OPERATOR:	STATOILHYDRO
WELL:	15/9-F-10
WELLBORE:	15/9-F-10
FIELD:	VOLVE
RIG:	MÆRSK INSPIRER
COUNTRY:	NORWAY
DRILL PERMIT#:	3097-P

Report

WLC_PETROPHYSICAL_COMPOSITE_1.DLIS

Prepared by: **LOGTEK AS**
Date: **18-JAN-2010**

WLC_PETROPHYSICAL_COMPOSITE_1_INF_1

The WLC_PETROPHYSICAL_COMPOSITE_1.DLIS has been created in accordance with the NPD "**Guidelines to the Petroleum Regulations/REPORTING REQUIREMENTS FOR DIGITAL WELL DATA (Drilling Regulations, Section 12)**".
http://www.npd.no/Global/Norsk/5%20-%20Regelverk/Tematiske%20veiledninger/B_og_b_digital_rapportering_e.pdf

Purpose

To preserve 'specialist' composited data curves that may be created for a well but which do not fall into the 'standard' Composite (Section 3.1) or the 'Interpreted Data Input' data sets (described in Section 4.1). These data may have additional work done such as environmental or bed thickness corrections. This data set would normally be used by Petrophysicists. Operators are strongly recommended to report this data set in order to preserve value-added work.

Quality

Similar quality guidelines apply to the compositing work as described in Section 3.1.3 above. All work that is carried out must also be documented in an Information File.

Operationally, it is expected that both the 'standard' Composite Log and this 'specialized' Composite Log would normally be created in the same process but split into 2 data sets for reporting purposes. This ensures that the same depth shifting is applied to both data sets – an important quality requirement.

Content

Data that are not part of the 'Composited' or 'Interpretation Input' data sets. This may include:

- additional composited resistivity, NMR or other specialized curve data.
- composited data at high sampling rates for thin-bed analysis.
- a good guide is to include all 'presentation curves' from log prints (apart from those already included in the 'standard' composite). If quality curves such as Tension or Cable Speed are included (not a requirement), information must be included in the Information Files to show which data curves they refer to.

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MWD data plotted and verified to prints.
MWD PowerPulse, run 2:
Gaps in GRM1 appear interpolated on plot.

MWD ECOSCOPE, run 10:
Gap in GRMA and ROP5 appear interpolated on plot.

Depth units are meters.

Quality comments:
MWD PowerPulse, run 2:
Data above 201.7 m logged in casing (depth from log heading).
Log remarks:
All depths are referenced to driller's depth and are checked at least every stand.
All data is Real Time.
All data acquired while drilling.
Gamma Ray measurement is environmentally corrected for mud weight, bit size and collar thickness.
Missing Gamma Ray data in the intervals 619.5 to 621.5 m and 907 to 909 m due to high ROP.
26 in. section TD at 1400 m.

MWD ARC, run 3-4:
Data above 1388.9 m logged in casing (run 3, depth from log heading).
Log remarks:
All depths are referenced to driller's depth and are checked at least every stand.
All data from tool memory.
All data acquired while drilling.
Gamma Ray measurement is corrected for collar thickness only.
Resistivity measurements are borehole compensated and require no environmental correction for borehole effect.
Run 3 POOH at 1463.6 m due to lack of directional control.
Run 4 and 17 ½ in. section TD at 2616 m.

MWD ARC, run 5-7:
Data above 2607.5 m logged in casing (run 5, depth from log heading).
Log remarks:
All depths are referenced to driller's depth and are checked at least every stand.
All data from tool memory.
All data acquired while drilling.
Gamma Ray measurement is environmentally corrected for mud weight, bit size and collar thickness.
Resistivity measurements are borehole compensated and require no environmental correction for borehole effect.
Run 5 POOH at 2825.0 m due to loss of directional control.
Run 6 POOH at 3319.0 m due to low rate of penetration.
Run 7 and 12 ¼ in. section TD at 3442 m.

MWD ECOSCOPE, run 8, 10:
Data above 3441.0 m logged in casing (run 8, depth from log heading).
Log remarks:
All depths are referenced to driller's depth and are checked at least every stand.

All data from tool memory.
Run 8: All data acquired while drilling.
Run 10: Reamed from 4880 to 3695 m to log interval drilled in Run 9. All other data acquired while drilling.
Gamma Ray data is environmentally corrected for mud weight, bit size, collar thickness and neutron activation.
Resistivity measurements are borehole compensated and require no environmental correction for borehole effect.
Bulk Density is compensated for tool standoff/mudcake.
Neutron Porosity measurement is calculated with limestone matrix, and is environmentally corrected for bit size, mud weight, temperature, pressure, formation density and mud salinity.
Run 8: Neutron measurement failed at 3495 m.
Run 8 POOH at 3695.5 m due to EcoScope failure and low ROP.
Run 9 drilled from 3695.5 to 4911 m without LWD tools.
Run 10: 8 ½ in. section TD at 5331 m.

Editing on WLC_PETROPHYSICAL_COMPOSITE_1.DLIS:
MWD PowerPulse, run 2:
GRM1 interpolated due to match plot.

MWD ARC, run 4:
Constant values removed in bottom of curves.

MWD ARC, run 5:
Resistivities affected by casing above 2606.0 m and have been replaced by empty values in this zone.

MWD ECOSCOPE, run 8:
Resistivities affected by casing/large borehole above 3441.5 m and have been replaced by empty values in this zone.

MWD ECOSCOPE, run 10:
GRMA and ROP5 interpolated due to match plot.

Depth shifts:
No depth shifting applied.

CURVE SUMMARY, file WLC_PETROPHYSICAL_COMPOSITE_1.DLIS:

File #1. Incr.: 0.1524m

Main Services	Input Curve	Run no.	Date (Start)	Interval (Meters)	Merge depth (Meters)	Depth shifted	Edited
MWD ARC	A28H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	A28H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	A28H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	A34H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	A34H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	A34H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	A40H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	A40H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	A40H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	ATMP*	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	ATMP*	5-7	06-MAY-09	2599.9-3423.1		No	No
MWD ECOSCOPE	BPHI*	8,10	19-MAY-09	3437.8-5316.9		No	No
MWD SONICVISION BestDT	CHRP*	8	19-MAY-09	3396.2-3661.9	3662.0	No	No
MWD SONICVISION BestDT	CHRP*	10¤	31-MAY-09	3662.0-4850.0	4850.1	No	No
MWD SONICVISION BestDT	CHRP*	10	31-MAY-09	4850.1-5301.4		No	No
MWD SONICVISION BestDT	CHTP*	8	19-MAY-09	3399.7-3661.9	3662.0	No	No
MWD SONICVISION BestDT	CHTP*	10¤	31-MAY-09	3662.0-4850.0	4850.1	No	No
MWD SONICVISION BestDT	CHTP*	10	31-MAY-09	4850.1-5304.4		No	No
MWD ECOSCOPE	CRPM	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DCAV*	8,10	19-MAY-09	3437.8-5319.4		No	No

MWD ECOSCOPE	DCHO*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DCVE*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DRHB	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DRHL	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DRHO*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DRHR	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	DRHU	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD SONICVISION BestDT	DTCO	8,10¤,10	19-MAY-09	3396.2-5301.8		No	No
MWD SONICVISION BestDT	DTRP	8	19-MAY-09	3396.2-3661.9	3662.0	No	No
MWD SONICVISION BestDT	DTRP	10¤	31-MAY-09	3662.0-4850.0	4850.1	No	No
MWD SONICVISION BestDT	DTRP	10	31-MAY-09	4850.1-5301.4		No	No
MWD SONICVISION BestDT	DTRS	8	19-MAY-09	3396.1-3661.9	3662.0	No	No
MWD SONICVISION BestDT	DTRS	10¤	31-MAY-09	3662.0-4838.5		No	No
MWD SONICVISION BestDT	DTRS	10	31-MAY-09	4863.5-5301.2		No	No
MWD SONICVISION BestDT	DTSM	8,10¤	19-MAY-09	3396.1-4841.4		No	No
MWD SONICVISION BestDT	DTSM	10	31-MAY-09	4863.2-5304.4		No	No
MWD SONICVISION BestDT	DTTP	8	19-MAY-09	3399.7-3661.9	3662.0	No	No
MWD SONICVISION BestDT	DTTP	10¤	31-MAY-09	3662.0-4845.4	4845.6	No	No
MWD SONICVISION BestDT	DTTP	10	31-MAY-09	4845.6-5304.4		No	No
MWD SONICVISION BestDT	DTTS	8	19-MAY-09	3399.9-3661.9	3662.0	No	No
MWD SONICVISION BestDT	DTTS	10¤	31-MAY-09	3662.0-4841.7		No	No
MWD SONICVISION BestDT	DTTS	10	31-MAY-09	4866.3-5304.4		No	No
MWD ARC	GRM1	2	10-APR-09	177.2-1369.8		No	Yes
MWD ECOSCOPE	GRMA	8,10	19-MAY-09	3437.8-5320.6		No	Yes
MWD ARC	GR_ARC#	3-4	21-APR-09	1360.0-2595.8		No	No
MWD ARC	GR_ARC	5-7	06-MAY-09	2599.9-3422.1		No	No
MWD ARC	P16H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P16H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P16H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P16L	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P16L	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P16L	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P22H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P22H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P22H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P22L	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P22L	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P22L	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P28H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P28H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P28H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P28L	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P28L	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P28L	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P34H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P34H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P34H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P34L	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P34L	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P34L	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P40H	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P40H	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P40H	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ARC	P40L	3-4	21-APR-09	1360.0-2596.0		No	No
MWD ARC	P40L	5-7	06-MAY-09	2606.0-3422.3		No	No
MWD ECOSCOPE	P40L	8,10	19-MAY-09	3441.5-5317.8		No	No
MWD ECOSCOPE	PEB	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	PEF*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	PEL*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	PER*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	PEU*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	RHOB*	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	ROBB	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	ROBL	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	ROBR	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ECOSCOPE	ROBU	8,10	19-MAY-09	3437.8-5319.4		No	No
MWD ARC	ROP5_RM#	2	10-APR-09	175.9-1369.9	1370.1	No	No
MWD ARC	ROP5_RM#	3-4	21-APR-09	1370.1-2599.8	2599.9	No	No
MWD ARC	ROP5_RM	5-7	06-MAY-09	2599.9-3437.7	3437.8	No	No

MWD ECOSCOPE	ROP5_RM	8	19-MAY-09	3437.8-3694.8		No	No
MWD ECOSCOPE	ROP5_RM	10¤	31-MAY-09	3695.4-4910.9	4911.1	No	Yes
MWD ECOSCOPE	ROP5_RM	10	31-MAY-09	4911.1-5330.3		No	No
MWD ARC	TAB_ARC_RES#	3-4	21-APR-09	1360.8-2596.0		No	No
MWD ARC	TAB_ARC_RES	5-7	06-MAY-09	2599.9-3422.3		No	No
MWD ECOSCOPE	TAB_ARC_RES	8,10	19-MAY-09	3437.8-5317.8		No	No
MWD ECOSCOPE	TNPH	8,10	19-MAY-09	3437.8-5316.9		No	No
MWD ECOSCOPE	UCAV*	8,10	19-MAY-09	3437.8-5319.2		No	No
MWD ECOSCOPE	UCHO*	8,10	19-MAY-09	3437.8-5319.2		No	No
MWD ECOSCOPE	UCVE*	8,10	19-MAY-09	3437.8-5319.2		No	No
MWD SONICVISION BestDT	VPVS	8,10¤	19-MAY-09	3396.2-4841.4		No	No
MWD SONICVISION BestDT	VPVS	10	31-MAY-09	4863.4-5304.4		No	No

* Not presented on plots
# Renamed from GR_ARC_FILT
# Renamed from ARTM
# Renamed from ROP5
¤ Ream Up

Definitions:

Dynamic depth shift *– variable depth shifting (stretch and pull) as opposed to linear depth shifting.*
Linear depth shift *– Constant depth shift through a certain depth interval.*
Reference curve *– Curve that will be used as the depth* ***Reference*** *for a set of logging curves.*
Offset Curve *– Curve that will be compared to the* ***Reference*** *curve in order to find required depth pairs.*
Curves shifted *– Curves that will be shifted with depth pairs found by comparing* ***Reference*** *to* ***Offset*** *curve.*
Observed *–* ***Observed*** *depth is the depth of a point before depth shifting.*
Actual *–* ***Actual*** *depth is the depth of the point after depth shifting.*

WLC_PETROPHYSICAL_COMPOSITE_1.DLIS completed: 18-JAN-2010
WLC_PETROPHYSICAL_COMPOSITE_1_INF_1.PDF completed: 18-JAN-2010