Schlumberger

Company: **SANTOS − INPEX − UNOCAL**

VIC−P−52

Well: **Amrit−1**

Field: **Exploration**

Rig: **Jack Bates** State: **Victoria**

Company: SANTOS − INPEX − UNOCAL
Well: Amrit−1
Location: Otway Basin
Field: Exploration
Rig: Jack Bates

CDR − Resistivity
1:500 Measured Depth
Recorded Mode Data

Location

Total depth:	2979.0 m
Spud date:	20−Nov−2004
Runs:	1 To 4

Elevation

K.B.	Top Drive
G.L.	−1396.0 m
D.F.	29.0 m

Permanent datum:	LAT	Elev.:	0 m
Log measured from:	Rotary Table	29.0 m	above Perm. datum
Depth reference:	Driller's Pipe Tally		

API serial no.	X = 563729.6mE Y =5690204.1mN	Longitude 141° 44' 07.08"E	Latitude 38° 56' 05.20"S

Depth logged: 1425.0 m To 2763.0 m	Mag decl: 10.48 deg.	Other services:
Date logged: 20−Nov−04 To 7−Dec−04	Mag dip: −70.25 deg.	Directional Surveys

Bore hole record

Hole size	from	to
26 in.	1425.0 m	1835.0 m
17.5 in.	1835.0 m	2459.0 m
12.25 in.	2459.0 m	2979.0 m

Casing record

Size	Density	from	to
30 in.	456/309 lb/ft	1425.0 m	1510.0 m
20 in.	133 lb/ft	1425.0 m	1822.0 m
13.375 in.	68 lb/ft	1425.0 m	2454.5 m

Mud record

Type	from	to
Seawater	1425.0 m	1835.0 m
KCl/PHPA/Glycol	1835.0 m	2979.0 m

Borehole deviation record

Min	Max	from	to
0.26 deg.	1.07 deg.	1425.0 m	1835.0 m
0.12 deg.	0.40 deg.	1835.0 m	2459.0 m
0.00 deg.	0.07 deg.	2459.0 m	2797.0 m

Surface equipment

Unit	OLU ME 0104
Depth system	Geolograph

Software record

IDEAL Wis	ID9_1C_01
SPM	hspm9_2c_08
LWD	6.0 B08
MWD	7.0C00

Bit Run Summary

Run number		1	2	3	4
Bit size	in	26	17.5	12.25	12.25
Bit start depth	m	1425.0	1835.0	2459.0	2695.0
Bit end depth	m	1835.0	2459.0	2695.0	2979.0
Top interval logged	m	1425.0	1820.0	2444.0	2678.5
Bottom interval logged	m	1820.0	2444.0	2678.5	2963.0
Begin log: time		08:20:00	13:10:00	03:50:00	8:30:00
Begin log: date		20−Nov−04	27−Nov−04	4−Dec−04	6−Dec−04
End log: time		16:30:00	22:15:00	7:00:00	16:00:00
End log: date		22−Nov−04	1−Dec−04	6−Dec−04	7−Dec−04
Mud data					
Depth	m	1835.0	2459.0	2695.0	2979.0
Type		Sea water	KCl/PHPA/Glycol	KCl/PHPA/Glycol	KCl/PHPA/Glycol
Mud weight	ppg	8.6	9.2	9.5	9.6
Solids	%	N/A	4.0	8.8	9.5
Chlorides	mg/l	N/A	38500	52500	48000
Rm	OHHM@°C	N/A	0.1192@25.1	0.078@26.3	0.0968@25.2
Rmf	OHHM@°C	N/A	0.1087@24.9	0.0732@25.8	0.0891@24.9
Rmc	OHHM@°C	N/A	0.1248@26.8	0.1005@25.5	0.1285@24.5

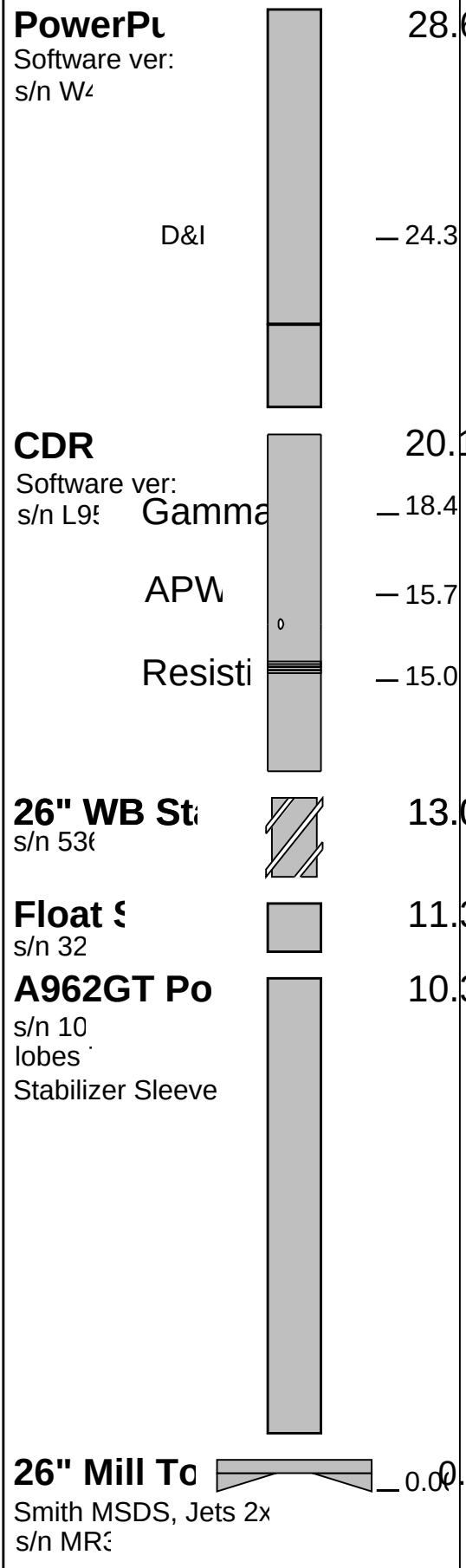
Potassium	%	N/A	4.0	5.4	5.1						
Environmental data											
GR											
Mud weight	ppg	8.6	9.2	9.5	9.6						
Bit size	in	26	17.5	12.25	12.25						
Resistivity											
Neutron porosity											
Hole Size	in	26	17.5	12.25	12.25						
Mud weight	ppg	8.6	9.2	9.5	9.6						
Bottom Hole Temperature	°C	17.0	23.0	24.0	26.0						
Mud salinity	ppm	N/A	N/A	N/A	N/A						
Formation salinity	ppm	N/A	N/A	N/A	N/A						
Recording rate 1	SEC	6	6	6	6	GR−APWD					
Recording rate 2	SEC	6	6	6	6	RES					
Filtering GR		3−Point	3−point	3−point	3−point						
Filtering density		N/A	N/A	N/A	N/A						
Filtering Neutron		N/A	N/A	N/A	N/A						
Company representative		D.Atkins	P. King	J.Young	R.Subramanian						
Anadrill personnel		D.Borges	O.Radicevic	L.Watson	B. Manjenic						

OTHER SERVICES FOR RUN1	OTHER SERVICES FOR RUN2	OTHER SERVICES FOR RUN3
Directional Surveys	Directional Surveys	Directional Surveys
Performance Drilling	Performance Drilling	Perfomance Drilling
Annular Pressure, ECD & Temperature	Annular Pressure, ECD & Temperature	Annular Presseure, ECD & Temperature
Internet Web Witness	Internet Web Witness	Multi Vibrational Chassis (MVC)
		Internet Web Witness
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2	REMARKS: RUN NUMBER 3
Depth is Driller's Depth.	Depth is Driller's Depth.	Depth is Driller's Depth.
CDR gamma ray is corrected for bit size, mud weight and tool size.	CDR gamma ray is corrected for bit size, mud weight and tool size.	CDR gamma ray is corrected for bit size, mud weight and tool size.
CDR resistivity is borehole compensated but not environmentally corrected.	CDR resistivity is borehole compensated but not environmentally corrected.	CDR resistivity is borehole compensated but not environmentally corrected.
Run Objective: Jet in 30" casing & continue to drill 26" to TD.	Run Objective: Drill 17.5" section to TD.	Run Objective: Drill 12.25" section to TD.
POOH: Section TD.	POOH: Section TD.	POOH: Rate of penetration.
Remarks: Low Gamma Ray readings are due to enlarged hole size.		

EQUIPMENT DESCRIPTION

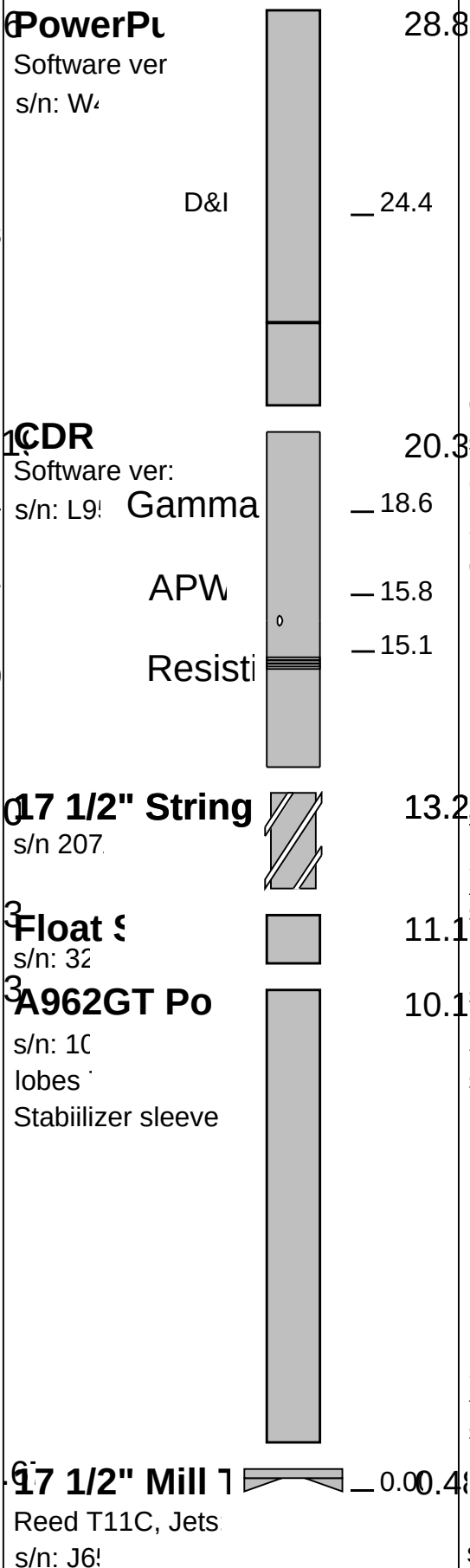
RUN1	RUN2	RUN3
DOWNHOLE E	DOWNHOLE E	DOWNHOLE E

DOWNHOLE E



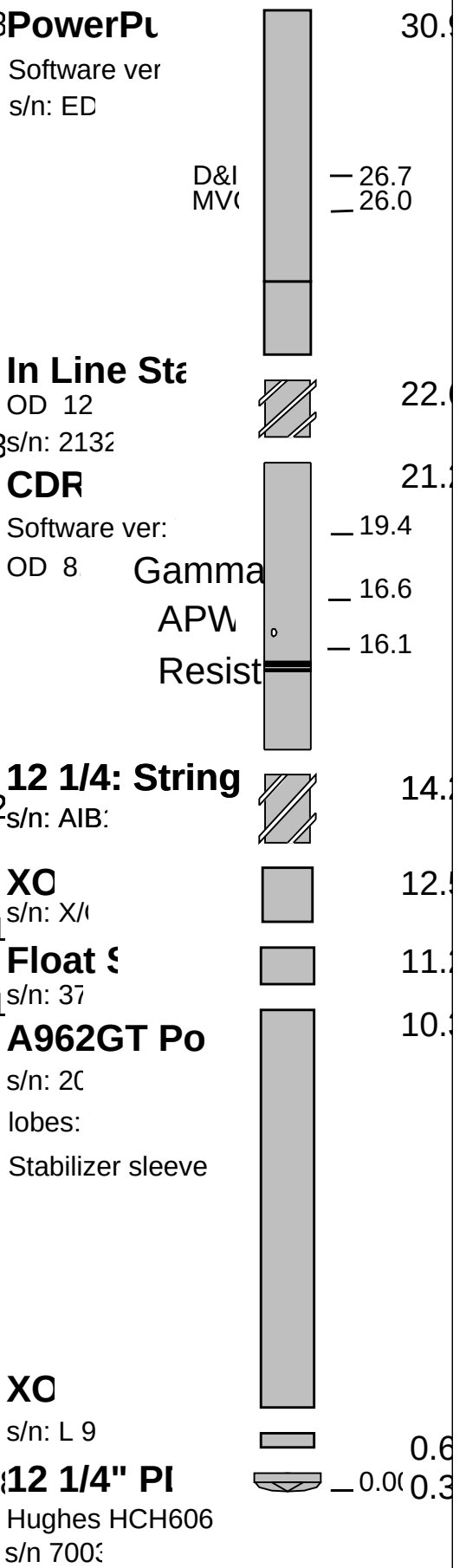
Maximum string dian
All lengths in

DOWNHOLE E



Maximum string dian
All lengths in

DOWNHOLE E



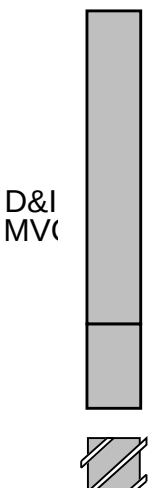
Maximum string dian
All lengths in

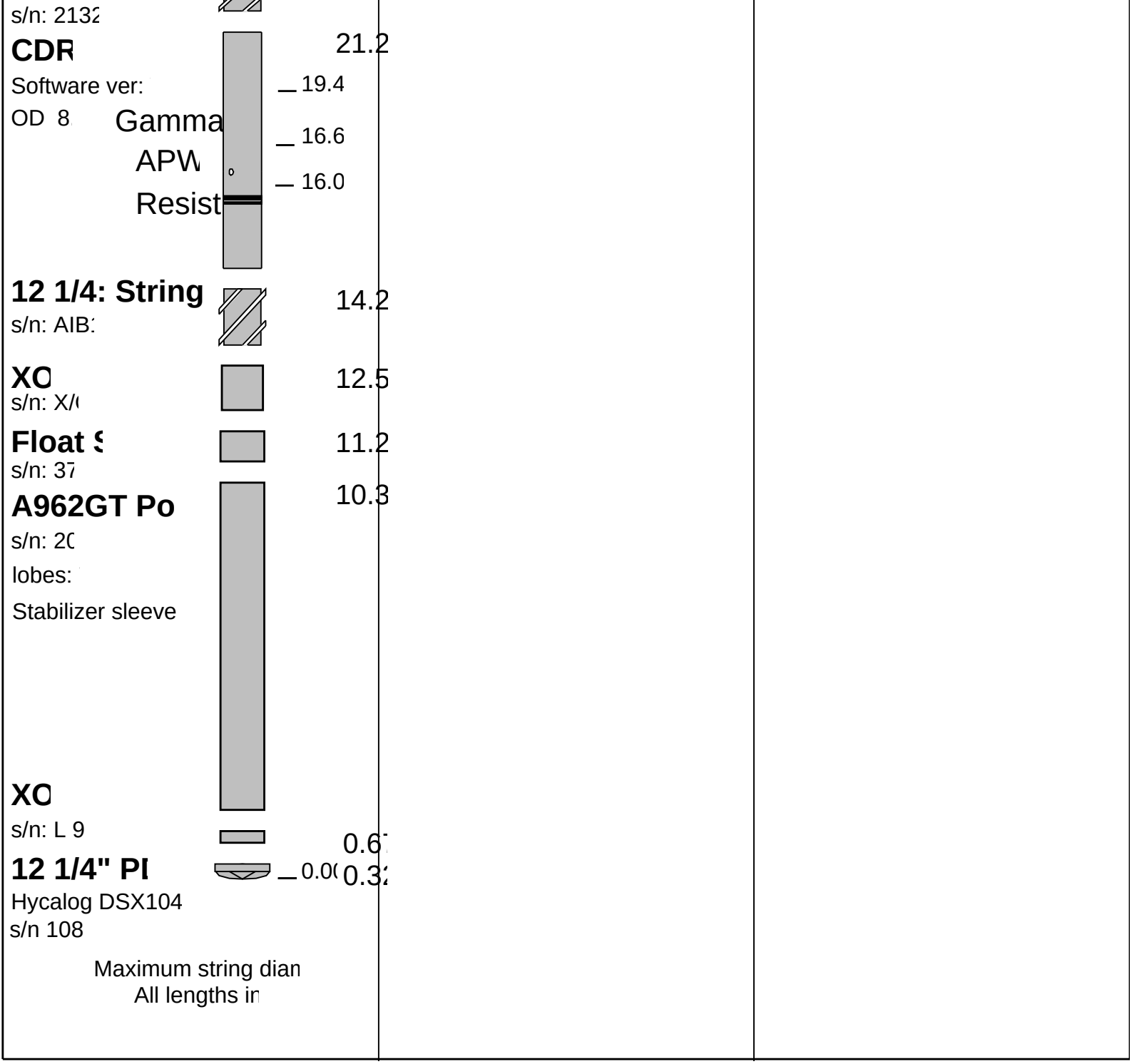
OTHER SERVICES FOR RUN4	OTHER SERVICES FOR RUN	OTHER SERVICES FOR RUN
Directional Surveys Performance Drilling Annular Pressure, ECD & Temperature Multi Vibrational Chassis (MVC) Internet Web Witness		
REMARKS: RUN NUMBER 4 Depth is Driller's Depth. CDR gamma ray is corrected for bit size, mud weight and tool size. CDR resistivity is borehole compensated but not environmentally corrected. Run Objective: Drill 12.25" section to TD. POOH: TD of Armit−1.	REMARKS: RUN NUMBER	REMARKS: RUN NUMBER

EQUIPMENT DESCRIPTION

RUN4	RUN	RUN

DOWNHOLE E





Variable Name	Variable Description	Run Name & Value			
		Run #1	Run #2	Run #3	Run #4
BHT_RM	Bottom Hole Temperature (degC)	17.000000	23.000000	24.000000	26.000000
BS_RM	Bit Size (in)	26.000000	17.500000	12.250000	12.250000
MST_RM	Mud Sample temperature (degC)	12.000000	25.100000	26.300000	25.200000
MW_RM	Mud Weight (ppg)	8.600000	9.200000	9.500000	9.600000
OBMF_RM	Oil Based Mud	NO	NO	NO	NO
RMS_RM	Resistivity of Mud Sample (ohmm)	0.000000	0.119200	0.078000	0.096800
SHT_RM	Surface Hole Temperature (degC)	12.000000	15.000000	15.000000	15.000000
TD_RM	Total Measured Depth (m)	1835.000000	2459.000000	2695.000000	2979.000000
ENV_SELECT	Res. Env. Corr. Selection	BS	BS	BS	BS
TSIZ_CDR	CDR Tool Size (in)	9.500000	9.500000	8.250000	8.250000
PLATEU	CDR: Plateau GR sensor	YES	YES	YES	YES
VERS_CDR	CDR Down hole software version Number	6.0B0800	6.0B0800	6.0B0800	6.0B0800

IDEAL Version: ID9_1C_01

IDF

Format: CDRRM_1:500MD Vertical Scale: 1:500 Graphics File Created: 08−Dec−2004 02:24

Parameters

DLIS Name	Description	Value
DO	Depth Offset	0.0 m

PIP SUMMARY

Gamma Ray samples

Resistivity samples

CDR Resistivity Time After Bit (TAB_CDR_RES)

0 (HR) 10

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)

200 (M/HR) 0

Uncorrected Attenuation Resistivity (ATR)

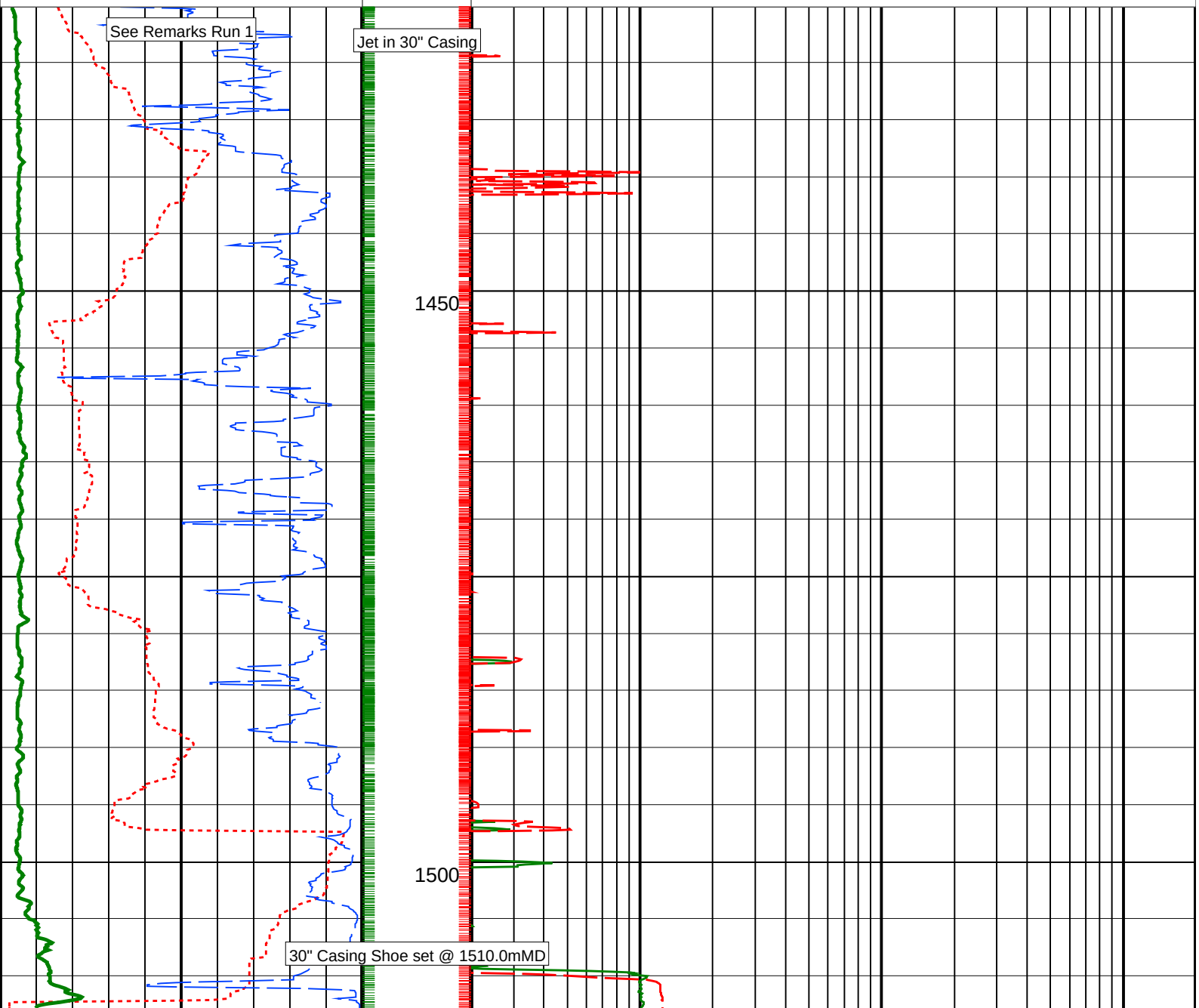
0.2 (OHMM) 200

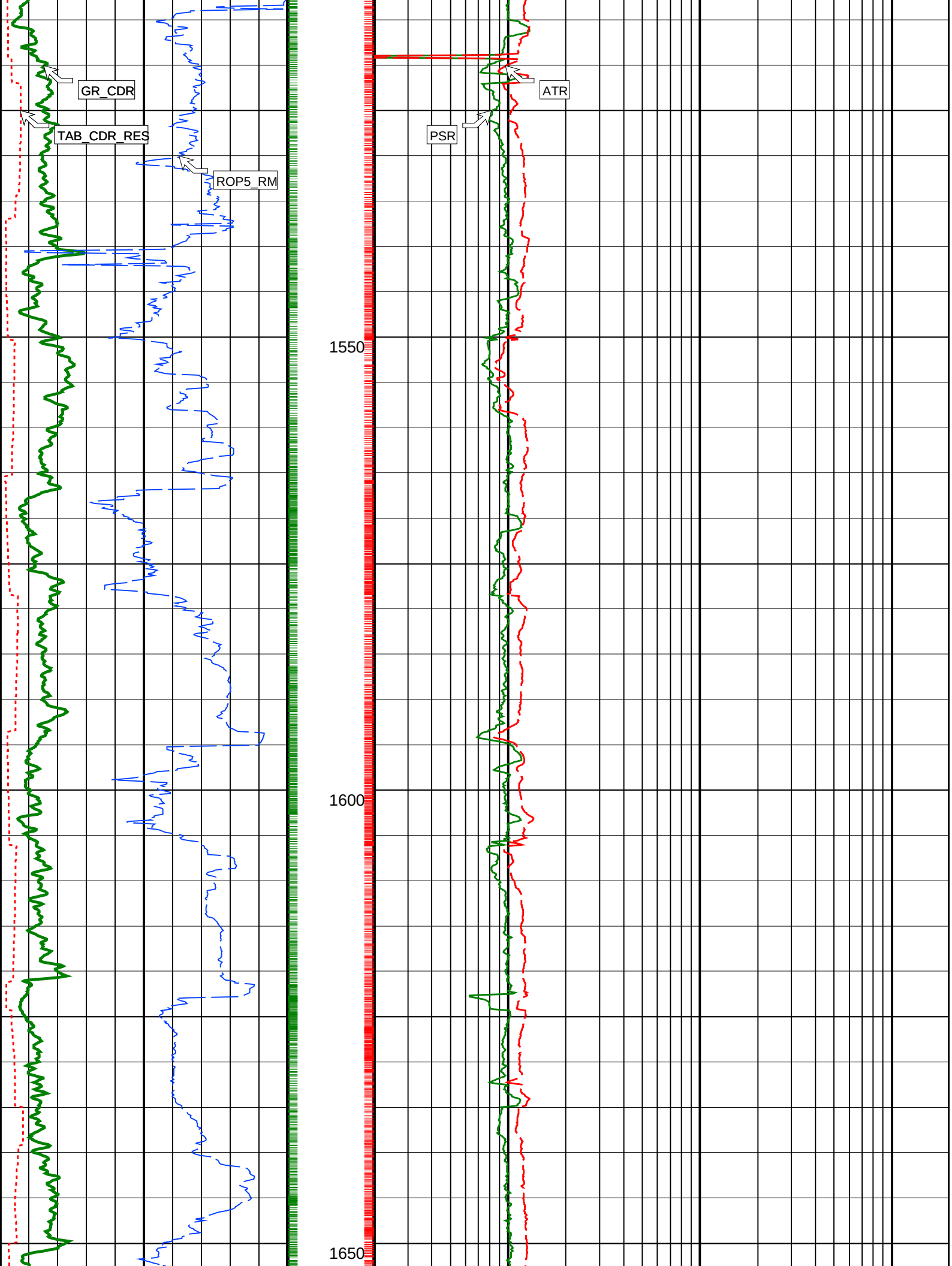
CDR Gamma Ray (GR_CDR)

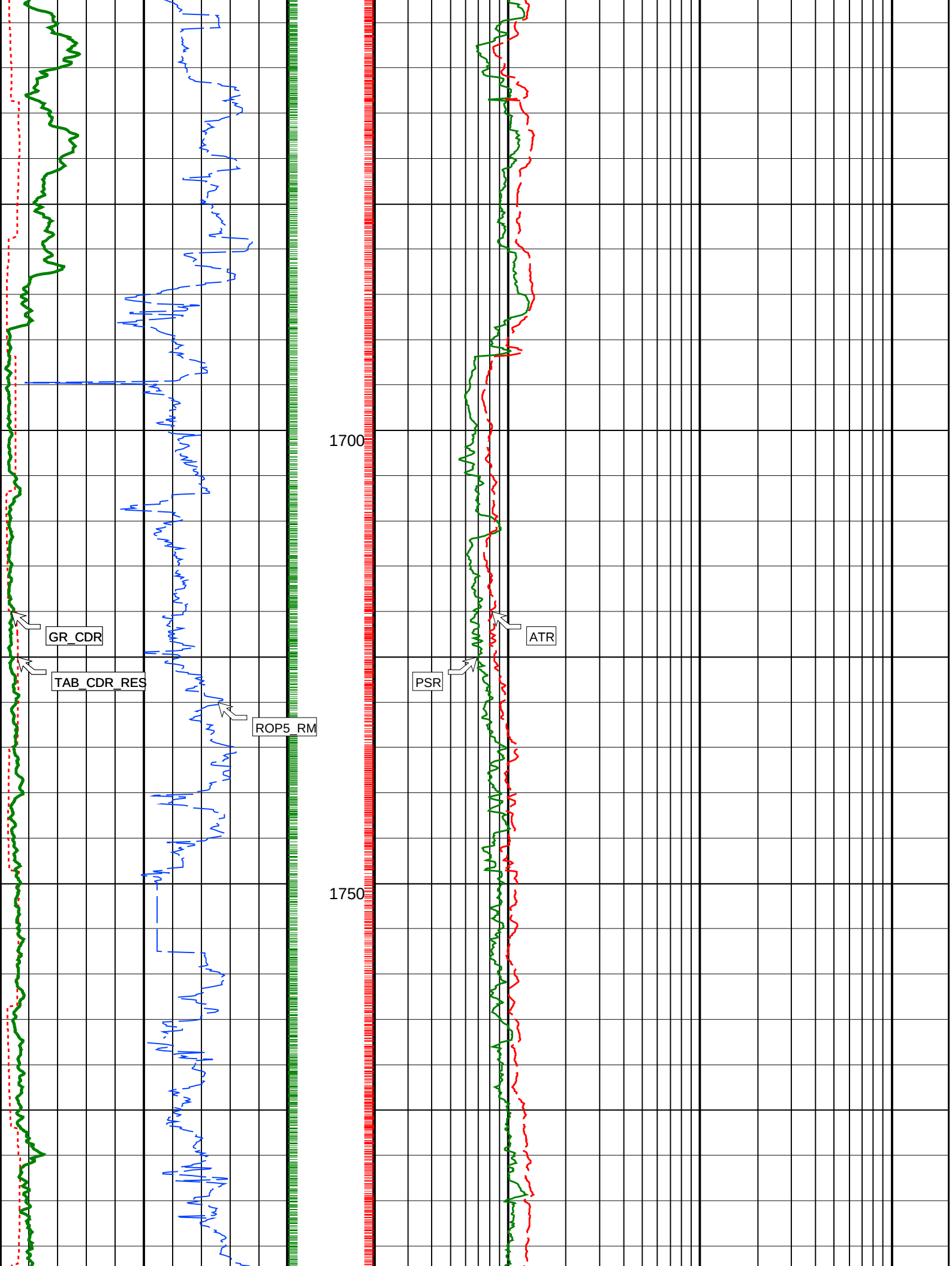
0 (GAPI) 200

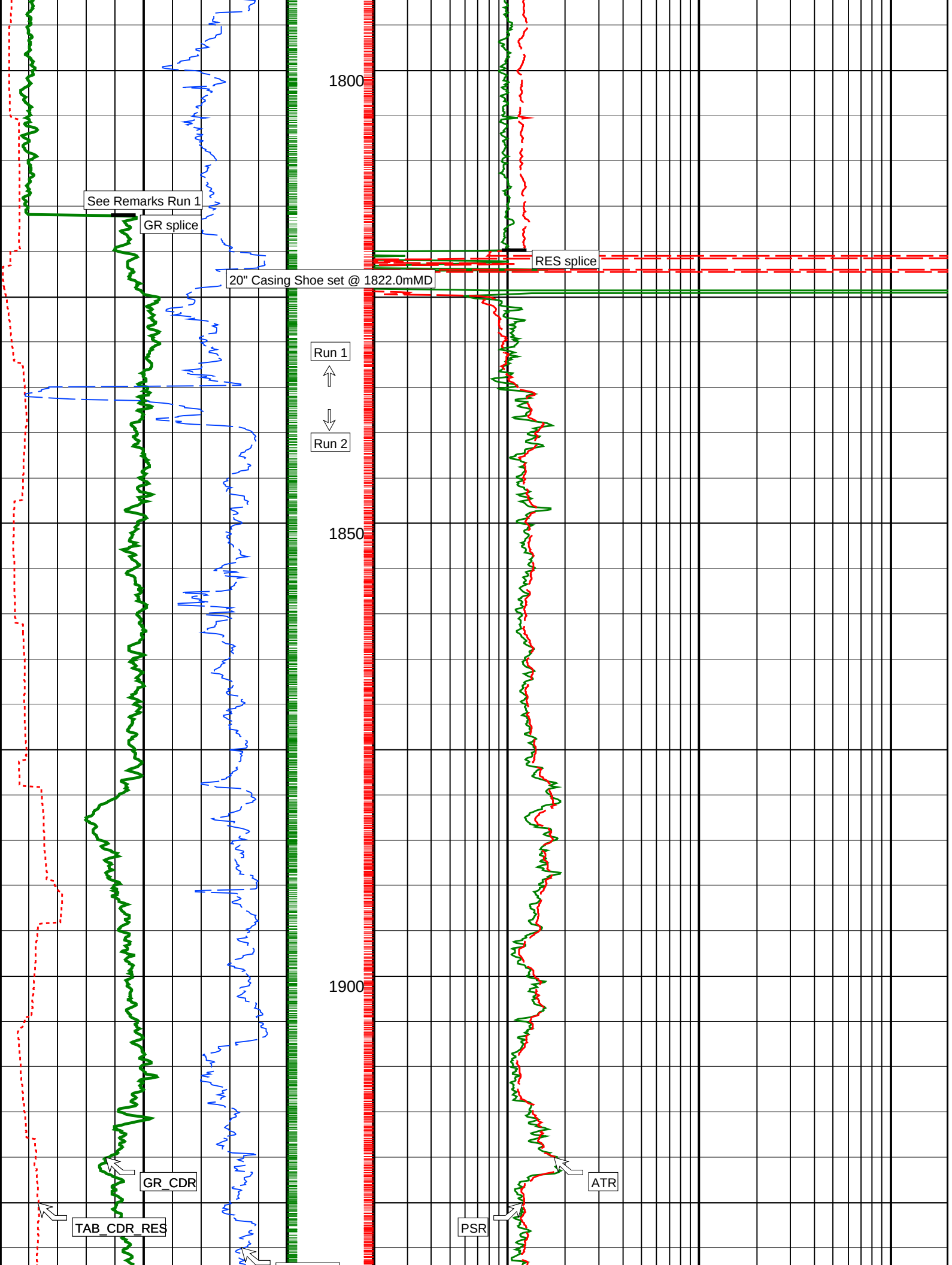
Uncorrected Phase Shift Resistivity (PSR)

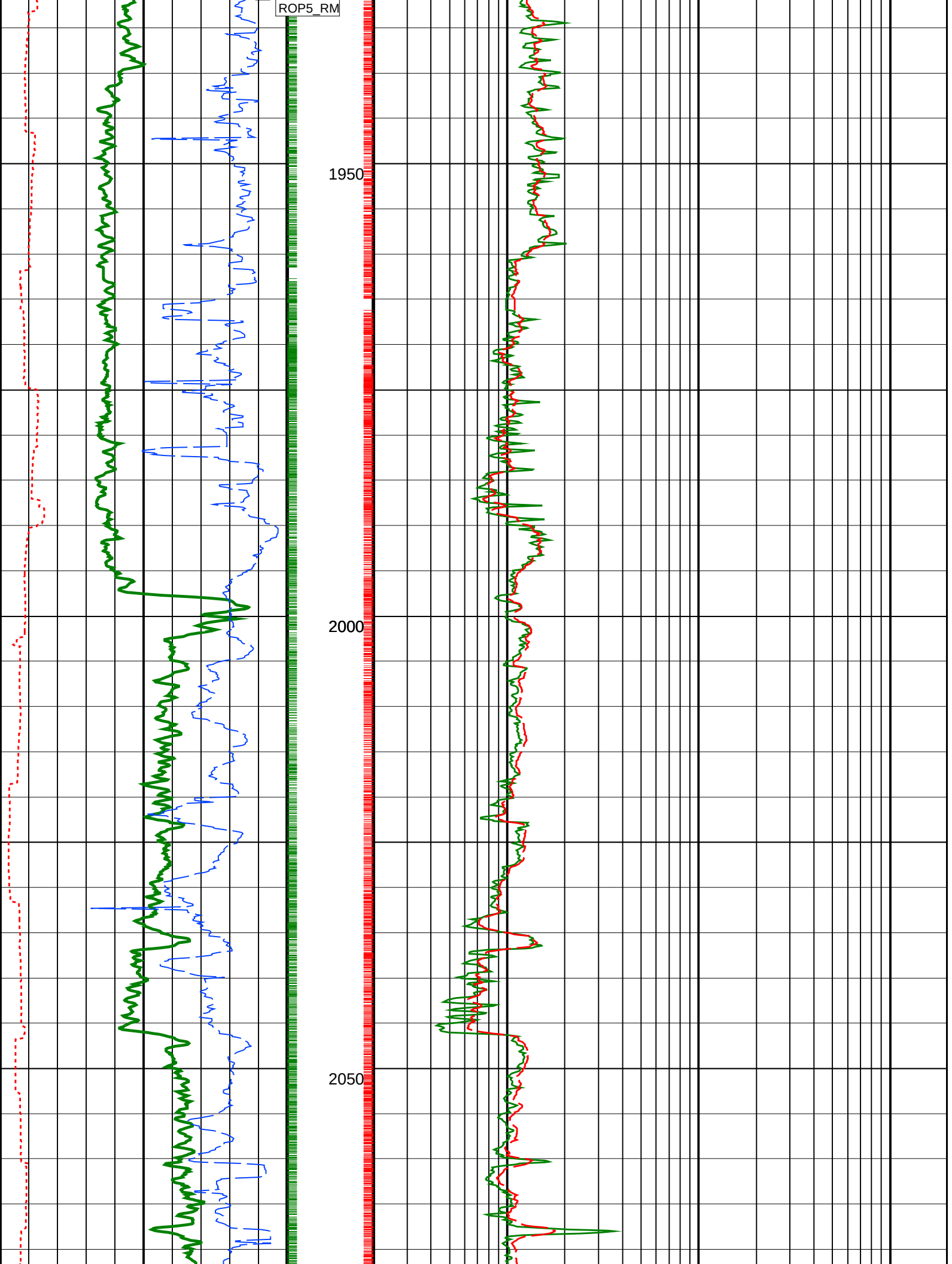
0.2 (OHMM) 200

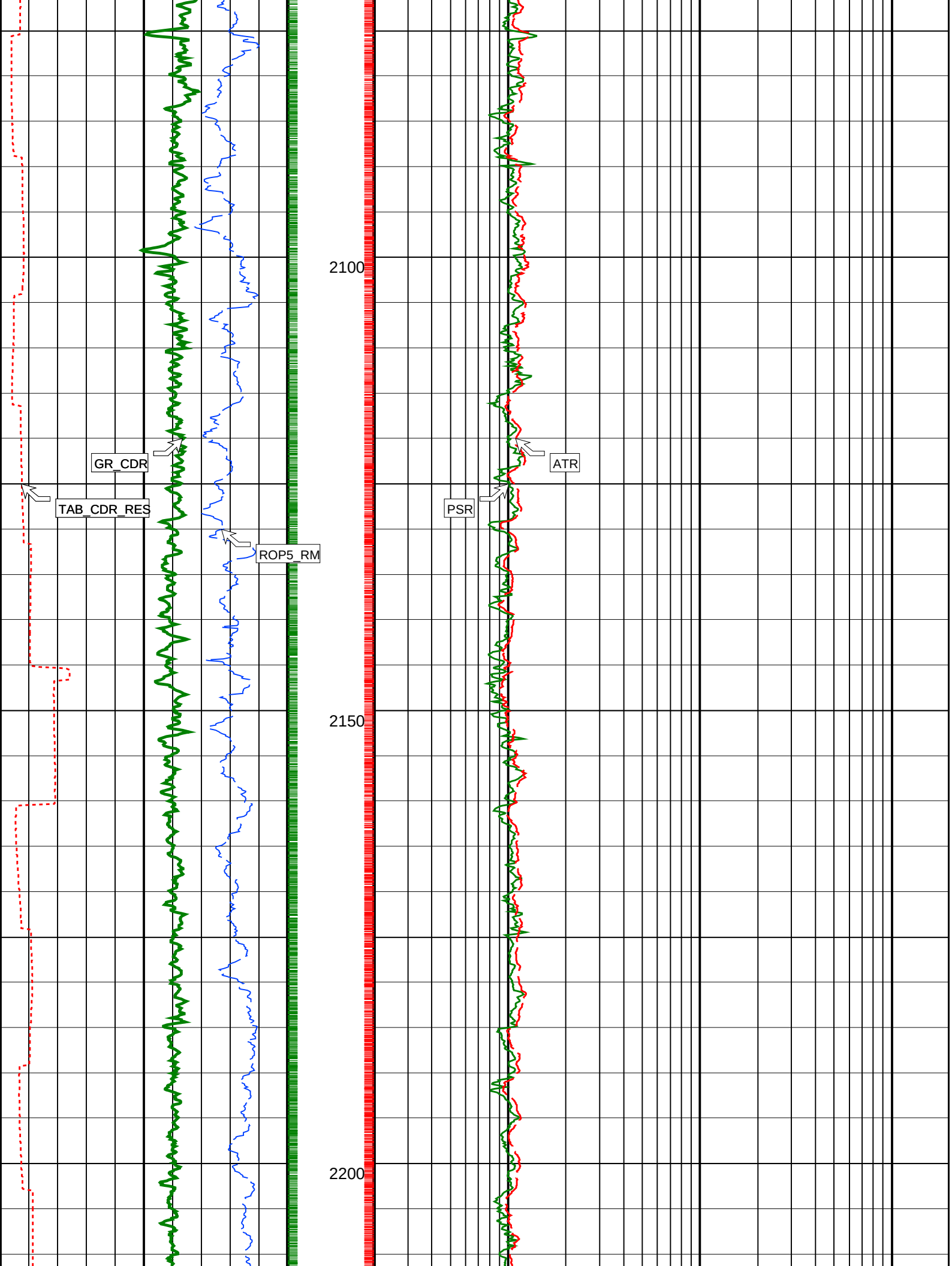


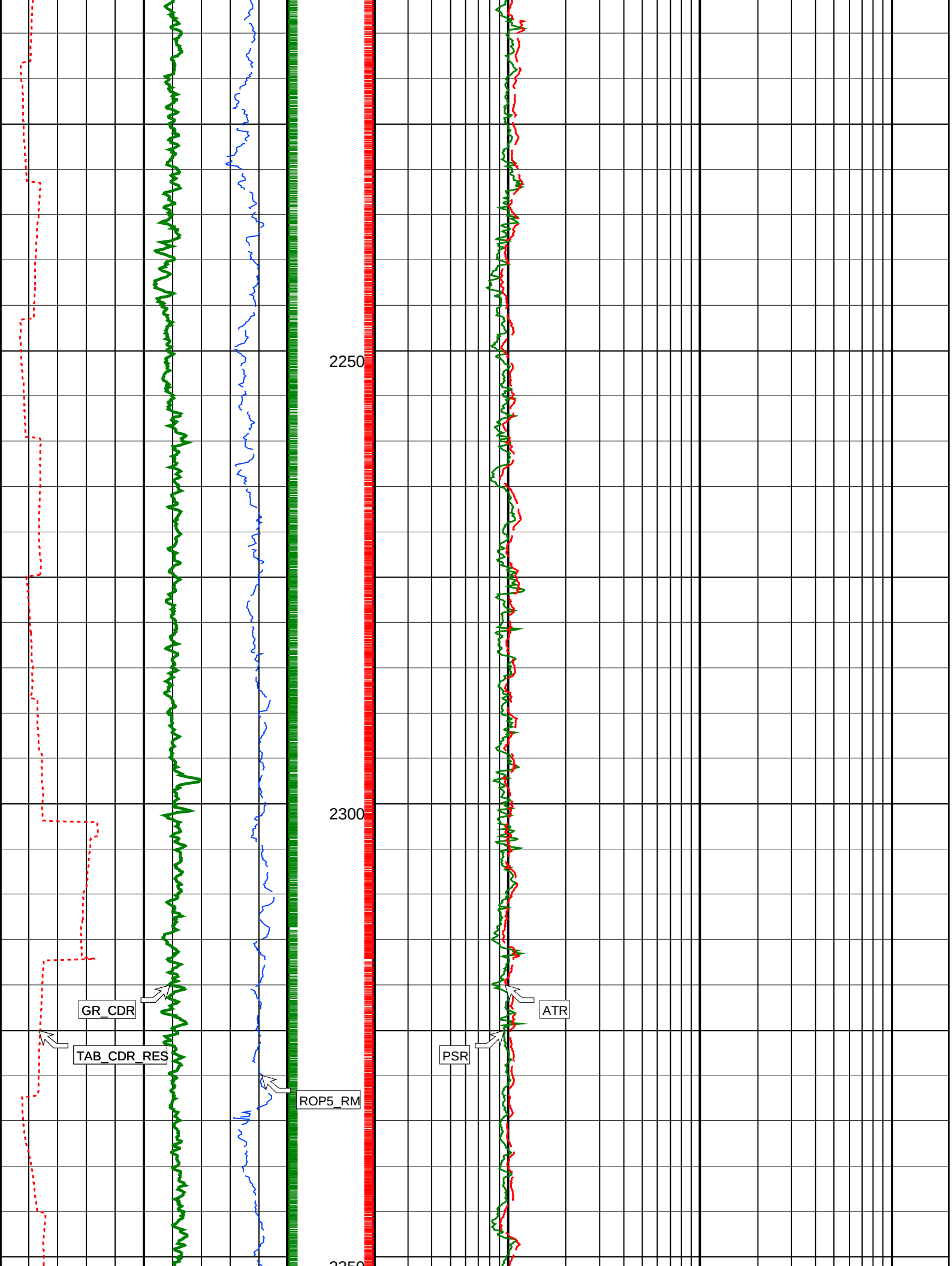

GR_CDR
TAB_CDR_RES
ROP5_RM
ATR
PSR
1550
1600
1650

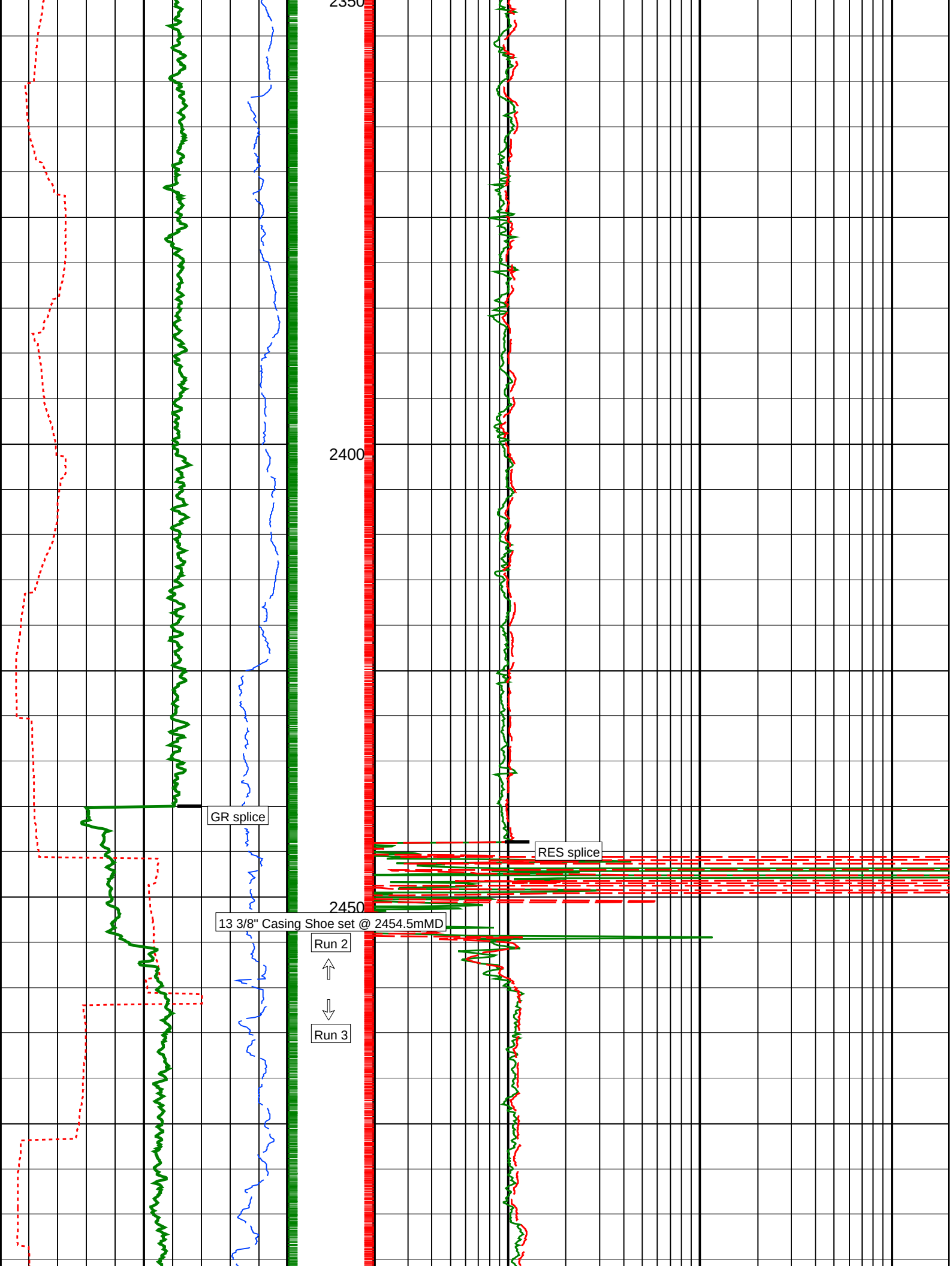

1700
1750
GR_CDR
TAB_CDR_RES
ROP5_RM
PSR
ATR

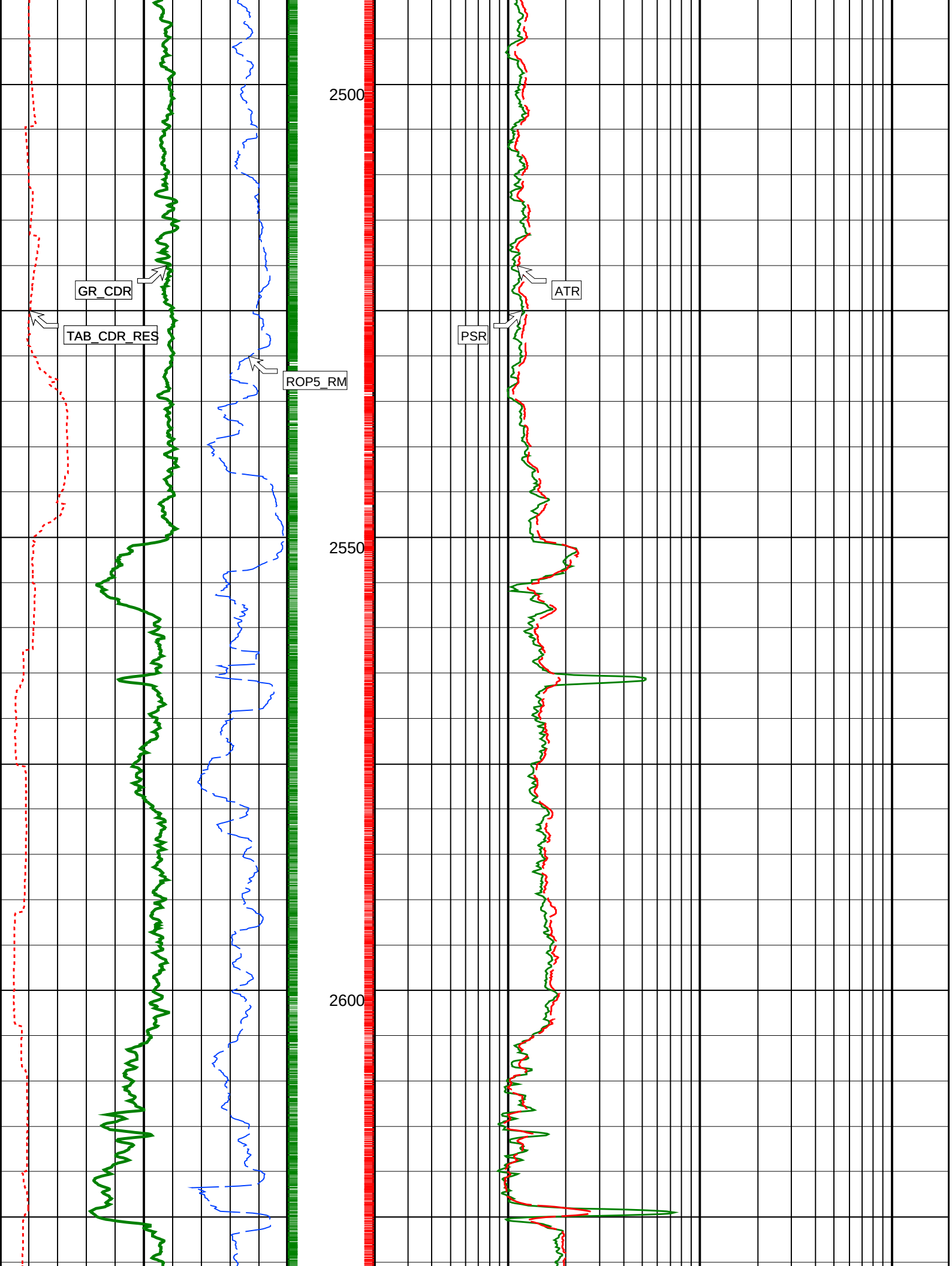

1800
See Remarks Run 1
GR splice
RES splice
20" Casing Shoe set @ 1822.0mMD
Run 1
Run 2
1850
1900
GR_CDR
ATR
TAB_CDR_RES
PSR

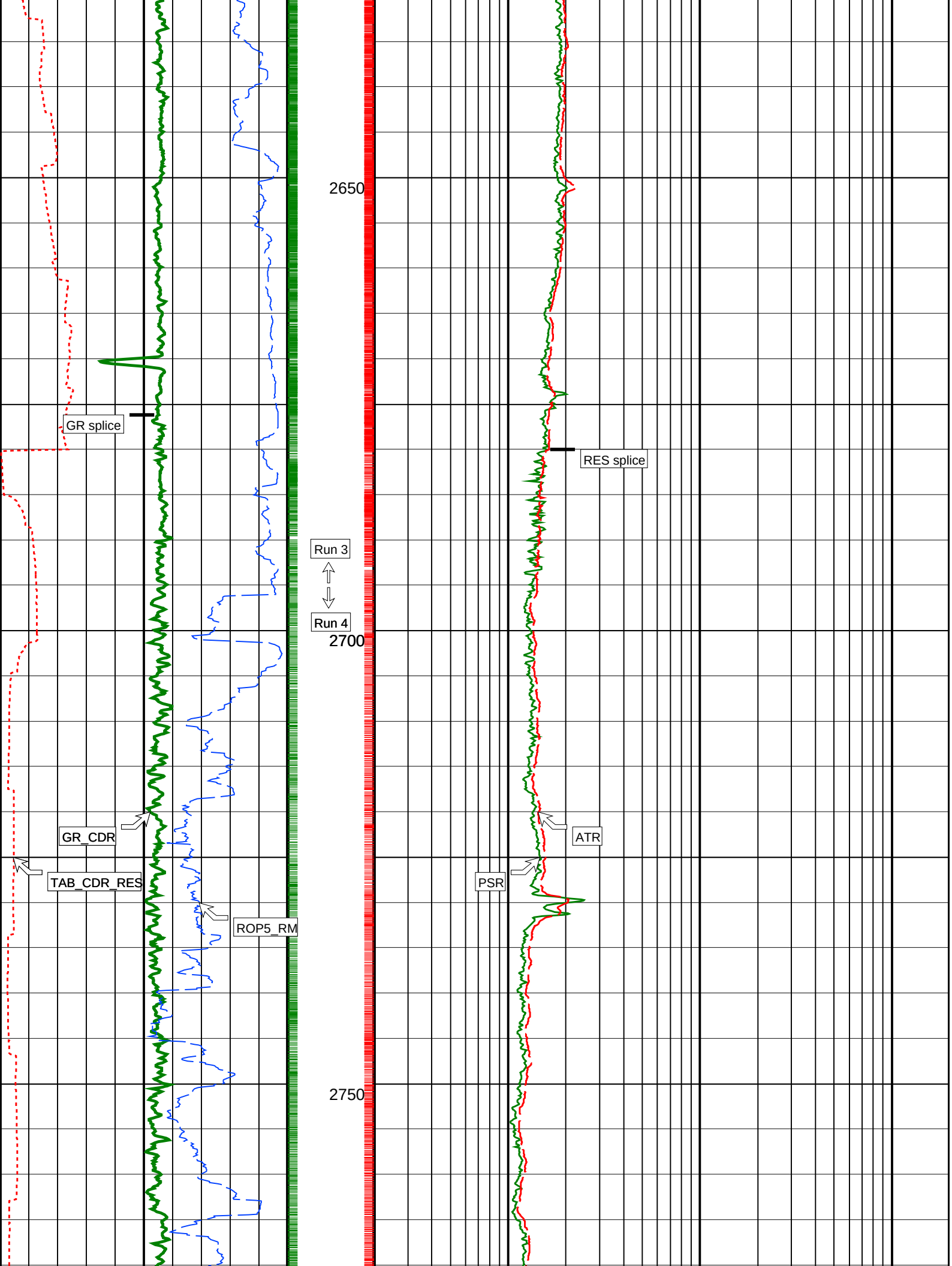

ROP5_RM
1950
2000
2050

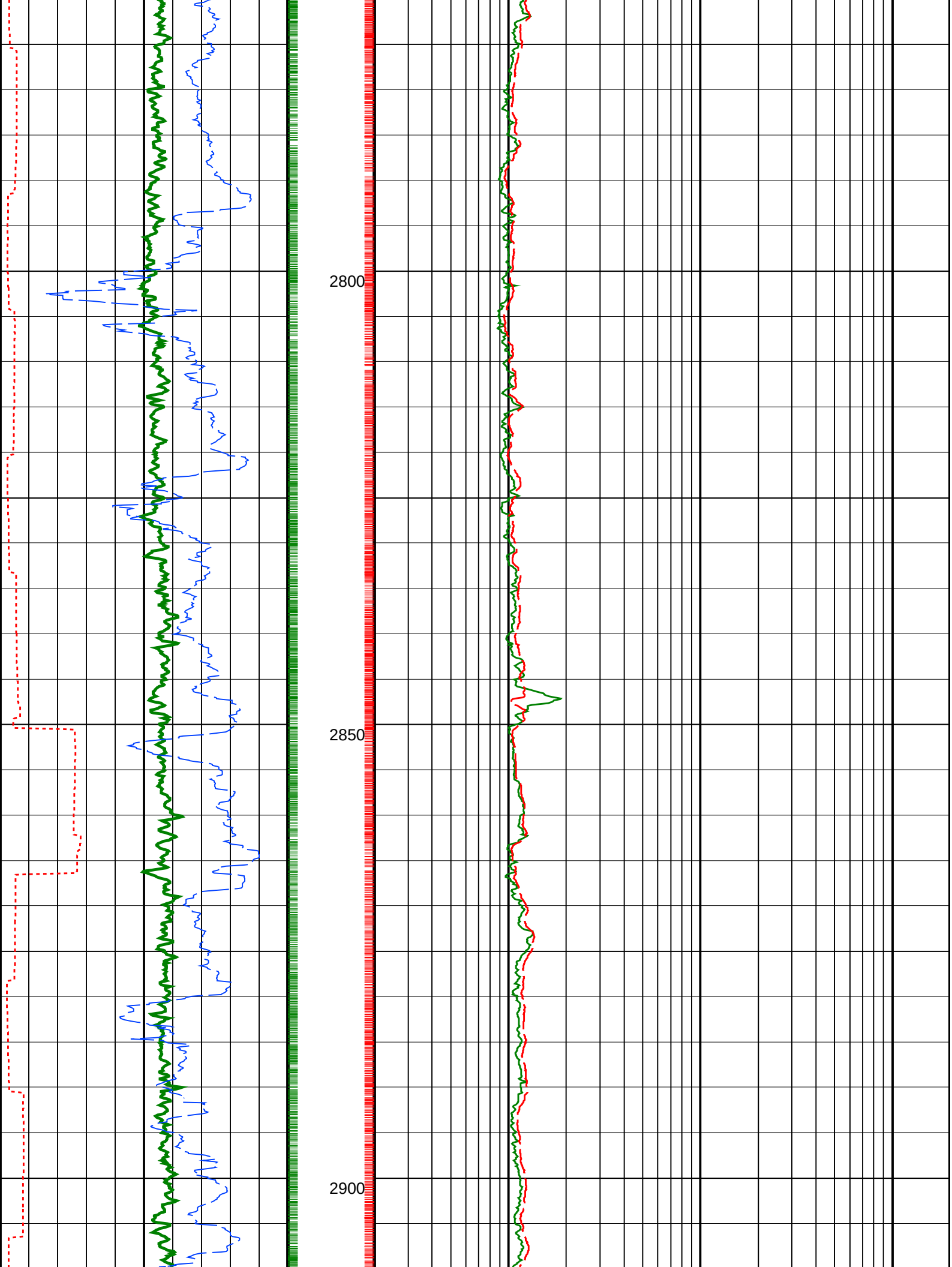

2100
2150
2200
GR_CDR
TAB_CDR_RES
ROP5_RM
PSR
ATR

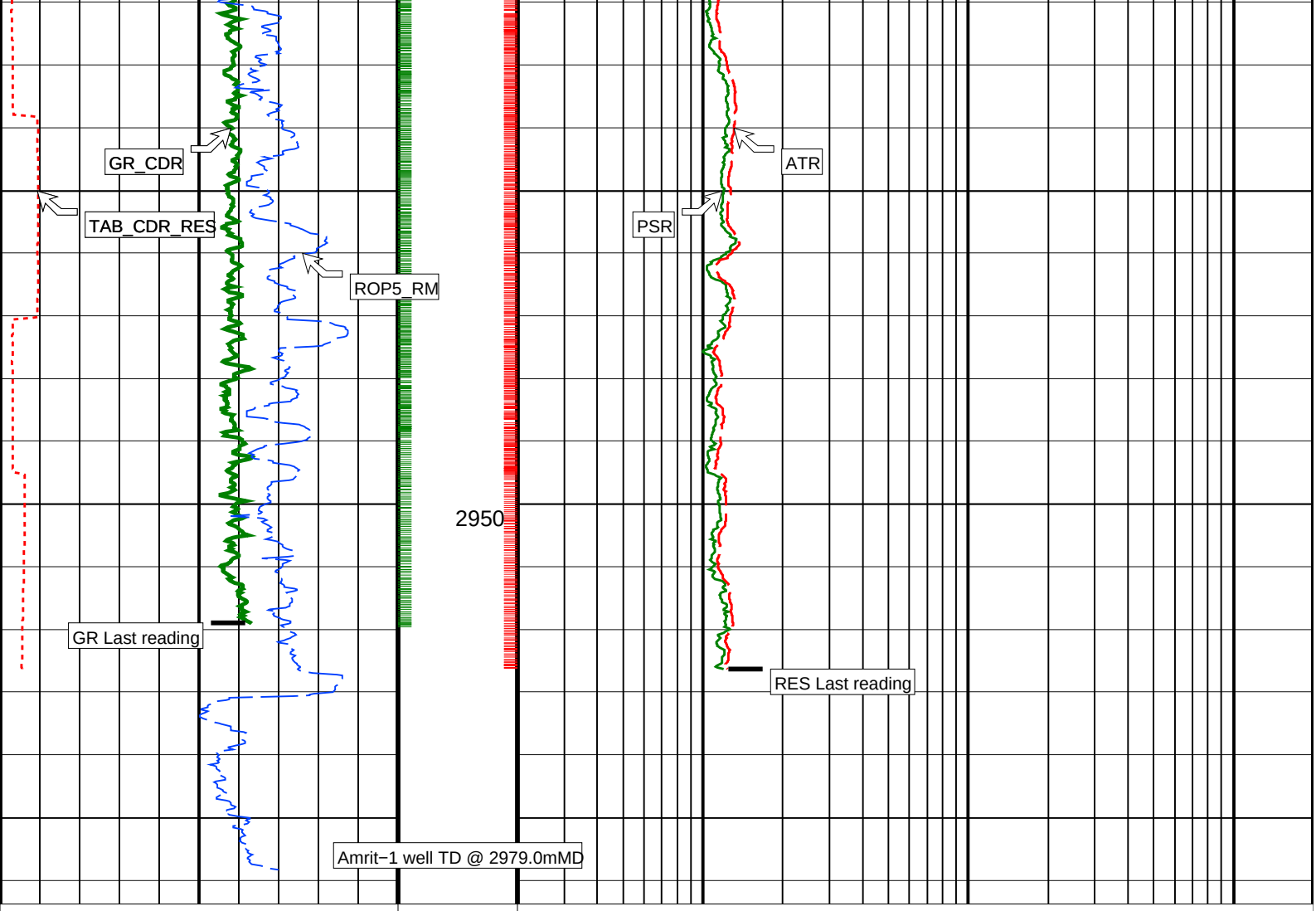

2250
2300
GR_CDR
TAB_CDR_RES
ROP5_RM
ATR
PSR


2350
2400
2450
GR splice
RES splice
13 3/8" Casing Shoe set @ 2454.5mMD
Run 2
Run 3


2500
2550
2600
GR_CDR
TAB_CDR_RES
ROP5_RM
ATR
PSR


2650
GR splice
RES splice
Run 3
Run 4
2700
GR_CDR
ATR
TAB_CDR_RES
PSR
ROP5_RM
2750


2800
2850
2900



CDR Gamma Ray (GR_CDR)
0 (GAPI) 200

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)
200 (M/HR) 0

CDR Resistivity Time After Bit (TAB_CDR_RES)
0 (HR) 10

Uncorrected Phase Shift Resistivity (PSR)
0.2 (OHMM) 200

Uncorrected Attenuation Resistivity (ATR)
0.2 (OHMM) 200

PIP SUMMARY

Gamma Ray samples

Resistivity samples

IDEAL Version: ID9_1C_01

IDF

9.50−in. Compensated Dual Resistivity / Equipment Identification

Primary Equipment:		
Tool Name and Serial Number	RGS9 − AA	9525
Gamma Ray Type	Plat − GR	
Calibration Status	−	

Master: 2−Oct−2004 8:36

9.50−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Attenuation down DB	Value	Phase	Attenuation up DB	Value	Phase	BHC attenuation DB	Value
Master		3.705	Master		3.932	Master		3.818

Phase	Phase shift down DEG	Value	Phase	Phase shift up DEG	Value	Phase	BHC phase shift DEG	Value
Master		3.709	Master		3.932	Master		3.818
	3.290 (Minimum) 3.890 (Nominal) 4.490 (Maximum)			3.290 (Minimum) 3.890 (Nominal) 4.490 (Maximum)			3.790 (Minimum) 3.890 (Nominal) 3.990 (Maximum)	

Master: 2−Oct−2004 8:36

9.50−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Phase shift down DEG	Value	Phase	Phase shift up DEG	Value	Phase	BHC phase shift DEG	Value
Master		0.1082	Master		0.09295	Master		0.1006
	−2.400 (Minimum) 0.1000 (Nominal) 2.600 (Maximum)			−2.400 (Minimum) 0.1000 (Nominal) 2.600 (Maximum)			−0.9000 (Minimum) 0.1000 (Nominal) 1.100 (Maximum)	

Master: 2−Oct−2004 7:55

9.50−in. Compensated Dual Resistivity Calibration

Gamma Ray: Blanket

Phase	Gain	Value
Master		0.9923
	0.8000 (Minimum) 1.000 (Nominal) 1.200 (Maximum)	

8.25−in. Compensated Dual Resistivity / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	CDR8 − AA	8001
Gamma Ray Type	Plat − GR	
Calibration Status	−	

Master: 3−Nov−2004 2:01

8.25−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Attenuation down DB	Value	Phase	Attenuation up DB	Value	Phase	BHC attenuation DB	Value
Master		4.993	Master		4.928	Master		4.960
	4.400 (Minimum) 5.000 (Nominal) 5.600 (Maximum)			4.400 (Minimum) 5.000 (Nominal) 5.600 (Maximum)			4.900 (Minimum) 5.000 (Nominal) 5.100 (Maximum)	

Master: 3−Nov−2004 2:01

8.25−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Phase shift down DEG	Value	Phase	Phase shift up DEG	Value	Phase	BHC phase shift DEG	Value
Master		−0.2902	Master		0.6567	Master		0.1833
	−2.400 (Minimum) 0.1000 (Nominal) 2.600 (Maximum)			−2.400 (Minimum) 0.1000 (Nominal) 2.600 (Maximum)			−0.9000 (Minimum) 0.1000 (Nominal) 1.100 (Maximum)	

Master: 3−Nov−2004 4:17

8.25−in. Compensated Dual Resistivity Calibration

Gamma Ray: Blanket

Phase	Gain	Value
Master		0.8570
	0.8000 (Minimum) 1.000 (Nominal) 1.200 (Maximum)	

SCHLUMBERGER

Survey report

Client.....: SANTOS − INPEX − UNOCAL
Field.....: Amrit

Well.....: Amrit−1 Spud date.....: 20−Nov−2004
API number.....: Last survey date.....: 07−Dec−04
Engineer.....: D.Borges, L.Watson, O.Radicevic Total accepted surveys...: 44
MD of first survey.....: 0.00 m
RIG:.....: Jack Bates MD of last survey.....: 2979.00 m
STATE:.....: Victoria

STATE:..... Victoria

−−−−− Survey calculation methods−−−−−−−−−−−−−− −−−−− Geomagnetic data −−−-
Method for positions.....: Minimum curvature Magnetic model.....: BGGM version 2004
Method for DLS.....: Mason & Taylor Magnetic date.....: 20−Nov−2004
Magnetic field strength..: 1221.99 HCNT
−−−−− Depth reference −−−−−−−−−−−−−−−−−−−−−− Magnetic dec (+E/W−).....:
Permanent datum.....: LAT Magnetic dip.....: −70.25 degrees
Depth reference.....: Driller's Pipe Tally
GL above permanent.....: −1396.00 m −−−−− MWD survey Reference Criteria −−−−
KB above permanent.....: Top Drive Reference G.....: 1000.09 mGal
DF above permanent.....: 29.00 m Reference H.....: 1221.99 HCNT
Reference Dip.....: −70.25 degrees
−−−−− Vertical section origin−−−−−−−−−−−−−−−− Tolerance of G.....: (+/−)
Latitude (+N/S−).....: 0.00 m Tolerance of H.....: (+/−) 6.00 HCNT
Departure (+E/W−).....: 0.00 m Tolerance of Dip.....: (+/−) 0.45 degrees

−−−−− Platform reference point−−−−−−−−−−−−−−− −−−−− Corrections −−−−−
Latitude (+N/S−).....: 0.00 m Magnetic dec (+E/W−).....: 10.48 degrees
Departure (+E/W−).....: 0.00 m Grid convergence (+E/W−).: −0.46 degrees
Total az corr (+E/W−)....: 10.94 degrees
Azimuth from Vsect Origin to target: 0.00 degrees (Total az corr = magnetic dec − grid conv)
Survey Correction Type ...:
I=Sag Corrected Inclination
M=Schlumberger Magnetic Correction
S=Shell Magnetic Correction
F=Failed Axis Correction
R=Magnetic Resonance Tool Correction
D=Dmag Magnetic Correction

[(c)2004 IDEAL ID9_1C_01]
SCHLUMBERGER Survey Report

Seq #	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S− (m)	Displ +E/W− (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy Tool type	Tool Corr
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIP	None
2	1425.49	0.59	234.33	1425.49	1425.46	−4.28	−4.28	−5.96	7.34	234.33	0.00	MWD	None
3	1454.01	1.07	295.89	28.52	1453.98	−4.25	−4.25	−6.32	7.62	236.09	0.33	MWD	None
4	1487.29	0.97	129.33	33.28	1487.26	−4.29	−4.29	−6.38	7.69	236.08	0.61	MWD	None
5	1510.95	0.86	56.64	23.66	1510.92	−4.32	−4.32	−6.08	7.46	234.60	0.46	MWD	None
6	1539.34	0.80	303.78	28.39	1539.31	−4.09	−4.09	−6.07	7.32	235.99	0.49	MWD	None
7	1568.02	0.85	315.97	28.68	1567.98	−3.83	−3.83	−6.38	7.44	239.03	0.06	MWD	None
8	1595.59	0.53	308.57	27.57	1595.55	−3.60	−3.60	−6.62	7.54	241.45	0.12	MWD	None
9	1624.12	0.56	304.38	28.53	1624.08	−3.44	−3.44	−6.84	7.66	243.29	0.02	MWD	None
10	1653.18	0.34	298.89	29.06	1653.14	−3.32	−3.32	−7.03	7.78	244.73	0.08	MWD	None
11	1681.34	0.26	305.03	28.16	1681.30	−3.24	−3.24	−7.16	7.86	245.63	0.03	MWD	None
12	1709.52	0.31	319.56	28.18	1709.48	−3.15	−3.15	−7.26	7.91	246.56	0.03	MWD	None
13	1737.89	0.40	311.67	28.37	1737.85	−3.02	−3.02	−7.38	7.98	247.73	0.04	MWD	None
14	1766.33	0.35	299.78	28.44	1766.29	−2.92	−2.92	−7.53	8.08	248.85	0.03	MWD	None
15	1809.32	0.26	261.27	42.99	1809.28	−2.86	−2.86	−7.74	8.26	249.70	0.05	MWD	None
16	1849.73	0.23	231.00	40.41	1849.69	−2.93	−2.93	−7.90	8.42	249.65	0.03	MWD	None
17	1878.02	0.37	193.70	28.29	1877.98	−3.05	−3.05	−7.96	8.53	249.02	0.08	MWD	None
18	1908.10	0.34	223.98	30.08	1908.06	−3.21	−3.21	−8.05	8.67	248.24	0.06	MWD	None
19	1935.76	0.18	265.57	27.66	1935.72	−3.28	−3.28	−8.15	8.78	248.11	0.09	MWD	None
20	1963.97	0.17	252.91	28.21	1963.92	−3.29	−3.29	−8.23	8.87	248.21	0.01	MWD	None
21	1991.95	0.12	204.40	27.98	1991.90	−3.33	−3.33	−8.29	8.93	248.11	0.05	MWD	None
22	2020.87	0.20	231.00	28.92	2020.82	−3.39	−3.39	−8.34	9.00	247.88	0.04	MWD	None
23	2049.42	0.23	223.20	28.55	2049.37	−3.46	−3.46	−8.41	9.10	247.64	0.01	MWD	None
24	2077.78	0.26	214.74	28.36	2077.73	−3.56	−3.56	−8.49	9.21	247.27	0.02	MWD	None
25	2105.32	0.33	183.75	27.54	2105.27	−3.69	−3.69	−8.53	9.29	246.63	0.06	MWD	None
26	2134.71	0.29	176.46	29.39	2134.66	−3.85	−3.85	−8.53	9.36	245.74	0.02	MWD	None
27	2162.92	0.22	203.34	28.21	2162.87	−3.97	−3.97	−8.55	9.42	245.11	0.05	MWD	None
28	2192.60	0.14	180.37	29.68	2192.55	−4.06	−4.06	−8.57	9.48	244.68	0.04	MWD	None
29	2220.68	0.29	203.20	28.08	2220.63	−4.15	−4.15	−8.60	9.55	244.21	0.06	MWD	None
30	2248.46	0.15	220.05	27.78	2248.41	−4.25	−4.25	−8.65	9.64	243.85	0.05	MWD	None
31	2277.42	0.31	183.89	28.96	2277.37	−4.35	−4.35	−8.68	9.71	243.36	0.07	MWD	None
32	2306.21	0.34	216.07	28.79	2306.16	−4.50	−4.50	−8.74	9.83	242.74	0.06	MWD	None
33	2334.13	0.40	185.07	27.92	2334.08	−4.67	−4.67	−8.79	9.95	242.05	0.07	MWD	None
34	2361.66	0.37	221.08	27.53	2361.61	−4.83	−4.83	−8.86	10.09	241.42	0.09	MWD	None
35	2390.55	0.33	232.85	28.89	2390.50	−4.95	−4.95	−8.99	10.26	241.17	0.03	MWD	None
36	2419.57	0.32	200.20	29.02	2419.52	−5.08	−5.08	−9.08	10.40	240.81	0.06	MWD	None
37	2433.15	0.24	208.59	13.58	2433.10	−5.14	−5.14	−9.11	10.46	240.59	0.07	MWD	None
38	2476.28	0.50	232.35	43.13	2476.23	−5.33	−5.33	−9.30	10.72	240.19	0.07	MWD	None
39	2534.29	0.33	216.60	58.01	2534.24	−5.62	−5.62	−9.60	11.13	239.67	0.04	MWD	None
40	2649.13	0.37	195.11	114.84	2649.07	−6.24	−6.24	−9.90	11.70	237.76	0.01	MWD	None
41	2762.85	0.23	199.79	113.72	2762.79	−6.81	−6.81	−10.07	12.16	235.92	0.01	MWD	None
42	2878.16	0.23	190.81	115.31	2878.10	−7.26	−7.26	−10.19	12.51	234.55	0.00	MWD	None
43	2950.00	0.26	140.59	71.84	2949.94	−7.52	−7.52	−10.11	12.61	233.35	0.03	MWD	None
44	2979.00	0.26	140.59	29.00	2978.94	−7.63	−7.63	−10.03	12.60	232.76	0.00	Proj. to TD	

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Company:	**SANTOS − INPEX − UNOCAL**	Schlumberger
Well:	**Amrit−1**	
Field:	**Exploration**	
Rig:	**Jack Bates**	**VIC−P−52**
State:	**Victoria**	
	CDR − Resistivity **1:500 Measured Depth** **Recorded Mode Data**	