

Company: Esso Australia Pty. Ltd.

Well: COBIA A19A

Field: HALIBUT

Rig: Crane / Prod 4

Country: Australia

RST-C  
Sigma Log  
18-Mar-2010

Crane / Prod 4	
HALIBUT	
Gippsland	
COBIA A19A	
Esso Australia Pty. Ltd.	
LOCATION	
Gippsland	Elev.: K.B. 40.99 m
Basin	G.L. -79.00 m
Bass Strait	D.F. 40.99 m
Permanent Datum:	M.S.L.
Log Measured From:	K.B.
Drilling Measured From:	K.B.
State: Victoria	Max. Well Deviation 48 deg
Longitude 148 18' 28.3"E	Latitude 38 27' 03.5" S

Logging Date	18-Mar-2010
Run Number	1
Depth Driller	3200 m
Schlumberger Depth	3114 m
Bottom Log Interval	3110 m
Top Log Interval	3010 m
Casing Fluid Type	Production Fluid
Salinity	
Density	
Fluid Level	332 m
BIT/CASING/TUBING STRING	
Bit Size	8.500 in
From	597 m
To	3200 m
Casing/Tubing Size	7.000 in
Weight	35.2 lbm/ft
Grade	L-80
From	20.7 m
To	3196 m
Maximum Recorded Temperatures	106 degC
Logger On Bottom	18-Mar-2010
Unit Number	889
Recorded By	C. Rowand / W. Mackenzie
Witnessed By	D. Madden

PVT DATA			
Oil Density	Run 1	Run 2	R
Water Salinity			
Gas Gravity			
Bo			
Bw			
1/Bg			
Bubble Point Pressure			
Bubble Point Temperature			
Solution GOR			
Maximum Deviation	48 deg		
CEMENTING DATA			
Primary/Squeeze			
Casing String No			
Lead Cement Type			
Volume			
Density			
Water Loss			
Additives			
Tail Cement Type			
Volume			
Density			
Water Loss			
Additives			
Expected Cement Top			
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Fluid Type			
Salinity			
Density			
Fluid Level			
BIT/CASING/TUBING STRING			
Bit Size			
From			
To			
Casing/Tubing Size			
Weight			
Grade			
From			
To			
Maximum Recorded Temperatures			
Logger On Bottom			
Unit Number			
Recorded By			
Witnessed By			

Date Created: 18-MAR-2010 20:12:40

## Logging Cable

Type:	2-32ZT
Serial Number:	208558
Length:	5920 M
<hr/>	
Conveyance Method:	Wireline
Rig Type:	Offshore Fixed

Log Sequence:	Subsequent Trip To the Well
Reference Log Name:	ExxonMobil Petrophysical Analysis
Reference Log Run Number:	
Reference Log Date:	
Subsequent Trip Down Log Correction:	-4.50 M

1. Rigged up on main deck using platform crane
2. Tool zero referenced from tubing hanger at 19.11m
3. Depth correlated over interval 3090 – 3105m
4. .
5. .
6. .

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES2  
OS1:  
OS2:  
OS3:  
OS4:  
OS5:

REMARKS: RUN NUMBER 2

1. Log Objective: Complete 2 x static RST-C (Sigma) surveys over the interval 3160 – 3020m
2. Log correlated to Solar Composite Log provided by client
3. Logged background GR/CCL log from 3106.0 – 3010m at 1800ft/hr
4. Logged two shut-in Sigma passes from 3110.0 – 3010m at 900ft/hr
5. HUD was tagged at 3114.0m
6. All depths are MDKB

Logging Parameters:
MATR: Sandstone, CSIZ: 7", CWEI: 26lb/ft, BS: 8.5", BSAL: UNKNOWN
CWEI zoned from 3091 – 3010 from 26lb/ft to 35.2lb/ft
Encountered drilling fluid at HUD (3114.0m). HUD was sticky resulting in varying tags
Estimated TOC at 3153 according to client, but did not RIH further at client request

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:			PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		

SURFACE EQUIPMENT		
WITM-A PSC_16MHZ		

DOWNHOLE EQUIPMENT			
MH-32			13.34
MH-32			
AH-SWBS			13.02
AH-SWBS 785			
AH-SWBS			12.33
AH-SWBS 786			
AH-SWBS			11.63
AH-SWBS 787			
AH-SWBS			10.93
AH-SWBS 788			
AH-SWBS			10.23
AH-SWBS 789			
	Detail MT		
	TelStatus		
	CTEM	9.54	
PSPT			9.54
PSC-A 2760			
PSPT-B			
PSTC-A 2760			
PBMS-B 1750			
CQG_F_Mano 1750			
RTD_Thermometer 1750			
GR 1750			
CCL 1750			
PBMS			
	Well_Temp	7.48	
	CQG Manom	7.37	
	CCL	7.25	
	PBMS PSTC	7.02	
RST-C			7.02
RSCH-A 471			
RSC-C 488			
RSS-A 437			
RSXH-A 500			
RSC-C 412			

RSC-A Far  
RSC-A PNG  
RSC-A Nea  
RSX-A PNG

4.24

4.09

Tension HV 0.00  
TOOL ZERO

MAXIMUM STRING DIAMETER 1.72 IN  
MEASUREMENTS RELATIVE TO TOOL ZERO  
ALL LENGTHS IN METERS

Client: Esso Australia Pty. Ltd.

Drawing Date: 3/19/2010

Well: COBIA A19A

Field: HALIBUT

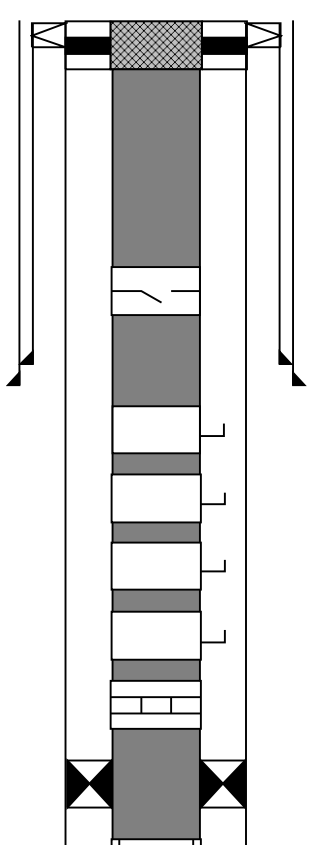
Rig Name: COBIA

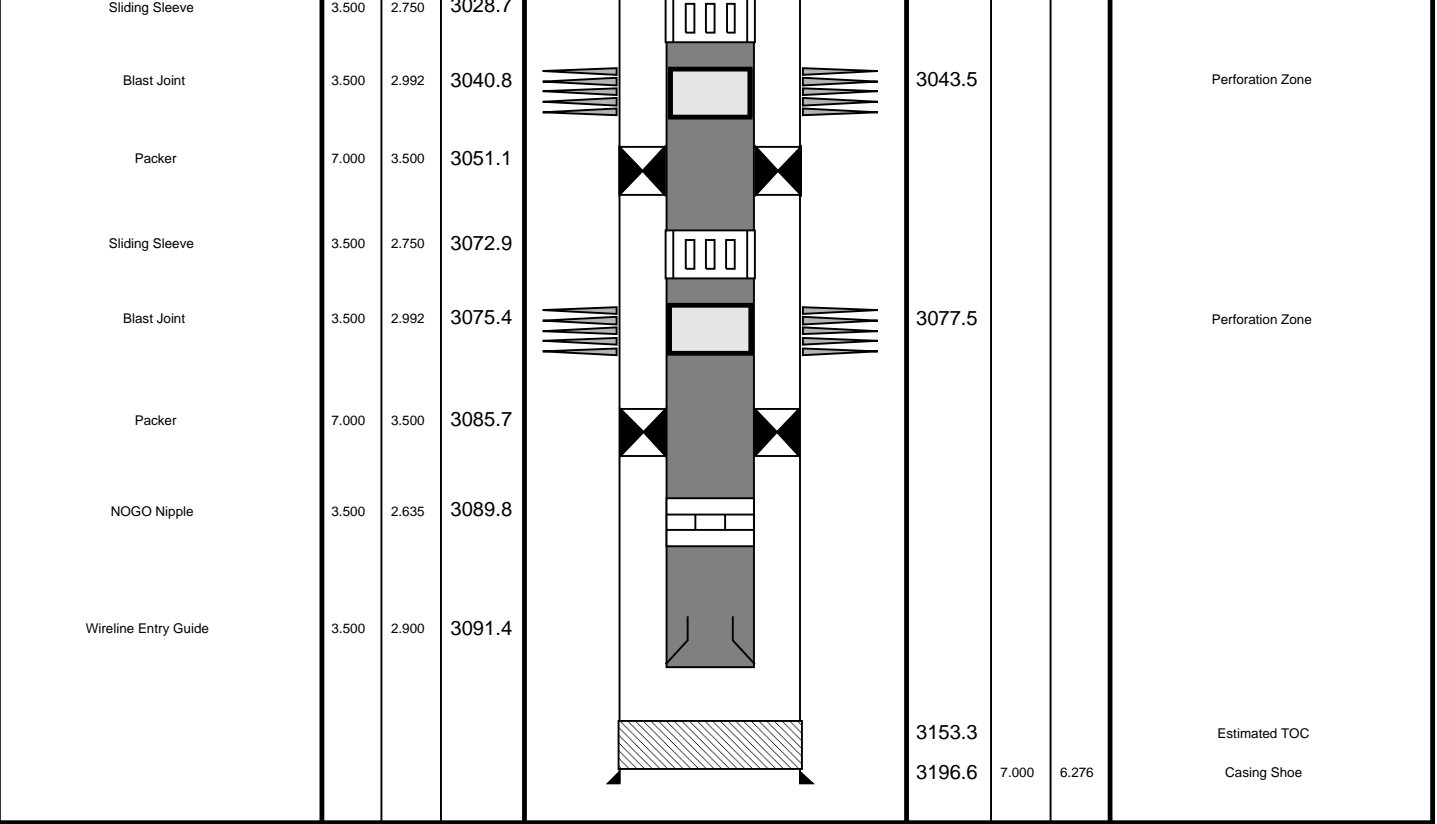
State: Victoria

Reference Datum: Mean Sea Level

Country: Australia

Elevation: 0.0 m

Production String	(in)		(m)	Well Schematic	(m)			Casing String
	OD	ID	MD		MD	OD	ID	
Tubing Hanger	7.000	3.500	19.1		20.7	9.625	8.681	Surface Casing Surface Casing Production Casing
Tubing	3.500	2.992	19.6		20.6	10.750	10.050	
					20.7	7.000	6.276	
SSSV	3.500	2.750	450.3		596.0	9.625	8.681	Casing Shoe Casing Shoe
					607.6	10.750	10.050	
Side Pocket Mandrel	3.500	2.867	832.7					
Side Pocket Mandrel	3.500	2.867	1195.7					
Side Pocket Mandrel	3.500	2.867	1470.9					
Side Pocket Mandrel	3.500	2.867	1699.0					
Landing Nipple	3.500	2.750	1713.8					
Packer	7.000	3.500	3013.1					



All Depths are Drillers Depths  
Not to Scale



Merged Sigma Passes  
Shut In

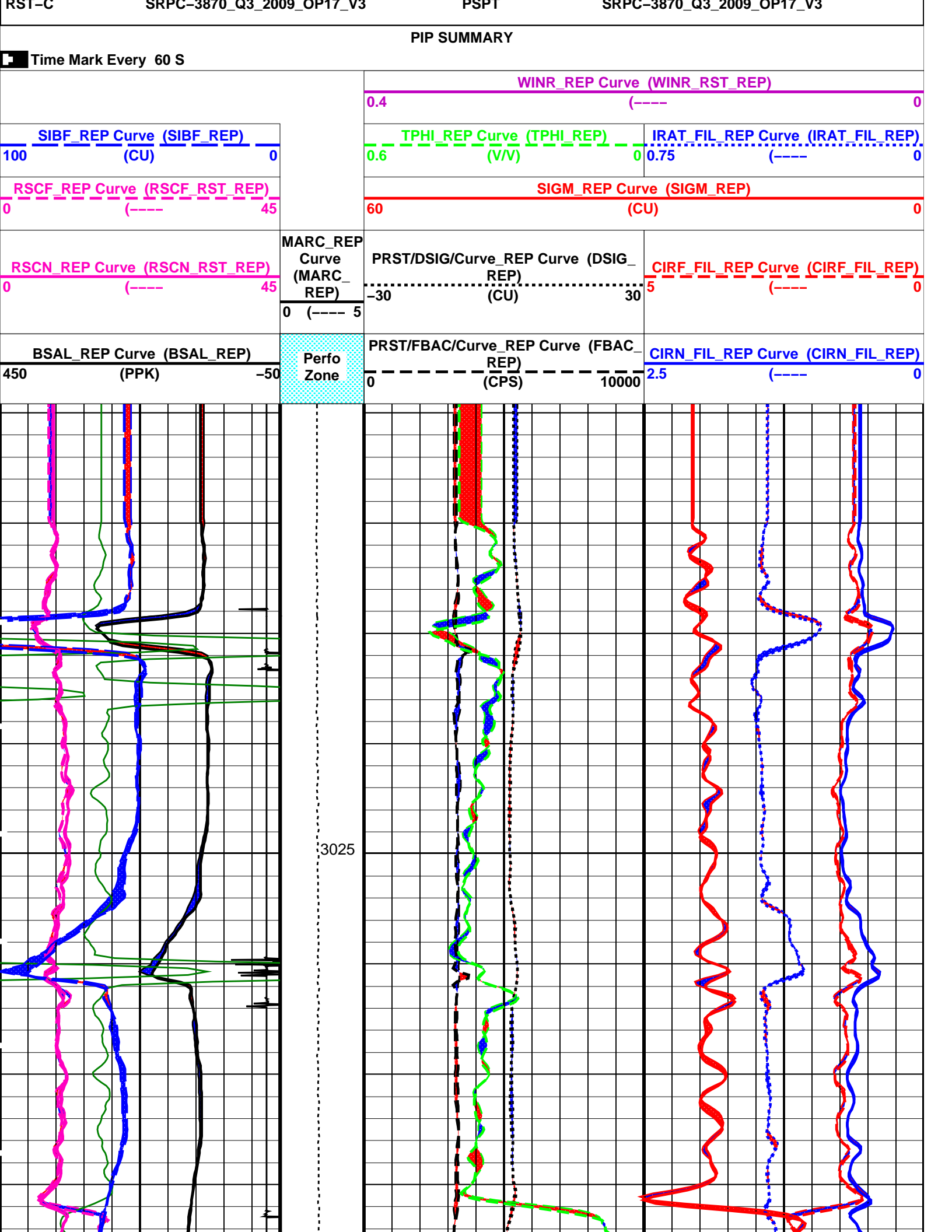
MAXIS Field Log

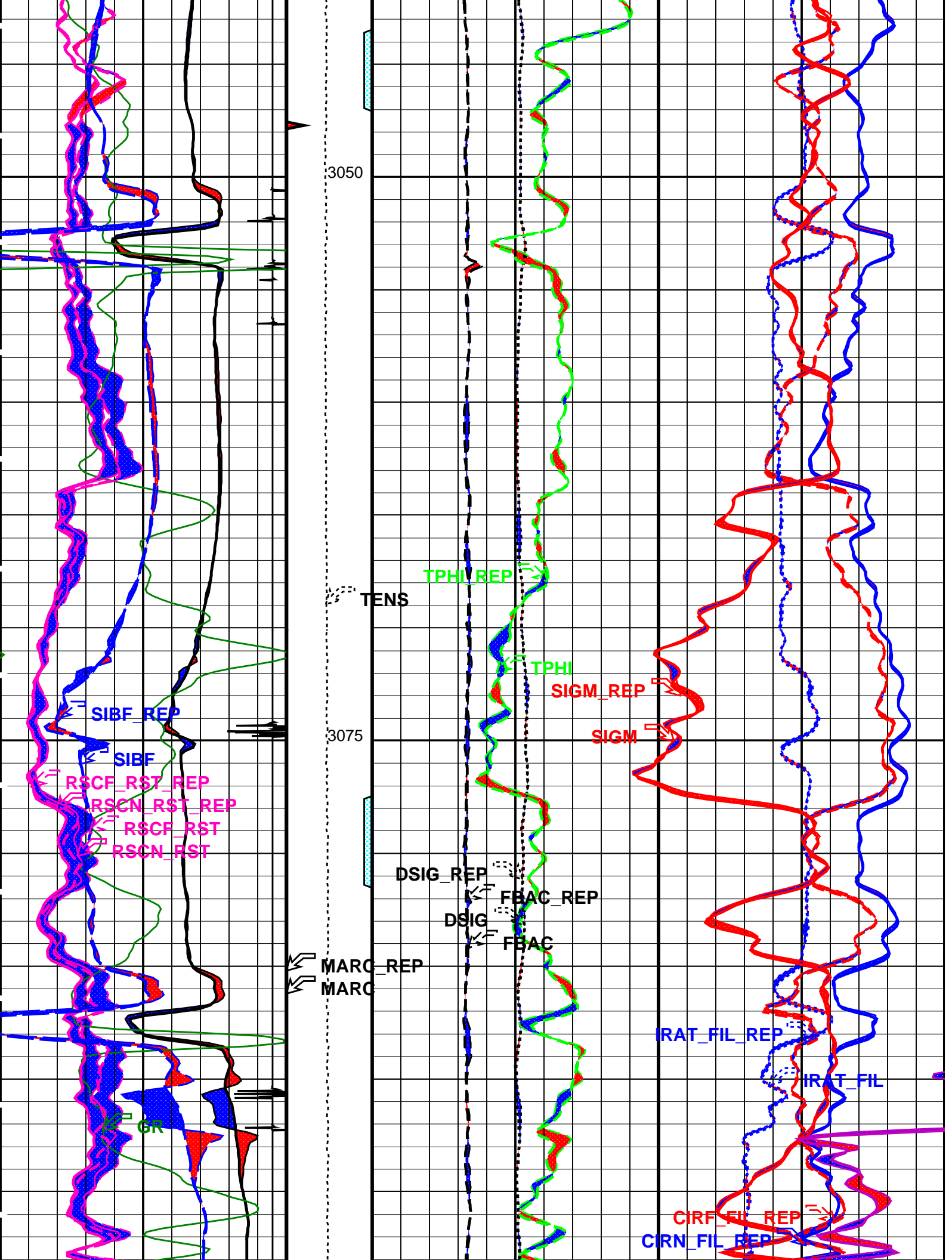
Company: Esso Australia Pty. Ltd.

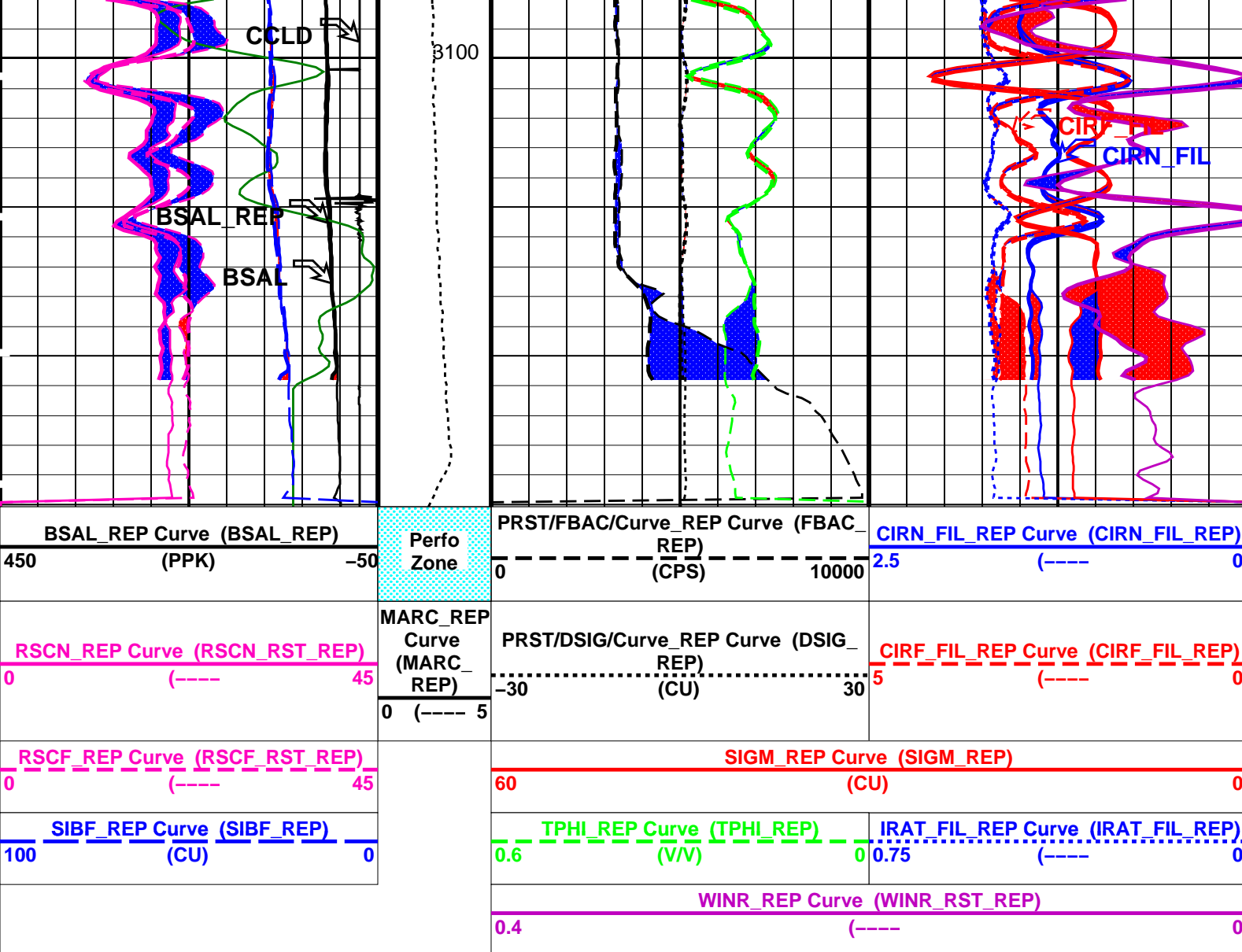
Well: COBIA A19A

Input DLIS Files						
DEFAULT	RST_PSP_010LUP	FN:13	PRODUCER	18-Mar-2010 16:22	3118.7 M	2993.9 M
DEFAULT	RST_PSP_009PUP	FN:30	PRODUCER	18-Mar-2010 19:43	3115.1 M	3004.4 M
Output DLIS Files						
DEFAULT	RST_PSP_010PUP	FN:33	PRODUCER	18-Mar-2010 19:53	3118.9 M	3004.4 M
CUSTOMER	RST_PSP_010PUC	FN:34	CUSTOMER	18-Mar-2010 19:53	3118.9 M	3004.4 M
CUST_FILT	RST_PSP_010PUC	FN:35	CUSTOMER	18-Mar-2010 19:53	3118.9 M	3004.4 M

OP System Version: 17C0-154







Time Mark Every 60 S

Format: RST\_SIG\_ANSW\_REP

Vertical Scale: 1:200

Graphics File Created: 18-Mar-2010 19:53

## OP System Version: 17C0-154

RST-C

SRPC-3870\_Q3\_2009\_OP17\_V3

PSPT

SRPC-3870\_Q3\_2009\_OP17\_V3

### Input DLIS Files

DEFAULT	RST_PSP_010LUP	FN:13	PRODUCER	18-Mar-2010 16:22	3118.7 M	2993.9 M
DEFAULT	RST_PSP_009PUP	FN:30	PRODUCER	18-Mar-2010 19:43	3115.1 M	3004.4 M

### Output DLIS Files

DEFAULT	RST_PSP_010PUP	FN:33	PRODUCER	18-Mar-2010 19:53
CUSTOMER	RST_PSP_010PUC	FN:34	CUSTOMER	18-Mar-2010 19:53
CUST_FILT	RST_PSP_010PUC	FN:35	CUSTOMER	18-Mar-2010 19:53



Company: Esso Australia Pty. Ltd.

Well: COBIA A19A

Input DLIS Files

DEFAULT

RST\_PSP\_010LUP

FN:13

PRODUCER

18-Mar-2010 16:22

3118.7 M

2993.9 M

Output DLIS Files

DEFAULT

RST\_PSP\_010PUP

FN:33

PRODUCER

18-Mar-2010 19:53

3118.9 M

3004.4 M

CUSTOMER

RST\_PSP\_010PUC

FN:34

CUSTOMER

18-Mar-2010 19:53

3118.9 M

3004.4 M

CUST\_FILT

RST\_PSP\_010PUC

FN:35

CUSTOMER

18-Mar-2010 19:53

3118.9 M

3004.4 M

OP System Version: 17C0-154

RST-C

SRPC-3870\_Q3\_2009\_OP17\_V3

PSPT

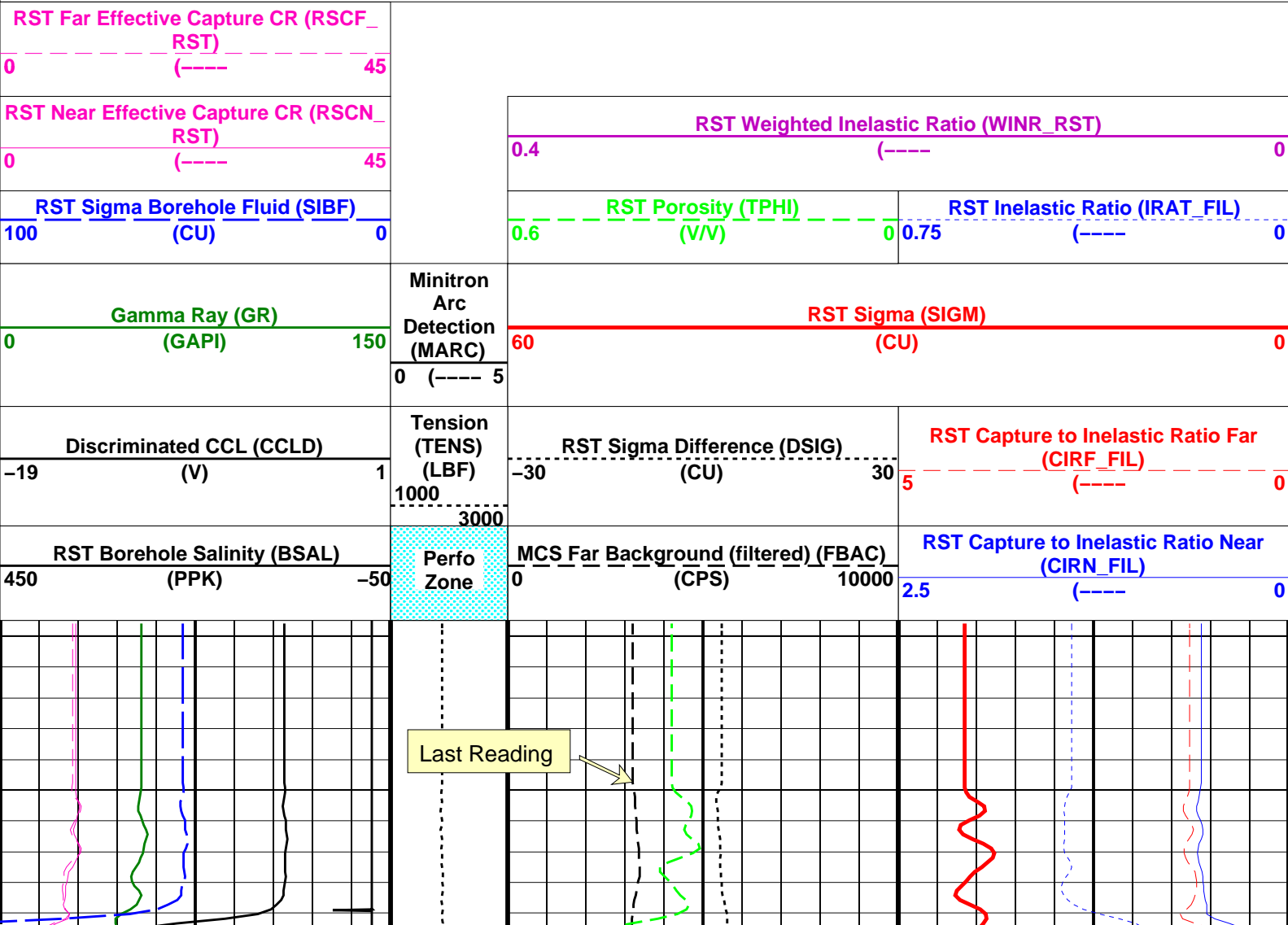
SRPC-3870\_Q3\_2009\_OP17\_V3

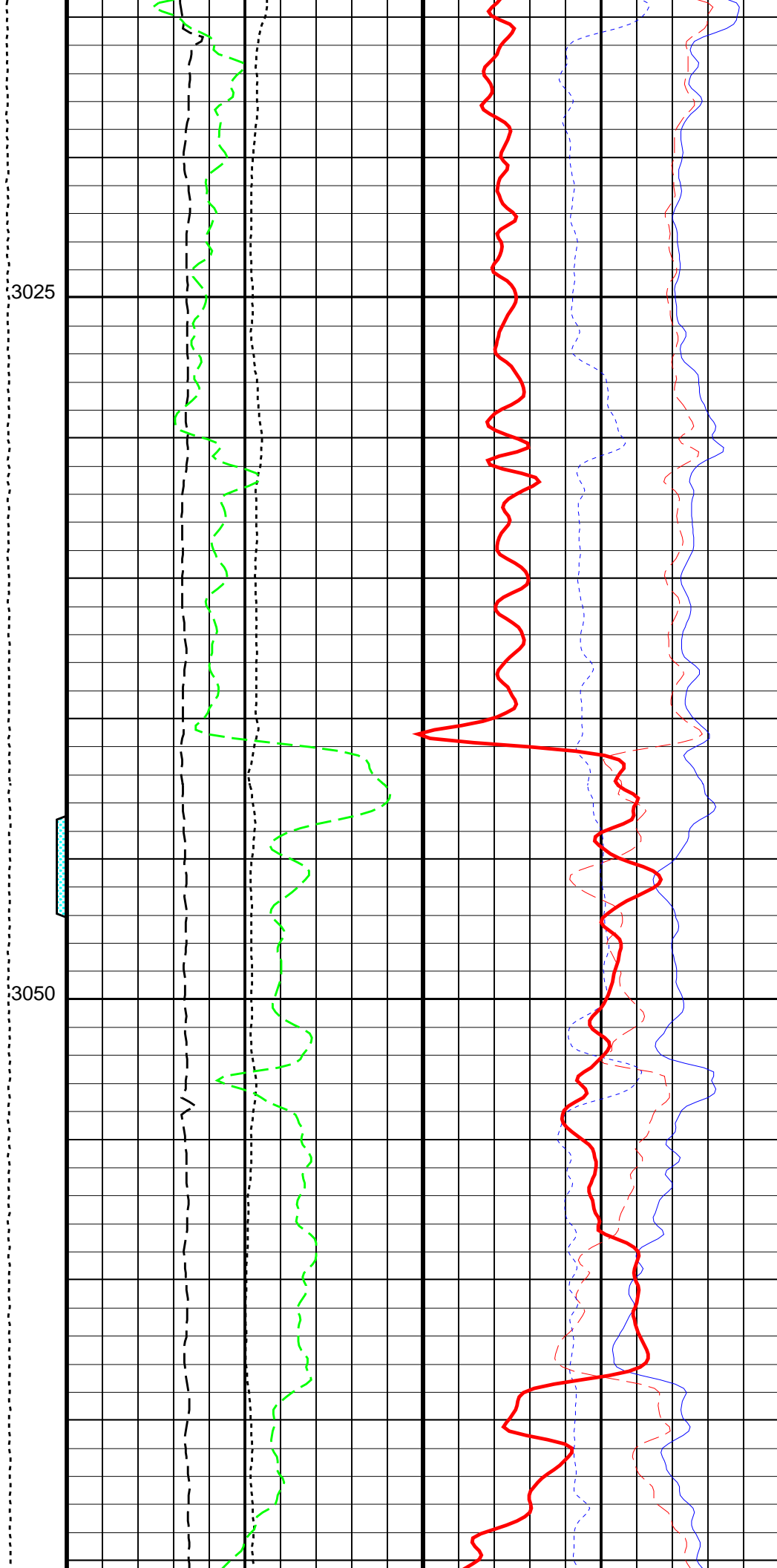
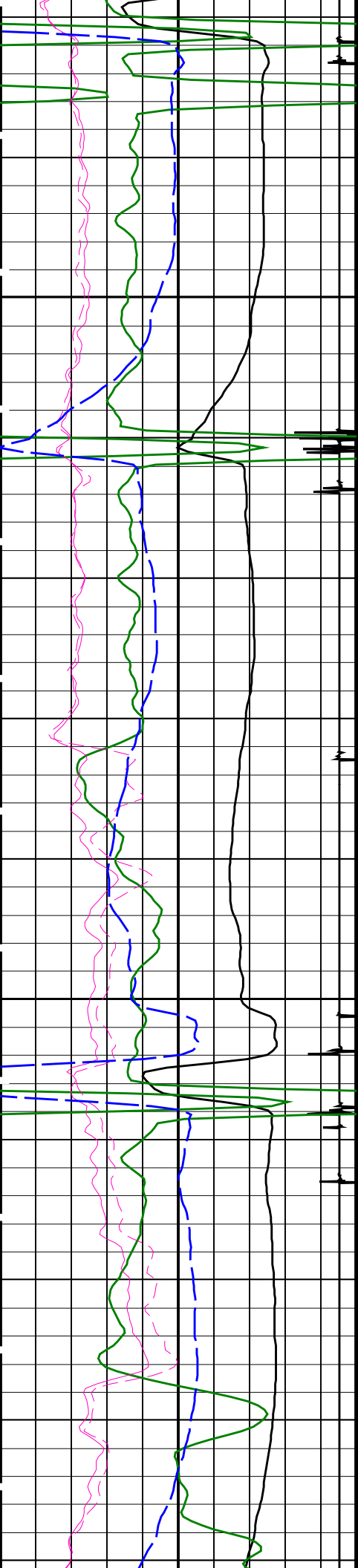
Changed Parameter Summary

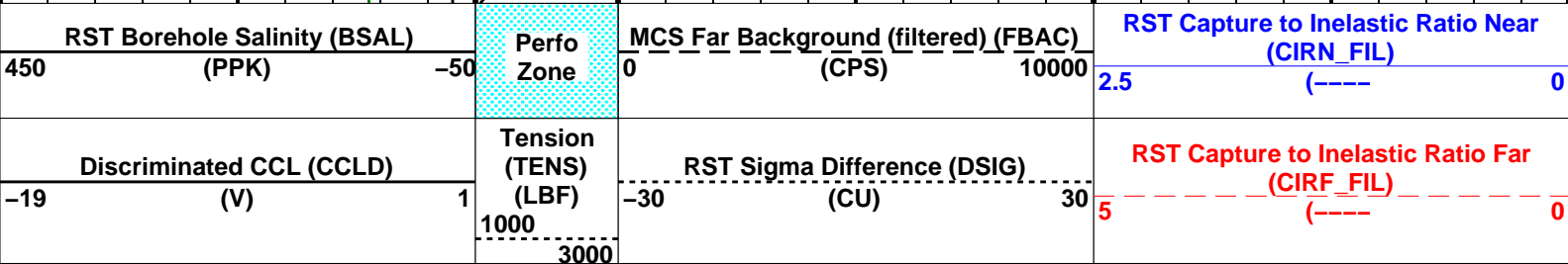
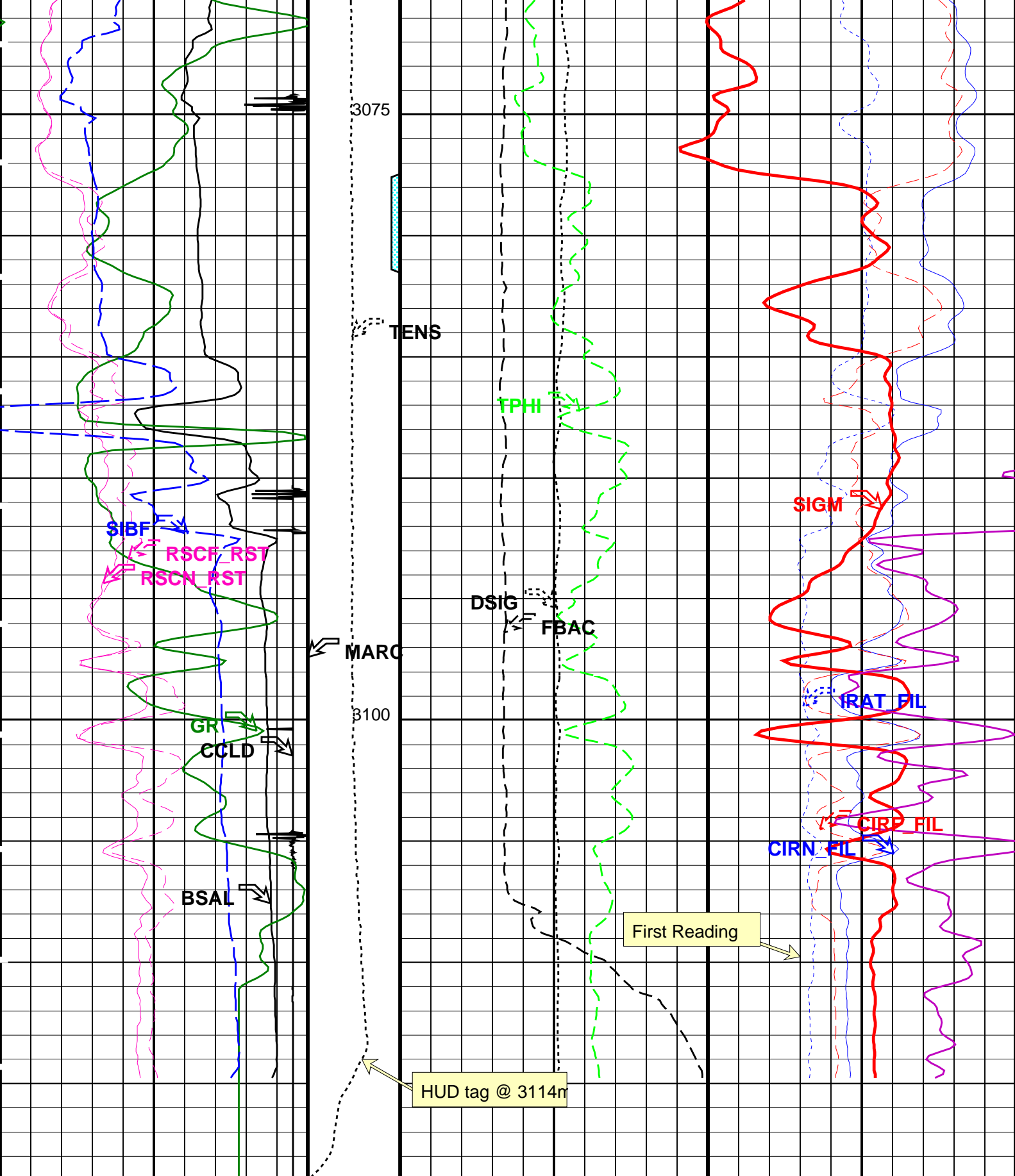
DLIS Name	New Value	Previous Value	Depth & Time
CWEI	26.00 LB/F 35.20 LB/F	35.20 LB/F 26.00 LB/F	3118.9 19:53:52 3091.0 19:54:01

PIP SUMMARY

☒ Time Mark Every 60 S







<b>Gamma Ray (GR)</b> 0 (GAPI) 150	Minitron Arc Detection (MARC) 0 (---- 5	<b>RST Sigma (SIGM)</b> 60 (CU) 0	
		<b>RST Porosity (TPHI)</b> 0.6 (V/V) 0	<b>RST Inelastic Ratio (IRAT_FIL)</b> 0.75 (----) 0
<b>RST Sigma Borehole Fluid (SIBF)</b> 100 (CU) 0		<b>RST Weighted Inelastic Ratio (WINR_RST)</b> 0.4 (----) 0	
<b>RST Near Effective Capture CR (RSCN_RST)</b> 0 (----) 45			
<b>RST Far Effective Capture CR (RSCF_RST)</b> 0 (----) 45			

PIP SUMMARY			
Time Mark Every 60 S			

Parameters			
DLIS Name	Description	Value	
RST-C: Reservoir Saturation Pro Tool C			
AIRB	RST Air Borehole	No	
BHS	Borehole Status	CASED	
BSALOPT	RST Borehole Salinity Option	Unknown	
BSFL	RST Borehole Salinity Filter Length	51	
DFPC	RST Depth Filter Processing Constant	One	
DFPC_TDTL	RST Depth Filter Processing Constant (TDT-like)	Two	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NORM_IRAT_RST	RST Normalized Inelastic Ratio	0.48	
NORM_SIGM_RST	RST Normalized Sigma	30	CU
RGAI	Near/Far Gain Calibration Ratio	1	
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma	
PSPT: Production Services Logging Platform			
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
System and Miscellaneous			
BS	Bit Size	8.500	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	0.1	M
DORL	Depth Offset for Repeat Analysis	0.0	M
PP	Playback Processing	NORMAL	

Format: RST_SIG_ANSW	Vertical Scale: 1:200	Graphics File Created: 18-Mar-2010 19:53
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OP System Version: 17C0-154			
RST-C	SRPC-3870_Q3_2009_OP17_V3	PSPT	SRPC-3870_Q3_2009_OP17_V3

Input DLIS Files						
DEFAULT	RST_PSP_010LUP	FN:13	PRODUCER	18-Mar-2010 16:22	3118.7 M	2993.9 M
Output DLIS Files						
DEFAULT	RST_PSP_010PUP	FN:33	PRODUCER	18-Mar-2010 19:53		
CUSTOMER	RST_PSP_010PUC	FN:34	CUSTOMER	18-Mar-2010 19:53		
CUST_FILT	RST_PSP_010PUC	FN:35	CUSTOMER	18-Mar-2010 19:53		



RST Sigma Pass # 1

Shut In

Company: Esso Australia Pty. Ltd.

Well: COBIA A19A

## Input DLIS Files

DEFAULT	RST_PSP_009LUP	FN:11	PRODUCER	18-Mar-2010 15:52	3114.9 M	2999.1 M
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## Output DLIS Files

DEFAULT	RST_PSP_009PUP	FN:30	PRODUCER	18-Mar-2010 19:43	3115.1 M	3004.4 M
CUSTOMER	RST_PSP_009PUC	FN:31	CUSTOMER	18-Mar-2010 19:43	3115.1 M	3004.4 M
CUST_FILT	RST_PSP_009PUC	FN:32	CUSTOMER	18-Mar-2010 19:43	3115.1 M	3004.4 M

## OP System Version: 17C0-154

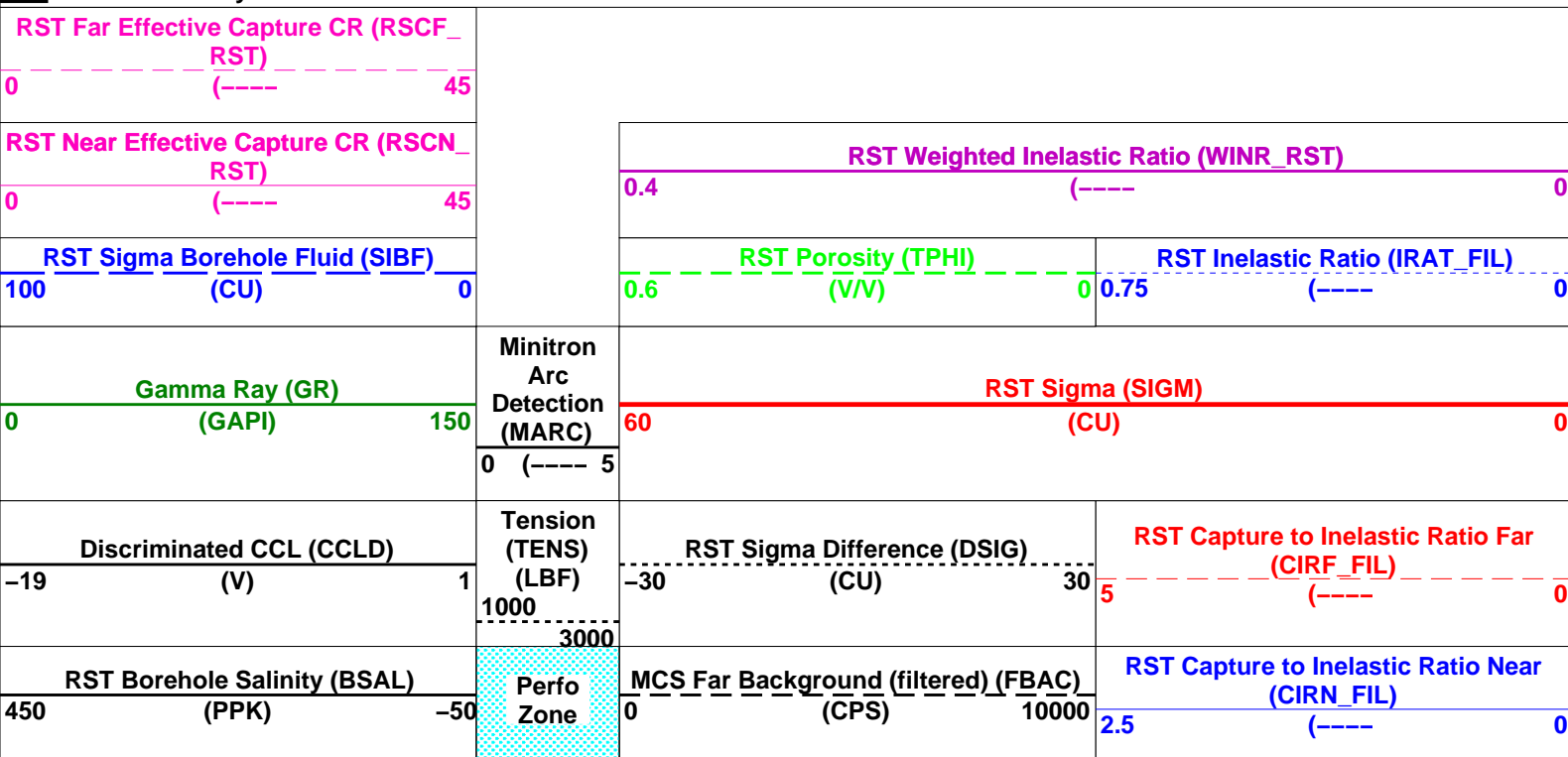
RST-C	SRPC-3870_Q3_2009_OP17_V3	PSPT	SRPC-3870_Q3_2009_OP17_V3
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## Changed Parameter Summary

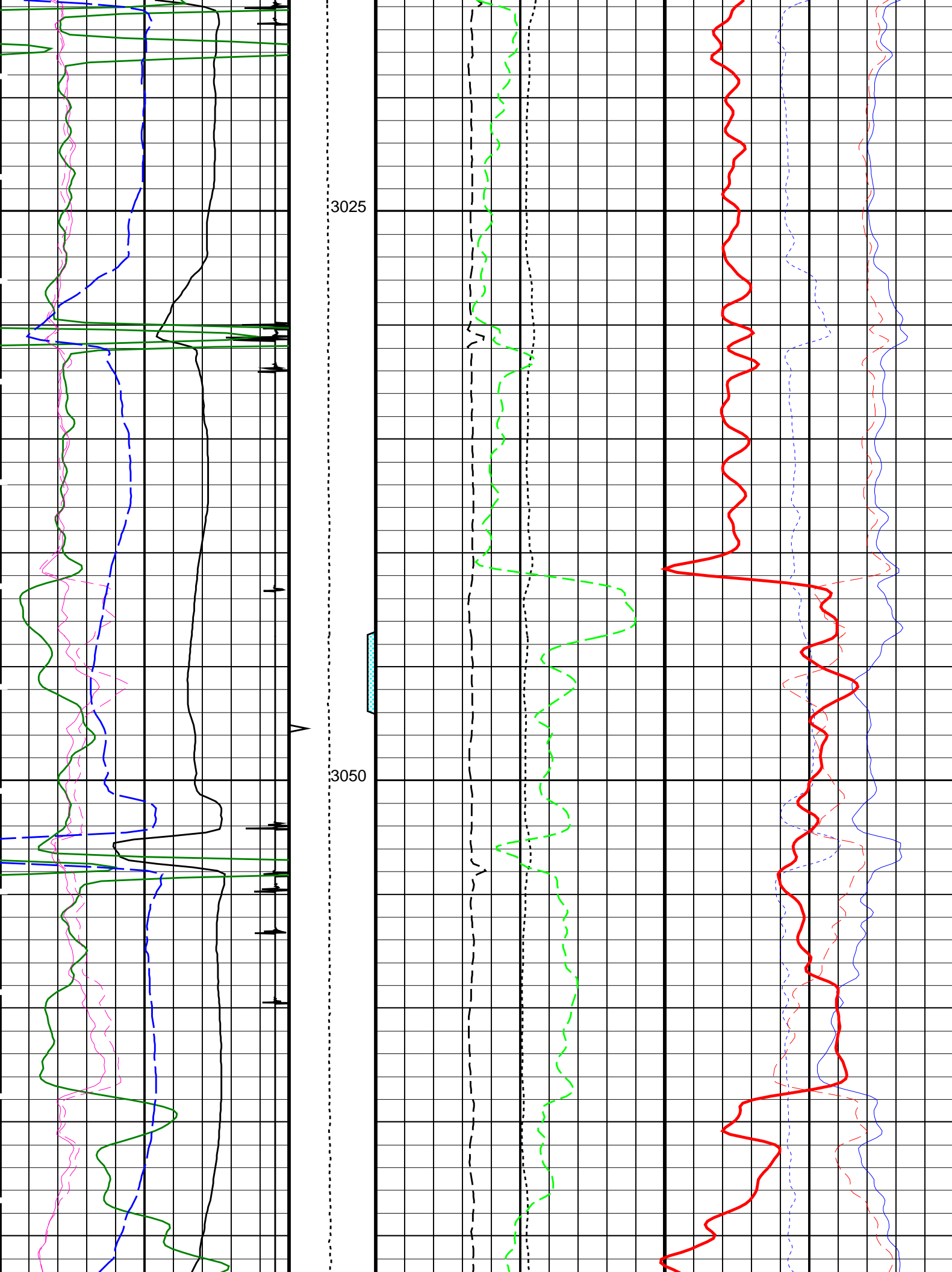
DLIS Name	New Value	Previous Value	Depth & Time
CWEI	26.00 LB/F	35.20 LB/F	3115.1 19:43:50
	35.20 LB/F	26.00 LB/F	3091.0 19:44:00

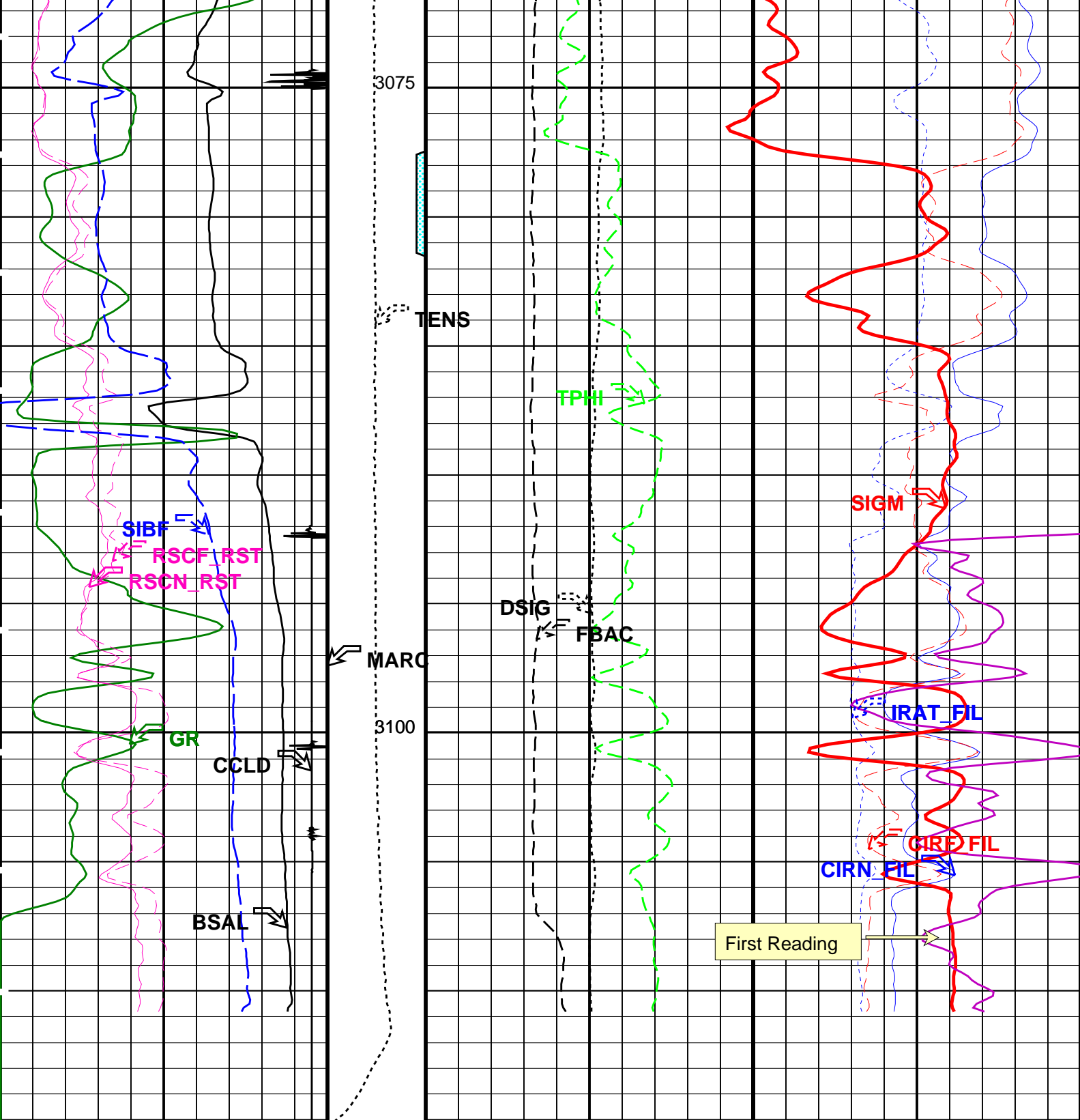
## PIP SUMMARY

Time Mark Every 60 S



Last Reading





RST Borehole Salinity (BSAL) (PPK)	450	-50	Perfo Zone	MCS Far Background (filtered) (FBAC) (CPS)	0	10000	RST Capture to Inelastic Ratio Near (CIRN_FIL)	2.5	0
Discriminated CCL (CCLD) (V)	-19	1	Tension (TENS) (LBF)	RST Sigma Difference (DSIG) (CU)	-30	30	RST Capture to Inelastic Ratio Far (CIRF_FIL)	5	0
Gamma Ray (GR) (GAPI)	0	150	Minitron Arc Detection (MARC)	RST Sigma (SIGM) (CU)	60				0
RST Sigma Borehole Fluid (SIBF)				RST Porosity (TPHI)			RST Inelastic Ratio (IRAT_FIL)		

100	(CU)	0	0.6	(V/V)	0	0.75	(---	0
RST Near Effective Capture CR (RSCN_RST)			RST Weighted Inelastic Ratio (WINR_RST)					
0	(----	45	0.4	(----				0
RST Far Effective Capture CR (RSCF_RST)								
0	(-----	45						

#### PIP SUMMARY

Time Mark Every 60 S

### Parameters

DLIS Name	Description	Value	
RST-C: Reservoir Saturation Pro Tool C			
AIRB	RST Air Borehole	No	
BHS	Borehole Status	CASED	
BSALOPT	RST Borehole Salinity Option	Unknown	
BSFL	RST Borehole Salinity Filter Length	51	
DFPC	RST Depth Filter Processing Constant	One	
DFPC_TDTL	RST Depth Filter Processing Constant (TDT-like)	Two	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NORM_IRAT_RST	RST Normalized Inelastic Ratio	0.48	
NORM_SIGM_RST	RST Normalized Sigma	30	CU
RGAI	Near/Far Gain Calibration Ratio	1	
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma	
PSPT: Production Services Logging Platform			
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
System and Miscellaneous			
BS	Bit Size	8.500	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	0.1	M
PP	Playback Processing	NORMAL	

Format: RST\_SIG\_ANSW Vertical Scale: 1:200 Graphics File Created: 18-Mar-2010 19:43

### OP System Version: 17C0-154

RST-C SRPC-3870\_Q3\_2009\_OP17\_V3 PSPT SRPC-3870\_Q3\_2009\_OP17\_V3

#### Input DLIS Files

DEFAULT	RST_PSP_009LUP	FN:11	PRODUCER	18-Mar-2010 15:52	3114.9 M	2999.1 M
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#### Output DLIS Files

DEFAULT	RST_PSP_009PUP	FN:30	PRODUCER	18-Mar-2010 19:43
CUSTOMER	RST_PSP_009PUC	FN:31	CUSTOMER	18-Mar-2010 19:43
CUST_FILT	RST_PSP_009PUC	FN:32	CUSTOMER	18-Mar-2010 19:43

**Schlumberger**

**Background GR Survey  
Shut In**

MAXIS Field Log



Input DLIS Files

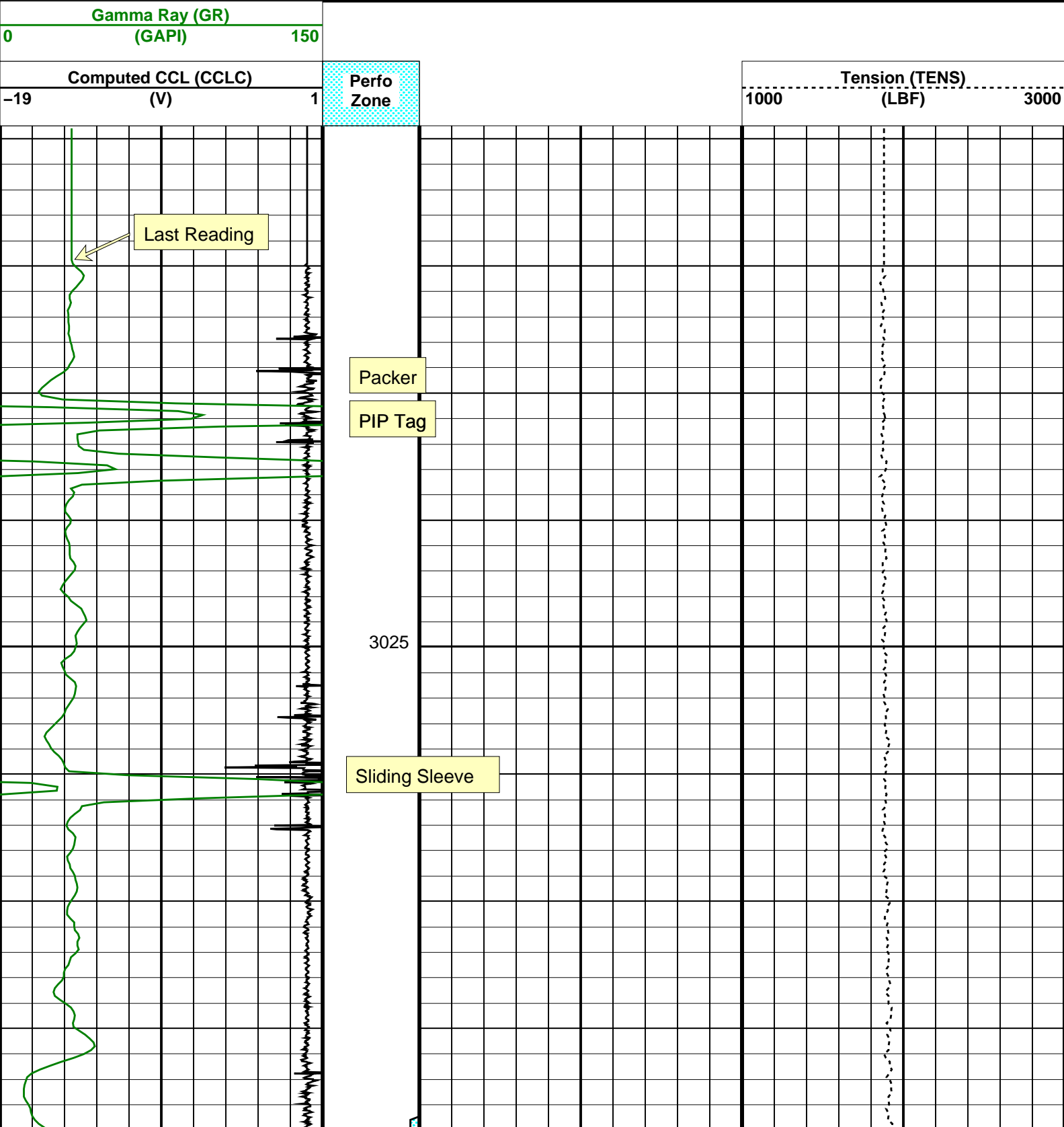
DEFAULT	RST_PSP_008LUP	FN:9	PRODUCER	18-Mar-2010 15:24	3115.2 M	2993.6 M
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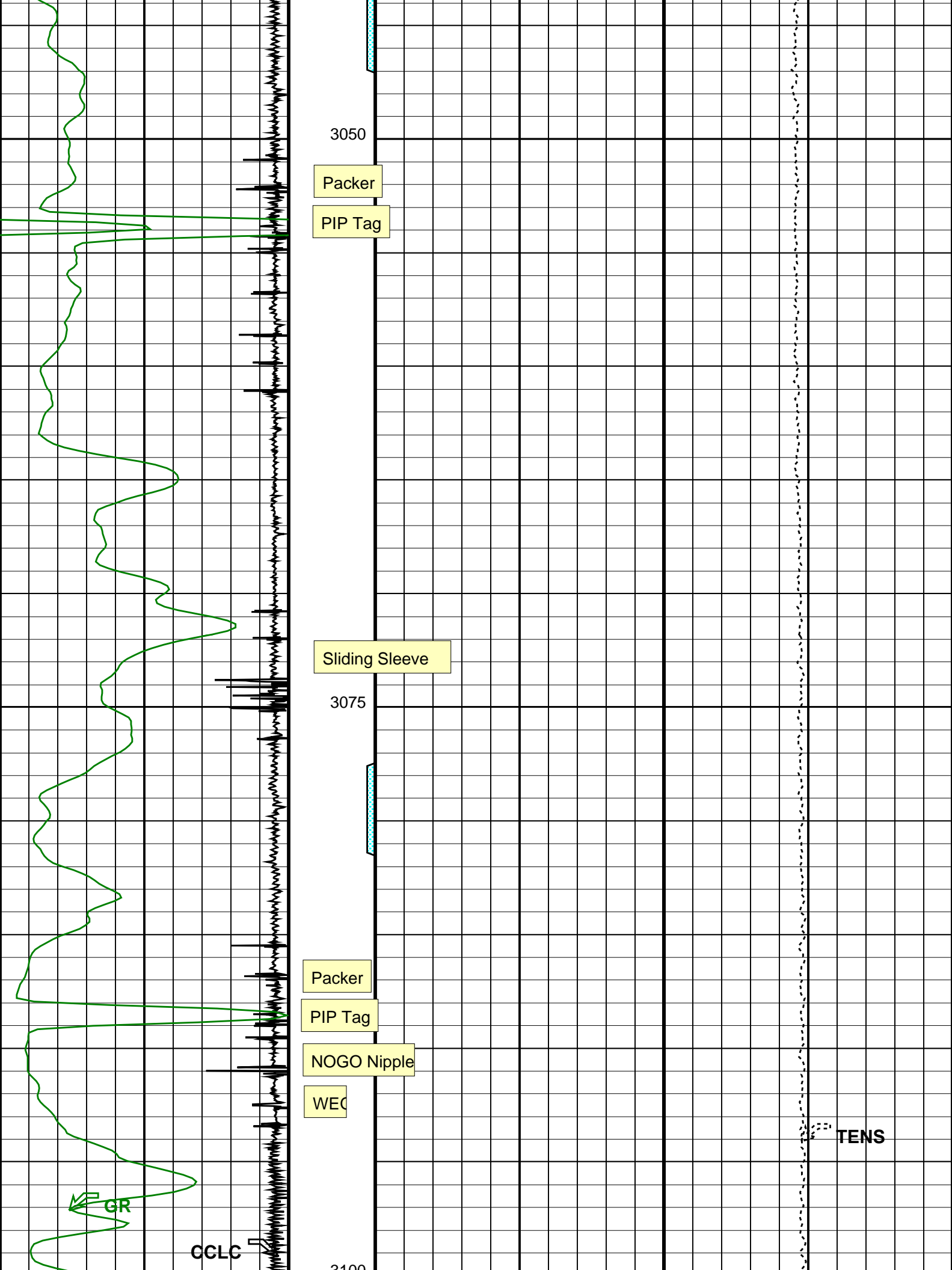
Output DLIS Files

DEFAULT	RST_PSP_008PUP	FN:27	PRODUCER	18-Mar-2010 19:15	3113.5 M	3004.4 M
CUSTOMER	RST_PSP_008PUC	FN:28	CUSTOMER	18-Mar-2010 19:15	3113.5 M	3004.4 M
CUST_FILT	RST_PSP_008PUC	FN:29	CUSTOMER	18-Mar-2010 19:15	3113.5 M	3004.4 M

OP System Version: 17C0-154

RST-C	SRPC-3870_Q3_2009_OP17_V3	PSPT	SRPC-3870_Q3_2009_OP17_V3
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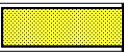

Before: 17-Mar-2010 9:58 Gamma-Ray Jig-Bkg	125.0	N/A	130.7	N/A	N/A	N/A	GAPI
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Production Services Logging Platform / Equipment Identification

Primary Equipment:

Production Logging Platform (CQG-F)	PSPT - B	
PSP Basic Measurement Sonde (CQG_F)	PBMS - B	1750
PSP Basic measurement module	PBMS -	
PSP CCL	CCL -	1750
PSP GR	GR -	1750
PSP RTD Well Temperature	RTD_ -	1750
PSP Crystal Quartz Gauge Type F	CQG_ -	1750
PSP Telemetry and bus master cartridge	PSTC - A	2760

Auxiliary Equipment:

Production Services Logging Platform Wellsite Calibration							
Detector Calibration							
Phase	Gamma-Ray Background	GAPI	Value	Phase	Gamma-Ray Jig-Bkg	GAPI	Value
Before			6.808	Before			130.7
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		110.0 (Minimum)	125.0 (Nominal)	140.0 (Maximum)	
Before: 17-Mar-2010 9:58							

Company: **Esso Australia Pty. Ltd.**

**Schlumberger**

Well: **COBIA A19A**  
Field: **HALIBUT**  
Rig: **Crane / Prod 4**  
Country: **Australia**

RST-C  
Sigma Log  
18-Mar-2010