

Company: Esso Australia Pty. Ltd.

Well: COBIA A15B

Field: HALIBUT

Rig: Crane / Prod 4

Country: Australia

RST-C  
Sigma Log  
20-Mar-2010

Rig: Crane / Prod 4	
Field: HALIBUT	
Location: Gippsland	
Well: COBIA A15B	
Company: 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: _____	Elev.: 40.99 m
Log Measured From: K.B. _____	-40.99 m above Perm. Datum
Drilling Measured From: K.B. _____	
State: Victoria	Max. Well Deviation 51.2 deg
	Longitude 148 18' 28.3"E
	Latitude 38 27' 03.5" S

Logging Date	20-Mar-2010		
Run Number	1		
Depth Driller	3200 m		
Schlumberger Depth	3061.5 m		
Bottom Log Interval	3057.5 m		
Top Log Interval	3015 m		
Casing Fluid Type	Production Fluid		
Salinity			
Density			
Fluid Level	309 m		
BIT/CASING/TUBING STRING			
Bit Size	9.875 in		
From	655.7 m		
To	3120 m		
Casing/Tubing Size	7.000 in		
Weight	26 lbm/ft		
Grade	L-80		
From	20.83 m		
To	3115.66 m		
Maximum Recorded Temperatures	106 degC		
Logger On Bottom	20-Mar-2010	8:40	
Unit Number	889	AUSL	
Recorded By	C. Rowand / W. Mackenzie		
Witnessed By	D. Madden		

	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	51.2 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: 20-MAR-2010 12:48:41

### Logging Cable

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

Log Sequence:	Subsequent Trip To the Well
Reference Log Name:	Cobia A15B Correlation Logs
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 20.09m
3. Depth correlated to single peak & trough between 3030 – 3033m
4. Due to LSA scale observed over perforations and GR anomaly at 3023 – 3030m
5. EOT observed at 2084.5m, NOGO at 2080.5m – schematic depths 2999 & 2995m
- 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 3060 – 3020m
2. Log correlated to Solar Composite Log provided by client
3. Logged background GR/CCL log from 2975 – 3061.5m at 1800ft/hr
4. Logged two shut-in Sigma passes from 3057.5 – 3015m at 700ft/hr
5. HUD was tagged at 3061.5m
6. All depths are MDPB

Logging Parameters:					
MATR: Sandstone, CSIZ: 7", CWEI: 26lb/ft, BS: 8.5", BSAL: UNKNOWN					

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					

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

4.24

4.09

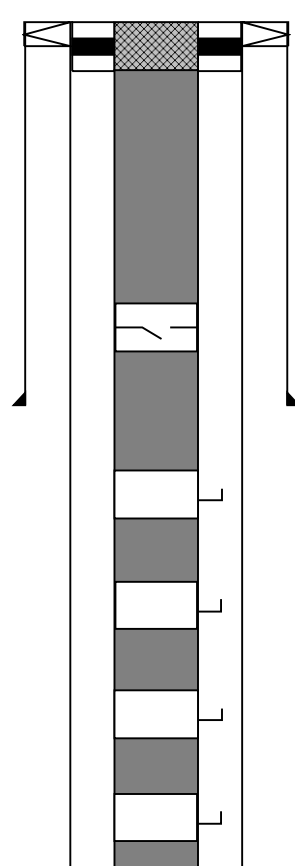
Tension HV 0.00  
TOOL ZERO

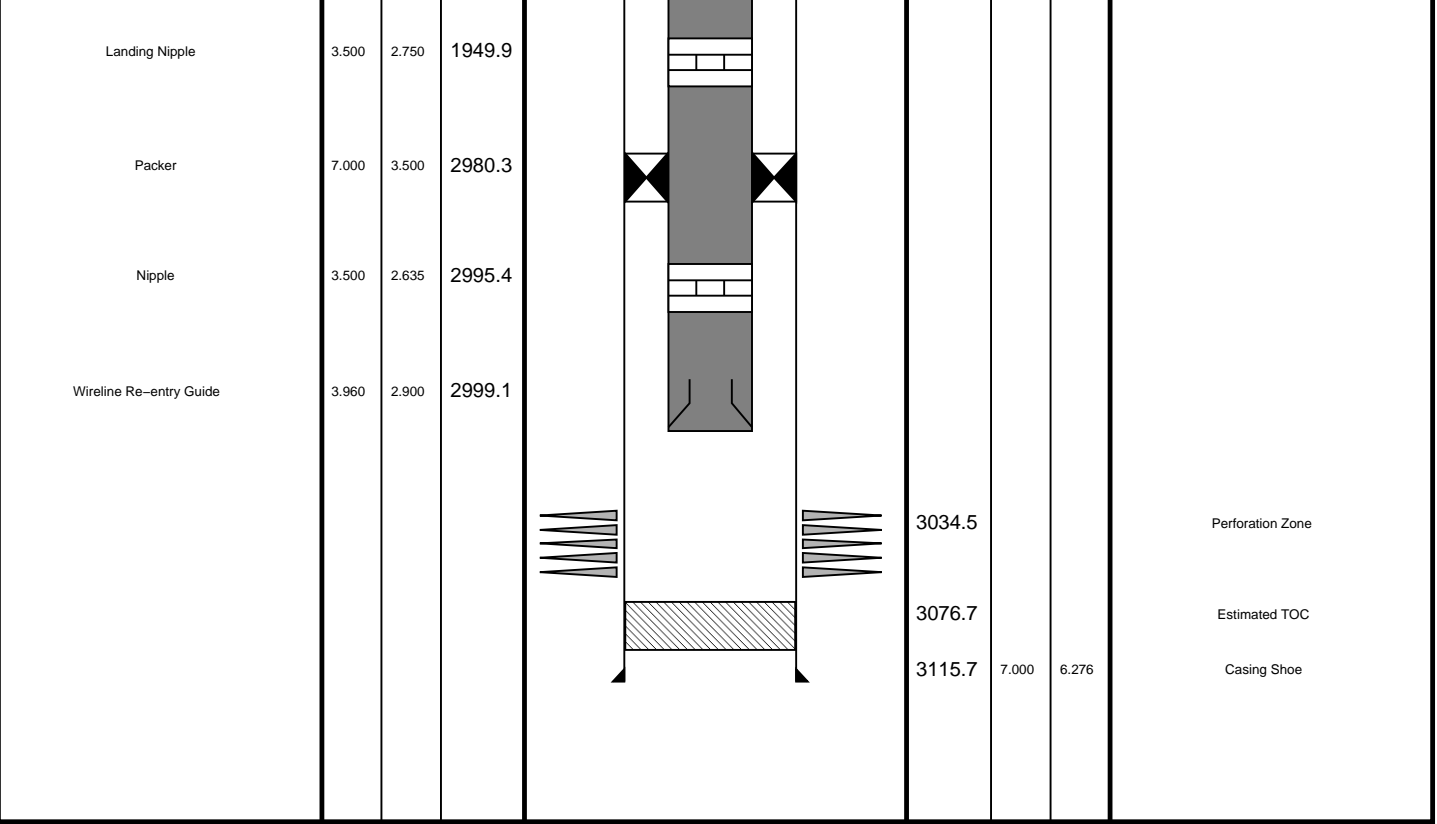
MAXIMUM STRING DIAMETER 1.72 IN  
MEASUREMENTS RELATIVE TO TOOL ZERO  
ALL LENGTHS IN METERS

Client: Esso Australia Pty Ltd  
Well: COBIA A15B  
Field: HALIBUT  
State: Victoria  
Country: Australia

Drawing Date: 2/23/2010

Rig Name: Crane / Prod4  
Reference Datum: Mean Sea Level  
Elevation: 0.0 m

Production String	(in)		(m)	Well Schematic	(m)	(in)		Casing String
	OD	ID	MD		MD	OD	ID	
Tubing Hanger	7.000	3.500	20.1		21.3	10.750	10.050	Casing String Casing String
Tubing	3.500	2.992	20.6		20.8	7.000	6.276	
SSSV	3.500	2.750	450.0		655.7	10.750	10.050	Casing Shoe
Side Pocket Mandrel	3.500	2.867	1042.2					
Side Pocket Mandrel	3.500	2.867	1476.5					
Side Pocket Mandrel	3.500	2.867	1713.8					
Side Pocket Mandrel	3.500	2.867	1934.9					



All Depths are Drillers Depths  
Not to Scale



Merged Sigma Passes  
Shut In

MAXIS Field Log

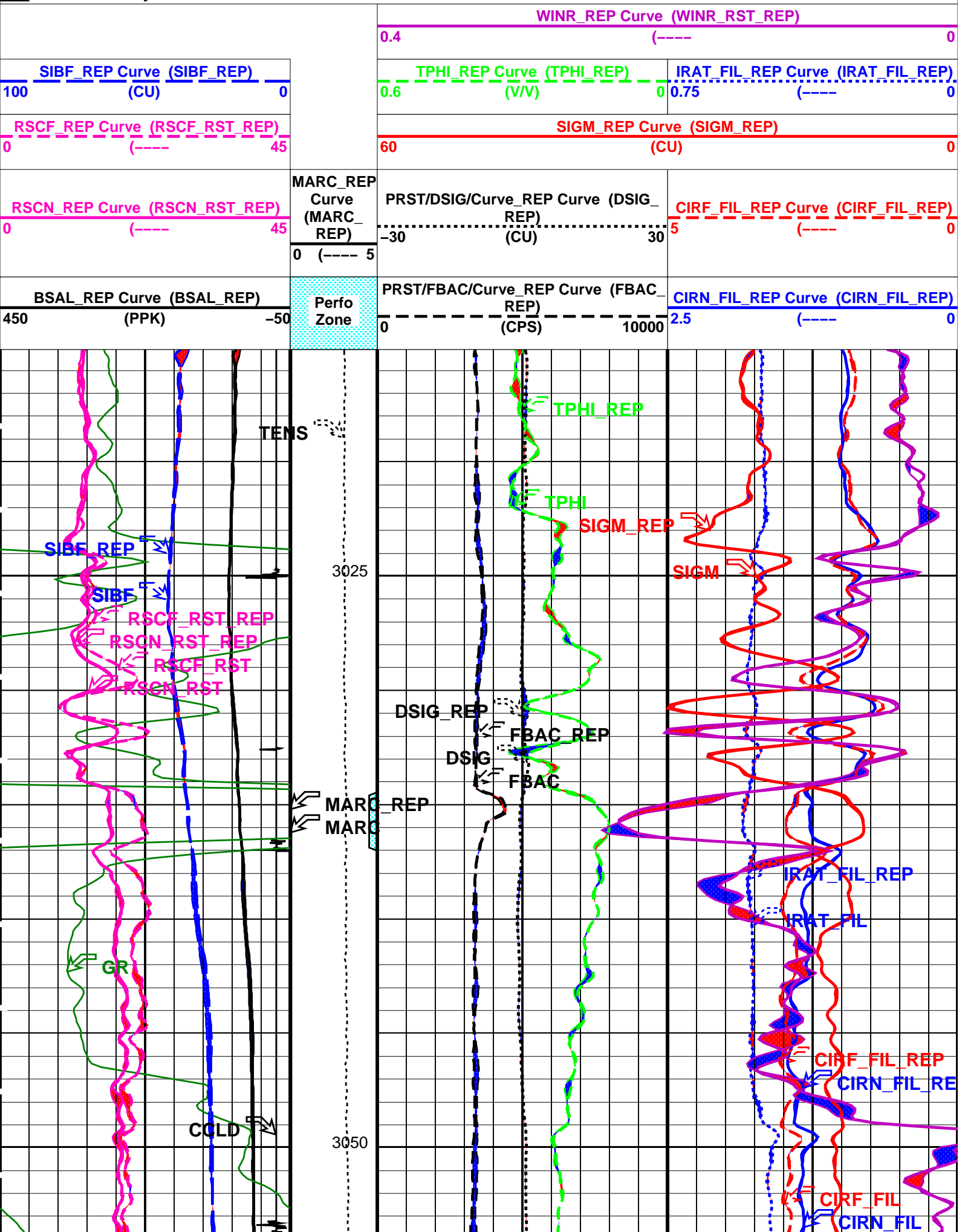
Company: Esso Australia Pty. Ltd. Well: COBIA A15B

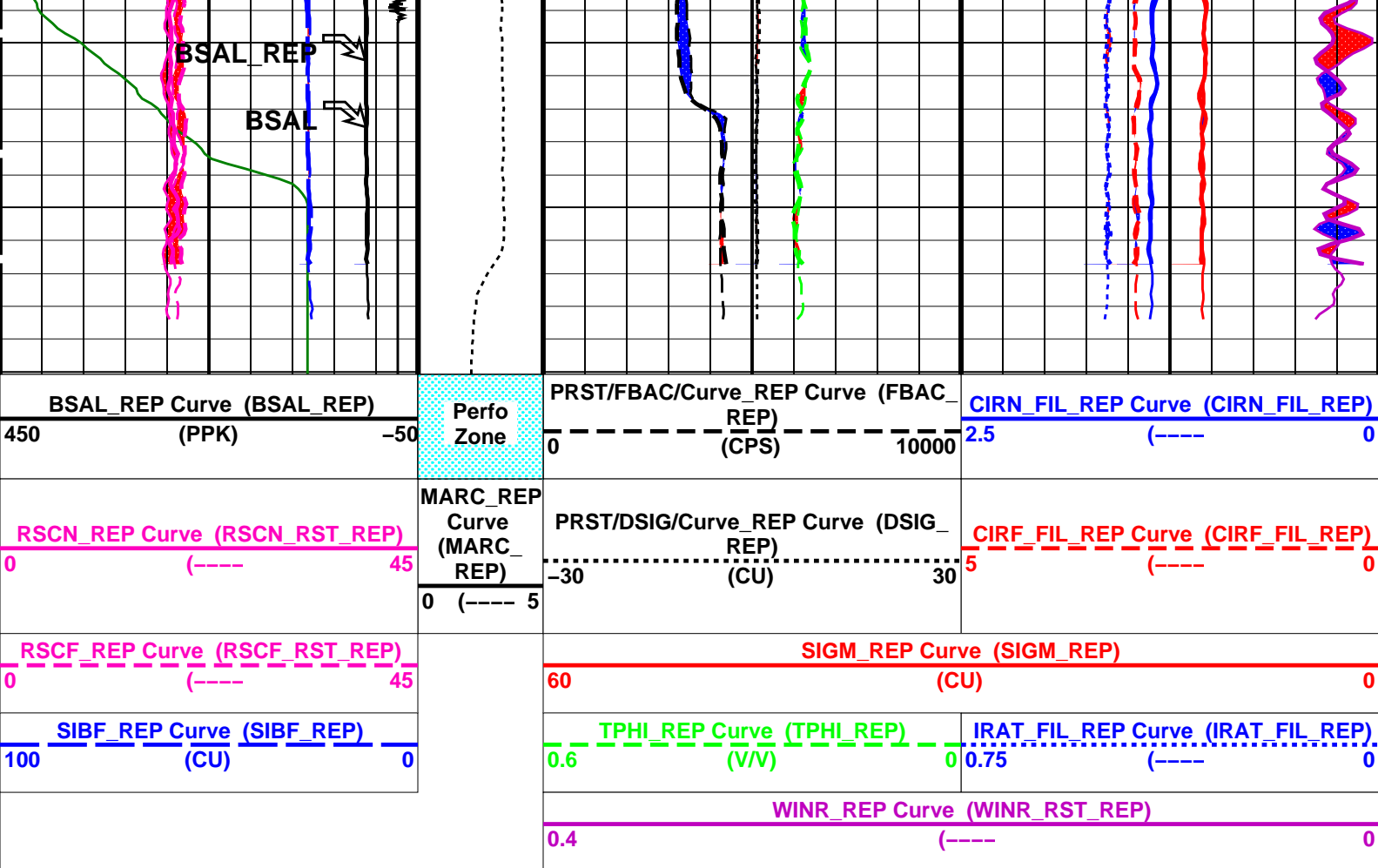
Input DLIS Files						
DEFAULT	RST_PSP_009PUP	FN:18	PRODUCER	20-Mar-2010 11:33	3065.1 M	3014.9 M
Output DLIS Files						
DEFAULT	RST_PSP_010PUP	FN:21	PRODUCER	20-Mar-2010 12:09	3065.1 M	3014.9 M
CUSTOMER	RST_PSP_010PUC	FN:22	CUSTOMER	20-Mar-2010 12:09	3065.1 M	3014.9 M
CUST_FILT	RST_PSP_010PUC	FN:23	CUSTOMER	20-Mar-2010 12:09	3065.1 M	3014.9 M

OP System Version: 17C0-154

# PIP SUMMARY

Time Mark Every 60 S





#### PIP SUMMARY

Time Mark Every 60 S

Format: RST\_SIG\_ANSW\_REP Vertical Scale: 1:200

Graphics File Created: 20-Mar-2010 12:09

### OP System Version: 17C0-154

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

#### Input DLIS Files

File Name	FN	PRODUCER	Date	Size	Size
DEFAULT RST_PSP_009PUP	FN:18	PRODUCER	20-Mar-2010 11:33	3065.1 M	3014.9 M

#### Output DLIS Files

File Name	FN	PRODUCER	Date
DEFAULT RST_PSP_010PUP	FN:21	PRODUCER	20-Mar-2010 12:09
CUSTOMER RST_PSP_010PUC	FN:22	CUSTOMER	20-Mar-2010 12:09
CUST_FILT RST_PSP_010PUC	FN:23	CUSTOMER	20-Mar-2010 12:09

**Schlumberger**

**RST Sigma Pass # 2  
Shut In**

MAXIS Field Log

Input DLIS Files

DEFAULT RST\_PSP\_010LUP FN:9 PRODUCER 20-Mar-2010 09:33 3067.5 M 2963.4 M

Output DLIS Files

DEFAULT RST\_PSP\_010PUP FN:21 PRODUCER 20-Mar-2010 12:09 3065.1 M 3014.9 M  
CUSTOMER RST\_PSP\_010PUC FN:22 CUSTOMER 20-Mar-2010 12:09 3065.1 M 3014.9 M  
CUST\_FILT RST\_PSP\_010PUC FN:23 CUSTOMER 20-Mar-2010 12:09 3065.1 M 3014.9 M

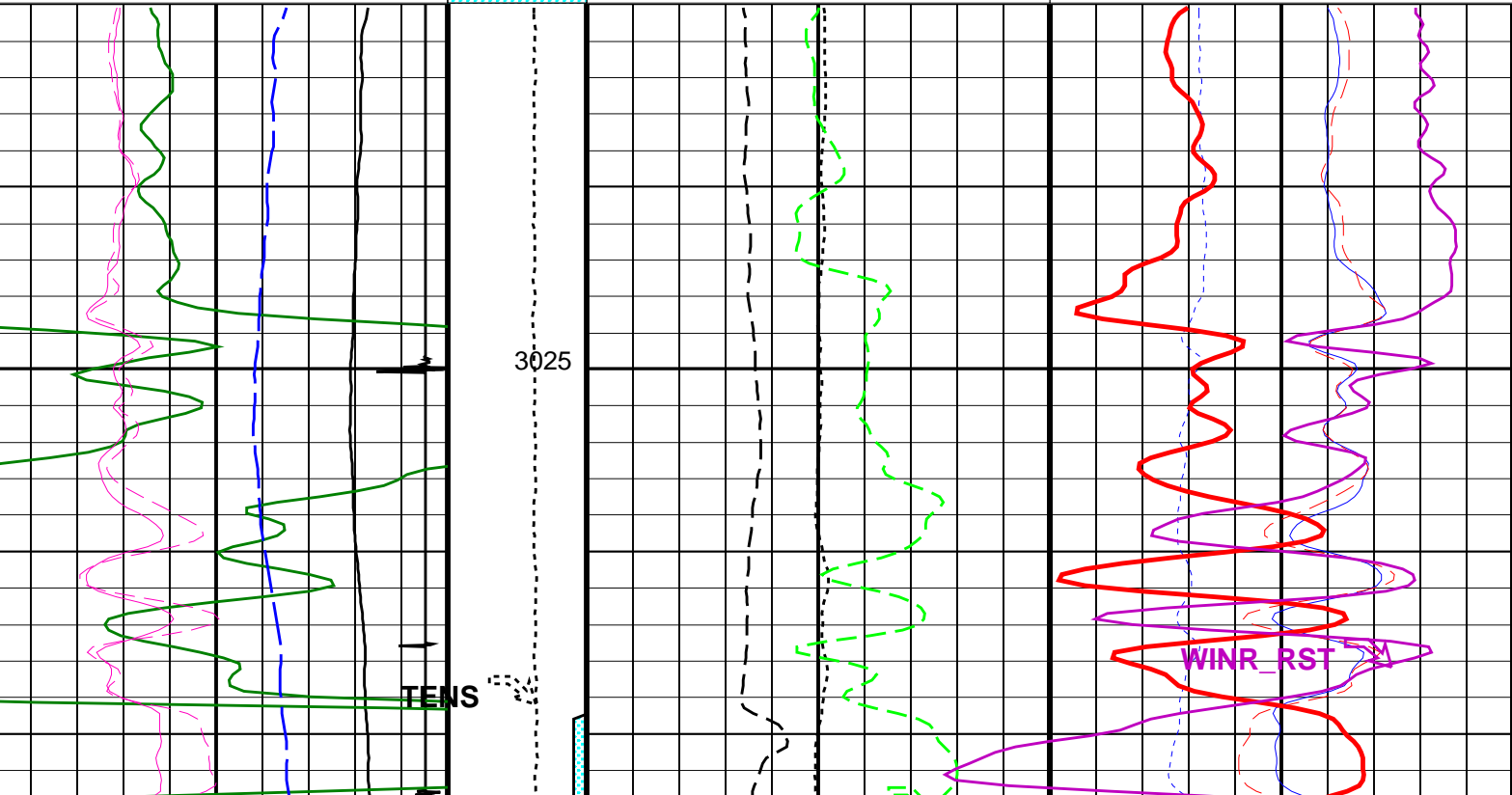
OP System Version: 17C0-154

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

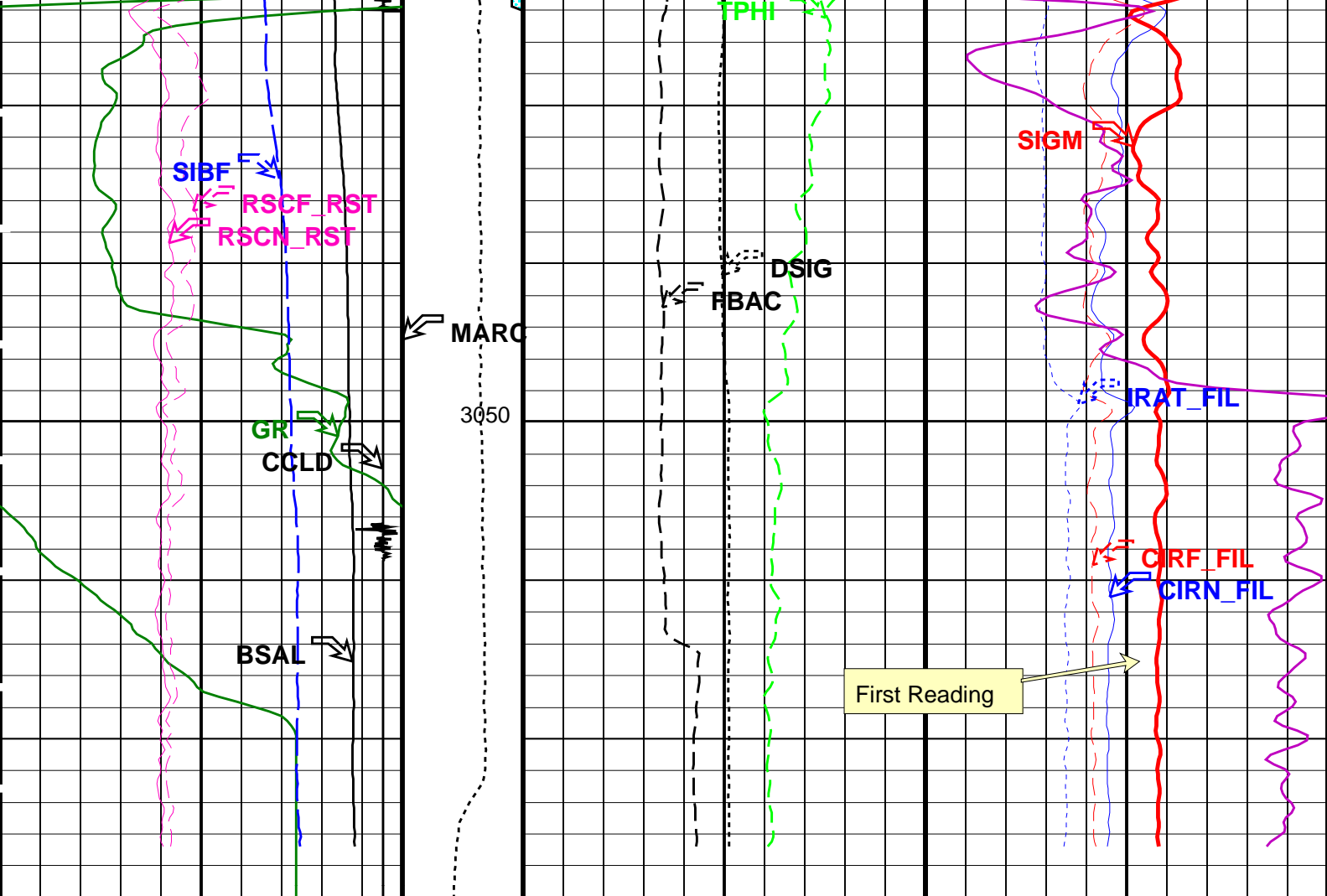
PIP SUMMARY

Time Mark Every 60 S

RST Far Effective Capture CR (RSCF_RST) 0 (----) 45		RST Weighted Inelastic Ratio (WINR_RST) 0.4 (----) 0	
RST Near Effective Capture CR (RSCN_RST) 0 (----) 45		RST Porosity (TPHI) (V/V) 0.6 (----) 0	
RST Sigma Borehole Fluid (SIBF) 100 (CU) 0		RST Inelastic Ratio (IRAT_FIL) 0.75 (----) 0	
Gamma Ray (GR) (GAPI) 0 150		RST Sigma (SIGM) 60 (CU) 0	
Discriminated CCL (CCLD) -19 (V) 1		RST Sigma Difference (DSIG) -30 (CU) 30	
RST Borehole Salinity (BSAL) 450 (PPK) -50		RST Capture to Inelastic Ratio Far (CIRF_FIL) 5 (----) 0	
		RST Capture to Inelastic Ratio Near (CIRN_FIL) 2.5 (----) 0	
		MCS Far Background (filtered) (FBAC) 0 (CPS) 10000	







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) (CU)	100	0		RST Porosity (TPHI) (V/V)	0.6	0	RST Inelastic Ratio (IRAT_FIL) (----	0.75	(----	0
RST Near Effective Capture CR (RSCN_RST) (----	0	45		RST Weighted Inelastic Ratio (WINR_RST) (----	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
RUS	RST Reservoir Saturation	CASE

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	9.875	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	0.2	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: 20-Mar-2010 12:09

## 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:9	PRODUCER	20-Mar-2010 09:33	3067.5 M	2963.4 M
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### Output DLIS Files

DEFAULT	RST_PSP_010PUP	FN:21	PRODUCER	20-Mar-2010 12:09		
CUSTOMER	RST_PSP_010PUC	FN:22	CUSTOMER	20-Mar-2010 12:09		
CUST_FILT	RST_PSP_010PUC	FN:23	CUSTOMER	20-Mar-2010 12:09		

**Schlumberger**

**RST Sigma Pass # 1  
Shut In**

MAXIS Field Log

Company: Esso Australia Pty. Ltd.    Well: COBIA A15B

### Input DLIS Files

DEFAULT	RST_PSP_009LUP	FN:8	PRODUCER	20-Mar-2010 09:03	3066.0 M	2961.9 M
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### Output DLIS Files

DEFAULT	RST_PSP_009PUP	FN:18	PRODUCER	20-Mar-2010 11:33	3065.1 M	3014.9 M
CUSTOMER	RST_PSP_009PUC	FN:19	CUSTOMER	20-Mar-2010 11:33	3065.1 M	3014.9 M
CUST_FILT	RST_PSP_009PUC	FN:20	CUSTOMER	20-Mar-2010 11:33	3065.1 M	3014.9 M

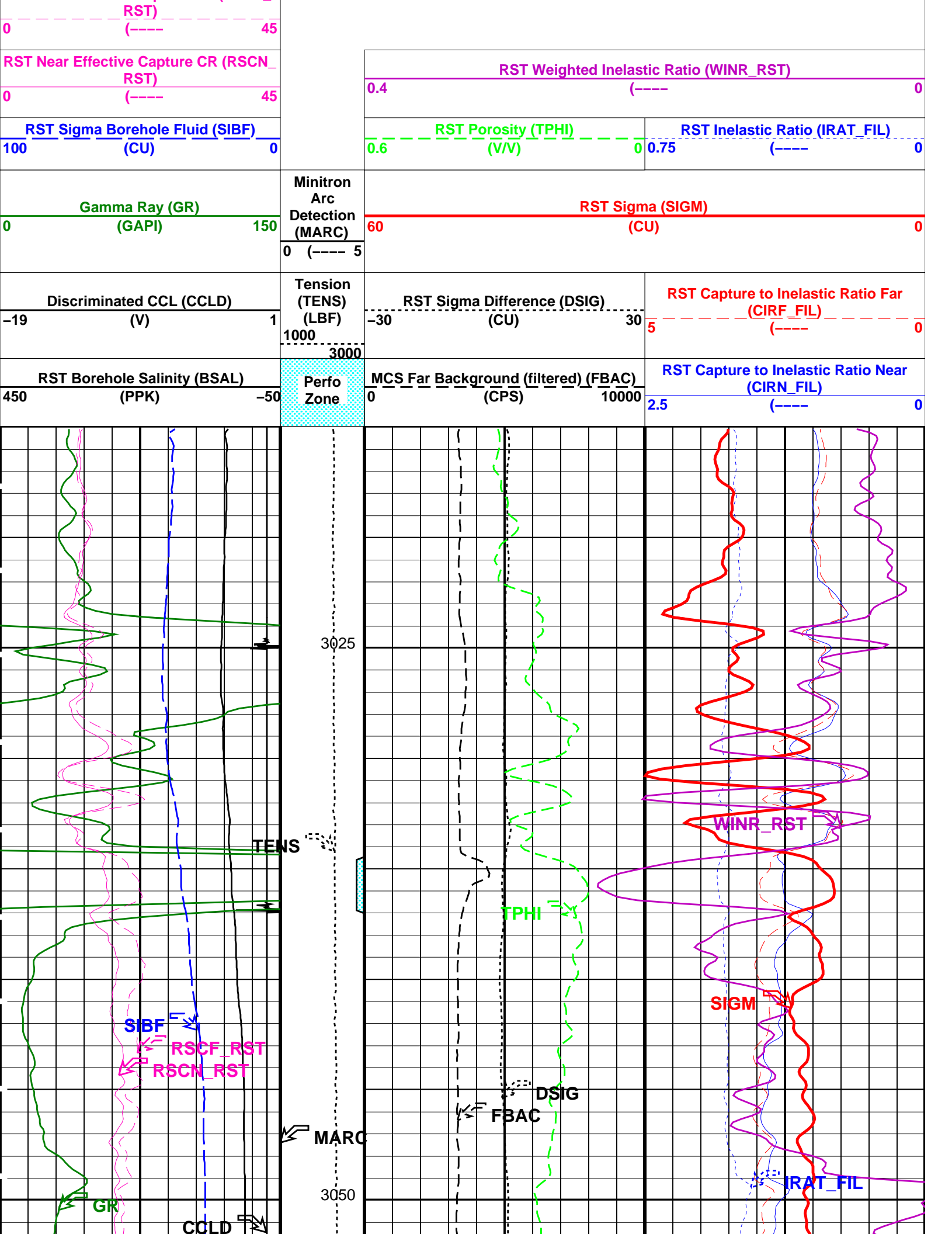
## OP System Version: 17C0-154

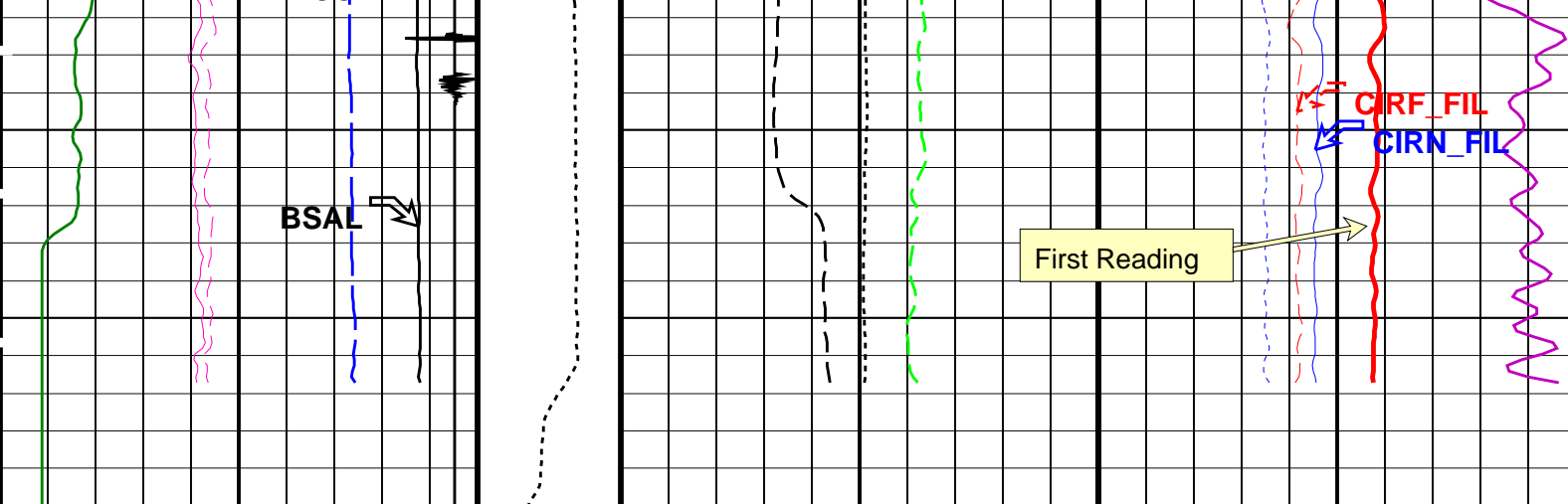
RST-C    SRPC-3870\_Q3\_2009\_OP17\_V3    PSPT    SRPC-3870\_Q3\_2009\_OP17\_V3

PIP SUMMARY

Time Mark Every 60 S

RST Far Effective Capture CR (RSCF





RST Borehole Salinity (BSAL)		Perfo Zone	MCS Far Background (filtered) (FBAC)	RST Capture to Inelastic Ratio Near	
450 (PPK)	-50		0 (CPS)	10000	(CIRN_FIL)
					2.5 (----) 0
Discriminated CCL (CCLD)		Tension (TENS) (LBF)	RST Sigma Difference (DSIG)	RST Capture to Inelastic Ratio Far	
-19 (V)	1	1000	-30 (CU)	30	(CIRF_FIL)
		3000			5 (----) 0
		Minitron Arc Detection (MARC)			
Gamma Ray (GR)		0 (----) 5	RST Sigma (SIGM)		
0 (GAPI)	150		60 (CU)	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
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	9.875 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	0.0 M
PP	Playback Processing	NORMAL

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

## Input DLIS Files

DEFAULT	RST_PSP_009LUP	FN:8	PRODUCER	20-Mar-2010 09:03	3066.0 M	2961.9 M
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## Output DLIS Files

DEFAULT	RST_PSP_009PUP	FN:18	PRODUCER	20-Mar-2010 11:33		
CUSTOMER	RST_PSP_009PUC	FN:19	CUSTOMER	20-Mar-2010 11:33		
CUST_FILT	RST_PSP_009PUC	FN:20	CUSTOMER	20-Mar-2010 11:33		

Background GR Survey  
Shut In

MAXIS Field Log

Company: Esso Australia Pty. Ltd.

Well: COBIA A15B

## Input DLIS Files

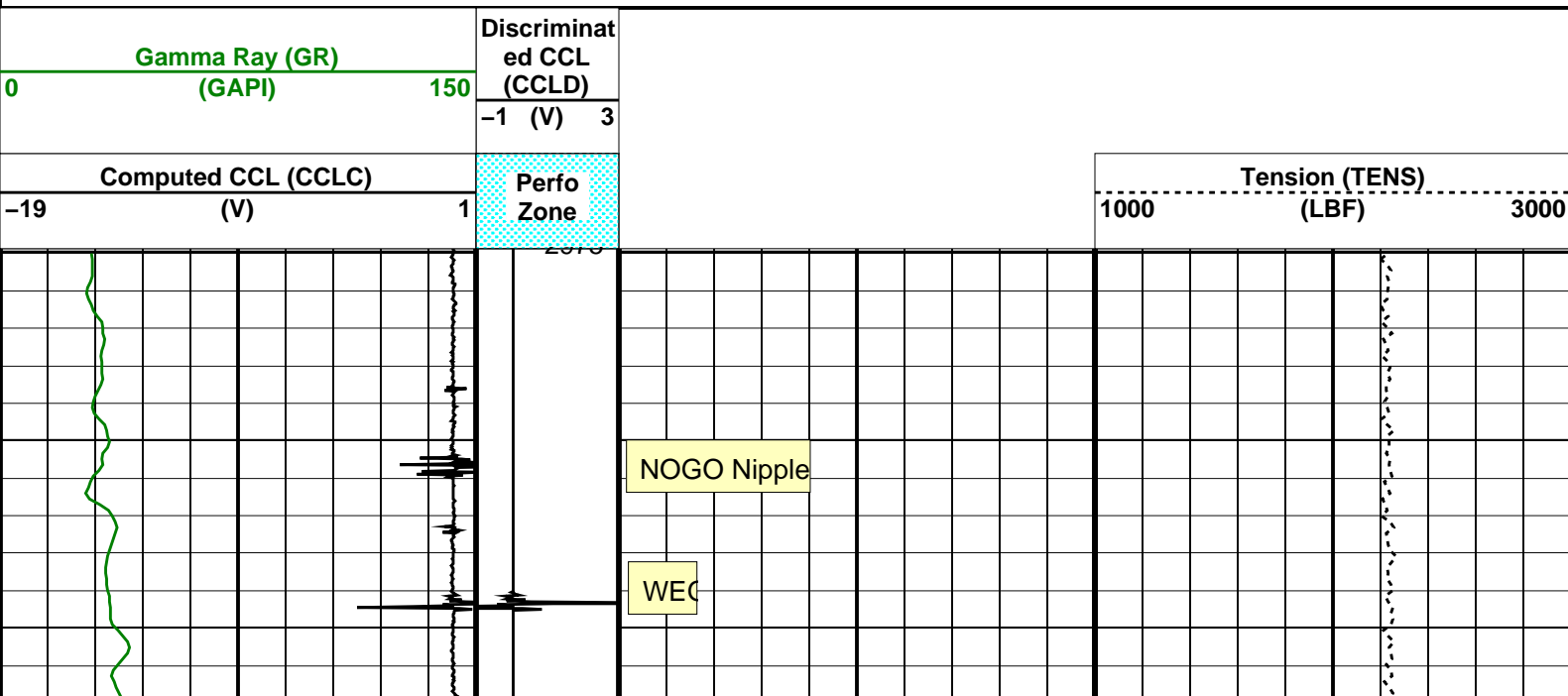
DEFAULT	RST_PSP_008LUP	FN:7	PRODUCER	20-Mar-2010 08:42	3069.9 M	2962.4 M
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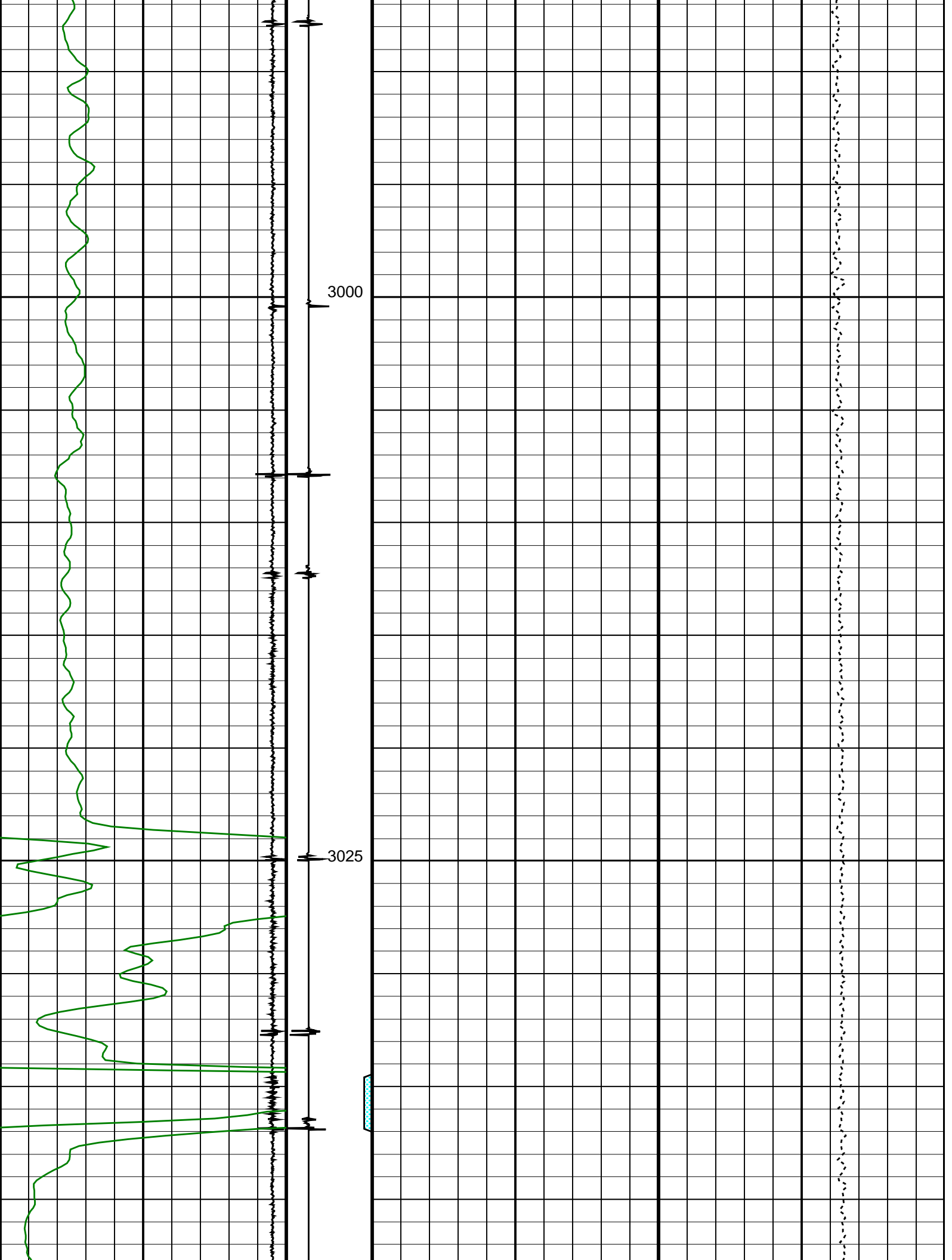
## Output DLIS Files

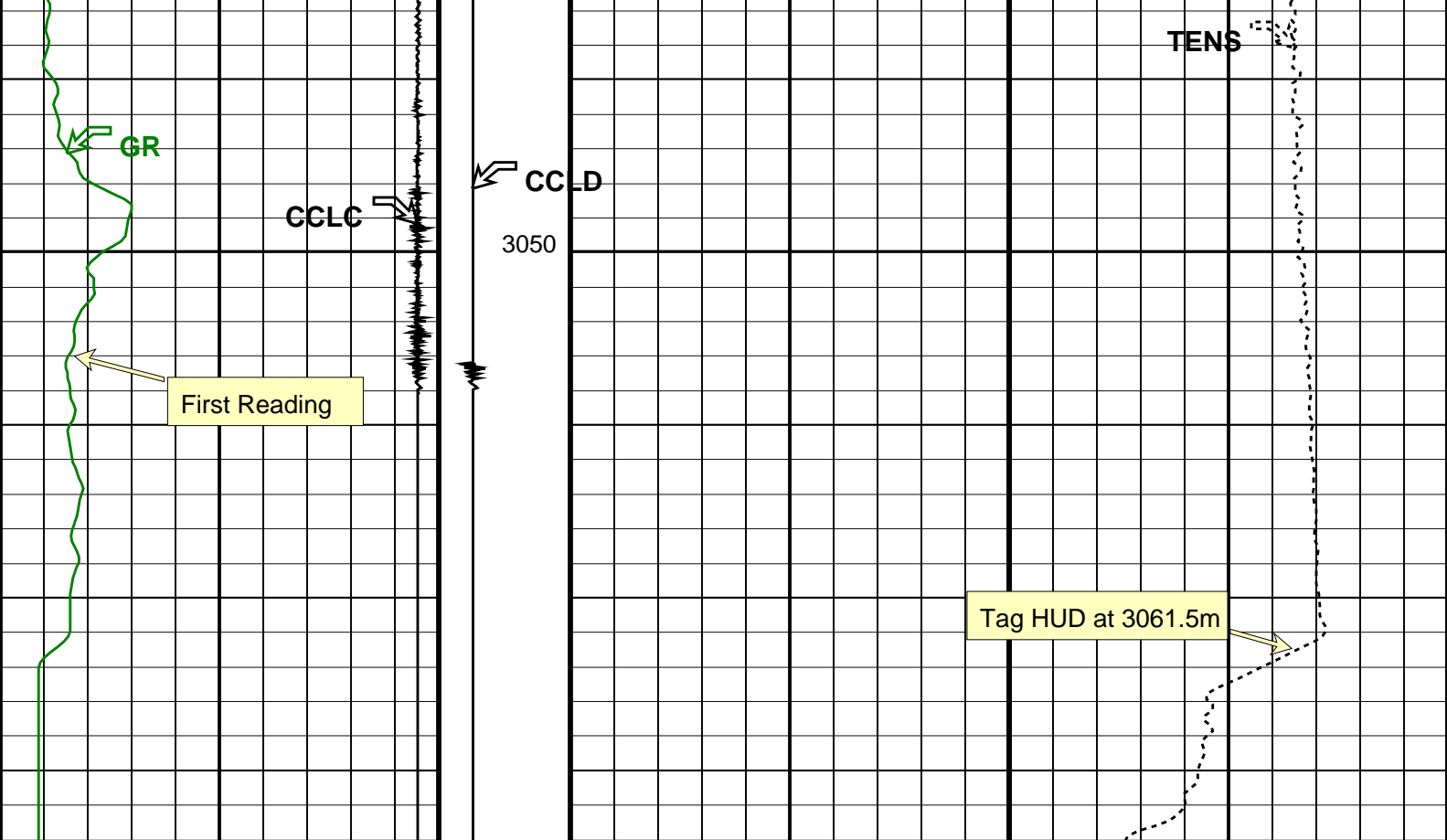
DEFAULT	RST_PSP_008PUP	FN:12	PRODUCER	20-Mar-2010 11:03	3067.1 M	2974.8 M
CUSTOMER	RST_PSP_008PUC	FN:13	CUSTOMER	20-Mar-2010 11:03	3067.1 M	2974.8 M
CUST_FILT	RST_PSP_008PUC	FN:14	CUSTOMER	20-Mar-2010 11:03	3067.1 M	2974.8 M

## OP System Version: 17C0-154

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







Computed CCL (CCLC)			Perfo Zone	Tension (TENS)		
-19	(V)	1		1000	(LBF)	3000
Gamma Ray (GR)			Discriminat ed CCL (CCLD)			
0	(GAPI)	150				
			-1 (V)	3		

Parameters		
DLIS Name	Description	Value
DO	System and Miscellaneous	
PP	Depth Offset for Playback	-0.2 M
	Playback Processing	NORMAL

Format: CORRELATION	Vertical Scale: 1:200	Graphics File Created: 20-Mar-2010 11:03
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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_008LUP	FN:7	PRODUCER	20-Mar-2010 08:42	3069.9 M	2962.4 M
Output DLIS Files						
DEFAULT	RST_PSP_008PUP	FN:12	PRODUCER	20-Mar-2010 11:03		
CUSTOMER	RST_PSP_008PUC	FN:13	CUSTOMER	20-Mar-2010 11:03		
CUST_FILT	RST_PSP_008PUC	FN:14	CUSTOMER	20-Mar-2010 11:03		



Before Survey  
Calibration

# MAXIS Field Log

## Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
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Production Services Logging Platform Wellsite Calibration – Detector Calibration

Before: 19-Mar-2010 14:10

Gamma-Ray Jig-Bkg	125.0	N/A	132.0	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			7.217	Before			132.0
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		110.0 (Minimum)	125.0 (Nominal)	140.0 (Maximum)

Before: 19-Mar-2010 14:10

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

**Schlumberger**

Well: **COBIA A15B**

Field: **HALIBUT**

Rig: **Crane / Prod 4**

Country: **Australia**

RST-C

Sigma Log

20-Mar-2010