OPERATOR:	**STATOILHYDRO ASA**
WELL:	**15/9-F-15**
WELLBORE:	**15/9-F-15 A**
FIELD:	**VOLVE**
RIG:	**MAERSK INSPIRER**
COUNTRY:	**NORWAY**
DRILL PERMIT#:	**2937-P**

Report

WLC_PETROPHYSICAL_COMPOSITE_2.DLIS

Prepared by: **LOGTEK AS**
Date: **24-JUN-2014**

WLC_PETROPHYSICAL_COMPOSITE_2_INF_1

The WLC_PETROPHYSICAL_COMPOSITE_2.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.

Depth units are meters.

Quality comments:
Wellbore 15/9-F-15 A was sidetracked from 15/9-F-15 at 1380.0m (MD).

MWD ARC, run 7:
20" casing shoe at 1368.4m (from log heading).
Log Remarks:
All depths are referenced to driller's depth and 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.
17 ½ in. section TD at 2591.0m.

MWD ECOSCOPE/SonicVISION BestDT, run 9-10:
13 3/8" casing shoe at 2561.8m (from log heading, run 9).
Log Remarks:
All depths are referenced to driller's depth and 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, collar thickness and neutron activation.
Resistivity measurements are borehole compensated but not environmentally corrected.
Bulk density is compensated for tool standoff/mud cake.
Neutron Porosity measurement is calculated with limestone matrix, and is environmentally corrected for bit size, mud weight, temperature, pressure, and mud salinity.
Run 9 POOH at 3179.7m due to poor directional response from Xceed tool.
Run 10 and 8 ½ in. section TD at 4095.0m.
SonicVISION BestDT Remarks:
Delta-T Compressional (DTCO) derived from receiver and transmitter.
Delta-T Compressional (DTCO) processed using a 10-13 kHz filter.
Median Residual 4000 noise cut applied.

Editing on WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:
MWD ECOSCOPE-SONIC, run 9:
A28H, A34H, A40H, P16H, P22H, P28H, P34H, P40H, P16L, P22L, P28L, P34L and P40L are affected by casing/large borehole and have been removed above 2591.1m.

Depth shifts:
Depth shifting applied to MWD ARC, run 7 in order to match MWD POWERPULSE, run 2 (Wellbore 15/9-F-15).

Reference curve: GRM1 (MWD POWERPULSE, run 2 (Wellbore 15/9-F-15)).
Offset curve: GR_ARC_FILT (MWD ARC, run 7).
Curves shifted: All curves.

Shift pairs used:

Observed depth:	Actual depth:
1369.619	1370.533
1375.258	1375.410
1381.354	1380.744
1386.230	1386.230

CURVE SUMMARY, file WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:

File #1. Incr.: 0.1524

Main Services	Input Curve	Run no.	Date (start)	Interval (meters)	Merge depth (meters)	Depth shifted	Edited
MWD ARC	A28H	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	A28H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	A34H	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	A34H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	A40H	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	A40H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	ATMP	7	09-DEC-08	1350.9-2571.4		Yes	No
MWD ECOSCOPE	CRPM	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DCAV*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DCHO*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DCVE*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DRHB	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DRHL	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DRHO*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DRHR	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	DRHU	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD SonicVISION BestDT	DTCO	9	28-DEC-08	2606.8-3153.9	3154.0	No	No
MWD SonicVISION BestDT	DTCO	10	02-JAN-09	3154.0-4070.0		No	No
MWD SonicVISION BestDT	DTTP	9	28-DEC-08	2607.0-3153.9	3154.0	No	No
MWD SonicVISION BestDT	DTTP	10	02-JAN-09	3154.0-4070.0		No	No
MWD SonicVISION BestDT	DTRP	9	28-DEC-08	2606.6-3151.0	3151.2	No	No
MWD SonicVISION BestDT	DTRP	10	02-JAN-09	3151.2-4066.9		No	No
MWD ARC	GR_ARC_FILT	7	09-DEC-08	1350.9-2570.5		Yes	No
MWD ECOSCOPE	GRMA	9-10	28-DEC-08	2550.0-4085.1		No	No
MWD ECOSCOPE	P16H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P16L	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P16L	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ECOSCOPE	P22H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P22L	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P22L	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P28H	7	09-DEC-08	1350.0-2570.7		Yes	No
MWD ECOSCOPE	P28H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P28L	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P28L	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P34H	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P34H	9-10	28-DEC-08	2591.1-4083.1		No	No

MWD ARC	P34L	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P34L	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P40H	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P40H	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ARC	P40L	7	09-DEC-08	1350.9-2570.7		Yes	No
MWD ECOSCOPE	P40L	9-10	28-DEC-08	2591.1-4083.1		No	No
MWD ECOSCOPE	PEB	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	PEF*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	PEL*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	PER*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	PEU*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	RHOB*	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	ROBB	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	ROBL	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	ROBR	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ECOSCOPE	ROBU	9-10	28-DEC-08	2550.0-4084.6		No	No
MWD ARC	ROP5_RM	7	09-DEC-08	1350.9-2591.0	2591.1	Yes	No
MWD ECOSCOPE	ROP5_RM	9-10	28-DEC-08	2591.1-4095.0		No	No
MWD ARC	SHK1_ARC	7	09-DEC-08	1350.9-2569.6		Yes	No
MWD ARC	TAB_ARC_RES	7	09-DEC-08	1350.9-2570.7	2570.8	Yes	No
MWD ECOSCOPE	TAB_ARC_RES	9-10	28-DEC-08	2570.8-4083.1		No	No
MWD ECOSCOPE	TNPH	9-10	28-DEC-08	2550.0-4081.9		No	No
MWD ECOSCOPE	UCAV*	9-10	28-DEC-08	2550.0-4084.5		No	No
MWD ECOSCOPE	UCHO	9-10	28-DEC-08	2552.1-4084.5		No	No
MWD ECOSCOPE	UCVE	9-10	28-DEC-08	2550.0-4084.5		No	No

* Not presented on plot.

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_2.DLIS completed: 24-JUN-2014
WLC_PETROPHYSICAL_COMPOSITE_2_INF_1.PDF completed: 24-JUN-2014