

Company: Esso Australia Pty Ltd.

Well: COBIA A33
Field: HALIBUT
Rig: Crane / Prod 4

Country: Australia

RST-C
Sigma Log
16-Mar-2010

Rig: Crane / Prod 4
Field: HALIBUT
Location: Gippsland
Well: COBIA A33
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:	M.S.L. _____
Log Measured From:	K.B. _____
Drilling Measured From:	K.B. _____
State: Victoria	Max. Well Deviation 16.2 deg
	Longitude 148 18' 28.3" E
	Latitude 38 27' 03.5" S

Logging Date	16-Mar-2010		
Run Number	One		
Depth Driller	2579 m		
Schlumberger Depth	2537 m		
Bottom Log Interval	2532 m		
Top Log Interval	2455 m		
Casing Fluid Type	Production Fluid		
Salinity			
Density			
Fluid Level	185 m		
BIT/CASING/TUBING STRING			
Bit Size	9.875 in		
From	589.6 m		
To	2579 m		
Casing/Tubing Size	7.000 in		
Weight	26 lbn/ft		
Grade	L-80		
From	20.68 m		
To	2562.81 m		
Maximum Recorded Temperatures	108 degC		
Logger On Bottom	16-Mar-2010	9:15	
Unit Number	889	AUSL	
Recorded By	C. Rowand / W. Mackenzie		
Witnessed By	B. White		

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	16.2 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: 16-MAR-2010 9:52:16

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 Petro Analysis
Reference Log Run Number:	Composite
Reference Log Date:	
Subsequent Trip Down Log Correction:	-3.70 M

1. Rigged up on main deck using the platform crane
2. Tool Zero is referenced from the Tubing Hanger at 21.03m.
3. Depth correlated over the interval: 2480–2500m.
- 4.
- 5.
6. Tension: $a = 3.75 \text{ E-}5$, $b = 0.8051$ & $c = -129.5$

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

All depths are MDKB.

Logging Parameters:









MATR = Sandstone, CSIZ = 7", CWEI = 26 lb/ft, BS = 9-7/8" , BSAL = -50000 ppm.

From 2475m to 2460m the CWEI is zoned (changed) to 35.2 lb/ft.

Found possible PIP tag at 2412m

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-SWBH MH-SWBH 759		13.35			
AH-SWBS AH-SWBS 785		13.03			
AH-SWBS AH-SWBS 789		12.33			
AH-SWBS AH-SWBS 786		11.63			
AH-SWBS AH-SWBS 787		10.93			
AH-SWBS AH-SWBS 788		10.24			
PSPT PSC-A 2760 PSPT-B PSTC-A 2760 PBMS-B 1750 CQG_F_Mano 1750 RTD_Thermometer 1750 GR 1750 CCL 1750 PBMS-B 1750		9.54			
	Detail MT TelStatus CTEM	9.54			
	GR	8.41			
	Well_Temp CQG Manom CCL PBMS PSTC	7.48 7.37 7.25 7.02			
RST-C RSCH-A 471 RSC-C 488 RSS-A 437 RSXH-A 500 RSC-C 412		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

Client: Esso Australia Pty Ltd

Drawing Date: 2/23/2010

Well: CBA A33

Field: Halibut

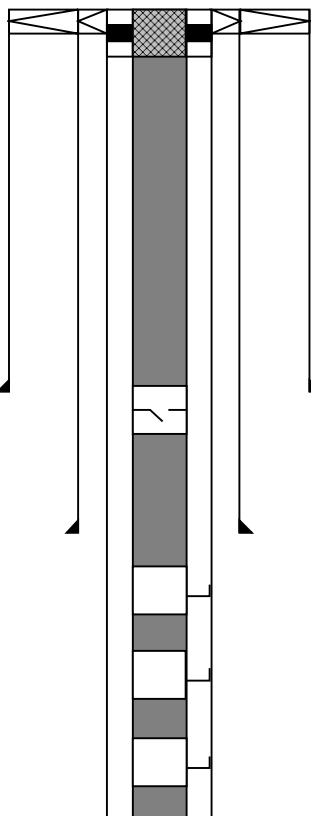
Rig Name: Crane / Prod4

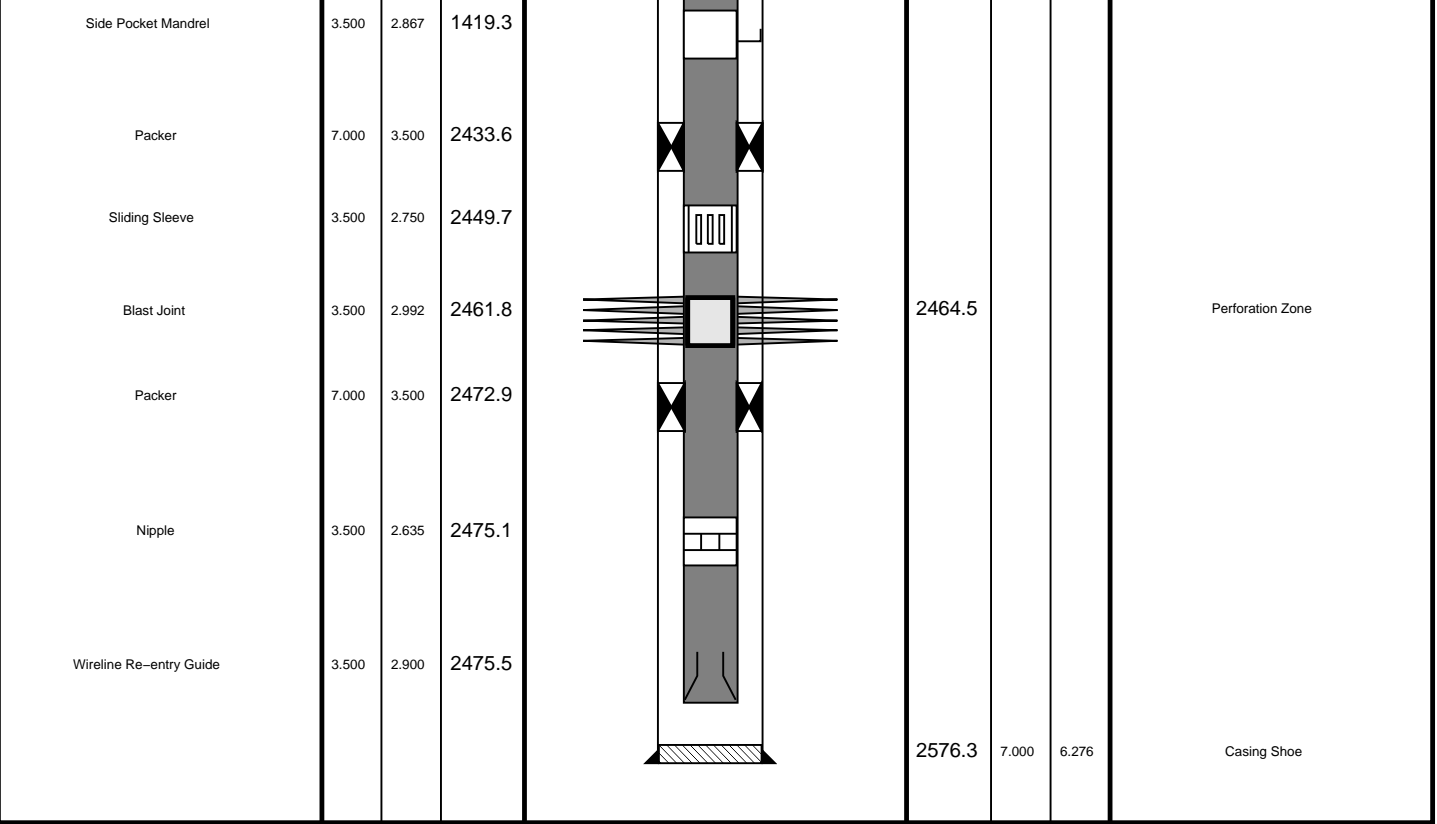
State: Victoria

Reference Datum: Mean Sea Level

Country: Australia

Elevation: 0.0 m

Production String	(in)		(m)	Well Schematic	(m)		(in)	Casing String	
	OD	ID	MD		MD	OD	ID		
Tubing Hanger Tubing	7.000	3.500	21.0		20.7	7.000	6.276	Production Casing Conductor Pipe Surface Casing	
					21.6	20.000	18.638		
					21.6	10.750	10.050		
Injection Valve	3.500	2.750	452.1			201.3	20.000	18.638	Casing Shoe
Side Pocket Mandrel	3.500	2.867	889.5			587.6	10.750	10.050	Casing Shoe
Side Pocket Mandrel	3.500	2.867	1175.1						
Side Pocket Mandrel	3.500	2.867	1307.2						



All Depths are Drillers Depths



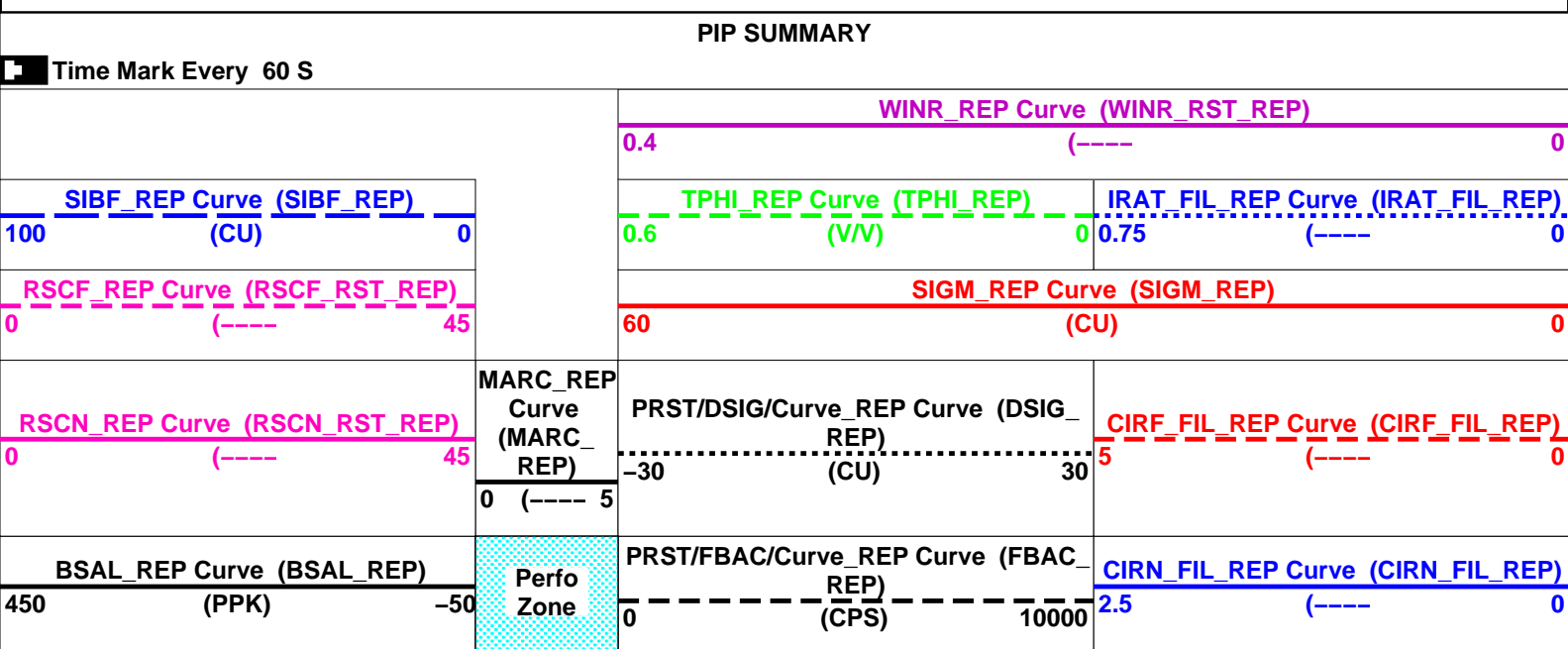
Merged Sigma Passes
Shut In

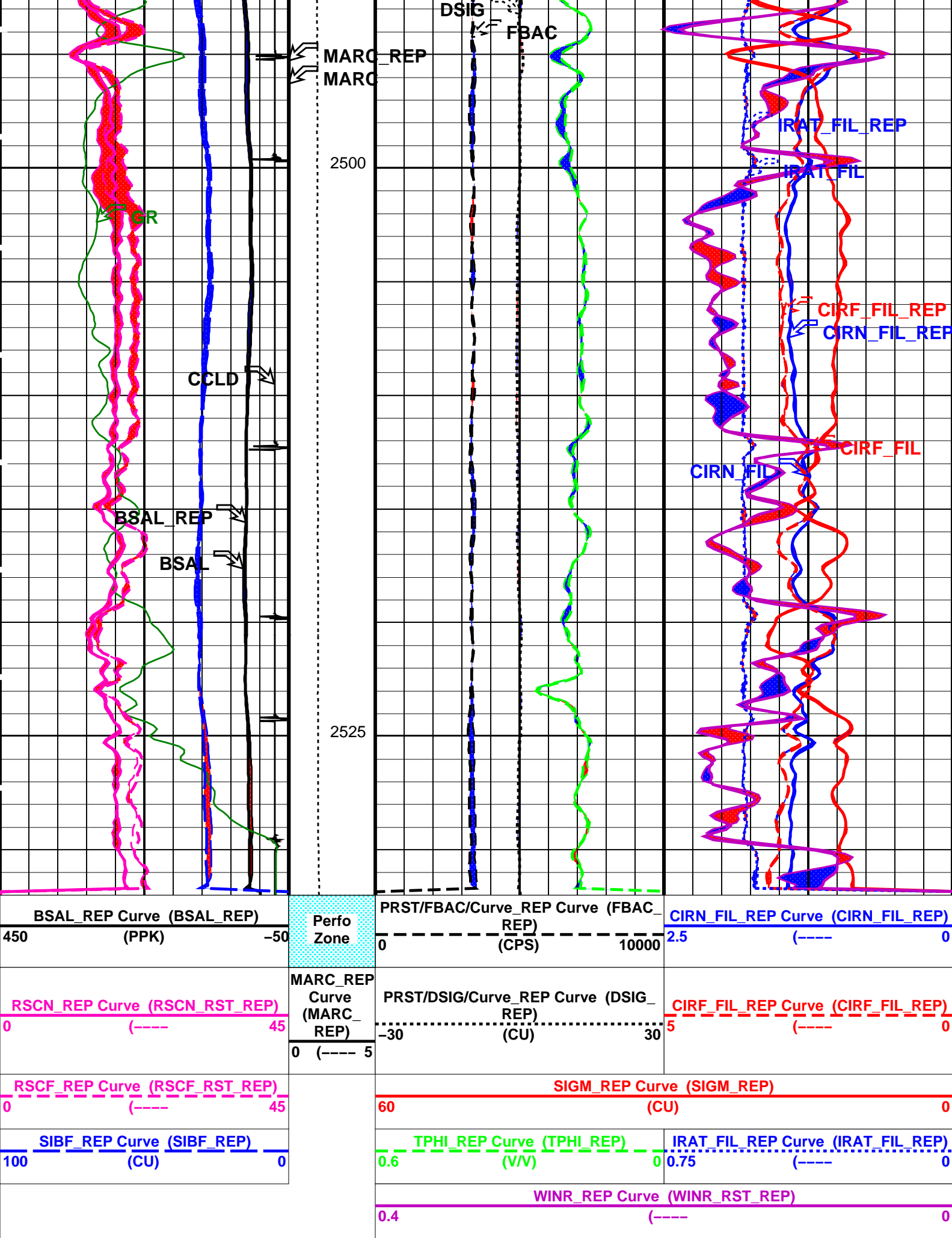
MAXIS Field Log

Company: Esso Australia Pty Ltd. Well: COBIA A33

Input DLIS Files						
DEFAULT	RST_PSP_008LUP	FN:7	PRODUCER	16-Mar-2010 10:06	2537.9 M	2438.9 M
DEFAULT	RST_PSP_007PUP	FN:24	PRODUCER	16-Mar-2010 15:53	2532.0 M	2454.9 M
Output DLIS Files						
DEFAULT	RST_PSP_008PUP	FN:27	PRODUCER	16-Mar-2010 16:08	2532.0 M	2454.9 M
CUSTOMER	RST_PSP_008PUC	FN:28	CUSTOMER	16-Mar-2010 16:08	2532.0 M	2454.9 M
CUST_FILT	RST_PSP_008PUC	FN:29	CUSTOMER	16-Mar-2010 16:08	2532.0 M	2454.9 M

OP System Version: 17C0-154





PIP SUMMARY

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	16-Mar-2010 10:06	2537.9 M	2438.9 M
DEFAULT	RST_PSP_007PUP	FN:24	PRODUCER	16-Mar-2010 15:53	2532.0 M	2454.9 M
Output DLIS Files						
DEFAULT	RST_PSP_008PUP	FN:27	PRODUCER	16-Mar-2010 16:08		
CUSTOMER	RST_PSP_008PUC	FN:28	CUSTOMER	16-Mar-2010 16:08		
CUST_FILT	RST_PSP_008PUC	FN:29	CUSTOMER	16-Mar-2010 16:08		



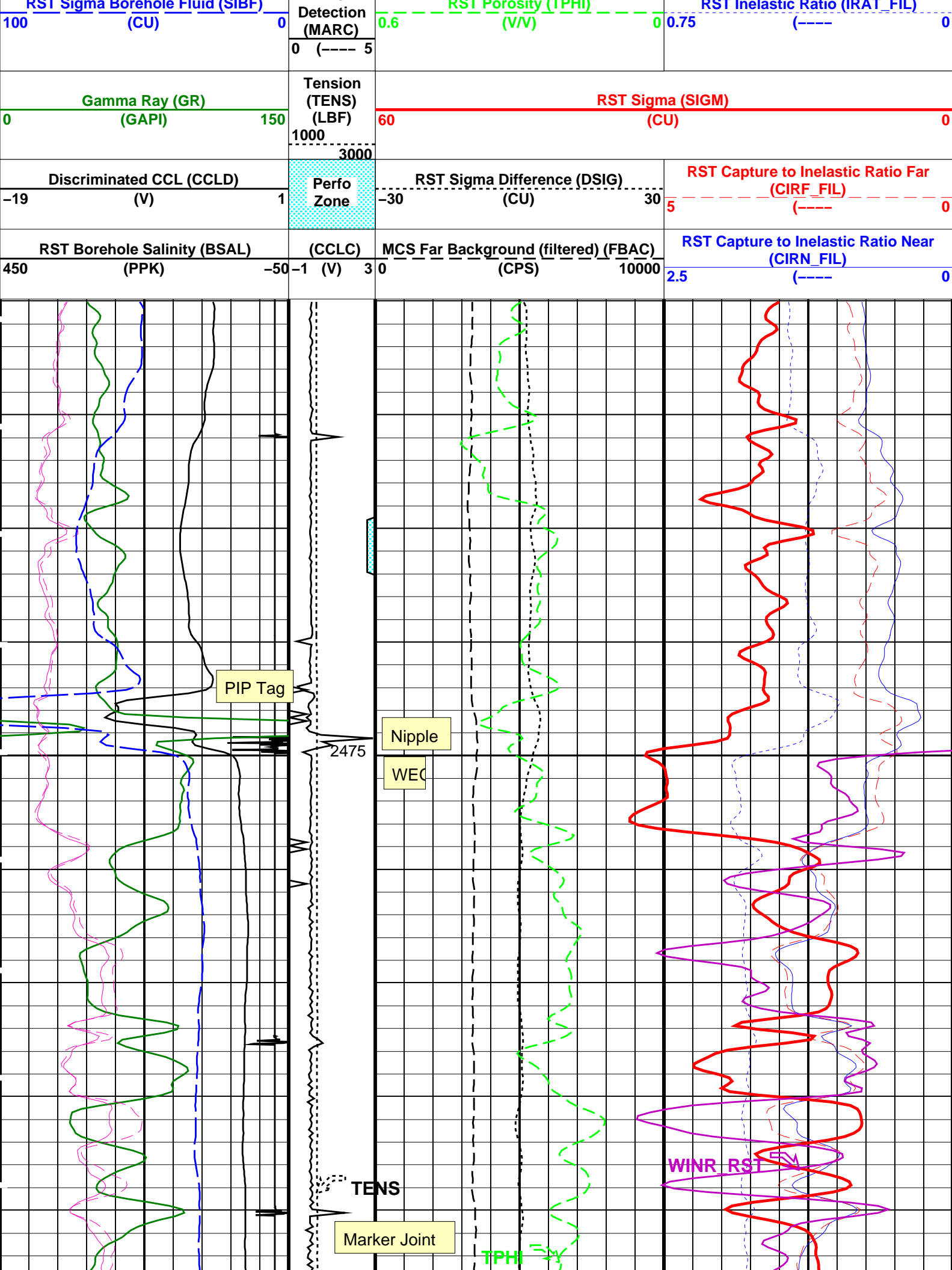
RST Sigma Pass # 2

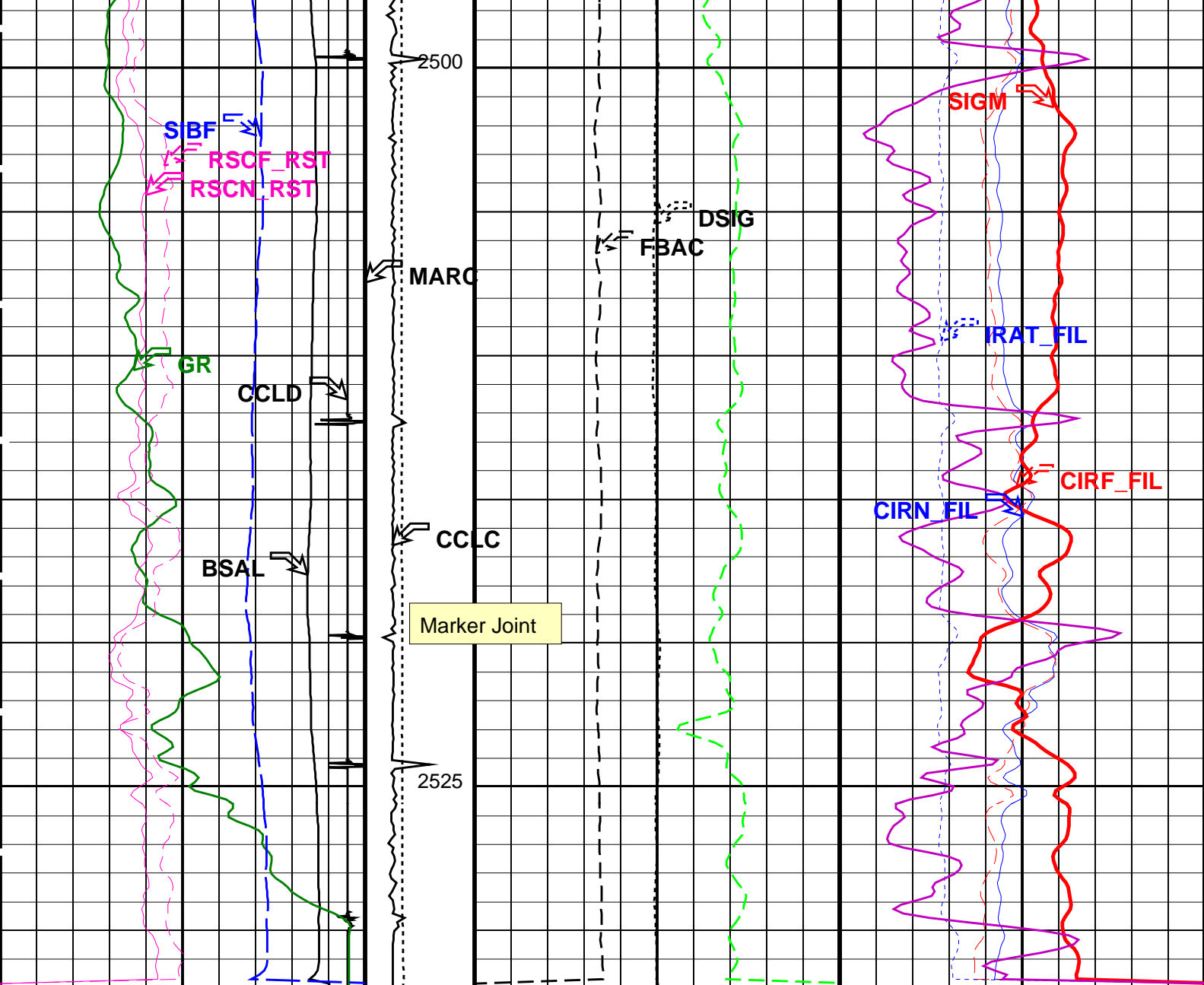
Shut In

MAXIS Field Log

Company: Esso Australia Pty Ltd.				Well: COBIA A33		
Input DLIS Files						
DEFAULT	RST_PSP_008LUP	FN:7	PRODUCER	16-Mar-2010 10:06	2537.9 M	2438.9 M
Output DLIS Files						
DEFAULT	RST_PSP_008PUP	FN:27	PRODUCER	16-Mar-2010 16:08	2532.0 M	2454.9 M
CUSTOMER	RST_PSP_008PUC	FN:28	CUSTOMER	16-Mar-2010 16:08	2532.0 M	2454.9 M
CUST_FILT	RST_PSP_008PUC	FN:29	CUSTOMER	16-Mar-2010 16:08	2532.0 M	2454.9 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	2532.0 16:08:18	
	35.20	LB/F	26.00	LB/F	2475.0 16:08:32	

PIP SUMMARY			
Time Mark Every 60 S			
RST Far Effective Capture CR (RSCF_RST)			
0	(----	45	
RST Near Effective Capture CR (RSCN_RST)		RST Weighted Inelastic Ratio (WINR_RST)	
0	(----	45	0.4 (----- 0
RST Sigma Pass # 2 (RST_SIG)	Minitron Arc	RST Sigma Pass # 2 (RST_SIG)	RST Sigma Pass # 2 (RST_SIG)





RST Borehole Salinity (BSAL)		(CCLC)	MCS Far Background (filtered) (FBAC)		RST Capture to Inelastic Ratio Near (CIRN_FIL)	
450	(PPK)	-50	-1 (V) 3	0	10000	2.5 (----) 0
Discriminated CCL (CCLD)		Perfo Zone	RST Sigma Difference (DSIG)		RST Capture to Inelastic Ratio Far (CIRF_FIL)	
-19	(V)		1	-30 (CU) 30	5 (----) 0	
Gamma Ray (GR)		Tension (TENS) (LBF)	RST Sigma (SIGM)			
0	(GAPI)	150	60	0		
		1000				
		3000				
RST Sigma Borehole Fluid (SIBF)		Minitron Arc Detection (MARC)	RST Porosity (TPHI)		RST Inelastic Ratio (IRAT_FIL)	
100	(CU)	0	0.6 (V/V) 0	0.75 (----) 0		
		0 (---- 5				
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				

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	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
DORL	Depth Offset for Repeat Analysis	0.0	M
PP	Playback Processing	NORMAL	

Format: RST_SIG_ANSW
Vertical Scale: 1:200
Graphics File Created: 16-Mar-2010 16:08

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	16-Mar-2010 10:06	2537.9 M	2438.9 M
Output DLIS Files						
DEFAULT	RST_PSP_008PUP	FN:27	PRODUCER	16-Mar-2010 16:08		
CUSTOMER	RST_PSP_008PUC	FN:28	CUSTOMER	16-Mar-2010 16:08		
CUST_FILT	RST_PSP_008PUC	FN:29	CUSTOMER	16-Mar-2010 16:08		

RST Sigma Pass # 1
Shut In

MAXIS Field Log

Company: Esso Australia Pty Ltd.
Well: COBIA A33

Input DLIS Files						
DEFAULT	RST_PSP_007LUP	FN:6	PRODUCER	16-Mar-2010 09:42	2537.0 M	2444.3 M
Output DLIS Files						
DEFAULT	RST_PSP_007PUP	FN:24	PRODUCER	16-Mar-2010 15:53		
CUSTOMER	RST_PSP_007PUC	FN:25	CUSTOMER	16-Mar-2010 15:53		
CUST_FILT	RST_PSP_007PUC	FN:26	CUSTOMER	16-Mar-2010 15:53		

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

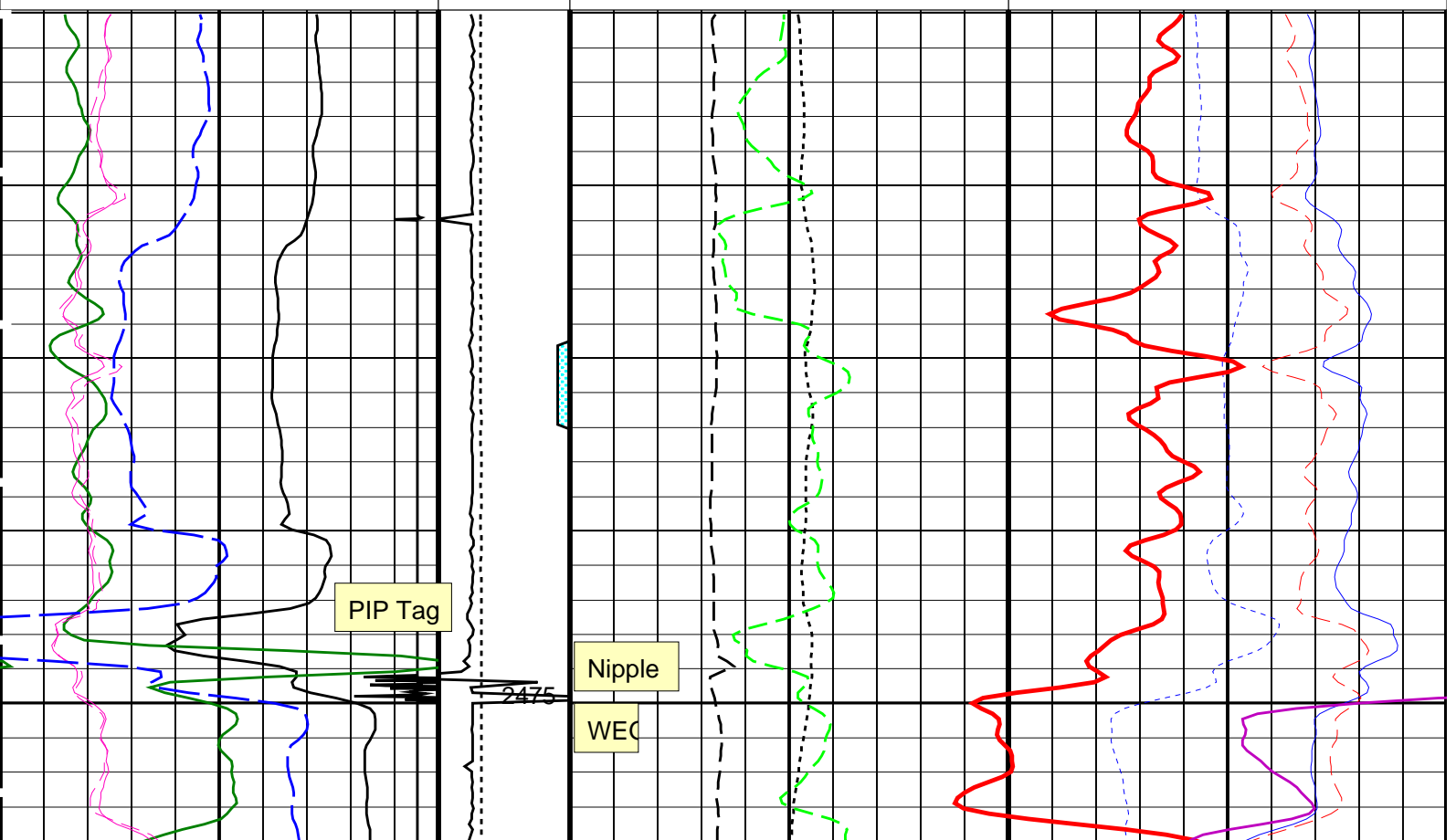
CWEI

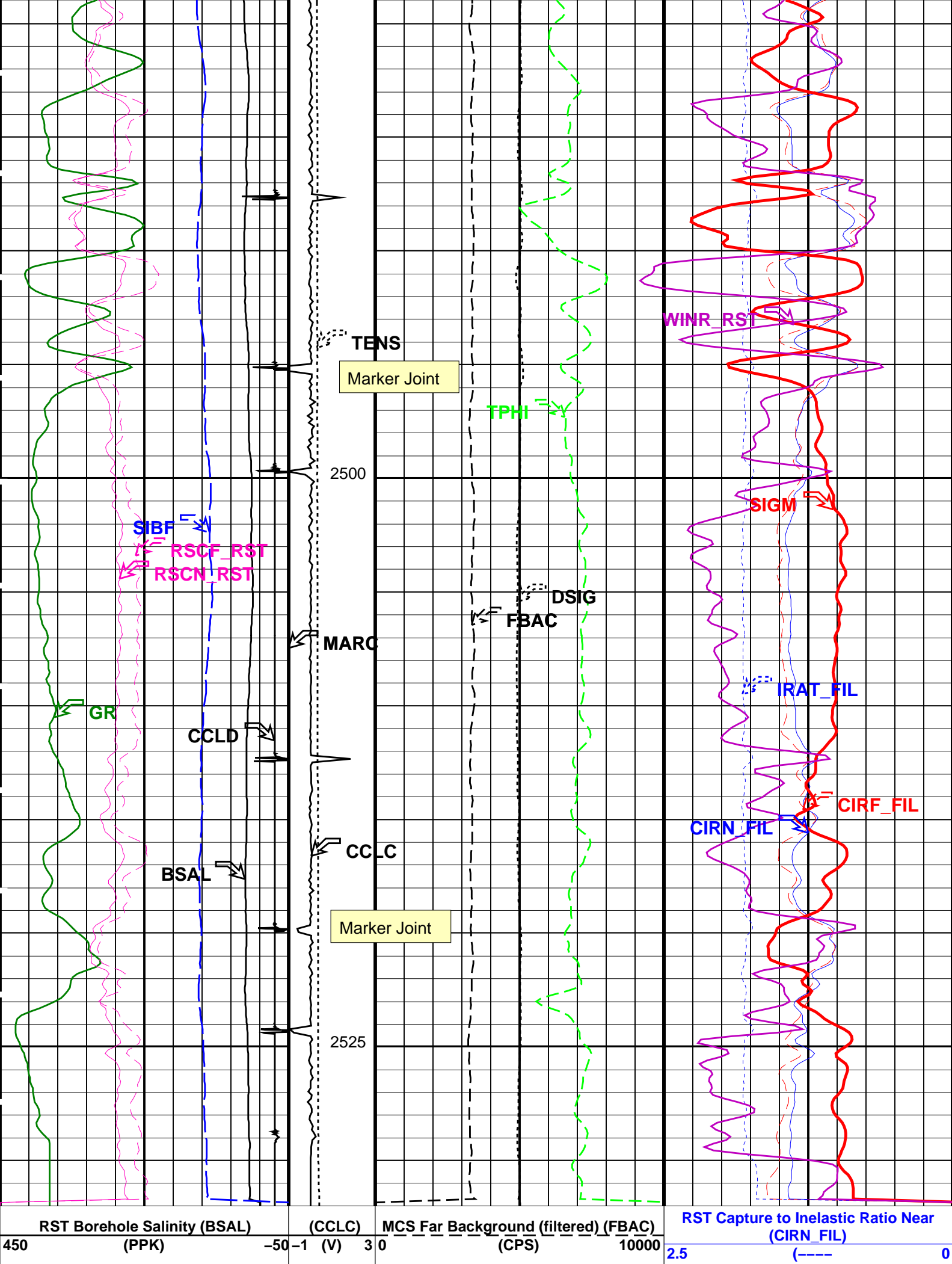
26.00 LB/F
35.20 LB/F26.00 LB/F
26.00 LB/F2532.0 15:53:02
2475.0 15:53:16

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 Sigma Borehole Fluid (SIBF) 100 (CU) 0	Minitron Arc Detection (MARC) 0 (----) 5	RST Porosity (TPHI) (V/V) 0.6 0	RST Inelastic Ratio (IRAT_FIL) 0.75 (----) 0
Gamma Ray (GR) (GAPI) 0 150	Tension (TENS) (LBF) 1000 3000	RST Sigma (SIGM) 60 (CU) 0	
Discriminated CCL (CCLD) (V) -19 1	Perfo Zone	RST Sigma Difference (DSIG) (CU) -30 30	RST Capture to Inelastic Ratio Far (CIRF_FIL) 5 (----) 0
RST Borehole Salinity (BSAL) (PPK) 450 -50	(CCLC) (V) -1 3	MCS Far Background (filtered) (FBAC) (CPS) 0 10000	RST Capture to Inelastic Ratio Near (CIRN_FIL) 2.5 (----) 0





Discriminated CCL (CCLD)		Perfo Zone	RST Sigma Difference (DSIG)		RST Capture to Inelastic Ratio Far (CIRF_FIL)
-19 (V)	1		-30 (CU)	30	5 (----) 0
Gamma Ray (GR)		Tension (TENS) (LBF)	RST Sigma (SIGM)		
0 (GAPI) 150		1000	60 (CU)		0
		3000			
RST Sigma Borehole Fluid (SIBF)		Minitron Arc Detection (MARC)	RST Porosity (TPHI) (V/V)		RST Inelastic Ratio (IRAT_FIL)
100 (CU) 0		0 (----) 5	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	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

Format: RST_SIG_ANSW Vertical Scale: 1:200 Graphics File Created: 16-Mar-2010 15:53

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_007LUP	FN:6	PRODUCER	16-Mar-2010 09:42	2537.0 M	2444.3 M
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Output DLIS Files

DEFAULT	RST_PSP_007PUP	FN:24	PRODUCER	16-Mar-2010 15:53
CUSTOMER	RST_PSP_007PUC	FN:25	CUSTOMER	16-Mar-2010 15:53
CUST_FILT	RST_PSP_007PUC	FN:26	CUSTOMER	16-Mar-2010 15:53

Company: Esso Australia Pty Ltd.

Well: COBIA A33

Input DLIS Files

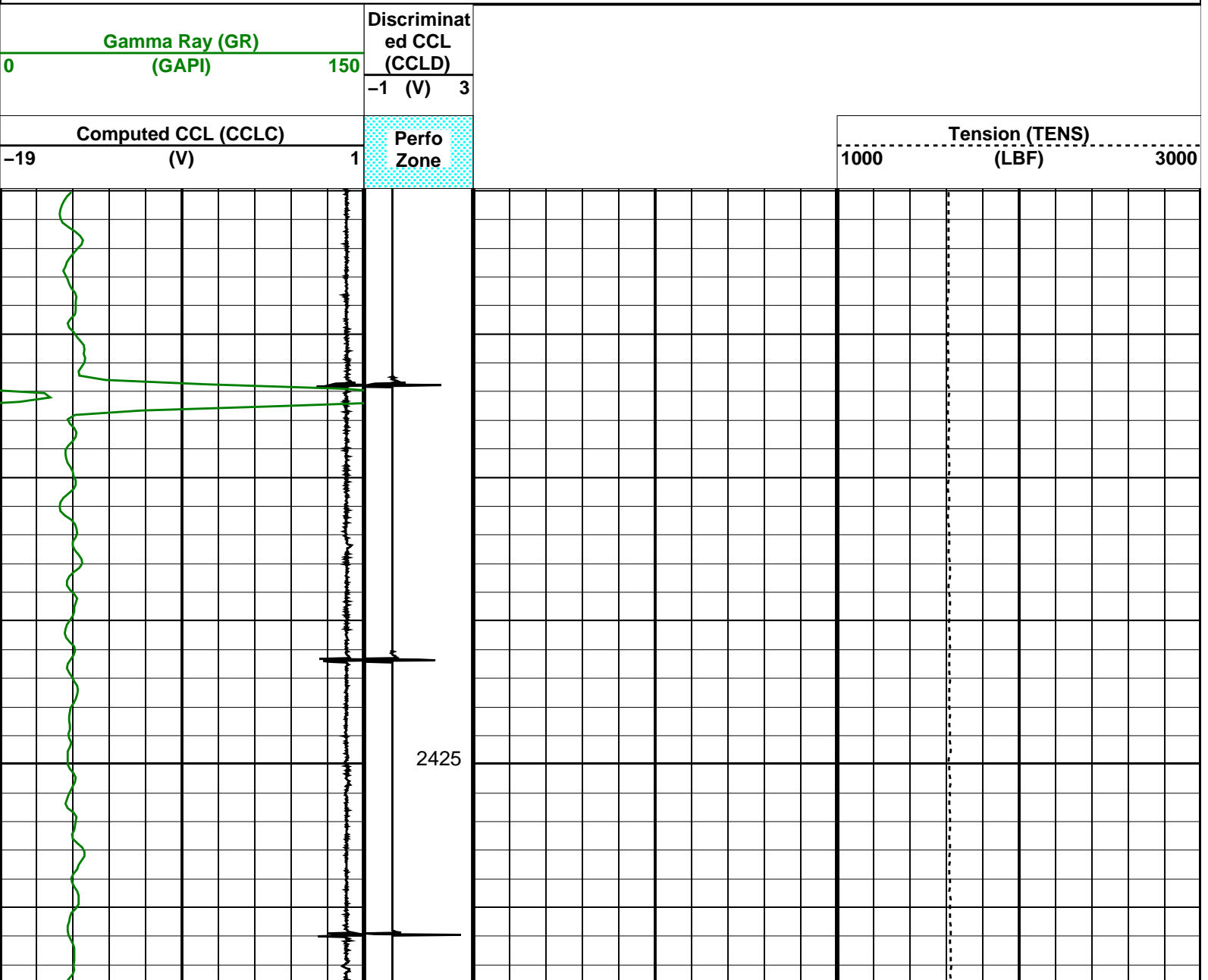
DEFAULT	RST_PSP_006LUP	FN:5	PRODUCER	16-Mar-2010 09:16	2539.0 M	2404.7 M
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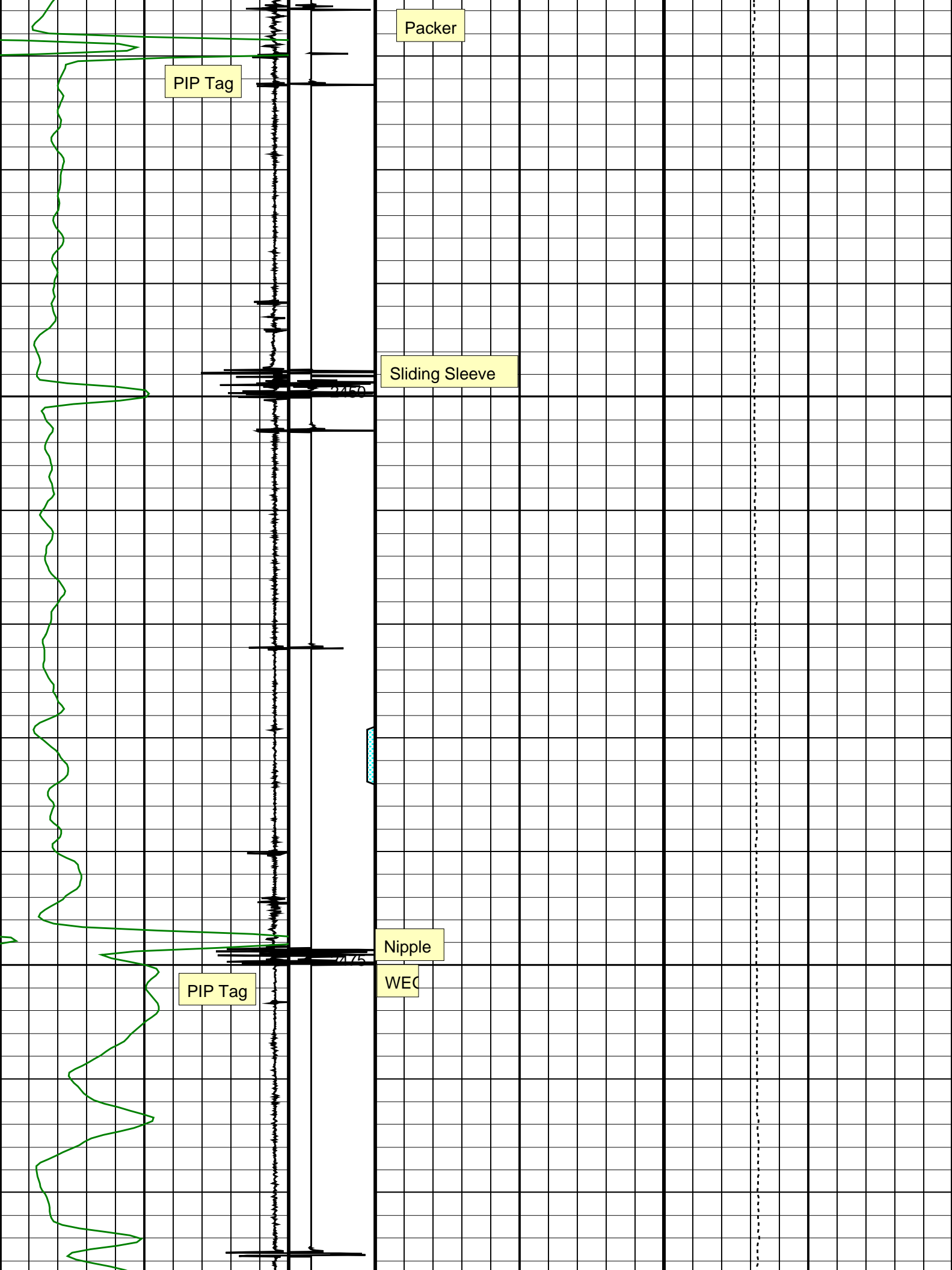
Output DLIS Files

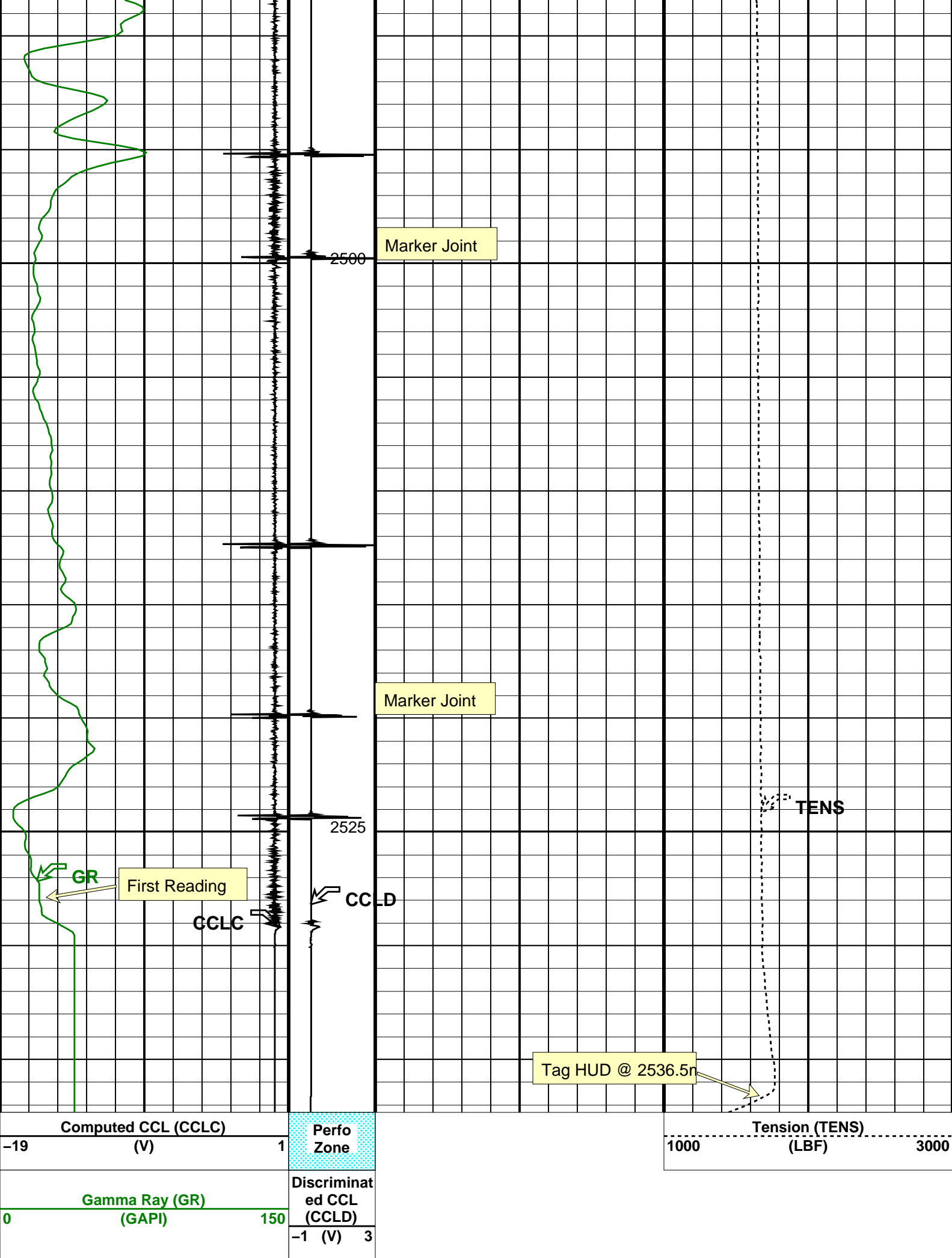
DEFAULT	RST_PSP_006PUP	FN:33	PRODUCER	16-Mar-2010 16:40	2537.3 M	2404.9 M
CUSTOMER	RST_PSP_006PUC	FN:34	CUSTOMER	16-Mar-2010 16:40	2537.3 M	2404.9 M
CUST_FILT	RST_PSP_006PUC	FN:35	CUSTOMER	16-Mar-2010 16:40	2537.3 M	2404.9 M

OP System Version: 17C0-154

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

DLIS Name	Description	Value
DO	System and Miscellaneous	
PP	Depth Offset for Playback	-1.7 M
	Playback Processing	NORMAL

Format: CORRELATION Vertical Scale: 1:200 Graphics File Created: 16-Mar-2010 16:40

OP System Version: 17C0-154


RST-C	SRPC-3870_Q3_2009_OP17_V3	PSPT	SRPC-3870_Q3_2009_OP17_V3
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Input DLIS Files

DEFAULT	RST_PSP_006LUP	FN:5	PRODUCER	16-Mar-2010 09:16	2539.0 M	2404.7 M
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Output DLIS Files

DEFAULT	RST_PSP_006PUP	FN:33	PRODUCER	16-Mar-2010 16:40
CUSTOMER	RST_PSP_006PUC	FN:34	CUSTOMER	16-Mar-2010 16:40
CUST_FILT	RST_PSP_006PUC	FN:35	CUSTOMER	16-Mar-2010 16:40





Before Survey Calibration

MAXIS Field Log

Calibration and Check Summary							
Measurement	Nominal	Master	Before	After	Change	Limit	Units
Production Services Logging Platform Wellsite Calibration – Detector Calibration							
Before: 14-Mar-2010 13:22							
Gamma-Ray Jig-Bkg	125.0	N/A	131.9	N/A	N/A	N/A	GAPI

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 – B	1750
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			3.741	Before			131.9

0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	110.0 (Minimum)	125.0 (Nominal)	140.0 (Maximum)
Before: 14-Mar-2010 13:22					

Company: **Esso Australia Pty Ltd.**

Schlumberger

Well: **COBIA A33**

Field: **HALIBUT**

Rig: **Crane / Prod 4**

Country: **Australia**

RST-C

Sigma Log

16-Mar-2010