

HALLIBURTON

PWD Pressure While Drilling



Sperry Drilling Services

Country : Australia Field : Exploration Location : Lat: 38° 5' 8.75" South Long: 147° 33' 44.11" East Well : Galloway-1 Company : SANTOS Ltd Rig : Ensign Rig 32 <div> <div>LOCATION</div> <div> Company : SANTOS Ltd Rig : Ensign Rig 32 Well : Galloway-1 Field : Exploration Country : Australia DOE Number : </div> <div> Latitude : 38° 5' 8.75" South Longitude : 147° 33' 44.11" East UTM Easting = 549,307.00 m UTM Northing = 5,784,519.99 m </div> <div>Other Services Directional Drilling</div> </div>	Permanent Datum : Mean Sea Level Elevation : 0.00 m		Elev. KB DF GL WD 8.60 m 2.78 m	
	Log Measured From : Drill Floor		8.60 m Above Permanent Datum	
	Drilling Measured From : Drill Floor		TIME LOG	
	Depth Logged : 320.00 m To 2,315.00 m		Unit No. : 182	
	Date Logged : 25-Jul-06 To 22-Aug-06		Job No. : AU-FE-0004392520	
	Total Depth MD : 2,315.00 m TVD : 1,364.69 m		Plot Type : Final	
	Spud Date : 25-Jul-06		Plot Date : 04-Oct-06	
	Run No. Size From To Borehole Record (MD)		Run No. Size From To Borehole Record (MD)	
	2	12,250 in	320.00 m	636.00 m
	3	12,250 in	636.00 m	1,606.00 m
	4	8,500 in	1,606.00 m	1,660.00 m
	5	8,500 in	1,660.00 m	1,680.00 m
	6	8,500 in	1,680.00 m	1,881.00 m
	7	8,500 in	1,881.00 m	2,315.00 m
	Casing Record (MD)		Size Weight From To	
			20,000 in	198.00 kgpm SURFACE 60.00 m
			13,380 in	101.00 kgpm SURFACE 317.00 m
			9,625 in	70.00 kgpm SURFACE 1,598.00 m

WELL INFORMATION

MWD Run Number	200	300	400	500	600
Date run completed	03-Aug-06	06-Aug-06	13-Aug-06	15-Aug-06	16-Aug-06
Rig Bit Number	3	4	7	8	8RR
Bit Size (in)	12.25	12.25	8.5	8.5	8.5
Tool Nominal OD (in)	8.00	8.00	6.75	6.75	6.75
Log Start Depth (MD, m)	320.00	636.00	1,606.00	1,660.00	1,680.00
Log End Depth (MD, m)	636.00	1,606.00	1,660.00	1,680.00	1,881.00
Drill or Wipe	Drilling	Drilling	Drilling	Drilling	Drilling
Drill/Wipe Start Date and Time	02-Aug-06 22:42	04-Aug-06 12:19	12-Aug-06 02:08	13-Aug-06 13:12	15-Aug-06 09:35
Drill/Wipe End Date and Time	03-Aug-06 14:45	06-Aug-06 02:19	12-Aug-06 14:24	14-Aug-06 20:52	16-Aug-06 06:41
Min Inc (deg) @ Depth (MD, m)	22.40 @ 325.11	70.35 @ 712.75	69.84 @ 1,647.79	N/A @ N/A	47.98 @ 1,851.05
Max Inc (deg) @ Depth (MD, m)	70.37 @ 622.25	73.81 @ 799.62	71.72 @ 1,620.16	N/A @ N/A	67.72 @ 1,677.35
Bit TFA(in2) / Bit Type	1.03 / Reed T11C	1.37 / ReedRSX516S	90 / ReedRSX616MB1	90 / ReedRSX616MB1	49 / ReedRSX616MB1
Flow Rate (gpm)	701	770	580	554	600
Max AV (mpm) / CV (mpm) @ MWD	76.1 / 127.0	96.1 / 64.0	162.4 / 167.0	164.8 / 167.0	168.0 / 162.0
Fluid Type	Polymer	Polymer	Polymer	Polymer	Polymer
Density (sg) / Viscosity (spqt)	1.09 / 45	1.13 / 58	1.15 / 53	1.17 / 55	1.25 / 51
Filtrate CL (ppm)	25,307	34,742	30,062	30,062	36,602
pH / Fluid Loss (mptm)	10.00 / 5	9.00 / 5.8	9.50 / 5.6	9.50 / 5	9.00 / 9.0
PV (cP) / YP (lbf/2)	12 / 14	22 / 40	12 / 21	16 / 24	21 / 29
% Solids / % Sand	3.4 / 0.75	4.6 / 1	6.5 / 0.1	6.6 / 0.3	8.6 / 0.2
% Oil / Oil:Water Ratio	0 / 0:100	0 / 0:100	0 / 0:100	0 / 0:100	0 / 0:100
Rm @ Measured Temp (degC)	N/A @ N/A	N/A @ N/A	0.15 @ 22.00	0.14 @ 21.00	0.10 @ 22.00
Rmf @ Measured Temp (degC)	N/A @ N/A	0 @ N/A	0.12 @ 24.00	0.12 @ 20.00	0.09 @ 20.00
Rmc @ Measured Temp (degC)	N/A @ N/A	N/A @ N/A	0.3 @ 24.00	0.25 @ 26.00	0.18 @ 22.00
Max Tool Temp (degC) / Source	51.00 / HCIM	67.00 / HCIM	47.00 / EWR-P4	52.00 / EWR-P4	67.00 / EWR-P4
Rm @ Max Tool Temp (degC)	N/A @ 51.00	N/A @ 67.00	0.10 @ 47.00	0.09 @ 52.00	0.03 @ 67.00
Lead MWD Engineer	A. Rule	A. Rule	M. Lee	M. Lee	M. Lee
Customer Representative	T. Reid	T. Reid	T. Reid	T. Reid	T. Reid

SENSOR INFORMATION

Downhole Processor Information					
Tool Type	HCIM	HCIM	HCIM	HCIM	HCIM
Software Version	72.13	72.13	72.13	72.13	72.13
Sub Serial Number	078516	078516	145273	145273	145273
Insert Serial Number	076895	076895	81832	81832	81832
Date and Time Initialized	02-Aug-06 15:32	04-Aug-06 00:49	11-Aug-06 14:53	13-Aug-06 21:32	15-Aug-06 04:48:08
Date and Time Read	03-Aug-06 19:49	06-Aug-06 16:25	13-Aug-06 00:04	15-Aug-06 02:05	16-Aug-06 14:41:15

Directional Sensor Information					
Tool Type	DM	DM	DM	DM	DM
Distance From Bit (m)	12.99	8.90	8.95	8.96	8.96
Software Version	3.15	3.15	3.15	3.15	3.15
Sub Serial Number	10603354	CP5763	CP1004338	CP1004338	CP1004338
Sonde Serial Number	85268	85267	85268	85268	85268
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	168	Rotary	Rotary	Rotary	Rotary

Gamma Ray Sensor Information					
Tool Type	DGR	DGR	DGR	DGR	DGR
Distance From Bit (m)	16.34	11.99	11.42	11.43	11.43
Recorded Sample Period (sec)	12	12	12	12	12
Software Version	N/A	N/A	N/A	N/A	N/A
Sub Serial Number	177739	177739	176027	176027	176027
Insert/Sonde Serial Number	10602972	10602972	16131	16131	16131

Resistivity Sensor Information					
Tool Type			EWR-P4	EWR-P4	EWR-P4
Distance From Bit (m)			13.78	13.79	13.79
Recorded Sample Period (sec)			12	12	12
Software Version			1.38	1.38	1.38
Sub Serial Number			226818	226818	226818
Receiver Insert Serial Number			225217	225217	225217
Transmitter Insert Serial Number			225154	225154	225154
Receiver Orientation			Down	Down	Down

Neutron Sensor Information					
Tool Type			CTN	CTN	CTN
Distance From Bit (m)			26.16	26.75	26.75
Recorded Sample Period (sec)			12	12	12
Sub Serial Number			10603697	10603696	10603696
Insert Serial Number			192981	10508914	10508914
Source Serial Number			0044NN	0044NN	0044NN
Source Factor			N/A	N/A	N/A
Pin Orientation			Up	Up	Up

Density Sensor Information					
Tool Type			ALD	ALD	ALD
Distance From Bit (m)			22.10	22.69	22.69
Recorded Sample Period (sec)			16	16	16
Software Version			2.13	2.13	2.13
Sub Serial Number			96941	174401	174401
Insert Serial Number			10640614	215917	215917
Sensor ID Number			12024	32001	32001
Source Serial Number			2615GW	2852GW	2852GW
Pin Orientation			Up	Up	Up
Stabilizer Blade O.D. (in)			8.250	8.250	8.250
DPA Offset			100.00	250.00	250.00

Caliper Sensor Information					
Tool Type			ACAL		
Distance From Bit (m)			25.10		
Software Version			4.00		

Software Version			4.20		
Sub Serial Number			10603697		
Insert Serial Number			192981		

WELL INFORMATION					
MWD Run Number	700				
Date run completed	21-Aug-06				
Rig Bit Number	9				
Bit Size (in)	8.50				
Tool Nominal OD (in)	6.75				
Log Start Depth (MD, m)	1,881.00				
Log End Depth (MD, m)	2,315.00				
Drill or Wipe	Drilling				
Drill/Wipe Start Date and Time	17-Aug-06 11:25				
Drill/Wipe End Date and Time	20-Aug-06 15:32				
Min Inc (deg) @ Depth (MD, m)	0.92 @ 2,284.10				
Max Inc (deg) @ Depth (MD, m)	44.71 @ 1,880.03				
Bit TFA(in2) / Bit Type	0.921 / Reed TC11P				
Flow Rate (gpm)	570				
Max AV (mpm) / CV (mpm) @ MWD	157.0 / 205.0				
Fluid Type	Polymer				
Density (sg) / Viscosity (spqt)	1.26 / 60				
Filtrate CL (ppm)	34,742				
pH / Fluid Loss (mptm)	9.00 / 9.0				
PV (cP) / YP (lbf2)	25 / 36				
% Solids / % Sand	10.3 / 0.3				
% Oil / Oil:Water Ratio	0 / 0:100				
Rm @ Measured Temp (degC)	0.09 @ 28.00				
Rmf @ Measured Temp (degC)	0.06 @ 20.00				
Rmc @ Measured Temp (degC)	0.27 @ 26.00				
Max Tool Temp (degC) / Source	63.00 / EWR-P4				
Rm @ Max Tool Temp (degC)	0.04 @ 63.00				
Lead MWD Engineer	M. Lee				
Customer Representative	T. Reid				

SENSOR INFORMATION

Downhole Processor Information					
Tool Type	HCIM				
Software Version	72.13				
Sub Serial Number	145273				
Insert Serial Number	81832				
Date and Time Initialized	16-Aug-06 17:02:11				
Date and Time Read	21-Aug-06 01:32				

Directional Sensor Information					
Tool Type	DM				
Distance From Bit (m)	9.18				
Software Version	3.15				
Sub Serial Number	CP1004338				
Sonde Serial Number	85268				
Sensor ID Number	N/A				
Toolface Offset (deg)	Rotary				

Gamma Ray Sensor Information					
Tool Type	DGR				
Distance From Bit (m)	11.65				
Recorded Sample Period (sec)	12				
Software Version	N/A				
Sub Serial Number	176027				
Insert/Sonde Serial Number	16131				

Resistivity Sensor Information

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (m)	14.01				
Recorded Sample Period (sec)	12				
Software Version	1.38				
Sub Serial Number	226818				
Receiver Insert Serial Number	225217				
Transmitter Insert Serial Number	225154				
Receiver Orientation	Down				

Neutron Sensor Information

Tool Type	CTN				
Distance From Bit (m)	26.97				
Recorded Sample Period (sec)	12				
Sub Serial Number	10603696				
Insert Serial Number	10508914				
Source Serial Number	0044NN				
Source Factor	N/A				
Pin Orientation	Up				

Density Sensor Information

Tool Type	ALD				
Distance From Bit (m)	22.91				
Recorded Sample Period (sec)	16				
Software Version	2.13				
Sub Serial Number	174401				
Insert Serial Number	215917				
Sensor ID Number	32001				
Source Serial Number	2852GW				
Pin Orientation	Up				
Stabilizer Blade O.D. (in)	8.250				
DPA Offset	250.00				

Caliper Sensor Information

Tool Type					
Distance From Bit (m)					
Software Version					
Sub Serial Number					
Insert Serial Number					

REMARKS

1.) All depths are bit depths and are referenced to the driller's pipe tally unless otherwise noted.

2.) AV/CV values are calculated at the LWD collar using the Bingham Law for oil based mud, measured in m/min.

3.) Curve Mnemonics used are:

TIME	. sec	- Time & Date
ROP	. m/hr	- Average Rate of Penetration (Sperry)
RUN_SPD	. m/min	- Running Speed (Sperry)
BLK_POS	. m	- Block Position (Sperry)
BITDEP	. m	- Bit Depth (Sperry)
HKLD	. kl b	- Hookload (Geoservices)
TORQUE	. ft-kl b	- Torque (Geoservices)
SPP	. psig	- Stand Pipe Pressure (Sperry)
PWA	. psig	- PWD Annular Pressure While Drilling (Sperry)
PI PR	. psig	- PWD Internal Pressure While Drilling (Sperry)
TEMP	. degC	- PWD Electronics Temperature (Sperry)
PAE	. sg	- Annular Pressure While Drilling, Equivalent Mud Weight (Sperry)
RPM	. rpm	- Surface Revolutions Per Minute from GeoPilot (Sperry)
MFI	. gpm	- Flow In Pumps Average (Sperry)
MW I N	. sg	- Mud Weight In (Geoservices)

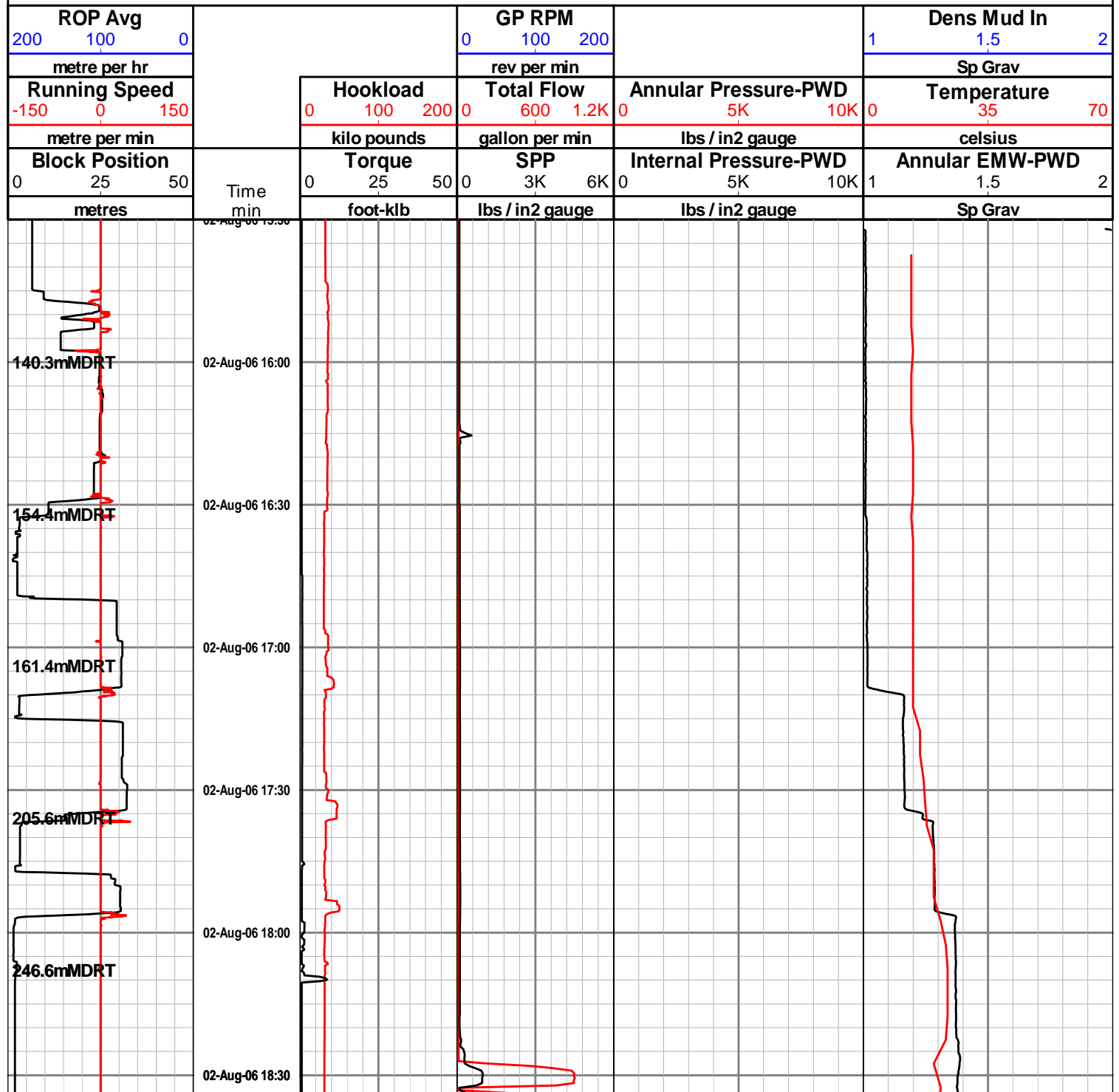
4.) SDI Data presented as supplied by Geoservices

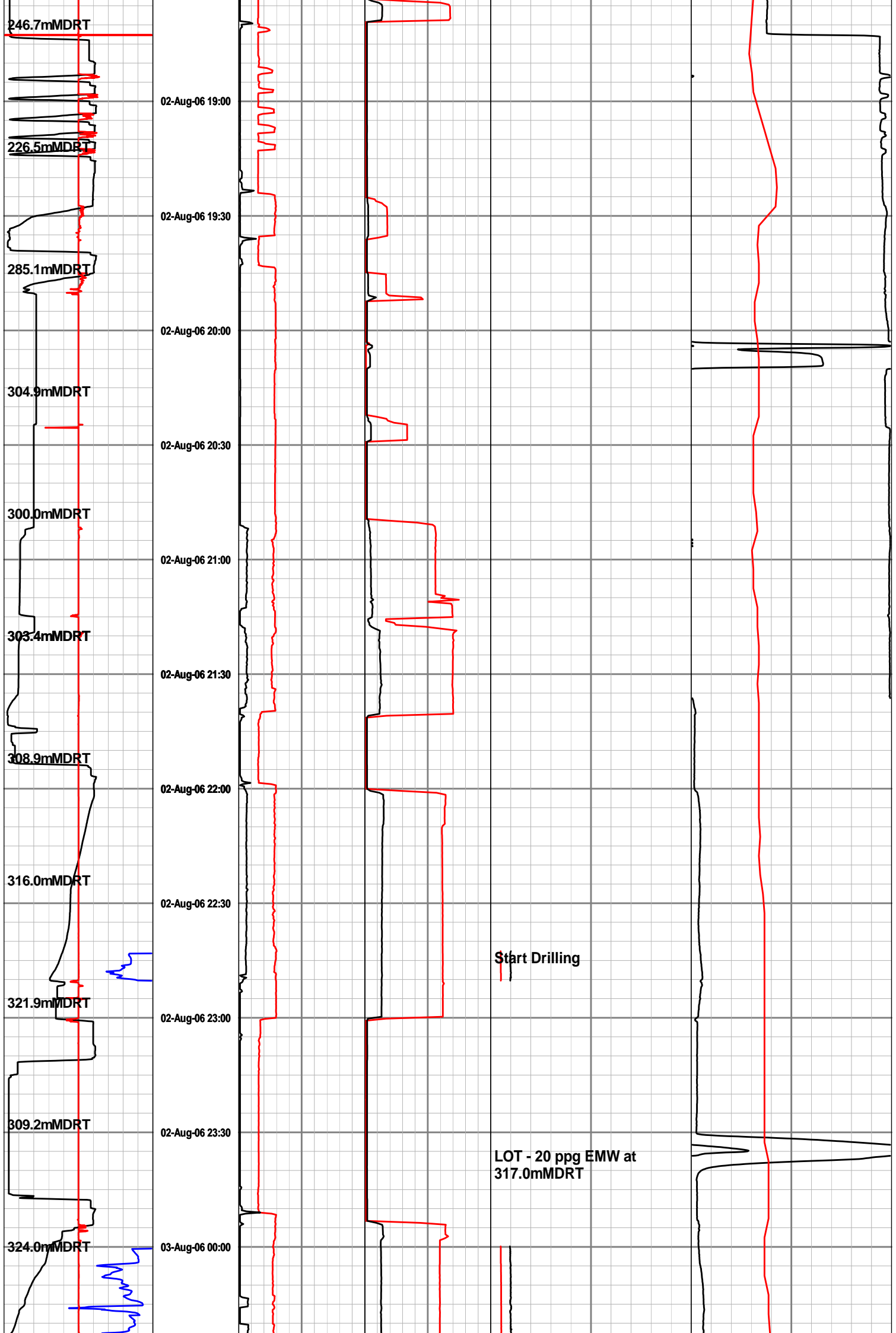
WARRANTY

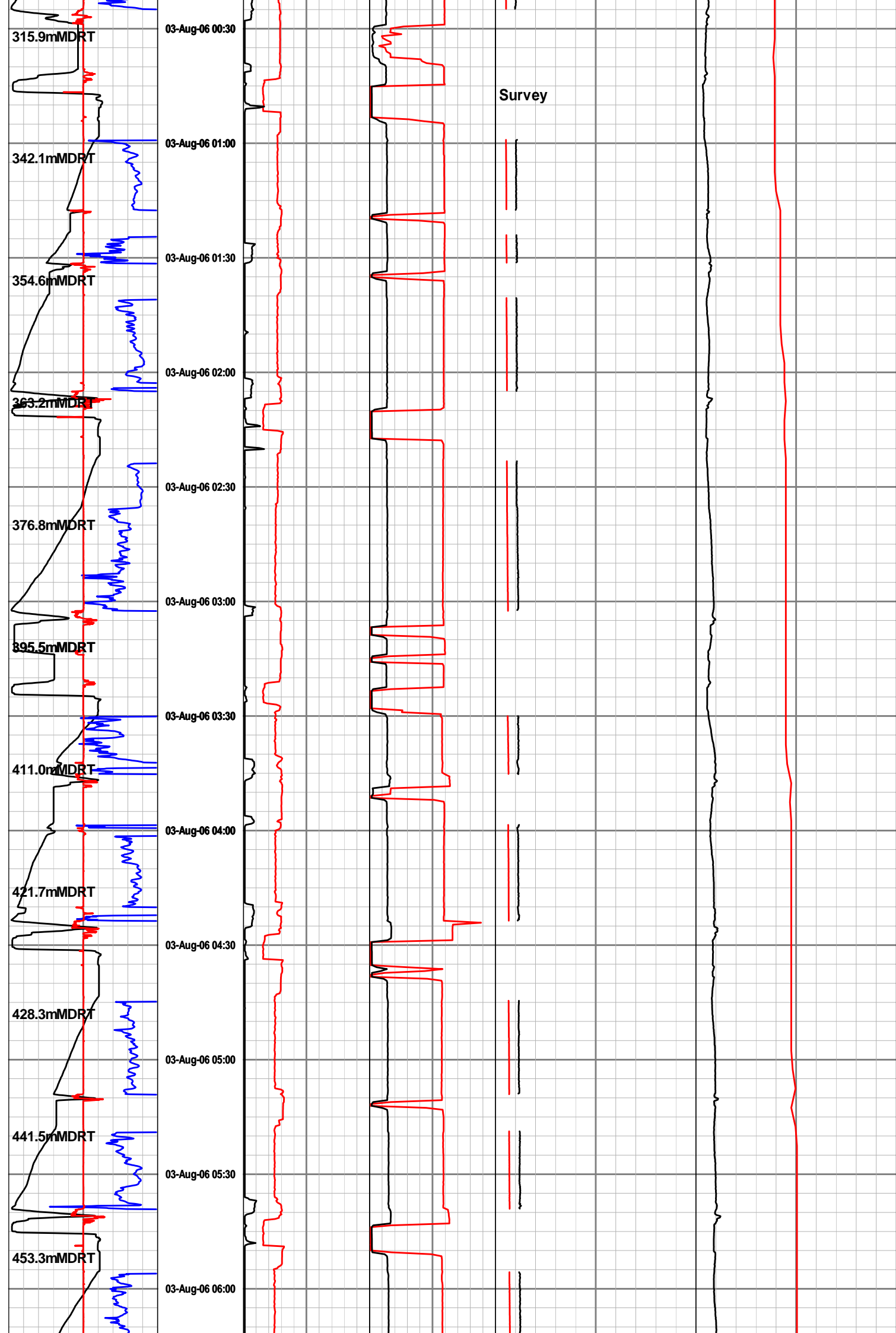
HALLIBURTON ENERGY SERVICES (HES) WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HES CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HES MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HES BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HES.

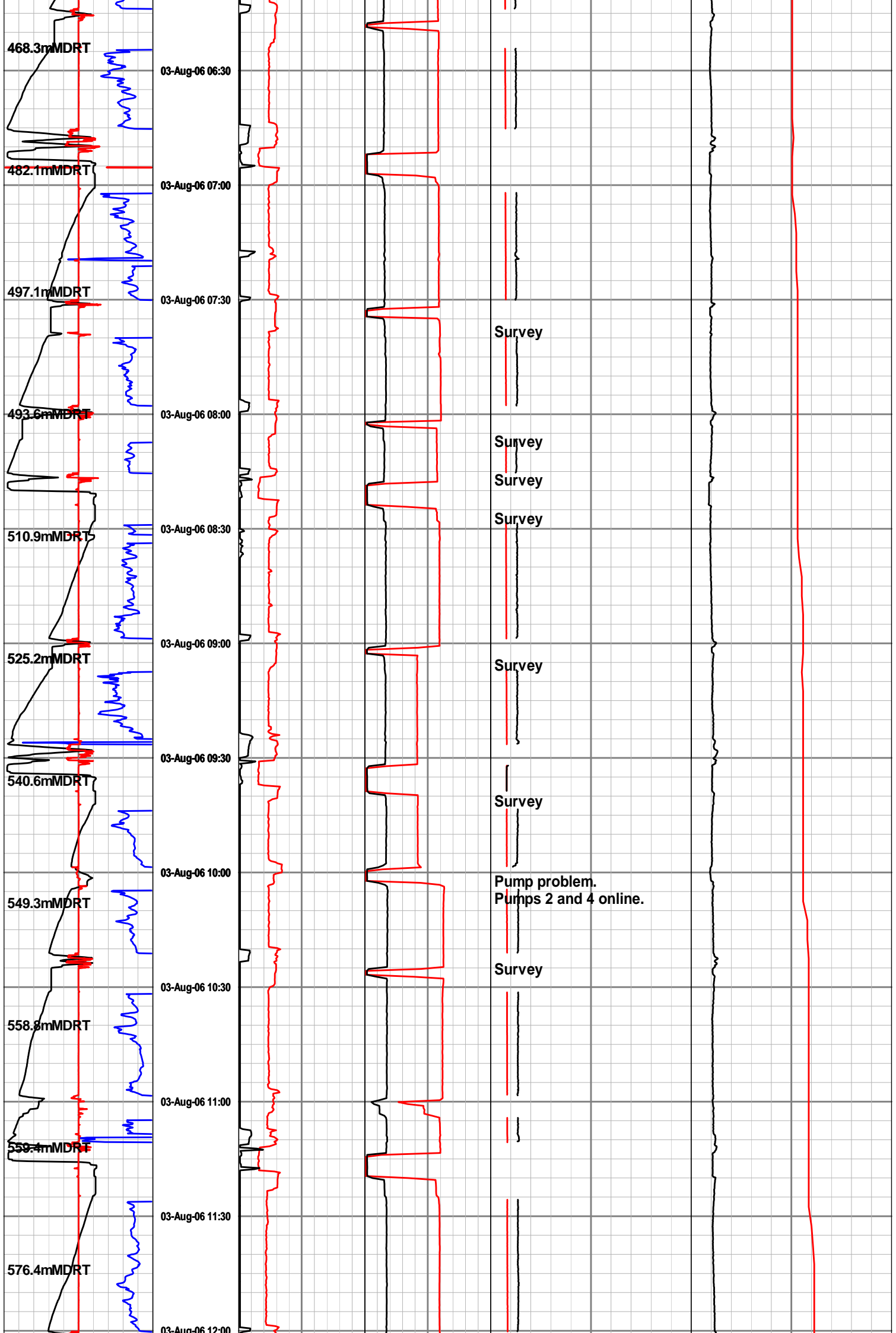
MWD Run 200

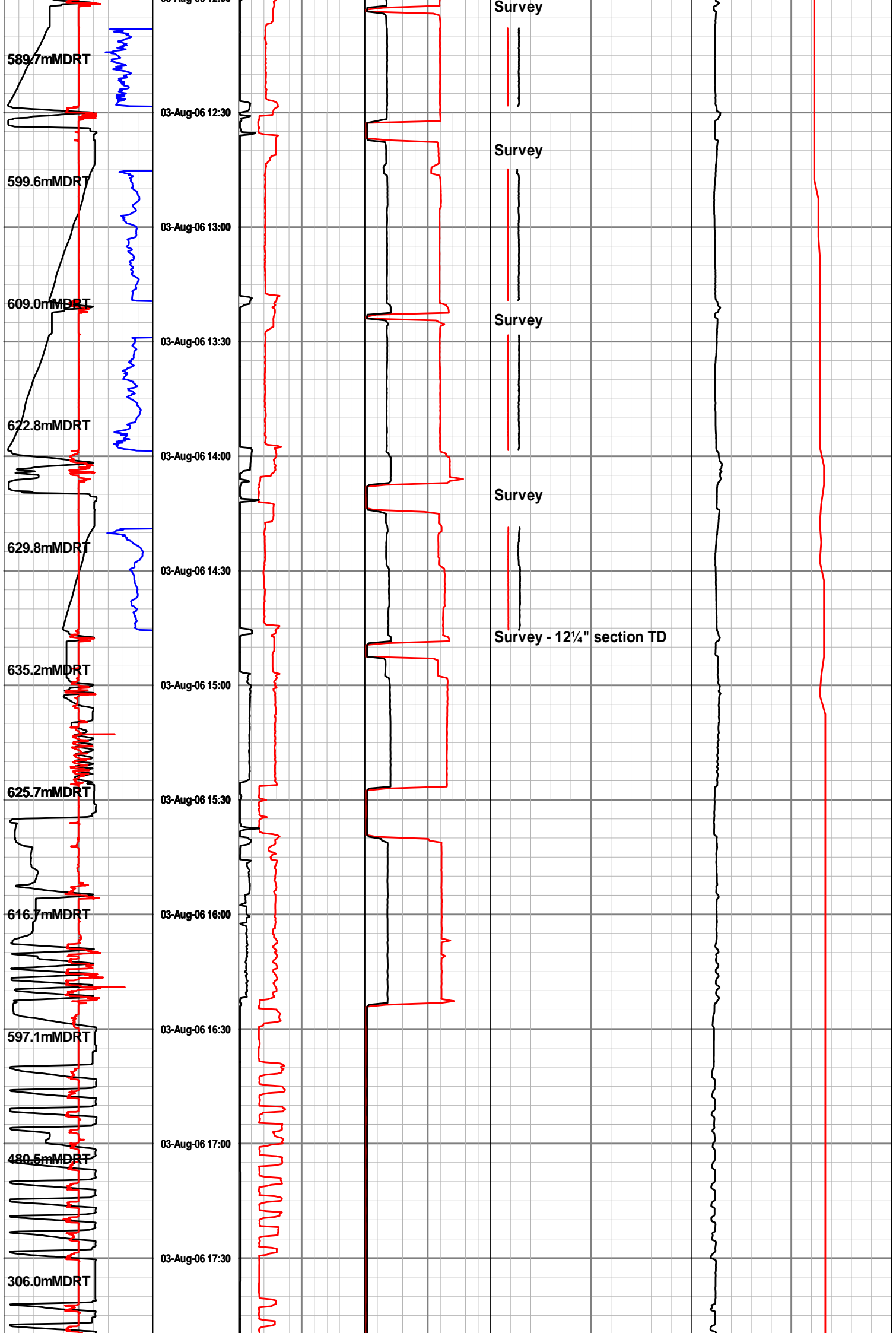
1530 hrs 2nd August 2006 - 1950 hrs 3rd August 2006

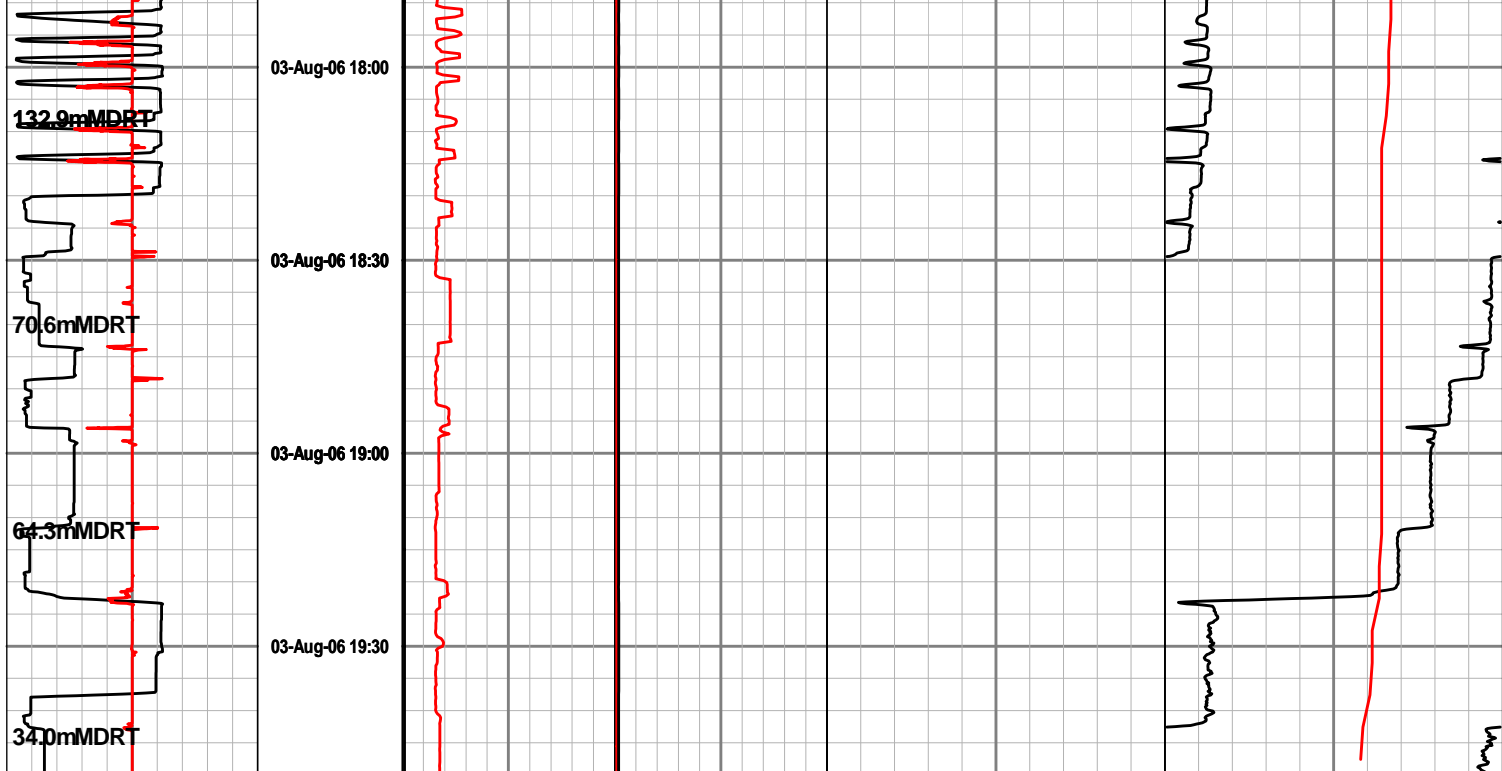








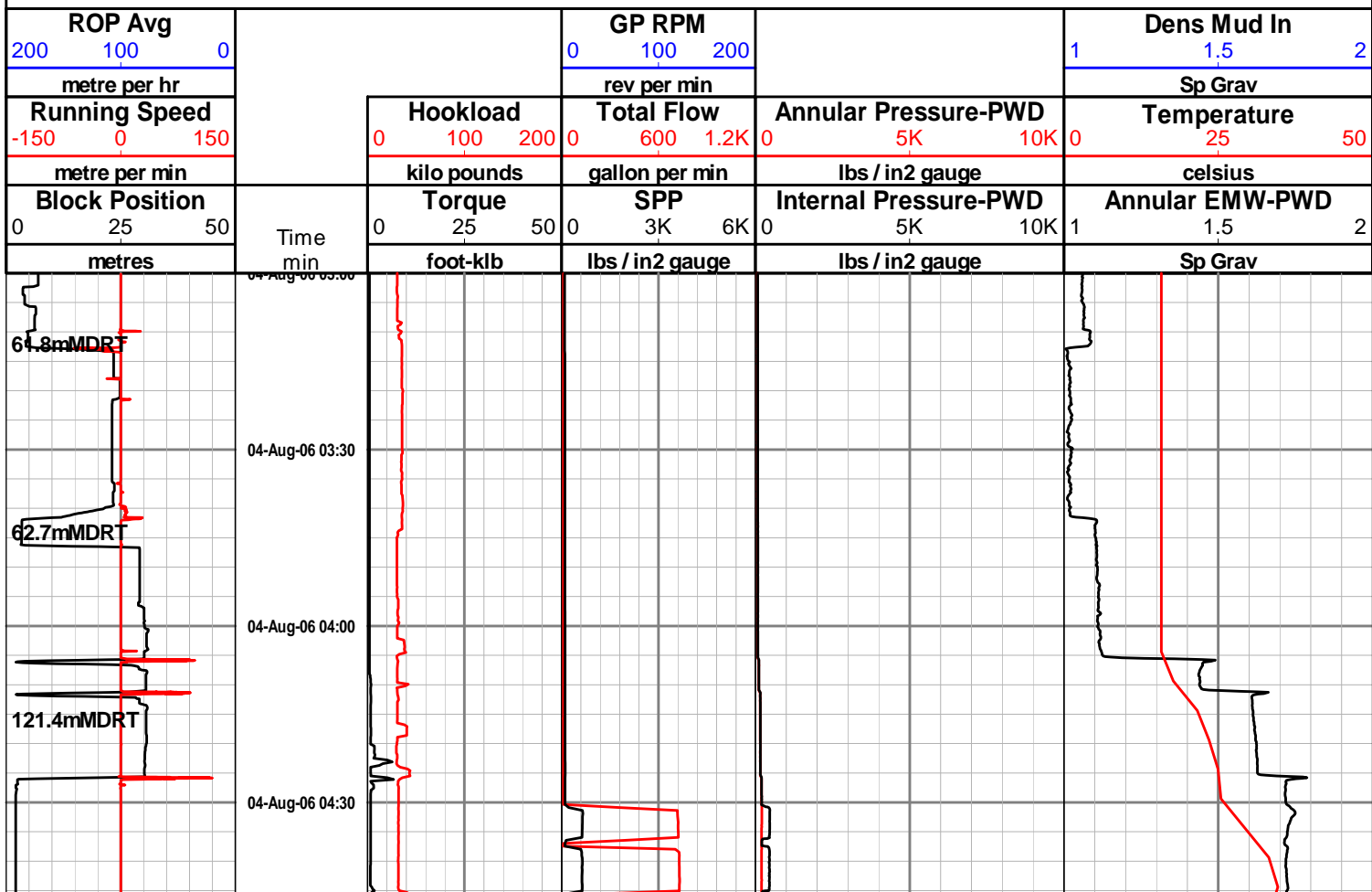




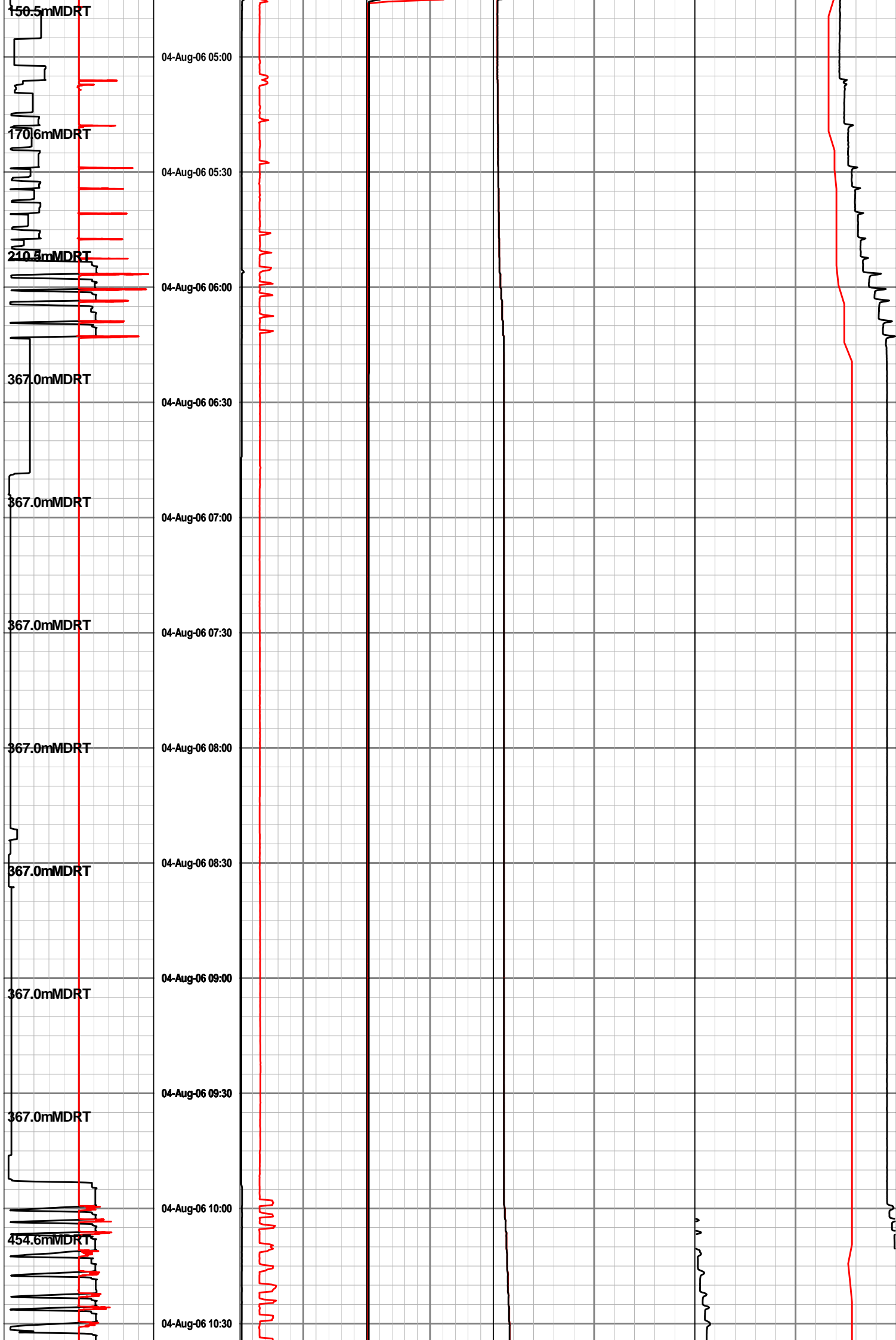
Block Position	Time min	Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav
Running Speed		Hookload	Total Flow	Annular Pressure-PWD	Temperature
-150 0 150		0 100 200	0 600 1.2K	0 5K 10K	0 35 70
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
ROP Avg			GP RPM		Dens Mud In
200 100 0			0 100 200		1 1.5 2
metre per hr			rev per min		Sp Grav

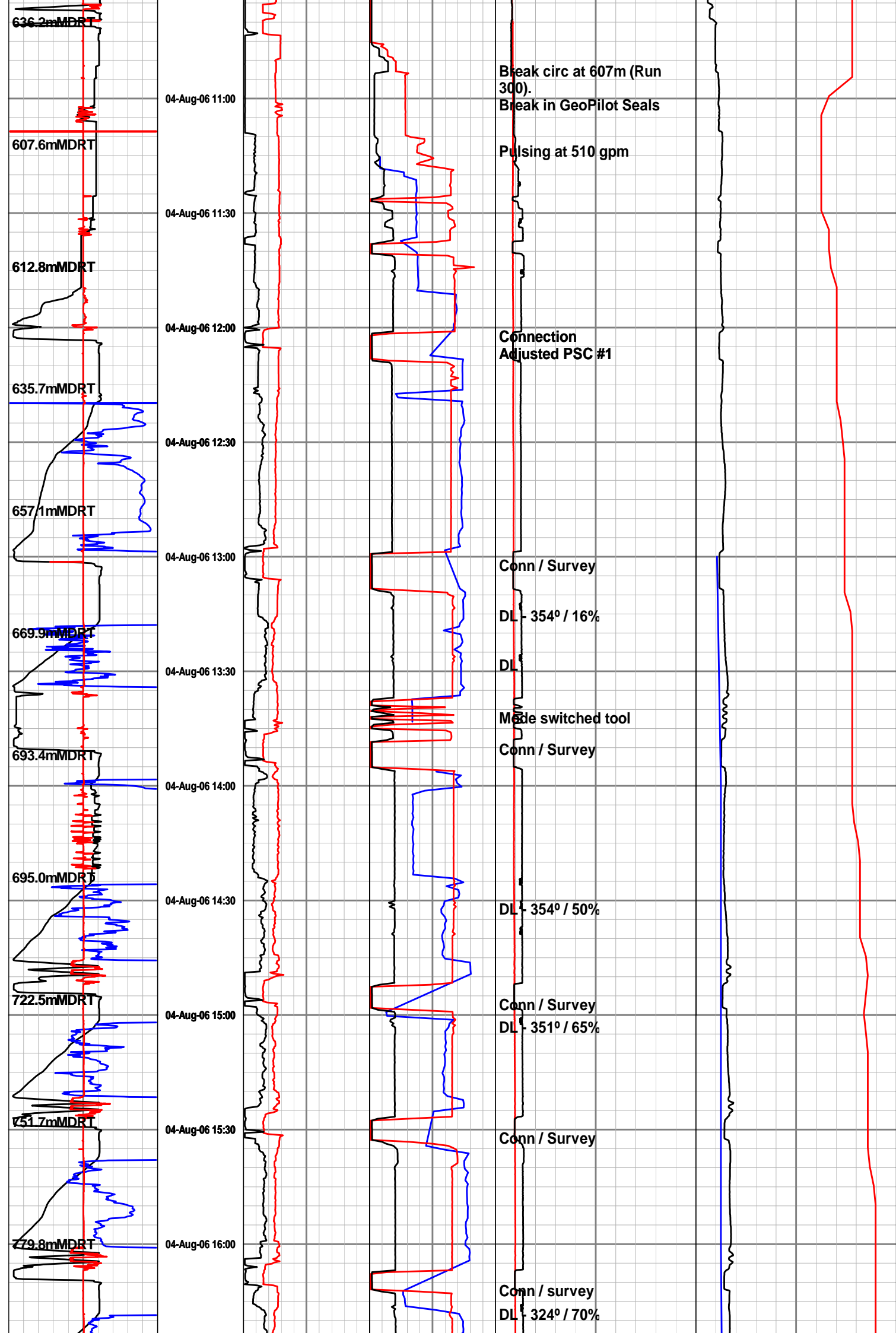
MWD Run 300

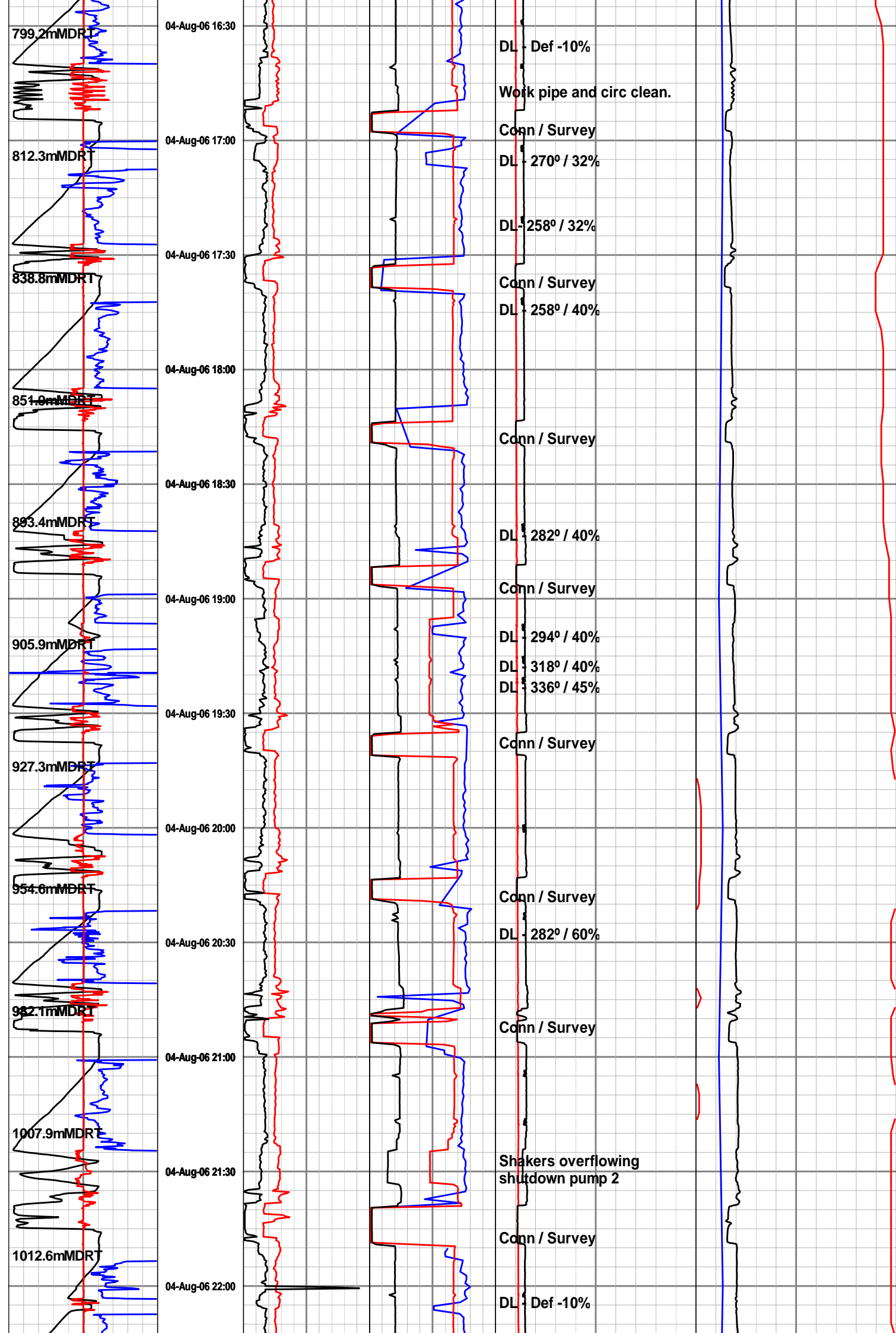
0300 hrs 4th August 2006 - 1630 hrs 6th August 2006

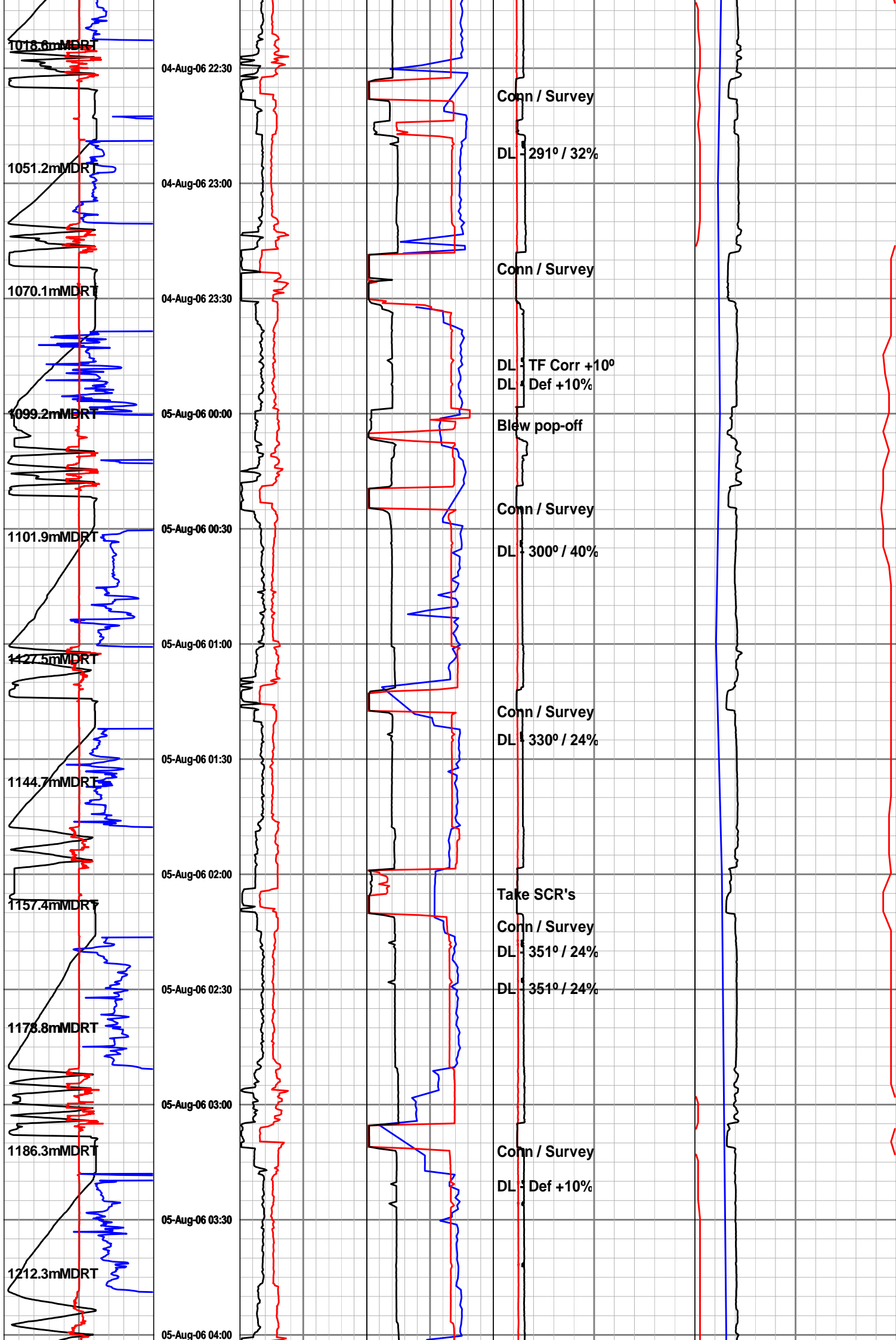


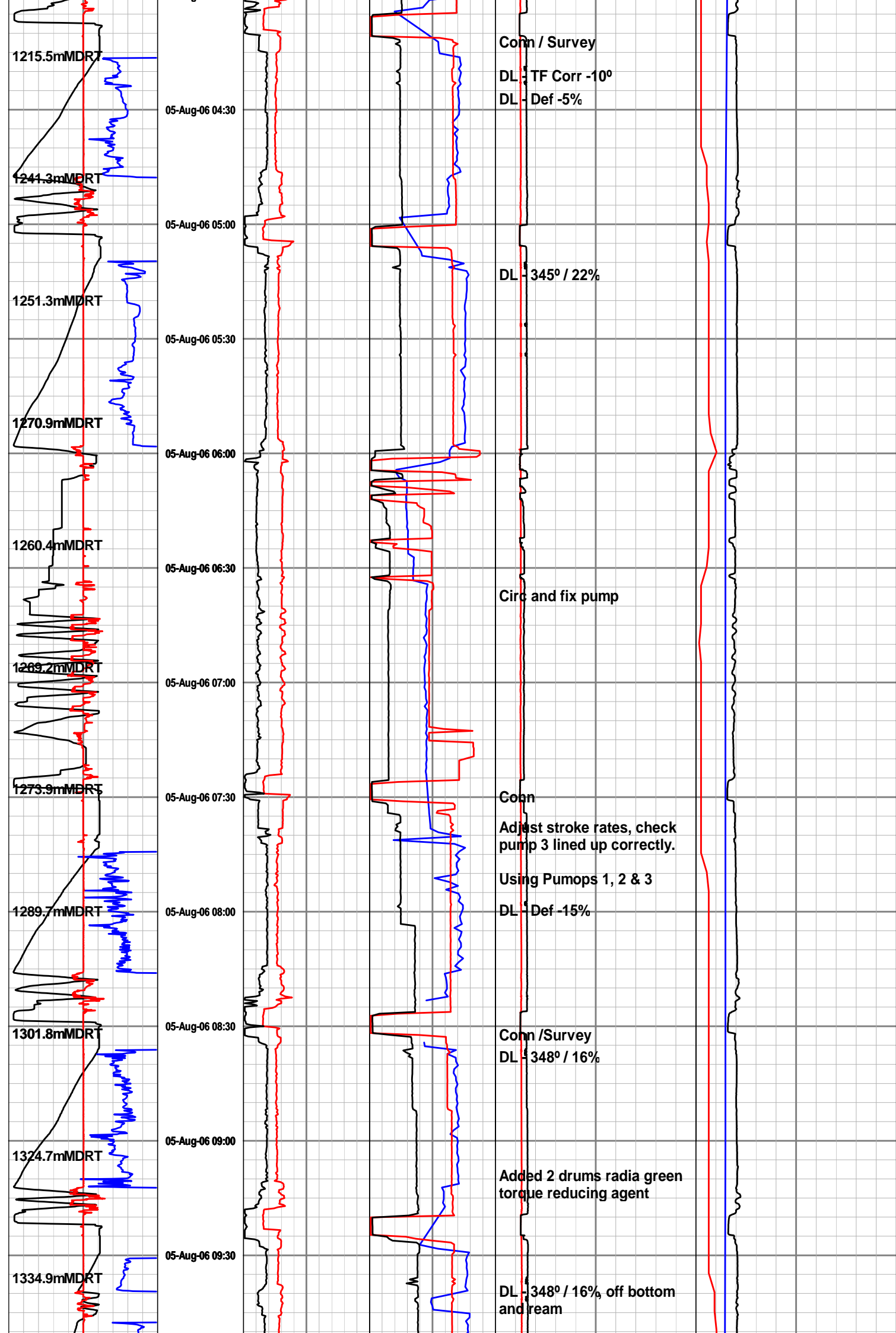
ROP Avg	Time min	Hookload	GP RPM	Annular Pressure-PWD	Dens Mud In
200 100 0		0 100 200	0 100 200	0 5K 10K	1 1.5 2
metre per hr			rev per min		Sp Grav
Running Speed		Total Flow	Annular Pressure-PWD	Temperature	
-150 0 150		0 600 1.2K	0 5K 10K	0 25 50	
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
Block Position		Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav

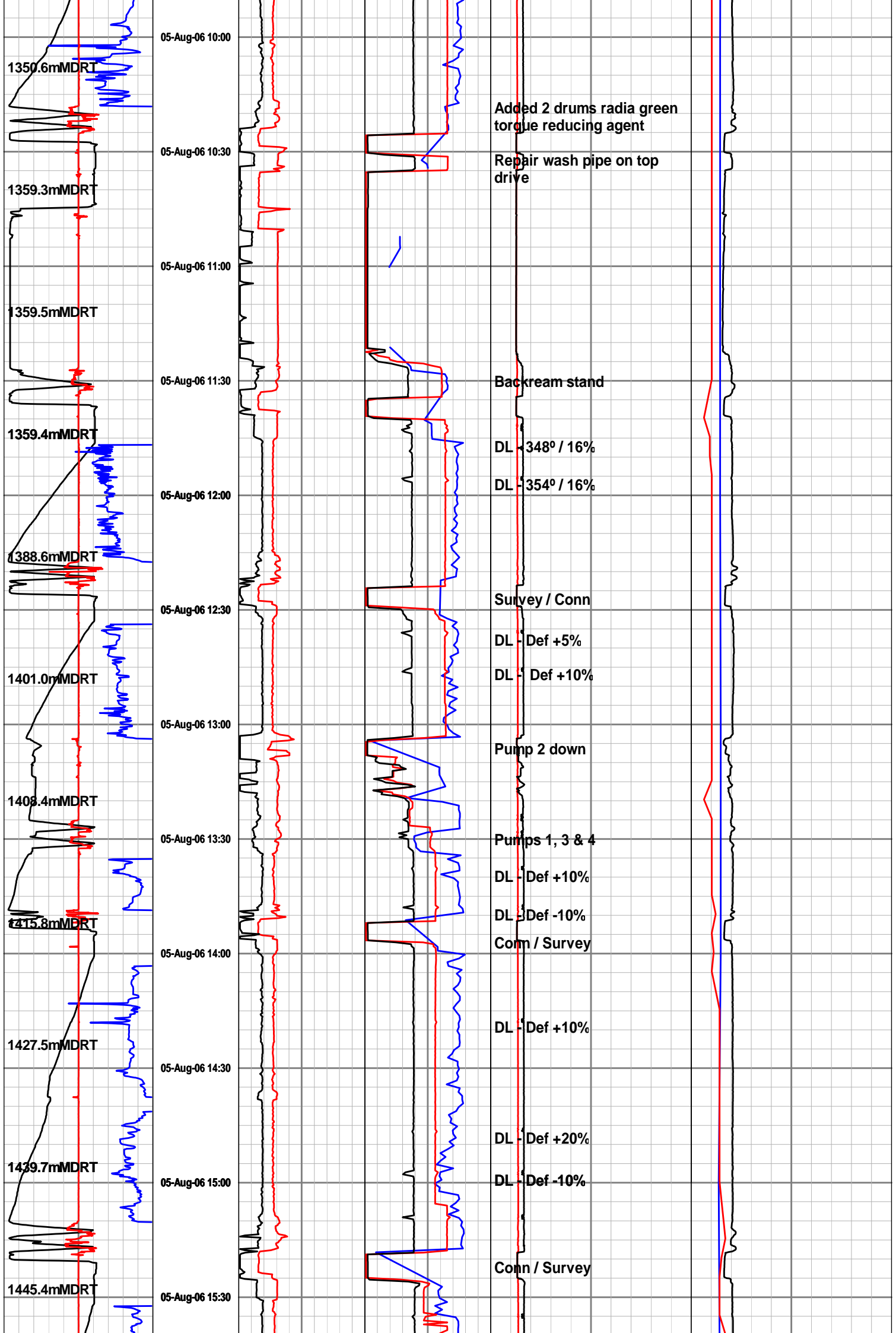


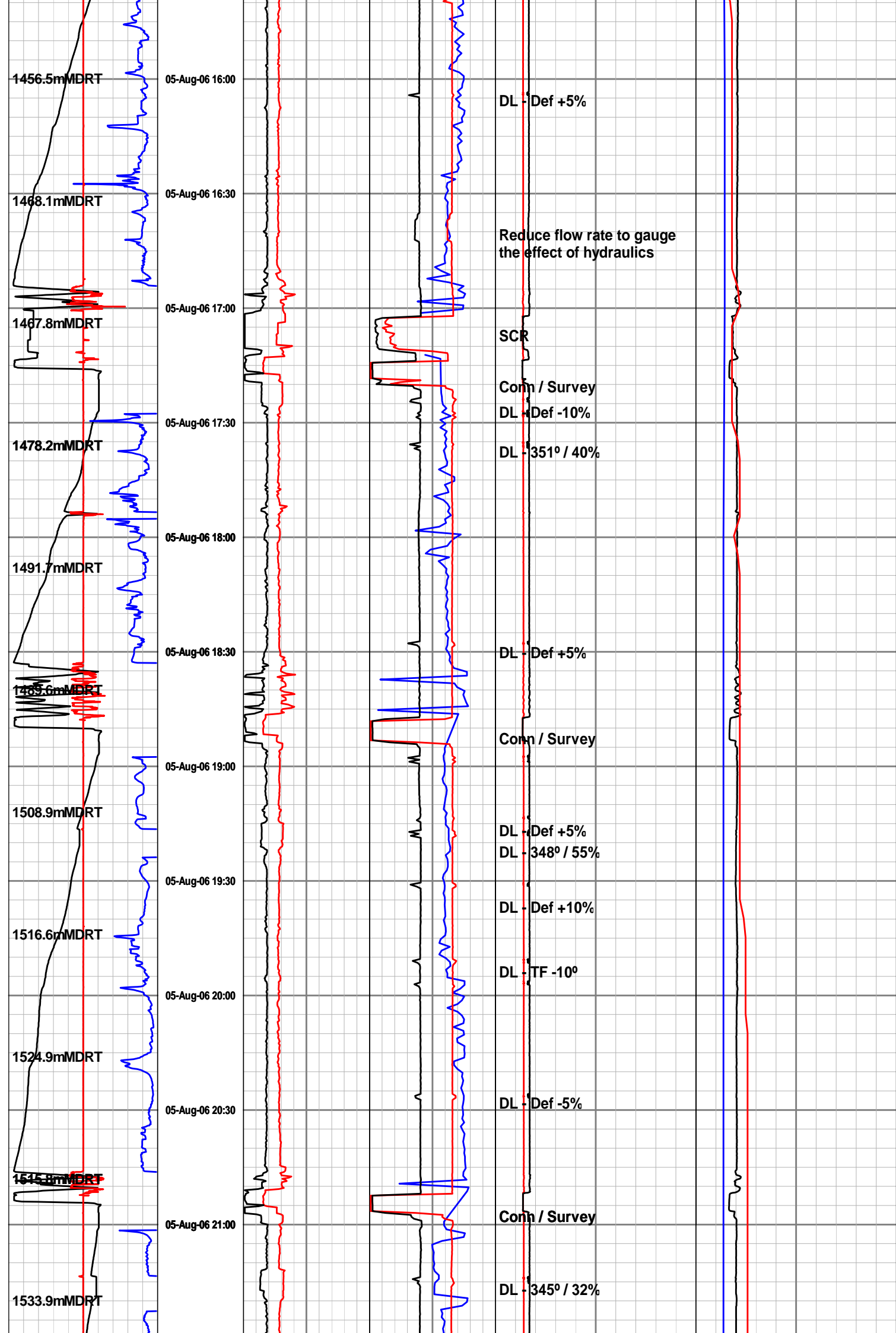


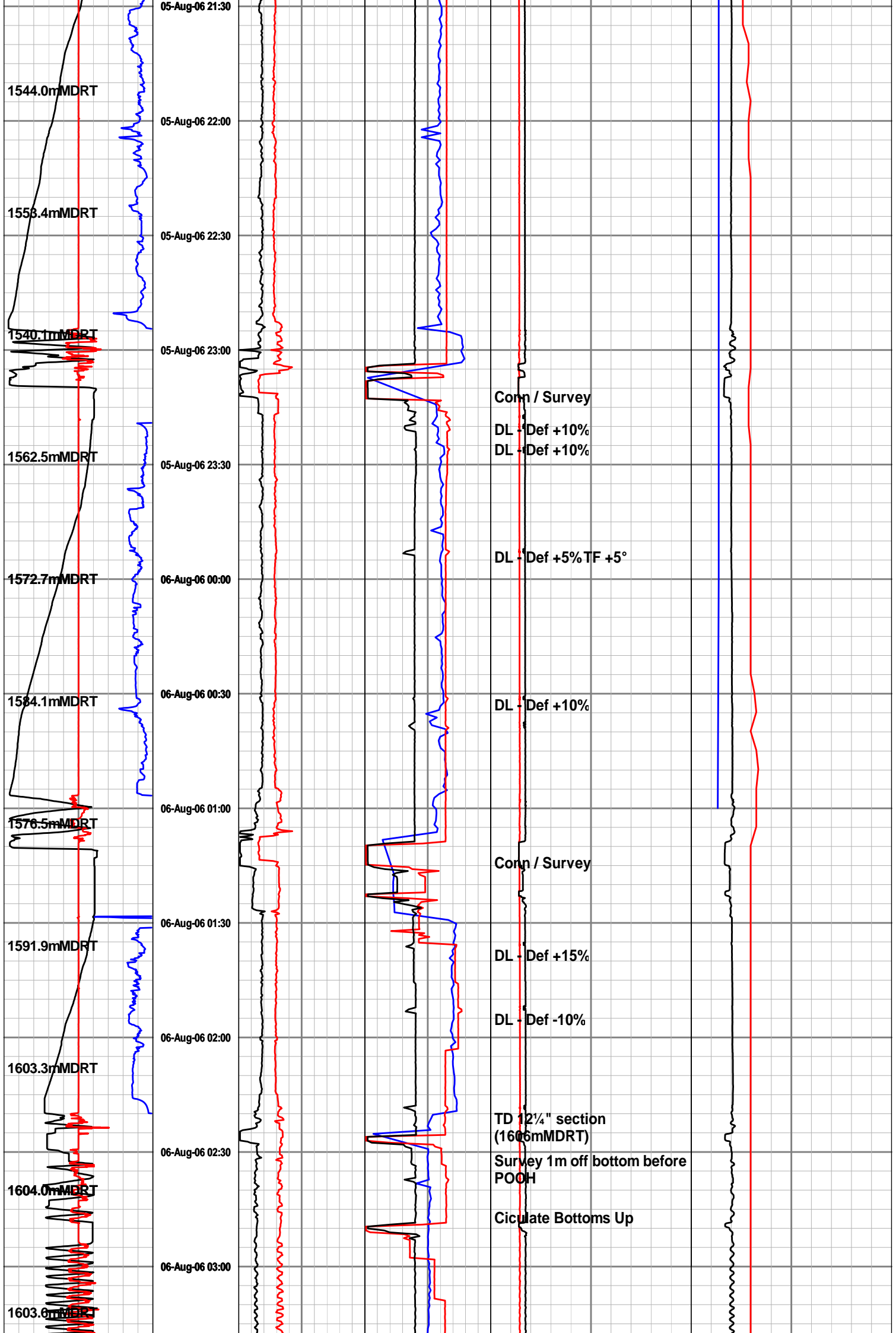


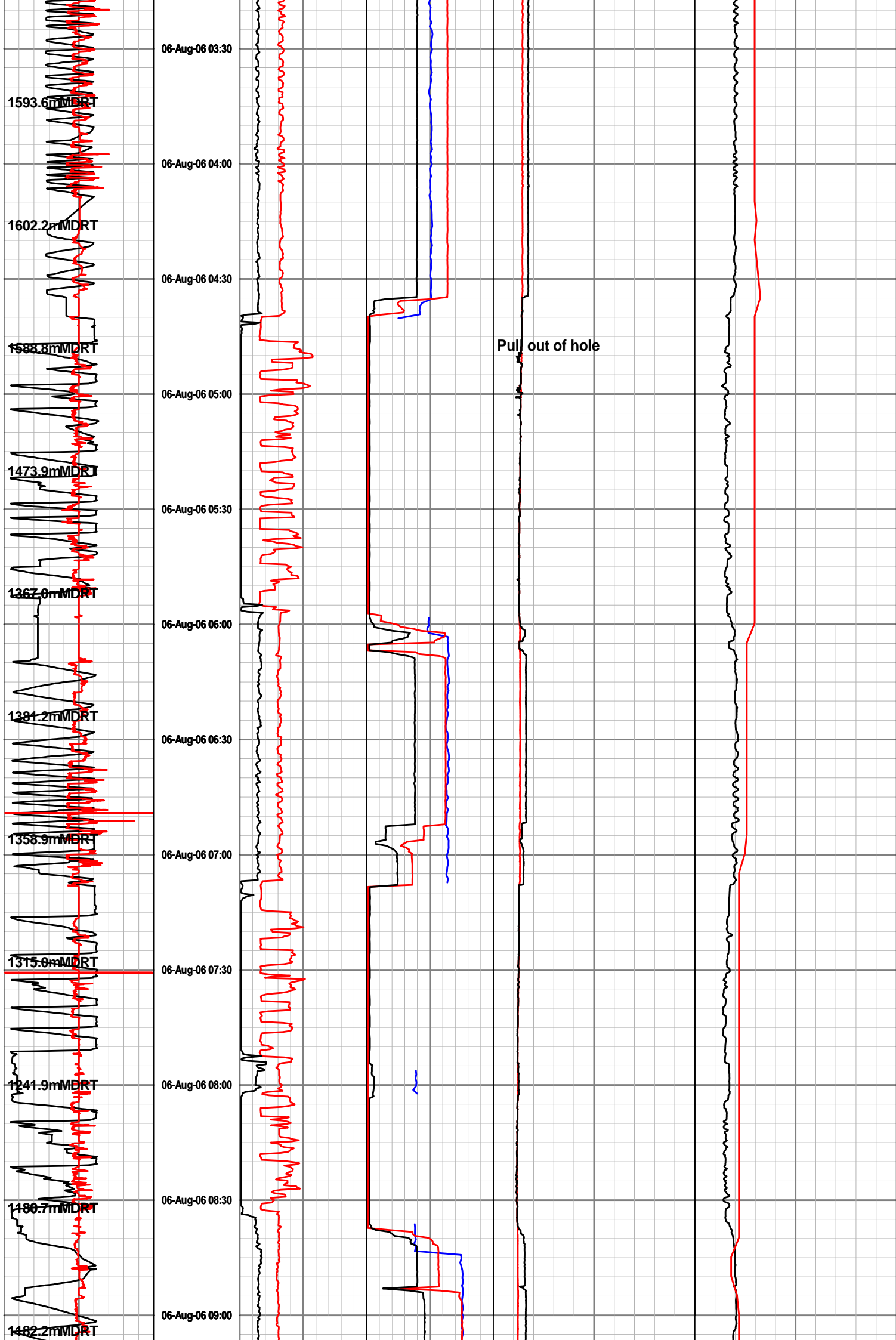


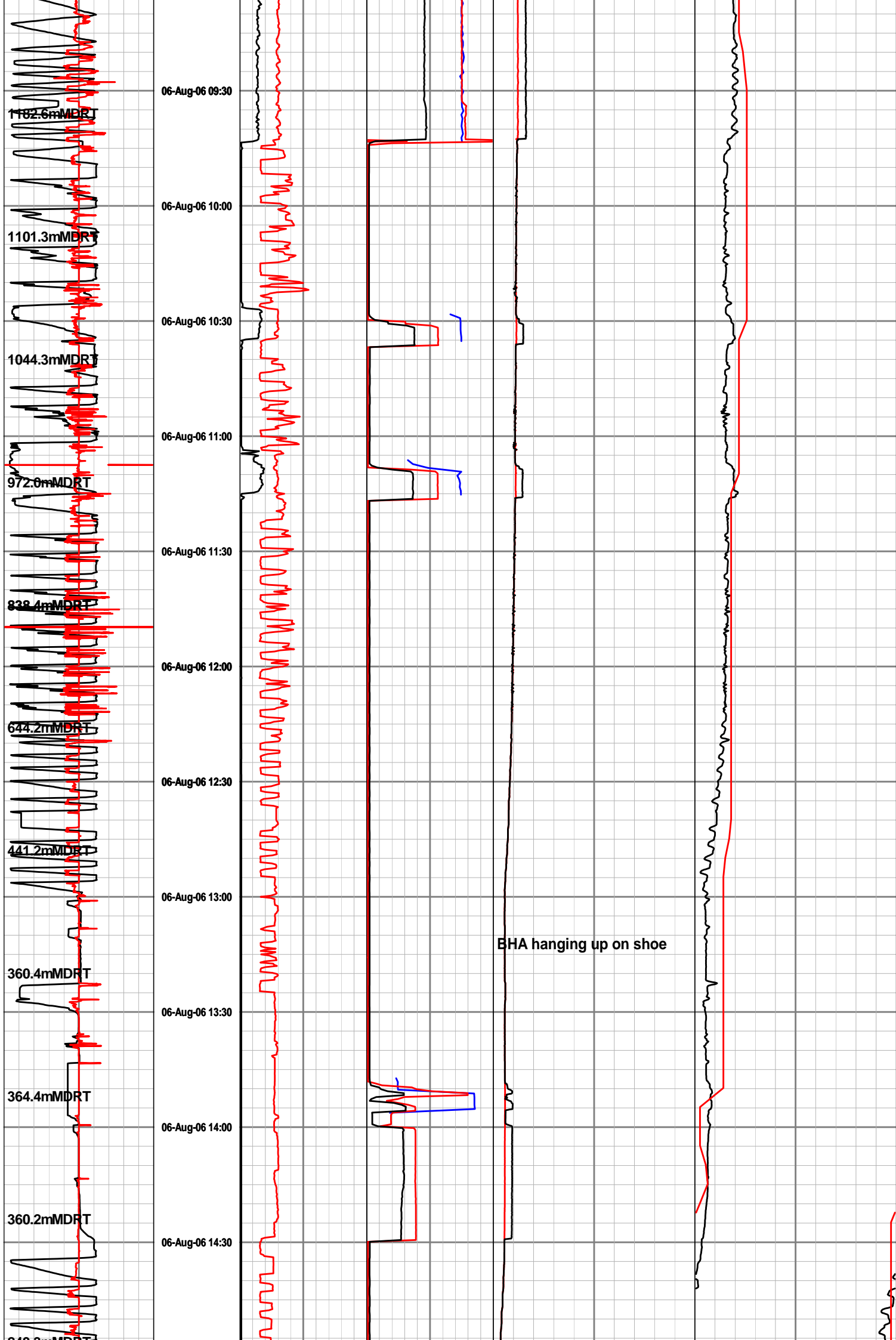












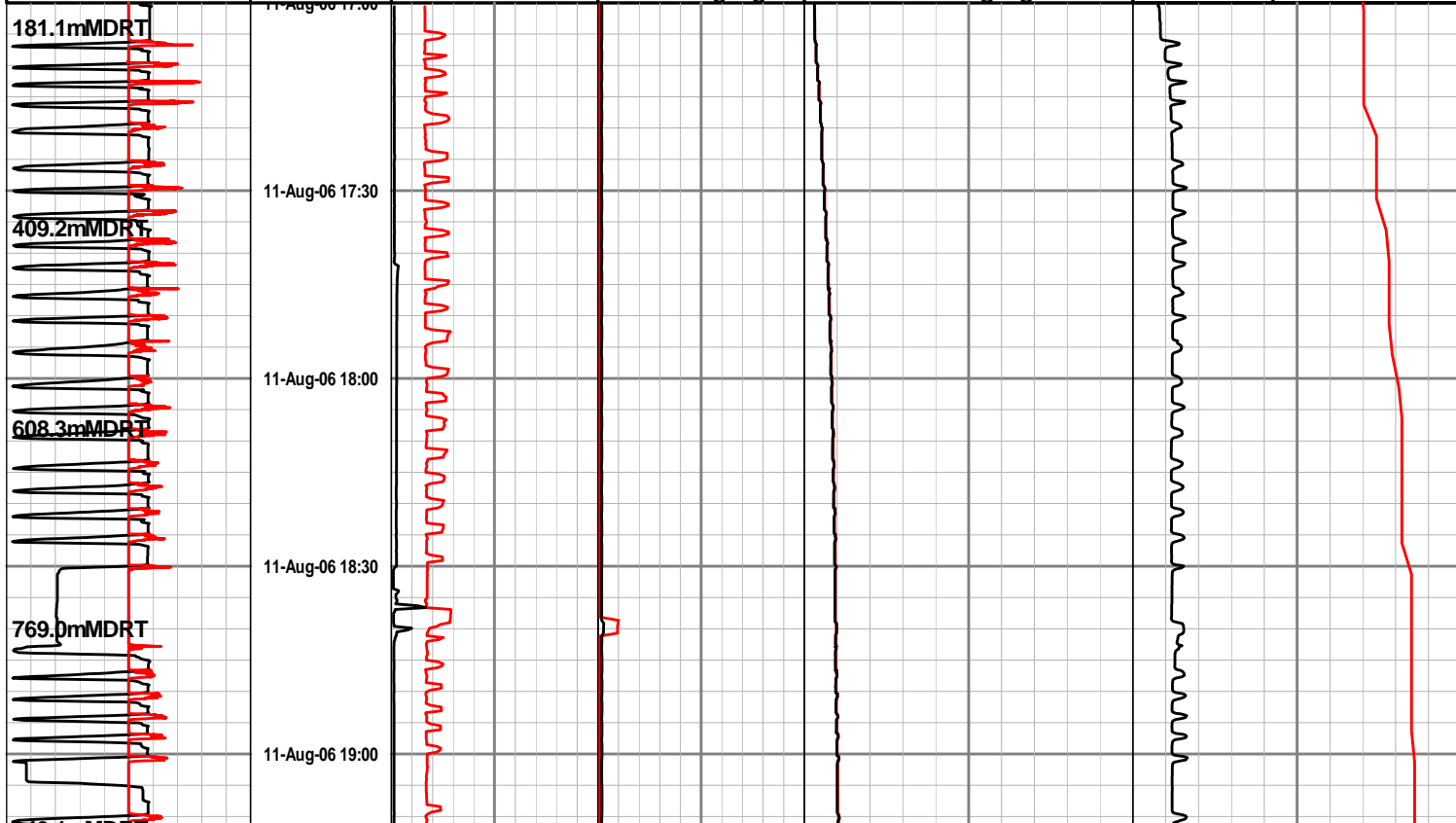


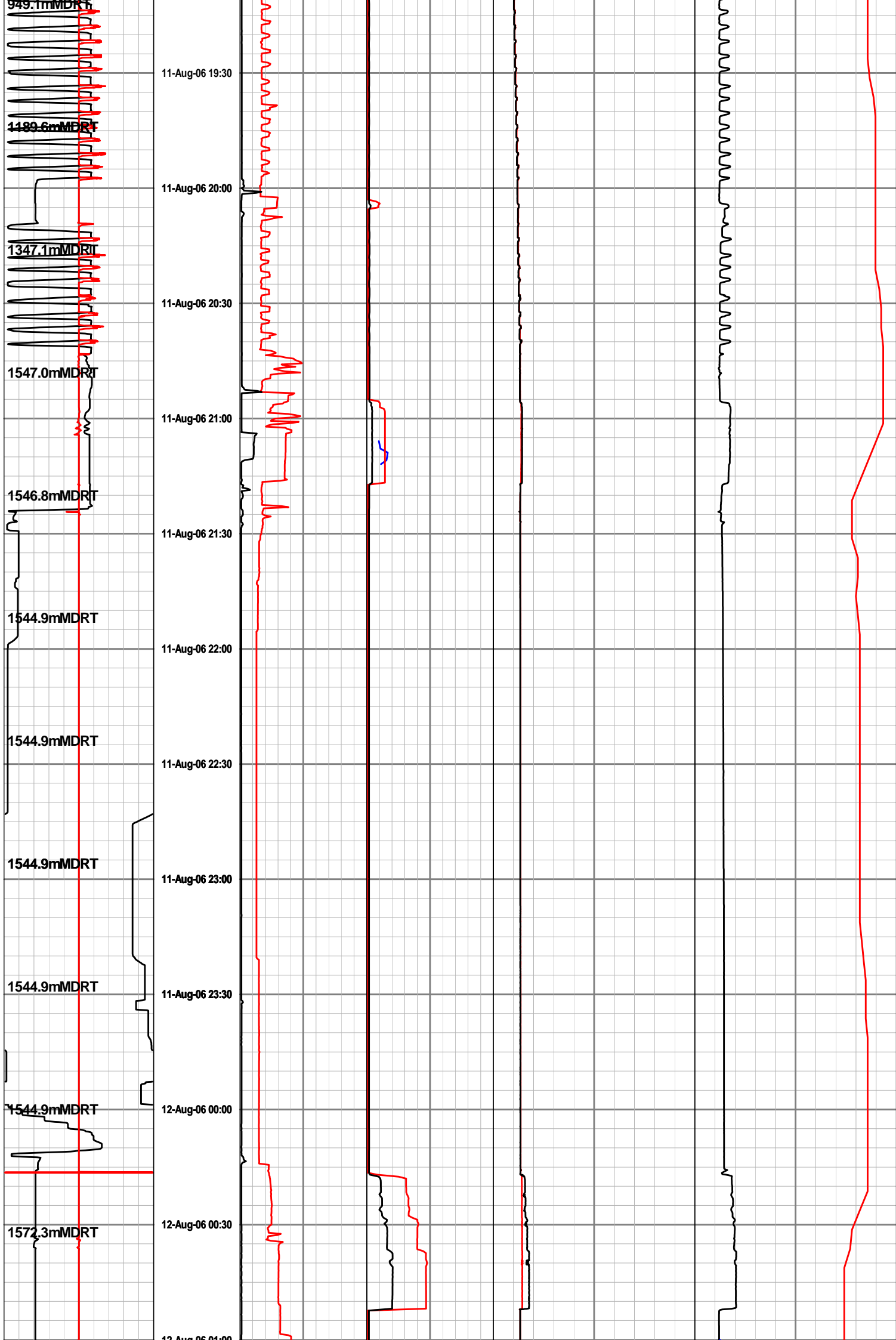
Block Position	Time min	Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav
Running Speed		Hookload	Total Flow	Annular Pressure-PWD	Temperature
-150 0 150		0 100 200	0 600 1.2K	0 5K 10K	0 25 50
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
ROP Avg			GP RPM		Dens Mud In
200 100 0			0 100 200		1 1.5 2
metre per hr			rev per min		Sp Grav

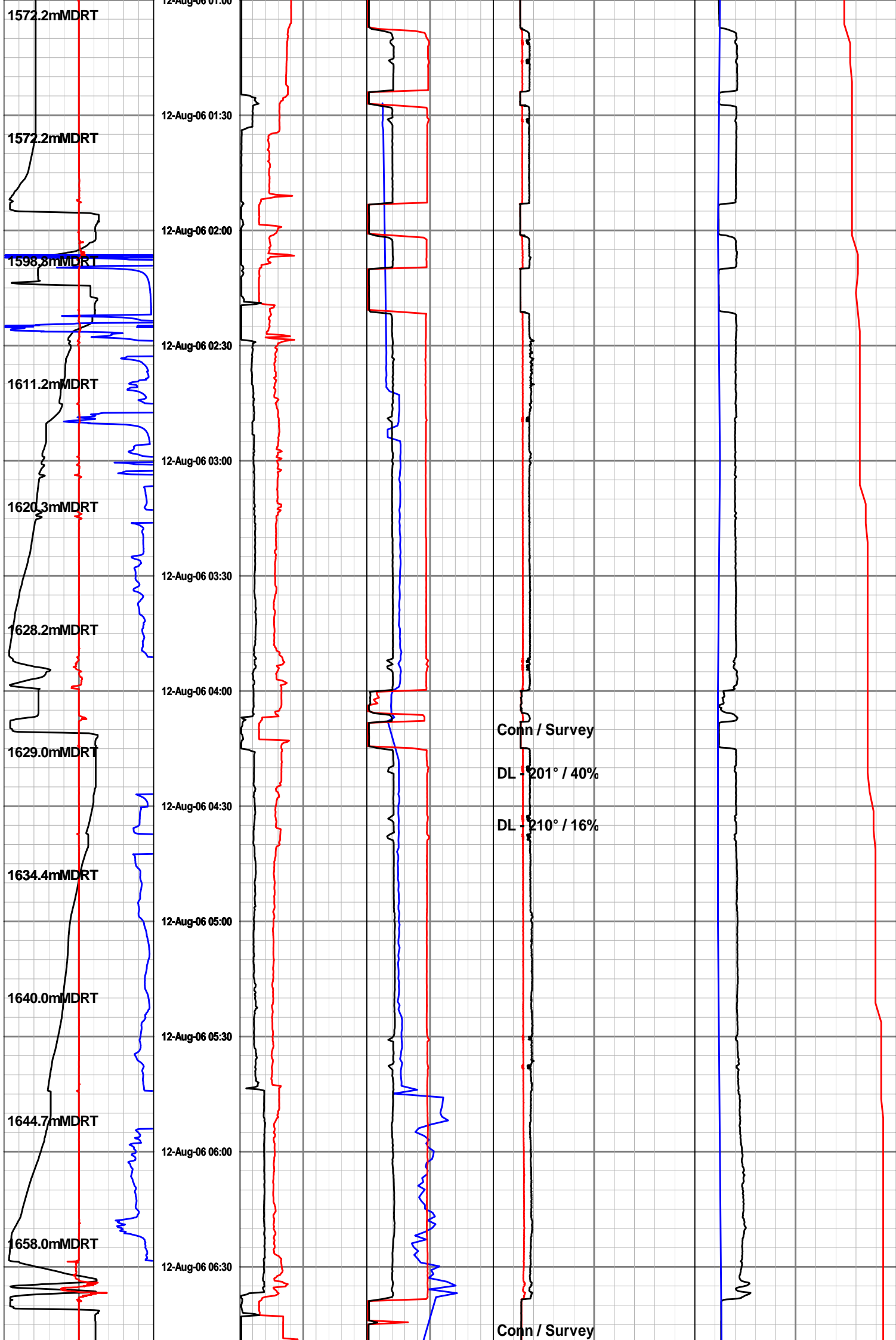
MWD Run 400

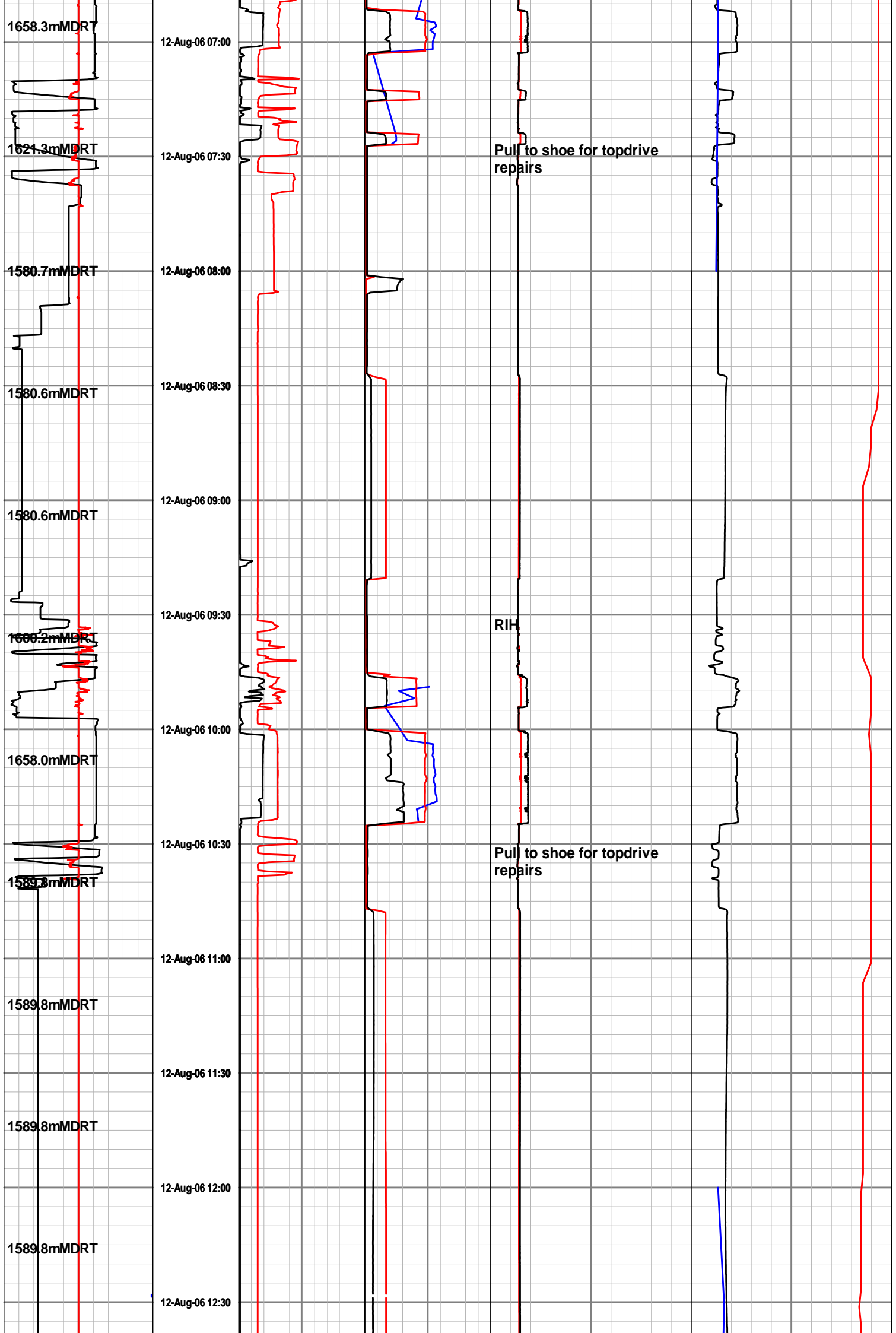
1700 hrs 11th August 2006 - 2200 hrs 12th August 2006

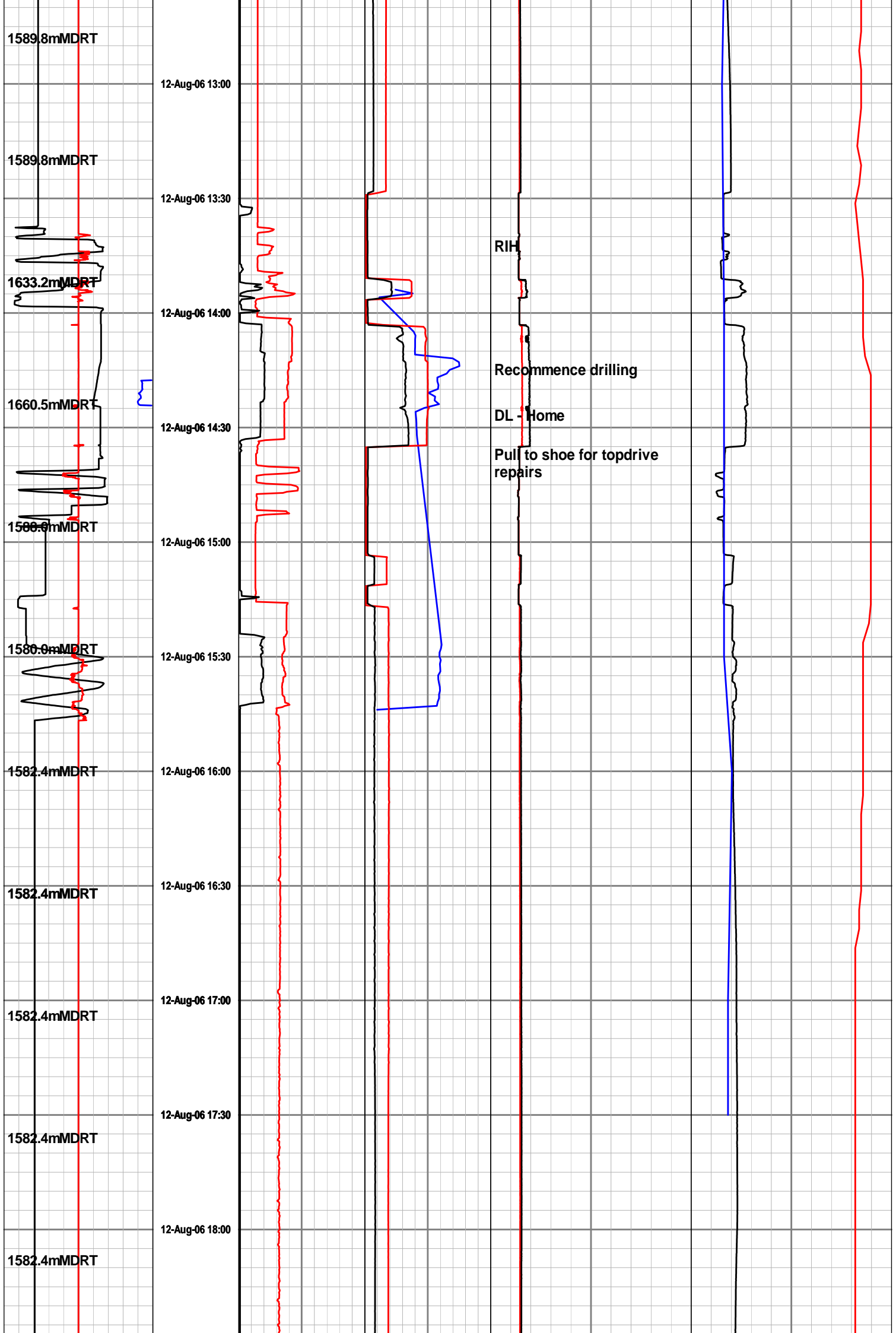
ROP Avg			GP RPM			Dens Mud In				
200 100 0			0 100 200			1 1.5 2				
metre per hr			rev per min			Sp Grav				
Running Speed			Hookload		Total Flow		Annular Pressure-PWD		Temperature	
-150 0 150			0 100 200		0 600 1.2K		0 5K 10K		0 25 50	
metre per min			kilo pounds		gallon per min		lbs / in2 gauge		celsius	
Block Position			Torque		SPP		Internal Pressure-PWD		Annular EMW-PWD	
0 25 50			0 25 50		0 3K 6K		0 5K 10K		1 1.5 2	
metres			foot-klb		lbs / in2 gauge		lbs / in2 gauge		Sp Grav	

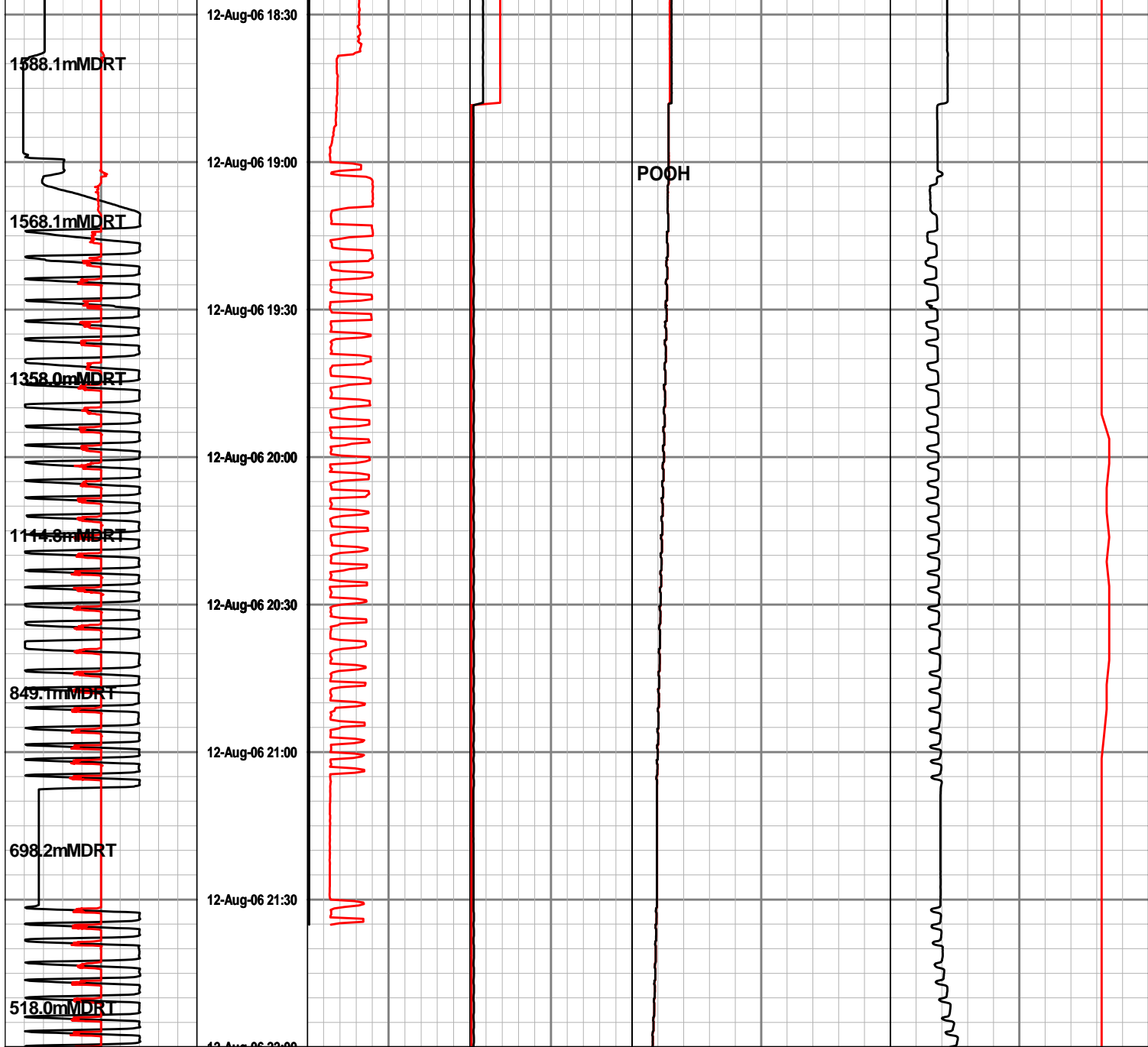










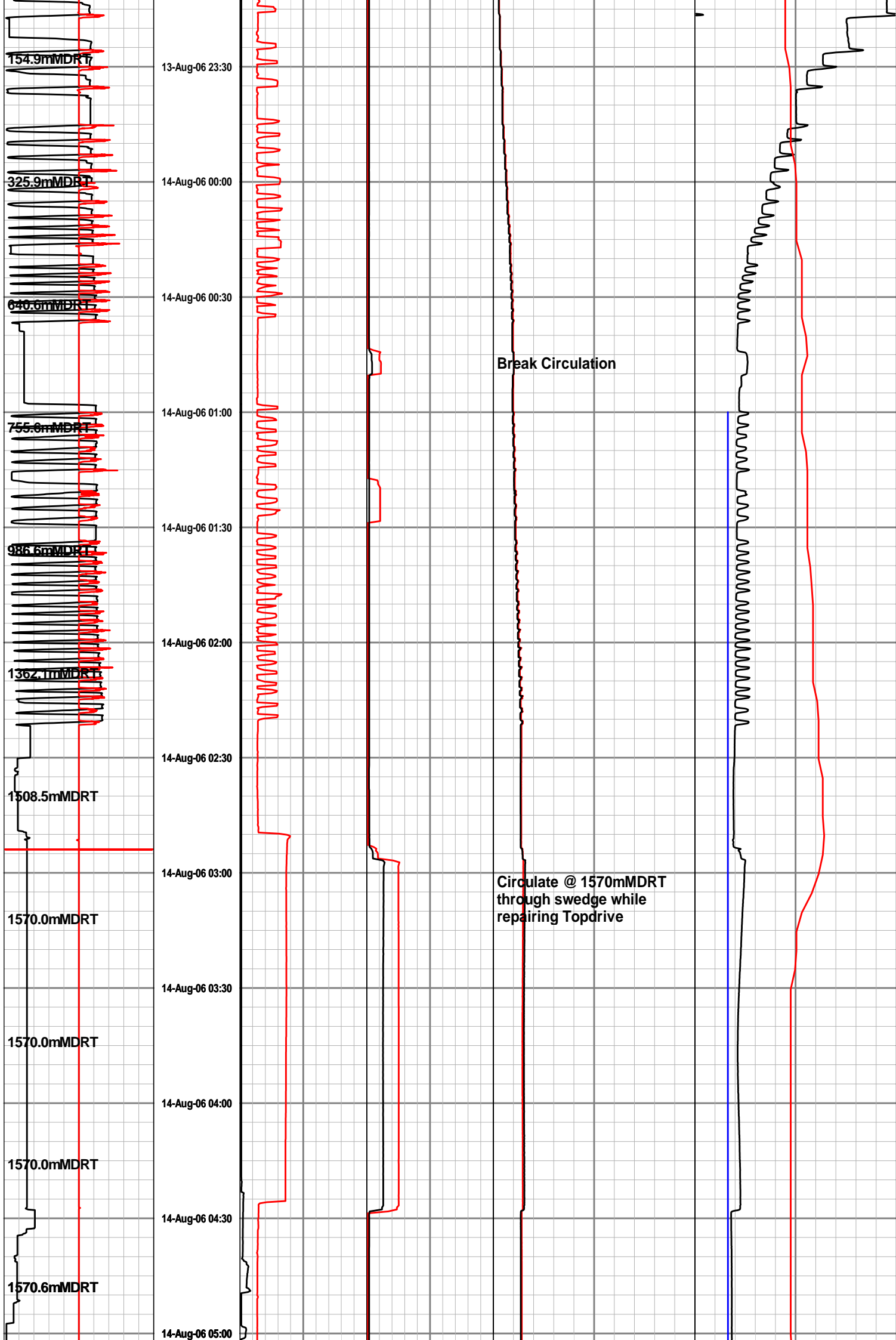


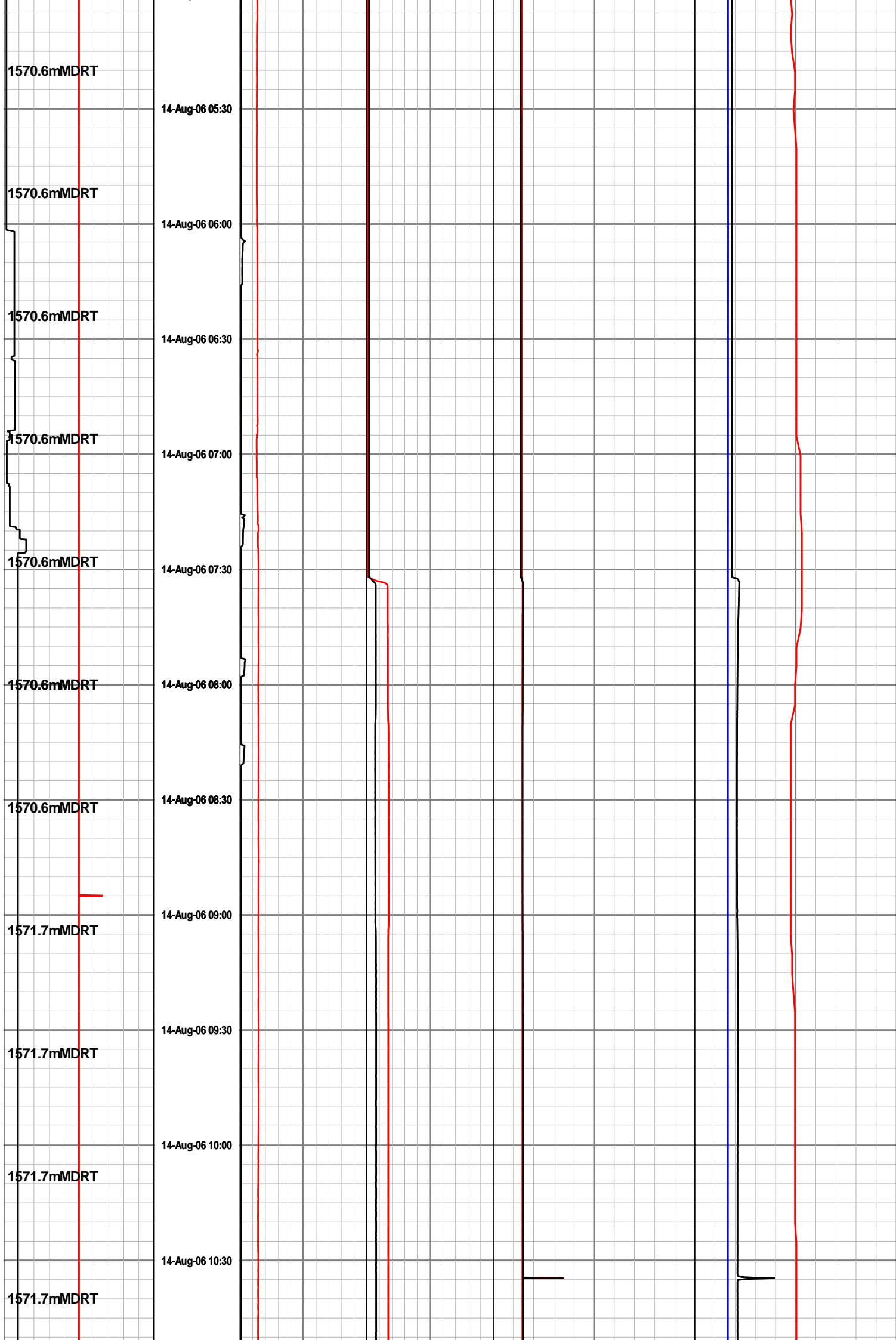
Block Position	Time min	Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav
Running Speed		Hookload	Total Flow	Annular Pressure-PWD	Temperature
-150 0 150		0 100 200	0 600 1.2K	0 5K 10K	0 25 50
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
ROP Avg			GP RPM		Dens Mud In
200 100 0			0 100 200		1 1.5 2
metre per hr			rev per min		Sp Grav

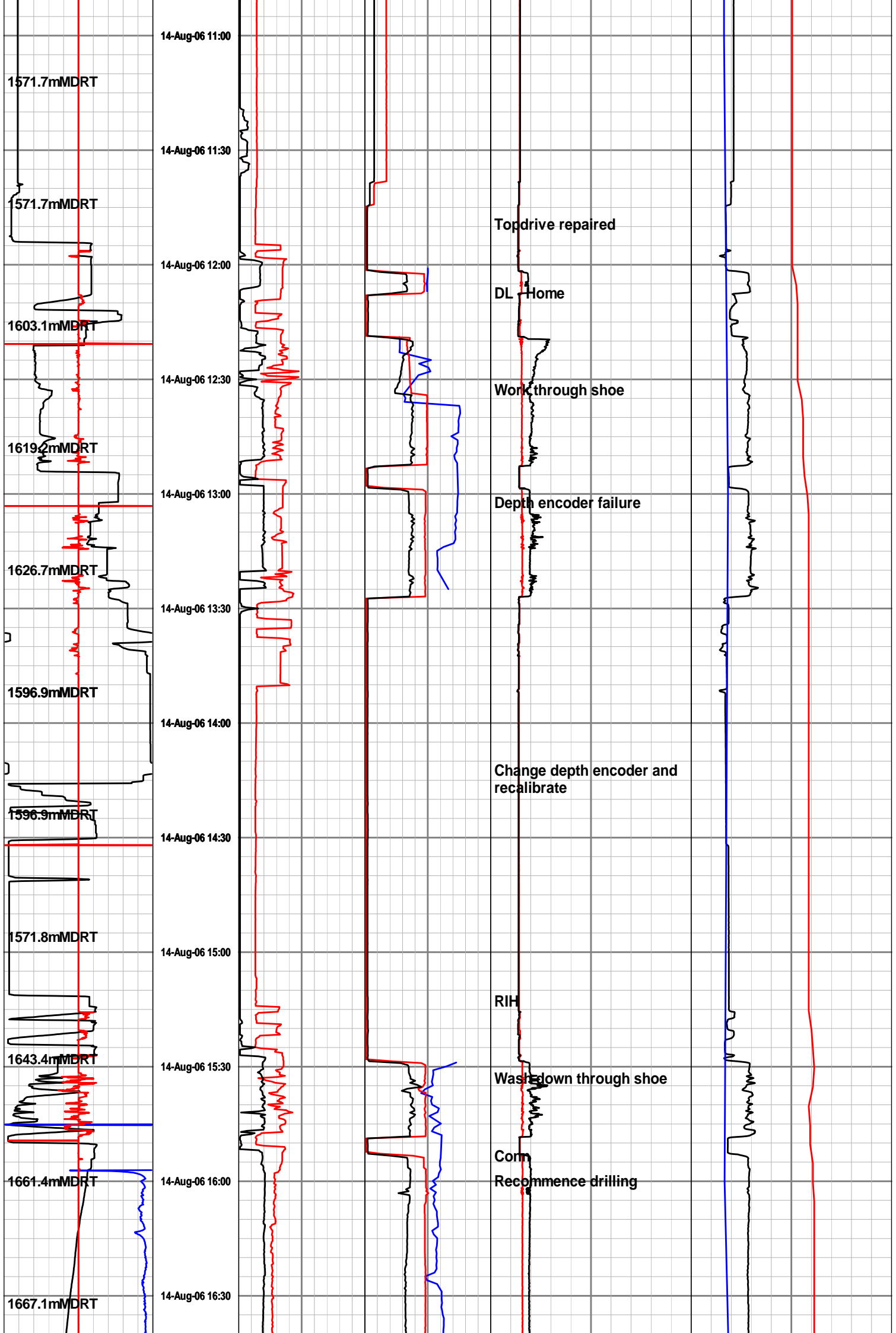
MWD Run 500

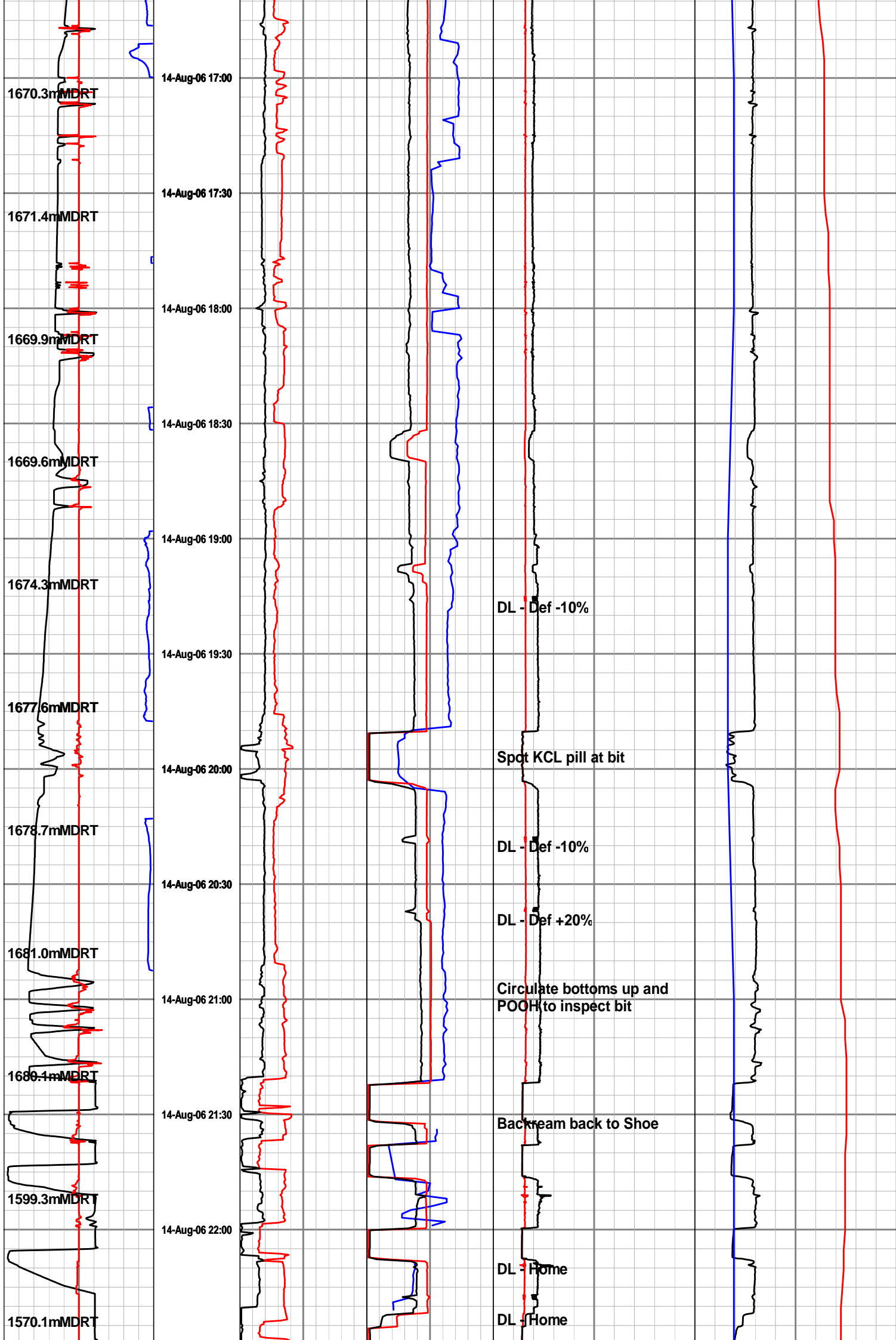
2300 hrs 13th August 2006 - 2300 hrs 14th August 2006

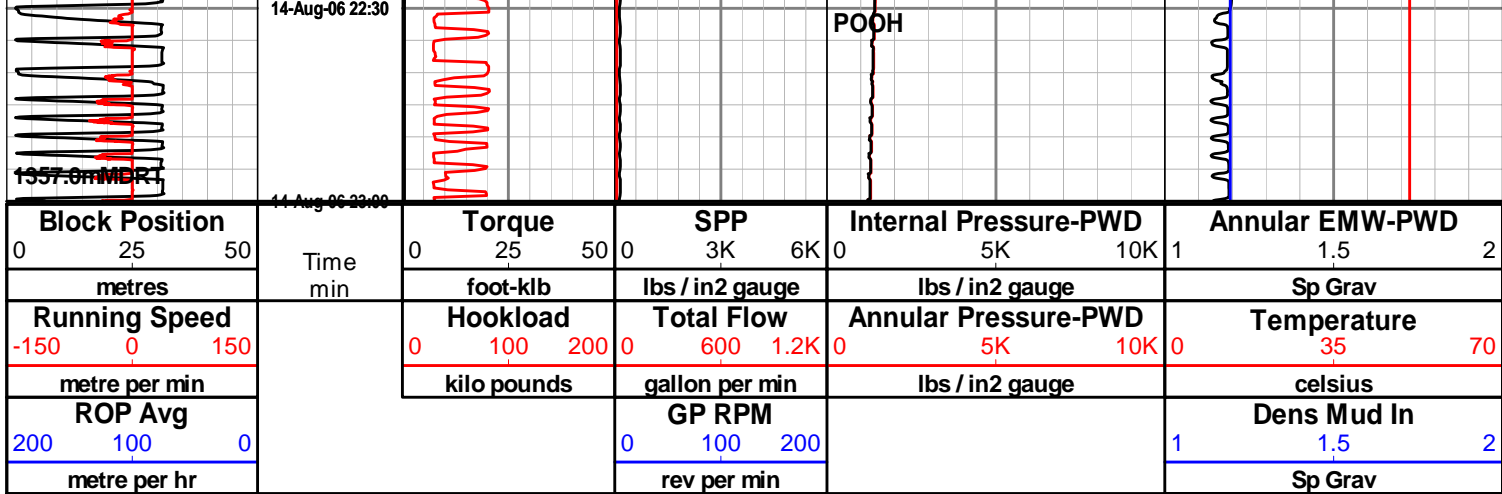
ROP Avg	Time min	GP RPM		Dens Mud In	
200 100 0		0 100 200		1 1.5 2	
metre per hr		rev per min		Sp Grav	
Running Speed		Hookload	Total Flow	Annular Pressure-PWD	Temperature
-150 0 150		0 100 200	0 600 1.2K	0 5K 10K	0 35 70
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
Block Position		Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav





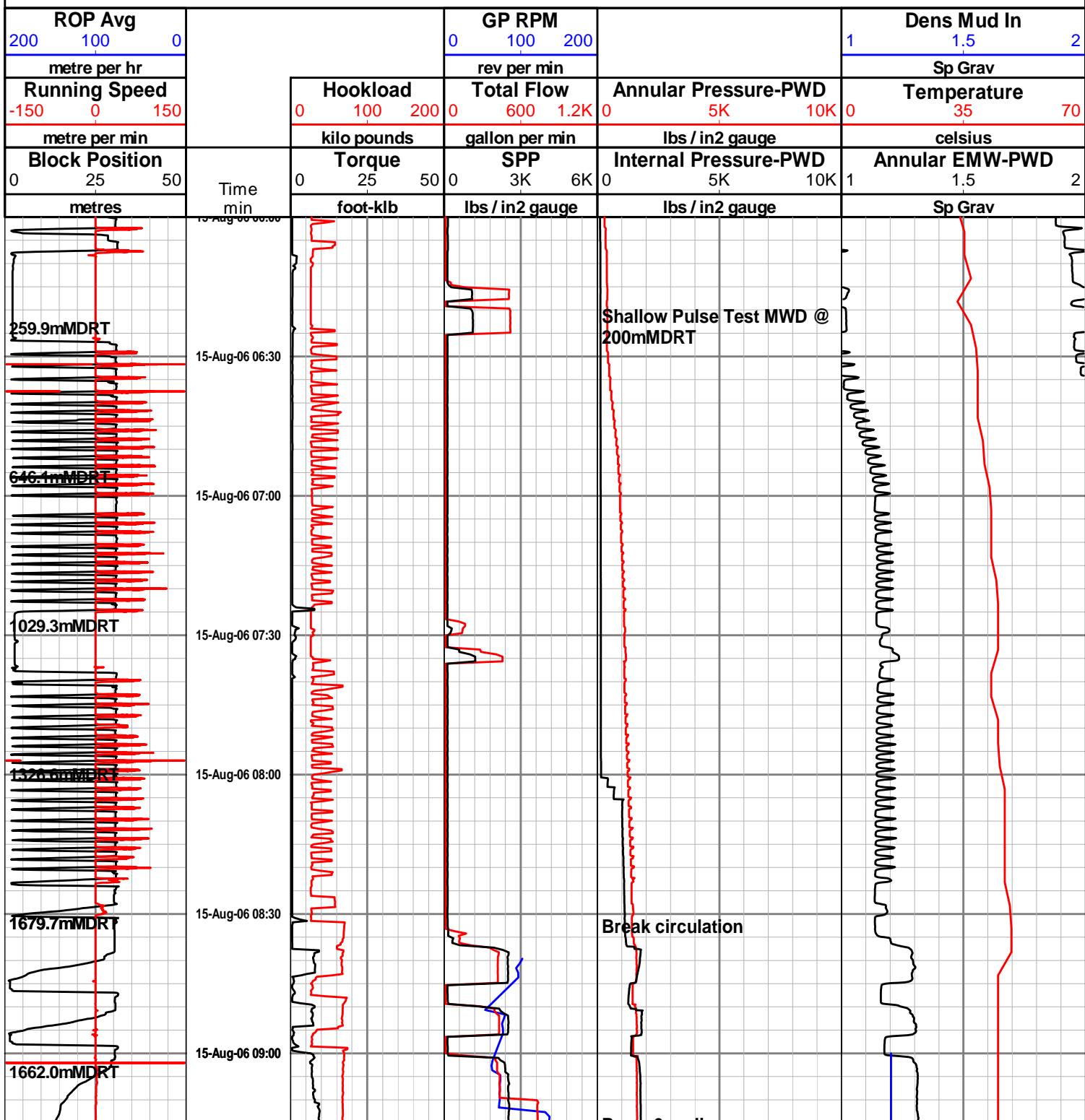


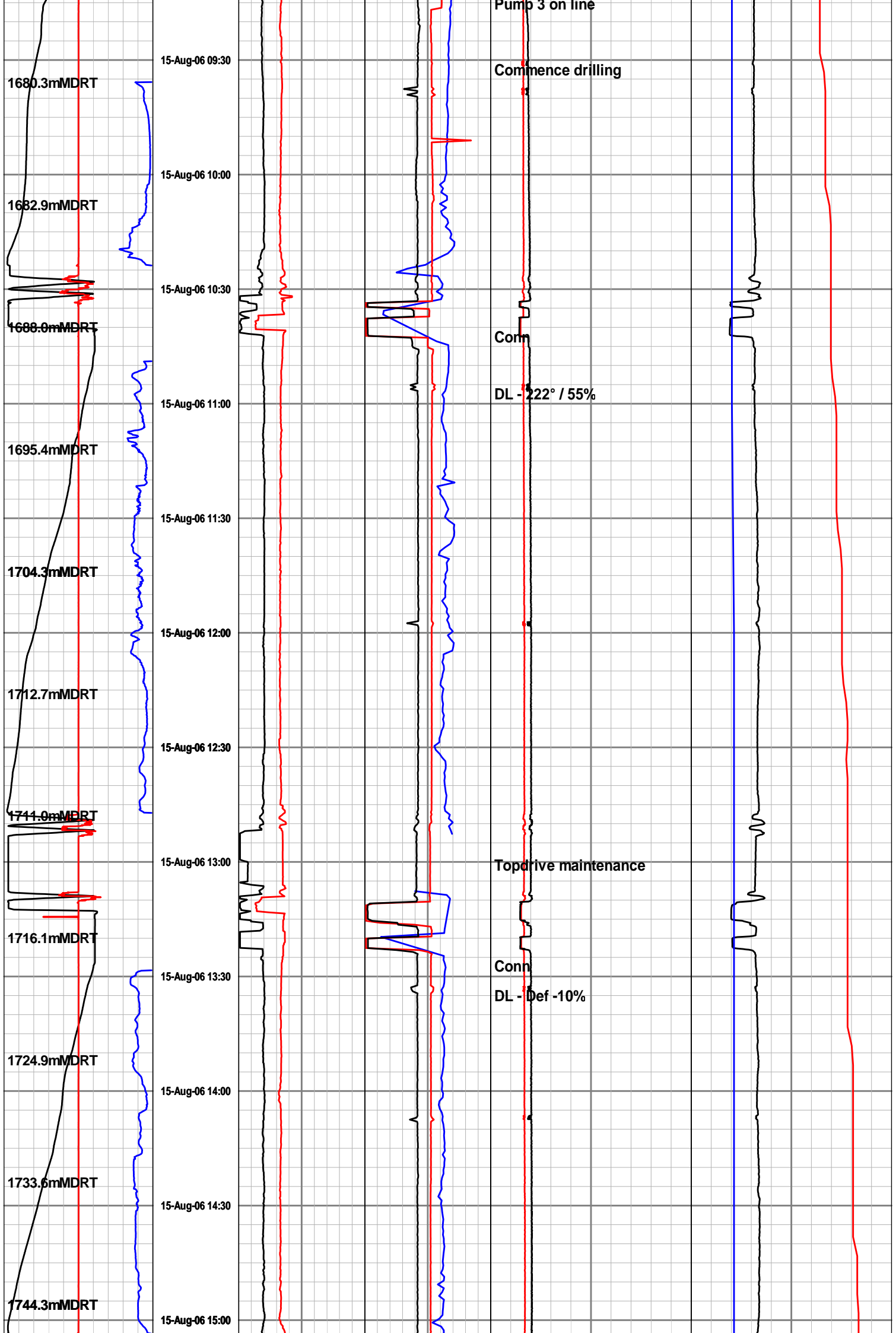


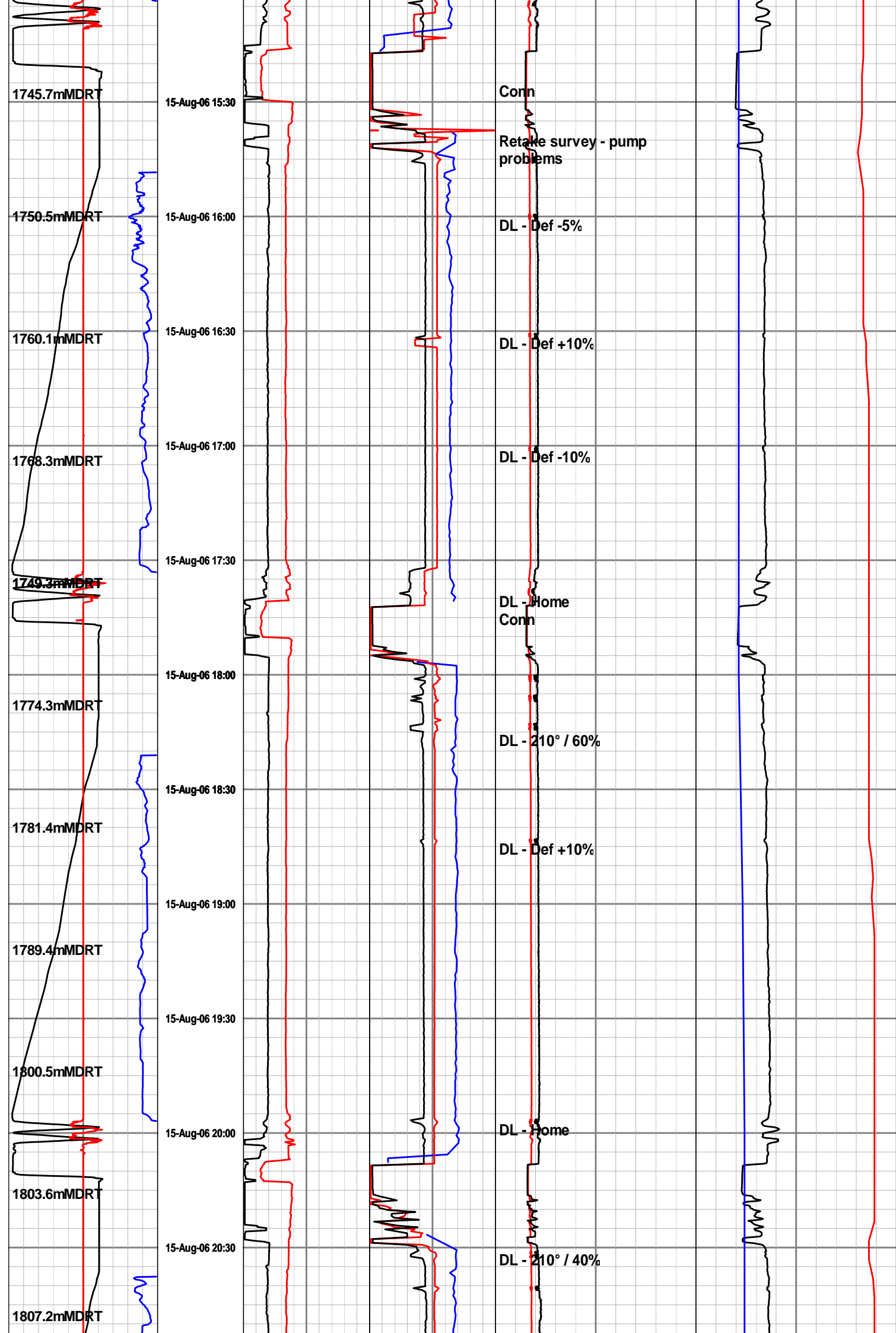


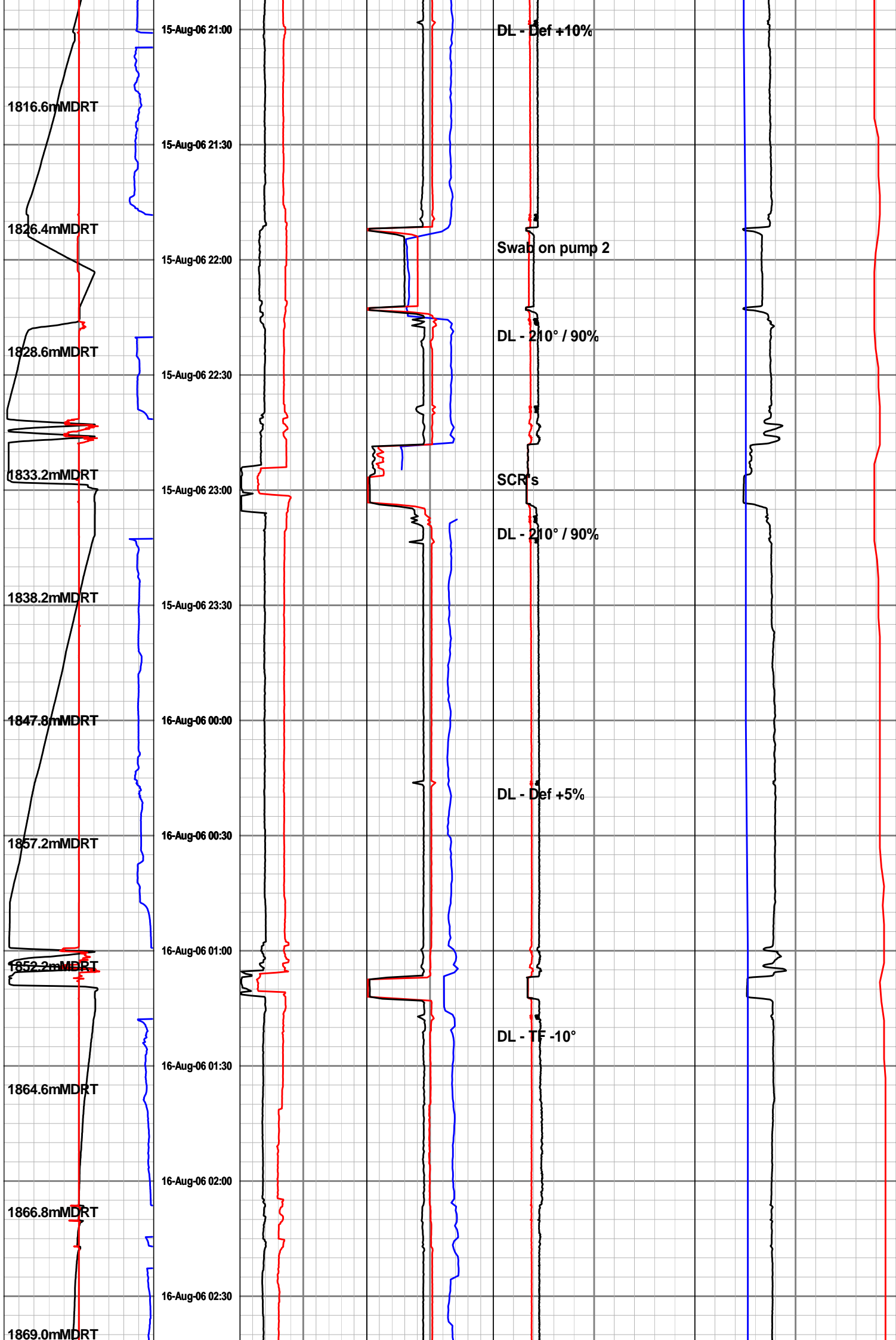
MWD Run 600

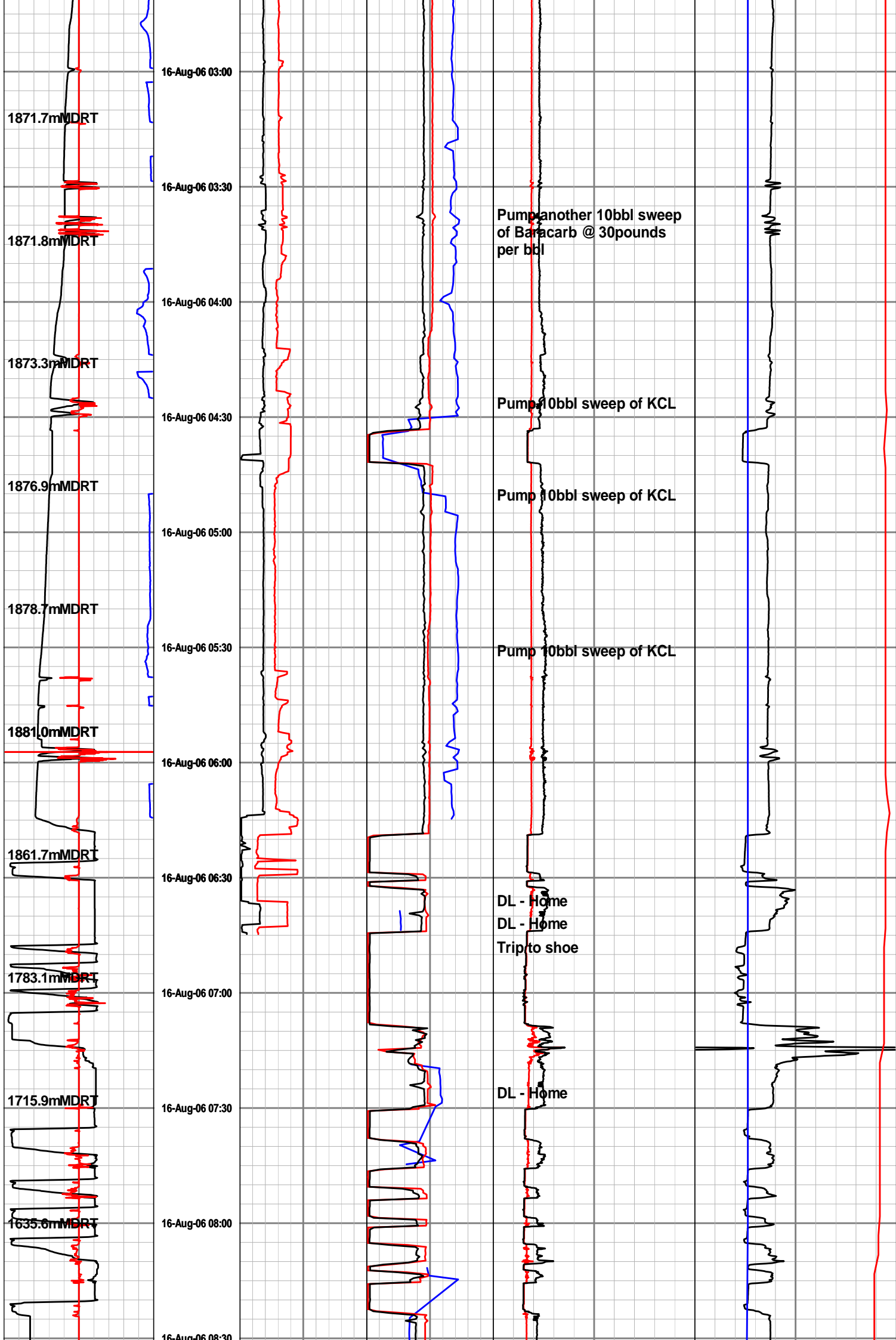
0600 hrs 15th August 2006 - 1300 hrs 16th August 2006

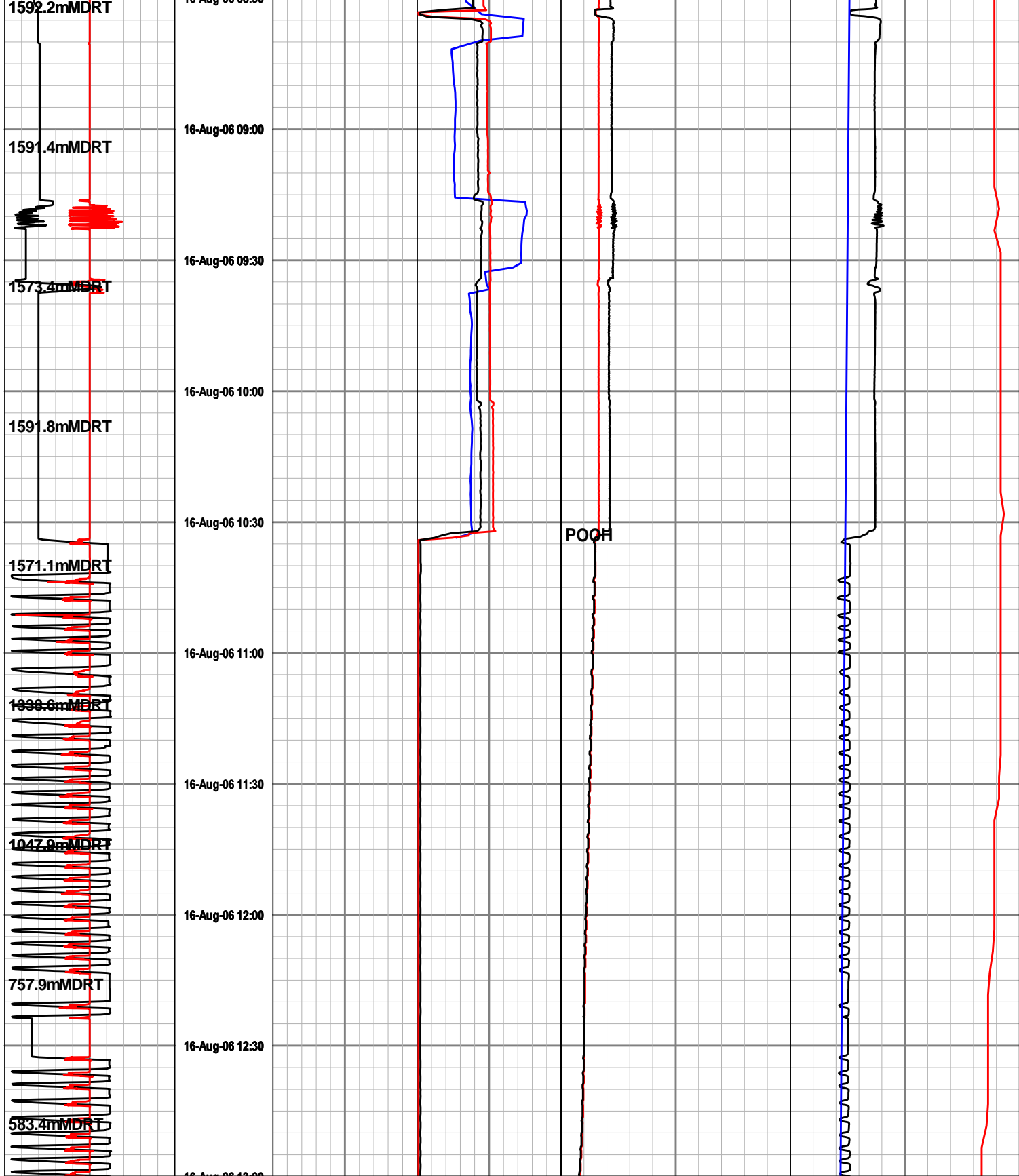








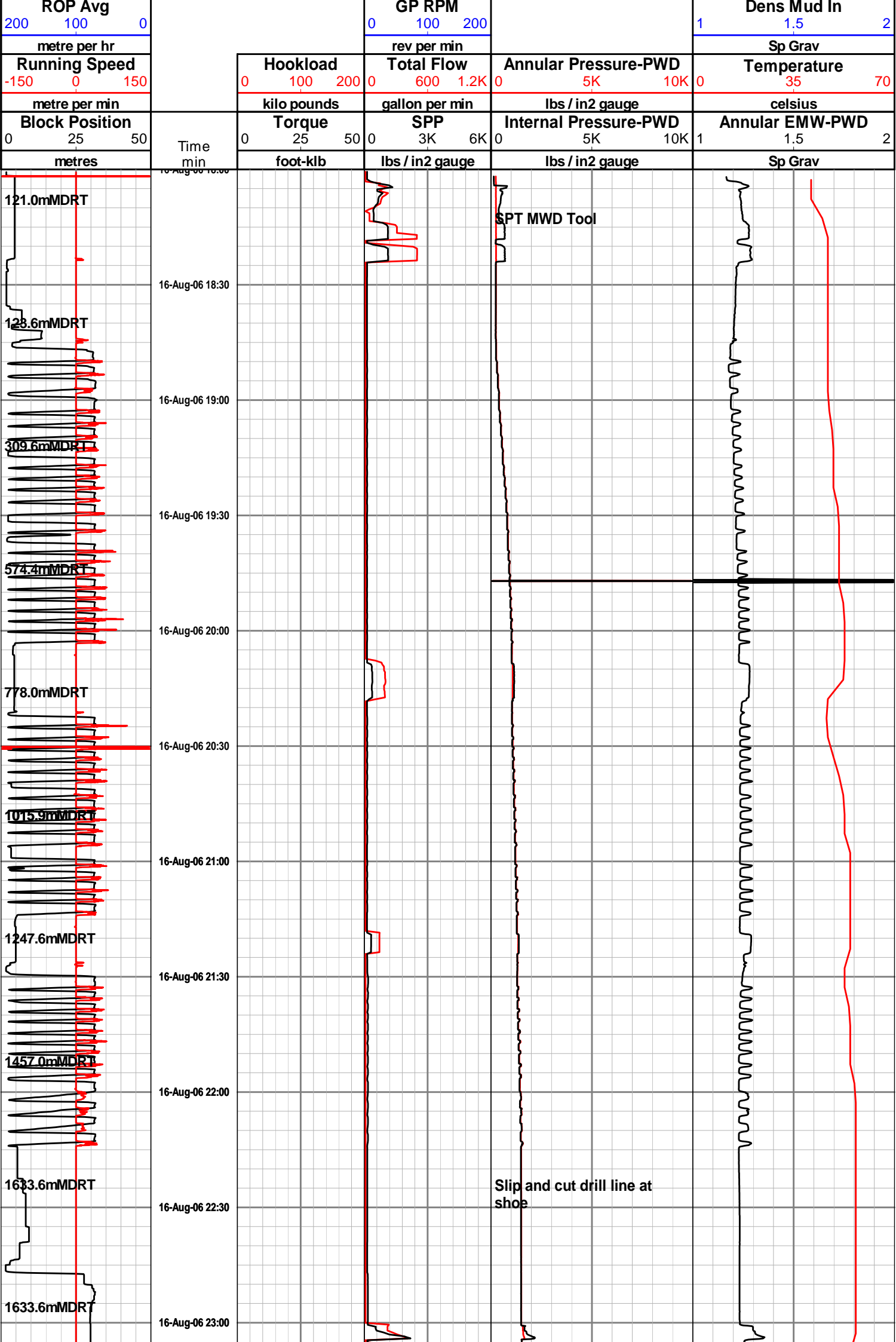


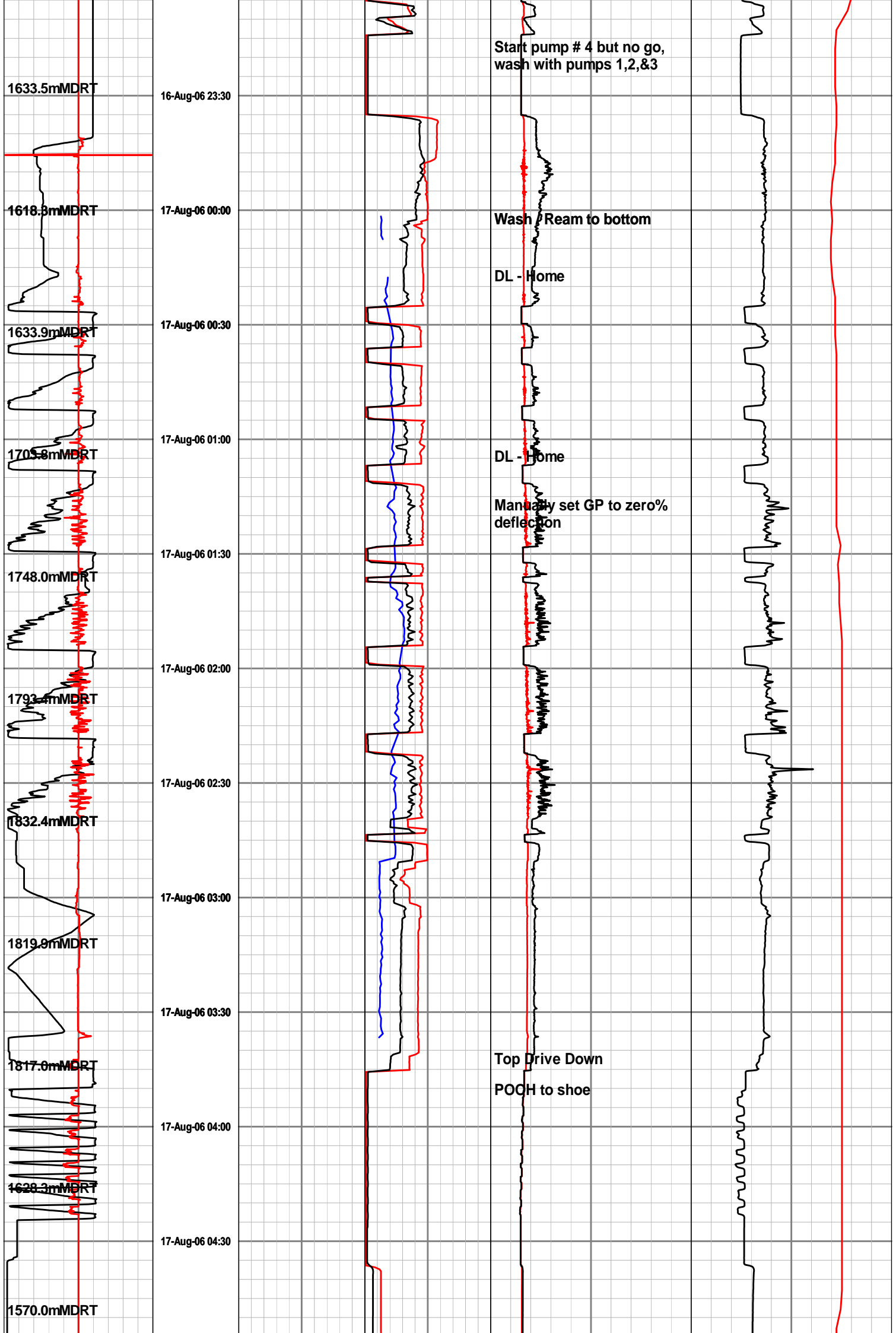


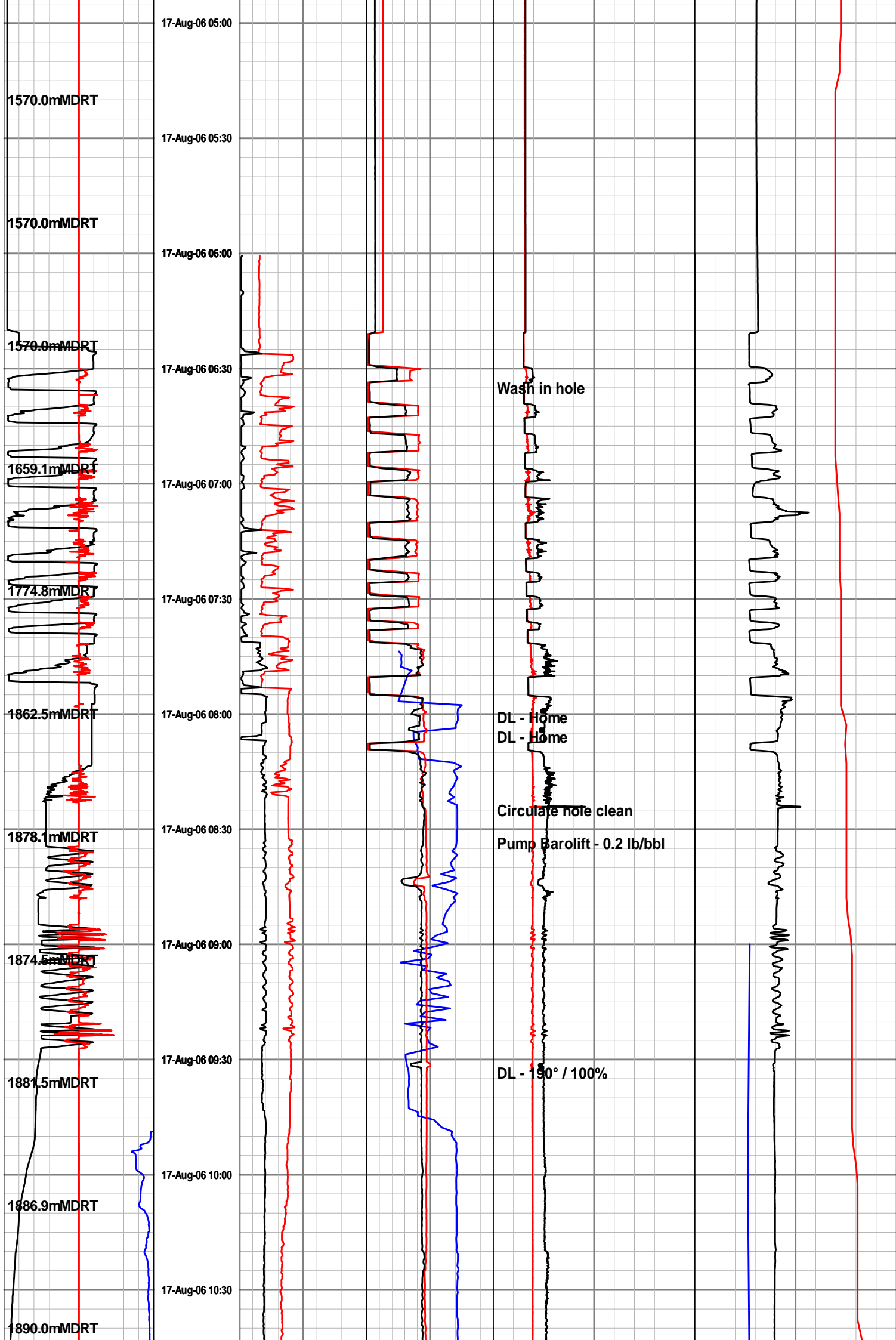
Block Position			Time min	Torque			SPP			Internal Pressure-PWD			Annular EMW-PWD		
0	25	50		0	25	50	0	3K	6K	0	5K	10K	1	1.5	2
metres				foot-klb			lbs / in2 gauge			lbs / in2 gauge			Sp Grav		
Running Speed				Hookload			Total Flow			Annular Pressure-PWD			Temperature		
-150	0	150		0	100	200	0	600	1.2K	0	5K	10K	0	35	70
metre per min				kilo pounds			gallon per min			lbs / in2 gauge			celsius		
ROP Avg							GP RPM						Dens Mud In		
200	100	0					0	100	200				1	1.5	2
metre per hr							rev per min						Sp Grav		

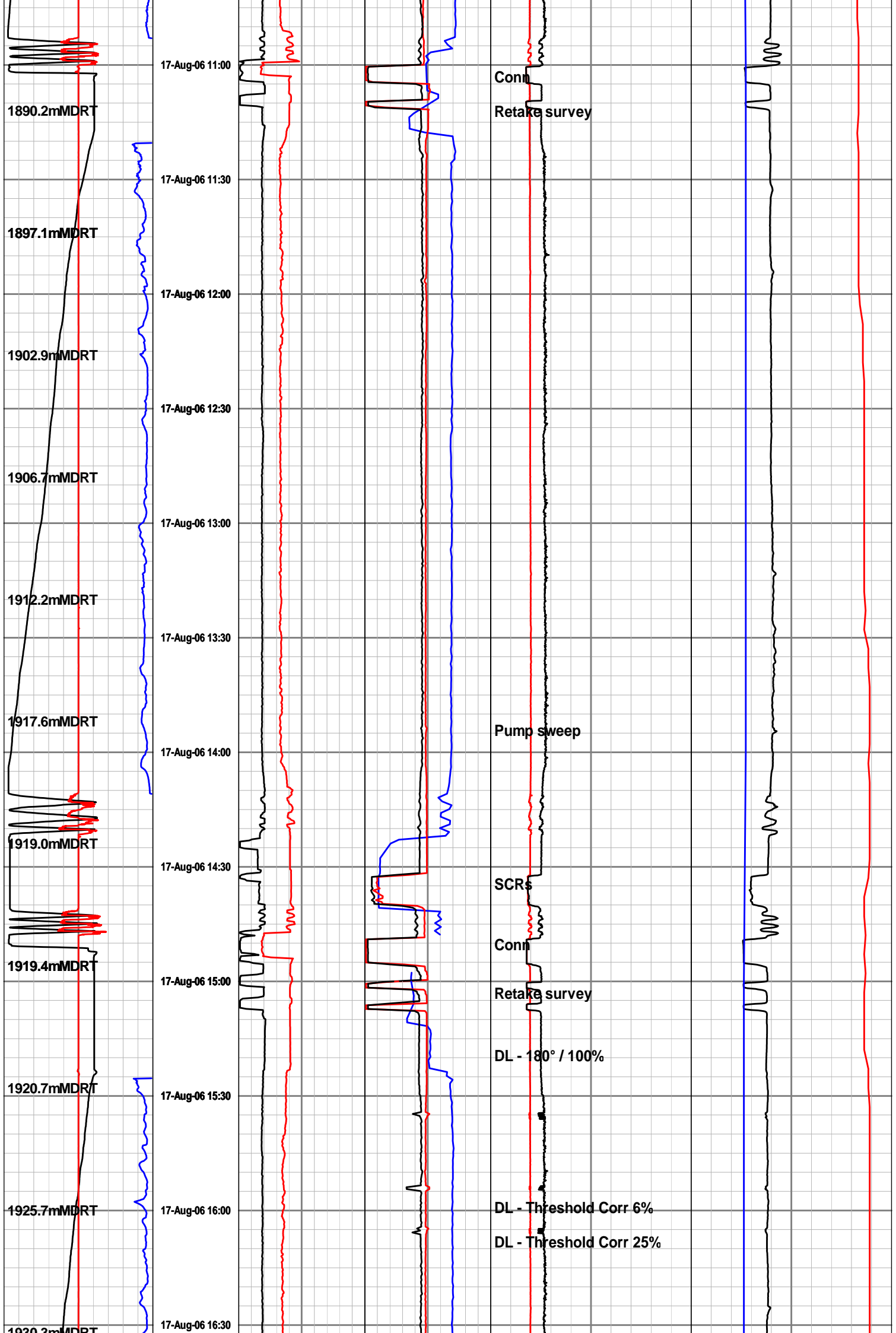
MWD Run 700

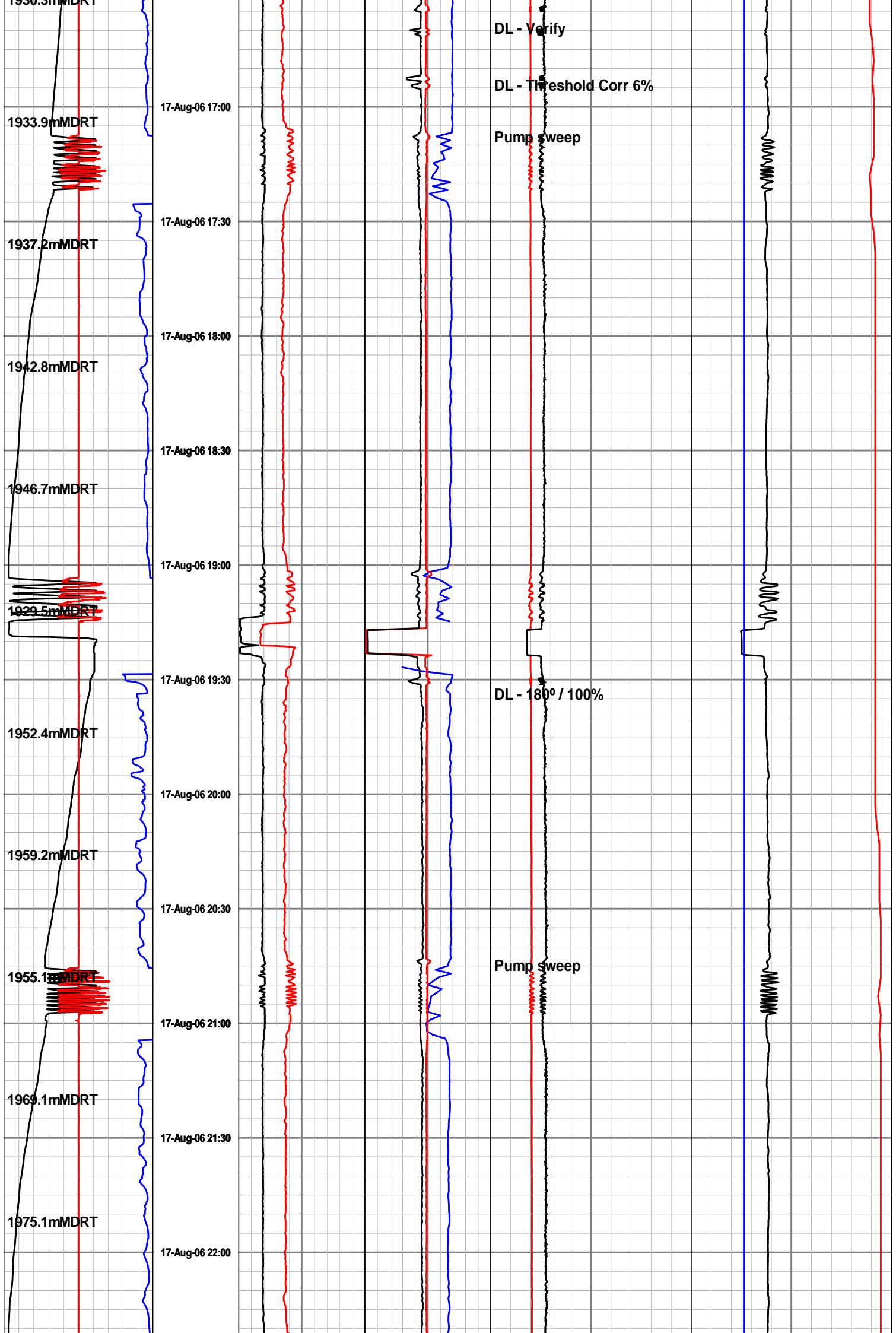
1800 hrs 16th August 2006 - 2200 hrs 20th August 2006

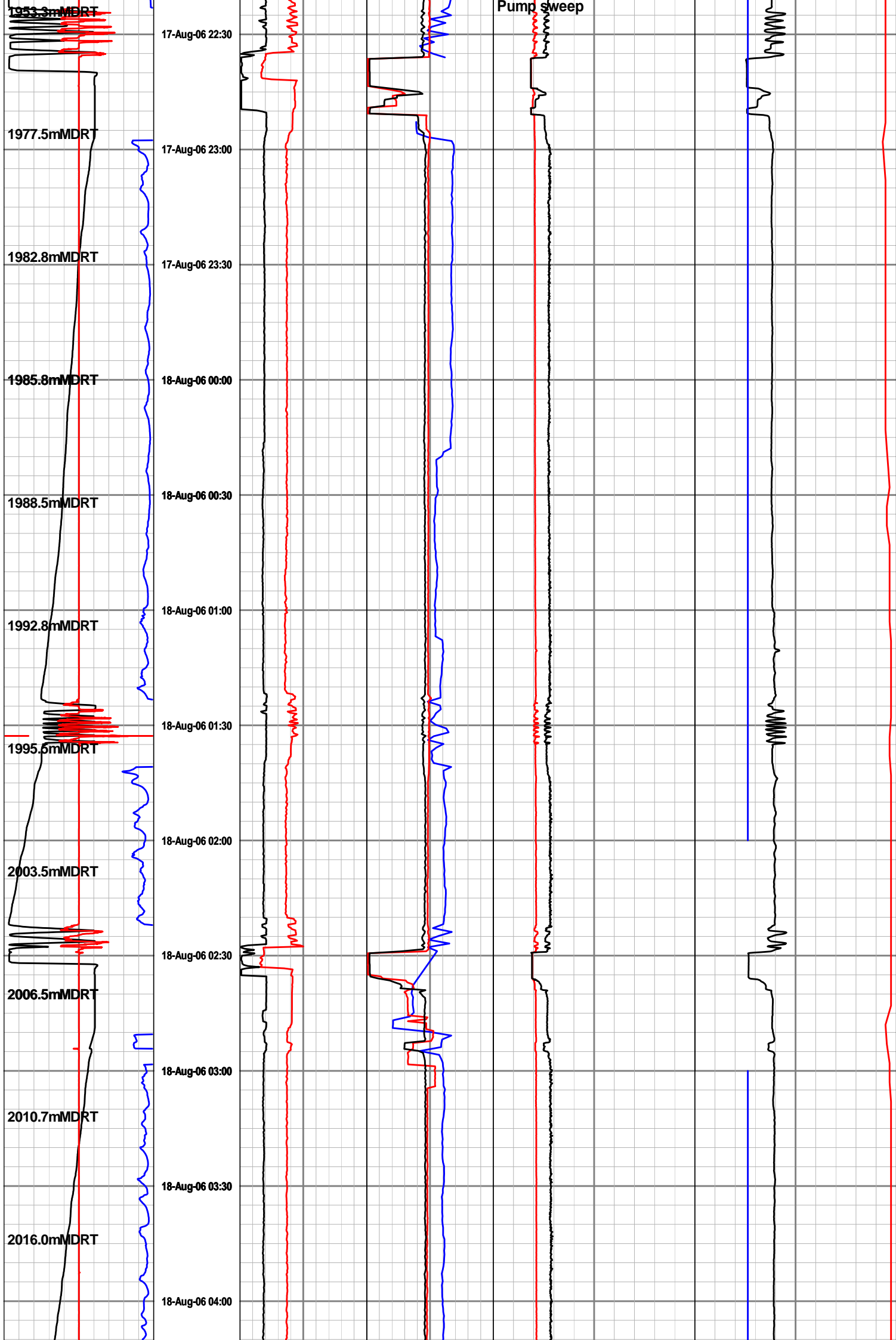


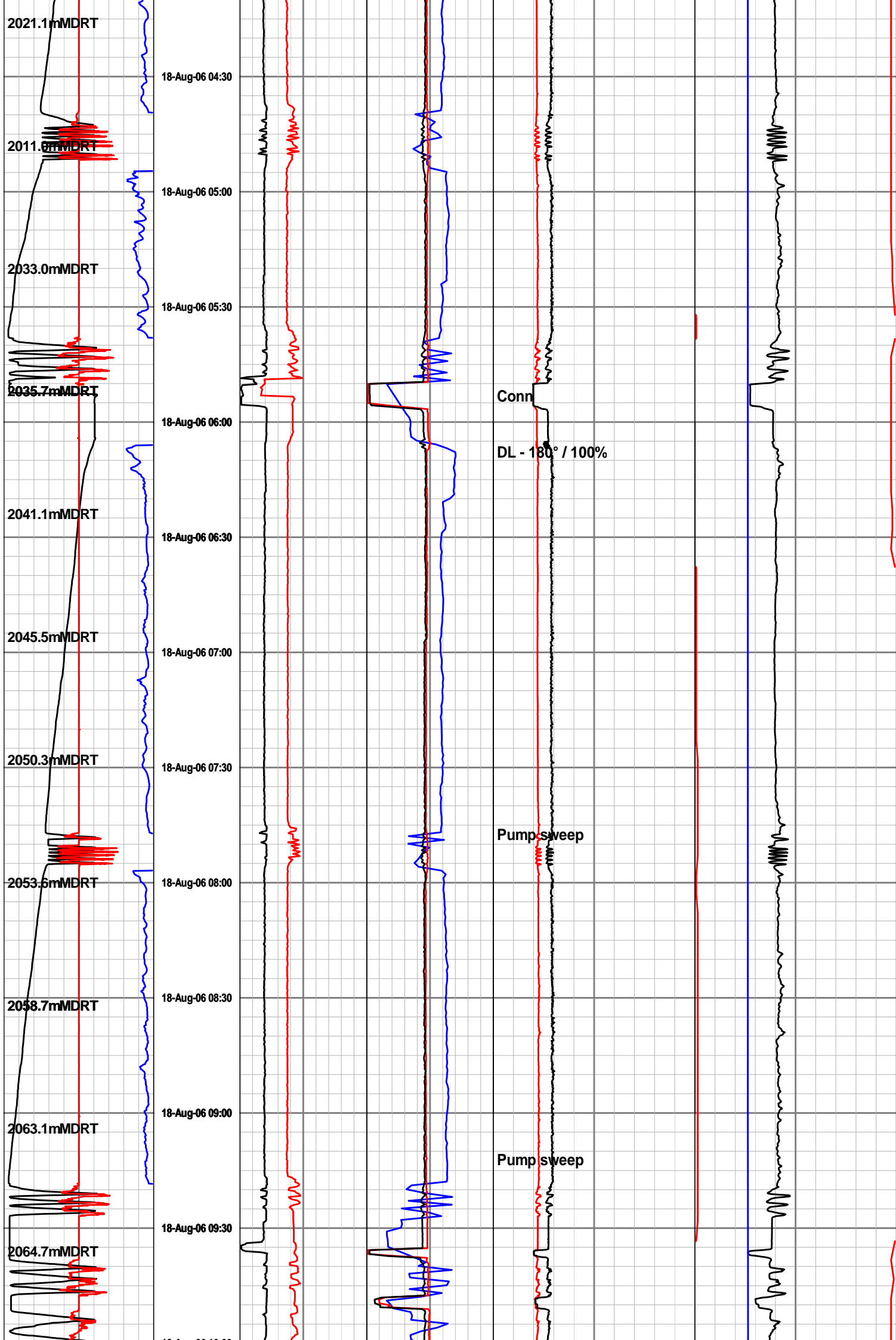


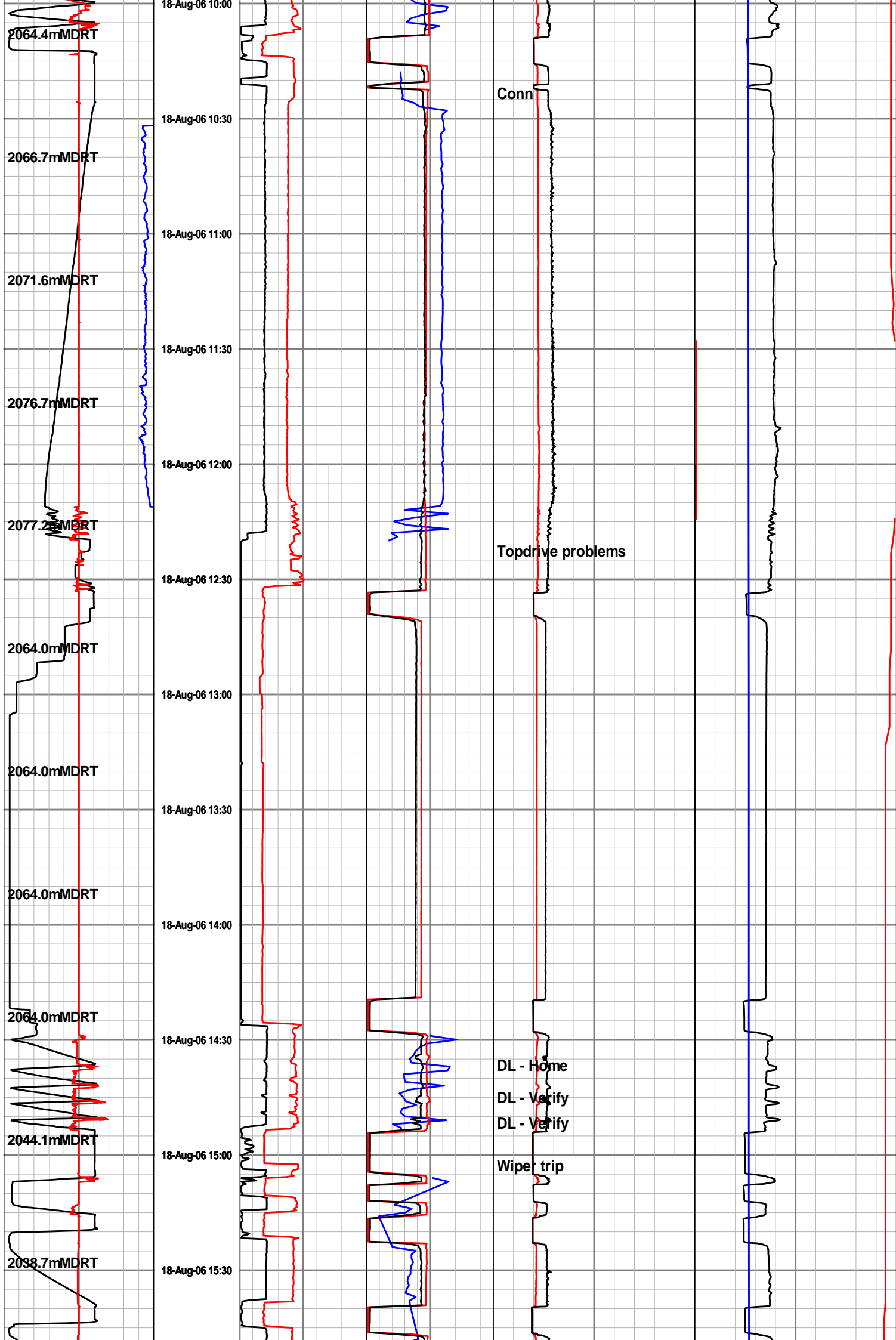


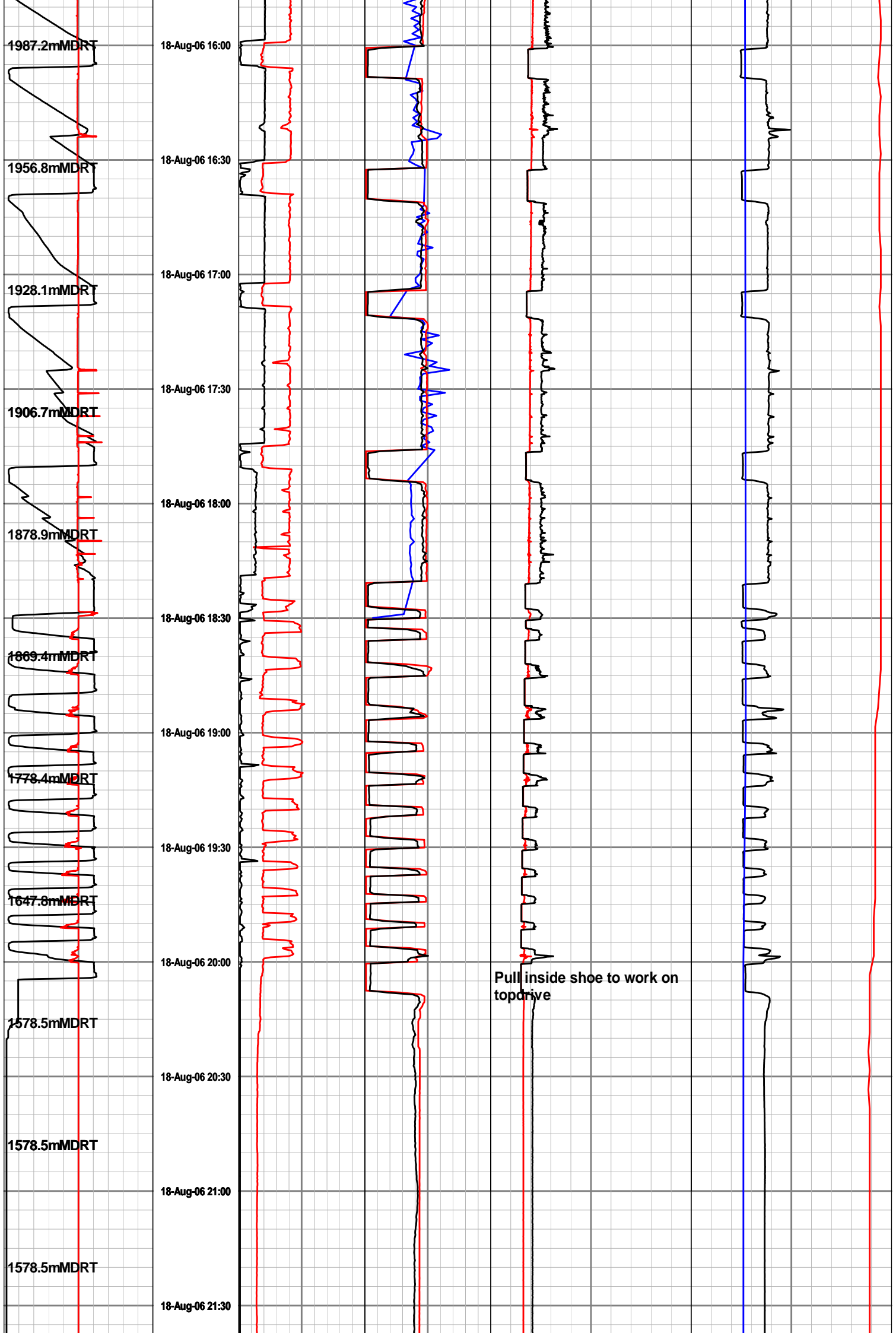


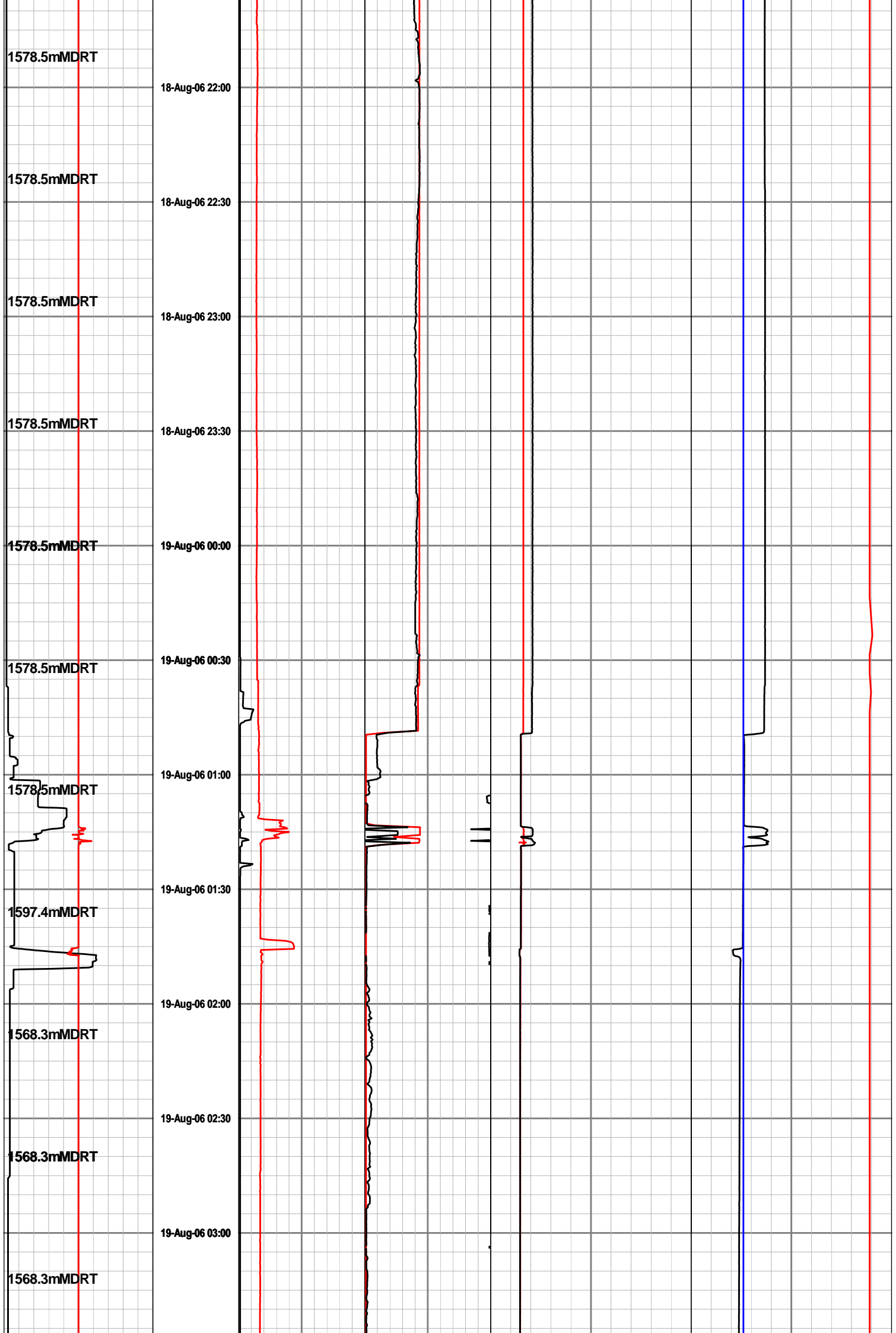


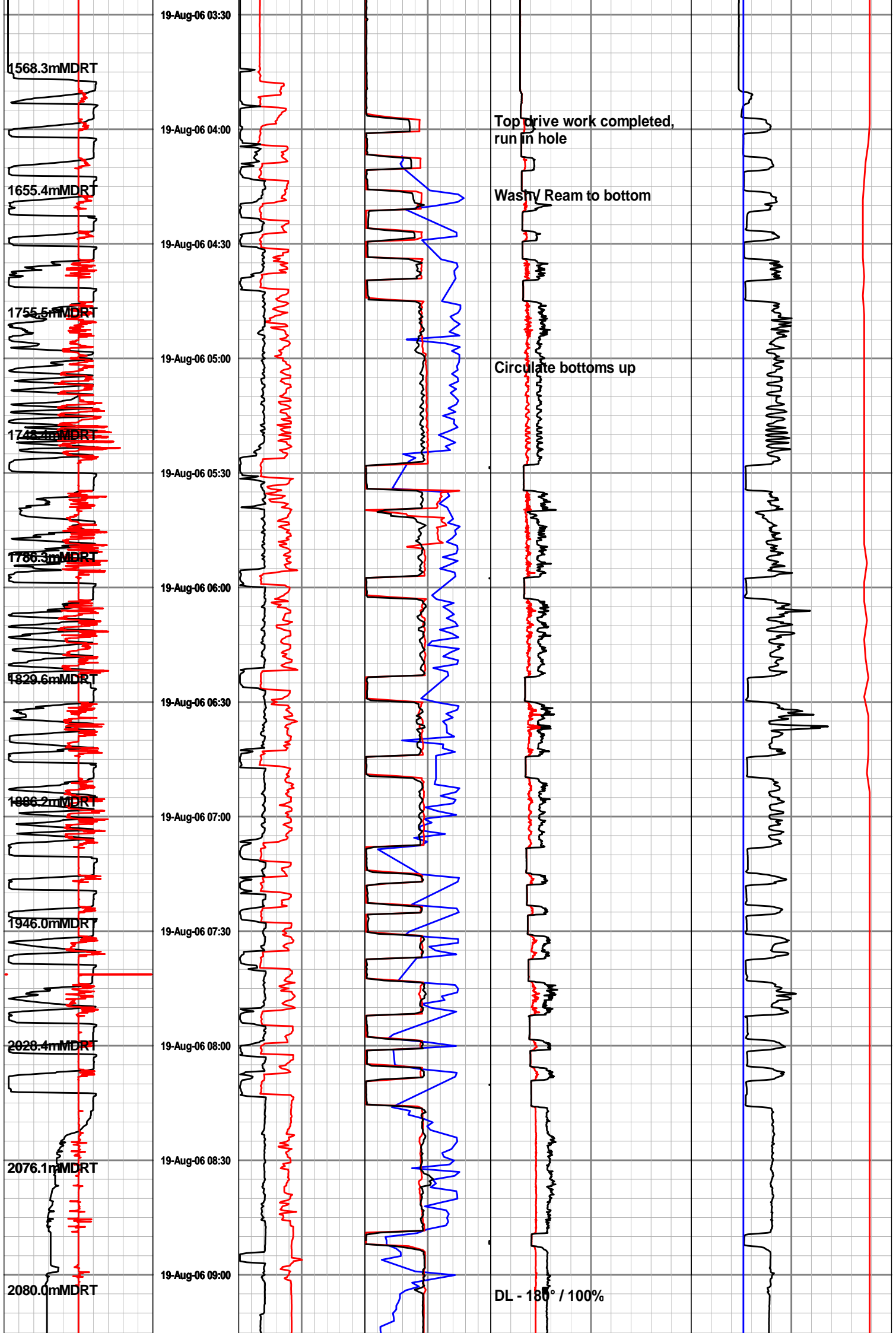


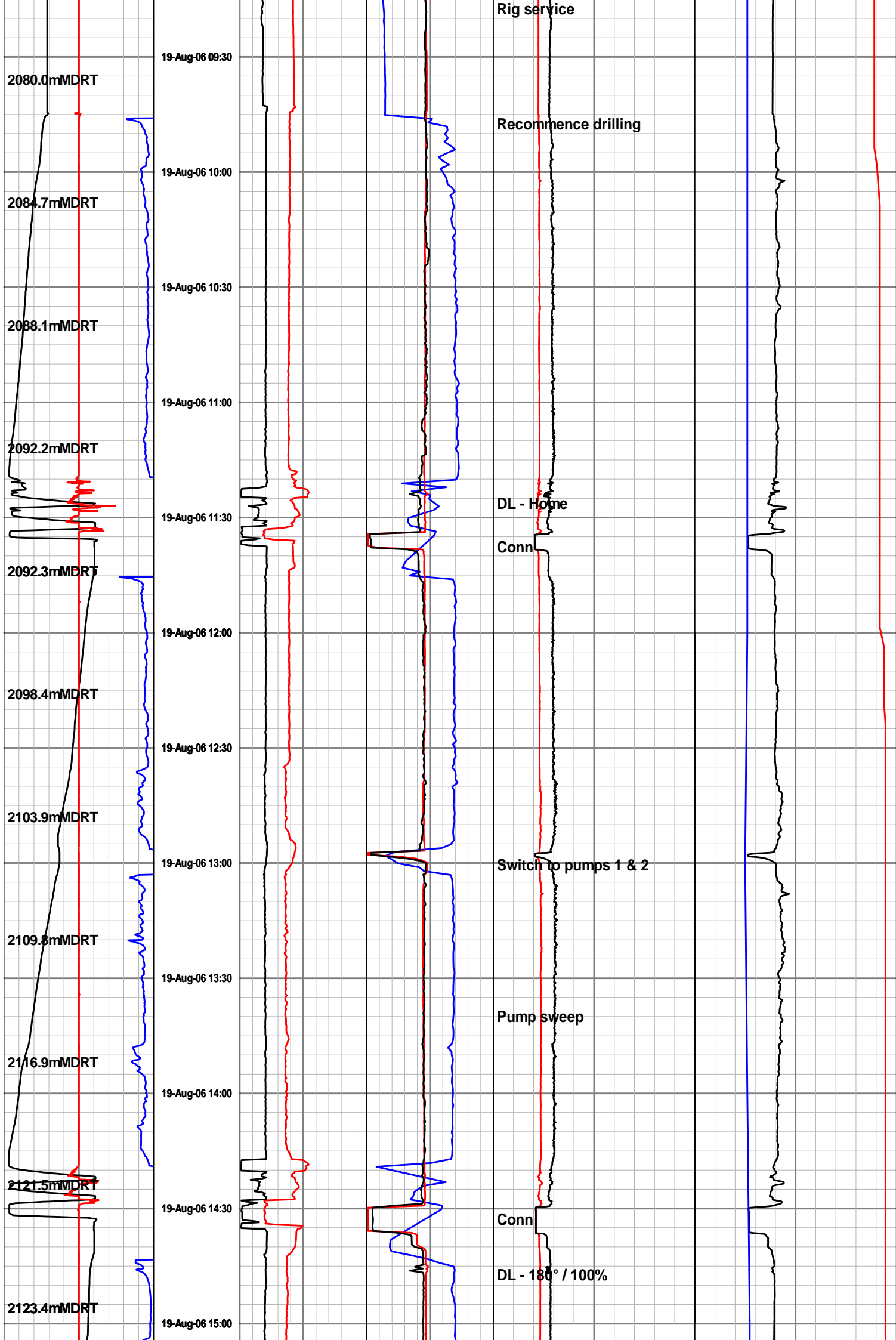


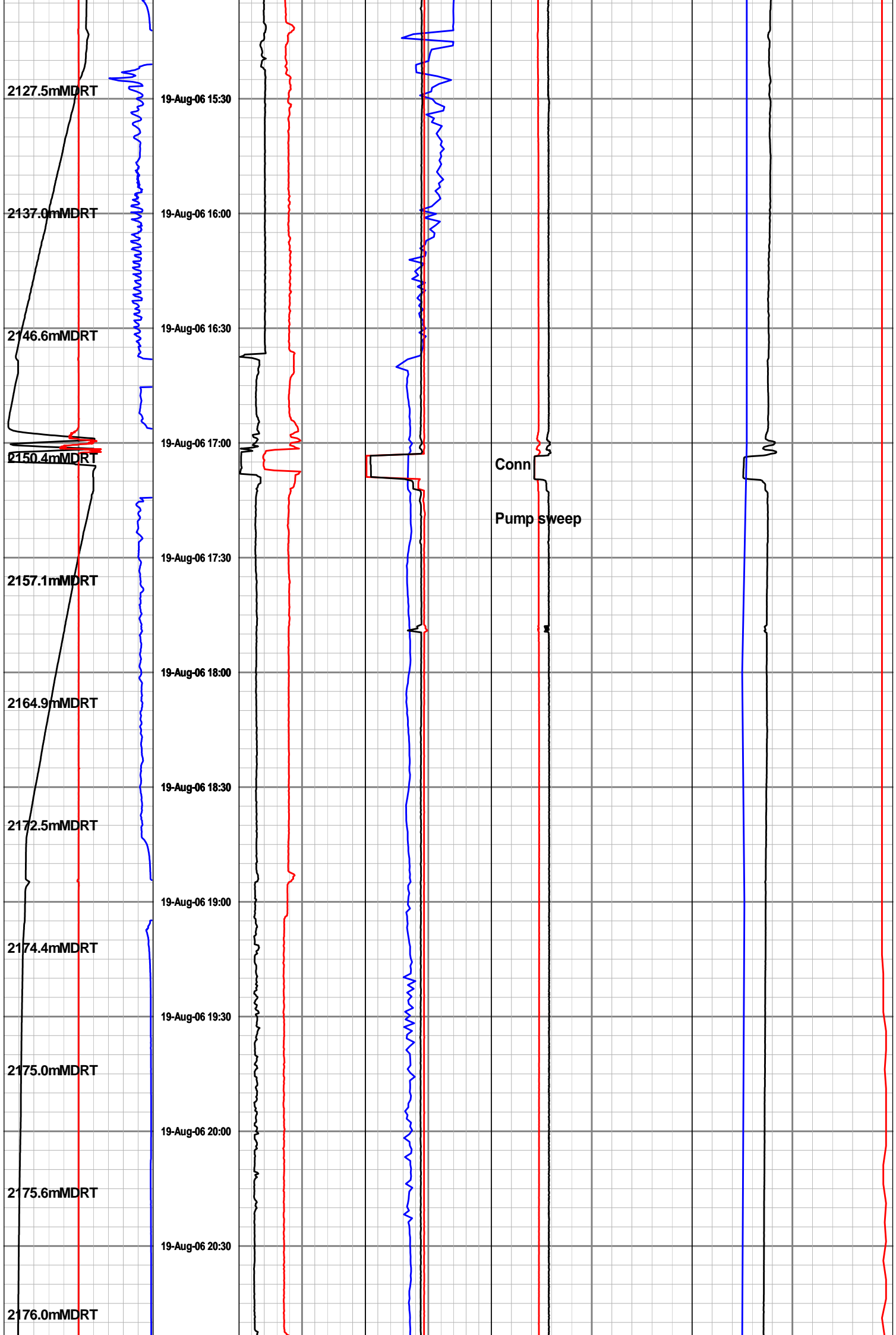


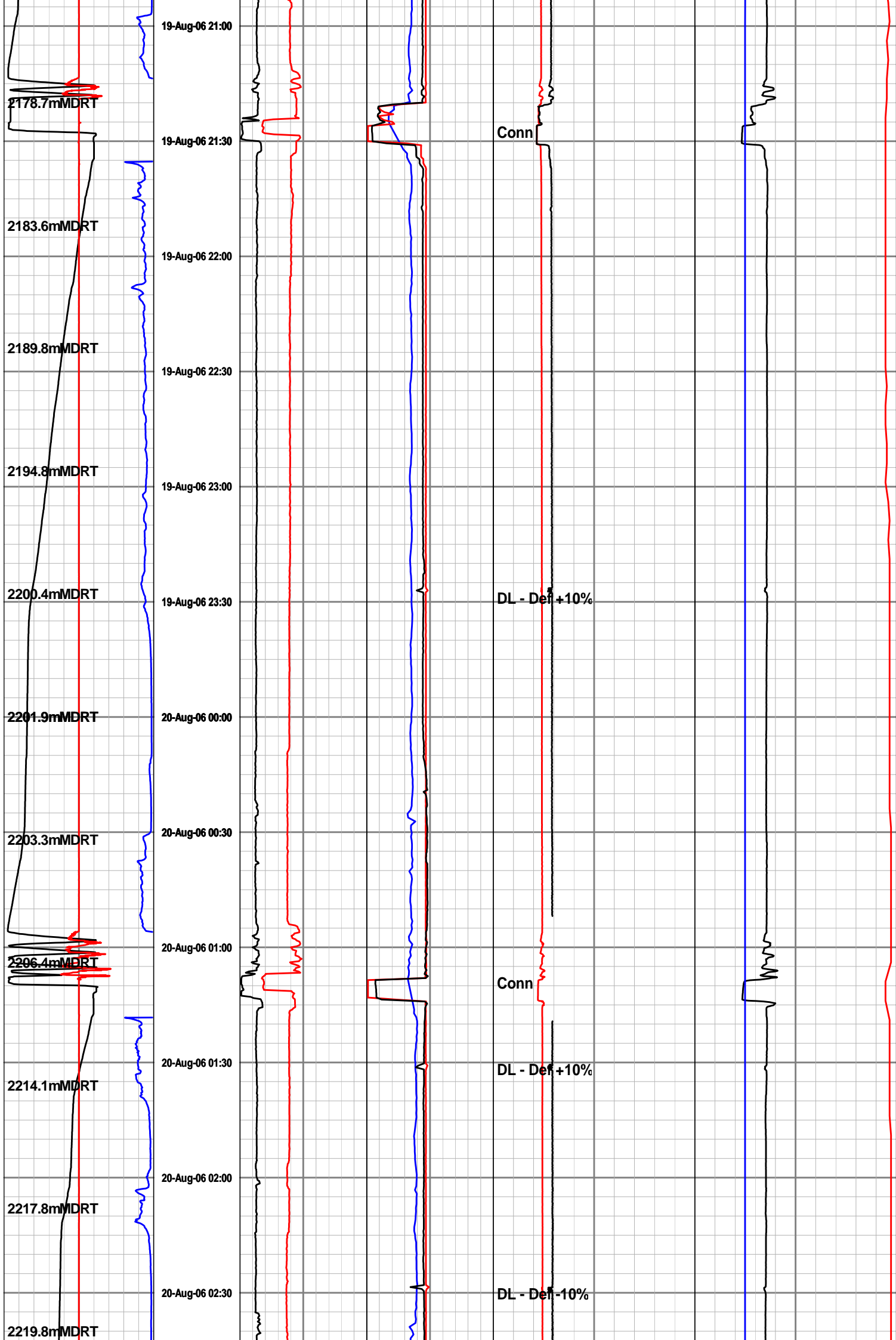


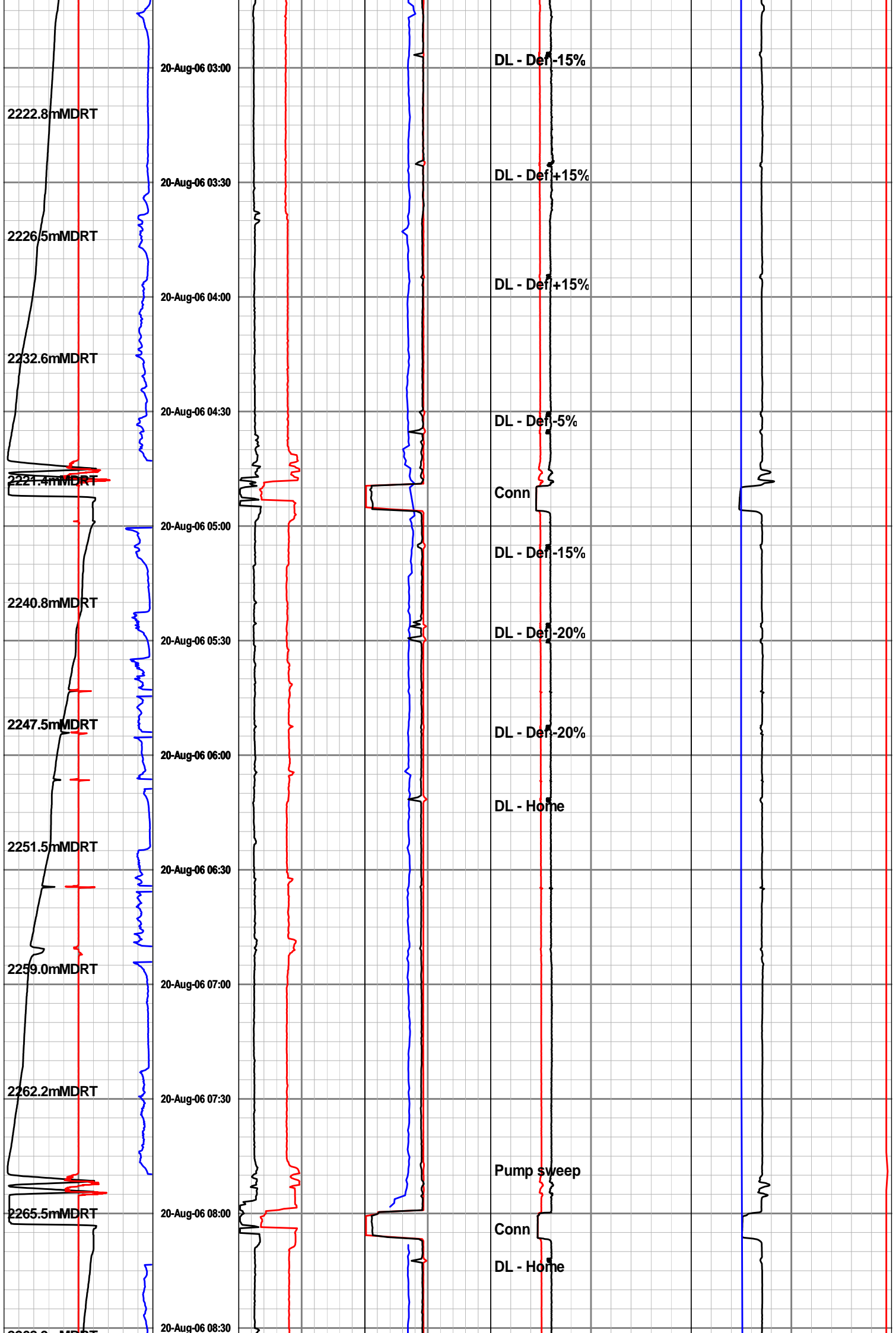


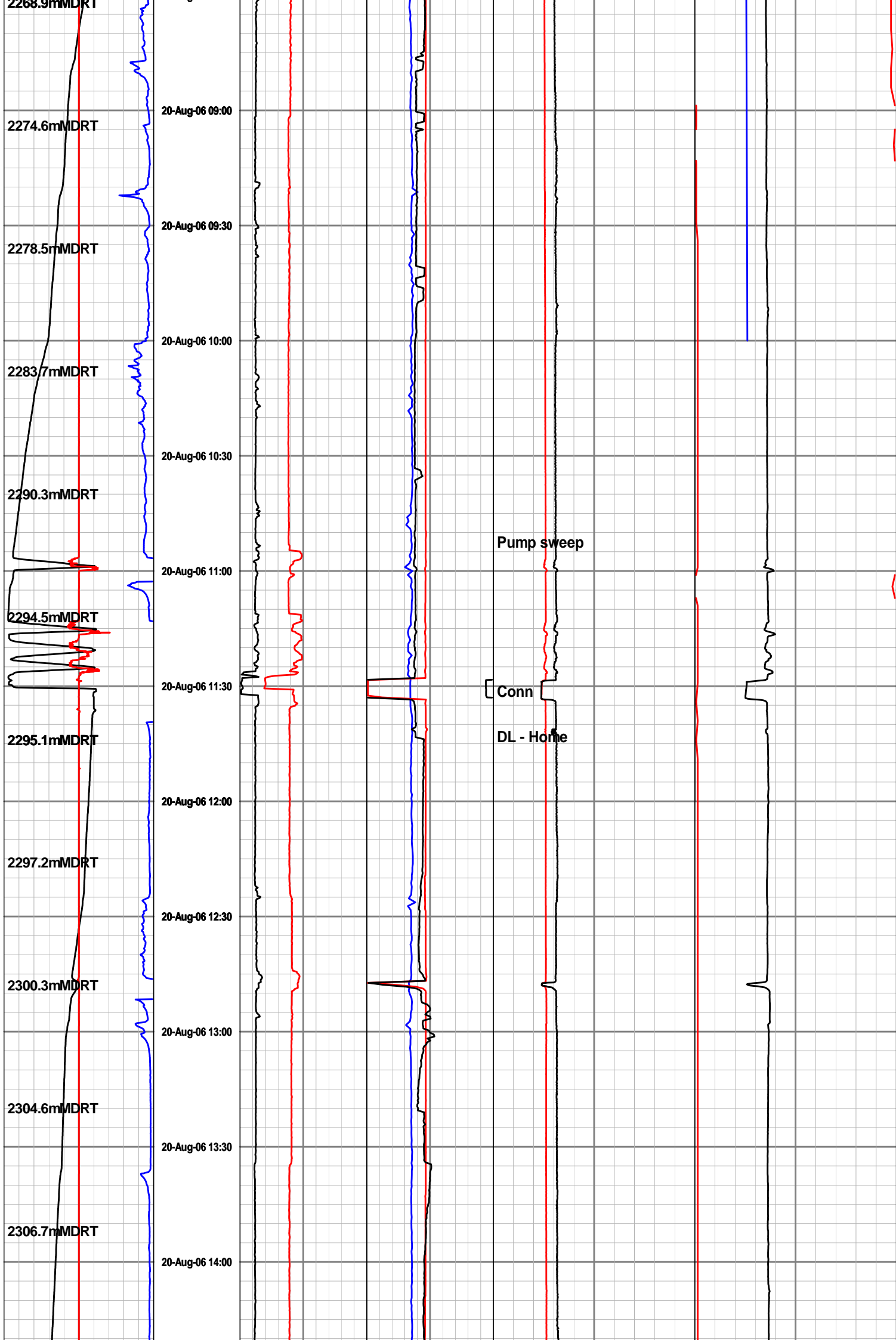


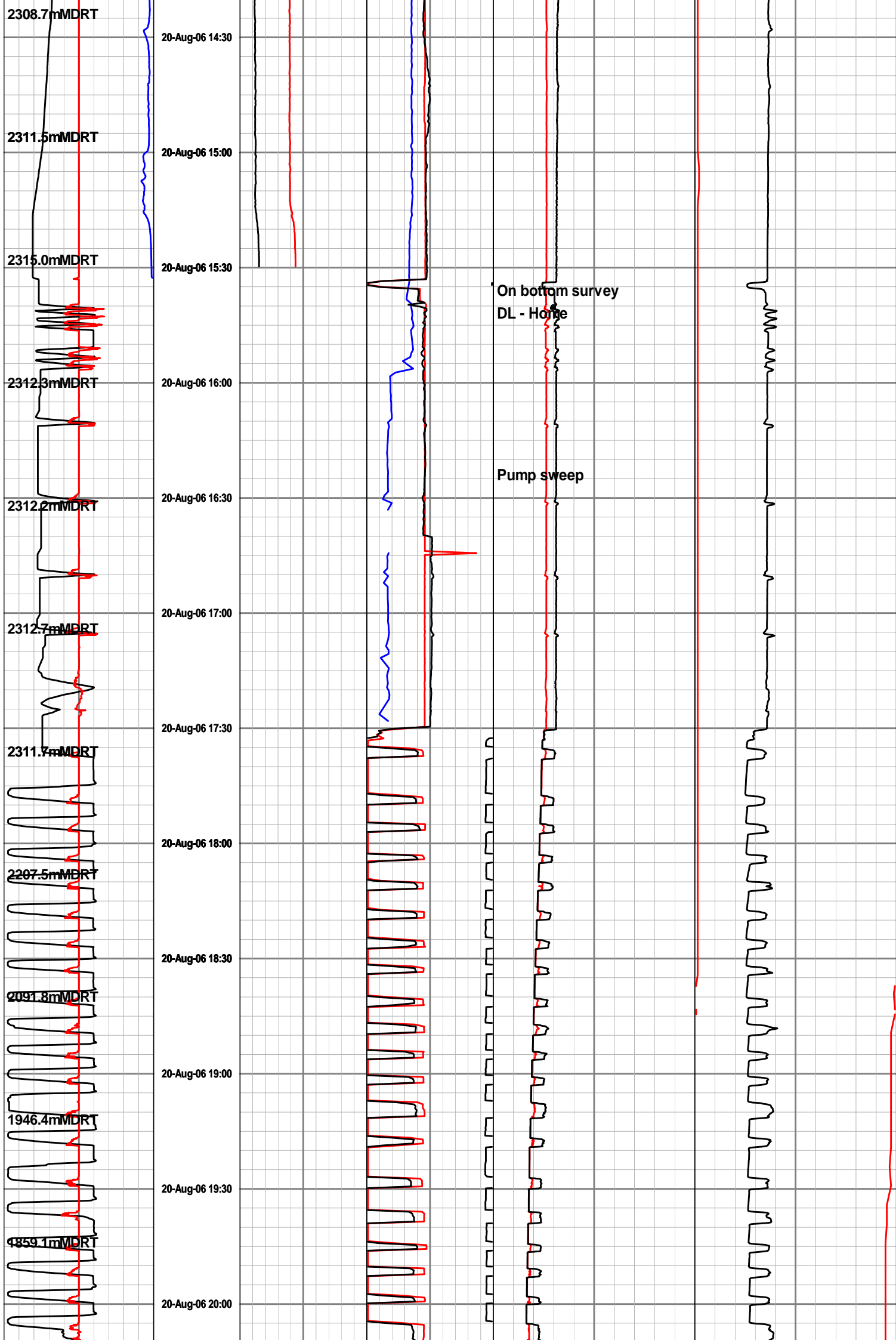


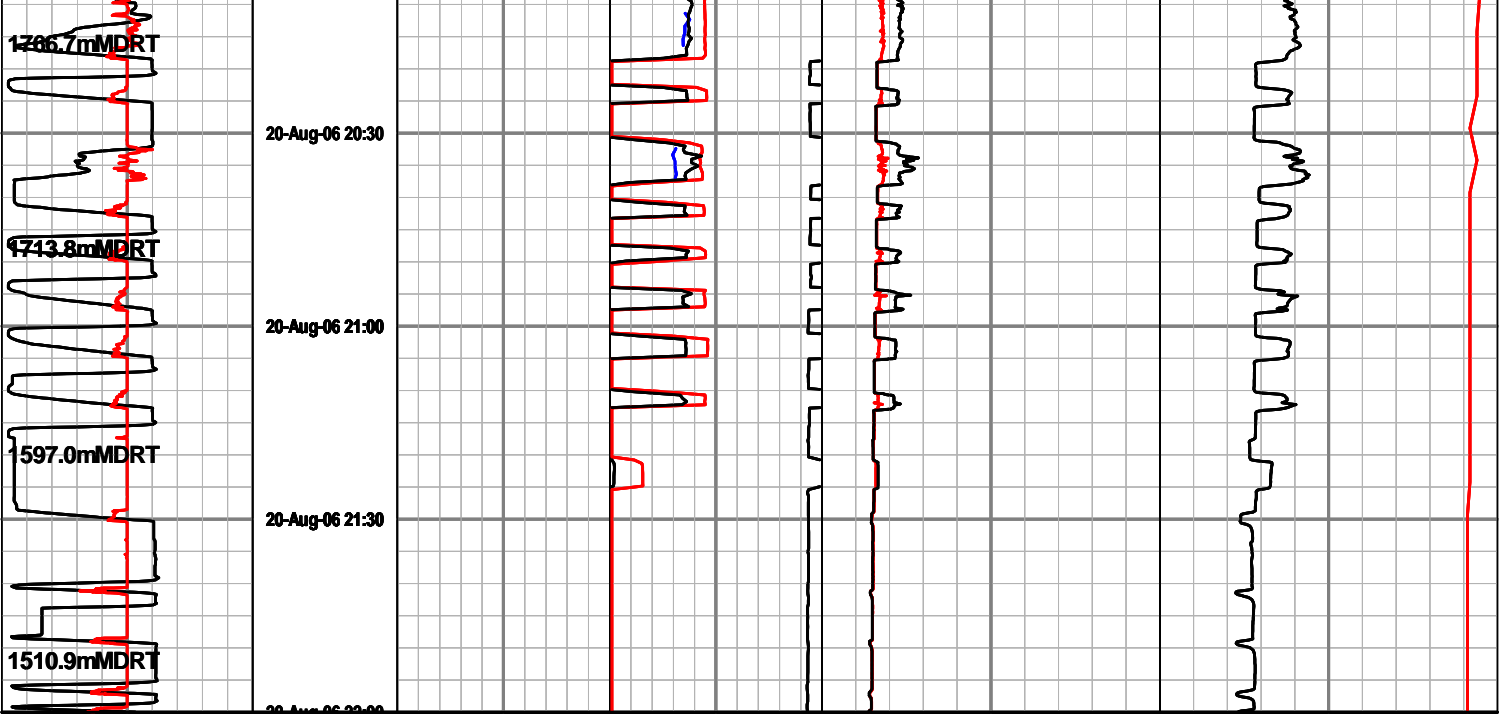












Block Position	Time min	Torque	SPP	Internal Pressure-PWD	Annular EMW-PWD
0 25 50		0 25 50	0 3K 6K	0 5K 10K	1 1.5 2
metres		foot-klb	lbs / in2 gauge	lbs / in2 gauge	Sp Grav
Running Speed		Hookload	Total Flow	Annular Pressure-PWD	Temperature
-150 0 150		0 100 200	0 600 1.2K	0 5K 10K	0 35 70
metre per min		kilo pounds	gallon per min	lbs / in2 gauge	celsius
ROP Avg			GP RPM		Dens Mud In
200 100 0			0 100 200		1 1.5 2
metre per hr			rev per min		Sp Grav