The following report relates to wellbores **15/9-F-15 A and 15/9-F-15 C**

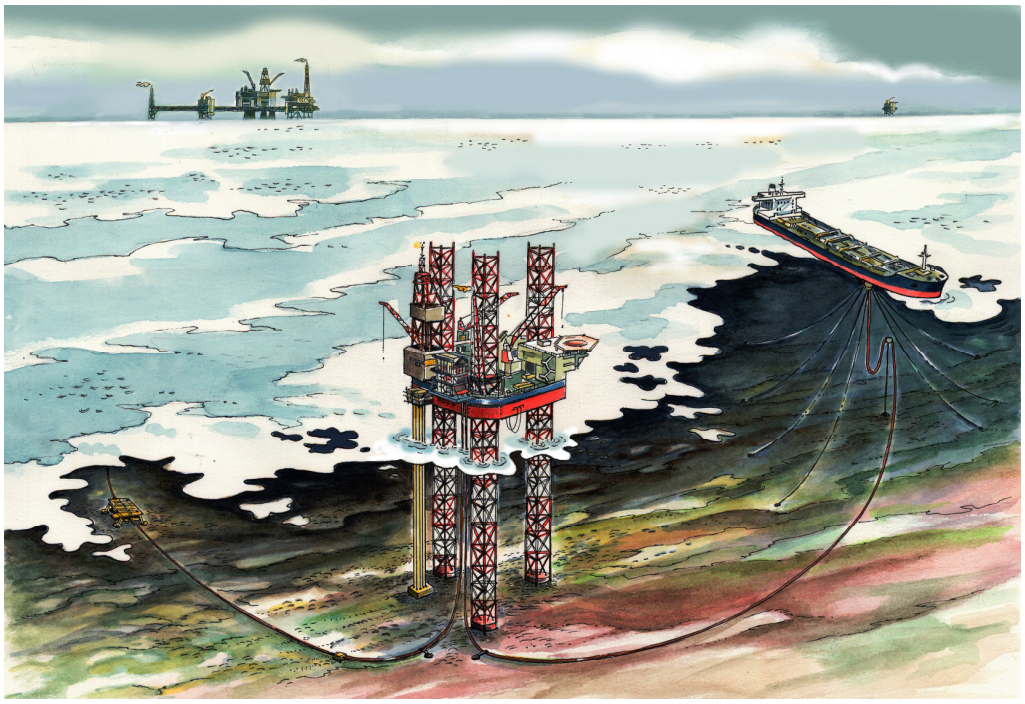
Please note that the wellbore names referred to in the report have been changed and are as follows:

	Wellbore names in report:	Final wellbore names:
Pilot 1	**15/9-F-15**	**15/9-F-15 A**
Oil Producer	**15/9-F-15 A**	**15/9-F-15 C**

Individual Development Well

Drilling Program
15/9-F-15 & F-15A

Volve



StatoilHydro

Title:
Individual Drilling Program Well 15/9-F-15/F-15A Field Volve

Document no.:	Contract no./project no.:	Filing no.:
Volve F- 15/F-15A		

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PETEK Manager ONS MAS PTC	**Jon Hansveit**	

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1 General Well Data

Drilling rig: Maersk Inspirer
Licence number: PL 046BS
Well name: 15/9-F-15/F-15A (excl. 36" and 26" section)
Slot: 15
Type of well: Producer in Hugin
Water depth /air gap: 91 m MSL / 54.9 m MSL
Subsea Wellhead: 138.9 m RT (top 18 ¾" wellhead)
Surface Wellhead: 21.4 m RT to bottom surface wellhead (multibowl)
Depth reference: All depths in metres Below Rotary Table (RT) unless otherwise stated.

Coordinates at Wellhead Level (as installed 27.06.07)				
	Structure Centre		Slot Centre F-15	
	N	E	N	E
UTM:	6 478 563.52	435 050.02	6 478 560,36	435 053,55
Geographic	58° 26' 29.807"	1° 53' 14.929"	58° 26' 29.657"	1° 53' 14.990"
Rectangular (from structure centre)	0	0	-3,17	3,53

Tie in Point

Tie in Point:					
MD (m)	Inc (°)	Azi (°)	TVD (m)	N/S (m)	E/W (m)
1361,7	26,39	242,91	1332.21	-185,38	-79,11

1.1 Well Target :

F-15

Well target position	N	E	TVD RT	TVD MSL
Base Hugin	6477997 m	433914 m	3119	3064

F-15 A

Well target position	N	E	TVD RT	TVD MSL
Base Hugin Fm res	6477861 m	434309 m	3018	2963
Base Hugin Fm res	6478023 m	433860 m	3120	3065

1.2 WBS numbers and network number:

WBS Numbers	
Drilling	L.O046V.002.2A01A01
Completion	L.O046V.002.2A01A02
Other costs	L.0046V.002..2A01A03

Network Number
945255

1.3 Budgets

F-15

Section	Budget Days
36”	4.0
26”	13.4
17 ½”	15.0
8 ½” pilot hole	26.1
P&A m/rigg	6.4
Total Drilling F-15	**64.9**

F-15A

12 ¼"	12.1
8 ½"	33.0
Total Drilling F-15A	**45.1**

1.4 Well Status

30” shoe	221 m MD / 221 mTVD
TOC behind 30” conductor	145,9 m
20” shoe	1368 m MD / 1345 mTVD
26” rathole	1378 m / 1347 mTVD
TOC behind 20” surface casing	145,9 m
Inclination at 20” shoe	26˚
Well filled with OBM	1.44 sg
Nominal Seat Protector	Installed
Top of 9 5/8” csg stump	+/- 1420 mMD
Top of cement KOP	1328 mMD

2 Geology

2.1 Objectives

Well F-15 will be a pilot to collect reservoir data in the western part of the Volve field. The collected data will be used to optimize the design of the F-15 A deviated producer. Well F-15 A is the first highly deviated well and the third and last oil producer in the Volve development drilling program. The F-15 A will be located southern part of the Volve structure, west of the F-4 injection well, securely close to the south bounding fault of the structure.

Well objectives are summarized below:

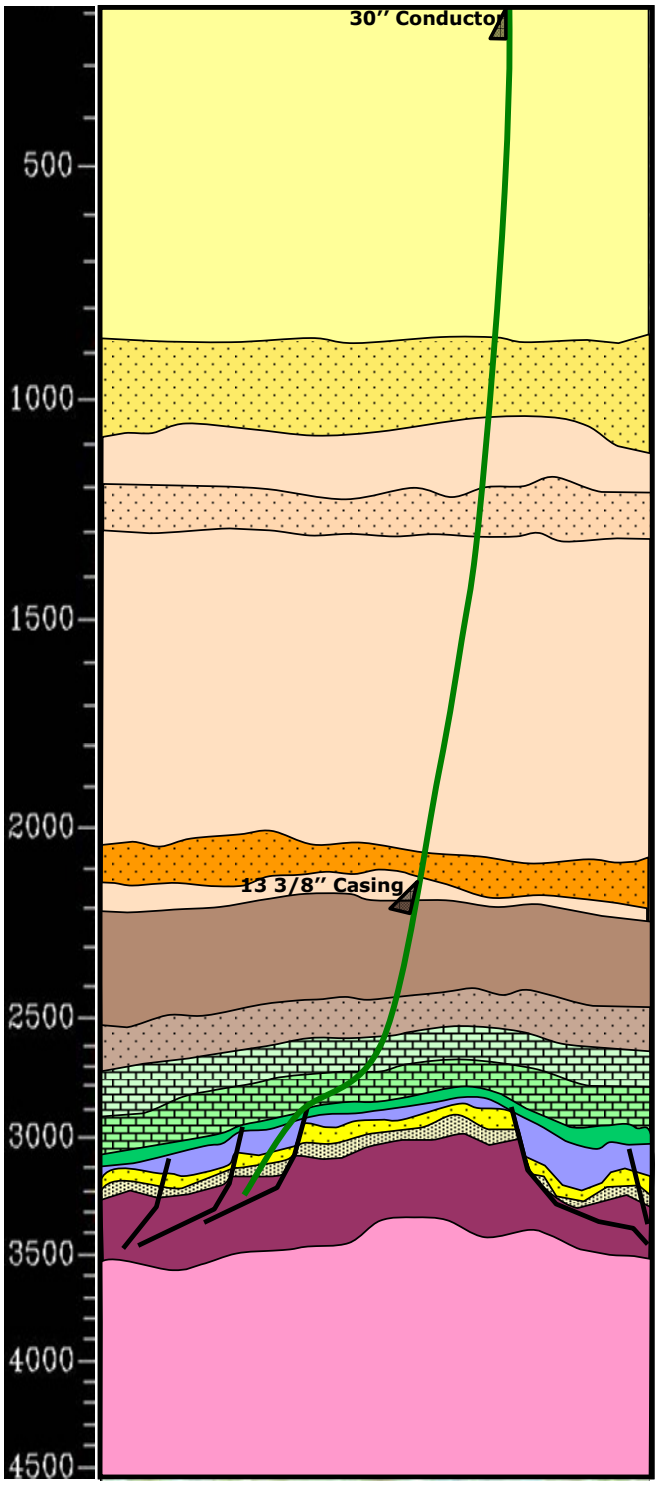
- Main objectives:
  - Establish oil production wells draining the south/south-western area of the Volve Field
  - These wells will assist in maintaining the plateau production of Volve.

- Secondary objectives:
  - Collect data for planning of future wells and optimizing production
    - Logs: GR/Density/Neutron/Resistivity/Sonic/Pressure both wells
    - NMR in 15/9-F-15 A
    - VSP in 15/9-F-15

The pressure points will be collected to verify the reservoir model and to establish the oil/water-contact for the Volve field at the western flank.

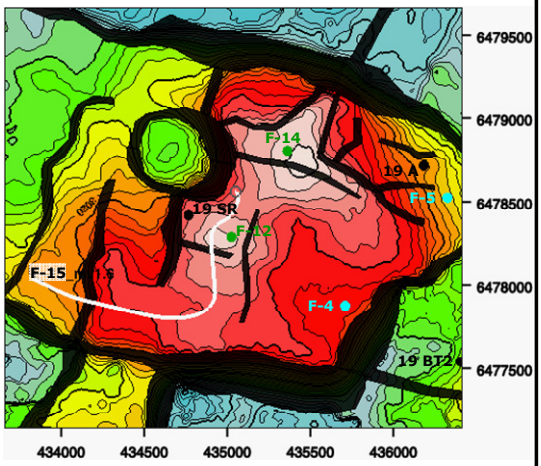
2.2 Geological Section

F-15 Well Plan



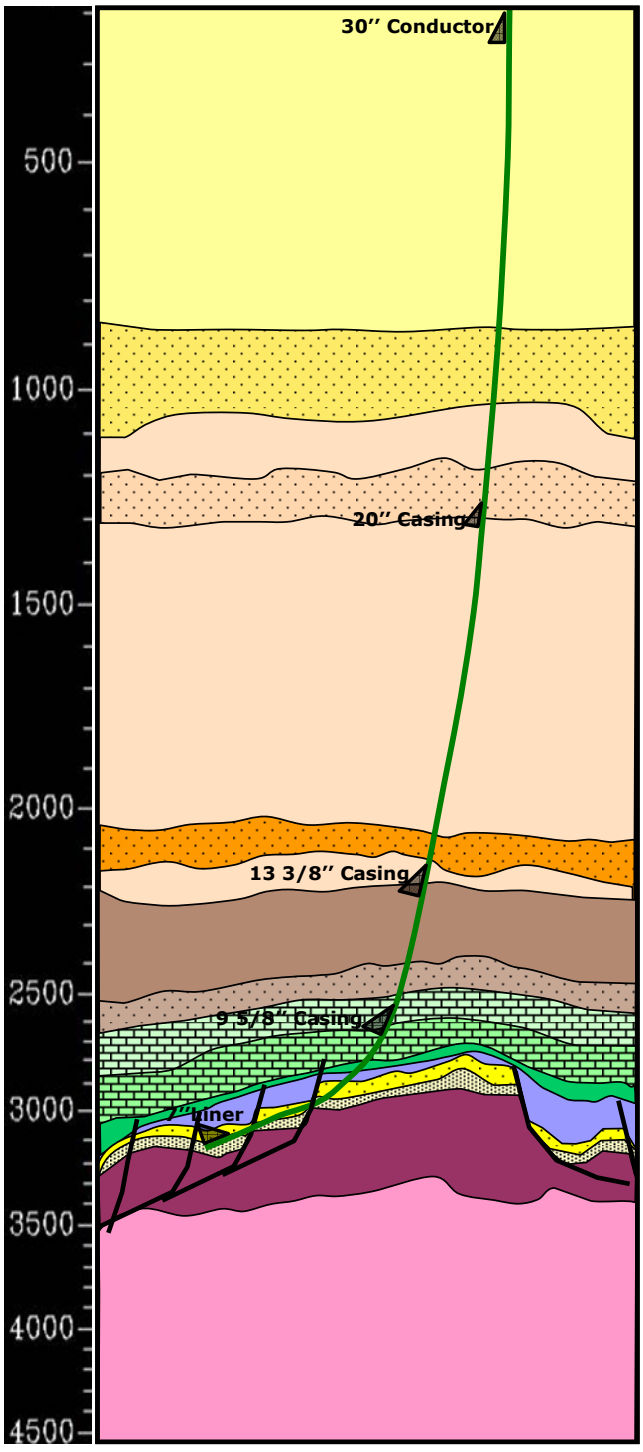
Top Hugin 2006 Depth Map

With Exploration wells, F-12 & F-14 Producers and F-4 & F-5 Injectors



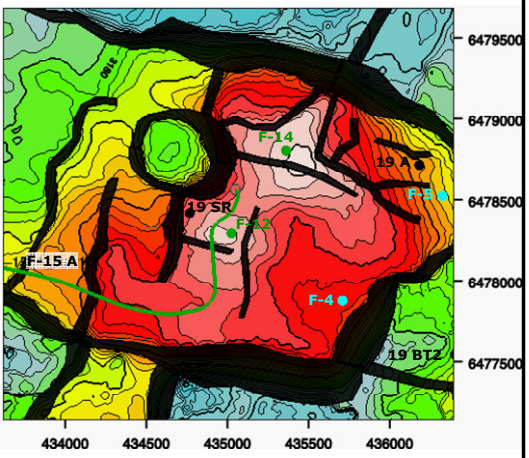
	Nordland Gp.
	Utsira Fm.
	Hordaland Gp.
	Skade Fm.
	Grid Fm.
	Rogaland Gp.
	Ty Fm.
	Shetland Gp.
	Shetland Gp below top Hod
	Cromer Knoll Gp
	Viking Gp
	Hugin Fm.
	Sleipner Fm.
	Hegre Gp.
	Zechstein Gp.

F-15 A Well Plan



Top Hugin 2006 Depth Map

With Exploration wells, F-12 & F-14 Producers and F-4 & F-5 Injectors



	Nordland Gp.
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	Viking Gp
	Hugin Fm.
	Sleipner Fm.
	Hegre Gp.
	Zechstein Gp.

2.3 Geological prognosis

Use TVD RT depths for planning. Measured depths (MD) will depend on the actual well path as drilled.

F-15

Formation Tops	m MD	m TVD RT	m TVD MSL	Uncertainty (+/-)
Utsira	887	879	825	20
Base Utsira	1074	1060	1005	20
Skade	1211	1190	1135	20
Base Skade	1340	1312	1257	20
Grid	2198	2080	2025	50
Base Grid	2272	2145	2090	50
Balder	2400	2258	2203	30
Sele	2484	2333	2278	30
Lista	2554	2394	2339	30
Ty	2670	2494	2440	30
Ekofisk	2800	2598	2543	25
Tor	2827	2617	2563	25
Hod	3005	2731	2676	20
Blodøks	3259	2831	2776	20
Hidra	3339	2858	2803	30
Rødeby	3367	2868	2813	40
Åsgard	3590	2950	2895	40
Draupne	3662	2989	2934	20
Heather	3744	3043	2989	20
Hugin	3786	3072	3017	50
Sleipner	3852	3119	3064	30
	4002	3233	3178	

F-15 A

Formation Tops	m MD	m TVD RT	m TVD MSL	Uncertainty (+/-)
Utsira	887	879	825	20
Base Utsira	1074	1060	1005	20
Skade	1211	1190	1135	20
Base Skade	1340	1312	1257	20
Grid	2198	2080	2025	50
Base Grid	2272	2145	2090	50
Balder	2400	2258	2203	30
Sele	2484	2333	2278	30
Lista	2553	2394	2340	30
Ty	2664	2494	2439	30
Ekofisk	2785	2598	2543	25
Tor	2808	2617	2562	25
Hod	2942	2726	2671	20
Blodøks	3079	2830	2775	20
Hidra	3113	2853	2798	30
Rødeby	3122	2859	2804	40
Åsgard	3164	2886	2831	40
Draupne	3211	2914	2859	20
Heather	3270	2945	2890	20
Hugin	3303	2961	2906	30
Sleipner	3463	3018	2963	20
Heather	3643	3043	2988	20
Hugin	3749	3062	3007	30*
Sleipner	3960	3120	3065	20*
Hugin	4123	3162	3107	30
Sleipner	4201	3177	3122	20
	4255	**3186**	**3131**	

3 Dispensations

3.1 Dispensations from PSA/NPD

No dispensations identified

3.2 Exemptions from StatoilHydro AR/WR

Disp. no	Disp. from sect.	Requirement	Short description of dispensation
41456	WR0256 - 3.2	Inspection of casing hanger on cuttings injection wells	No casing hanger inspection will be performed in the cuttings injection wells.
41519	WR0445 - App D.2	Mud drop in 20" casing	20" casing on oil production wells on Volve can not handle the lost return with mud drop criteria. The criteria is extremely conservative.
42593 42613	WR0529 - 4.2 WR0436 - 7.5.2	Change default survey interval from 30 to 40,5 m	Maersk Inspirer is racking 3 singles of range 3 pipe in one stand, giving at stand length of approx. 40,5 m. With 40,5 m stand length it will be required to take surveys between connections to comply to the 30 m default survey interval. Allowable separator factor will be 1,25 minimum
76690	NORSOK D-010	Pulling HPDR with one annular barrier	HPDR can be pulled without having installed MS1 casing annular seal, meaning only casing cement acting as a annular well barrrier
76482	WR0529 – 4.5.2	Verification survey less than 500 m along from the top of the reservoir on F-15.	Verification survey will be taken with gyro at well TD.
43967	NORSOK D-010	Termination of Chemical injection line on wellheads for Volve Gas lift Wells	Not using valve of firesafe material as chemical injection valve on X-mas tree. Worst case leakage rate in case of failure is minor. (7g/sec)

3.3 Dispensations from Volve Main Drilling Program GL0113 Ver. 1

Section	Text in Main Drilling Program	Short description of dispensation
6.2/6.5	Setting depth 13 3/8" below Ty	Setting depth into top Sele
6.4	The 10 ¾" x 9 5/8" string will be run as 9 5/8" liner and 10 ¾" x 9 5/8" tieback	The 10 ¾" x 9 5/8" string will be run as casing
6.7.2	Ref. Volve report VOLVE-RA 00087 – Particle Strategy Document	In the "particle strategy document" it is stated that when drilling through Grid a relatively low concentration, 20 kg/m3, should be added to prevent differential sticking. The LCM material will be on the rig as a contingency in Grid but will be added in Balder. Extra focus on tendencies of differential sticking will be brought up in the risk log for F-15 & F-15A.

Section	Text in Main Drilling Program	Short description of dispensation
6.7	Production wells 12 ¼" section 1,40-1,60 sg	Based on logging information from earlier drilled wells and pressure data from F-12 it is possible to use mud weights below 1,40 sg in the Viking group.
6.4	9 5/8" csg Vam Top connection	Based on Wellcat simulations for production loads of the 10 ¾" x 9 5/8" csg, it is decided to use Vam Top HC connections from btm Ty at +/- 2800m MD to 1800 mMD, to meet expected axial loads
6.5	Setting depth 10 ¾" x 9 5/8" csg shoe into top Hugin	10 ¾" x 9 5/8" csg shoe will be set in lower Shetland
6.9.1	Centralizers; none on 14" csg, last 200 m 10 ¾" x 9 5/8" csg, two ea. per joint 7" liner.	Centralizers; 1 ea. per joint on lower 400 of 13 3/8" csg, 1 ea. per joint on lower 400 m of 10 ¾" x 9 5/8" csg, 1 ea. per joint 7"over entire liner length.
7.6.2	The HPDR will be used drilling the well from 17 ½" section to TD	The 8 ½" section will be drilled having production riser installed while drilling through the 10 ¾" surface tieback

3.4 Dispensations from Recommendation To Drill (RTD)

Section	Text in RTD	Short description of dispensation
4.1	Driller's target tolerances	Updated, approved, risk managed and included in this programme

4 Health, Safety, Environment & Quality (HSE & Q)

4.1 HSE

Volve HSE goals are, as for Statoil in general, zero accidents, injuries, losses or serious discharges to the environment. A HSE Program for Volve operations will be prepared prior to commencement of the operations.

To achieve our HSE goals special focus will be given to:

- Active leadership in the field.
- Establish good working relationships between involved companies.
- Open dialog, close cooperation and involvements on all levels.
- Perform Falling Object inspection prior to start of operation and implement routines for derrick inspection to avoid falling objects.
- Avoid working on two levels simultaneously without two barriers.
- Crane operations, particularly with respect to heavy lift and transport of long items.
- Verification of rig drain system (i.e. spill to sea).
- It is fully acceptable to take 'time out' to stop and think.
- High activity level on rig floor with dual operations

4.2 Quality

Well 15/9-F-15 is the third oil producer on the Volve Field. Special quality focus points will be:

- Detailed Procedures for all operations prepared in the planning phase.
  Statoil drilling supervisors, Maersk personnel, as well as service companies have actively participated in the detailed planning to ensure good quality of the prepared documentation.
- Improve offshore planning by using drilling/completion engineer offshore.
- Active use of tool box meetings on the rig to ensure the crews are aware/prepared for the upcoming operations.
- Ensure the crews understand that there is time to do the job correctly.
- Use 60,000 NOK/hr as quality cost in Synergi if related to rig time. (Note change from previous wells)
- Use 5,000 NOK/hr as quality cost in Synergi if not related to rig time.
- All personnel to complete the courses 'Work permit' and Safe job analysis' found on www.samarbeidforsikkerhet.no before arriving Volve.
- Dual operations for improved performance and effective rig operations

4.3 Key Performance Indicators (KPI)

HSE Key Performance Indicators (KPI)	
Total recordable injury frequency (TRIF	0
Serious incident frequency (SIF)	0
Falling objects frequency	0
Accidental oil spills total frequency	0
Accidental other spill total frequency	0
Operational Key Performance Indicators	
Operational factor - uptime drilling	85%
Number of new wells in 2008	5
Rushmore metre/day	82

4.4 Risk Assessment

The Risk assessment matrix is attached in Appendix C.1.7

During the detailed planning phase risk matrices for each hole section will be prepared. The risks are rated according to the risk matrix for D&W found in WR0442 “Planning of Drilling and Well operations”.

The risk matrix will be reviewed before start of each section both on- and offshore. The logs will be continuously updated and signed off if new risks are identified. The risk logs shall be used offshore during the operation, and will be discussed as a part of the daily meeting with the rig.

4.4.1 Well interference potential

The safety factors for the Volve wells are 1.25 due to the change in default survey interval from 30 to 40.5 m

The closest wells (Separation factor <5) are listed in the table below.
F15

Interference wells	Depth in well F-15	Centre/centre distance	Separation Factor	Comments
	m MD	m MD		
No wells with separation factor <5				

F15 A

Interference wells	Depth in well F-15A	Centre/centre distance	Separation Factor	Comments
	m MD	m MD		
F15	**3875**	**15,72**	**0,451**	**Cemented back pilot hole**
No further wells with separation factor < 5				

4.4.2 Pressure anomalies

A hydrostatic pore pressure gradient is expected down to the chalk inI the Shetland group followed by an increase to 1.28sg in the Draupne shale. The pore pressure at top reservoir level will be depleted due to production from the F-12 well. A reduction of 20bar from the original reservoir pressure of 344 bar is estimated.

The maximum collapse in the lower Hordaland within the planned trajectory is estimated at 1.40sg in F-15 and F-15A. The peak value within the Draupne shales is calculated 1.40sg in F-15 and ~1.41 sg in F-15A

The Balder formation within the Rogaland group is associated with low fracture gradient in the tuffaceous and friable rocks. The XLOT on F-14 proved, however, that the first 20 mTVD has a higher fracture gradient, 1.67 sg, than in the expected one in lower Balder, 1.6 sg. The Ty formation is depleted due to production from the main Sleipner field, the pore pressure measured in F-12 was 0.87sg.

See Appendix C.1.1 and C.1.2 – Wellbore stability plots for details.

4.4.3 Kick tolerances

The kick tolerances is calculated using "Kick Calc"-Program, using similar BHAs to those in Appendix B.1.3 and using the Well stability figure in Appendix C.1.1 and C.1.2

F-15 Hole Section	Pore Pressure	MW for calculation (PP +0.05)	Calculated Kick Tolerance	Leak off used for calculation
	SG	SG	m^3	SG
17 ½"	1.01	1.06	**112,7**	1.61
8 ½" pilot hole	1.29	1.34	**25,6**	1.72

F-15A Hole Section	Pore Pressure	MW for calculation (PP +0.05)	Calculated Kick Tolerance	Leak off used for calculation
	SG	SG	m^3	SG
12 ¼"	1.04	1.09	**Infinite**	1.72
8 ½"	1.29	1,34	**Infinite**	1.84

4.4.4 Potential Drilling Problems and special focus for the wells

The drilling risk of F-15 is considered to be low to moderate. Risks are identified, consequences and probabilities are evaluated, and risks are given a risk factor based on StatoilHydro's risk matrix.

The main drilling related operational risk elements identified for the drilling operation is related to cement job on 9 5/8" x 10 ¾" csg planning for 100 m of cement inside the 13 3/8" csg. This is needed to be able to conduct gaslift at a later stage in the production. Another main risk on F-15A is related to liner running having to run approximately 1400 m of 7" liner.

See Risk Assessment appendix C.1.7. The major risks are tabulated below.

Risk	Consequences	Reducing Measures	Risk Level
Dual operations – High activity on drill floor with making up casing in stands while drilling	Personal injury – Loss of time	Focus on procedures prior to operation. Perform pre-job meetings. Use lead driller as main contact point for off-critical path activities on drill floor.	25
Dropping object(s) on template and wellheads	Stop in operation. Possible damage of wellhead. Possible stop in production.	Focus on procedures. Use of supplement to WR0220 Simultaneous Drilling, Well and Production Operations - Volve wells	75
Unable to shear BOP component in well control incident	Loss of secondary BOP barrier	Plan for dropping BHA made before operations	30
Shut down in operations due to turbine exhaust blown to rig floor.	Not able to secure well	Air supply/inlet to driller cabin moved to limit exhaust exposition. Cascade is available for limited time being used during operation.	50
Not able to get 13 3/8 " casing shoe below Balder	Set casing shallow and set 9 5/8" liner into Shetland to seal off Balder Fm. prior to drill pilot hole into the reservoir. For F-15A the risk for going on losses in Balder during the 9 5/8" casing cement job, meaning unable to get cement inside 13 3/8" x 9 5/8" casing.	Drill 17 1/2" hole section with sufficient margin against collapse gradient and run 13 3/8" casing with reamer shoe. Optimise cement job with possible foam if 13 3/8" casing is set above Balder in F-15 in order to achieve cement inside 13 3/8" x 9 5/8" annulus	20
Not able to hit target(s) due to problems with achieving the planned dogleg inside Shetland.	Pull for correction - time consuming. Increased open hole exposure.	Perform Idrill study to optimize parameters to reduce slip-stick. Run AST tool having a smoother torque to combat slip & stick even further. Reduced MW through Shetland for increased ROP and minimum slip & stick exposure to BHA.	20
Mud column and volume control in the reservoir	Well influx	Focus on well parameters and volume control in all operations	30
Swabbing during tripping	Loss of hydrostatic head and possibility for gas kick and stability problems in Draupne.	Focus on correct procedures – 1st 5 stands pulled wet. Swab simulations to be run prior to pulling out of hole.	20
Mud losses in the Hugin Fm. Hugin reservoir pressure lower than expected.	Loss of hydrostatic head and possible gas kick situation	Add LCM material while drilling the end of the section. Have focus on the ECD during drilling. Estimation of the frac pressure in worst case	20

		scenarios. Limit the MW to minimum required to maintain the Draupne formation (based on previous well experience) No previous experience with losses in Hugin with 1.44 sg MW.	
Pressure sampling (LWD)	Stuck pipe. Fishing job or necessary to leave pipe, cement hole and sidetrack.	Manageable overbalance. OBM in hole; prepare Schlumberger Hazid. Fast operations to limit static exposure time.	**20**
WL gyro 500 meters above the reservoir.	Stuck in Ty with drill string while taking WL gyro. Fishing job or necessary to leave BHA, cement hole and sidetrack.	Dispensation granted: Drop gyro at TD of 8 1/2" section to rule out static exposure in Ty.	**10**
Draupne Fm. causing collapse problems while drilling the reservoir section or when running the 7" liner due to longer open hole exposure performing TLC NMR logging.	Lost time by using 5" contingency liner in reservoir and 7" liner to isolate Draupne. Worst case necessary having to do sidetrack.	Draupne formation will be drilled outside of critical margin with respect to hole angle and dip angle. Also plan to have 7" liner as contingency to isolate the Draupne Fm. before continuing drilling the reservoir section.	**20**
Excessive open hole exposure due to NMR run on wireline.	Hole instability with chance off getting stuck with the TLC NMR. In worst case this will involve technical sidetrack.	Try to have a smooth NMR operation limiting the open hole exposure. Clean and condition well properly prior to logging. If possible run NMR in drilling BHA	**50**
Unable to run liner to TD after TLC NMR.	POOH liner - time consuming	Perform wiper trip with dedicated 8 1/4" BHA.	**20**

4.4.5 H_2S

No H_2S requiring any protective equipment is expected on the rig during drilling and completion of F-05. During testing of the exploration wells, 6 ppm was measured in the separator gas.
Ref. 'Volve PUD document' for Volve design values.

4.4.6 Shallow Gas

The well is classified as Class 0, hence no shallow gas is predicted. This was confirmed by F-12 pilot hole. See "Volve Shallow gas strategy document. 13 3/8" casing is set.

4.4.7 Stuck pipe

See Risk Assessment in Appendix C.1.7

5 Drilling

5.1 General Drilling

15/9-F-15 is the third oil producer in the Volve development drilling program. The well will be drilled in the south/south western part of the structure. The well drains the southern and south-western part of the field with a pressure support from F-4 and F-1. To reduce the uncertainties and optimize the design of the producer, a pilot well will be drilled to the first fault block of Volve west. The well will be drilled from the no. 15 slot on the Volve well head module and is thus the NO 15/9-F-15 and NO 15/9-F-15 A wells, F-15 being the pilot and F-15 A being the producer.

5.2 Rig

The mud pumps will be fitted with 6 ½" liners. These give a max. flow of 6650 lpm using 100 SPM and 97% volumetric efficiency (14" stroke) . Maximum liner pressure is 352 bar. Pop off valves are planned to be set to 345 bar.

Maersk will supply an official 'Volume Sheet' including drill pipe and casing specification available on the rig.

Any object shipped to the rig, longer or heavier than normal, should be accepted by logistics. Maximum length of items sent to rig is 15,8 m. Maximum basket length is 23 m. Whip line is 15 tons.

5.3 Drilling Fluids

See one-page Drilling Fluid Program in Appendix C.1.4.
For general operational procedures for drilling fluids, see Halliburton's "Drilling Fluid Guidelines" on the Volve General Teamsite.

Focus points are;

- Circulate hole clean before every trip out of hole. Detailed working procedures will give specific details.
- Sized Ground CaCO3 (Baracarb) and Graphite (Steelseal) will be used as bridging agents to minimise fluid loss and increase well-bore strength. New material will be added to maintain particle size distribution as drilling continues. Details of the various grades and concentrations are detailed in the Volve Particle Strategy Document.

5.4 Directional Drilling

The well will be sidetracked from F-15S below the 20" casing shoe. The 9 5/8" casing from F-15S is planned to cut 50m below the 20" casing shoe and retrieved and a cement kick-off plug will be installed between the 9 5/8" casing stump and the 20" casing shoe.

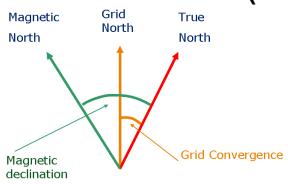
Since the sidetrack starts at below the 20" shoe of the 15/9 F-15 and F-15S is permanently plugged back there is little risk of colliding with neighbouring wells. Nevertheless, all precautionary measures shall be taken as per standard procedures.
In order to avoid a stuck scenario with the BHA across the depleted Ty formation, no wireline gyro will be performed <500m from top Hugin reservoir in the pilot hole section.

However, a drop gyro will be run at TD of the 8 ½" pilot hole section. Reference is made to dispensation #76482. Rotational checkshots and benchmark surveys will be taken and analysed to ensure correct MWD surveys in the 8 ½" pilot hole section. Before drilling into the reservoir the MWD surveys will be analysed using multi-station analysis to identify potential error sources.

5.5 Directional correction Data

Directional correction Data						
Section	Declination BGGM 2007	H total	Magnetic Dip	Date	Grid Convergence	Total Correction
F15 17 ½"	-2.077	50401	71.621	1.11.08	-0.95	-1.127
F15 8 1/2"	-2.079	50422	71.62	1.11.08	-0.95	-1.129
F15A 12 1/4"	-2.076	50417	71.619	1.11.08	-0.95	-1.126
F15A 8 ½"	-2.08	50427	71.62	1.11.08	-0.95	-1.13

Total Correction = (Magnetic Declination) – (Grid convergence)



Corrections are based on the approximate mid point depth of each section
The Main Geomagnetic Field
BGGM 2007 model
There is no IFR (in field reference) correction for Volve.

SAG of drill string BHA
The directional Driller will provide BHA sag calculations. If the sag correction ≥ 0.1° the survey will be corrected and the applied SAG value included in the survey listing.

QA/QC: MWD engineer to provide Survey QC to directional coordinator documentation including IDEAL screen shots
Extrapolation to TD:
Distance last survey station to TD <50m= use models, MWD, standard, non mag
Distance last survey station to TD >50m= use models , MWD, mag-old

References
Statoil Best Practice Directional Surveying
WR0529 Well construction

Survey Programme							
	Section	**Tool**	**Error Model**	**Applied Corrections**	**Frequency**	**From/ To (m)**	**Comment**
F15	**17 1/2"**	Powerpulse	MWD, Std, non mag	Inc: Sag Az: Grid	40.5m	1378-2544	
	17 ½"	SDC Keeper	Keeper, Continuous		10m	1378-2544	Drop Gyro at 17 1/2" TD tied to Drop Gyro in F15S
	8 ½"	Powerpulse	MWD, Std, non mag	Inc: Sag Az: Grid	40.5m	2544-4002	Dispensation 76482
	8 ½"	SDC Keeper	Keeper, Continuous		10m	2544-4002	Drop Gyro at TD
F15A	**12 ¼"**	Powerpulse	MWD, Std, non mag	Inc: Sag Az: Grid	40.5m	2544-2971	
	12 1/4"	SDC Keeper	Keeper, Continuous		10m	2544-2870	Drop Gyro at 12 ¼" TD tied to drop gyro in 17 ½" section of F-15
	8 ½"	Powerpulse	MWD, Std, non mag	Inc: Sag Az: Grid	40.5m	2971-4255	

Definitive Survey Construction				
	Tool	**Error model**	**Section**	**Planned Depths**
F15	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F15S mother bore	146m - 1378m
	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F15 17 ½" TD	1378m - 2544m
	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F15 8 ½" TD	2544m - 4002m
F15A	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F15S mother bore	146m - 1378m
	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F-15	1378m - 2544
	Wellbore surveyor (Gyrodata)	Wellbore surveyor continuous	F15A 12 ¼"	2544m - 2971m
	Magnetic (MWD)	MWD, Standard, non Mag	F15A 8 1/2 "	2971m – 4255m

5.6 Cementing

A detailed procedure containing final recipe and simulations will be sent to the rig well in advance of each cement job.

5.7 Contingency Plans/ Procedures –all hole sections

All contingency plans will be prepared and available on Teamsite. The major contingency plans will be listed in the Detailed Operational Procedures (DOP)

5.8 36" Section & 26" Section F-15

The 36" & 26" sections were drilled from Maersk Inspirer in Nov - Dec 2007 as part of the Volve Batch Drilling Program. See Well Status 1.4 and Well Schematic Appendix C.1.3

Section	mMD RT	mTVD RT	Inclination
30" casing shoe	221	221	0°
20" casing shoe	1368	1345	26°

5.9 17 ½" Section F-15

	m MD	m TVD	Inclination
Section Start	1378	1346	26°
Section TD	2544	2385	26°
Section Length	1166	1040	
Casing Shoe	2539	2382	26°

5.9.1 Objective

To set 13 $^{3}/_{8}$" casing 55 m MD into the Sele Fm. and cement with top of cement 400 m MD above shoe.

5.9.2 Operational Summary

1. MU and RIH with 17 ½" Powerdrive BHA (F-15S budget time)
2. Drill cement inside 20" casing shoe and initiate sidetrack with 1.42 sg OBM (F-15S budget time)
3. Drill 17 ½" hole to section TD at +/- 2544 m MD
4. Circulate hole clean, drop gyro and POOH.
5. Retrieve nominal hole seat protector, wash WH, riser and BOP.
6. Run and cement 13 $^{3}/_{8}$" casing.
7. Test casing to 345 bar on plug bump with 1.42 sg OBM
8. Set 13 $^{3}/_{8}$" seal assembly and pressure test seal and riser to 345bar/1.42sg
9. Release running tool, POOH and L/D SRT
10. MU WBRT, RIH and install wear bushing. POOH and L/D WBRT
11. Pressure BOP and well to 345 bar / 1.42 sg
12. MU & RIH with 12 1/4 " clean-out assembly.
13. Drill out 13 3/8" shoe track
14. Drill 3 m new formation while displacing to 1.30 sg OBM.
15. Circulate hole clean and perform FIT to 1.56 sg (to accommodate cementing ECD below 13 3/8" casing while cementing 9 5/8" x 10 ¾" casing of F-15A).

5.9.3 HPDR

The HPDR is a flange type riser and will be used while drilling the well from the 17 ½" section to TD. The HP drilling riser has a pressure rating of 345 bar and is already installed during F-15S operations. Ref GL0113 - Volve Main Drilling Program

5.9.4 Directional Drilling

See Appendices B.1.1 Well Profile and B.1.2 Survey Listing

Inclination:	Drop from from 26° to 23°. Build up to 28° and drill tangent section to from 1715 m MD to section TD.
Azimuth:	Turning from 242° to 175° and back
Planned Dogleg:	2.5° /30m, 2.75° /30m, 3.0° /30m

Tool	Measurements	Operating Range
Rotary Steerable PowerDrive X51100	Inclination Gamma Ray	1.381 TFA gives operating range of 4000 – 4500 lpm 180RPM drilling 80 RPM reaming

Ref. Appendix B.1.2 BHA Proposals.

5.9.5 Torque & drag

Design Criteria	
Block Weight (T)	69 Tonnes
BHA	Powerdrive see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis
Bit	PDC
Bit Torque (kN-m)	3 kN-m
WOB (T)	10 Tonnes
Mud	1.42sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Simulated Values (Wellplan)							
Bit depth	**1400**	**1600**	**1800**	**2000**	**2200**	**2400**	**2544**
Torque Off bottom (kN-m)	**3.7**	**5.2**	**6.7**	**8.0**	**9.3**	**10.6**	**11.8**
Torque On Bottom (kN-m)	**6.0**	**6.9**	**8.1**	**9.2**	**10.5**	**11.8**	**12.8**
Hookload PU (T)	**119**	**127**	**133**	**140**	**146**	**153**	**158**
Hookload SO (T)	**111**	**115**	**118**	**121**	**125**	**128**	**130**
Min WOB (buckling) (T)	**88**	**88**	**88**	**94**	**99**	**103**	**104**
WOB to Helical Buckle (rotating)	**20**	**23**	**25**	**22**	**22**	**22**	**23**
Max WOB (bit) (T)	**22**	**22**	**22**	**22**	**22**	**22**	**22**

Torque and drag readings to be taken each stand as per standard procedure in DOP. These readings will be plotted by Geoservices and compared to the predicted values (roadmap). Roadmap to be always available in real time for evaluation of hole condition.

5.9.6 Bit selection

Manufacturer	Model	Type	TFA	Comments	Max WOB	
Hycalog	RSR616 M-A12	PDC 6 blade 16mm cutters Short taper shallow cone	1.107 3 x 15 3 x 16	**Primary**	**22 T**	
Hycalog	RSR616 M-A12	PDC 6 blade 16mm cutters Short taper shallow cone	1.107 3 x 15 3 x 16	Back up	22T	
Smith	GGH	Milled tooth IADC 135	0.746 3x18	Contingency	27T	
Smith	GF15BD ODV	Insert IADC 447	0.746 3x18	Contingency	27T	

5.9.7 Hydraulics

Design Criteria	
BHA	Powerdrive see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis
Bit	PDC, 8 x 15, TFA =1.381 in²
Required bit loss (powerdrive)	35-50
Mud	1.42 sg OBM
ROP	30 m/hr
String RPM	120
Rheology 600,300,200,100,60,30,6,3	90,52,41,31,23,19,11,10

Hydraulics (Wellplan)								
Bit depth mMD	Flow lpm	ECD at bit SG	ECD at shoe	Pump pres bar	MW sg	TFA in²	**Pres. loss at bit Bar	**HSI hp/in²
1400	4500	1.447	1.447	224	1.42	1.381	50.3	2.0
1800	4500	1.448	1.447	248	1.42	1.381	50.3	2.0
2200	4500	1.448	1.447	273	1.42	1.381	50.3	2.0
2544	4500	1.448	1.447	291	1.42	1.381	50.3	2.0

***calculated for 95% of flow to allow for loss over Powerdrive pads*

5.9.8 MWD/LWD

Tool	Measurements	Operating Range
PowerPulse 8 (MWD)	Inclination (°) Azimuth (°)	3028 – 5488 l/min
ARC 8 w/ PWD (Vision Resistivity)	Gamma Ray (API) Multi depth Resistivity (ohm) Annular Pressure Static Annular Pressure Dynamic Annular Temperature ECD	7380 l/min max

5.9.9 Drilling fluids

The section will be drilled with 1.42 sg Enviromul OBM.

See summary Drilling Fluids Program in Appendix C.1.4

5.9.10 TD criteria

The plan is to set the 13 $^{3}/_{8}$"shoe into top Sele Fm.. ~ 55m MD into top Sele Fm. as identified by logs.

5.9.11 Wellhead

Drilling Tieback Connector is used to connect the HPDR to the 18 ¾" MS-700 Wellhead
housing. Drilling tieback connector is equipped with a high pressure riser to surface and BOP. Connector is locked to the 18 ¾" WHH using ROV

The 13 3/8" casing hanger is run on a PADPRT prepacked with SSRII cement plugs from shore. A MS-seal is used to seal of the annulus and is being installed in the same run with PADPRT and hanger.

5.9.12 13 $^{3}/_{8}$" Casing

Ref. Well Schematic Appendix C.1.3.

- The casing will be cleaned, drifted, measured and doped at Statoil onshore base.
- **Shoe track** is Reamer shoe/joint/joint/pup/float/joint delivered in 3 assemblies from shore with centralisers fitted on shoe joint and float collar joint only.
- Maximum running speed should be estimated based on ECD simulations done by Halliburton and Geoservices prior to running the casing.
- Evaluate to break circulation every 500 m MD when running in hole.
- Circulate bottoms up at the 20" casing shoe.

:

Design Criteria	
Block Weight (T)	69 Tonnes
13 3/8"	2396 m 72.0#
Optimum/Maximum MU torque	31.4 kNm / 34.5 kNm
Running string	5 ½" 57.4# HWDP
Mud	1.42sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Calculated P/U & S/O (Wellplan)							
Shoe depth	1500	1700	1900	2100	2300	2500	2539
PU weight (mT)	206	227	248	269	291	311	314
SO Weight (mT)	188	201	212	223	234	243	245

5.9.13 Centralisers

Ref. Well schematic. Appendix C.1.3

Centralisers will be fitted onshore.

5.9.14 Pip Tags & Pup joints

None

5.9.15 Casing cementing

In order to ensure a good quality cement job, it is recommended to displace spacer and cement slurry into annulus at a pump rate of 3000 lpm. The pump rate should be reduced to 1200 lpm for the last 2-3 m3 prior to bump plug.

Pre-job simulations indicate a maximum ECD in the Balder formation of 1,56 sg, when simulated with 3000 lpm displacement rate and gauge hole. Prognosed fracture gradient at this depth is 1,60 sg. Maximum ECD below the 20" casing shoe is 1,45 sg.
Mud properties used in ECD simulation are as follows:
Density: 1,42 sg
Rheology: 53 – 41 – 29 – 24 – 19 – 14 - 12 (300 through 30 rpm reading)

A 1,90 sg cement slurry design using silicablend cement is proposed for this cementing operation. Silica flower is added in order to prevent strength retrogression due to high production temperature. Total slurry volume is based on TOC at 2139 m MD, 400 m above casing shoe, and with an OH excess of 30%. Total volume to be pumped is 35,4 m3.

20 m3 of 1,60 sg spacer should be pumped ahead of the cement slurry in order to ensure proper hole cleaning.

The casing is planned to be run with a 13 3/8" double-valve reamer-shoe and using the SSR-II wiperplug system. When using the SSR-II wiper plugs, the cement head will be preloaded with the appurtenant launching darts onshore.

A detailed cement procedure with final simulations included will be sent to the rig prior to the cement job.

Ref: Cement Program. Appendix C.1.5

5.9.16 Sampling

None

5.9.17 Wireline Logging

None

5.9.18 Contingency Plans & Procedures

See Risk matrix Appendix C.1.7 and the contingency plans on the Teamsite.

5.9.19 Gyro surveying

A drop gyro will be run to TD of the 17 ½" section, to limit the well position uncertainty in the event a relief well is required.

5.10 8 ½" Section F-15

	m MD	m TVD	Inclination
Section Start	2544	2385	28°
Section TD	4002	3233	34°
Section Length	1458	848	

5.10.1 Objective

The 8 ½" section is designed to penetrate Hugin Fm. in the western block of the Volve structure which holds major uncertainty of the vertical reservoir position and thickness. The objective of the section is to collect data and minimize geological and geophysical uncertainties before drilling the producer F-15A. The well path and targets of F-15 A will be optimized based on the results of F-15.

5.10.2 Operational Summary

1. RIH with 8 ½" Powerdrive Vortex Xceed BHA.
2. Drill 8 ½" hole section to TD at +/- 4002 mMD / 3233 mTVD while increasing MW gradually from 1.30 sg to 1.44 sg before entering Cromer Knoll formation.
3. Circulate hole clean at TD.
4. Run VSP log on wireline through DP.
5. Drop gyro and POOH with 8 ½" BHA.

5.10.3 Directional Drilling

See Appendices B.1.1 Well Profile and B.1.2 Well Listing

Inclination:	Build from 28° to 70° at 3152 m MD. Drill tangent section to 3501 m MD and then drop to 33° at section TD at 3913 m MD
Azimuth:	Turn from 219° to 283° at 3152 m MD, hold to 3501 m MD then increase to 295 at 3726 m MD. Hold to TD at 3913 m MD
Planned Dogleg:	3°/30m, 3,5°/30m, 2,5°/30m

Tool	Measurements	Operating Range
Xceed Vortex	Inclination	1900 to 3200 l/min allowing for 7% flow through motor bearings (Xceed itself will operate 1800 to 3028 lpm) 180 RPM drilling 40 RPM reaming Motor output 0.076 rev/litre

Ref. Appendix B.1.2, BHA Proposals.

5.10.4 Torque & drag

Design criteria:
Surface torque and weight for PowerDrive BHA: 5 ½" 21.7# DP + 5" 19.5# in open hole.

Design Criteria	
Block Weight (T)	69 Tonnes
BHA	Powerdrive Vortex Exceed see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam EIS + 1500m 5" 19.5#
Bit	PDC
Bit Torque (kN-m)	3 kN-m
WOB (T)	8 Tonnes
Mud	1.30 – 1,44 sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Bit depth	2550	2700	2850	3000	3150	3300	3450	3600	3750	4002
Torque Off bottom (kN-m)	8.2	9.3	10.3	11.0	11.7	12.4	13.3	14.5	16.6	18.5
Torque On Bottom (kN-m)	9.7	10.7	11.6	12.5	13.4	14.0	14.8	15.5	16.8	18.2
Hookload PU (T)	148	153	158	161	162	164	165	170	178	191
Hookload SO (T)	128	130	131	132	132	132	131	133	136	140
MW (sg)	1,3	1,3	1,3	1,3	1,3	1,3	1,44	1,44	1,44	1,44
Min. Wt. Hel. Buckle (tripping in)	95	95	96	96	97	98	98	99	99	100
Max WOB (buckling) (T)	24	27	28	29	29	30	31	33	28	31
Max WOB (bit) (T)	12	12	12	12	12	12	12	12	12	12

Torque and drag readings to be taken each stand as per standard procedure in DOP. These readings will be plotted by Geoservices and compared to the predicted values (roadmap).
Roadmap to be always available in real time for evaluation of hole condition.

5.10.5 Bit selection

The final bit selection will be based on the ongoing I-drill study but the following bits are available:

Manuf.	Model	Type	TFA	Comments	Max WOB	
Smith	MDi716	7 blade 16mm face 13mm gauge		**Primary Bit for Exceed**	16 T	
Hycalog	RSR716M-C1	7 blade 16mm face 13mm gauge Short taper shallow cone		**Back-up Bit for Exceed**	15 T	
Smith	MFDGH	Milled tooth IADC 137	3x 18	Contingency	20 T	
Smith	GF15SD1GV	Insert IADC 447	3x 18	Contingency		
Hughes	HC606	6 blade PDC	~8x12	Under gauge bit 8 ¼" Wiper Trip		

5.10.6 Hydraulics

Design Criteria	
BHA	Powerdrive Vortex see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis +1500m 5" 19.5#
Bit	PDC 7x14 1.052 in²
Required bit loss (powerdrive)	35-55
Mud	1.30sg-1.44sg OBM
ROP	25 m/hr
Rheology 600,300,200,100,60,30,6,3	71,44,34,22,17,12,8,7

Hydraulics for Powerdrive (Wellplan)								
Bit depth mMD	Flow lpm	ECD at bit SG	ECD at shoe	Pump pres bar	MW sg	TFA in²	Pres. loss at bit Bar	HSI hp/in²
2550	2500	1.34	1.34	191	1.30	1.052	27	2.7
3000	2500	1.34	1.34	208	1.30	1.052	27	2.7
3300	2500	1.38	1.34	218	1.30	1.052	27	2.7
3450	2500	1.51	1.48	228	1.44	1.052	30	3.0
3750	2500	1.52	1.48	238	1.44	1.052	30	3.0
4002	2500	1.53	1.48	246	1.44	1.052	30	3.0

5.10.7 MWD/LWD

Tool	Measurements	Operating Range
Telescope6 (MWD)	Inclination (°) Azimuth (°)	1514-3028 lpm
Ecoscope6	Gamma Ray (API) Multiphase Resistivity Annular Pressure Annular Temperature ECD Density Neutron Porosity	3040 lpm max
Sonic Vision 6	Memory only	3040 lpm max
Stethoscope 6	Formation Pressure	

5.10.8 Drilling fluids

New 1.30 sg mud will be mobilized for the start of this section and then will be weight will be increased while drilling to 1.44 sg before drilling into Cromer Knoll.

Concentration of Sized Baracarb & Steelseal will be added as per “particle strategy document”.

Additive	Before entering Ty
Baracarb 150	10 Kg /m³
Baracarb 50	5 Kg/m³
Steelseal	15 Kg/m³

Additive	Before Entering Cromer Knoll
Baracarb 150	15 Kg /m³
Baracarb 50	15 Kg /m³
Steelseal	15 Kg /m³

See summary Drilling Fluids Program in Appendix C.1.4

5.10.9 TD criteria

The TD criterion of the F-15 well is based on the possibilities of logging the transition from Base Hugin Formation into Sleipner Formation. It is therefore set to be approximately 50 m below the Base Hugin Formation.

5.10.10 Sampling

See RTD 5

Standard cuttings samples for lithostratigraphic control to be collected at 10m intervals from Sele formation to top Hugin. Reduce to 3m intervals from top Hugin to TD.

Mud Samples (1 litre) at 50mMD intervals from top Hugin to TD:

Well fluid samples to be collected on drill pipe MDT run.

5.10.11 Wireline Logging

VSP will be run on wireline inside drillpipe.

5.10.12 Contingency Plans & Procedures

See Risk matrix Appendix C.1.7 and the contingency plans on the Teamsite.

5.10.13 Gyro surveying

A drop gyro will be run to TD of the 8½" section as a verification survey for gross errors.

5.11 P & A section F-15

	From mMD	From mTVD	To mMD	To mTVD
Reservoir plug	4002	3233	3700	3013
Cement plug below 13 3/8" casing	2689	2510	2489	2337

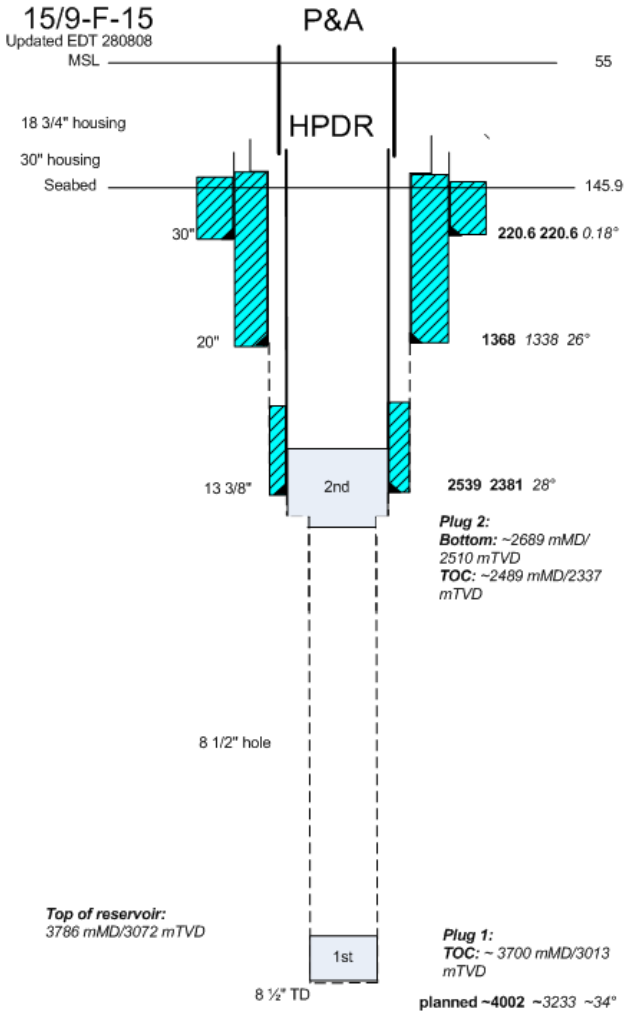
5.11.1 Objective

The objective is to permanently abandon the well with one plug covering the reservoir and extending at least 50 meters above top of the permeable zones. A second plug will cover the transition zone from open hole, at least 50 meters below, and inside the 9 5/8" casing. The transition plug will be tested to at least 70 bar above minimum fracture pressure below the plug.

5.11.2 Operational summary

1. MU and RIH with 3 ½" cement stinger to TD.
2. Circulate and condition mud.
3. Set cement plug across the reservoir from TD at 4002 to min 50m above top reservoir.
4. POOH above TOC at 3700 mMD
5. Circulate out excess cement
6. POOH to 150m below 13 3/8" casing shoe at +/- 2689 mMD. Set 200m cement plug with TOC, 50 meters inside the 13 3/8" casing.
7. Pull above TOC at +/- 2489 mMD.
8. Circulate out excess cement.
9. POOH and L/D 3 ½" cement stinger.
10. The 2nd cement plug will be tested to 70 bar above frac pressure in section 5.12.2.

5.11.3 Planned well status after P&A operation



5.12 12 ¼" Section F-15A

	m MD	m TVD	Inclination
Section Start	2544	2385	28°
Section TD	2971	2749	38°
Section Length	427	364	
Casing Shoe	2966	2746	31°

5.12.1 Objective

Sidetrack from F-15 below the 13 3/8" casing shoe, set 10 ¾" x 9 ⅝"casing 25mMD into the Hod Fm. and cement with top of cement 100 m MD inside the 13 3/8" csg shoe.

5.12.2 Operational Summary

1. MU 12 ¼" Vortex Powerdrive Xceed BHA, RIH
2. Test transition plug to 150 bar with 1.44 sg OBM; equivalent to 70 bar above frac pressure below cement kick-off plug.
3. Drill out sement inside 13 3/8" casing and initiate sidetrack while displacing to 1.30 sg OBM.
4. Drill 12 ¼" hole using 1.30 sg OBM to TD at +/- 2971 mMD.
5. Circulate well clean and drop gyro
6. POOH with 5 ½" drill pipe
7. Drop 5 ½" HWDP drift
8. POOH and L/D BHA
9. Retrieve nominal seat protector
10. Run and cement 10 ¾"x 9 ⅝"casing, pressure test to 345 bar on plug bump using 1.30 sg mw. If unable to bump plugs, max well test pressure after cement has set-up is 320 bar with 1.30 sg mw ~ 338 bar at 10 ¾" casing hanger.
11. Install lock down sub ***(Do not set 10 ¾" MS-1 seal)***
12. Install barrier plug inside 10 ¾" casing at +/- 300 mMD and test same
13. Nipple down diverter and BOP
14. Disconnect HPDR and pull out same
15. Run production riser
16. Install centralizers and tension ring
17. Pressure test riser and connector
18. Cut and prepare production riser for surface wellhead
19. N/U surface wellhead and surface riser
20. N/U BOP and diverter and pressure test BOP to 345 bar
21. Retrieve tie-back adapter insert and bowl protector from subsea wellhead.
22. Displace riser to 1.03 treated seawater
23. Run 10 ¾" tie-back casing to surface wellhead
24. Test tie-back connector and casing against barrier to 345 bar / 1.03 sg
25. Run bowl protector in surface wellhead
26. RIH with plug pulling tool, retrieve barrier plug and POOH

5.12.3 Directional Drilling

See Appendices B.1.1 Well Profile and B.1.2 Survey Listing
A drop gyro is planned at 12 ¼" TD.

Inclination:	Build inclination from 28° to 38°.
Azimuth:	Turning from 219° to 264°
Planned Dogleg:	2.6°/30m

Tool	Measurements	Operating Range
PowerDrive Vortex Xceed Ref. Appendix B.1.2, BHA Proposals.	Inclination	2450 – 4900 lpm allowing 7% flow through motor. (Xceed operates 2270 – 4540 lpm) 180RPM drilling 40 RPM reaming Motor output 0.0289 rev/liter

5.12.4 Torque & drag

Design Criteria	
Block Weight (T)	69 Tonnes
BHA	Powerdrive see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis
Bit	PDC
Bit Torque (kN-m)	6 kN-m
WOB (T)	10 Tonnes
Mud	1.30sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Simulated Values (Wellplan)					
Bit depth	**2550**	**2650**	**2750**	**2850**	**2971**
Torque Off bottom (kN-m)	**4.0**	**4.7**	**5.3**	**6.1**	**6.9**
Torque On Bottom (kN-m)	**9.9**	**10.6**	**10.1**	**11.6**	**12.4**
Hookload PU (T)	**165**	**169**	**172**	**175**	**178**
Hookload SO (T)	**157**	**159**	**160**	**162**	**164**
Min. Wt. Hel. Buckle (tripping in)	**33**	**34**	**36**	**38**	**32**
Max WOB (buckling) (T)	**39**	**39**	**41**	**43**	**38**
Max WOB (bit) (T)	**22**	**22**	**22**	**22**	**22**

Torque and drag readings to be taken each stand as per standard procedure in DOP.
These readings will be plotted by Geoservices and compared to the predicted values (roadmap).
Roadmap to be always available in real time for evaluation of hole condition.

5.12.5 Bit Selection

The final bit selection will be based on the ongoing I-drill study but the following bits are available:

Manufacturer	Model	Type	TFA	Comments	Max WOB	
Smith	MDi716	7 blade 16mm face 13mm gauge	1.107 3 x 15 3 x 16	**Primary Bit for Exceed**	22 T	
Hycalog	RSR616 M-A12	PDC 6 blade 16mm cutters Short taper shallow cone	1.107 3 x 15 3 x 16	Back up	22T	
Smith	GGH	Milled tooth IADC 135	0.746 3x18	Contingency	27T	
Smith	GF15BD ODV	Insert IADC 447	0.746 3x18	Contingency	27T	

5.12.6 Hydraulics

Design Criteria	
BHA	Powerdrive see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis
Bit	PDC 3x15,3x16 tfa 1.107in²
Mud	1.30sg OBM
ROP	25 m/hr
String RPM	140
Rheology 600,300,200,100,60,30,6,3	78,49,38,25,19,14,8,7

Hydraulics (Wellplan)								
Bit depth mMD	**Flow lpm**	**ECD at bit SG**	**ECD at shoe**	**Pump pres bar**	**MW sg**	**TFA in²**	**Pres. loss at bit Bar**	**HSI hp/in²**
2550	3500	1.34	1.34	217	1.30	1.107	48	3.2
2650	3500	1.34	1.34	220	1.30	1.107	48	3.2
2750	3500	1.34	1.34	223	1.30	1.107	48	3.2
2850	3500	1.34	1.34	226	1.30	1.107	48	3.2
2971	3500	1.34	1.34	232	1.30	1.107	48	3.2

5.12.7 MWD/LWD

Tool	Measurements	Operating Range
PowerPulse 8 (MWD)	Inclination (°) Azimuth (°)	2270 – 4540 l/min
ARC 8 w/ PWD (Vision Resistivity)	Gamma Ray (API) Resistivity (ohm) Annular Pressure Static Annular Pressure Dynamic Annular Temperature ECD	7410 l/min max

5.12.8 Drilling fluids

The well will be displaced to 1.30 sg Enviromul OBM while drilling the shoetrack. Sized Baracarb & Steelseal will be added to the mud system before entering the Ty formation

Additive	Before entering Ty
Baracarb 150	10 Kg /m³
Baracarb 50	5 Kg/m³
Steelseal	15 Kg/m³

See summary Drilling Fluids Program in Appendix C.1.4

5.12.9 TD criteria

The plan is to set the 9 ⅝"shoe inside the Hod Fm. ~25m MD below top Hod as identified by logs from F-15.

5.12.10 Wellhead

The 10 ¾" MS-700 casing hanger is run on a PADPRT prepacked with cement SSRII wiper plugs from shore and made up to a casing pup joint.
The internal profile features a latch ring profile which mates with the relevant running tools and provides a location for the wear bushing D ring.

In order to monitor the B-annulus pressure during gaslift operations, no MS seal will be installed on the 10 ¾" subsea casing hanger, meaning that full communication is existing between the well and the 13 3/8" x 10 ¾" x 9 5/8" casing until the lockdown sub and 10 ¾" tie-back string is run and surface 10 ¾" hanger seal is installed.

5.12.11 10 ¾" x 9 ⅝" Casing

Ref. Well Schematic Appendix C.1.3.

- The casing will be cleaned, drifted, measured and doped at Statoil onshore base.
- **Shoe track** is Reamer shoe/joint/joint/pup/float/joint delivered in 3 assemblies from shore with centralisers fitted on shoe joint and float collar joint only.
- 9 5/8" Vam Top HC NA connections will be run from 1800 mMD to bottom Ty at +/- 2800 mMD to meet expected compression load during production.
- Maximum running speed should be estimated based on ECD simulations done by Halliburton and Geoservices prior to running the casing.
- Evaluate to break circulation every 500 m MD when running in hole.
- Circulate bottoms up at the 13 3/8" casing shoe.

:

Design Criteria	
Block Weight (T)	69 Tonnes
10 ¾"	1654m 60.7# 13Cr80
9 ⅝"	1166m 53.5# 13 Cr80
Optimum/Maximum MU torque 10 ¾"	23 150 ftLbs
Optimum/Maximum MU torque 9 5/8" VT HC NA	23 150 ftLbs
Optimum/Maximum MU torque 9 5/8" VT	23 150 ftLbs
Running string	5 ½" 57.4# HWDP
Mud	1.30sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Calculated P/U & S/O (Wellplan)						
Shoe depth	500	1000	1500	2000	2500	2966
PU weight (T)	103	136	172	210	246	280
SO Weight (T)	102	134	168	203	235	262

5.12.12 Centralisers

Ref. Well schematic. Appendix C.1.3

Centralisers will be fitted onshore.

5.12.13 Pip Tags & Pup joints

None

5.12.14 Casing Cementing

In order to ensure a good quality cement job, it is recommended to displace base oil, spacer and cement slurry into annulus at a pump rate of 1500 – 2500 lpm. The pump rate should be reduced to 1000 lpm for the last 2 - 3 m3 prior to bump plug.

Pre-job simulations indicate a maximum ECD at section TD of 1,62 – 1,63 sg, when simulated with 2300 lpm displacement rate and gauge hole. Prognosed fracture gradient at this depth is 1,84 sg.
In the Ty formation, expected maximum ECD is 1,58 sg, with a prognosed fracture gradient of 1.71 sg.
At the 13 3/8" casing shoe expected maximum ECD is 1,52 sg, with a prognosed fracture gradient of 1,78 sg.
Mud properties used in ECD simulation are as follows:
Density: 1,30 sg
Rheology: PV = 27 cp, YP = 12 lbf/ft2

A 1,90 sg cement slurry design, using silica blend cement to avoid strength retrogression due to high static temperatures, is proposed for this cementing operation. Total slurry volume is based on TOC at 2439 m MD, 100 m into previous casing shoe, and with an OH excess of 30%. Total volume to be pumped is 20,1 m3.

6 m3 base oil and 20 m3 of 1,60 sg spacer should be pumped ahead of the cement slurry in order to ensure proper hole cleaning and reduce ECD towards the end of the job.

The casing is planned to be run with a 9 5/8" double-valve reamer-shoe and using the SSR-II wiperplug system. When using the SSR-II wiper plugs, the cement head will be preloaded with the appurtenant launching darts onshore.

A detailed cement procedure with final simulations included will be sent to the rig prior to the cement job.

Ref: Cement Program. Appendix C.1.5

5.12.15 Sampling

Standard cuttings samples for lithostratigraphic control to be collected at 20m intervals.
Geoservices to log cavings throughout.

5.12.16 Wireline Logging

None

5.12.17 Contingency Plans & Procedures

See Risk matrix Appendix C.1.7 and the contingency plans on the Teamsite.

5.12.18 Gyro surveying

A drop gyro will be run at TD of the 12 ¼" section as a gross error verification survey <500m md MD from top reservoir.

5.13 8 ½" Section F-15A

The 8 ½" section of this drilling program is based on a prognosed reservoir top on the west flank of the reservoir fault, dividing the F-15A reservoir targets. The final well trajectory for F-15A will be defined after formation evaluation log results form F-15.

	m MD	m TVD	Inclination
Section Start	2971	2749	38°
Section TD	4255	3186	82°
Section Length	1284	662	
Liner Shoe	4253	3186	82°

5.13.1 Objective

Drill Reservoir section, set and cement 7" liner.

5.13.2 Operational Summary

1. MU & RIH with 8 ½" Powerdrive X5 BHA
2. Drill out 9 ⅝"shoe + 3m new formation while displacing to 1.44 sg OBM
3. Perform FIT to 1.60 sg (to accommodate drilling ECD and cementing ECD)
4. Drill to TD at +/- 4255 mMD, take pressure points with stethoscope.
5. Circulate clean, drop 5 ½" DP drift and POOH
6. Run TLC NMR log on 5 ½" x 5" drillpipe.
7. Evaluate to run 8 ¼" wiper trip assy to verify hole condition before running liner
8. Run 7" liner on 5 1/2" DP
9. Cement liner, pressure test liner on plug bump to 220bar / 1.44sg, equivalent to 70 bar above fracture gradient below 7" liner shoe.
10. Set TSP packer, and test liner packer to 240 bar / 1.44 sg, equivalent to max final test pressure of 345 bar with 1.03 sg packer fluid.
    Note: In order to test the liner packer to 70 bar above fracture gradient below 7" liner shoe, the packer needs to be tested to 295 bar. However a test pressure of 295 bar with 1.44 sg result in a burst case on the 9 5/8" casing across Ty formation. Maximum test pressure with 1.44 sg mud in the well is 280 bar.
11. Circulate out excess cement
12. POOH, prepare for cleanout run.

5.13.3 Directional Drilling

See Appendices B.1.1 Well Profile and B.1.2 Well Listing

Inclination:	Build from 38° to 86° at 3595mMD, drop to 73° from 3616 m MD to 3779 m MD, hold to 3810 m MD. Gradually increase to ~82° at TD.
Azimuth:	Turn from 264° to 292° at 3039 m MD, turn steadily to 281° at TD.
Planned Dogleg:	2.6°/30m , 2.4°/30m , 2.0° /30m , 0.9°/30m

Tool	Measurements	Operating Range
PowerDrive675 X5	Inclination Gamma	2000 to 2350 l/min with 0.701in^2 TFA 180 RPM drilling 80 RPM reaming 40-55bar pressure drop below tool

Ref. Appendix B.1.2, BHA Proposals.

5.13.4 Torque & drag

Design criteria:
Surface torque and weight for PowerDrive BHA: 5 ½" 21.7# DP + 5" 19.5# in open hole.

Design Criteria	
Block Weight (T)	69 Tonnes
BHA	Powerdrive X5 see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam EIS + 1300m 5" 19.5#
Bit	PDC
Bit Torque (kN-m)	3 kN-m
WOB (T)	8 Tonnes
Mud	1.44sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Bit depth	3000	3250	3500	3750	4000	4253
Torque Off bottom (kN-m)	3.8	5.1	6.2	7.4	8.6	9.8
Torque On Bottom (kN-m)	6.7	8.2	9.8	10.9	11.8	13.1
Hookload PU (T)	166	171	173	176	181	184
Hookload SO (T)	15	159	158	157	160	159
Min. Wt. Hel. Buckle (tripping in)	80	81	82	83	102	102
Max WOB (buckling) (T)	25	28	28	22	17	18
Max WOB (bit) (T)	16	16	16	16	16	16

Torque and drag readings to be taken each stand as per standard procedure in DOP. These readings will be plotted by Geoservices and compared to the predicted values (roadmap).
Roadmap to be always available in real time for evaluation of hole condition.

5.13.5 Bit selection

Manuf.	Model	Type	TFA	Comments	Max WOB	
Smith	MDi616	6 blade PDC 16mm cutters	0.701 4x 12; 2x13	**Primary Bit for Powerdrive X5**	**12 T**	
Hycalog	RSR716M-C1	7 blade 16mm face 13mm gauge Short taper shallow cone		Back-up	15 T	
Smith	MDi716	7 blade 16mm face 13mm gauge		Back-up	16 T	
Smith	MFDGH	Milled tooth IADC 137	3x 18	Contingency	20 T	
Smith	GF15SD1GV	Insert IADC 447	3x 18	Contingency		
Hughes	HC606	6 blade PDC	~8x12	Under gauge bit 8 ¼" Wiper Trip		

5.13.6 Hydraulics

Design Criteria	
BHA	Powerdrive see Appendix B.1.2
Drill pipe	5 ½" 21.9# Vam Eis +1300m 5" 19.5#
Bit	PDC 4x12 2x13 0.701 in²
Required bit loss (powerdrive)	35-55
Mud	1.44sg OBM
ROP	25 m/hr
Rheology 600,300,200,100,60,30,6,3	80,52,41,27,22,19,11,10

Hydraulics for Powerdrive (Wellplan)								
Bit depth mMD	Flow lpm	ECD at bit SG	ECD at shoe	Pump pres bar	MW sg	TFA in²	**Pres. loss at bit Bar	**HSI hp/in²
3000	2300	1.52	1.52	190	1.44	0.701	52	4.5
3300	2300	1.53	1.52	198	1.44	0.701	52	4.5
3600	2300	1.54	1.52	207	1.44	0.701	52	4.5
3900	2300	1.55	1.52	215	1.44	0.701	52	4.5
4255	2300	1.56	1.53	224	1.44	0.701	52	4.5

***calculated for 95% of flow to allow for loss over Powerdrive pads*

5.13.7 MWD/LWD

Tool	Measurements	Operating Range
Telescope6 (MWD)	Inclination (°) Azimuth (°)	1520-3040 lpm
Ecoscope6	Gamma Ray (API) Multiphase Resistivity Annular Pressure Annular Temperature ECD Density Neutron Porosity	3040 lpm max
Stethoscope 6	Formation Pressure	Max flow 3040 lpm
Sonic Vision	Delta t	Max flow 3040 lpm

5.13.8 Drilling fluids

The 1.30sg mud will be carried over from the previous section. The weight will be increased to 1.44 sg before entering the Cromer Knoll.

Concentration of Sized Baracarb & Steelseal will be maintained at 15Kg/m³

Additive	Before Entering Cromer Knoll
Baracarb 150	15 Kg /m³
Baracarb 50	15 Kg /m³
Steelseal	15 Kg /m³

See summary Drilling Fluids Program in Appendix C.1.4

5.13.9 TD criteria

To be defined after formation evaluation logs from F-15.

5.13.10 7" Liner

Ref. Well Schematic Appendix C.1.3.

- The liner will be cleaned, drifted, measured and doped at Statoil onshore base.
- The **shoe track** will be: Reamer shoe/joint/pup/float/joint/joint/landing collar, delivered in 3 assemblies from shore with centralisers fitted on the shoe and landing collar joints only. The assemblies will be thread locked onshore but the connections will not be thread locked on the rig, to allow racking back if required.
- The liner hanger will be Weatherford with "R"-type running tool and Floating Junk Bonnet
- A 5 ½" DP will be used in the landing string
- Maximum running speed should be estimated based on ECD simulations done by Halliburton and Geoservices prior to running the casing.
- Running string to be drifted to DP API drift
- Liner dart OD is 2 ¾"

Design Criteria	
Block Weight (T)	69 Tonnes
7"	1387 m 29# 13CrS110
Couplings	Vam Top HT opt m/u 24kNm
Running string	5 ½" 21.9#
Mud	1.44sg OBM
Friction Factor in Casing	0,15
Friction Factor in Open Hole	0,20

Torque & Drag (Wellplan)					
Shoe depth	2500	3000	3500	4000	4253
PU weight (T)	148	160	168	171	173
SO Weight (T)	142	152	154	151	150
Min. Wt. Hel. Buckle tripping in	71	79	79	79	79
Torque 20 RPM (kNm)	2.5	4.0	6.4	9.1	10.5

5.13.11 Centralisers

Ref. Well schematic. Appendix C.1.3

Centralisers will be fitted onshore.

5.13.12 Pip Tags & Pup joints

3 ea. radio active collars will be installed. One will be installed below hanger and one each at top Hugin on the two different blocks.

Pup joints will be installed below the liner hanger, above the top of the reservoir of block 1 and above the top of the reservoir of block 2.

Ref. Well schematic. Appendix C.1.3

5.13.13 Liner Cementing

In order to ensure a good quality cement job, it is recommended to displace base oil, spacer and cement slurry into annulus at a pump rate of 1000 – 1200 lpm. The pump rate should be reduced to 500 lpm for the last 2 - 3 m3 prior to bump plug. In addition the liner should, if possible, be rotated throughout the cement job

Pre-job simulations indicate a maximum ECD at section TD of 1,87 sg, when simulated with 1200 lpm displacement rate and gauge hole. Prognosed fracture gradient at this depth is 1,92 sg.
At the 9 5/8" casing shoe expected maximum ECD is 1,53 sg, with a prognosed fracture gradient of 1,84 sg.

Mud properties used in ECD simulation are as follows:
Density: 1,44 sg
Rheology: 53 – 41 – 29 – 24 – 19 – 14 - 12 (300 through 30 rpm reading)

A 1,90 sg cement slurry design, using silica blend cement to avoid strength retrogression due to high static temperatures, is proposed for this cementing operation. Total slurry volume is based on having TOC to above liner lap at 2866 m MD, and with an OH excess of 65%. Total volume to be pumped is 27 m3.

8 m3 base oil and 15 m3 of 1,50 sg spacer should be pumped ahead of the cement slurry in order to ensure proper hole cleaning.

A detailed cement procedure with final simulations included will be sent to the rig prior to the cement job.

Depending on coal quantity encountered in F-15, a foam cement job may be performed to reduce the risk of losses during the cement job in Hugin.

Ref: Cement Program. Appendix C.1.5

5.13.14 Sampling

See RTD 5

Standard cuttings samples for lithostratigraphic control to be collected at 10m intervals from Shetland to top Hugin. Reduce to 3m intervals from top Hugin to TD.

Mud Samples (1 litre) at 50mMD intervals from top Hugin to TD:

Well fluid samples to be collected on drill pipe MDT run.

5.13.15 Wireline Logging

NMR TLC logging run will be performed after drilling to TD of the 8 ½" section. Magtrac NMR will be evaluated to be used in the BHA which will replace NMR TLC wireline logging.

5.13.16 Contingency Plans & Procedures

See Risk matrix Appendix C.1.7 and the contingency plans on the Teamsite.

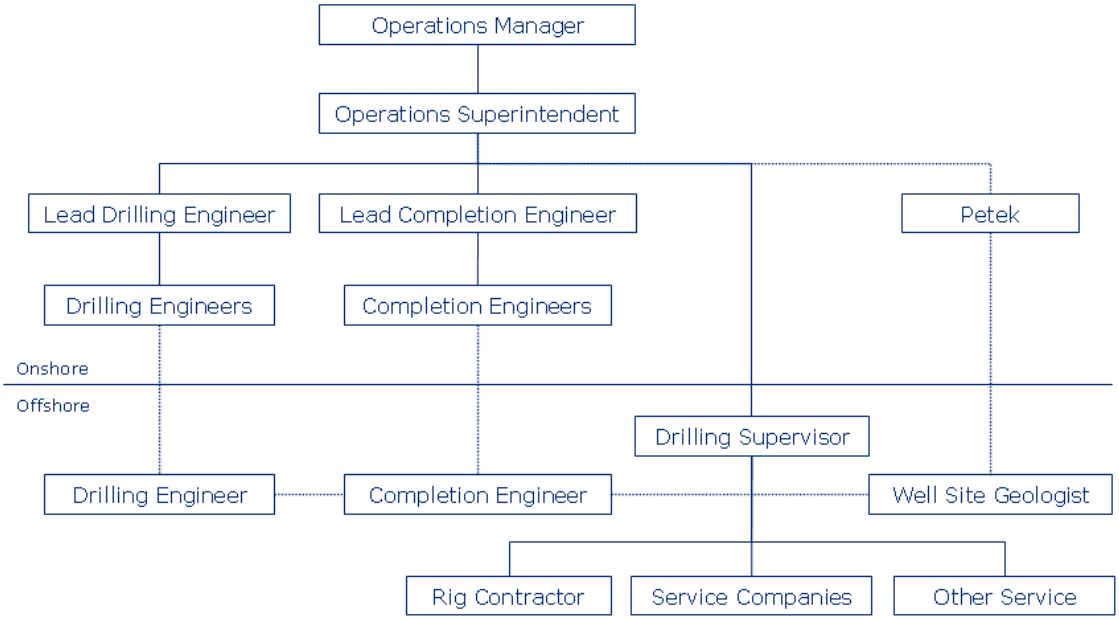
5.13.17 Gyro surveying

None.

App A Organisation

A.1 Organisation, Responsibilities, Communication & Reporting

EPN DWS MDUN MI organisation is responsible for planning, execution and follow-up of the drilling and completion operations on Volve. The figure below shows the Volve onshore and offshore organisation layout.



A.1.1 StatoilHydro organization for the project

Contact points	Position	Phone	E-mail @Statoilhydro.com
Jostein Vestvik	D&W Manager	90615413	JOVES
Tore Endresen	Operations Superintendent	48080316	TOEN
Roel Heusschen	Drilling Plan Manager	95427874	RHEU
Espen Torgersen	Drilling Engineer	94152451	EDT
Tord Nesse	Drilling Engineer	97629639	TORDN
Maria Mora	Drilling Engineer	41711933	MARMO
Beathe Magnussen	Well Plan Manager	91189706	BEAMA
Eivind Lie Kristensen	Completion Engineer	99409732	EIKR
Trond H Berge	Completion Engineer	51993854	TRBER
Hasse Herland	Completion Engineer	40404980	HASHE
Poul Starck	Completion Engineer	91374227	POUS
Arnfinn Johansen	Operations Geologist	95202558	ARJO
Svein-Egil Skjæveland	Logistics	94809265	SVSKJ
Kristine Haaland	HSE	46928519	KRHAA
John Martin Johnsen	Economics	94156518	JMJ
Elin Jekteberg	Personal coordinator	95413562	BREJ

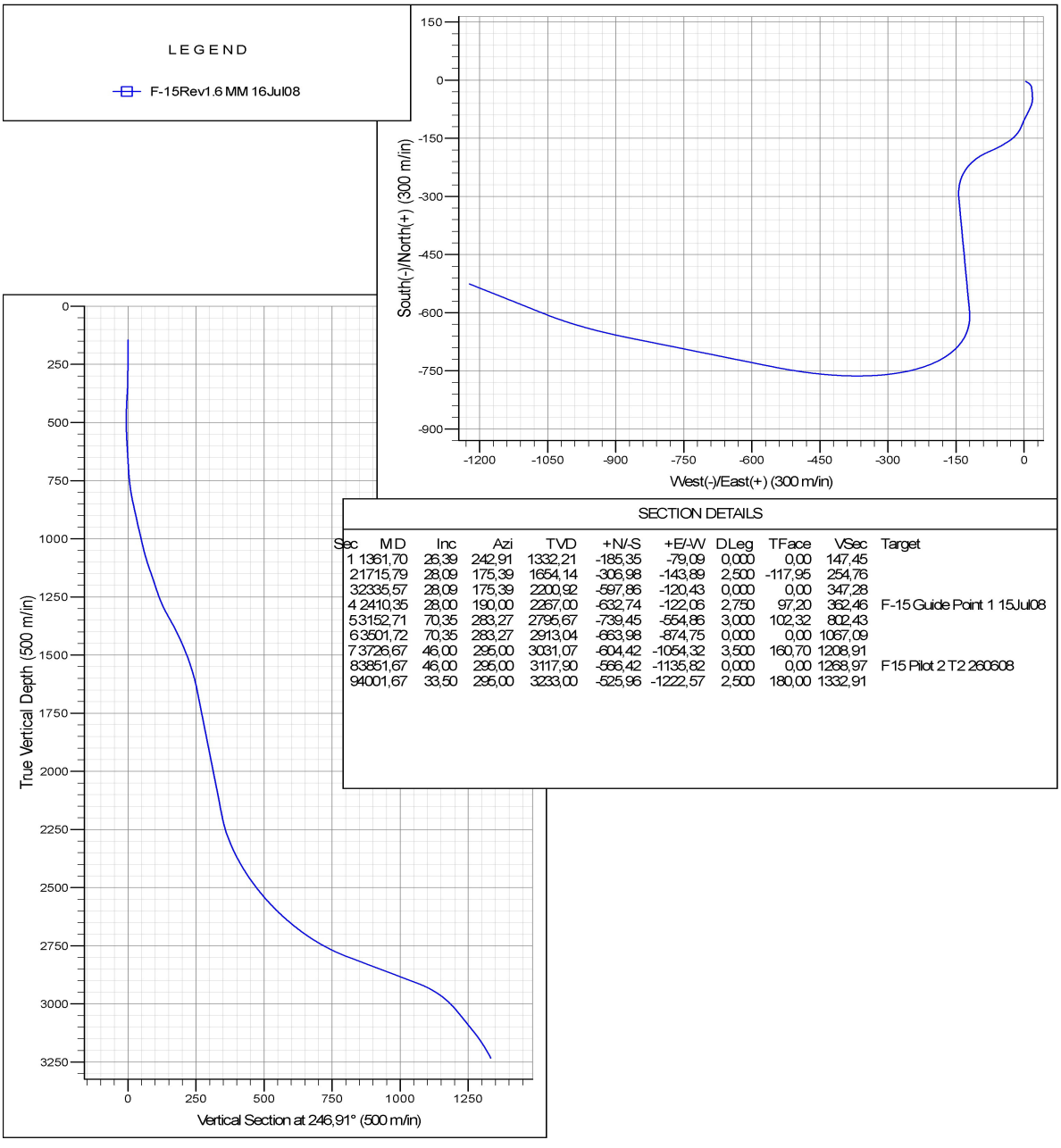
A.1.2 Contractors

Contact point	Company	Phone	Service
Bjarte Taranger	Maersk	40807029	Superintendent
Claus Bachmann	Maersk	40807020	Operations manager
Colin Cockburn	Schlumberger	98226560	DD, MWD, Mudlogging
Rene van der Laan	Smith Intern.	99087382	Drilling optimisation Engineer
Johannes Rygg	Halliburton	99091845	Drilling fluids
John Inge Blom	Halliburton	97699648	Drilling fluids
Brit Dirdal	Halliburton	91604155	Cement/ Well Cleaning Chemicals
Tore Bernhoff	Oceaneering	90188866	ROV
Randi Midthun	Vetco	93235326	Wellhead
Jan Ove Steinsland	Gyrodata	91846848	Drop Gyro
Tor Jostein Gudmestad	Weatherford	90726705	Liner hanger
Halvard Salomonsen	Weatherford	95242168	Liner hanger
Tor Olav Refsland	Baker Oil Tools	91592282	Completion Equipment
Olav Edland	Seadrill	92438715	Wireline
Ben Wood	Schlumberger	98226591	Wireline
Gareth Legg	Schlumberger	92071420	Oilphase Fluid Sampling

App B Directional Drilling

B.1.1 Well profiles

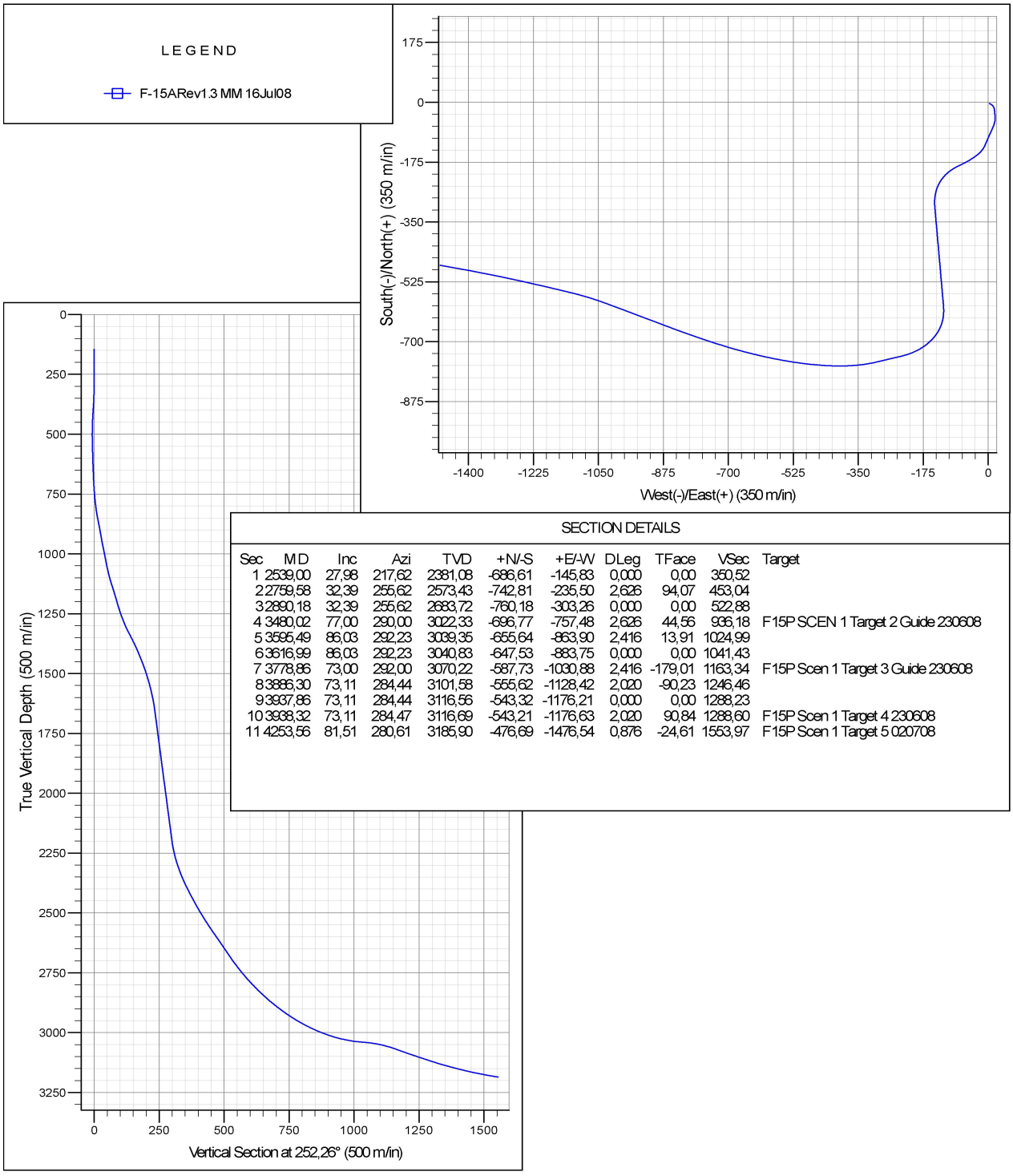
Project: SLEIPNER
Site: Volve F
Well: F-15
Wellbore: F-15
Design: F-15Rev1.6 MM 16Jul08



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	1361,70	26,39	242,91	1332,21	-185,35	-79,09	0,000	0,00	147,45	
2	1715,79	28,09	175,39	1654,14	-306,98	-143,89	2,500	-117,95	254,76	
3	2335,57	28,09	175,39	2200,92	-597,86	-120,43	0,000	0,00	347,28	
4	2410,35	28,00	190,00	2267,00	-632,74	-122,06	2,750	97,20	362,46	F-15 Guide Point 1 15Jul08
5	3152,71	70,35	283,27	2795,67	-739,45	-554,86	3,000	102,32	802,43	
6	3501,72	70,35	283,27	2913,04	-663,98	-874,75	0,000	0,00	1067,09	
7	3726,67	46,00	295,00	3031,07	-604,42	-1054,32	3,500	160,70	1208,91	
8	3851,67	46,00	295,00	3117,90	-566,42	-1135,82	0,000	0,00	1268,97	F15 Pilot 2 T2 260608
9	4001,67	33,50	295,00	3233,00	-525,96	-1222,57	2,500	180,00	1332,91	

Project: SLEIPNER
Site: Volve F
Well: F-15
Wellbore: F-15 A
Design: F-15ARev1.3 MM 16Jul08



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	2539,00	27,98	217,62	2381,08	-686,61	-145,83	0,000	0,00	350,52	
2	2759,58	32,39	255,62	2573,43	-742,81	-235,50	2,626	94,07	453,04	
3	2890,18	32,39	255,62	2683,72	-760,18	-303,26	0,000	0,00	522,88	
4	3480,02	77,00	290,00	3022,33	-696,77	-757,48	2,626	44,56	936,18	F15P SCEN 1 Target 2 Guide 230608
5	3595,49	86,03	292,23	3039,35	-655,64	-863,90	2,416	13,91	1024,99	
6	3616,99	86,03	292,23	3040,83	-647,53	-883,75	0,000	0,00	1041,43	
7	3778,86	73,00	292,00	3070,22	-587,73	-1030,88	2,416	-179,01	1163,34	F15P Scen 1 Target 3 Guide 230608
8	3886,30	73,11	284,44	3101,58	-555,62	-1128,42	2,020	-90,23	1246,46	
9	3937,86	73,11	284,44	3116,56	-543,32	-1176,21	0,000	0,00	1288,23	
10	3938,32	73,11	284,47	3116,69	-543,21	-1176,63	2,020	90,84	1288,60	F15P Scen 1 Target 4 230608
11	4253,56	81,51	280,61	3185,90	-476,69	-1476,54	0,876	-24,61	1553,97	F15P Scen 1 Target 5 020708

B.1.2 Well Listings

Statoil
Survey Report

Company:	STATOILHYDRO NORWAY	Local Coordinate Reference:	Site Volve F
Project:	SLEIPNER	TVD Reference:	
Site:	Volve F	MD Reference:	
Well:	F-15	North Reference:	
Wellbore:	F-15	Survey Calculation Method:	
Design:	F-15Rev1.6MWM16Jul08	Database:	

Project

Map System:	Universal Transverse Mercator	System Datum:	
Geo Datum:	European 1950 - Mean		Using Well Reference Point
Map Zone:	Zone 31N (0 E to 6 E)		Using geodetic scale factor

Site

Site Position:		Northing:	6 478 563,52m	Latitude:	
From:	Map	Easting:	435 050,02m	Longitude:	
Position Uncertainty:	0,00m	Slot Radius:	in	Grid Convergence:	-0,95

Well F-15

Well Position	+N/-S	-3,17 m	Northing:	6 478 560,36 m	Latitude:	
	+E/-W	3,53 m	Easting:	435 053,55m	Longitude:	
Position Uncertainty		0,00 m	Wellhead Depth:	91,00 m	Water Depth:	91,00

Wellbore F-15

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IETICREFERENCE	14.07.2008	-2,13	71,62	50 354

Design F-15Rev1.6MWM16Jul08

Audit Notes:

Version:	Phase:	PLAN	Tie On Depth:

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	145,90	-3,17	3,53	246,91

Survey Tool Program Date 21.08.2008

From (m)	To (m)	Survey (Wellbore)	Tool Name	Description
149,77	211,13	F15 36in MWD Survey (F-15)	Magnetic, other	
220,60	1 361,70	F15 26" GyroMWD survey (F-15)	Keeper, stat	
149,77	4 001,67	F-15Rev1.6 MWM16Jul08 (F-15)	Wellbore Surveyor, cont	

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
200,00	0,19	260,04	200,00	-3,22	3,52	0,03	0,000	0,00	0,00
300,00	0,87	136,18	300,00	-3,78	3,86	-0,06	0,296	0,21	-37,16
400,00	5,76	128,13	399,74	-7,44	9,27	-3,61	1,472	1,47	-2,41
500,00	6,43	159,77	499,22	-15,50	15,26	-5,95	1,014	0,20	9,49
600,00	8,07	174,26	598,43	-27,87	17,14	-2,83	0,732	0,49	4,35
700,00	9,13	175,15	697,29	-42,90	18,30	1,99	0,322	0,32	0,27
800,00	12,21	194,18	795,58	-61,08	16,70	10,60	1,391	0,92	5,71
900,00	14,77	202,12	892,46	-84,22	8,08	27,61	0,948	0,77	2,38
1 000,00	16,66	200,49	989,02	-108,12	-1,95	46,21	0,580	0,57	-0,49
1 100,00	17,26	211,07	1 084,85	-134,41	-13,01	66,69	0,942	0,18	3,17
1 200,00	16,59	232,04	1 180,10	-156,89	-33,25	94,13	1,832	-0,20	6,29
1 300,00	20,30	239,90	1 275,54	-173,87	-57,64	123,22	1,338	1,11	2,36
1 361,70	26,39	242,91	1 332,21	-185,35	-79,09	147,46	3,018	2,96	1,46
1 400,00	25,04	236,24	1 366,73	-193,73	-93,41	163,92	2,500	-1,06	-5,23
1 500,00	23,17	216,26	1 458,16	-221,40	-122,69	201,70	2,500	-0,56	-5,99
1 600,00	24,04	195,46	1 549,95	-256,96	-139,78	231,37	2,500	0,26	-6,24

Statoil
Survey Report

Company:	STATOILHYDRO NORWAY	Local Coordinate Reference:	Site Volve F
Project:	SLEIPNER	TVD Reference:	
Site:	Volve F	MD Reference:	
Well:	F-15	North Reference:	
Wellbore:	F-15	Survey Calculation Method:	
Design:	F-15 Rev1.6 MM 16 Jul 08	Database:	

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1 700,00	27,38	177,78	1 640,17	-299,64	-144,33	252,29	2,500	1,00	-5,30
1 715,79	28,09	175,39	1 654,14	-306,98	-143,89	254,76	2,500	1,34	-4,53
1 800,00	28,09	175,39	1 728,44	-346,50	-140,70	267,34	0,000	0,00	0,00
1 900,00	28,09	175,39	1 816,66	-393,44	-136,91	282,26	0,000	0,00	0,00
2 000,00	28,09	175,39	1 904,88	-440,37	-133,13	297,19	0,000	0,00	0,00
2 100,00	28,09	175,39	1 993,10	-487,30	-129,34	312,12	0,000	0,00	0,00
2 200,00	28,09	175,39	2 081,32	-534,24	-125,56	327,04	0,000	0,00	0,00
2 300,00	28,09	175,39	2 169,54	-581,17	-121,77	341,97	0,000	0,00	0,00
2 335,57	28,09	175,39	2 200,92	-597,86	-120,43	347,28	0,000	0,00	0,00
2 400,00	27,92	187,98	2 257,86	-627,95	-121,30	359,89	2,750	-0,08	5,86
2 410,35	28,00	190,00	2 267,00	-632,74	-122,06	362,46	2,750	0,23	5,84
2 500,00	27,41	209,31	2 346,53	-671,54	-135,85	390,36	3,000	-0,20	6,46
2 600,00	29,82	229,68	2 434,52	-707,79	-166,15	432,45	3,000	0,72	6,11
2 700,00	34,81	245,97	2 519,17	-735,57	-211,29	484,87	3,000	1,50	4,89
2 800,00	41,45	258,13	2 597,90	-754,05	-269,90	546,03	3,000	1,99	3,65
2 900,00	49,06	267,30	2 668,31	-762,66	-340,20	614,08	3,000	2,28	2,75
3 000,00	57,24	274,50	2 728,28	-761,13	-420,05	686,93	3,000	2,45	2,16
3 100,00	65,77	280,46	2 775,98	-749,52	-507,03	762,39	3,000	2,56	1,79
3 152,71	70,35	283,27	2 795,67	-739,46	-554,86	802,43	3,000	2,61	1,60
3 200,00	70,35	283,27	2 811,57	-729,23	-598,20	838,29	0,000	0,00	0,00
3 300,00	70,35	283,27	2 845,20	-707,60	-689,86	914,12	0,000	0,00	0,00
3 400,00	70,35	283,27	2 878,83	-685,98	-781,52	989,96	0,000	0,00	0,00
3 500,00	70,35	283,27	2 912,46	-664,35	-873,18	1 065,79	0,000	0,00	0,00
3 501,72	70,35	283,27	2 913,04	-663,98	-874,75	1 067,09	0,000	0,00	0,00
3 600,00	59,58	287,65	2 954,58	-640,43	-960,46	1 136,70	3,500	-3,29	1,33
3 700,00	48,82	293,21	3 013,02	-612,43	-1 036,40	1 195,57	3,500	-3,23	1,67
3 726,67	46,00	295,00	3 031,07	-604,42	-1 054,32	1 208,91	3,500	-3,17	2,01
3 800,00	46,00	295,00	3 082,01	-582,13	-1 102,13	1 244,15	0,000	0,00	0,00
3 851,67	46,00	295,00	3 117,90	-566,42	-1 135,82	1 268,97	0,000	0,00	0,00
3 900,00	41,97	295,00	3 152,67	-552,24	-1 166,23	1 291,39	2,500	-2,50	0,00
4 000,00	33,64	295,00	3 231,61	-526,35	-1 221,74	1 332,29	2,500	-2,50	0,00
4 001,67	33,50	295,00	3 233,00	-525,96	-1 222,57	1 332,91	2,500	-2,50	0,00

Statoil
Survey Report

Company:	STATOILHYDRO NORWAY	Local Coordinate Reference:	Site Volve F
Project:	SLEIPNER	TVD Reference:	Inspirer Rotary Table @54,90m (Actual RTE)
Site:	Volve F	MD Reference:	Inspirer Rotary Table @54,90m (Actual RTE)
Well:	F-15	North Reference:	Grid
Wellbore:	F-15 A	Survey Calculation Method:	Minimum Curvature
Design:	F-15ARev1.3MM16Jul08	Database:	EDMProd P246N

Project	SLEIPNER, Norway		
Map System:	Universal Transverse Mercator	System Datum:	Mean Sea Level
Geo Datum:	European 1950 - Mean		Using Well Reference Point
Map Zone:	Zone 31N (0 E to 6 E)		Using geodetic scale factor

Site	Volve F, 159				
Site Position:		Northing:	6 478 563,52m	Latitude:	58°26' 29,807 N
From:	Map	Easting:	435 050,02m	Longitude:	1°53' 14,929 E
Position Uncertainty:	0,00m	Slot Radius:	in	Grid Convergence:	-0,95 °

Well	F-15					
Well Position	+N/-S	-3,17 m	Northing:	6 478 560,36 m	Latitude:	58°26' 29,706 N
	+E/-W	3,53 m	Easting:	435 053,55m	Longitude:	1°53' 15,149 E
Position Uncertainty		0,00 m	Wellhead Depth:	91,00 m	Water Depth:	91,00m

Wellbore	F-15 A				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IETICREFERENCE	15.07.2008	-2,13	71,62	50 354

Design	F-15ARev1.3MM16Jul08			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	2 539,00

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	145,90	-3,17	3,53	252,26

Survey Tool Program Date 21.08.2008

From (m)	To (m)	Survey (Wellbore)	Tool Name	Description
149,77	2 539,00	F-15Rev1.6 MM16Jul08 (F-15)	Wellbore Surveyor, cont	Gyro Tool from GD
2 539,00	2 540,00	F-15ARev1.3 MM 16Jul08 (F-15 A)	Magnetic, std, non-mag	Magnetic Tools (MWD, BMS)
149,00	2 540,00	F-15ARev1.3 MM 16Jul08 (F-15 A)	Wellbore Surveyor, cont	Gyro Tool from GD
2 540,00	2 542,00	F-15ARev1.3 MM 16Jul08 (F-15 A)	Magnetic, std, non-mag	Magnetic Tools (MWD, BMS)
149,77	2 971,00	F-15ARev1.3 MM 16Jul08 (F-15 A)	Wellbore Surveyor, cont	Gyro Tool from GD
2 971,00	4 253,56	F-15ARev1.3 MM 16Jul08 (F-15 A)	Magnetic, std, non-mag	Magnetic Tools (MWD, BMS)

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
200,00	0,63	217,62	200,00	-3,41	3,35	0,25	0,000	0,00	0,00
300,00	1,80	217,62	299,97	-5,09	2,05	1,99	0,351	0,35	0,00
400,00	2,97	217,62	399,89	-8,39	-0,49	5,42	0,351	0,35	0,00
500,00	4,14	217,62	499,69	-13,30	-4,27	10,52	0,351	0,35	0,00
600,00	5,31	217,62	599,35	-19,82	-9,30	17,30	0,351	0,35	0,00
700,00	6,48	217,62	698,82	-27,96	-15,57	25,75	0,351	0,35	0,00
800,00	7,65	217,62	798,06	-37,70	-23,08	35,87	0,351	0,35	0,00
900,00	8,82	217,62	897,03	-49,04	-31,82	47,65	0,351	0,35	0,00

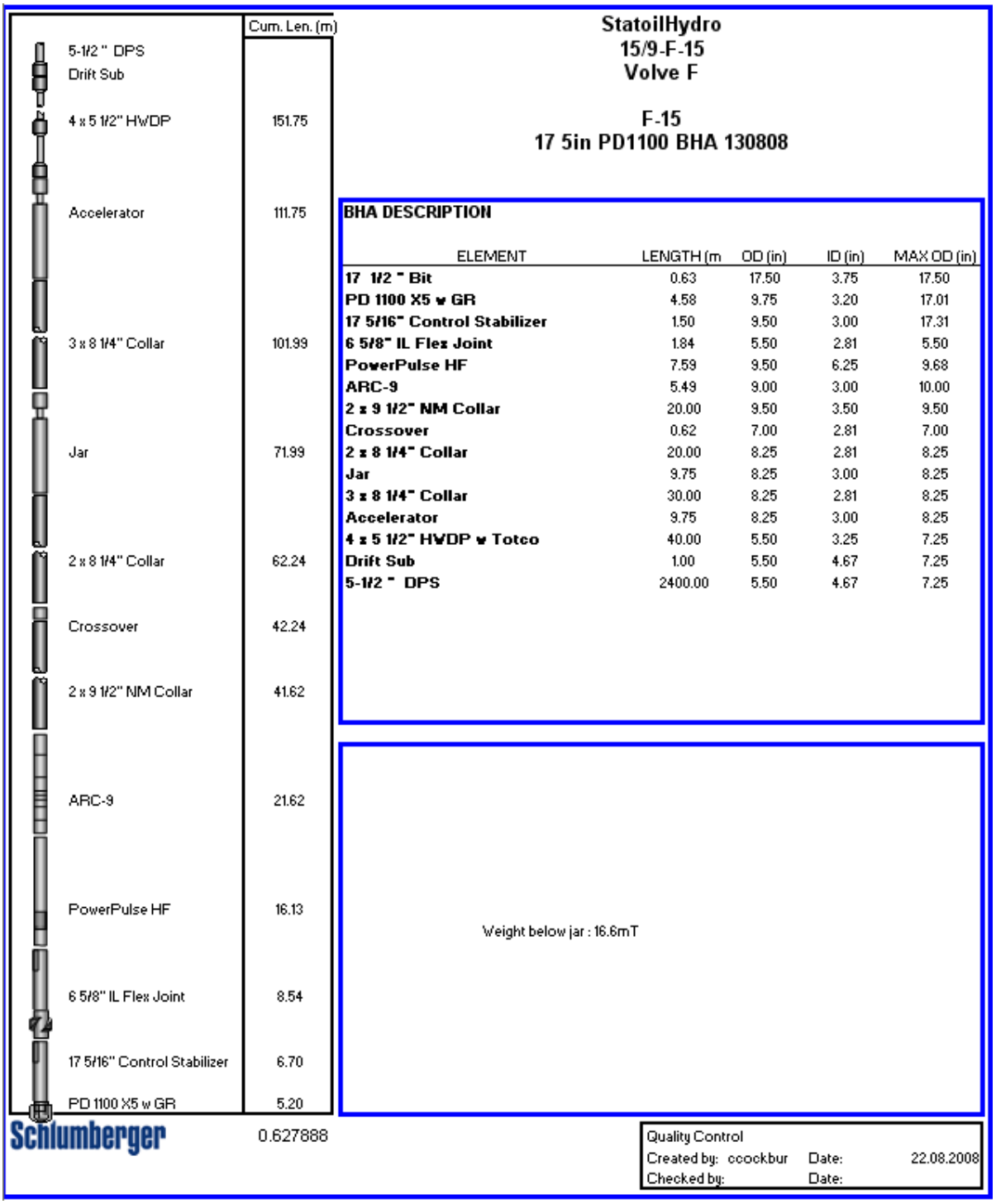
Statoil
Survey Report

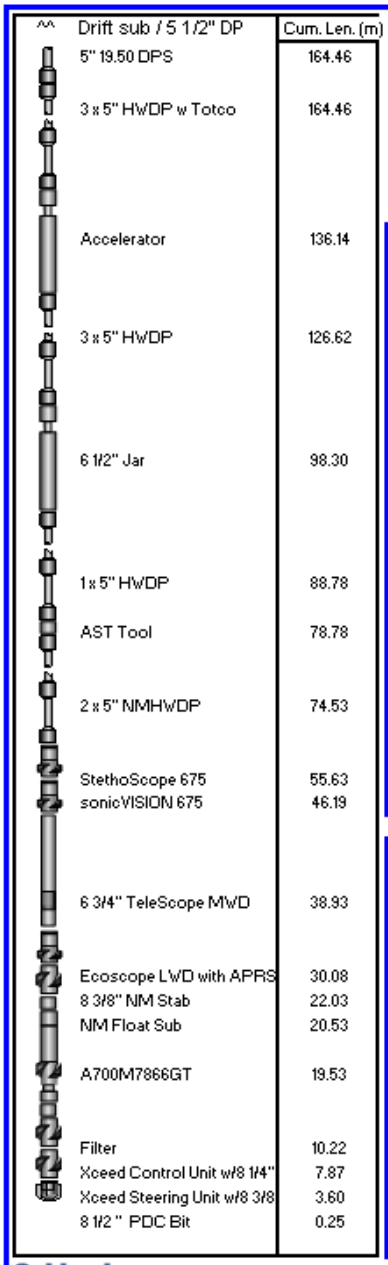
Company:	STATOILHYDRO NORWAY	Local Coordinate Reference:	Site Volve F
Project:	SLEIPNER	TVD Reference:	Inspirer Rotary Table @54,90m (Actual RTE)
Site:	Volve F	MD Reference:	Inspirer Rotary Table @54,90m (Actual RTE)
Well:	F-15	North Reference:	Grid
Wellbore:	F-15 A	Survey Calculation Method:	Minimum Curvature
Design:	F-15ARev1.3MM16Jul08	Database:	EDMProd P246N

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1 000,00	9,99	217,62	995,68	-61,98	-41,79	61,09	0,351	0,35	0,00
1 100,00	11,16	217,62	1 093,98	-76,51	-52,99	76,18	0,351	0,35	0,00
1 200,00	12,33	217,62	1 191,89	-92,63	-65,41	92,92	0,351	0,35	0,00
1 300,00	13,49	217,62	1 289,36	-110,33	-79,05	111,31	0,351	0,35	0,00
1 400,00	14,66	217,62	1 386,35	-129,59	-93,90	131,32	0,351	0,35	0,00
1 500,00	15,83	217,62	1 482,83	-150,43	-109,95	152,96	0,351	0,35	0,00
1 600,00	17,00	217,62	1 578,75	-172,81	-127,20	176,21	0,351	0,35	0,00
1 700,00	18,17	217,62	1 674,08	-196,75	-145,65	201,07	0,351	0,35	0,00
1 800,00	19,34	217,62	1 768,76	-222,22	-165,28	227,53	0,351	0,35	0,00
1 900,00	20,51	217,62	1 862,77	-249,21	-186,08	255,57	0,351	0,35	0,00
2 000,00	21,68	217,62	1 956,07	-277,72	-208,05	285,18	0,351	0,35	0,00
2 100,00	22,85	217,62	2 048,61	-307,73	-231,18	316,35	0,351	0,35	0,00
2 200,00	24,02	217,62	2 140,36	-339,23	-255,45	349,07	0,351	0,35	0,00
2 300,00	25,19	217,62	2 231,28	-372,21	-280,86	383,32	0,351	0,35	0,00
2 400,00	26,36	217,62	2 321,34	-406,64	-307,40	419,10	0,351	0,35	0,00
2 500,00	27,53	217,62	2 410,48	-442,53	-335,06	456,37	0,351	0,35	0,00
2 539,00	27,98	217,62	2 381,08	-686,61	-146,83	350,52	0,351	0,35	0,00
2 600,00	28,07	229,00	2 434,96	-707,38	-165,41	375,49	2,626	0,04	5,59
2 700,00	30,16	246,53	2 522,48	-732,87	-206,29	422,20	2,626	0,63	5,26
2 759,58	32,39	255,62	2 573,43	-742,81	-235,50	453,04	2,626	1,12	4,58
2 800,00	32,39	255,62	2 607,56	-748,18	-256,47	474,65	0,000	0,00	0,00
2 890,18	32,39	255,62	2 683,72	-760,18	-303,26	522,88	0,000	0,00	0,00
2 900,00	33,01	256,73	2 691,98	-761,44	-308,41	528,17	2,626	1,89	3,38
3 000,00	39,75	266,18	2 772,51	-769,84	-366,94	586,47	2,626	2,02	2,84
3 100,00	47,06	273,20	2 845,15	-769,92	-435,52	651,81	2,626	2,19	2,11
3 200,00	54,72	278,69	2 908,21	-761,69	-512,56	722,69	2,626	2,30	1,65
3 300,00	62,57	283,22	2 960,23	-745,34	-596,28	797,44	2,626	2,36	1,36
3 400,00	70,56	287,14	2 999,98	-721,25	-684,71	874,32	2,626	2,39	1,18
3 480,02	77,00	290,00	3 022,33	-696,77	-757,48	936,18	2,626	2,42	1,07
3 500,00	78,56	290,39	3 026,56	-690,03	-775,81	951,57	2,416	2,35	0,59
3 595,49	86,03	292,23	3 039,35	-655,64	-863,90	1 024,99	2,416	2,35	0,58
3 600,00	86,03	292,23	3 039,66	-653,94	-868,06	1 028,44	0,000	0,00	0,00
3 616,99	86,03	292,23	3 040,83	-647,53	-883,75	1 041,43	0,000	0,00	0,00
3 700,00	79,35	292,12	3 051,39	-616,47	-959,95	1 104,54	2,416	-2,42	-0,04
3 778,86	73,00	292,00	3 070,22	-587,73	-1 030,88	1 163,34	2,416	-2,42	-0,04
3 800,00	73,00	290,51	3 076,40	-580,40	-1 049,72	1 179,06	2,020	0,00	-2,11
3 886,30	73,11	284,44	3 101,58	-555,62	-1 128,42	1 246,46	2,020	0,04	-2,11
3 900,00	73,11	284,44	3 105,56	-552,35	-1 141,12	1 257,56	0,000	0,00	0,00
3 937,86	73,11	284,44	3 116,56	-543,32	-1 176,21	1 288,23	0,000	0,00	0,00
3 938,32	73,11	284,47	3 116,69	-543,21	-1 176,63	1 288,60	2,020	-0,03	2,11
4 000,00	74,75	283,69	3 133,76	-528,79	-1 234,12	1 338,96	0,876	0,80	-0,38
4 100,00	77,41	282,46	3 157,82	-506,85	-1 328,65	1 422,31	0,876	0,80	-0,37
4 200,00	80,08	281,25	3 177,33	-486,71	-1 424,63	1 507,59	0,876	0,80	-0,36
4 253,56	81,51	280,61	3 185,90	-476,69	-1 476,54	1 553,97	0,876	0,80	-0,36

B.1.3 BHA proposals





Cum. Len. (m)
164.46
164.46
136.14
126.62
98.30
88.78
78.78
74.53
55.63
46.19
38.93
30.08
22.03
20.53
19.53
10.22
7.87
3.60
0.25

StatoilHydro
15/9-F-15
Volve F

F-15
8 1/2" BHA Vortex Xceed F15

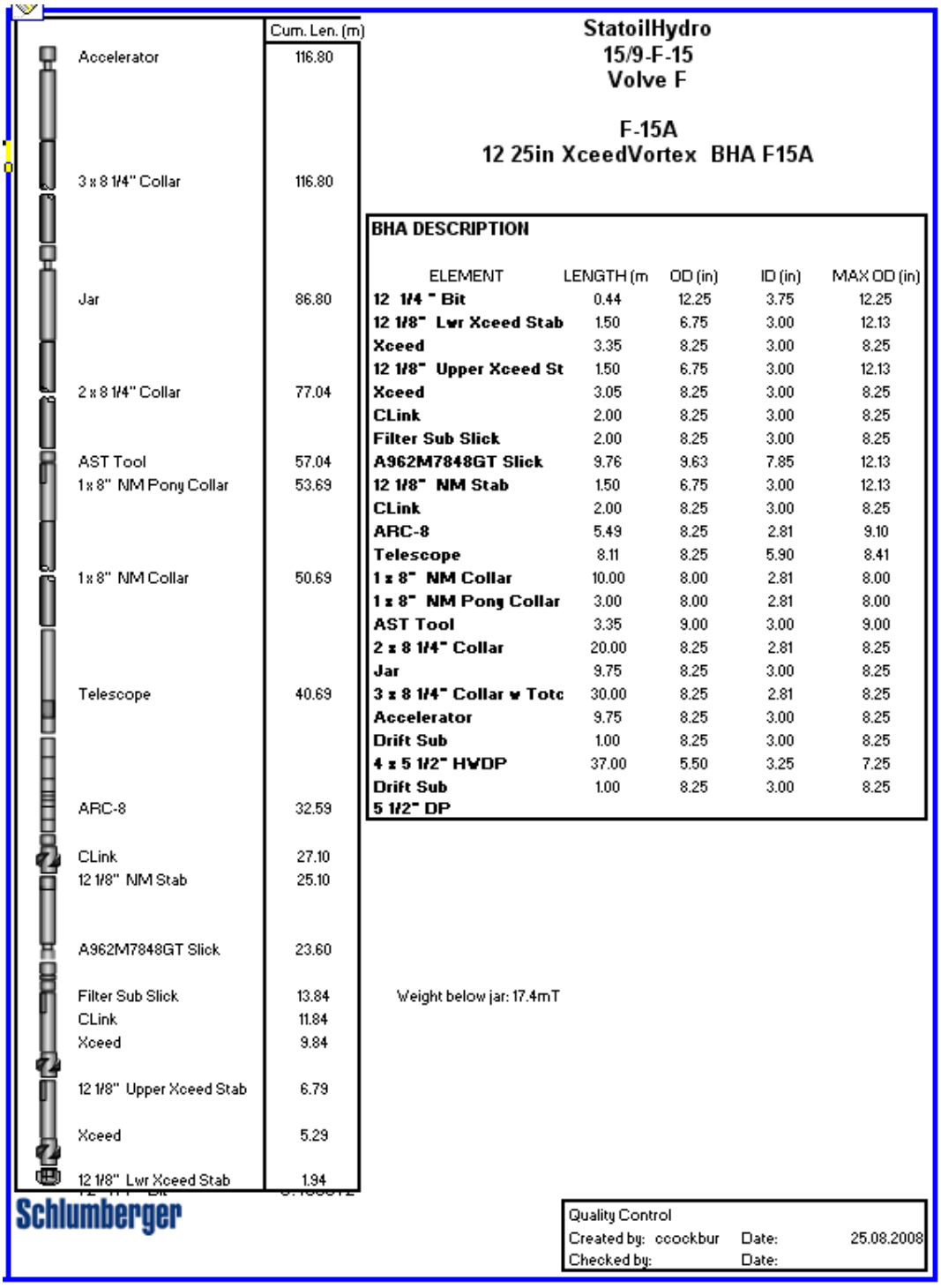
BHA DESCRIPTION

ELEMENT	LENGTH (m	OD (in)	ID (in)	MAX OD (in)
8 1/2 " PDC Bit	0.25	8.50	2.25	8.50
Xceed Steering Unit w/8 3/8" Slvs w/non portec	3.35	7.60	3.25	8.38
Xceed Control Unit w/8 1/4" Slvs	4.27	7.60	3.25	8.25
Filter	2.35	6.75	2.00	6.75
A700M7866GT	9.31	7.00	5.50	8.38
NM Float Sub	1.00	6.75	2.00	6.75
8 3/8" NM Stab	1.50	6.75	3.00	8.38
Ecoscope LWD with APRS	8.05	6.75	2.81	8.25
6 3/4" TeleScope MWD	8.85	6.75	5.11	6.89
sonicVISION 675	7.25	6.75	3.29	7.50
StethoScope 675	9.45	6.75	2.81	7.28
2 x 5" NMHWDP	18.90	5.00	3.00	6.50
AST Tool	4.25	6.50	2.40	6.50
1 x 5" HWDP	10.00	5.00	3.00	6.50
6 1/2" Jar	9.52	6.50	2.75	6.50
3 x 5" HWDP	28.32	5.00	3.00	6.50
Accelerator	9.52	6.50	2.75	6.50
3 x 5" HWDP w Totco	28.32	5.00	3.00	6.50
5" DPS	1500.00	5.00	4.28	6.63
Drift Sub	1.00	5.00	4.28	6.63
5 1/2" DP	2400.00			

Weight below jar : 10.6mT

Schlumberger

Quality Control
Created by: ccockbur Date: 25.08.2008
Checked by: Date:



StatoilHydro
15/9-F-15
Volve F

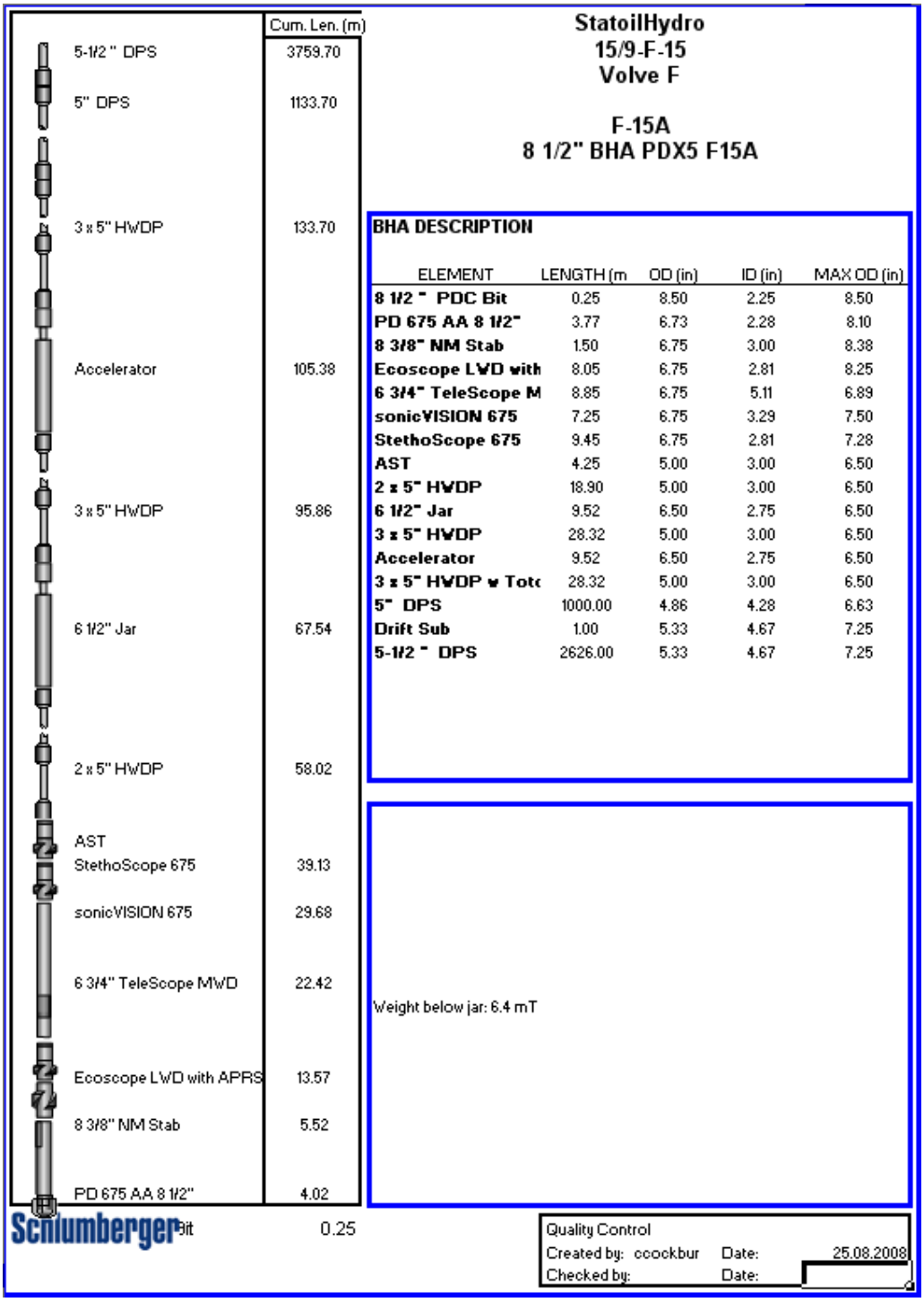
F-15A
12 25in XceedVortex BHA F15A

BHA DESCRIPTION

ELEMENT	LENGTH (m	OD (in)	ID (in)	MAX OD (in)
12 1/4 " Bit	0.44	12.25	3.75	12.25
12 1/8" Lwr Xceed Stab	1.50	6.75	3.00	12.13
Xceed	3.35	8.25	3.00	8.25
12 1/8" Upper Xceed St	1.50	6.75	3.00	12.13
Xceed	3.05	8.25	3.00	8.25
CLink	2.00	8.25	3.00	8.25
Filter Sub Slick	2.00	8.25	3.00	8.25
A962M7848GT Slick	9.76	9.63	7.85	12.13
12 1/8" NM Stab	1.50	6.75	3.00	12.13
CLink	2.00	8.25	3.00	8.25
ARC-8	5.49	8.25	2.81	9.10
Telescope	8.11	8.25	5.90	8.41
1 x 8" NM Collar	10.00	8.00	2.81	8.00
1 x 8" NM Pony Collar	3.00	8.00	2.81	8.00
AST Tool	3.35	9.00	3.00	9.00
2 x 8 1/4" Collar	20.00	8.25	2.81	8.25
Jar	9.75	8.25	3.00	8.25
3 x 8 1/4" Collar w Totc	30.00	8.25	2.81	8.25
Accelerator	9.75	8.25	3.00	8.25
Drift Sub	1.00	8.25	3.00	8.25
4 x 5 1/2" HWDP	37.00	5.50	3.25	7.25
Drift Sub	1.00	8.25	3.00	8.25
5 1/2" DP				

Weight below jar: 17.4mT

Quality Control
Created by: ccockbur Date: 25.08.2008
Checked by: Date:


Cum. Len. (m)
5-1/2 " DPS
3759.70
5" DPS
1133.70
3 x 5" HWDP
133.70
Accelerator
105.38
3 x 5" HWDP
95.86
6 1/2" Jar
67.54
2 x 5" HWDP
58.02
AST
StethoScope 675
39.13
sonicVISION 675
29.68
6 3/4" TeleScope MWD
22.42
Ecoscope LWD with APRS
13.57
8 3/8" NM Stab
5.52
PD 675 AA 8 1/2"
4.02
Bit
0.25
Schlumberger
StatoilHydro
15/9-F-15
Volve F
F-15A
8 1/2" BHA PDX5 F15A
BHA DESCRIPTION
ELEMENT LENGTH (m OD (in) ID (in) MAX OD (in)
8 1/2 " PDC Bit 0.25 8.50 2.25 8.50
PD 675 AA 8 1/2" 3.77 6.73 2.28 8.10
8 3/8" NM Stab 1.50 6.75 3.00 8.38
Ecoscope LWD with 8.05 6.75 2.81 8.25
6 3/4" TeleScope M 8.85 6.75 5.11 6.89
sonicVISION 675 7.25 6.75 3.29 7.50
StethoScope 675 9.45 6.75 2.81 7.28
AST 4.25 5.00 3.00 6.50
2 x 5" HWDP 18.90 5.00 3.00 6.50
6 1/2" Jar 9.52 6.50 2.75 6.50
3 x 5" HWDP 28.32 5.00 3.00 6.50
Accelerator 9.52 6.50 2.75 6.50
3 x 5" HWDP w Tot 28.32 5.00 3.00 6.50
5" DPS 1000.00 4.86 4.28 6.63
Drift Sub 1.00 5.33 4.67 7.25
5-1/2 " DPS 2626.00 5.33 4.67 7.25
Weight below jar: 6.4 mT
Quality Control
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App C Figures and tables

C.1.1 F-15 Wellbore stabilities and pore pressures

C.1.2 F-15A Wellbore stabilities and pore pressures

C.1.3 Well Schematic, casing and logging program

C.1.4 Mud Program

C.1.5 Cementing Program

C.1.6 Well barrier drawings

C.1.7 Risk matrix