

Company: Esso Australia Pty Ltd.

Well: A-4b
Field: Bream A
Rig : Prod4

Country: Australia

RST-C SIGMA
Static Survey
12-Nov-2009

LOCATION

Gippsland
Basin
Bass Strait

Elev.: K.B. 32.82 m
G.L. -59.00 m
D.F. 32.82 m

Permanent Datum: M.S.L.
Log Measured From: D.F.
Drilling Measured From: D.F.

Elev.: 0.00 m
32.82 m above Perm. Datum

Rig :
Field:
Location:
Well:
Company:

Prod4
Bream A
Gippsland
A-4b
Esso Australia Pty Ltd.

Logging Date	12-Nov-2009	Max. Well Deviation 62.9 deg	Longitude 147 46'15"E	Latitude 038 30'4"S
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Run Number	One		
Depth Driller	2845 m		
Schlumberger Depth	2755.6 m		
Bottom Log Interval	2755.6 m		
Top Log Interval	2720 m		
Casing Fluid Type	Production Fluids		
Salinity			
Density			
Fluid Level	1875 m		
BIT/CASING/TUBING STRING			
Bit Size	9.375 in		
From	1447 m		
To	2845 m		
Casing/Tubing Size	7.000 in		
Weight	38.6 lbm/ft		
Grade	N-80		
From	152 m		
To	2832 m		
Maximum Recorded Temperatures	202 degF		
Logger On Bottom	12-Nov-2009	Time	0:11
Unit Number	889	Location	AUSL
Recorded By	O Darby		
Witnessed By	G Rimmer		

PVT DATA				Run 1	Run 2	R
Oil Density						
Water Salinity						
Gas Gravity						
Bo						
Bw						
1/Bg						
Bubble Point Pressure						
Bubble Point Temperature						
Solution GOR						
Maximum Deviation				62.9 deg		
CEMENTING DATA						
Primary/Squeeze				Primary		
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				Time		
Unit Number				Location		
Recorded By						
Witnessed By						

Depth System Equipment

Date Created: 12-NOV-2009 2:22:55

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-EB	Type:	PSDS/OSDS	Type:	2-32ZT
Serial Number:	6373	Serial Number:	325357	Serial Number:	207505
Calibration Date:	13-Oct-2009	Calibration Date:	21-Oct-2009	Length:	6421 M
Calibrator Serial Number:	30	Calibrator Serial Number:	854	Conveyance Method:	Wireline
Calibration Cable Type:	2-32ZT	Number of Calibration Points:	9	Rig Type:	Rigless
Wheel Correction 1:	0	Calibration RMS:	454		
Wheel Correction 2:	-2	Calibration Peak Error:	281		

Log Sequence:	Subsequent Trip To the Well
Reference Log Name:	Solar Composite Log
Reference Log Run Number:	
Reference Log Date:	
Subsequent Trip Down Log Correction:	

1. IDW used as primary depth control
2. Z Chart used as secondary depth control.

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 SERVICES1
OS1: MWPT , MPBT & DB
OS2:
OS3:
OS4:
OS5:

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

REMARKS: RUN NUMBER 1

REMARKS: RUN NUMBER 2

Log correlated to ExxonMobil petrophysical analysis composite provided by client

Maximum well deviation = 62.9Deg @ 1330m MDKB, Average 42.8Deg

Objective:
Perform 2 static with RST in SIGMA mode over the interval
HUD to 2720m MDKB to determine perforation interval .

HUD : 2755.6m MDKB
SBHT: 202 DegF
SBHP: 2618 Psi
Crew:
D Halstead & G Martin

RUN 1			RUN 2		
SERVICE ORDER #:		B69I-00012	SERVICE ORDER #:		
PROGRAM VERSION:		17C0-154	PROGRAM VERSION:		
FLUID LEVEL:		1875 m	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

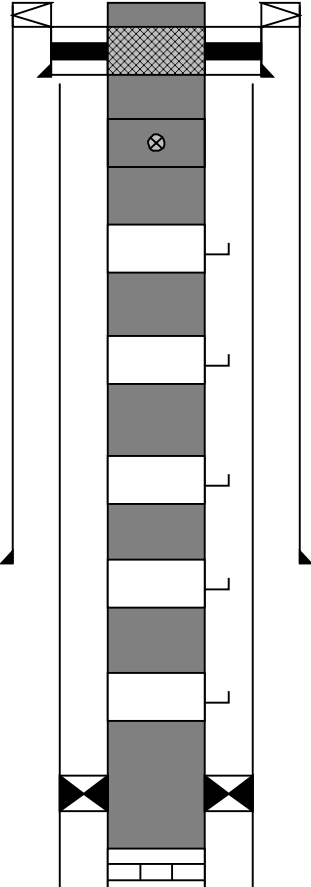
RUN 1			RUN 2		
SURFACE EQUIPMENT			<div></div>		
WITM-A PSC_16MHZ					
DOWNHOLE EQUIPMENT					
AH-SWBS-B 789 AH-SWBS-B 789		13.30			
AH-SWBS-B 788 AH-SWBS-B 788		12.61			
AH-SWBS-B 787 AH-SWBS-B 787		11.93			
AH-SWBS-B 786 AH-SWBS-B 786		11.24			
AH-SWBS-B 785 AH-SWBS-B 785		10.55			
MH-SWHS-A 759 MH-SWHS-A 759	Detail MT TelStatus CTEM	9.87			
PSPT-B PSC-A 3918 PSPT-B 3918 PSTC 3918 PBMS-B 3918 CQG_F_Mano 3918 RTD_Thermometer 3918 GR 3918 CCL 3918 PBMS 3918	GR	9.54 9.54 8.41			
	Well_Temp CQG Manom CCL PBMS PSTC	7.48 7.37 7.25 7.02			
RST-C BLK-2 RSCH-A 111 RSC-C 111 RSS-A 108 RSXH-A 108 RSX_C 115		7.02			

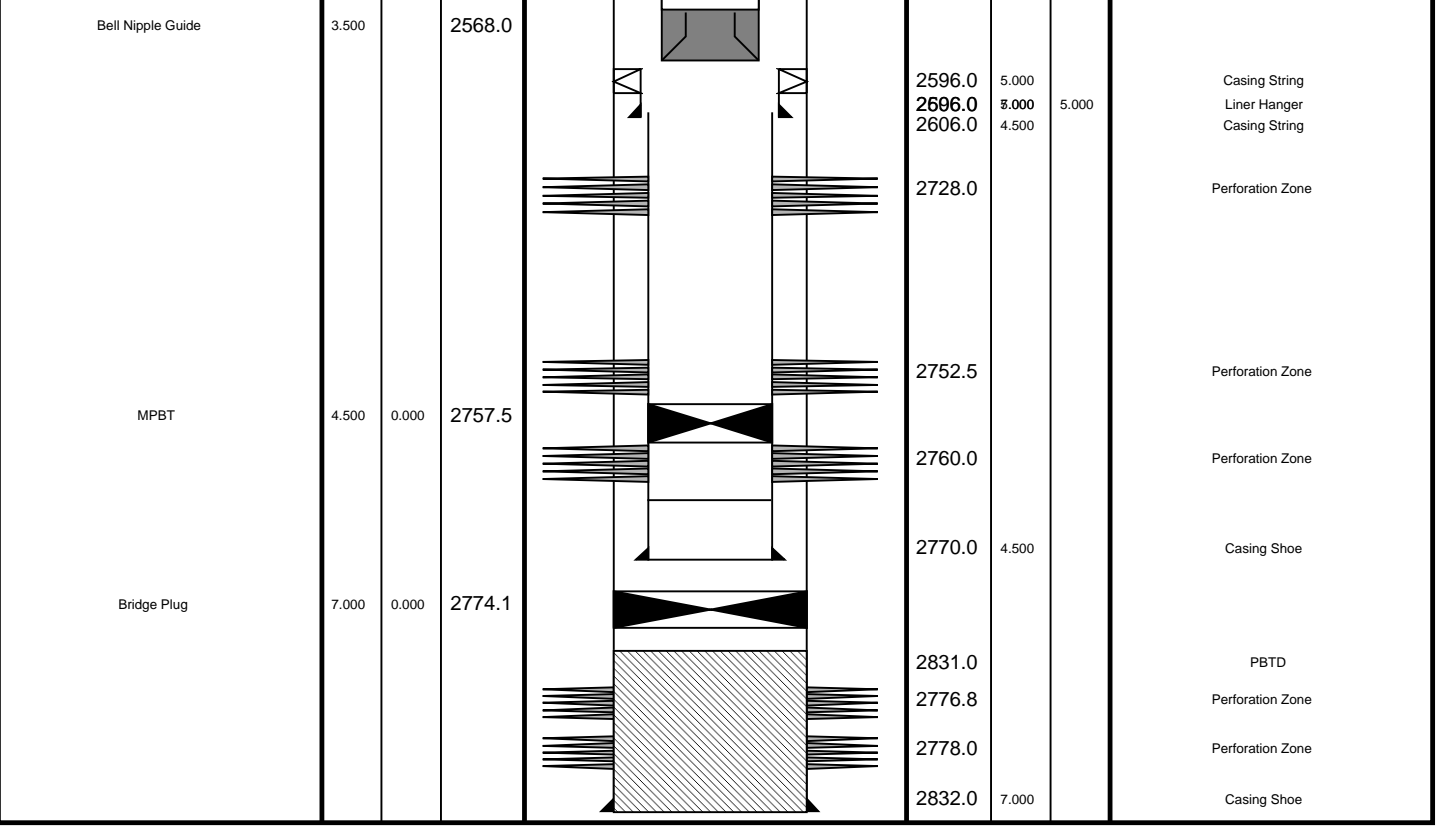
RSC-A Far
RSC-A PNG
RSC-A Nea
RSX-A PNG

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

Production String	(in)		(m)	Well Schematic	(m)	(in)		Casing String
	OD	ID	MD		MD	OD	ID	
Tubing	3.500		12.0		16.0	10.375		Casing String Liner Hanger Casing Shoe Casing String
Tubing Hanger		3.500	12.0		12.3	10.375	7.625	
					140.0	7.625		
					152.0	7.000		
SSSV	3.500		455.0					Casing Shoe
Gas Lift Mandrel	3.500		572.0					
Gas Lift Mandrel	3.500		1174.0					
Gas Lift Mandrel	3.500		1455.0					
Gas Lift Mandrel	3.500		1725.0		1396.0	10.375		
Gas Lift Mandrel	3.500		2181.0					
Packer	7.000	3.500	2561.0					Casing Shoe
Nipple	3.500		2197.0					



Job Event Summary

MAXIS Field Log

Schlumberger Job Event Summary

Time	Elapsed Time	Depth (M)	File
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Simulated Log	12-Nov-2009 19:47	000:01	RST_PSP_011LUP
OP checked RST			
Log Pass (up)	12-Nov-2009 20:47	000:06	2763.2 - 2696.7
RST - Correlation pass			RST_PSP_013LUP
Log Pass (up)	12-Nov-2009 21:15	000:10	2758.1 - 2704.8
RST - First SIGMA pass			RST_PSP_020LUP
Log Pass (up)	12-Nov-2009 21:33	000:10	2758.1 - 2708.1
RST - Second SIGMA pass			RST_PSP_024LUP

RST-C
Repeat Analysis

MAXIS Field Log

Company: Esso Australia Pty Ltd.

Well: A-4b

Input DLIS Files

DEFAULT	RST_PSP_022PUP	FN:21	PRODUCER	12-Nov-2009 21:29	2758.1 M	2714.4 M
DEFAULT	RST_PSP_024LUP	FN:23	PRODUCER	12-Nov-2009 21:33	2758.1 M	2708.1 M

Output DLIS Files

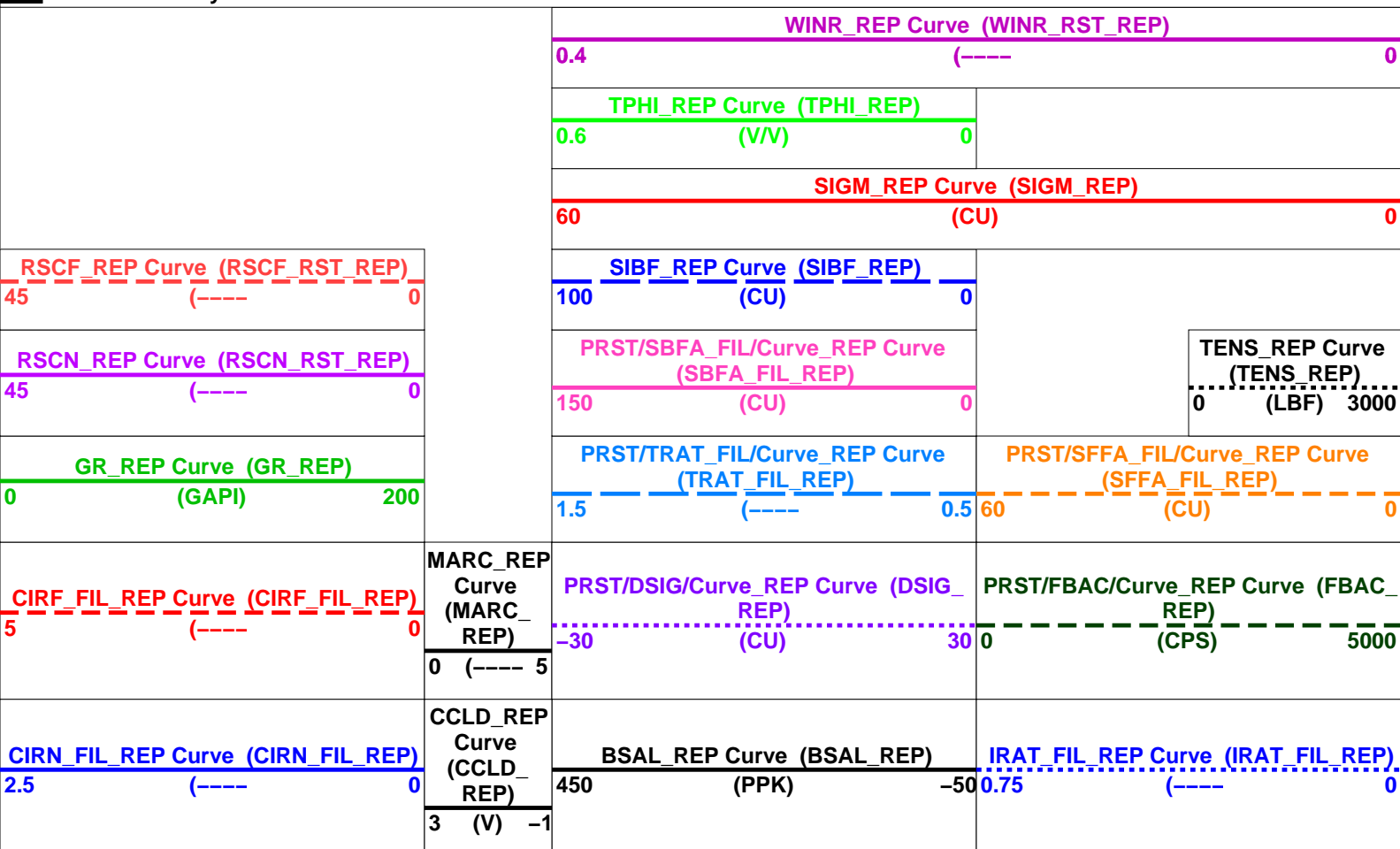
DEFAULT	RST_PSP_033PUP	FN:32	PRODUCER	13-Nov-2009 00:39	2758.1 M	2714.4 M
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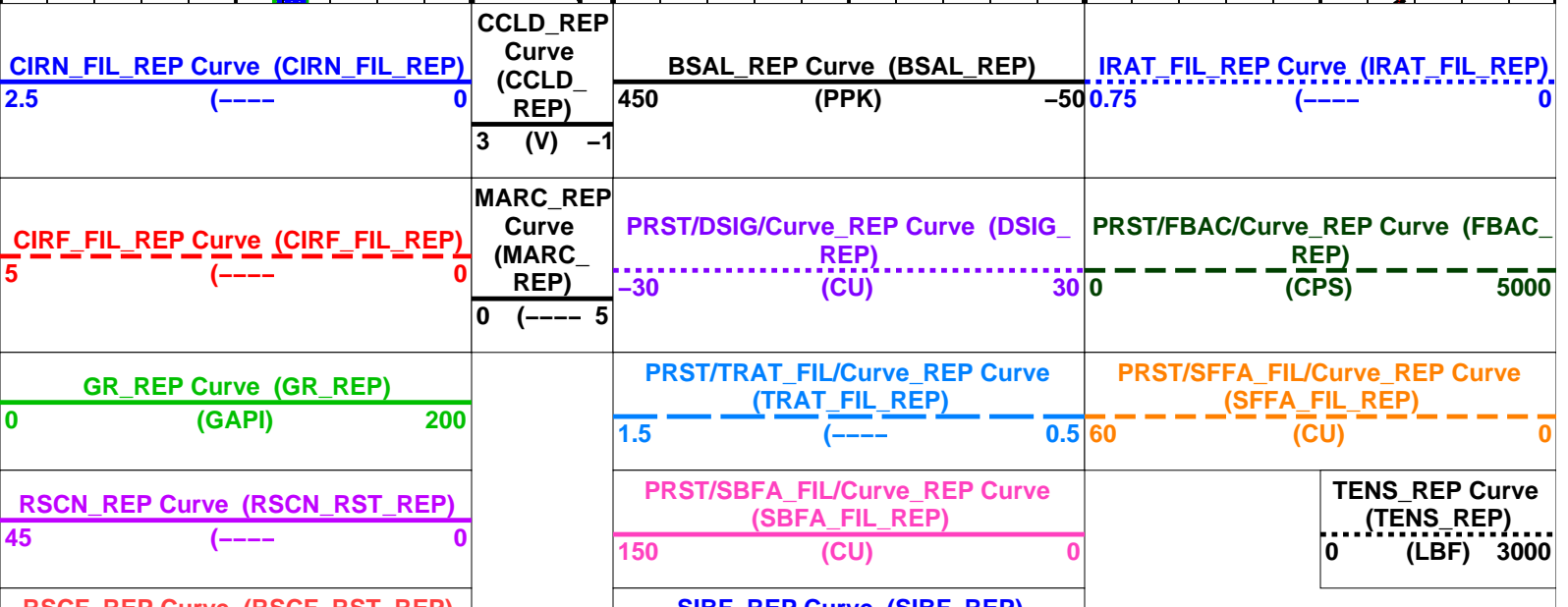
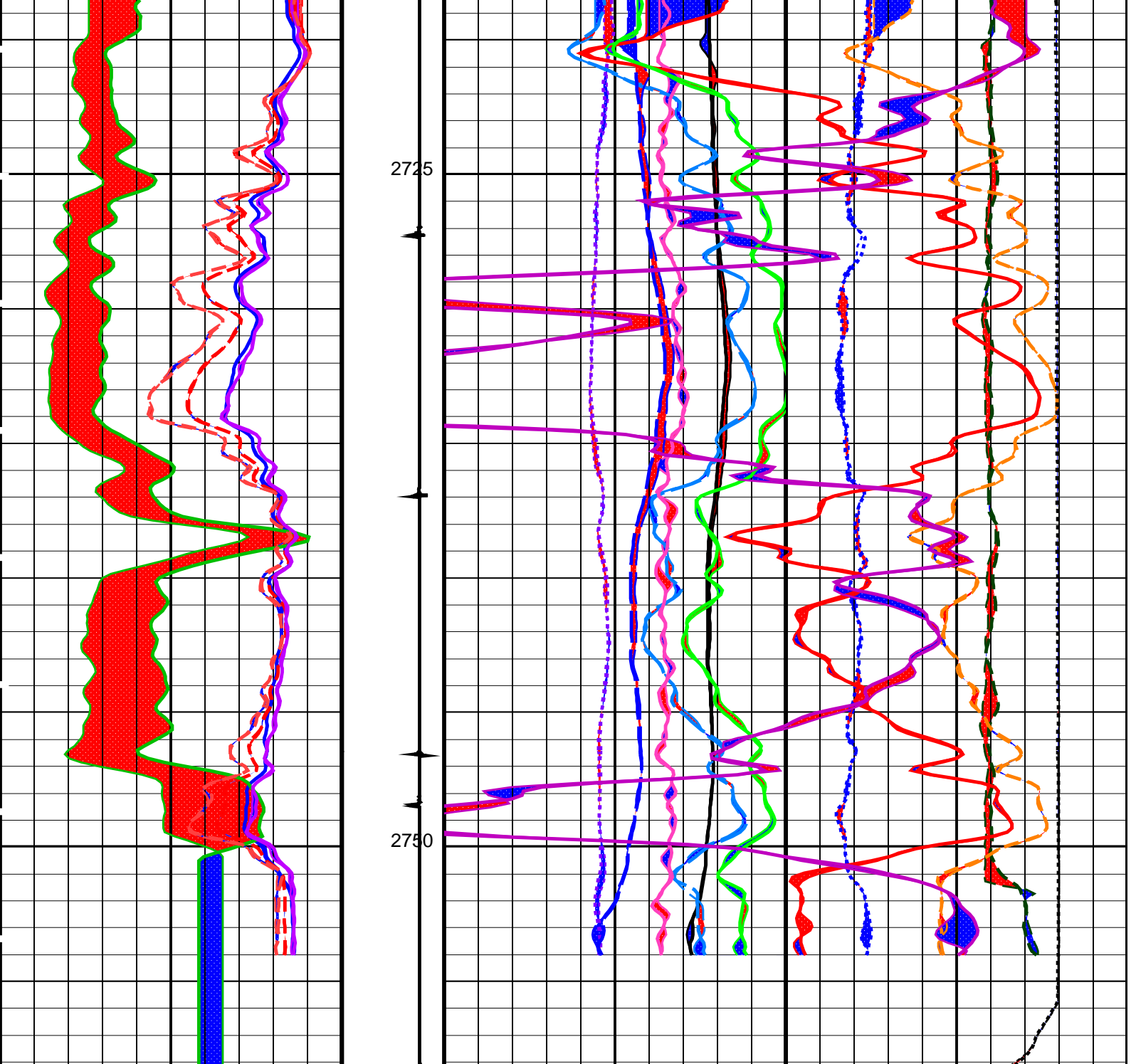
OP System Version: 17C0-154

RST-C	17C0-154	PSPT-B	17C0-154
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PIP SUMMARY

Time Mark Every 60 S





RSCP_REP Curve (RSCP_RST_REP)	45	(-----)	0
SIBF_REP Curve (SIBF_REP)	100	(CU)	0
SIGM_REP Curve (SIGM_REP)			
	60	(CU)	0
TPHI_REP Curve (TPHI_REP)			
	0.6	(V/V)	0
WINR_REP Curve (WINR_RST_REP)			
	0.4	(-----)	0

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-B: Production Services Logging Platform			
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
System and Miscellaneous			
BS	Bit Size	9.375	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	38.60	LB/F
DO	Depth Offset for Playback	0.0	M
DORL	Depth Offset for Repeat Analysis	0.0	M
PP	Playback Processing	NORMAL	

Format: RST_SIG_ANSW_REP Vertical Scale: 1:200 Graphics File Created: 13-Nov-2009 00:39

OP System Version: 17C0-154

RST-C 17C0-154 PSPT-B 17C0-154

Input DLIS Files

DEFAULT	RST_PSP_022PUP	FN:21	PRODUCER	12-Nov-2009 21:29	2758.1 M	2714.4 M
DEFAULT	RST_PSP_024LUP	FN:23	PRODUCER	12-Nov-2009 21:33	2758.1 M	2708.1 M

Output DLIS Files

DEFAULT	RST_PSP_033PUP	FN:32	PRODUCER	13-Nov-2009 00:39
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Schlumberger

RST-C SIGMA 2nd Static Survey
2755.6m – 2720m MDKB

MAXIS Field Log

Output DLIS Files

DEFAULT

RST_PSP_024LUP

FN:23

PRODUCER

12-Nov-2009 21:33

OP System Version: 17C0-154

RST-C

17C0-154

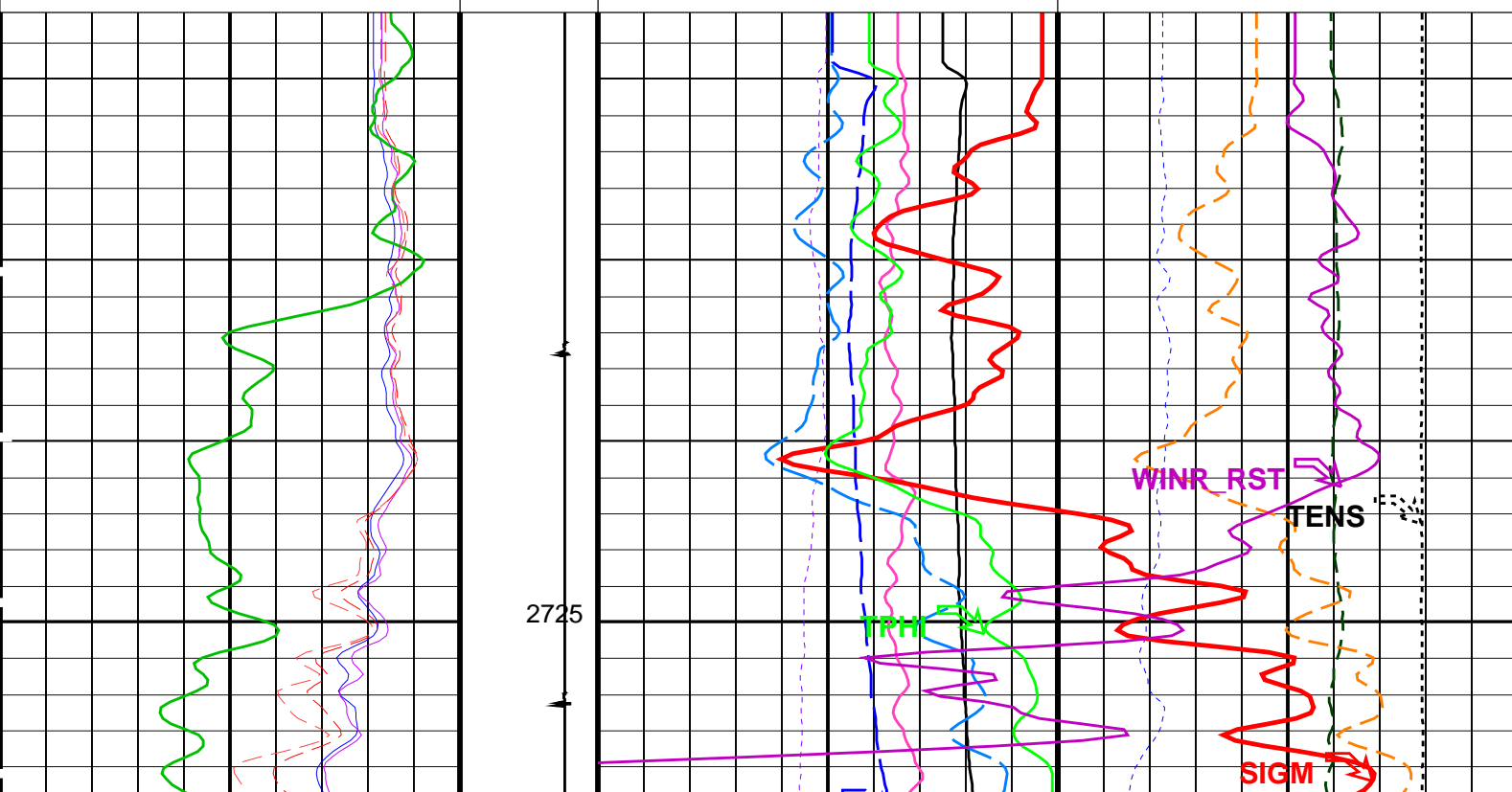
PSPT-B

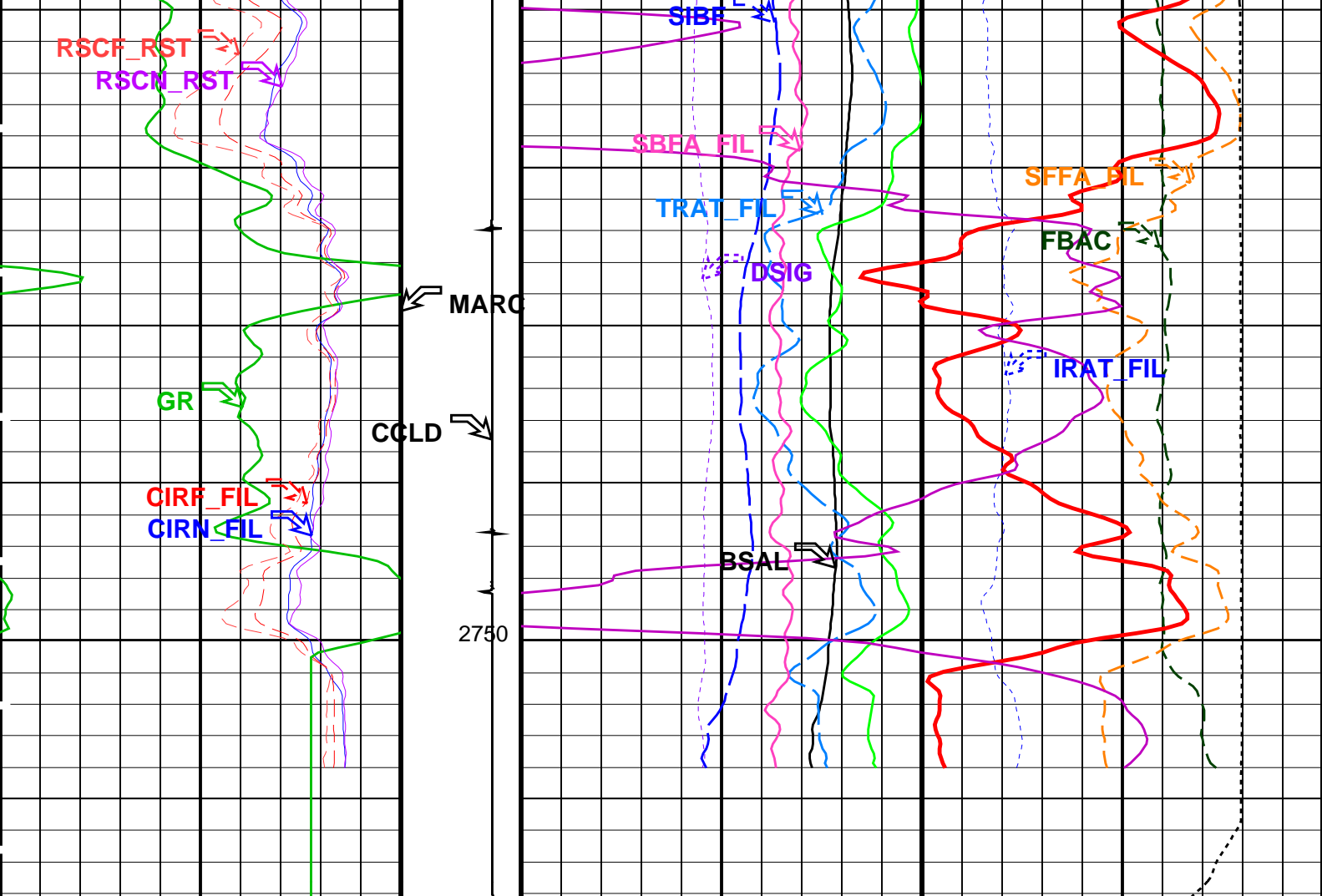
17C0-154

PIP SUMMARY

Time Mark Every 60 S

		RST Sigma (SIGM)	
		60 (CU)	0
		RST Weighted Inelastic Ratio (WINR_RST)	
		0.4 (----	0
		RST Porosity (TPHI)	
		0.6 (V/V)	0
RST Far Effective Capture CR (RSCF_RST)		RST Sigma Borehole Fluid (SIBF)	
45 (----	0	100 (CU)	0
RST Near Effective Capture CR (RSCN_RST)		Sigma Borehole Far Apparent (SBFA_FIL)	
45 (----	0	150 (CU)	0
RST Capture to Inelastic Ratio Far (CIRF_FIL)		RST Capture Ratio (TRAT_FIL)	Sigma Formation Far Apparent (SFFA_FIL)
5 (----	0	1.5 (----	0.5 60 (CU)
RST Capture to Inelastic Ratio Near (CIRN_FIL)		RST Sigma Difference (DSIG)	MCS Far Background (filtered) (FBAC)
2.5 (----	0	-30 (CU)	30 0 5000 (CPS)
Gamma Ray (GR)		RST Borehole Salinity (BSAL)	RST Inelastic Ratio (IRAT_FIL)
0 (GAPI)	150	450 (PPK)	-50 0.75 (----
			0





<div>Gamma Ray (GR)</div> <div>(GAPI)</div> <div>0150</div>	<div>Discriminat</div> <div>ed CCL</div> <div>(CCLD)</div> <div>3 (V) -1</div>	<div>RST Borehole Salinity (BSAL)</div> <div>(PPK)</div> <div>450-50</div>	<div>RST Inelastic Ratio (IRAT_FIL)</div> <div>(----</div> <div>0.750</div>
<div>RST Capture to Inelastic Ratio Near</div> <div>(CIRN_FIL)</div> <div>2.5 (----) 0</div>	<div>Minitron</div> <div>Arc</div> <div>Detection</div> <div>(MARC)</div> <div>0 (----) 5</div>	<div>RST Sigma Difference (DSIG)</div> <div>(CU)</div> <div>-3030</div>	<div>MCS Far Background (filtered) (FBAC)</div> <div>(CPS)</div> <div>05000</div>
<div>RST Capture to Inelastic Ratio Far</div> <div>(CIRF_FIL)</div> <div>5 (----) 0</div>		<div>RST Capture Ratio (TRAT_FIL)</div> <div>(----</div> <div>1.50.5</div>	<div>Sigma Formation Far Apparent (SFFA_</div> <div>FIL)</div> <div>(CU)</div> <div>600</div>
<div>RST Near Effective Capture CR (RSCN_</div> <div>RST)</div> <div>45 (----) 0</div>		<div>Sigma Borehole Far Apparent (SBFA_</div> <div>FIL)</div> <div>(CU)</div> <div>1500</div>	<div>Tension (TENS)</div> <div>(LBF)</div> <div>03000</div>
<div>RST Far Effective Capture CR (RSCF_</div> <div>RST)</div> <div>45 (----) 0</div>		<div>RST Sigma Borehole Fluid (SIBF)</div> <div>(CU)</div> <div>1000</div>	
		<div>RST Porosity (TPHI)</div> <div>(V/V)</div> <div>0.60</div>	
		<div>RST Weighted Inelastic Ratio (WINR_RST)</div> <div>(----</div> <div>0.40</div>	
		<div>RST Sigma (SIGM)</div> <div>(CU)</div> <div>600</div>	

PIP SUMMARY

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-B: Production Services Logging Platform			
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
System and Miscellaneous			
BS	Bit Size	9.375	IN
BSAL	Borehole Salinity	-50000.00	PPI
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	38.60	LB

Format: RST_SIG_ANSW Vertical Scale: 1:200 Graphics File Created: 12-Nov-2009 21:33

OP System Version: 17C0-154

RST-C	17C0-154	PSPT-B	17C0-154
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Output DLIS Files

DEFAULT RST_PSP_024LUP FN:23 PRODUCER 12-Nov-2009 21:33



RST-C SIGMA 1st Static Survey

2755.6m – 2720m MDKB

MAXIS Field Log

Company: Esso Australia Pty Ltd.	Well: A-4b
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Input DLIS Files

DEFAULT	RST_PSP_020LUP	FN:19	PRODUCER	12-Nov-2009 21:15	2758.1 M	2704.8 M
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Output DLIS Files

DEFAULT	RST_PSP_022PUP	FN:21	PRODUCER	12-Nov-2009 21:29	2758.1 M	2714.4 M
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OP System Version: 17C0-154

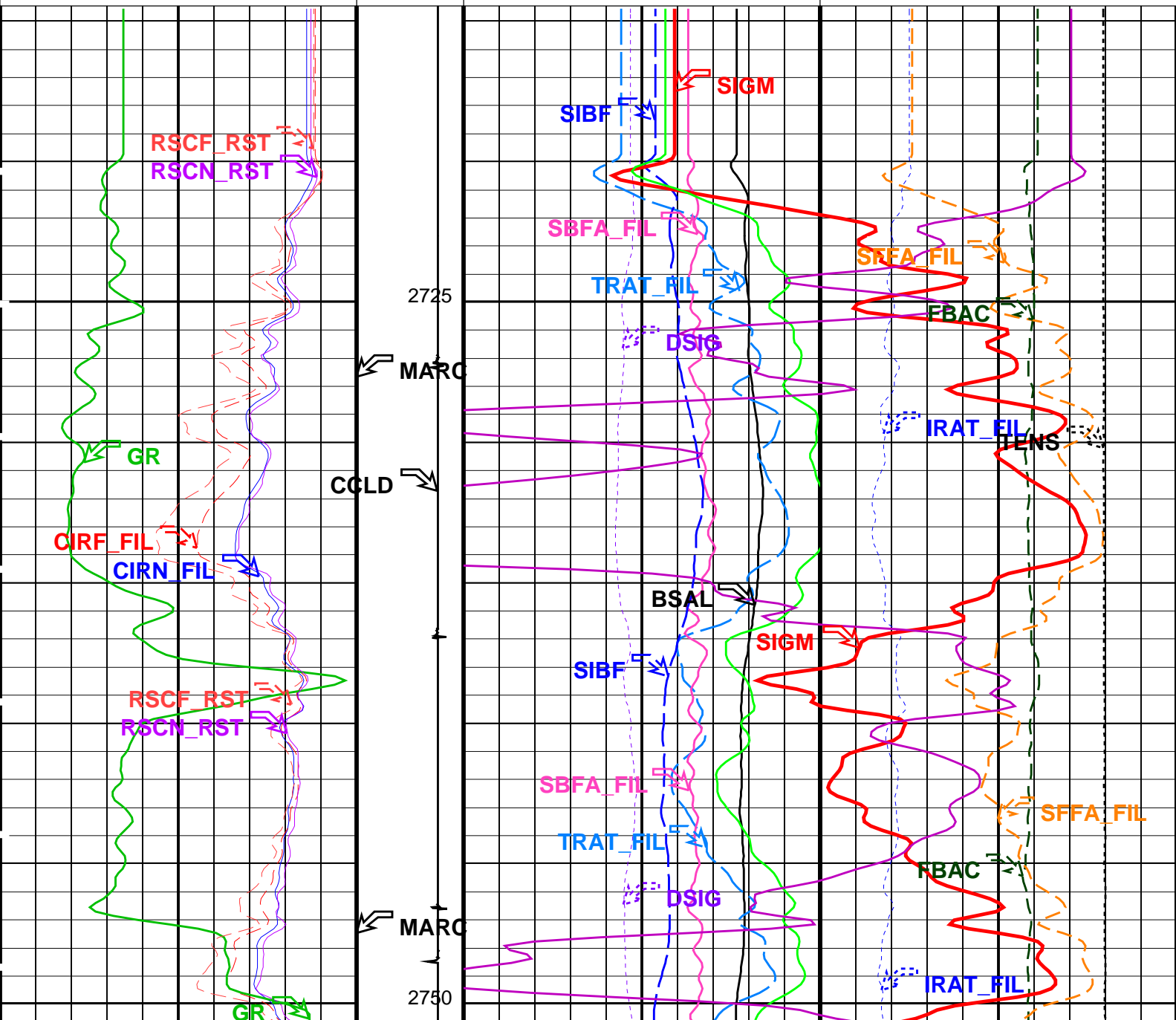
RST-C	17C0-154	PSPT-B	17C0-154
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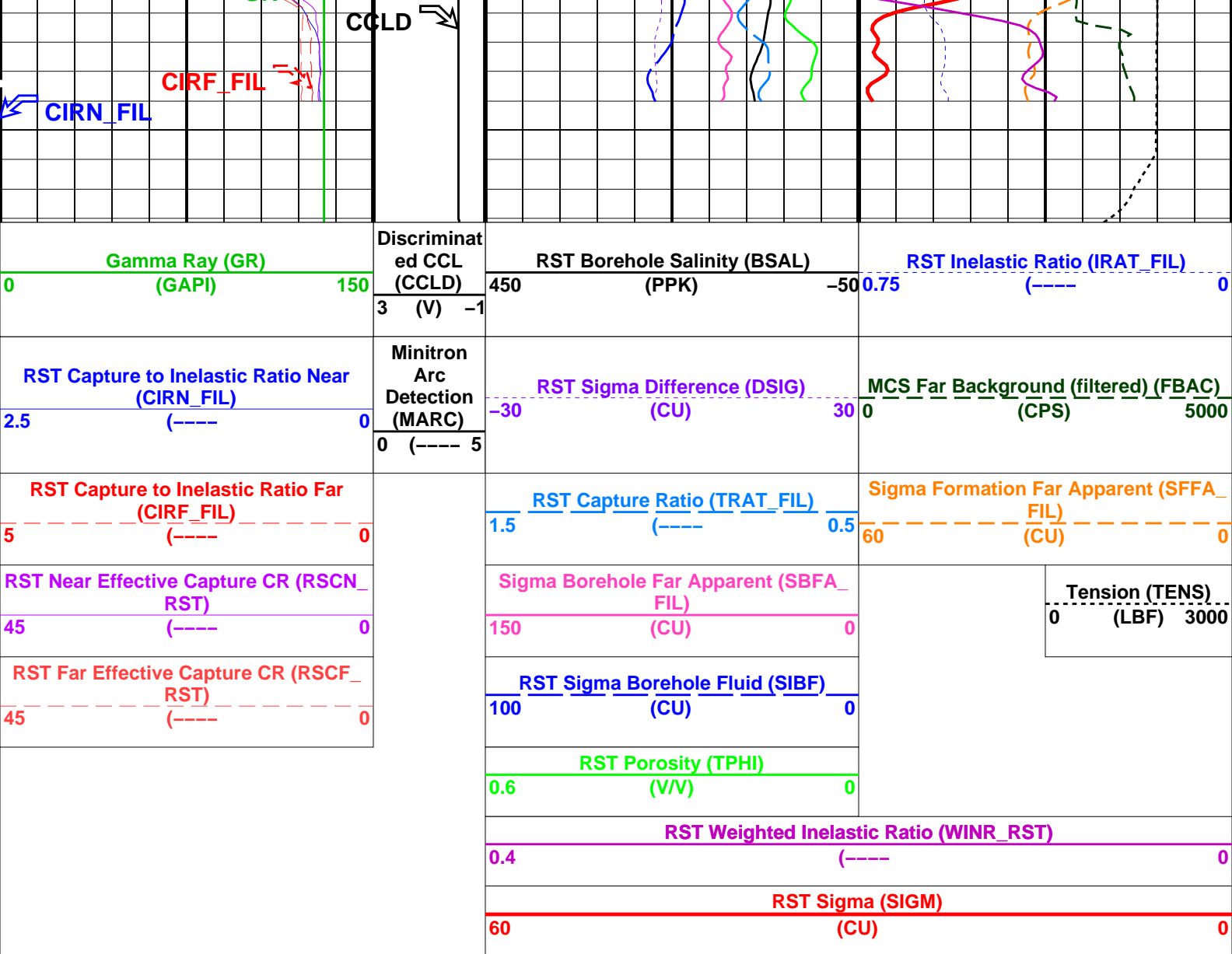
PIP SUMMARY

Time Mark Every 60 S

RST Sigma (SIGM)		
60	(CU)	0
RST Weighted Inelastic Ratio (WINR_RST)		
0.4	(----	0
RST Density (TRHU)		

RST Far Effective Capture CR (RSCF_RST) 45 (----) 0		RST Porosity (IPHI) (V/V) 0.6 0			
RST Near Effective Capture CR (RSCN_RST) 45 (----) 0		RST Sigma Borehole Fluid (SIBF) (CU) 100 0		Sigma Borehole Far Apparent (SBFA_FIL) (CU) 150 0	
RST Capture to Inelastic Ratio Far (CIRF_FIL) (----) 0		RST Capture Ratio (TRAT_FIL) (----) 1.5 0.5		Sigma Formation Far Apparent (SFFA_FIL) (CU) 60 0	
RST Capture to Inelastic Ratio Near (CIRN_FIL) (----) 0		RST Sigma Difference (DSIG) (CU) -30 30		MCS Far Background (filtered) (FBAC) (CPS) 0 5000	
Gamma Ray (GR) (GAPI) 0 150		RST Borehole Salinity (BSAL) (PPK) 450 -50		RST Inelastic Ratio (IRAT_FIL) (----) 0.75 0	
		Minitron Arc Detection (MARC) 0 (----) 5		Tension (TENS) (LBF) 0 3000	
		Discriminat ed CCL (CCLD) (V) 3 -1			





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
RGAI	Near/Far Gain Calibration Ratio	1
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma
PSPT-B: Production Services Logging Platform		
BHS	Borehole Status	CASED
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE
System and Miscellaneous		
BS	Bit Size	9.375 IN
BSAL	Borehole Salinity	-50000.00 PPM
CSIZ	Current Casing Size	7.000 IN
CWEI	Casing Weight	38.60 LB/F
DO	Depth Offset for Playback	0.0 M
PP	Playback Processing	NORMAL

Format: RST_SIG_ANSW Vertical Scale: 1:200 Graphics File Created: 12-Nov-2009 21:29

RST-C17C0-154PSPT-B17C0-154

Input DLIS Files

DEFAULTRST_PSP_020LUPFN:19PRODUCER12-Nov-2009 21:152758.1 M2704.8 M

Output DLIS Files

DEFAULTRST_PSP_022PUPFN:21PRODUCER12-Nov-2009 21:29

Schlumberger

RST-C
Correlation pass

MAXIS Field Log

Company: Esso Australia Pty Ltd.

Well: A-4b

Input DLIS Files

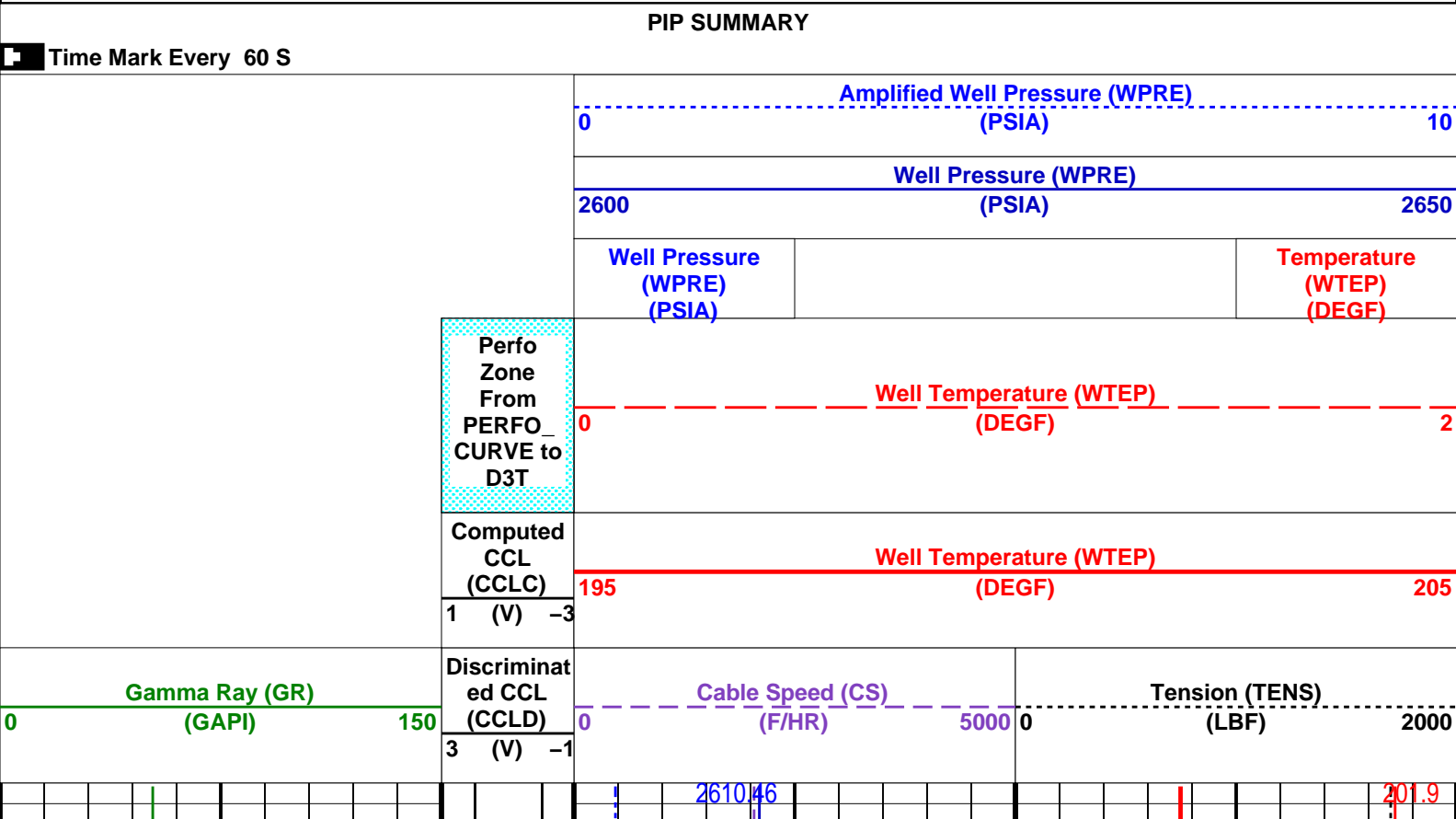
DEFAULTRST_PSP_013LUPFN:12PRODUCER12-Nov-2009 20:472763.2 M2696.7 M

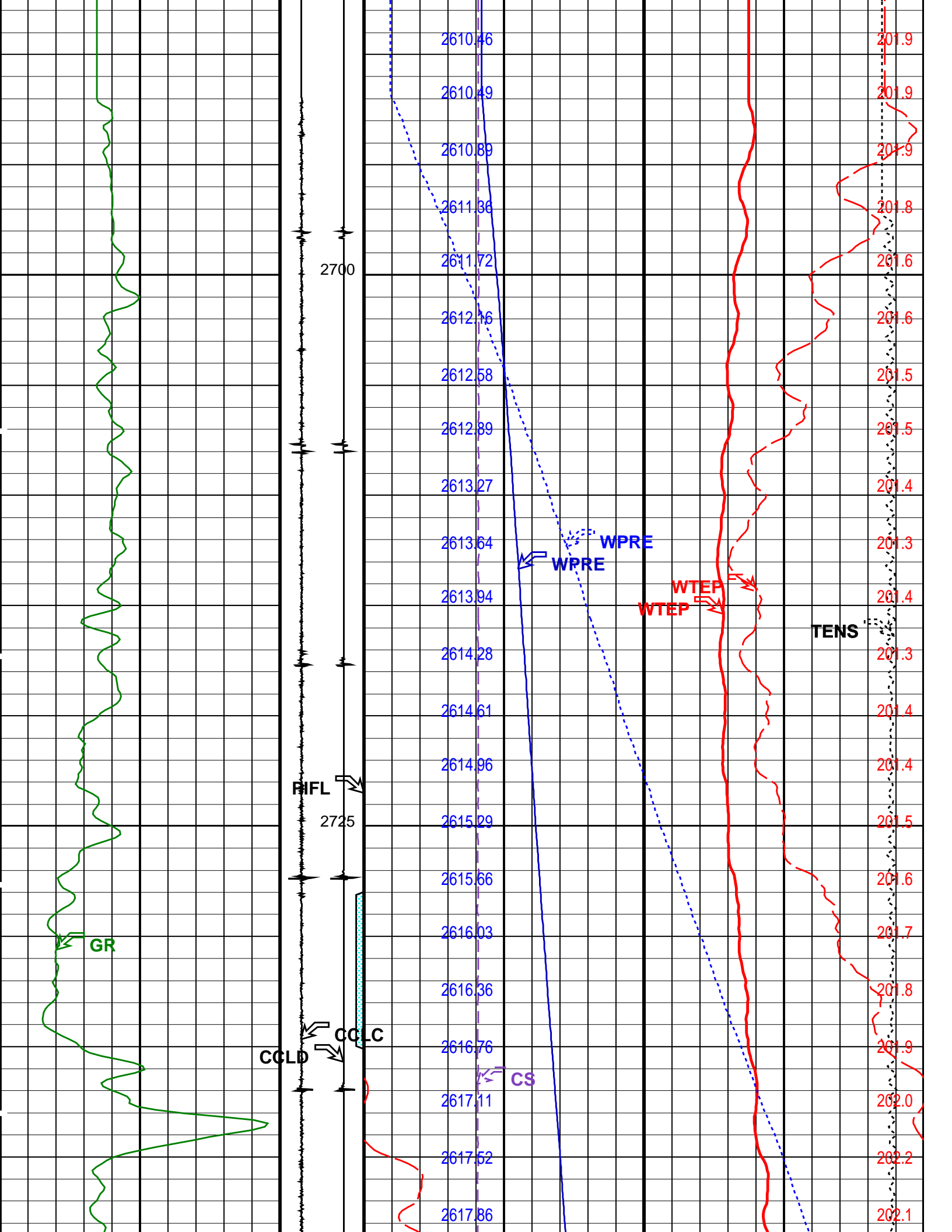
Output DLIS Files

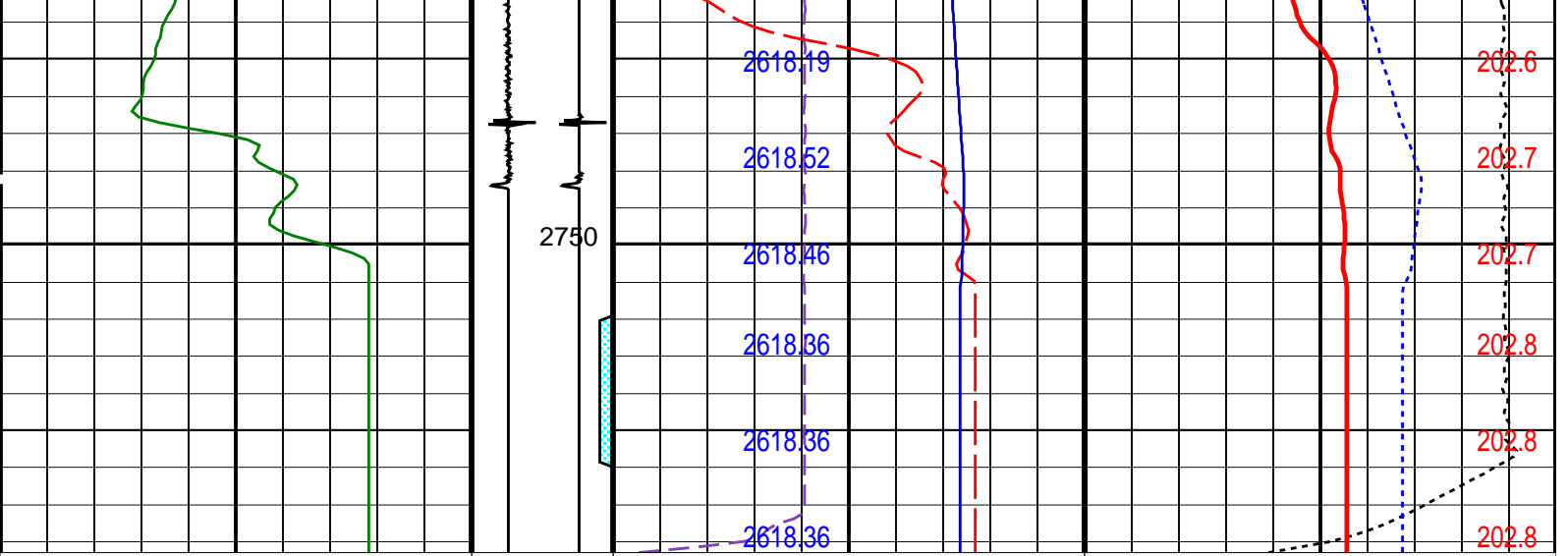
DEFAULTRST_PSP_018PUPFN:17PRODUCER12-Nov-2009 21:032758.3 M2686.4 M

OP System Version: 17C0-154

RST-C17C0-154PSPT-B17C0-154







	Gamma Ray (GR) (GAPI)	Discriminat ed CCL (CCLD)	Cable Speed (CS) (F/HR)	Tension (TENS) (LBF)
	0 150	3 (V) -1	0 5000	0 2000
		Computed CCL (CCLC)	Well Temperature (WTEP) (DEGF)	
		1 (V) -3	195 205	
		Perfo Zone From PERFO_ CURVE to D3T	Well Temperature (WTEP) (DEGF)	
			0 2	
			Well Pressure (WPRE) (PSIA)	Temperature (WTEP) (DEGF)
			Well Pressure (WPRE) (PSIA)	
			2600 2650	
			Amplified Well Pressure (WPRE) (PSIA)	
			0 10	

PIP SUMMARY

☐ Time Mark Every 60 S

Format: PSP_1 Vertical Scale: 1:200 Graphics File Created: 12-Nov-2009 21:03

OP System Version: 17C0-154

RST-C 17C0-154 PSPT-B 17C0-154

Parameters		
DLIS Name	Description	Value
DO PP	System and Miscellaneous Depth Offset for Playback Playback Processing	-4.9 M NORMAL

Input DLIS Files						
DEFAULT	RST_PSP_013LUP	FN:12	PRODUCER	12-Nov-2009 20:47	2763.2 M	2696.7 M
Output DLIS Files						
DEFAULT	RST_PSP_018PUP	FN:17	PRODUCER	12-Nov-2009 21:03		

Company: **Esso Australia Pty Ltd.**

Schlumberger

Well: **A-4b**

Field: **Bream A**

Rig : **Prod4**

Country: **Australia**

RST-C SIGMA

Static Survey

12-Nov-2009