Appendix D

UC-1-P-1SRC Data

This page intentionally left blank

Table D−1. UC-1-P-1SRC Chronology

Date	Time	Depth (ft bgs)	Activity
05/23/09	13:30 – 18:30	NA	Position workover rig over the hole and pulled out about 50 ft of 4.5-in. casing. A steel die fell into hole and indications were that casing had separated during initial pulling.
05/24/09	06:00 – 09:00	NA	Workover rig moves off the hole after pulling out about 480 ft of 4.5-in. casing. About 440 ft of casing had separated and is still in the hole.
05/26/09	14:35	NA	DRI runs downhole camera into hole – too murky to see anything.
05/27/09	09:45	NA	After pumping two water truck loads of water down the borehole, DRI reran the downhole camera into the borehole.
05/27/09	23:00	NA	After three attempts with a magnet fishing tool to retrieve the steel die down the borehole (all unsuccessful), DRI ran the camera down the hole, but the water was too murky to see.
05/28/09	09:20	NA	After gravity-feeding and airlifting three water truck loads of water down the borehole to clean it up, DRI ran the camera back down the borehole.
05/28/09	23:30	NA	Completed using wire brush to clean scale off inside of old 10.75 and 4.5-in. casing in borehole.
05/30/09	22:20	NA	HQ and AQ rods used to airlift and circulate to clean out borehole down to 932 ft. BQ rod with brush used to clean casing from 900 to 922 ft.
05/31/09	08:10	NA	Drill pipe run into borehole with casing retrieval tool removed 120 ft of old 4.5-in. casing, leaving an estimated 320 ft of old casing in the borehole.
05/31/09	14:00	NA	Two water truck loads of water used to settle sediment in the borehole and video camera indicated a bridge at a depth of 530 ft.
06/01/09	05:30	NA	Tripped in drill string with 8.75-in. drill bit and drilled through bridge and on down to top of old 4.5-in. casing at depth of 601 ft.
06/01/09	19:45	NA	A grappler was attached to the bottom of drill string and attempts (unsuccessful) were made to pull more of the old 4.5-in. casing from the borehole. Drill string and grappler were tripped out of borehole.
06/02/09	10:00	NA	Prepared for well construction. Tripped in BQ rod and tagged firm bottom at 626 ft.
06/02/09	19:00	NA	Placed hot batch of cement followed by cement up to a tagged depth of 584 ft.
06/02/09	23:45	NA	Finish tripping in 5.5-in. well casing and landed well at a depth of 573.78 ft.
06/03/09	06:00	NA	Completed placing 1/8 to 1/4 in. gravel to depth of 488 ft.
06/03/09	15:00	NA	Completed placing No. 6 sand to a depth of 458 ft, 3/8-in. bentonite chips to a depth of 445 ft, and cement to the surface.
06/03/09	18:00	NA	Trip in HQ and AQ rods and begin airlift development.
06/04/09	14:10	NA	Airlift development ended at 12:15 and AQ and HQ rods tripped out.
06/06/09	15:00	NA	Pump crew completes installing Gundfos® 10S50-58DS stainless steel pump, intake set at 498 ft. Completed tripping in 1.5-in. water access tubing to depth of 495 ft.
06/08/09	18:30	NA	Inside of well casing washed down with 1.5 truck loads of water.
06/09/09	11:30	NA	Start of final well development.
06/09/09	17:30	NA	End of final well development.

NA = Not applicable

Table D−2. CNTA UC-1-P-1SRC Well Construction Materials

Construction	Material	Type	Interval (ft)	Stemming Material	Volume (ft^3)	Interval (ft)
Monitor Well Casing	5.5-in. CS Casing (Internal Ceramic Coated)	Blank	+ 0.82 – 512.04	Cement Seal	207.1	0.0 – 445.0
				3/8-in. Bentonite Chips	6.0	445.0 – 458.0
		Screen w/end cap	512.04 – 573.78	No. 6 Sand Pack	14.0	458.0 – 488.0
				1/8 - 1/4 in. Gravel Pack	40.5	488.0 – 584.0
Bottom Seal	NA			Cement Seal	22.3	584.0 – 626.0
Submersible pump	Grundfos® 10S50-58DS Pump	Top	493.0	NA		
		Intake	498.0	NA		
		Bottom	500.0	NA		
Pump Riser Pipe	1.5-in. CS EUE	Blank	+1.5 – 493.0	NA		
Water Access Tubing	1.5-in. Flush Joint Schedule 80 PVC	Blank	+1.2 – 455.0	NA		
		Screen w/end cap	455.0 – 495.0	NA		

CS = Carbon steel
ft = Feet
ft^3 = Cubic feet
in. = Inch
NA = Not applicable
PVC = Polyvinyl chloride
EUE = External upset ends

Table D−3. UC-1-P-1SRC Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
Well Recompletion						
UC-1-P-1S Airlift	05/29/09	0524	WC	35.77	-270	3223
UC-1-P-1S Airlift	05/29/09	1730	WC	36.34	-720	3273
UC-1-P-1S Airlift	05/29/09	2300	WC	35.63	-90	3210
UC-1-P-1S Airlift	05/30/09	0433	WC	35.00	-900	3153
UC-1-P-1S Airlift	05/30/09	1230	WC	38.12	-1621	3434
UC-1-P-1S Airlift	06/03/09	1915	WC	34.87	0	3142
UC-1-P-1S Airlift	06/03/09	2015	WC	35.26	270	3177
UC-1-P-1S Airlift	06/03/09	2115	WC	35.51	-900	3199
UC-1-P-1S Airlift	06/03/09	2215	WC	35.97	180	3241
UC-1-P-1S Airlift	06/03/09	2315	WC	34.34	-180	3094
UC-1-P-1S Airlift	06/04/09	0015	WC	37.38	-4054	3367
UC-1-P-1S Airlift	06/04/09	0115	WC	38.04	-2072	3427
UC-1-P-1S Airlift	06/04/09	0215	WC	38.04	-2072	3427
UC-1-P-1S Airlift	06/04/09	0315	WC	37.39	-2702	3368
UC-1-P-1S Airlift	06/04/09	0415	WC	37.54	-2792	3382
UC-1-P-1S Airlift	06/04/09	0515	WC	37.08	-4054	3340
UC-1-P-1S Airlift	06/04/09	0615	WC	35.38	-4234	3187
UC-1-P-1S Airlift	06/04/09	0715	WC	37.09	-2522	3341
UC-1-P-1S Airlift	06/04/09	0815	WC	37.56	-1621	3384
UC-1-P-1S Airlift	06/04/09	0915	WC	38.98	-2432	3512
UC-1-P-1S Airlift	06/04/09	1015	WC	37.58	-3153	3386
UC-1-P-1S Airlift	06/04/09	1115	WC	36.87	-3243	3321
UC-1-P-1S Airlift	06/04/09	1215	WC	36.80	-1981	3316
Well Development - Pump						
UC-1 Well Dev.	06/09/09	1130	WD	38.18	-1531	3439
UC-1 Well Dev.	06/09/09	1330	WD	36.32	-1801	3272
UC-1 Well Dev.	06/09/09	1530	WD	38.46	-360	3465
UC-1 Well Dev.	06/09/09	1730	WD	39.43	90	3552

ft = Feet
dpm = Disintegrations per minute
MDA = Minimum detectable activity
pCi/L = Picocuries per liter
MDC = Minimum detectable concentration
WD = Well development
WC = Well cleanout - airlifting to remove sediment and well casing.

Table D−4. UC-1-P-1SRC Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
Well Recompletion							
05/29/09	0524	WD	7.24	17.31	314	8	>1000
05/29/09	1730	WD	7.73	18.49	269	3	>1000
05/29/09	2300	WD	7.89	18.4	267	1.6	>1000
05/30/09	0433	WD	7.69	19.29	272	3.1	>1000
05/30/09	1230	WD	7.92	20.05	360	57	250
06/03/09	1915	WD	9.25	20.22	356	21	334
06/03/09	2015	WD	9.16	19.41	312	15	120
06/03/09	2115	WD	9.18	18.82	300	13	124
06/03/09	2215	WD	9.13	18.85	299	11	159
06/03/09	2315	WD	8.88	19.05	291	12	62.8
06/04/09	0015	WD	8.93	18.86	286	8.2	43.3
06/04/09	0115	WD	8.85	19.35	291	7.3	40.1
06/04/09	0215	WD	8.73	18.2	290	6.2	39.4
06/04/09	0315	WD	8.7	18.08	291	5.1	38
06/04/09	0415	WD	8.77	18.51	295	4.7	24.4
06/04/09	0515	WD	8.71	18.31	293	3.9	25.5
06/04/09	0615	WD	8.78	18.85	284	3.7	43.9
06/04/09	0715	WD	8.73	18.5	281	3	47.9
06/04/09	0815	WD	8.75	19.17	287	2.5	94.3
06/04/09	0915	WD	8.51	18.83	309	2.2	16.3
06/04/09	1015	WD	8.35	18.57	315	2	15.2
06/04/09	1115	WD	8.45	18.94	317	1.6	17.7
06/04/09	1215	WD	8.47	20.87	321	1.5	19.9
Well Development - Pump							
06/09/09	1130	WD	7.76	21.83	218	2.3	161
06/09/09	1330	WD	8.53	20.48	294	12	19.1
06/09/09	1530	WD	8.48	19.81	288	4.6	6.63
06/09/09	1730	WD	8.43	20.18	286	2.1	5.75

Br– = Bromide
°C = Degrees Celsius
ft = Feet
mg/L = Milligrams per liter
NTU = Nephelometric turbidity unit
SU = Standard unit
WD = Well development
µS/cm = Microsiemens per centimeter

Schlumberger - Summary of Results

It is our goal in this review to present a general overview of the condition of the 4.5-inch casing at CNTA, UC-1-P-1S. All interpretations or opinions, as presented in this review, will be covered under Schlumberger's current Terms and Agreement Clause, which stipulates "Schlumberger will not be held responsible for any actions, real or inferred because of this review."

The PMIT-Caliper tool used to inspect the casing incorporates 40 individual probes. Each probe is capable of reading a minimum and maximum deflection. This advancement over previous tools allows inspection of a larger cross-section of the casing and also allows distinguishing perforations from anomalies such as casing splits or rips. Interpretation of the casing minimum ID will require a more subjective analysis because uneven scale build up will affect the ID measurement of the casing just like oval or dented pipe. The data collected during the logging are provided in three presentations. Presentation 1 is provided on page 4, Presentation 2 begins on page 5, and Presentation 3 begins on page 10. A brief summary of the presentations are provided below, and interpretations are provided on the logs.

- **Presentation 1** will be the first display that corresponds to a well depth of 538.292 feet. Inside the outer square box are two circles that depict 4.5-inch casing with an ID of 4 inches. The irregular curve inside the two simulated casing curves is the PMIT caliper curve, and it indicates the Internal Radius inside the casing. Note that in places, the internal radius is quite rugose and smaller than the true casing ID of 4 inches. There are also other small indentations that don't extend through the outside dimensions of the simulated casing and may be perforations. Both of these conditions may be attributed to scale buildup, which is filling the perforations and coating the interior wall of the casing.
- **Presentation 2, Column 1**, displays the tension curve.
- **Presentation 2, Column 2**, displays components of the PMIT caliper's casing profile.

  The **Averaged Internal Radius** is presented in black and is a quick visual reference only. The **Minimum Internal Radius** is displayed in blue, with a dashed red line indicating the true casing ID at 4 inches. Any deflections of the blue line to the left of this dashed red line indicates casing with an ID measuring less than 4 inches. We will presume this is scale buildup, instead of damage, because the casing is suspended freely in the well bore. The **Maximum External Radius** is displayed in red, with a dashed blue line indicating the true casing OD of 4.5 inches. Any deflections of the red line past the blue line on the right indicate that the perforations are clear through the OD of the casing. We will presume the perforations that diminish as we get deeper in the well are filling with concretions and scale, which eventually plug up the perforations.
- **Presentation 2, Column 3**, uses a black line to display the individual finger responses. A straight line indicates the nominal ID of the casing at 4 inches. Any deflections to the right indicate measurements larger than the ID of the casing and will be interpreted as perforations. Any deflections to the left indicate measurements smaller than the ID of the casing and will be interpreted as scale buildup.
- **Presentation 2, Column 4**, displays the individual finger responses in color. White shading indicates the nominal ID of the casing at 4 inches. **Measurements larger than the ID of the casing are shaded red** and will be interpreted as perforations. There will also be degradations of color shading, with the darkest red shading indicating deeper penetration

of the perforations through the casing. **Measurements smaller than the ID of the casing are shaded blue** and will be interpreted as scale buildup. There will also be degradations of color shading, with the darkest blue shade indicating that the scale buildup is at its thickest.

- **Presentation 3, Column 1**, displays the tension curve and casing collar indicator.
- **Presentation 3, Column 2**, displays the Gamma Ray reading and the fluid temperature in the well bore.
- **Presentation 3, Column 3**, displays components of the PMIT caliper's ID casing profile. The **Minimum Internal Radius** is displayed in blue, with a dashed red line indicating the true casing ID at 4 inches. Any deflections of the blue line to the left of this dashed red line indicates casing with an ID measuring less than 4 inches. We will presume this is scale buildup, instead of damage, because the casing is suspended freely in the well bore.
- **Presentation 3, Column 4**, displays components of the PMIT caliper's OD casing profile. The **Maximum External Radius** is displayed in red, with a dashed blue line indicating the true casing OD of 4.5 inches. Any deflections of the red line past the blue line on the right indicate that the perforations are clear through the OD of the casing. We will presume the perforations that diminish as we get deeper in the well are filling with concretions and scale, which eventually plug up the perforations.
- **Presentation 3, Column 5**, displays components of the PMIT caliper's casing profile. The **Average Internal Radius** is displayed in black for visual reference only. The **Metal Loss** is displayed with a purple line and is a calculation derived by averaging all of the arms measurements. We will presume the perforations, which are diminishing as we get deeper in the well, are filling with scale, which will eventually plug up the perforations. **This phenomenon is evident in the metal loss calculation.**

Schlumberger

Company: **S.M. STOLLER CORPORATION**

Well: **UC-1-P-1S**
Field: **CNTA**
County: **NYE** State: **NEVADA**

County: NYE
Field: CNTA
Location: CENTRAL NEVADA TEST AREA
Well: UC-1-P-1S
Company: S.M. STOLLER CORPORATION

PMIT-CALIPER- IMAGING TOO
GAMMA RAY / CCL
PMIT-GAMMA RAY CCL LOG

LOCATION

CENTRAL NEVADA TEST AREA NYE COUNTY, NEVADA		Elev.:	K.B. G.L. 6034.6 ft D.F.
Permanent Datum:	GROUND LEVEL	Elev.:	6034.6 ft
Log Measured From:	GROUND LEVEL	0.0 ft	above Perm. Datum
Drilling Measured From:	GROUND LEVEL		

API Serial No.	Section	Township	Range

Logging Date		16-Oct-2008					
Run Number		1					
Depth Driller		922 ft					
Schlumberger Depth		855 ft					
Bottom Log Interval		851.4 ft					
Top Log Interval		0 ft					
Casing Fluid Type		WATER					
Salinity							
Density		8.3 lbm/gal					
Fluid Level							
BIT/CASING/TUBING STRING							
Bit Size		10.750 in					
From		922 ft					
To		0 ft					
Casing/Tubing Size		4.500 in					
Weight		11.6 lbm/ft					
Grade		J55					
From		922 ft					
To		0 ft					
Maximum Recorded Temperatures							
Logger On Bottom	Time	16-Oct-2008	18:35				
Unit Number	Location	323	6615				
Recorded By		S.JABER					
Witnessed By		CRAIG GOODKNIGHT					

PVT DATA	Oil Density
	Water Salinity
	Gas Gravity
	Bo
	Bw
	1/Bg
	Bubble Point Pressure
	Bubble Point Temperature
	Solution GOR
	Maximum Deviation
	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 / Time
	Unit Number / Location
	Recorded By
	Witnessed By

DISCLAIMER

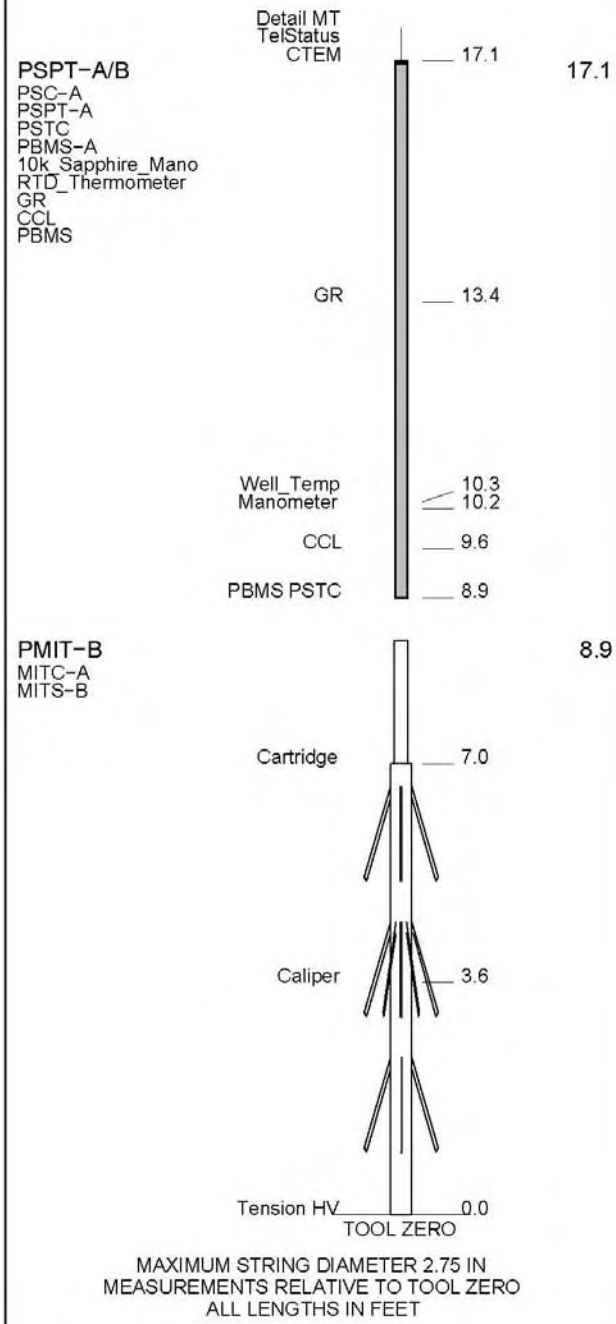
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
CORRELATED TO GL @MAT	
WELLCAD GENERATED FOR INTERPRETATION	

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:		15C0-309	PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

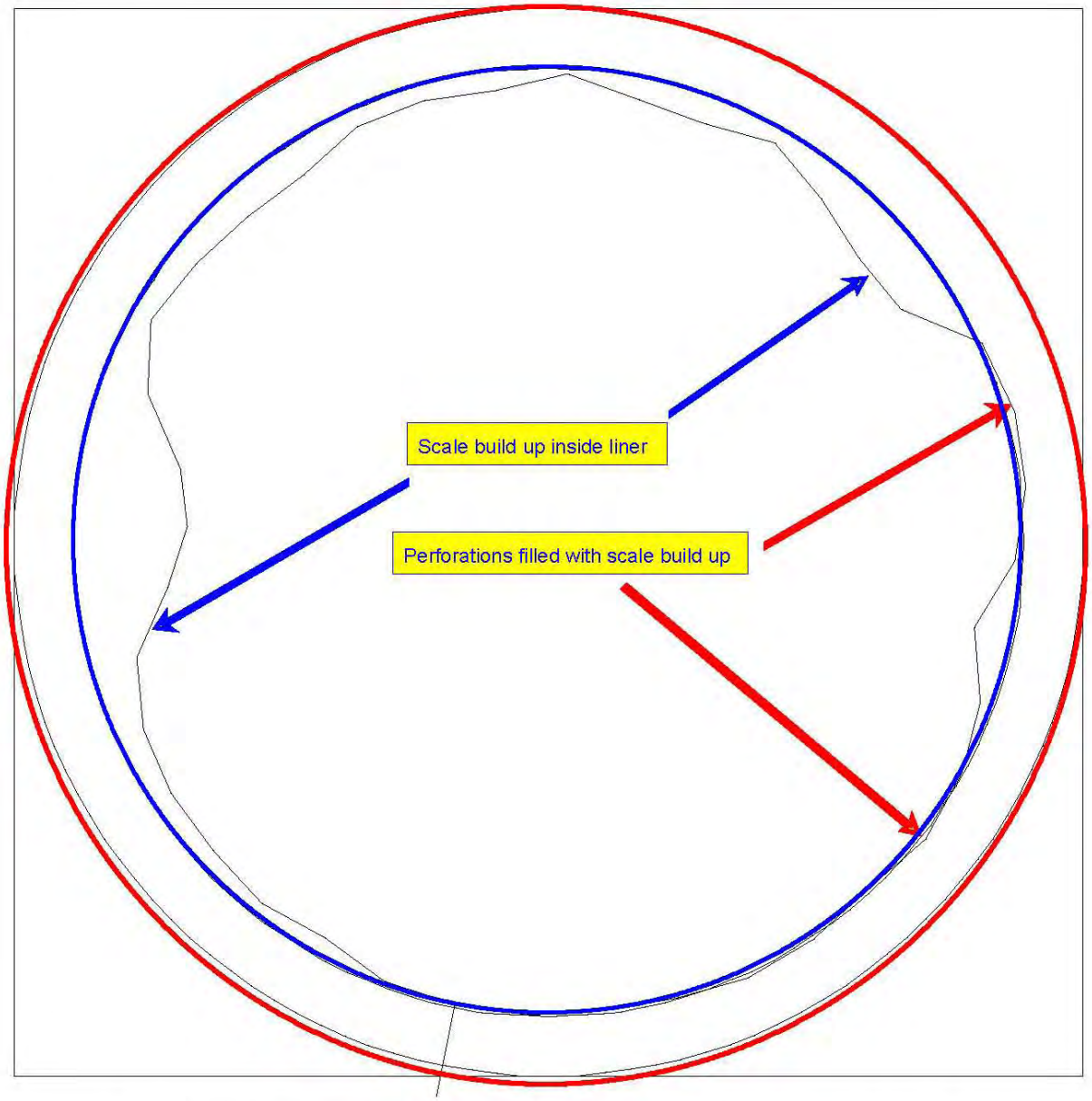
RUN 1	RUN 2
SURFACE EQUIPMENT WITM-A PSC_16MHZ	
DOWNHOLE EQUIPMENT	



MAXIMUM STRING DIAMETER 2.75 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

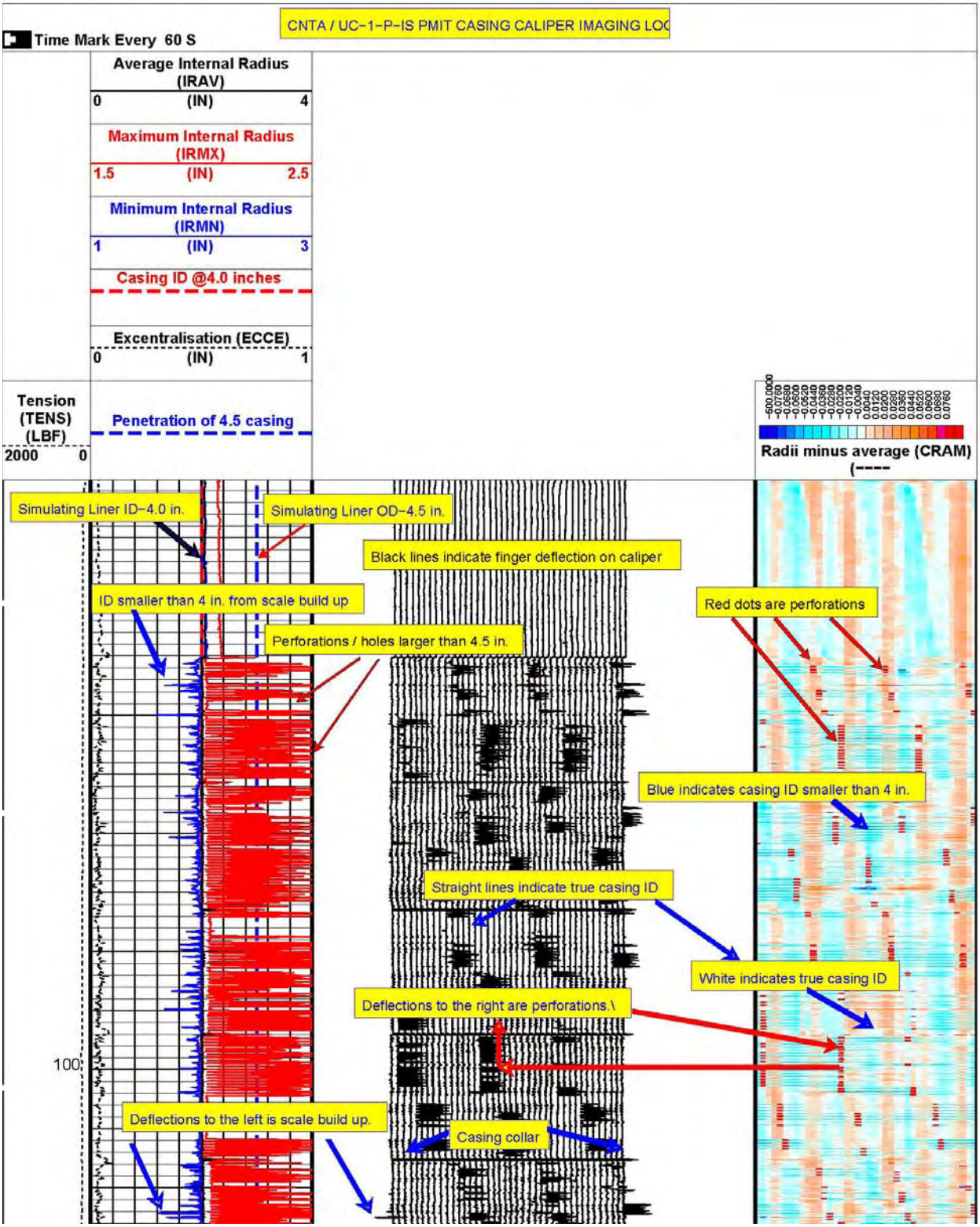
Presentation 1

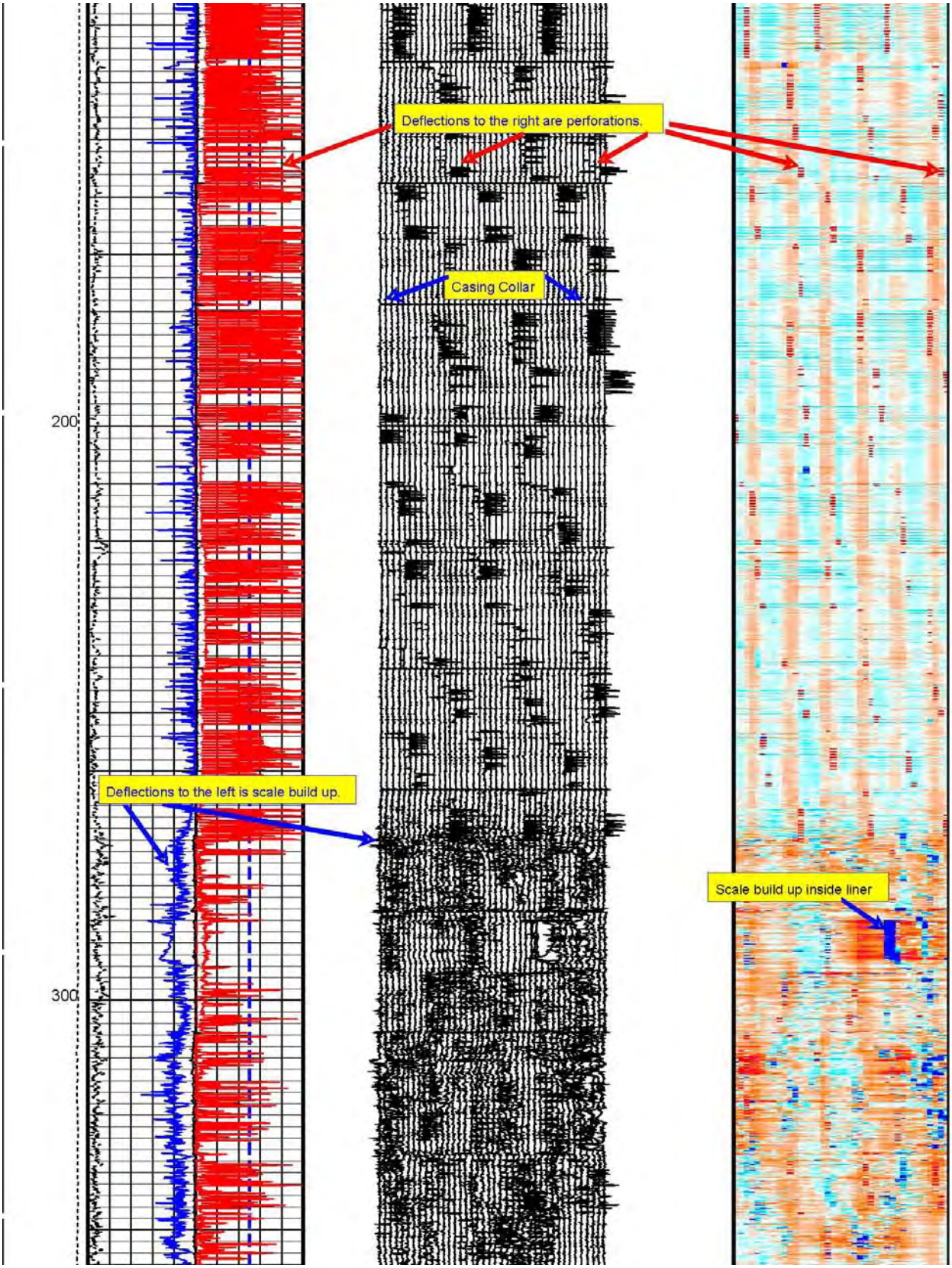
Depth = 538.292FT ID = 4.000in OD = 4.500in

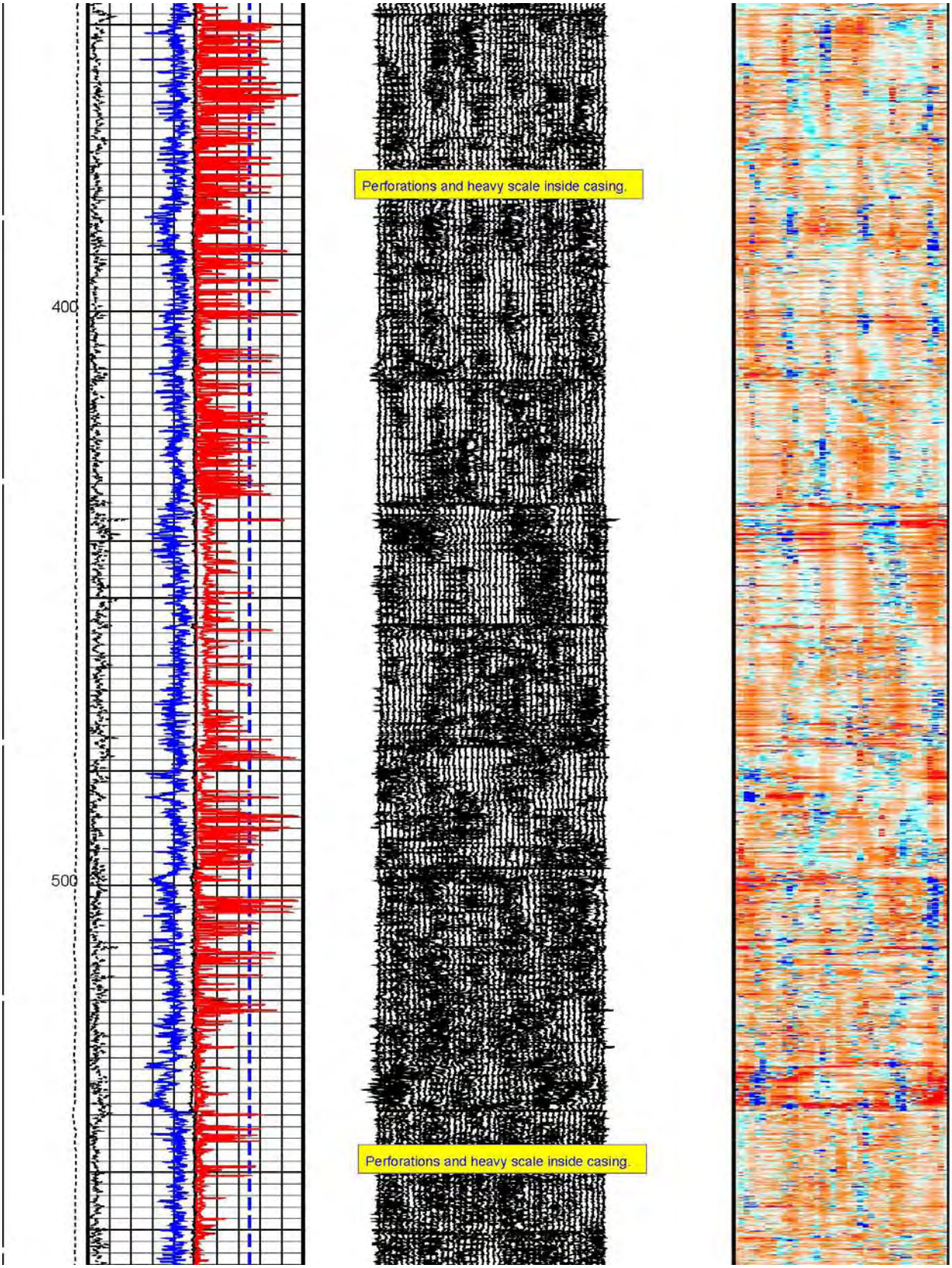


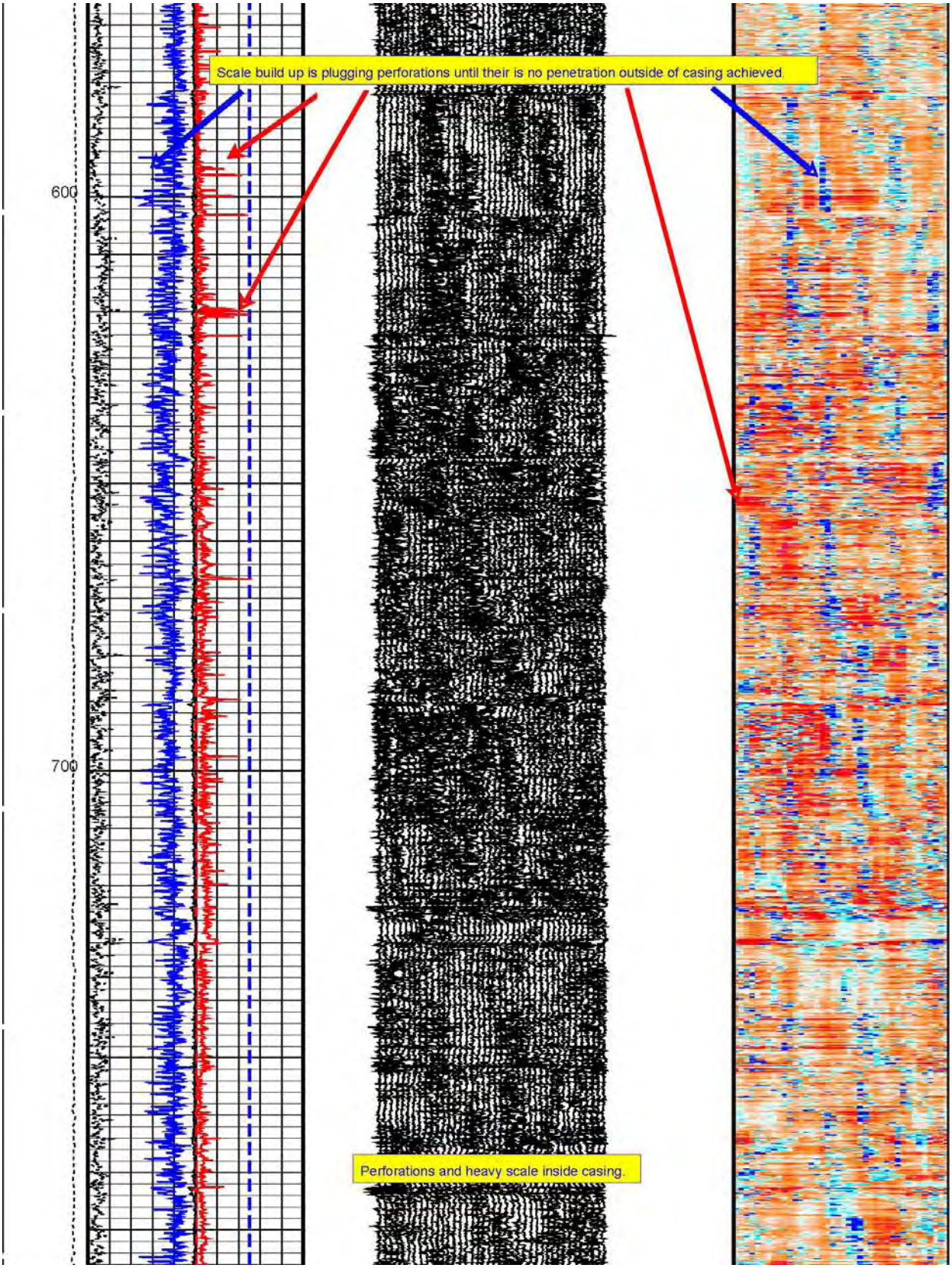
Maximum penetration = 16.2% Metal Loss = 1.2%

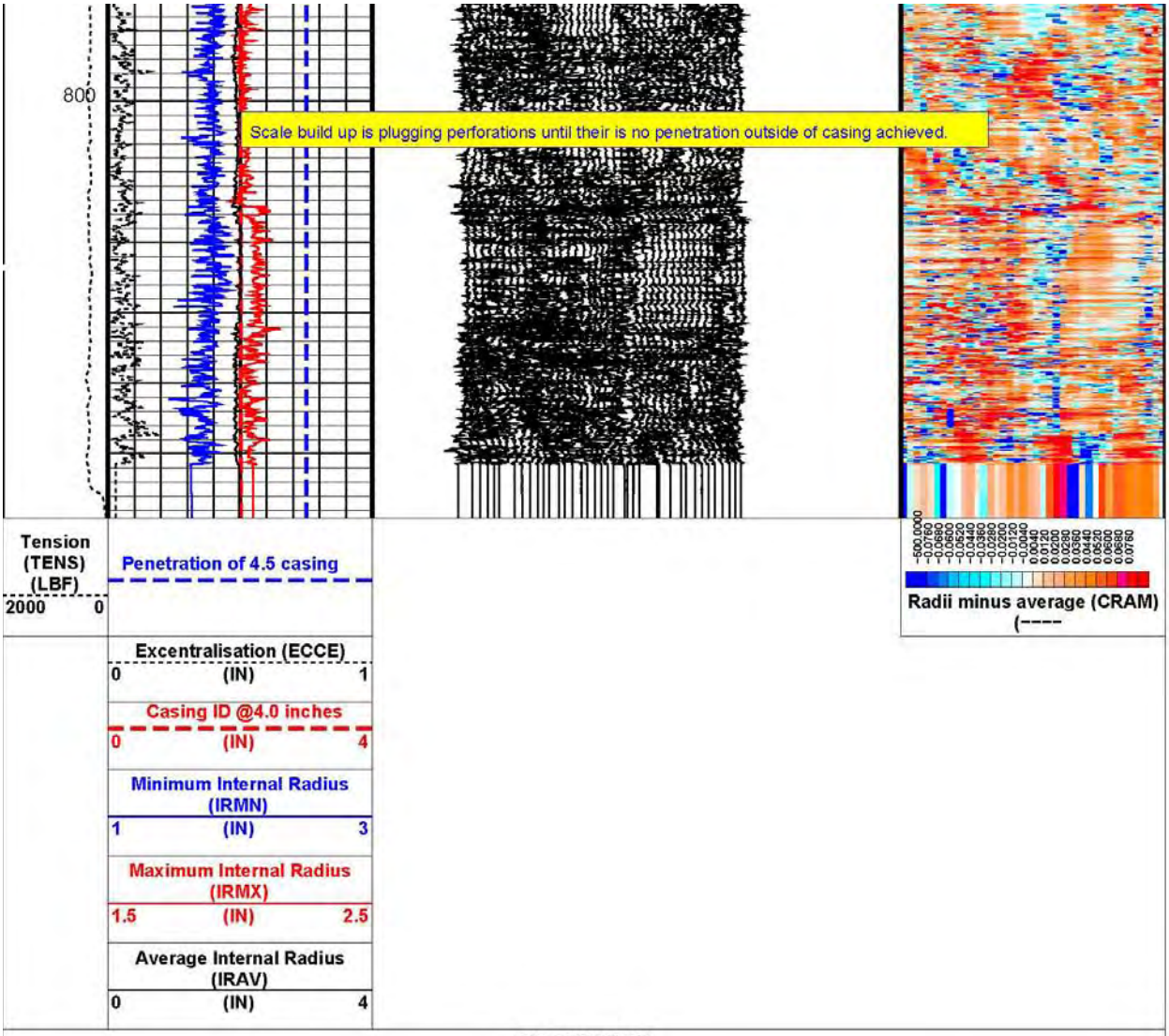
Presentation 2




Deflections to the right are perforations.
Casing Collar
200
Deflections to the left is scale build up.
Scale build up inside liner
300


400
500
Perforations and heavy scale inside casing.
Perforations and heavy scale inside casing.


Scale build up is plugging perforations until their is no penetration outside of casing achieved.
600
700
Perforations and heavy scale inside casing.



PIP SUMMARY

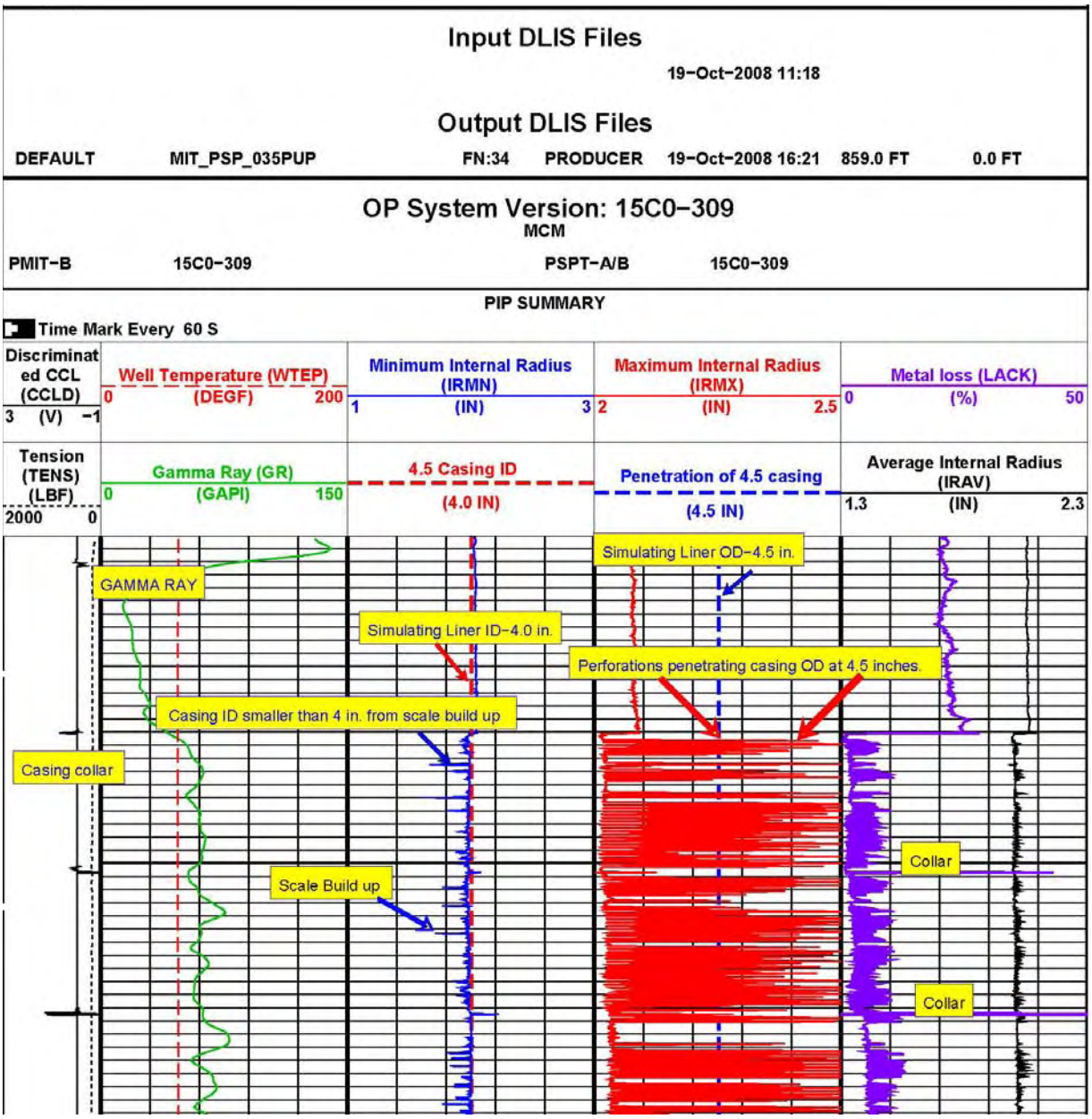
Time Mark Every 60 S

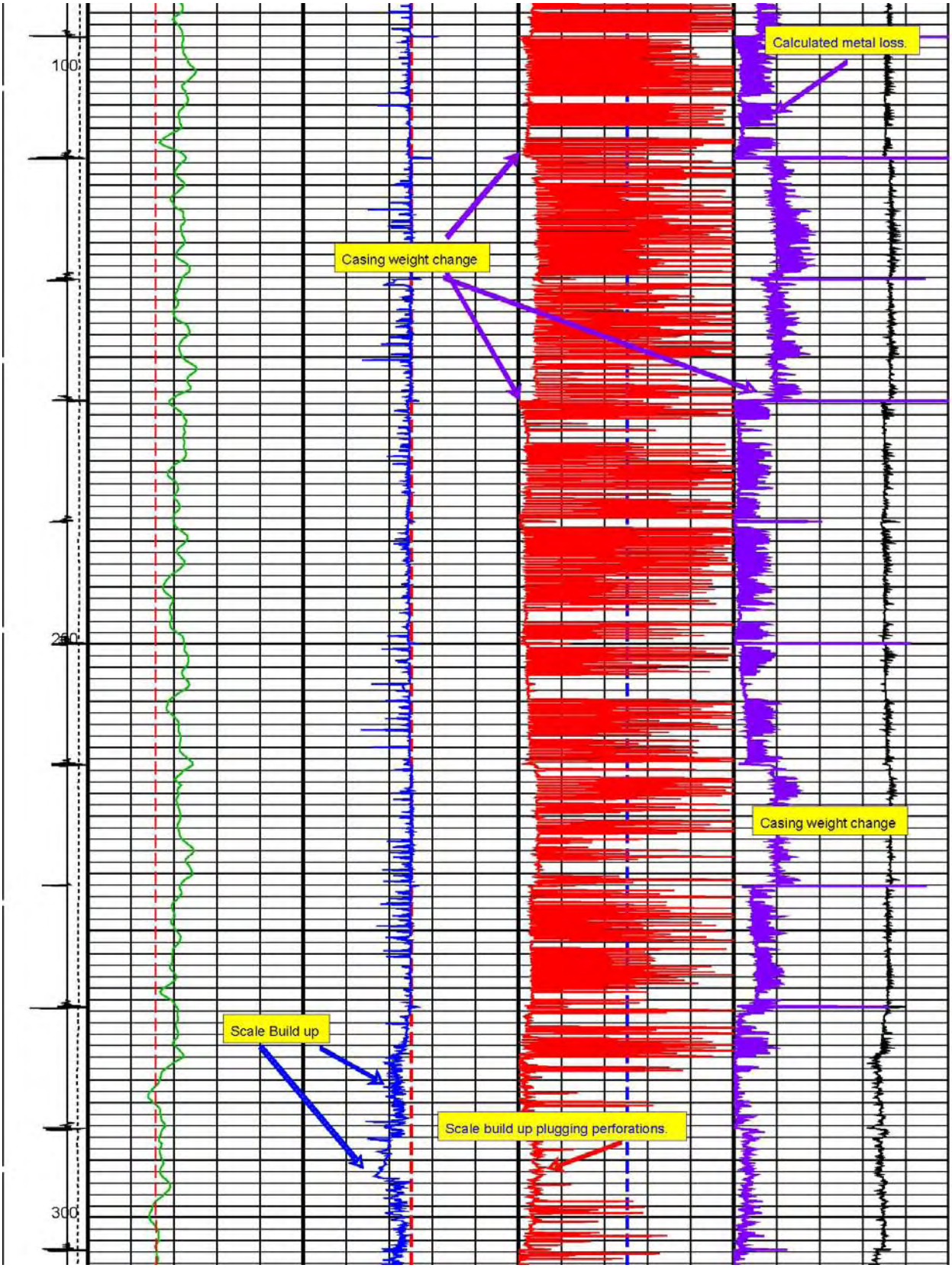
Parameters

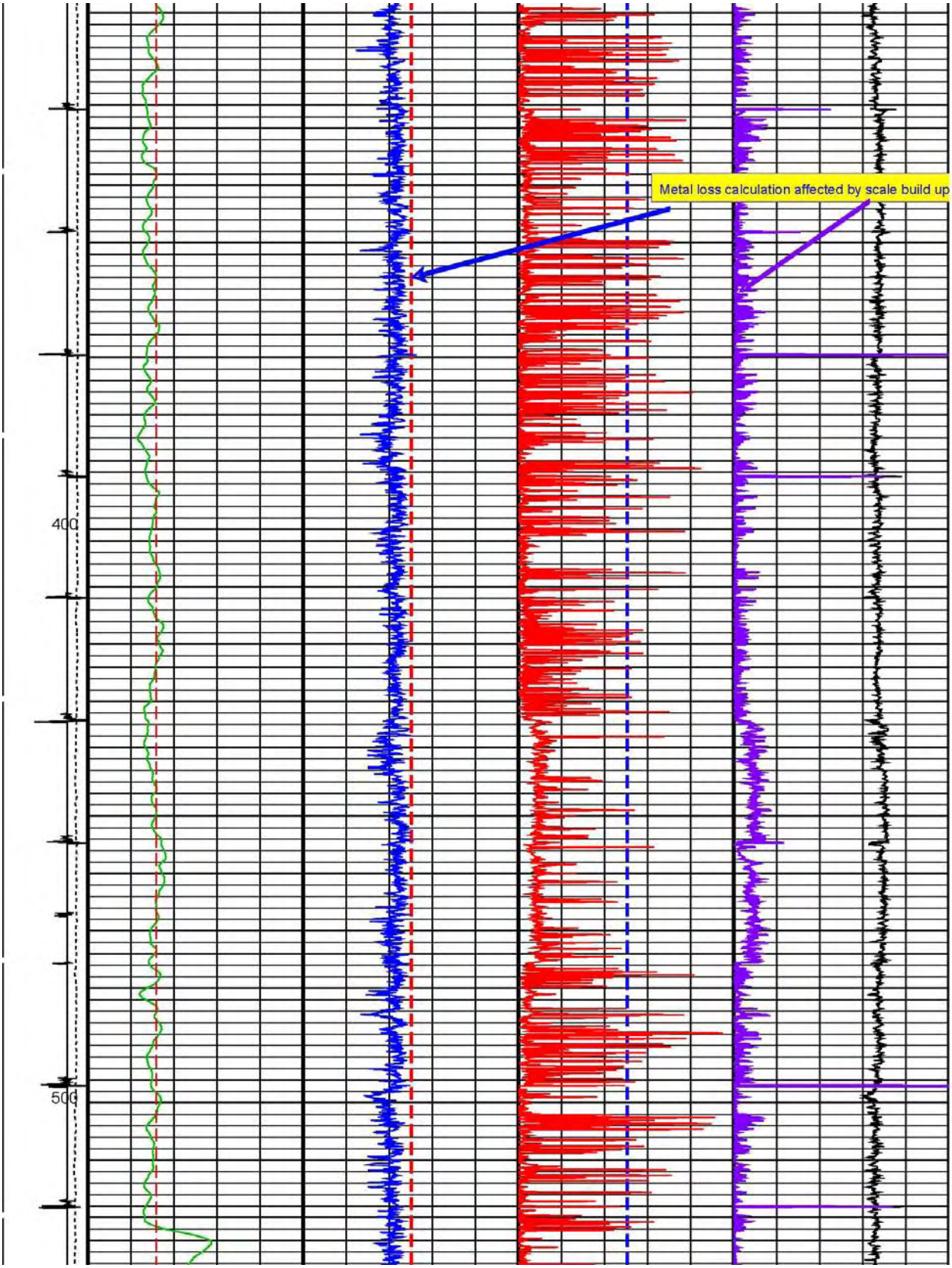
DLIS Name	Description	Value	
PMIT-B: Multifinger Imaging Tool - B			
ACQ_MODE	Data Acquisition Mode	RealTime	
BF	Bad finger List	None	
CSID	Casing Size I.D.	4	IN
EXCO	Eccentering Correction	Allowed	
FOCO	Finger Offset Correction	Allowed	
FWCO	Finger Wear Correction	Disallowed	
HIST	Histogram Accumulation Flag	Allowed	
MIT_CAL_MODE	Finger Calibration Mode	BestFit	
OVCO	Ovalization Correction	Disallowed	
VRES	Vertical Resolution	0.5in	
WLI	Logged Interval (for wear correction)	0	FT
PSPT-A/B: Production Services Logging Platform			
CSID	Casing Size I.D.	4	IN
System and Miscellaneous			
CSIZ	Current Casing Size	4.500	IN
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	RECOMPUTE	

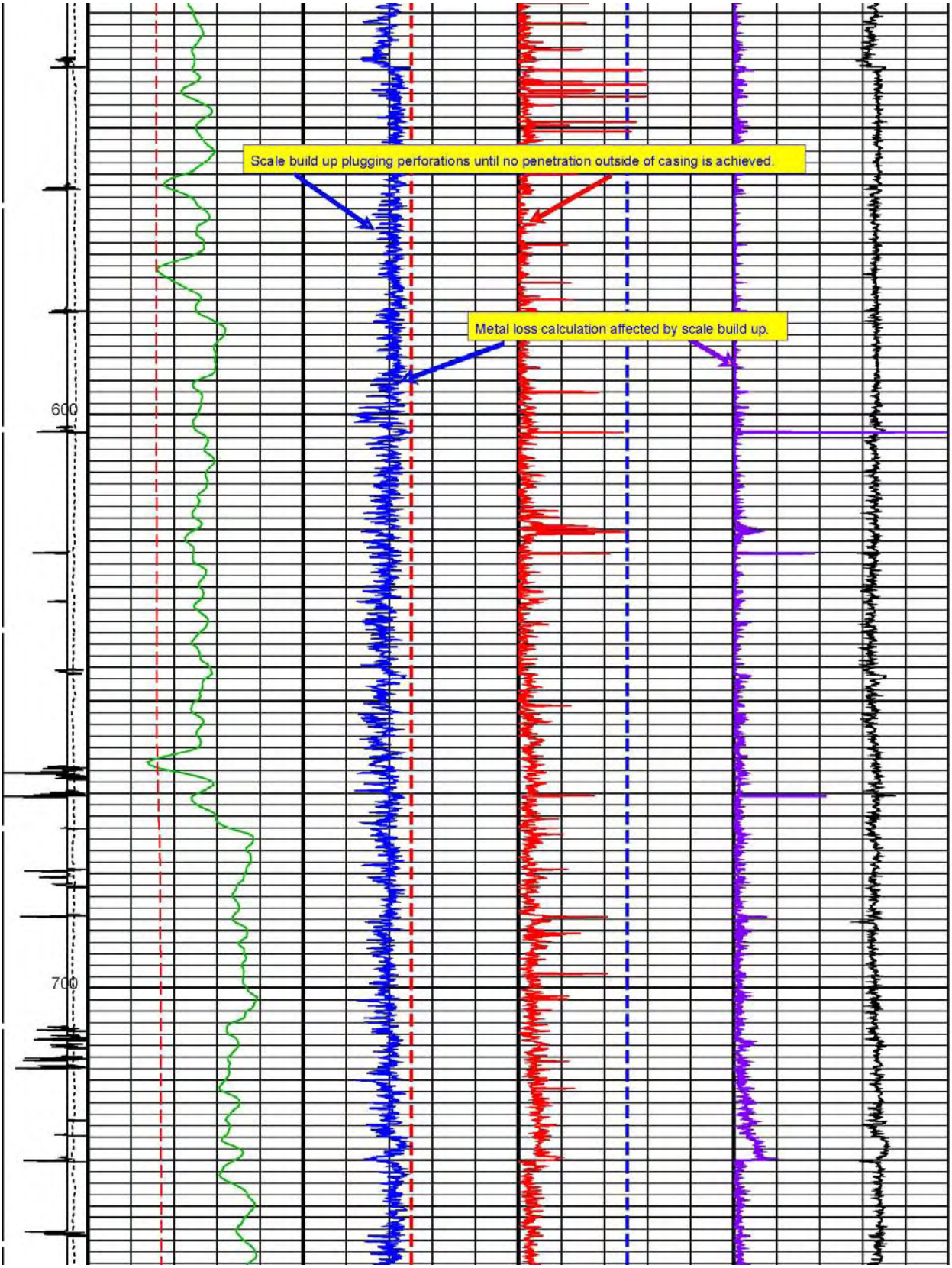
Format: PMITB_Radii_1 Vertical Scale: 5" per 100' Graphics File Created: 19-Oct-2008 16:21

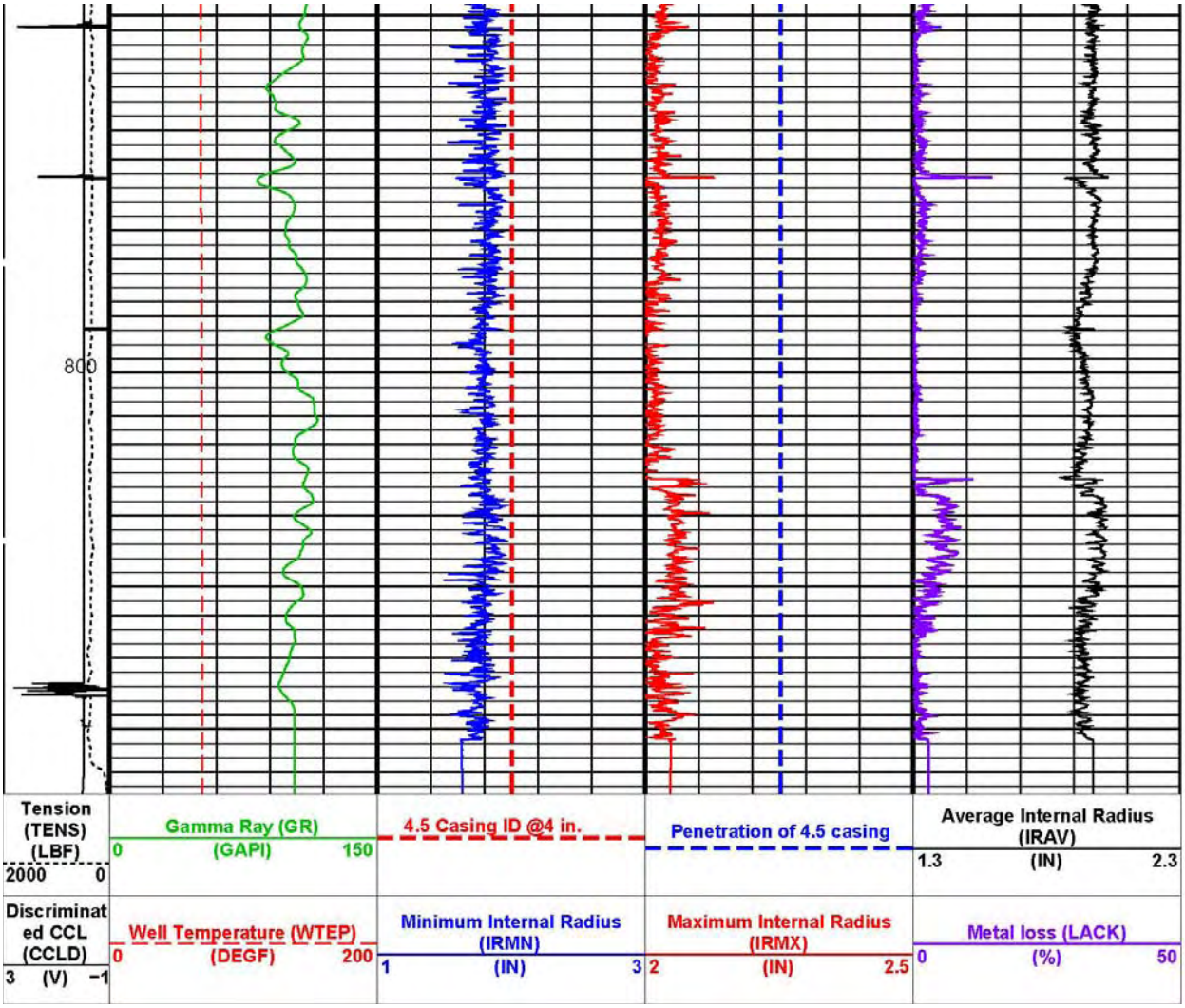
Presentation 3




100
250
300
Calculated metal loss.
Casing weight change
Casing weight change
Scale Build up
Scale build up plugging perforations.


Metal loss calculation affected by scale build up
400
500


Scale build up plugging perforations until no penetration outside of casing is achieved.
Metal loss calculation affected by scale build up.
600
700


800
Tension (TENS) (LBF)
2000 0
Gamma Ray (GR)
0 (GAPI) 150
4.5 Casing ID @4 in.
Penetration of 4.5 casing
Average Internal Radius (IRAV)
1.3 (IN) 2.3
Discriminated CCL (CCLD)
3 (V) −1
Well Temperature (WTEP)
0 (DEGF) 200
Minimum Internal Radius (IRMN)
1 (IN) 3
Maximum Internal Radius (IRMX)
2 (IN) 2.5
Metal loss (LACK)
0 (%) 50

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
PMIT-B: Multifinger Imaging Tool - B			
ACQ_MODE	Data Acquisition Mode	RealTime	
BF	Bad finger List	None	
CSID	Casing Size I.D.	4	IN
EXCO	Eccentering Correction	Allowed	
FOCO	Finger Offset Correction	Allowed	
FWCO	Finger Wear Correction	Disallowed	
HIST	Histogram Accumulation Flag	Allowed	
MIT_CAL_MODE	Finger Calibration Mode	BestFit	
OVCO	Ovalization Correction	Disallowed	
VRES	Vertical Resolution	0.5in	
WLI	Logged Interval (for wear correction)	0	FT
PSPT-A/B: Production Services Logging Platform			
CSID	Casing Size I.D.	4	IN
System and Miscellaneous			
CSIZ	Current Casing Size	4.500	IN
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	RECOMPUTE	

Format: PMITB_Pene Vertical Scale: 5" per 100' Graphics File Created: 19-Oct-2008 16:21

OP System Version: 15C0-309

MCM

PMIT-B	15C0-309	PSPT-A/B	15C0-309

Input DLIS Files

19-Oct-2008 11:18

Output DLIS Files

DEFAULT	MIT_PSP_035PUP	FN:34	PRODUCER	19-Oct-2008 16:21

Company: **S.M. STOLLER CORPORATION**

Schlumberger

Well: **UC-1-P-1S**
Field: **CNTA**
County: **NYE**
State: **NEVADA**

PMIT-CALIPER- IMAGING TOO
GAMMA RAY / CCL
PMIT-GAMMA RAY CCL LOG

This page intentionally left blank