00	29.71	84.33	1004.21	96.36	26.63	93.01	3.21	7322053.32	457275.58	N 66 0 52.869	E 8 3 29.279
	1030.00	30.91	84.75	1012.85	101.41	27.11	98.04	3.66	7322053.80	457280.60	N 66 0 52.887	E 8 3 29.677
	1040.00	32.02	85.17	1021.37	106.62	27.57	103.24	3.39	7322054.26	457285.80	N 66 0 52.905	E 8 3 30.089
	1050.00	32.89	85.40	1029.81	111.99	28.01	108.58	2.64	7322054.70	457291.14	N 66 0 52.921	E 8 3 30.513
	1060.00	33.37	85.46	1038.19	117.45	28.44	114.03	1.44	7322055.13	457296.59	N 66 0 52.938	E 8 3 30.944
	1070.00	33.82	85.43	1046.52	122.98	28.88	119.55	1.35	7322055.57	457302.10	N 66 0 52.955	E 8 3 31.381
	1080.00	34.80	85.28	1054.78	128.61	29.34	125.17	2.95	7322056.03	457307.72	N 66 0 52.972	E 8 3 31.826
	1090.00	35.35	85.21	1062.96	134.36	29.81	130.89	1.65	7322056.50	457313.44	N 66 0 52.991	E 8 3 32.280
	1100.00	36.16	85.27	1071.08	140.20	30.30	136.72	2.43	7322056.99	457319.26	N 66 0 53.009	E 8 3 32.741
	1110.00	37.13	85.61	1079.10	146.16	30.77	142.67	2.97	7322057.46	457325.21	N 66 0 53.027	E 8 3 33.213
	1120.00	37.83	85.92	1087.03	152.24	31.22	148.73	2.17	7322057.91	457331.28	N 66 0 53.045	E 8 3 33.693
	1130.00	38.64	86.49	1094.89	158.43	31.63	154.91	2.65	7322058.32	457337.45	N 66 0 53.061	E 8 3 34.183
	1140.00	40.08	87.25	1102.62	164.77	31.98	161.24	4.56	7322058.67	457343.78	N 66 0 53.075	E 8 3 34.685
	1150.00	40.97	87.70	1110.22	171.27	32.26	167.73	2.81	7322058.95	457350.27	N 66 0 53.087	E 8 3 35.199
	1160.00	41.70	87.95	1117.73	177.88	32.51	174.33	2.25	7322059.20	457356.87	N 66 0 53.099	E 8 3 35.722
	1170.00	43.02	87.70	1125.12	184.61	32.77	181.07	3.99	7322059.46	457363.60	N 66 0 53.110	E 8 3 36.256
	1180.00	43.59	87.69	1132.40	191.47	33.05	187.92	1.71	7322059.73	457370.45	N 66 0 53.122	E 8 3 36.799
	1190.00	44.10	87.66	1139.61	198.40	33.33	194.84	1.53	7322060.01	457377.37	N 66 0 53.135	E 8 3 37.348
	1200.00	44.52	87.68	1146.76	205.38	33.61	201.82	1.26	7322060.30	457384.34	N 66 0 53.147	E 8 3 37.901
	1210.00	44.99	87.62	1153.87	212.42	33.90	208.85	1.42	7322060.59	457391.38	N 66 0 53.160	E 8 3 38.459
	1220.00	45.32	87.74	1160.92	219.51	34.19	215.94	1.02	7322060.87	457398.46	N 66 0 53.173	E 8 3 39.021
	1230.00	45.77	87.77	1167.92	226.65	34.47	223.07	1.35	7322061.15	457405.59	N 66 0 53.185	E 8 3 39.586
	1240.00	46.14	87.76	1174.87	233.84	34.75	230.25	1.11	7322061.43	457412.77	N 66 0 53.198	E 8 3 40.155
	1250.00	46.44	87.77	1181.78	241.07	35.03	237.48	0.90	7322061.72	457419.99	N 66 0 53.210	E 8 3 40.728
	1260.00	46.58	87.72	1188.67	248.32	35.31	244.73	0.43	7322062.00	457427.23	N 66 0 53.223	E 8 3 41.303

1270.00	46.64	87.59	1195.54	255.59	35.61	251.99	0.34	7322062.30	457434.49	N 66 0 53.236	E 8 3 41.878
1280.00	46.73	87.64	1202.40	262.86	35.91	259.26	0.29	7322062.60	457441.76	N 66 0 53.250	E 8 3 42.455
1290.00	46.82	87.47	1209.24	270.15	36.23	266.54	0.46	7322062.91	457449.04	N 66 0 53.263	E 8 3 43.032
1300.00	46.77	87.06	1216.09	277.44	36.57	273.82	0.91	7322063.26	457456.31	N 66 0 53.278	E 8 3 43.609
1310.00	46.90	86.91	1222.93	284.73	36.96	281.10	0.51	7322063.64	457463.59	N 66 0 53.294	E 8 3 44.186
1320.00	46.93	86.69	1229.76	292.04	37.36	288.39	0.49	7322064.05	457470.88	N 66 0 53.310	E 8 3 44.764
1330.00	46.91	86.56	1236.59	299.34	37.79	295.68	0.29	7322064.48	457478.17	N 66 0 53.328	E 8 3 45.342
1340.00	46.94	86.37	1243.42	306.64	38.24	302.98	0.43	7322064.93	457485.46	N 66 0 53.346	E 8 3 45.920
1350.00	47.01	86.17	1250.25	313.95	38.72	310.27	0.49	7322065.41	457492.75	N 66 0 53.365	E 8 3 46.498
1360.00	47.06	85.87	1257.06	321.27	39.23	317.57	0.68	7322065.91	457500.05	N 66 0 53.385	E 8 3 47.076
1370.00	46.98	85.62	1263.88	328.58	39.77	324.87	0.60	7322066.46	457507.34	N 66 0 53.406	E 8 3 47.654
1380.00	47.08	85.43	1270.69	335.90	40.34	332.16	0.51	7322067.03	457514.64	N 66 0 53.428	E 8 3 48.232
1390.00	47.20	85.15	1277.50	343.22	40.94	339.47	0.71	7322067.63	457521.94	N 66 0 53.451	E 8 3 48.811
1400.00	47.18	84.85	1284.29	350.56	41.58	346.77	0.66	7322068.27	457529.24	N 66 0 53.475	E 8 3 49.390
1410.00	47.30	84.35	1291.08	357.89	42.27	354.08	1.16	7322068.96	457536.55	N 66 0 53.501	E 8 3 49.969
1420.00	47.46	83.97	1297.85	365.24	43.02	361.40	0.97	7322069.71	457543.87	N 66 0 53.528	E 8 3 50.548
1430.00	47.66	83.72	1304.60	372.61	43.81	368.74	0.82	7322070.50	457551.20	N 66 0 53.557	E 8 3 51.129
1440.00	47.81	83.51	1311.33	379.99	44.64	376.10	0.65	7322071.32	457558.55	N 66 0 53.587	E 8 3 51.712
1450.00	47.82	83.49	1318.04	387.39	45.48	383.46	0.05	7322072.16	457565.91	N 66 0 53.618	E 8 3 52.295
1460.00	47.89	83.36	1324.75	394.79	46.33	390.82	0.36	7322073.01	457573.28	N 66 0 53.649	E 8 3 52.878
1470.00	48.03	83.30	1331.45	402.20	47.19	398.20	0.44	7322073.87	457580.65	N 66 0 53.680	E 8 3 53.462
1480.00	48.15	83.23	1338.13	409.62	48.06	405.59	0.39	7322074.74	457588.04	N 66 0 53.712	E 8 3 54.047
1490.00	48.23	83.12	1344.79	417.06	48.95	412.99	0.34	7322075.63	457595.44	N 66 0 53.744	E 8 3 54.633
1500.00	48.13	83.19	1351.46	424.49	49.83	420.39	0.34	7322076.52	457602.83	N 66 0 53.777	E 8 3 55.219
1510.00	47.90	83.61	1358.15	431.91	50.69	427.77	1.16	7322077.37	457610.21	N 66 0 53.808	E 8 3 55.804
1520.00	47.54	84.06	1364.88	439.29	51.48	435.13	1.47	7322078.16	457617.57	N 66 0 53.837	E 8 3 56.386
1530.00	47.11	84.77	1371.66	446.64	52.20	442.45	2.03	7322078.88	457624.88	N 66 0 53.863	E 8 3 56.966
1540.00	46.58	85.52	1378.50	453.93	52.82	449.72	2.29	7322079.50	457632.15	N 66 0 53.887	E 8 3 57.542
1550.00	46.18	86.14	1385.40	461.17	53.34	456.94	1.80	7322080.02	457639.36	N 66 0 53.907	E 8 3 58.114
1560.00	46.23	86.33	1392.32	468.38	53.82	464.14	0.44	7322080.50	457646.56	N 66 0 53.926	E 8 3 58.685
1570.00	46.41	86.40	1399.22	475.61	54.28	471.36	0.56	7322080.96	457653.78	N 66 0 53.944	E 8 3 59.257
1580.00	46.79	86.47	1406.09	482.88	54.73	478.61	1.15	7322081.41	457661.03	N 66 0 53.962	E 8 3 59.831
1590.00	46.97	86.43	1412.93	490.18	55.18	485.89	0.55	7322081.86	457668.31	N 66 0 53.981	E 8 4 0.409
1600.00	47.09	86.35	1419.75	497.49	55.64	493.20	0.40	7322082.32	457675.61	N 66 0 53.999	E 8 4 0.987
1610.00	47.27	86.36	1426.54	504.83	56.11	500.52	0.54	7322082.79	457682.93	N 66 0 54.017	E 8 4 1.567
1620.00	47.32	86.33	1433.33	512.18	56.58	507.85	0.16	7322083.25	457690.26	N 66 0 54.036	E 8 4 2.149
1630.00	47.21	86.45	1440.11	519.52	57.04	515.18	0.42	7322083.72	457697.59	N 66 0 54.055	E 8 4 2.729
1640.00	47.03	86.75	1446.92	526.85	57.47	522.50	0.85	7322084.15	457704.90	N 66 0 54.072	E 8 4 3.309
1650.00	46.72	87.16	1453.75	534.15	57.86	529.78	1.29	7322084.54	457712.18	N 66 0 54.088	E 8 4 3.887
1660.00	46.39	87.65	1460.63	541.41	58.19	537.04	1.46	7322084.87	457719.43	N 66 0 54.102	E 8 4 4.462
1670.00	46.10	88.06	1467.54	548.63	58.46	544.25	1.24	7322085.14	457726.65	N 66 0 54.114	E 8 4 5.034
1680.00	45.94	88.54	1474.49	555.82	58.67	551.45	1.14	7322085.35	457733.84	N 66 0 54.125	E 8 4 5.604
1690.00	45.76	89.23	1481.45	563.00	58.81	558.62	1.58	7322085.49	457741.01	N 66 0 54.133	E 8 4 6.173
1700.00	45.58	89.93	1488.44	570.14	58.86	565.77	1.60	7322085.54	457748.16	N 66 0 54.138	E 8 4 6.740
1710.00	45.52	90.40	1495.44	577.27	58.84	572.91	1.02	7322085.52	457755.30	N 66 0 54.141	E 8 4 7.307
1720.00	45.65	90.67	1502.44	584.40	58.78	580.05	0.70	7322085.46	457762.44	N 66 0 54.142	E 8 4 7.873
1730.00	45.75	90.99	1509.43	591.54	58.67	587.21	0.75	7322085.35	457769.59	N 66 0 54.142	E 8 4 8.441
1740.00	45.87	91.17	1516.40	598.70	58.54	594.38	0.53	7322085.22	457776.76	N 66 0 54.141	E 8 4 9.010
1750.00	46.09	91.41	1523.35	605.87	58.38	601.57	0.84	7322085.05	457783.94	N 66 0 54.139	E 8 4 9.580
1760.00	46.28	91.77	1530.27	613.06	58.18	608.78	0.97	7322084.85	457791.15	N 66 0 54.136	E 8 4 10.153
1770.00	46.42	91.91	1537.17	620.28	57.94	616.01	0.52	7322084.62	457798.38	N 66 0 54.132	E 8 4 10.727
1780.00	46.53	92.15	1544.06	627.50	57.69	623.26	0.62	7322084.37	457805.62	N 66 0 54.127	E 8 4 11.302
1790.00	46.60	92.14	1550.93	634.73	57.42	630.52	0.21	7322084.09	457812.88	N 66 0 54.122	E 8 4 11.878
1800.00	46.80	91.97	1557.79	641.98	57.15	637.79	0.71	7322083.83	457820.15	N 66 0 54.117	E 8 4 12.455
1810.00	46.90	91.74	1564.63	649.26	56.92	645.08	0.59	7322083.60	457827.44	N 66 0 54.113	E 8 4 13.033
1820.00	47.11	91.47	1571.45	656.55	56.71	652.39	0.86	7322083.39	457834.75	N 66 0 54.110	E 8 4 13.614
1830.00	47.24	91.13	1578.25	663.86	56.55	659.73	0.84	7322083.23	457842.08	N 66 0 54.108	E 8 4 14.195
1840.00	47.43	90.70	1585.03	671.20	56.43	667.08	1.11	7322083.11	457849.43	N 66 0 54.108	E 8 4 14.779
1850.00	47.57	90.39	1591.78	678.56	56.36	674.45	0.80	7322083.04	457856.80	N 66 0 54.109	E 8 4 15.364
1860.00	47.67	90.08	1598.52	685.94	56.33	681.84	0.75	7322083.01	457864.18	N 66 0 54.112	E 8 4 15.950
1870.00	47.91	89.73	1605.24	693.34	56.34	689.24	1.06	7322083.02	457871.58	N 66 0 54.116	E 8 4 16.537
1880.00	48.16	89.39	1611.93	700.76	56.40	696.68	1.07	7322083.08	457879.02	N 66 0 54.121	E 8 4 17.127
1890.00	48.33	89.05	1618.59	708.22	56.50	704.14	0.92	7322083.18	457886.47	N 66 0 54.128	E 8 4 17.718
1900.00	48.58	88.72	1625.22	715.70	56.65	711.62	1.05	7322083.32	457893.95	N 66 0 54.136	E 8 4 18.312
1910.00	48.76	88.45	1631.82	723.21	56.83	719.13	0.81	7322083.51	457901.46	N 66 0 54.146	E 8 4 18.907
1920.00	48.95	88.06	1638.40	730.74	57.06	726.65	1.05	7322083.74	457908.98	N 66 0 54.157	E 8 4 19.504
1930.00	49.01	87.91	1644.97	738.28	57.33	734.19	0.38	7322084.00	457916.52	N 66 0 54.169	E 8 4 20.102
1940.00	49.05	87.84	1651.52	745.83	57.61	741.74	0.20	7322084.28	457924.06	N 66 0 54.181	E 8 4 20.700
1950.00	49.09	87.68	1658.07	753.38	57.90	749.29	0.38	7322084.58	457931.61	N 66 0 54.195	E 8 4 21.298
1960.00	49.23	87.64	1664.61	760.95	58.21	756.85	0.43	7322084.89	457939.16	N 66 0 54.208	E 8 4 21.897
1970.00	49.26	87.55	1671.14	768.52	58.53	764.42	0.22	7322085.21	457946.73	N 66 0 54.222	E 8 4 22.497
1980.00	49.15	87.36	1677.68	776.10	58.86	771.98	0.54	7322085.54			

2080.00	47.36	84.92	1744.24	850.70	63.58	846.44	0.93	7322090.25	458028.72	N 66 0 54.424	E 8 4 28.998
2090.00	47.13	84.64	1751.03	858.04	64.24	853.75	0.93	7322090.92	458036.03	N 66 0 54.449	E 8 4 29.577
2100.00	46.74	84.52	1757.86	865.33	64.93	861.03	1.20	7322091.61	458043.30	N 66 0 54.475	E 8 4 30.153
2110.00	46.43	84.34	1764.73	872.59	65.64	868.26	1.01	7322092.31	458050.53	N 66 0 54.501	E 8 4 30.726
2120.00	46.05	84.10	1771.65	879.80	66.37	875.44	1.25	7322093.04	458057.71	N 66 0 54.528	E 8 4 31.295
2130.00	45.67	83.97	1778.61	886.97	67.11	882.58	1.17	7322093.79	458064.85	N 66 0 54.555	E 8 4 31.860
2140.00	45.53	84.00	1785.61	894.10	67.86	889.69	0.42	7322094.53	458071.95	N 66 0 54.583	E 8 4 32.423
2150.00	45.35	84.05	1792.63	901.22	68.60	896.77	0.55	7322095.28	458079.03	N 66 0 54.610	E 8 4 32.984
2160.00	45.24	84.14	1799.66	908.31	69.33	903.84	0.38	7322096.01	458086.10	N 66 0 54.637	E 8 4 33.544
2170.00	45.00	84.31	1806.72	915.39	70.05	910.89	0.81	7322096.72	458093.15	N 66 0 54.664	E 8 4 34.102
2180.00	44.68	84.45	1813.81	922.43	70.74	917.91	1.00	7322097.41	458100.16	N 66 0 54.689	E 8 4 34.658
2190.00	44.46	84.61	1820.93	929.44	71.41	924.90	0.74	7322098.08	458107.15	N 66 0 54.714	E 8 4 35.212
2200.00	44.28	84.85	1828.08	936.43	72.05	931.86	0.74	7322098.72	458114.11	N 66 0 54.738	E 8 4 35.763
2210.00	44.20	85.18	1835.25	943.40	72.65	938.81	0.73	7322099.33	458121.05	N 66 0 54.761	E 8 4 36.314
2220.00	44.25	85.79	1842.41	950.37	73.20	945.76	1.29	7322099.88	458128.00	N 66 0 54.782	E 8 4 36.865
2230.00	44.22	86.45	1849.58	957.35	73.68	952.72	1.38	7322100.35	458134.96	N 66 0 54.801	E 8 4 37.416
2240.00	44.18	87.08	1856.75	964.32	74.07	959.68	1.32	7322100.74	458141.92	N 66 0 54.817	E 8 4 37.968
2250.00	44.19	87.87	1863.92	971.29	74.38	966.65	1.65	7322101.05	458148.88	N 66 0 54.830	E 8 4 38.520
2260.00	44.27	88.53	1871.08	978.26	74.59	973.62	1.40	7322101.27	458155.85	N 66 0 54.840	E 8 4 39.073
2270.00	44.25	89.30	1878.24	985.24	74.73	980.59	1.61	7322101.40	458162.82	N 66 0 54.848	E 8 4 39.626
2280.00	44.42	89.93	1885.40	992.22	74.77	987.58	1.42	7322101.45	458169.81	N 66 0 54.853	E 8 4 40.180
2290.00	44.60	90.23	1892.53	999.22	74.76	994.59	0.83	7322101.44	458176.82	N 66 0 54.856	E 8 4 40.736
2300.00	44.77	90.34	1899.64	1006.24	74.73	1001.63	0.56	7322101.40	458183.85	N 66 0 54.858	E 8 4 41.294
2310.00	44.59	90.41	1906.75	1013.26	74.68	1008.66	0.56	7322101.35	458190.88	N 66 0 54.860	E 8 4 41.852
2320.00	44.70	90.44	1913.86	1020.28	74.63	1015.68	0.34	7322101.30	458197.90	N 66 0 54.861	E 8 4 42.409
2330.00	45.02	90.60	1920.95	1027.32	74.57	1022.74	1.02	7322101.24	458204.95	N 66 0 54.863	E 8 4 42.969
2340.00	45.38	90.96	1928.00	1034.40	74.47	1029.83	1.32	7322101.14	458212.04	N 66 0 54.863	E 8 4 43.532
2350.00	45.80	91.34	1935.00	1041.53	74.33	1036.97	1.50	7322101.00	458219.18	N 66 0 54.862	E 8 4 44.099
2360.00	46.16	91.75	1941.94	1048.70	74.13	1044.16	1.40	7322100.80	458226.37	N 66 0 54.859	E 8 4 44.669
2370.00	46.35	91.91	1948.86	1055.90	73.90	1051.38	0.67	7322100.57	458233.59	N 66 0 54.855	E 8 4 45.242
2380.00	46.68	91.84	1955.74	1063.13	73.66	1058.63	1.00	7322100.34	458240.83	N 66 0 54.851	E 8 4 45.817
2390.00	46.99	91.92	1962.58	1070.40	73.43	1065.92	0.95	7322100.10	458248.12	N 66 0 54.846	E 8 4 46.396
2400.00	47.18	92.07	1969.39	1077.70	73.17	1073.24	0.66	7322099.84	458255.44	N 66 0 54.841	E 8 4 46.977
2410.00	47.50	92.20	1976.17	1085.02	72.90	1080.59	1.00	7322099.57	458262.78	N 66 0 54.836	E 8 4 47.560
2420.00	47.82	92.26	1982.90	1092.39	72.61	1087.98	0.97	7322099.28	458270.17	N 66 0 54.830	E 8 4 48.146
2430.00	48.24	92.18	1989.59	1099.79	72.32	1095.41	1.27	7322098.99	458277.59	N 66 0 54.825	E 8 4 48.736
2440.00	48.55	91.89	1996.23	1107.24	72.06	1102.88	1.13	7322098.73	458285.06	N 66 0 54.820	E 8 4 49.329
2450.00	48.88	91.62	2002.83	1114.73	71.83	1110.39	1.16	7322098.50	458292.57	N 66 0 54.816	E 8 4 49.925
2460.00	49.30	91.45	2009.38	1122.27	71.62	1117.95	1.32	7322098.30	458300.12	N 66 0 54.813	E 8 4 50.525
2470.00	49.68	91.14	2015.87	1129.85	71.45	1125.55	1.34	7322098.12	458307.72	N 66 0 54.811	E 8 4 51.128
2480.00	50.00	90.90	2022.32	1137.48	71.32	1133.19	1.11	7322097.99	458315.36	N 66 0 54.810	E 8 4 51.734
2490.00	50.29	90.48	2028.73	1145.14	71.22	1140.86	1.30	7322097.90	458323.03	N 66 0 54.811	E 8 4 52.343
2500.00	50.54	90.00	2035.10	1152.83	71.19	1148.57	1.34	7322097.86	458330.74	N 66 0 54.813	E 8 4 52.954
2510.00	50.70	89.58	2041.45	1160.56	71.22	1156.30	1.09	7322097.89	458338.46	N 66 0 54.818	E 8 4 53.567
2520.00	50.87	89.23	2047.77	1168.30	71.30	1164.05	0.96	7322097.97	458346.21	N 66 0 54.824	E 8 4 54.182
2530.00	51.04	88.83	2054.07	1176.06	71.43	1171.81	1.06	7322098.10	458353.97	N 66 0 54.832	E 8 4 54.798
2540.00	50.98	88.64	2060.36	1183.83	71.60	1179.58	0.48	7322098.28	458361.74	N 66 0 54.841	E 8 4 55.414
2550.00	50.83	88.43	2066.67	1191.59	71.80	1187.34	0.66	7322098.47	458369.49	N 66 0 54.851	E 8 4 56.029
2560.00	50.73	88.03	2072.99	1199.33	72.04	1195.09	0.98	7322098.71	458377.23	N 66 0 54.863	E 8 4 56.643
2570.00	50.68	87.69	2079.32	1207.07	72.33	1202.82	0.80	7322099.00	458384.97	N 66 0 54.876	E 8 4 57.256
2580.00	50.60	87.42	2085.66	1214.80	72.66	1210.54	0.67	7322099.33	458392.69	N 66 0 54.890	E 8 4 57.868
2590.00	50.51	87.16	2092.02	1222.53	73.02	1218.26	0.66	7322099.70	458400.40	N 66 0 54.905	E 8 4 58.480
2600.00	50.46	86.95	2098.38	1230.24	73.42	1225.96	0.51	7322100.09	458408.10	N 66 0 54.922	E 8 4 59.090
2610.00	50.34	86.78	2104.76	1237.95	73.84	1233.66	0.53	7322100.51	458415.79	N 66 0 54.939	E 8 4 59.700
2620.00	50.14	86.67	2111.15	1245.63	74.28	1241.33	0.65	7322100.95	458423.46	N 66 0 54.957	E 8 5 0.308
2630.00	49.83	86.60	2117.58	1253.29	74.73	1248.98	0.94	7322101.40	458431.10	N 66 0 54.975	E 8 5 0.914
2640.00	49.42	86.53	2124.06	1260.91	75.19	1256.58	1.24	7322101.86	458438.71	N 66 0 54.993	E 8 5 1.517
2650.00	49.01	86.47	2130.59	1268.48	75.65	1264.14	1.24	7322102.32	458446.26	N 66 0 55.012	E 8 5 2.116
2660.00	48.72	86.40	2137.17	1276.01	76.12	1271.66	0.88	7322102.79	458453.77	N 66 0 55.030	E 8 5 2.712
2670.00	48.47	86.40	2143.78	1283.51	76.59	1279.14	0.75	7322103.26	458461.26	N 66 0 55.049	E 8 5 3.305
2680.00	48.22	86.33	2150.43	1290.98	77.06	1286.60	0.77	7322103.73	458468.71	N 66 0 55.068	E 8 5 3.896
2690.00	47.95	86.19	2157.11	1298.42	77.55	1294.02	0.87	7322104.22	458476.13	N 66 0 55.087	E 8 5 4.484
2700.00	47.63	86.13	2163.83	1305.83	78.04	1301.41	0.97	7322104.71	458483.52	N 66 0 55.107	E 8 5 5.070
2710.00	47.33	86.11	2170.59	1313.20	78.54	1308.77	0.90	7322105.21	458490.87	N 66 0 55.126	E 8 5 5.653
2720.00	47.09	85.99	2177.38	1320.53	79.05	1316.09	0.77	7322105.72	458498.19	N 66 0 55.146	E 8 5 6.233
2730.00	46.92	85.86	2184.20	1327.85	79.57	1323.38	0.58	7322106.24	458505.48	N 66 0 55.166	E 8 5 6.811
2740.00	46.78	85.73	2191.04	1335.14	80.10	1330.66	0.51	7322106.77	458512.76	N 66 0 55.187	E 8 5 7.388
2750.00	46.52	85.56	2197.90	1342.41	80.65	1337.91	0.86	7322107.32	458520.00	N 66 0 55.208	E 8 5 7.962
2760.00	46.25	85.51	2204.80	1349.65	81.22	1345.13	0.82	7322107.89	458527.22	N 66 0 55.230	E 8 5 8.534
2770.00	46.11	85.52	2211.72	1356.86	81.78	1352.32	0.42	7322108.45	458534.41	N 66 0 55.251	E 8 5 9.104
2780.00	45.94	85.45	2218.67	1364.05	82.35	1359.50	0.53	7322109.02	458541.58	N 66 0 55.273	E 8 5 9.672
2											

2890.00	45.37	87.61	2295.84	1442.42	87.62	1437.70	0.62	7322114.29	458619.75	N 66 0 55.480	E 8 5 15.869	
2900.00	45.33	88.01	2302.87	1449.53	87.90	1444.81	0.86	7322114.56	458626.86	N 66 0 55.492	E 8 5 16.433	
2910.00	45.35	88.59	2309.90	1456.65	88.11	1451.92	1.24	7322114.77	458633.97	N 66 0 55.502	E 8 5 16.997	
2920.00	45.40	89.10	2316.92	1463.76	88.25	1459.03	1.10	7322114.92	458641.08	N 66 0 55.510	E 8 5 17.561	
2930.00	45.29	89.52	2323.95	1470.87	88.34	1466.14	0.96	7322115.00	458648.19	N 66 0 55.516	E 8 5 18.125	
2940.00	45.12	89.96	2331.00	1477.96	88.37	1473.24	1.07	7322115.04	458655.28	N 66 0 55.521	E 8 5 18.688	
2950.00	45.08	90.43	2338.05	1485.03	88.34	1480.32	1.01	7322115.01	458662.37	N 66 0 55.523	E 8 5 19.250	
2960.00	45.13	90.82	2345.11	1492.10	88.27	1487.41	0.84	7322114.93	458669.45	N 66 0 55.524	E 8 5 19.812	
2970.00	45.22	90.95	2352.16	1499.18	88.16	1494.50	0.39	7322114.82	458676.54	N 66 0 55.524	E 8 5 20.374	
2980.00	45.60	90.30	2359.18	1506.29	88.08	1501.62	1.80	7322114.75	458683.65	N 66 0 55.525	E 8 5 20.939	
2990.00	46.12	89.11	2366.15	1513.46	88.12	1508.80	3.00	7322114.78	458690.83	N 66 0 55.529	E 8 5 21.509	
3000.00	46.67	87.60	2373.04	1520.70	88.33	1516.03	3.67	7322114.99	458698.06	N 66 0 55.539	E 8 5 22.082	
3010.00	47.19	85.94	2379.87	1528.00	88.74	1523.33	3.96	7322115.40	458705.35	N 66 0 55.556	E 8 5 22.660	
3020.00	47.59	84.35	2386.64	1535.35	89.36	1530.66	3.71	7322116.03	458712.68	N 66 0 55.580	E 8 5 23.241	
3030.00	47.85	83.19	2393.37	1542.74	90.16	1538.02	2.69	7322116.83	458720.03	N 66 0 55.609	E 8 5 23.824	
3040.00	48.02	81.86	2400.07	1550.14	91.13	1545.38	3.01	7322117.80	458727.39	N 66 0 55.644	E 8 5 24.407	
3050.00	48.13	80.32	2406.75	1557.54	92.28	1552.73	3.45	7322118.95	458734.74	N 66 0 55.684	E 8 5 24.988	
3060.00	48.00	78.80	2413.43	1564.91	93.63	1560.04	3.41	7322120.29	458742.05	N 66 0 55.731	E 8 5 25.567	
3070.00	47.65	76.97	2420.15	1572.22	95.19	1567.29	4.20	7322121.85	458749.29	N 66 0 55.785	E 8 5 26.140	
3080.00	47.16	74.93	2426.92	1579.44	96.97	1574.43	4.74	7322123.63	458756.43	N 66 0 55.846	E 8 5 26.704	
3090.00	46.81	73.05	2433.74	1586.56	98.99	1581.45	4.26	7322125.65	458763.46	N 66 0 55.914	E 8 5 27.259	
3100.00	46.41	71.24	2440.61	1593.58	101.22	1588.37	4.12	7322127.88	458770.37	N 66 0 55.989	E 8 5 27.806	
3110.00	45.92	69.54	2447.54	1600.49	103.64	1595.17	3.96	7322130.30	458777.16	N 66 0 56.071	E 8 5 28.342	
3120.00	45.18	68.70	2454.54	1607.28	106.18	1601.84	2.86	7322132.84	458783.83	N 66 0 56.156	E 8 5 28.868	
3130.00	43.86	68.85	2461.67	1613.93	108.72	1608.37	3.97	7322135.38	458790.36	N 66 0 56.241	E 8 5 29.383	
3140.00	42.40	69.40	2468.97	1620.43	111.15	1614.76	4.52	7322137.81	458796.75	N 66 0 56.322	E 8 5 29.887	
3150.00	40.95	70.21	2476.44	1626.78	113.45	1621.00	4.64	7322140.11	458802.99	N 66 0 56.400	E 8 5 30.380	
3160.00	39.56	70.99	2484.07	1632.97	115.60	1627.09	4.44	7322142.25	458809.08	N 66 0 56.472	E 8 5 30.861	
3170.00	38.09	71.83	2491.86	1639.00	117.60	1633.03	4.68	7322144.25	458815.02	N 66 0 56.539	E 8 5 31.330	
3180.00	36.66	72.71	2499.80	1644.87	119.45	1638.82	4.58	7322146.10	458820.80	N 66 0 56.601	E 8 5 31.786	
3190.00	35.26	73.61	2507.90	1650.57	121.15	1644.44	4.49	7322147.80	458826.42	N 66 0 56.659	E 8 5 32.230	
3200.00	33.81	74.60	2516.14	1656.09	122.70	1649.89	4.66	7322149.35	458831.87	N 66 0 56.712	E 8 5 32.661	
3210.00	32.34	75.64	2524.52	1661.42	124.10	1655.16	4.73	7322150.76	458837.14	N 66 0 56.759	E 8 5 33.077	
3220.00	30.76	76.68	2533.04	1666.56	125.36	1660.24	5.01	7322152.01	458842.21	N 66 0 56.802	E 8 5 33.479	
3230.00	29.15	78.11	2541.70	1671.48	126.45	1665.11	5.28	7322153.10	458847.09	N 66 0 56.840	E 8 5 33.864	
3240.00	27.68	79.68	2550.50	1676.19	127.36	1669.78	4.95	7322154.02	458851.75	N 66 0 56.871	E 8 5 34.233	
3250.00	26.59	81.34	2559.40	1680.72	128.12	1674.28	3.98	7322154.77	458865.25	N 66 0 56.898	E 8 5 34.589	
3260.00	25.64	83.37	2568.37	1685.10	128.70	1678.64	3.91	7322155.36	458860.61	N 66 0 56.919	E 8 5 34.935	
3270.00	24.78	85.54	2577.42	1689.36	129.12	1682.88	3.79	7322155.77	458864.85	N 66 0 56.934	E 8 5 35.270	
3280.00	24.05	87.73	2586.53	1693.49	129.36	1687.01	3.49	7322156.01	458868.97	N 66 0 56.944	E 8 5 35.597	
3290.00	23.70	88.94	2595.67	1697.54	129.48	1691.05	1.81	7322156.13	458873.01	N 66 0 56.950	E 8 5 35.918	
3293.89	23.58	89.56	2599.24	1699.10	129.50	1692.61	2.13	7322156.15	458874.57	N 66 0 56.951	E 8 5 36.042	
3300.90	23.21	88.80	2605.67	1701.88	129.54	1695.39	2.04	7322156.19	458877.35	N 66 0 56.954	E 8 5 36.262	
3328.02	21.89	87.96	2630.72	1712.27	129.83	1705.79	1.50	7322156.48	458887.75	N 66 0 56.968	E 8 5 37.087	
3382.54	20.20	87.78	2681.60	1731.85	130.56	1725.35	0.93	7322157.21	458907.30	N 66 0 57.000	E 8 5 38.638	
3410.03	20.22	87.50	2707.40	1741.35	130.95	1734.84	0.11	7322157.60	458916.79	N 66 0 57.018	E 8 5 39.390	
3439.16	19.54	87.98	2734.79	1751.25	131.34	1744.74	0.72	7322157.99	458926.68	N 66 0 57.035	E 8 5 40.175	
3495.17	19.94	88.62	2787.51	1770.17	131.90	1763.65	0.24	7322158.55	458945.58	N 66 0 57.062	E 8 5 41.674	
3556.02	20.07	88.01	2844.69	1790.98	132.51	1784.46	0.12	7322159.16	458966.38	N 66 0 57.091	E 8 5 43.324	
ection to TD	3638.75	20.07	88.01	2922.39	1819.37	133.50	1812.83	0.00	7322160.15	458994.75	N 66 0 57.136	E 8 5 45.573

Survey Type: Definitive Survey

Survey Error Model: SLB ISCWSA version 16 *** 2-D 95.00% Confidence 2.4477 sigma

Surveying Prog:

<u>MD From (m)</u>	<u>MD To (m)</u>	<u>EOU Freq</u>	<u>Survey Tool Type</u>
0.00	0.00	Act-Stns	SLB_UNKNOWN (default tool used)
0.00	395.70	Act-Stns	SLB_ZERO
395.70	3293.89	Act-Stns	SLB_NS+MSHOT
3293.89	3556.02	Act-Stns	SLB_MWD+SAG
3556.02	3638.75	Act-Stns	SLB_BLIND

C-4 AH Definitive Survey Survey Report

Report Date:	December 5, 2003	Survey / DLS Computation Method:	Minimum Curvature / Lubinski
Client:	Statoil	Vertical Section Azimuth:	87.160°
Field:	NORNE	Vertical Section Origin:	N 7.470 m, W 2.520 m
Structure / Slot:	NORNE C Template / Template C Slot #4	TVD Reference Datum:	Stena Don RKB
Well:	6608/10-C-4 H	TVD Reference Elevation:	24.0 m relative to MSL
Borehole:	C-4 AH	Sea Bed / Ground Level Elevation:	-375.000 m relative to MSL
UWI/API#:		Magnetic Declination:	-0.775°
Survey Name / Date:	C4 AH Definitive Survey / December 2, 2003	Total Field Strength:	51900.745 nT
Tort / AHD / DDI / ERD ratio:	147.104° / 26386377332.81 m / 13.200 / 9029033.549	Magnetic Dip:	76.073°
Grid Coordinate System:	UTM Zone 32 on ED50 Datum	Declination Date:	November 05, 2003
Location Lat/Long:	N 66 0 52.205, E 8 3 21.724	Magnetic Declination Model:	BGGM 2003
Location Grid N/E Y/X:	N 7322034.167 m, E 457180.081 m	North Reference:	Grid North
Grid Convergence Angle:	-0.86246542°	Total Corr Mag North → Grid North:	+0.087°
Grid Scale Factor:	0.99962244	Local Coordinates Referenced To:	Structure Reference Point

Comments	Measured Depth (m)	Inclination (deg)	Azimuth (deg)	TVD (m)	Vertical Section (m)	NS (m)	EW (m)	Closure (m)	Closure Azimuth (deg)	DLS (deg/30 m)	Tool Face (deg)
Tie-In	0.00	0.00	0.00	0.00	0.00	7.47	-2.52	0.00	341.36	0.00	0.00M
Survey Datum	395.70	0.00	0.00	395.70	0.00	7.47	-2.52	0.00	341.36	0.00	-15.72M
	420.00	0.23	344.28	420.00	-0.01	7.52	-2.53	0.05	341.38	0.28	25.77M
	450.00	0.46	25.77	450.00	0.03	7.68	-2.50	0.21	342.00	0.33	51.16M
	480.00	0.85	51.16	480.00	0.27	7.93	-2.27	0.52	344.02	0.48	51.17M
	510.00	0.96	51.17	509.99	0.65	8.23	-1.90	0.98	346.98	0.11	48.24M
	540.00	1.13	48.24	539.99	1.09	8.58	-1.49	1.52	350.18	0.18	38.38M
	570.00	1.39	38.38	569.98	1.56	9.07	-1.04	2.18	353.46	0.34	30.69M
	600.00	2.24	30.69	599.97	2.12	9.85	-0.51	3.12	357.01	0.88	34.79M
	630.00	3.43	34.79	629.93	2.99	11.10	0.30	4.59	1.53	1.21	36.48M
	660.00	5.27	36.48	659.84	4.41	12.94	1.63	6.87	7.17	1.84	33.21G
	690.00	6.28	42.34	689.69	6.45	15.26	3.55	9.88	13.10	1.17	34.61G
	720.00	7.94	50.28	719.46	9.27	17.80	6.25	13.55	19.35	1.93	47.82G
	750.00	9.27	58.74	749.12	13.06	20.38	9.91	17.92	25.94	1.83	55.04G
	780.00	10.91	69.72	778.66	17.89	22.62	14.64	22.89	32.92	2.52	63.75G
	810.00	12.20	80.24	808.05	23.75	24.14	20.43	28.36	40.24	2.47	49.13G
	840.00	14.31	89.33	837.26	30.60	24.72	27.26	34.42	47.80	2.96	30.18G
	870.00	16.32	93.41	866.19	38.50	24.51	35.18	41.37	55.13	2.28	5.67G
	880.00	17.60	93.83	875.75	41.39	24.33	38.09	43.97	57.43	3.86	-1.46G
	890.00	18.47	93.76	885.26	44.47	24.12	41.18	46.76	59.64	2.61	-13.79G
	900.00	19.42	93.06	894.72	47.70	23.93	44.42	49.74	61.69	2.93	-24.81G
	910.00	20.31	91.88	904.13	51.08	23.78	47.81	52.91	63.55	2.93	-25.32G
	920.00	20.90	91.10	913.49	54.59	23.69	51.33	56.24	65.22	1.95	-39.94G
	930.00	21.36	90.05	922.81	58.19	23.66	54.94	59.69	66.70	1.79	-36.93G
	940.00	22.05	88.68	932.10	61.88	23.70	58.63	63.27	67.99	2.57	-35.90G
	950.00	22.80	87.29	941.35	65.70	23.83	62.45	66.99	69.11	2.76	-34.21G
	960.00	23.75	85.70	950.53	69.65	24.07	66.39	70.88	70.07	3.42	-20.95G
	970.00	24.60	84.92	959.66	73.74	24.41	70.47	74.93	70.89	2.72	-9.78G
	980.00	25.32	84.63	968.72	77.96	24.79	74.67	79.11	71.63	2.19	-9.65G
	990.00	26.23	84.28	977.73	82.30	25.21	79.00	83.43	72.30	2.77	-2.03G
	1000.00	27.40	84.19	986.65	86.80	25.67	83.49	87.91	72.91	3.51	0.89G
	1010.00	28.64	84.23	995.48	91.50	26.14	88.16	92.58	73.48	3.72	2.65G
	1020.00	29.71	84.33	1004.21	96.36	26.63	93.01	97.43	74.02	3.21	10.20G
	1030.00	30.91	84.75	1012.85	101.41	27.11	98.04	102.46	74.54	3.66	11.35G
	1040.00	32.02	85.17	1021.37	106.62	27.57	103.24	107.65	75.05	3.39	8.17G
	1050.00	32.89	85.40	1029.81	111.99	28.01	108.58	112.99	75.54	2.64	3.93G
	1060.00	33.37	85.46	1038.19	117.45	28.44	114.03	118.42	75.99	1.44	-2.12G
	1070.00	33.82	85.43	1046.52	122.98	28.88	119.55	123.93	76.42	1.35	-4.99G
	1080.00	34.80	85.28	1054.78	128.61	29.34	125.17	129.55	76.81	2.95	-4.21G
	1090.00	35.35	85.21	1062.96	134.36	29.81	130.89	135.27	77.17	1.65	2.50G
	1100.00	36.16	85.27	1071.08	140.20	30.30	136.72	141.10	77.50	2.43	11.95G
	1110.00	37.13	85.61	1079.10	146.16	30.77	142.67	147.04	77.83	2.97	15.20G
	1120.00	37.83	85.92	1087.03	152.24	31.22	148.73	153.11	78.14	2.17	23.76G
	1130.00	38.64	86.49	1094.89	158.43	31.63	154.91	159.27	78.46	2.65	18.80G
	1140.00	40.08	87.25	1102.62	164.77	31.98	161.24	165.58	78.78	4.56	18.36G
	1150.00	40.97	87.70	1110.22	171.27	32.26	167.73	172.05	79.11	2.81	12.84G
	1160.00	41.70	87.95	1117.73	177.88	32.51	174.33	178.62	79.44	2.25	-7.36G
	1170.00	43.02	87.70	1125.12	184.61	32.77	181.07	185.32	79.74	3.99	-0.69G
	1180.00	43.59	87.69	1132.40	191.47	33.05	187.92	192.15	80.03	1.71	-2.34G
	1190.00	44.10	87.66	1139.61	198.40	33.33	194.84	199.05	80.29	1.53	1.91G
	1200.00	44.52	87.68	1146.76	205.38	33.61	201.82	206.00	80.54	1.26	-5.16G
	1210.00	44.99	87.62	1153.87	212.42	33.90	208.85	213.02	80.78	1.42	14.50G
	1220.00	45.32	87.74	1160.92	219.51	34.19	215.94	220.09	81.00	1.02	2.73G
	1230.00	45.77	87.77	1167.92	226.65	34.47	223.07	227.20	81.22	1.35	-1.12G

1240.00	46.14	87.76	1174.87	233.84	34.75	230.25	234.37	81.42	1.11	1.38G
1250.00	46.44	87.77	1181.78	241.07	35.03	237.48	241.57	81.61	0.90	-14.54G
1260.00	46.58	87.72	1188.67	248.32	35.31	244.73	248.81	81.79	0.43	-57.63G
1270.00	46.64	87.59	1195.54	255.59	35.61	251.99	256.06	81.96	0.34	22.03G
1280.00	46.73	87.64	1202.40	262.86	35.91	259.26	263.32	82.11	0.29	-54.06G
1290.00	46.82	87.47	1209.24	270.15	36.23	266.54	270.59	82.26	0.46	-99.64G
1300.00	46.77	87.06	1216.09	277.44	36.57	273.82	277.87	82.39	0.91	-40.13G
1310.00	46.90	86.91	1222.93	284.73	36.96	281.10	285.15	82.51	0.51	-79.50G
1320.00	46.93	86.69	1229.76	292.04	37.36	288.39	292.44	82.62	0.49	-101.94G
1330.00	46.91	86.56	1236.59	299.34	37.79	295.68	299.74	82.72	0.29	-77.87G
1340.00	46.94	86.37	1243.42	306.64	38.24	302.98	307.04	82.81	0.43	-64.49G
1350.00	47.01	86.17	1250.25	313.95	38.72	310.27	314.35	82.89	0.49	-77.27G
1360.00	47.06	85.87	1257.06	321.27	39.23	317.57	321.66	82.96	0.68	-113.71G
1370.00	46.98	85.62	1263.88	328.58	39.77	324.87	328.98	83.02	0.60	-54.34G
1380.00	47.08	85.43	1270.69	335.90	40.34	332.16	336.29	83.08	0.51	-59.78G
1390.00	47.20	85.15	1277.50	343.22	40.94	339.47	343.62	83.12	0.71	-95.29G
1400.00	47.18	84.85	1284.29	350.56	41.58	346.77	350.96	83.16	0.66	-72.07G
1410.00	47.30	84.35	1291.08	357.89	42.27	354.08	358.30	83.19	1.16	-60.35G
1420.00	47.46	83.97	1297.85	365.24	43.02	361.40	365.66	83.21	0.97	-42.78G
1430.00	47.66	83.72	1304.60	372.61	43.81	368.74	373.04	83.22	0.82	-46.08G
1440.00	47.81	83.51	1311.33	379.99	44.64	376.10	380.44	83.23	0.65	-56.01G
1450.00	47.82	83.49	1318.04	387.39	45.48	383.46	387.84	83.24	0.05	-54.05G
1460.00	47.89	83.36	1324.75	394.79	46.33	390.82	395.26	83.24	0.36	-17.68G
1470.00	48.03	83.30	1331.45	402.20	47.19	398.20	402.68	83.24	0.44	-23.49G
1480.00	48.15	83.23	1338.13	409.62	48.06	405.59	410.12	83.24	0.39	-45.74G
1490.00	48.23	83.12	1344.79	417.06	48.95	412.99	417.58	83.24	0.34	152.47G
1500.00	48.13	83.19	1351.46	424.49	49.83	420.39	425.03	83.24	0.34	126.52G
1510.00	47.90	83.61	1358.15	431.91	50.69	427.77	432.46	83.24	1.16	137.39G
1520.00	47.54	84.06	1364.88	439.29	51.48	435.13	439.86	83.25	1.47	129.72G
1530.00	47.11	84.77	1371.66	446.64	52.20	442.45	447.21	83.27	2.03	134.34G
1540.00	46.58	85.52	1378.50	453.93	52.82	449.72	454.50	83.30	2.29	131.92G
1550.00	46.18	86.14	1385.40	461.17	53.34	456.94	461.74	83.34	1.80	70.04G
1560.00	46.23	86.33	1392.32	468.38	53.82	464.14	468.96	83.39	0.44	15.73G
1570.00	46.41	86.40	1399.22	475.61	54.28	471.36	476.18	83.43	0.56	7.65G
1580.00	46.79	86.47	1406.09	482.88	54.73	478.61	483.44	83.48	1.15	-9.23G
1590.00	46.97	86.43	1412.93	490.18	55.18	485.89	490.74	83.52	0.55	-26.03G
1600.00	47.09	86.35	1419.75	497.49	55.64	493.20	498.05	83.56	0.40	2.34G
1610.00	47.27	86.36	1426.54	504.83	56.11	500.52	505.38	83.60	0.54	-23.80G
1620.00	47.32	86.33	1433.33	512.18	56.58	507.85	512.73	83.64	0.16	141.34G
1630.00	47.21	86.45	1440.11	519.52	57.04	515.18	520.07	83.68	0.42	129.41G
1640.00	47.03	86.75	1446.92	526.85	57.47	522.50	527.39	83.72	0.85	136.15G
1650.00	46.72	87.16	1453.75	534.15	57.86	529.78	534.68	83.77	1.29	133.02G
1660.00	46.39	87.65	1460.63	541.41	58.19	537.04	541.93	83.82	1.46	134.54G
1670.00	46.10	88.06	1467.54	548.63	58.46	544.25	549.15	83.87	1.24	115.02G
1680.00	45.94	88.54	1474.49	555.82	58.67	551.45	556.33	83.93	1.14	110.22G
1690.00	45.76	89.23	1481.45	563.00	58.81	558.62	563.48	83.99	1.58	110.02G
1700.00	45.58	89.93	1488.44	570.14	58.86	565.77	570.61	84.06	1.60	100.30G
1710.00	45.52	90.40	1495.44	577.27	58.84	572.91	577.72	84.14	1.02	56.11G
1720.00	45.65	90.67	1502.44	584.40	58.78	580.05	584.83	84.21	0.70	66.52G
1730.00	45.75	90.99	1509.43	591.54	58.67	587.21	591.95	84.29	0.75	47.15G
1740.00	45.87	91.17	1516.40	598.70	58.54	594.38	599.08	84.38	0.53	38.20G
1750.00	46.09	91.41	1523.35	605.87	58.38	601.57	606.23	84.46	0.84	53.94G
1760.00	46.28	91.77	1530.27	613.06	58.18	608.78	613.40	84.54	0.97	35.94G
1770.00	46.42	91.91	1537.17	620.28	57.94	616.01	620.59	84.63	0.52	57.78G
1780.00	46.53	92.15	1544.06	627.50	57.69	623.26	627.79	84.71	0.62	-5.93G
1790.00	46.60	92.14	1550.93	634.73	57.42	630.52	635.00	84.80	0.21	-31.80G
1800.00	46.80	91.97	1557.79	641.98	57.15	637.79	642.23	84.88	0.71	-59.29G
1810.00	46.90	91.74	1564.63	649.26	56.92	645.08	649.49	84.96	0.59	-43.33G
1820.00	47.11	91.47	1571.45	656.55	56.71	652.39	656.76	85.03	0.86	-62.58G
1830.00	47.24	91.13	1578.25	663.86	56.55	659.73	664.06	85.10	0.84	-59.14G
1840.00	47.43	90.70	1585.03	671.20	56.43	667.08	671.38	85.16	1.11	-58.62G
1850.00	47.57	90.39	1591.78	678.56	56.36	674.45	678.73	85.22	0.80	-66.51G
1860.00	47.67	90.08	1598.52	685.94	56.33	681.84	686.10	85.28	0.75	-47.32G
1870.00	47.91	89.73	1605.24	693.34	56.34	689.24	693.49	85.33	1.06	-45.43G
1880.00	48.16	89.39	1611.93	700.76	56.40	696.68	700.91	85.37	1.07	-56.28G
1890.00	48.33	89.05	1618.59	708.22	56.50	704.14	708.36	85.41	0.92	-44.76G
1900.00	48.58	88.72	1625.22	715.70	56.65	711.62	715.83	85.45	1.05	-48.49G
1910.00	48.76	88.45	1631.82	723.21	56.83	719.13	723.33	85.48	0.81	-57.23G
1920.00	48.95	88.06	1638.40	730.74	57.06	726.65	730.86	85.51	1.05	-62.12G
1930.00	49.01	87.91	1644.97	738.28	57.33	734.19	738.40	85.54	0.38	-52.91G
1940.00	49.05	87.84	1651.52	745.83	57.61	741.74	745.95	85.56	0.20	-71.74G
1950.00	49.09	87.68	1658.07	753.38	57.90	749.29	753.50	85.58	0.38	-12.21G
1960.00	49.23	87.64	1664.61	760.95	58.21	756.85	761.06	85.60	0.43	-66.28G
1970.00	49.26	87.55	1671.14	768.52	58.53	764.42	768.63	85.62	0.22	-127.47G
1980.00	49.15	87.36	1677.68	776.10	58.86	771.98	776.20	85.64	0.54	-90.00G
1990.00	49.15	87.28	1684.22	783.66	59.22	779.54	783.77	85.66	0.18	-147.59G
2000.00	48.96	87.12	1690.77	791.21	59.59	787.08	791.32	85.67	0.68	-159.01G
2010.00	48.55	86.91	1697.36	798.73	59.98	794.59	798.84	85.68	1.32	-141.32G
2020.00	48.28	86.62	1704.00	806.21	60.40	802.06	806.32	85.69	1.04	-118.27G

2030.00	48.20	86.42	1710.66	813.67	60.85	809.50	813.78	85.70	0.51	-123.93G
2040.00	48.11	86.24	1717.33	821.12	61.33	816.94	821.23	85.71	0.48	-135.33G
2050.00	47.93	86.00	1724.02	828.55	61.83	824.35	828.66	85.71	0.76	-140.41G
2060.00	47.68	85.72	1730.74	835.96	62.37	831.74	836.07	85.71	0.97	-118.31G
2070.00	47.51	85.29	1737.48	843.34	62.95	839.10	843.45	85.71	1.08	-118.95G
2080.00	47.36	84.92	1744.24	850.70	63.58	846.44	850.81	85.70	0.93	-138.30G
2090.00	47.13	84.64	1751.03	858.04	64.24	853.75	858.15	85.70	0.93	-167.37G
2100.00	46.74	84.52	1757.86	865.33	64.93	861.03	865.46	85.69	1.20	-157.19G
2110.00	46.43	84.34	1764.73	872.59	65.64	868.26	872.72	85.68	1.01	-155.56G
2120.00	46.05	84.10	1771.65	879.80	66.37	875.44	879.94	85.66	1.25	-166.25G
2130.00	45.67	83.97	1778.61	886.97	67.11	882.58	887.11	85.65	1.17	171.31G
2140.00	45.53	84.00	1785.61	894.10	67.86	889.69	894.25	85.64	0.42	168.82G
2150.00	45.35	84.05	1792.63	901.22	68.60	896.77	901.37	85.63	0.55	149.85G
2160.00	45.24	84.14	1799.66	908.31	69.33	903.84	908.47	85.61	0.38	153.41G
2170.00	45.00	84.31	1806.72	915.39	70.05	910.89	915.55	85.60	0.81	162.90G
2180.00	44.68	84.45	1813.81	922.43	70.74	917.91	922.60	85.59	1.00	153.02G
2190.00	44.46	84.61	1820.93	929.44	71.41	924.90	929.62	85.59	0.74	137.09G
2200.00	44.28	84.85	1828.08	936.43	72.05	931.86	936.61	85.58	0.74	109.28G
2210.00	44.20	85.18	1835.25	943.40	72.65	938.81	943.58	85.57	0.73	83.52G
2220.00	44.25	85.79	1842.41	950.37	73.20	945.76	950.56	85.57	1.29	93.96G
2230.00	44.22	86.45	1849.58	957.35	73.68	952.72	957.53	85.58	1.38	95.43G
2240.00	44.18	87.08	1856.75	964.32	74.07	959.68	964.50	85.59	1.32	89.24G
2250.00	44.19	87.87	1863.92	971.29	74.38	966.65	971.47	85.60	1.65	80.38G
2260.00	44.27	88.53	1871.08	978.26	74.59	973.62	978.44	85.62	1.40	92.41G
2270.00	44.25	89.30	1878.24	985.24	74.73	980.59	985.41	85.64	1.61	69.11G
2280.00	44.42	89.93	1885.40	992.22	74.77	987.58	992.39	85.67	1.42	49.55G
2290.00	44.60	90.23	1892.53	999.22	74.76	994.59	999.38	85.70	0.83	24.50G
2300.00	44.77	90.34	1899.64	1006.24	74.73	1001.63	1006.40	85.73	0.56	164.73G
2310.00	44.59	90.41	1906.75	1013.26	74.68	1008.66	1013.41	85.77	0.56	10.86G
2320.00	44.70	90.44	1913.86	1020.28	74.63	1015.68	1020.42	85.80	0.34	19.48G
2330.00	45.02	90.60	1920.95	1027.32	74.57	1022.74	1027.45	85.83	1.02	35.49G
2340.00	45.38	90.96	1928.00	1034.40	74.47	1029.83	1034.52	85.86	1.32	-33.01G
2350.00	45.80	91.34	1935.00	1041.53	74.33	1036.97	1041.64	85.90	1.50	39.46G
2360.00	46.16	91.75	1941.94	1048.70	74.13	1044.16	1048.80	85.94	1.40	31.37G
2370.00	46.35	91.91	1948.86	1055.90	73.90	1051.38	1055.99	85.98	0.67	-8.77G
2380.00	46.68	91.84	1955.74	1063.13	73.66	1058.63	1063.22	86.02	1.00	10.69G
2390.00	46.99	91.92	1962.58	1070.40	73.43	1065.92	1070.48	86.06	0.95	30.09G
2400.00	47.18	92.07	1969.39	1077.70	73.17	1073.24	1077.77	86.10	0.66	16.68G
2410.00	47.50	92.20	1976.17	1085.02	72.90	1080.59	1085.09	86.14	1.00	7.91G
2420.00	47.82	92.26	1982.90	1092.39	72.61	1087.98	1092.44	86.18	0.97	-8.09G
2430.00	48.24	92.18	1989.59	1099.79	72.32	1095.41	1099.84	86.22	1.27	-35.07G
2440.00	48.55	91.89	1996.23	1107.24	72.06	1102.88	1107.29	86.26	1.13	-31.67G
2450.00	48.88	91.62	2002.83	1114.73	71.83	1110.39	1114.77	86.30	1.16	-17.06G
2460.00	49.30	91.45	2009.38	1122.27	71.62	1117.95	1122.30	86.33	1.32	-31.91G
2470.00	49.68	91.14	2015.87	1129.85	71.45	1125.55	1129.88	86.37	1.34	-29.90G
2480.00	50.00	90.90	2022.32	1137.48	71.32	1133.19	1137.50	86.40	1.11	-48.16G
2490.00	50.29	90.48	2028.73	1145.14	71.22	1140.86	1145.16	86.43	1.30	-56.10G
2500.00	50.54	90.00	2035.10	1152.83	71.19	1148.57	1152.85	86.45	1.34	-63.90G
2510.00	50.70	89.58	2041.45	1160.56	71.22	1156.30	1160.57	86.48	1.09	-58.03G
2520.00	50.87	89.23	2047.77	1168.30	71.30	1164.05	1168.31	86.49	0.96	-61.44G
2530.00	51.04	88.83	2054.07	1176.06	71.43	1171.81	1176.07	86.51	1.06	-112.17G
2540.00	50.98	88.64	2060.36	1183.83	71.60	1179.58	1183.84	86.53	0.48	-132.69G
2550.00	50.83	88.43	2066.67	1191.59	71.80	1187.34	1191.60	86.54	0.66	-108.01G
2560.00	50.73	88.03	2072.99	1199.33	72.04	1195.09	1199.35	86.55	0.98	-100.87G
2570.00	50.68	87.69	2079.32	1207.07	72.33	1202.82	1207.08	86.56	0.80	-111.05G
2580.00	50.60	87.42	2085.66	1214.80	72.66	1210.54	1214.81	86.57	0.67	-114.23G
2590.00	50.51	87.16	2092.02	1222.53	73.02	1218.26	1222.54	86.57	0.66	-107.22G
2600.00	50.46	86.95	2098.38	1230.24	73.42	1225.96	1230.25	86.57	0.51	-132.55G
2610.00	50.34	86.78	2104.76	1237.95	73.84	1233.66	1237.96	86.57	0.53	-157.12G
2620.00	50.14	86.67	2111.15	1245.63	74.28	1241.33	1245.64	86.58	0.65	-170.21G
2630.00	49.83	86.60	2117.58	1253.29	74.73	1248.98	1253.30	86.58	0.94	-172.61G
2640.00	49.42	86.53	2124.06	1260.91	75.19	1256.58	1260.92	86.58	1.24	-173.70G
2650.00	49.01	86.47	2130.59	1268.48	75.65	1264.14	1268.49	86.58	1.24	-169.72G
2660.00	48.72	86.40	2137.17	1276.01	76.12	1271.66	1276.02	86.57	0.88	180.00G
2670.00	48.47	86.40	2143.78	1283.51	76.59	1279.14	1283.52	86.57	0.75	-168.21G
2680.00	48.22	86.33	2150.43	1290.98	77.06	1286.60	1290.99	86.57	0.77	-158.95G
2690.00	47.95	86.19	2157.11	1298.42	77.55	1294.02	1298.44	86.57	0.87	-172.11G
2700.00	47.63	86.13	2163.83	1305.83	78.04	1301.41	1305.84	86.57	0.97	-177.19G
2710.00	47.33	86.11	2170.59	1313.20	78.54	1308.77	1313.21	86.57	0.90	-159.89G
2720.00	47.09	85.99	2177.38	1320.53	79.05	1316.09	1320.55	86.56	0.77	-150.83G
2730.00	46.92	85.86	2184.20	1327.85	79.57	1323.38	1327.86	86.56	0.58	-145.93G
2740.00	46.78	85.73	2191.04	1335.14	80.10	1330.66	1335.16	86.56	0.51	-154.63G
2750.00	46.52	85.56	2197.90	1342.41	80.65	1337.91	1342.43	86.55	0.86	-172.38G
2760.00	46.25	85.51	2204.80	1349.65	81.22	1345.13	1349.66	86.54	0.82	177.05G
2770.00	46.11	85.52	2211.72	1356.86	81.78	1352.32	1356.88	86.54	0.42	-163.52G
2780.00	45.94	85.45	2218.67	1364.05	82.35	1359.50	1364.07	86.53	0.53	-163.56G
2790.00	45.77	85.38	2225.63	1371.22	82.92	1366.65	1371.25	86.53	0.53	-151.20G
2800.00	45.64	85.28	2232.62	1378.38	83.51	1373.78	1378.40	86.52	0.45	165.29G
2810.00	45.45	85.35	2239.62	1385.51	84.09	1380.90	1385.54	86.52	0.59	115.18G

2820.00	45.36	85.62	2246.64	1392.63	84.65	1387.99	1392.65	86.51	0.64	86.73G	
2830.00	45.37	85.86	2253.67	1399.74	85.18	1395.09	1399.77	86.51	0.51	113.49G	
2840.00	45.29	86.12	2260.70	1406.85	85.67	1402.19	1406.88	86.50	0.60	98.39G	
2850.00	45.26	86.41	2267.73	1413.96	86.14	1409.28	1413.99	86.50	0.62	64.23G	
2860.00	45.36	86.70	2274.77	1421.07	86.56	1416.37	1421.09	86.50	0.69	81.83G	
2870.00	45.39	86.99	2281.79	1428.18	86.96	1423.48	1428.21	86.50	0.63	92.55G	
2880.00	45.38	87.32	2288.81	1435.30	87.31	1430.59	1435.33	86.51	0.71	92.88G	
2890.00	45.37	87.61	2295.84	1442.42	87.62	1437.70	1442.45	86.51	0.62	98.14G	
2900.00	45.33	88.01	2302.87	1449.53	87.90	1444.81	1449.56	86.52	0.86	87.43G	
2910.00	45.35	88.59	2309.90	1456.65	88.11	1451.92	1456.67	86.53	1.24	82.34G	
2920.00	45.40	89.10	2316.92	1463.76	88.25	1459.03	1463.78	86.54	1.10	110.36G	
2930.00	45.29	89.52	2323.95	1470.87	88.34	1466.14	1470.89	86.55	0.96	118.72G	
2940.00	45.12	89.96	2331.00	1477.96	88.37	1473.24	1477.98	86.57	1.07	97.02G	
2950.00	45.08	90.43	2338.05	1485.03	88.34	1480.32	1485.05	86.58	1.01	79.88G	
2960.00	45.13	90.82	2345.11	1492.10	88.27	1487.41	1492.12	86.60	0.84	45.74G	
2970.00	45.22	90.95	2352.16	1499.18	88.16	1494.50	1499.19	86.62	0.39	-50.85G	
2980.00	45.60	90.30	2359.18	1506.29	88.08	1501.62	1506.30	86.64	1.80	-59.08G	
2990.00	46.12	89.11	2366.15	1513.46	88.12	1508.80	1513.47	86.66	3.00	-63.82G	
3000.00	46.67	87.60	2373.04	1520.70	88.33	1516.03	1520.71	86.67	3.67	-67.36G	
3010.00	47.19	85.94	2379.87	1528.00	88.74	1523.33	1528.01	86.67	3.96	-71.67G	
3020.00	47.59	84.35	2386.64	1535.35	89.36	1530.66	1535.37	86.66	3.71	-73.54G	
3030.00	47.85	83.19	2393.37	1542.74	90.16	1538.02	1542.75	86.64	2.69	-80.68G	
3040.00	48.02	81.86	2400.07	1550.14	91.13	1545.38	1550.15	86.63	3.01	-85.03G	
3050.00	48.13	80.32	2406.75	1557.54	92.28	1552.73	1557.56	86.60	3.45	-97.07G	
3060.00	48.00	78.80	2413.43	1564.91	93.63	1560.04	1564.93	86.57	3.41	-105.08G	
3070.00	47.65	76.97	2420.15	1572.22	95.19	1567.29	1572.26	86.52	4.20	-108.76G	
3080.00	47.16	74.93	2426.92	1579.44	96.97	1574.43	1579.48	86.48	4.74	-104.92G	
3090.00	46.81	73.05	2433.74	1586.56	98.99	1581.45	1586.62	86.42	4.26	-107.54G	
3100.00	46.41	71.24	2440.61	1593.58	101.22	1588.37	1593.65	86.35	4.12	-112.37G	
3110.00	45.92	69.54	2447.54	1600.49	103.64	1595.17	1600.58	86.28	3.96	-141.27G	
3120.00	45.18	68.70	2454.54	1607.28	106.18	1601.84	1607.39	86.21	2.86	175.50G	
3130.00	43.86	68.85	2461.67	1613.93	108.72	1608.37	1614.07	86.13	3.97	165.76G	
3140.00	42.40	69.40	2468.97	1620.43	111.15	1614.76	1620.60	86.06	4.52	159.93G	
3150.00	40.95	70.21	2476.44	1626.78	113.45	1621.00	1626.97	86.00	4.64	160.37G	
3160.00	39.56	70.99	2484.07	1632.97	115.60	1627.09	1633.20	85.94	4.44	160.62G	
3170.00	38.09	71.83	2491.86	1639.00	117.60	1633.03	1639.26	85.88	4.68	159.87G	
3180.00	36.66	72.71	2499.80	1644.87	119.45	1638.82	1645.15	85.83	4.58	159.68G	
3190.00	35.26	73.61	2507.90	1650.57	121.15	1644.44	1650.87	85.79	4.49	159.25G	
3200.00	33.81	74.60	2516.14	1656.09	122.70	1649.89	1656.42	85.75	4.66	159.32G	
3210.00	32.34	75.64	2524.52	1661.42	124.10	1655.16	1661.78	85.71	4.73	161.44G	
3220.00	30.76	76.68	2533.04	1666.56	125.36	1660.24	1666.94	85.68	5.01	156.70G	
3230.00	29.15	78.11	2541.70	1671.48	126.45	1665.11	1671.87	85.66	5.28	153.75G	
3240.00	27.68	79.68	2550.50	1676.19	127.36	1669.78	1676.59	85.64	4.95	145.95G	
3250.00	26.59	81.34	2559.40	1680.72	128.12	1674.28	1681.14	85.62	3.98	137.66G	
3260.00	25.64	83.37	2568.37	1685.10	128.70	1678.64	1685.53	85.62	3.91	133.91G	
3270.00	24.78	85.54	2577.42	1689.36	129.12	1682.88	1689.79	85.61	3.79	129.88G	
3280.00	24.05	87.73	2586.53	1693.49	129.36	1687.01	1693.92	85.62	3.49	126.10G	
3290.00	23.70	88.94	2595.67	1697.54	129.48	1691.05	1697.96	85.62	1.81	116.05G	
Last gyro	3293.89	23.58	89.56	2599.24	1699.10	129.50	1692.61	1699.52	85.62	2.13	-141.15G
	3300.90	23.21	88.80	2605.67	1701.88	129.54	1695.39	1702.30	85.63	2.04	-166.67G
	3328.02	21.89	87.96	2630.72	1712.27	129.83	1705.79	1712.69	85.65	1.50	-177.89G
	3382.54	20.20	87.78	2681.60	1731.85	130.56	1725.35	1732.25	85.67	0.93	-78.45G
	3410.03	20.22	87.50	2707.40	1741.35	130.95	1734.84	1741.75	85.68	0.11	166.73G
	3439.16	19.54	87.98	2734.79	1751.25	131.34	1744.74	1751.65	85.70	0.72	28.69G
	3495.17	19.94	88.62	2787.51	1770.17	131.90	1763.65	1770.55	85.72	0.24	-58.37G
	3556.02	20.07	88.01	2844.69	1790.98	132.51	1784.46	1791.35	85.75	0.12	0.00G
Projection to TD	3638.75	20.07	88.01	2922.39	1819.37	133.50	1812.83	1819.72	85.79	0.00	0.00G

Survey Type: Definitive Survey

Survey Error Model: SLB ISCWSA version 16 *** 2-D 95.00% Confidence 2.4477 sigma

Surveying Prog:

MD From (m)	MD To (m)	EOU Freq	Survey Tool Type
0.00	0.00	Act-Stns	SLB_UNKNOWN (default tool used)
0.00	395.70	Act-Stns	SLB_ZERO
395.70	3293.89	Act-Stns	SLB_NSG+MSHOT
3293.89	3556.02	Act-Stns	SLB_MWD+SAG
3556.02	3638.75	Act-Stns	SLB_BLIND

Norne Field Map

A geological map showing a fault system. The map includes several symbols: a vertical dashed line labeled 'F1' at the top; a horizontal dashed line labeled 'F2' below it; a diagonal dashed line labeled 'F3'; a solid black line labeled 'F4'; a blue dot near the bottom center; and a label '2650' with a curved arrow pointing towards the bottom right. The background features hatched patterns representing different geological units.

A geological map showing the location of the Trost contacts relative to the 2700m and 2800m contour lines. The map includes various geological units and contact points labeled A through K.

WIRELINE LOGGING :

Date		Wireline			Interval m MD RT		
Start	Stop	Tool Combination	Company	run	Top	Botm	
06.12.2003	06.12.2003	DSI-AIT-PEX-CMR_200-GR	Schlumberger	1	17 1/2"	657	1174
08.12.2003	08.12.2003	MDT-GR	Schlumberger	2	12 1/4"	1124	3350
08.12.2003	03.12.2003	(GR-RES-DEN-NEUT)	Schlumberger	4	8 1/2"	3350	3638

MUD TYPE:

Well	Section	Mud type	Mud weight
C-4 AH	17 1/2"	Seawater / PAC	1.18 sg red to 1.15 sg @ 1007 m MD, red to 1.06 sg from 1036 m MD

