REPORT NO. ww3ft2011
PAGE NO. 1
TEST DATE: 20-SEP-2011

S T A R

Schlumberger Transient Analysis Report

Based on Model Verified Interpretation Of a Pressure Transient Fall-off Test

Schlumberger

COMPANY: CHEVRON N. AMERICA EXPL. & PR	WELL: SEC. 30 WW3
TEST IDENTIFICATION Test Type ..... FALL-OFF TEST Test Year ..... 2011 Test Interval (ft) ..... 395 to 997	**WELL LOCATION** Field ..... MIDWAY SUNSET County ..... KERN State ..... CALIFORNIA
COMPLETION CONFIGURATION Total Depth (MD/TVD) (ft) .... 997 Slotted liner I.D. (in) ..... 7"-23# Hole Size (in) ..... 8.75 Slotted Liner Interval (ft) .. 395 to 997 Net Pay (ft) 600	**TEST STRING CONFIGURATION** Gauge Depth (ft)/Type ..... 400 / ELEC. Downhole Valve (Y/N)/Type .... N **TEST CONDITIONS** Injection Time (days) ..... 1367 Shut-in Duration (hrs) 24.1
INTERPRETATION RESULTS Model of Behavior ..... HOMOGENEOUS Fluid Type Used for Analysis.. WATER Reservoir Pressure (psi) ..... 10.4 Transmissibility (md.ft/cp) .. 83100. Effective Permeability (md) .. 138 to Water Skin Factor ..... 16.8 Radius of Investigation (ft).. 3060.	**ROCK/FLUID/WELLBORE PROPERTIES** Water Cut (%) ..... 100 Viscosity (cp) ..... 1.0 Total Compressibility (1/psi). 3.0E-06 Porosity (%) ..... 10 Reservoir Temperature (F) .... 86.8 Form.Vol.Factor (bbl/STB) 1.0

PRODUCTION RATE DURING TEST: 3651 BWIPD = LAST INJECTION RATE

COMMENTS:

A 24-HR PRESSURE TRANSIENT FALL-OFF TEST WAS CONDUCTED ON THE WW3 WELL ON 20-SEP-2011 IN ORDER TO DETERMINE THE MODEL OF RESERVOIR BEHAVIOR AND PARAMETERS OF EXTRAPOLATED PRESSURE, TRANSMISSIBILITY, AND SKIN. ANALYSIS OF THE DIAGNOSTIC LOG-LOG PLOT OF PRESSURE AND DERIVTAIVE INDICATES THE PRESENCE OF A HOMOGENEOUS, INFINITE ACTING SYSTEM WITH SKIN AND VARIABLE WELLBORE STORAGE IN EARLY TIME, TRANSITIONAL FLOW, AND INFINITE ACTING RADIAL FLOW IN LATE TIME. THE FALL-OFF TEST DATA WAS MATCHED USING A HOMOGENEOUS, INFINITE SYSTEM RESERVOIR MODEL WITH SKIN AND VARIABLE WELLBORE STORAGE (SEE PLOTS AND SUMMARY RESULTS).

BASED ON THE MATCH, THE TESTED INTERVAL HAS THE CHARACTERISTICS OF HIGH PERMEABILITY EFFECTIVE TO THE INJECTED WATER, AND A SEVERELY DAMAGED WELLBORE CONDITION AT THE TIME OF THE TEST, WITH A SKIN FACTOR OF 16.8. NO SEALING OR SUPPORTING OUTER BOUNDARIES WERE OBSERVED WITHIN THE 3060-Ft RADIUS OF INVESTIGATION FOR THE TEST. QUESTIONS ABOUT THIS REPORT SHOULD BE DIRECTED TO DEBORA HALLFORD AT 303-486-3262.

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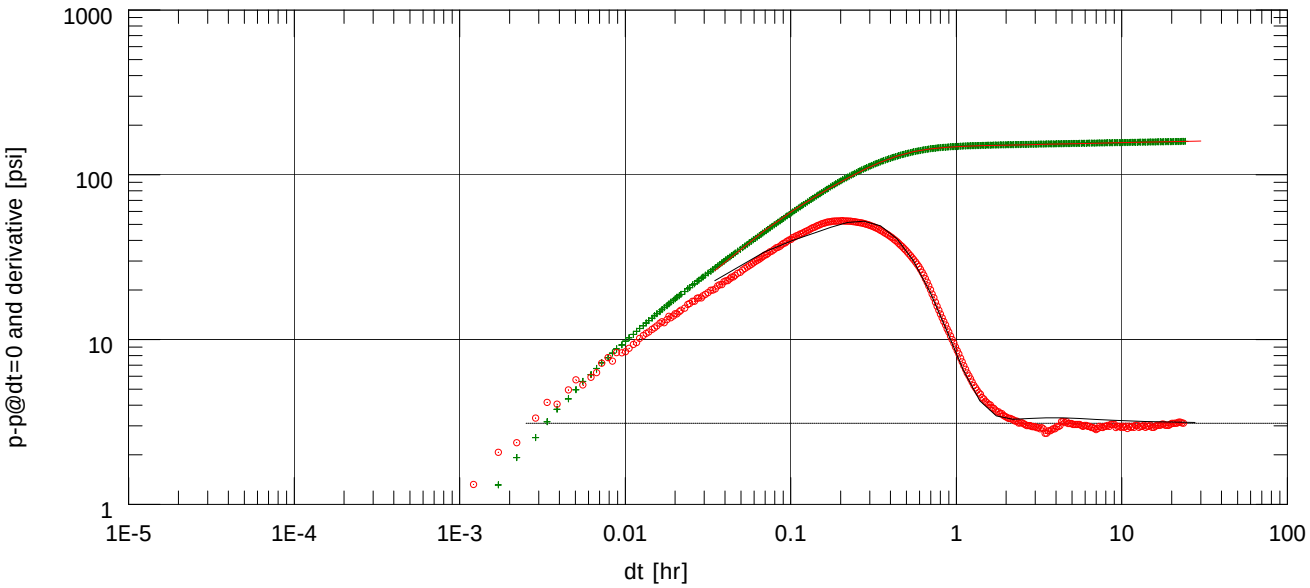
Log-Log plot	Analysis 1
Company Chevron N. America Expl. & Prod.	Field Midway Sunset
Well Sec. 30 WW3 Sunrise	Test Name / # ww3ft11



Pressure fall-off #1

Rate	0 STB/D
Rate change	3651 STB/D
P@dt=0	191.22 psia
Pi	10.4397 psia
Smoothing	0.1

Default values are used!

Selected Model

Model Option	Standard Model
Well	Vertical, Changing Storage (Hegeman)
Reservoir	Homogeneous
Boundary	Infinite

Main Model Parameters

TMatch	198 [hr]-1
PMatch	0.161 [psia]-1
C	0.124 bbl/psi
Total Skin	16.8
k.h, total	83100 md.ft
k, average	138 md
Pi	10.4397 psia

Model Parameters

Well & Wellbore parameters (Sec. 30 WW3 Sunrise)

C	0.124 bbl/psi
Ci/Cf	1.4
delta_t	0.911 hr
Skin	16.8

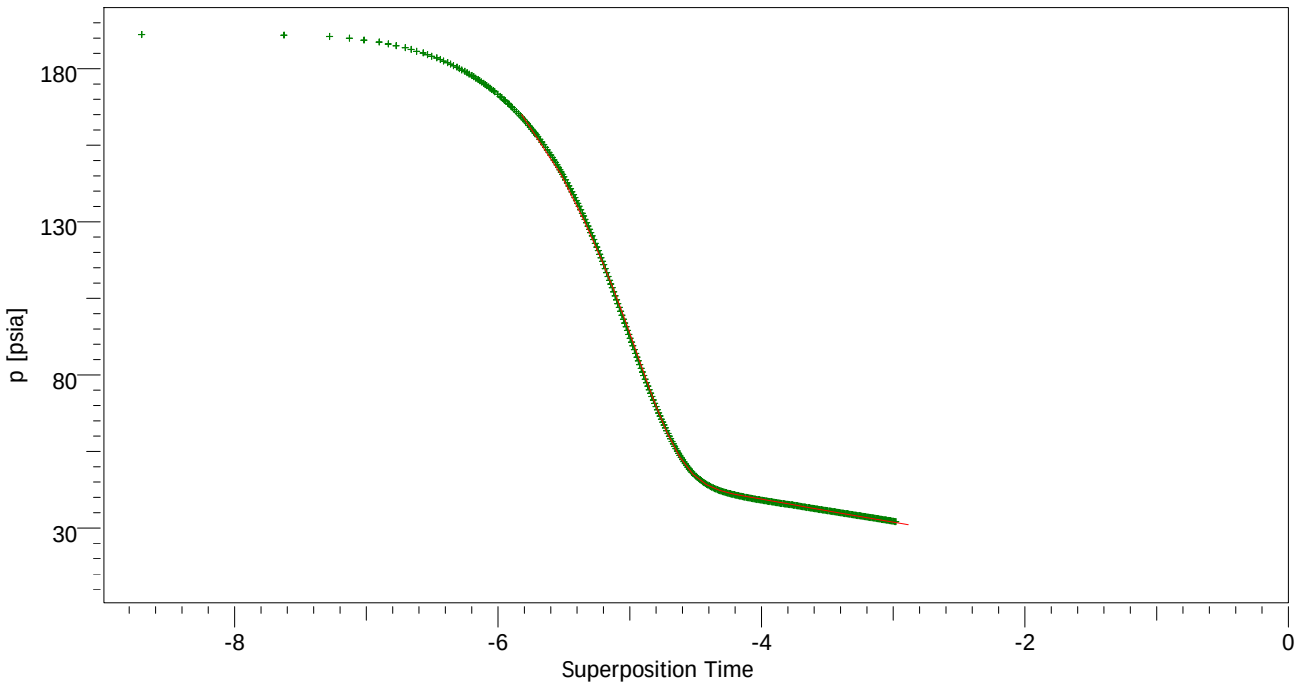
Reservoir & Boundary parameters

Pi	10.4397 psia
k.h	83100 md.ft
k	138 md

Derived & Secondary Parameters

Rinv	3060 ft
Test. Vol.	314.418 MMB
Delta P (Total Skin)	104.505 psi
Delta P Ratio (Total Skin)	0.65265 Fraction

Semi-Log plot	Analysis 1
Company Chevron N. America Expl. & Prod.	Field Midway Sunset
Well Sec. 30 WW3 Sunrise	Test Name / # ww3ft11



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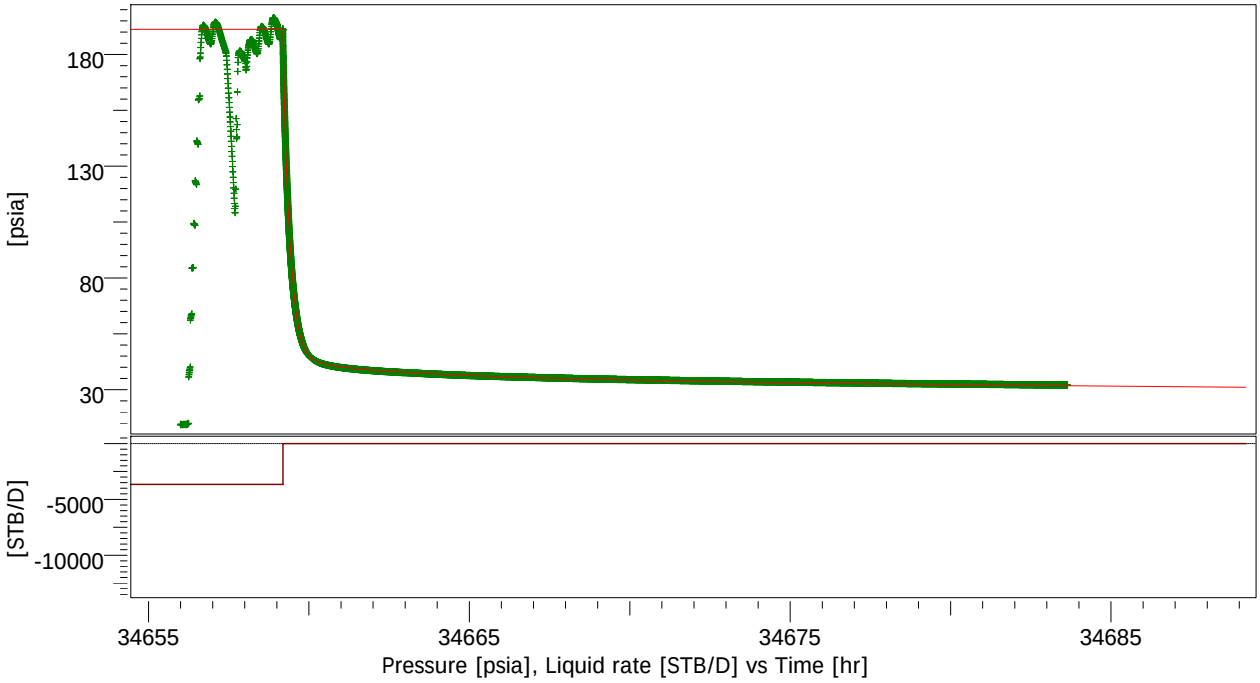

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Test date / time	9/20/2011 08:03:01
Formation interval	
Perforated interval	
Gauge type / #	elec. SN 5888
Gauge depth	400 ft.
Analyzed by	DEBORA HALLFORD
Analysis date / time	11/08/2011
TEST TYPE	Standard
Porosity Phi (%)	10
Well Radius rw	0.365 ft
Pay Zone h	600 ft
Form. compr.	3E-6 psi-1
Fluid type	Water
Volume Factor B	1 B/STB
Viscosity	1 cp
Total Compr. ct	3E-6 psi-1

Default values are used!

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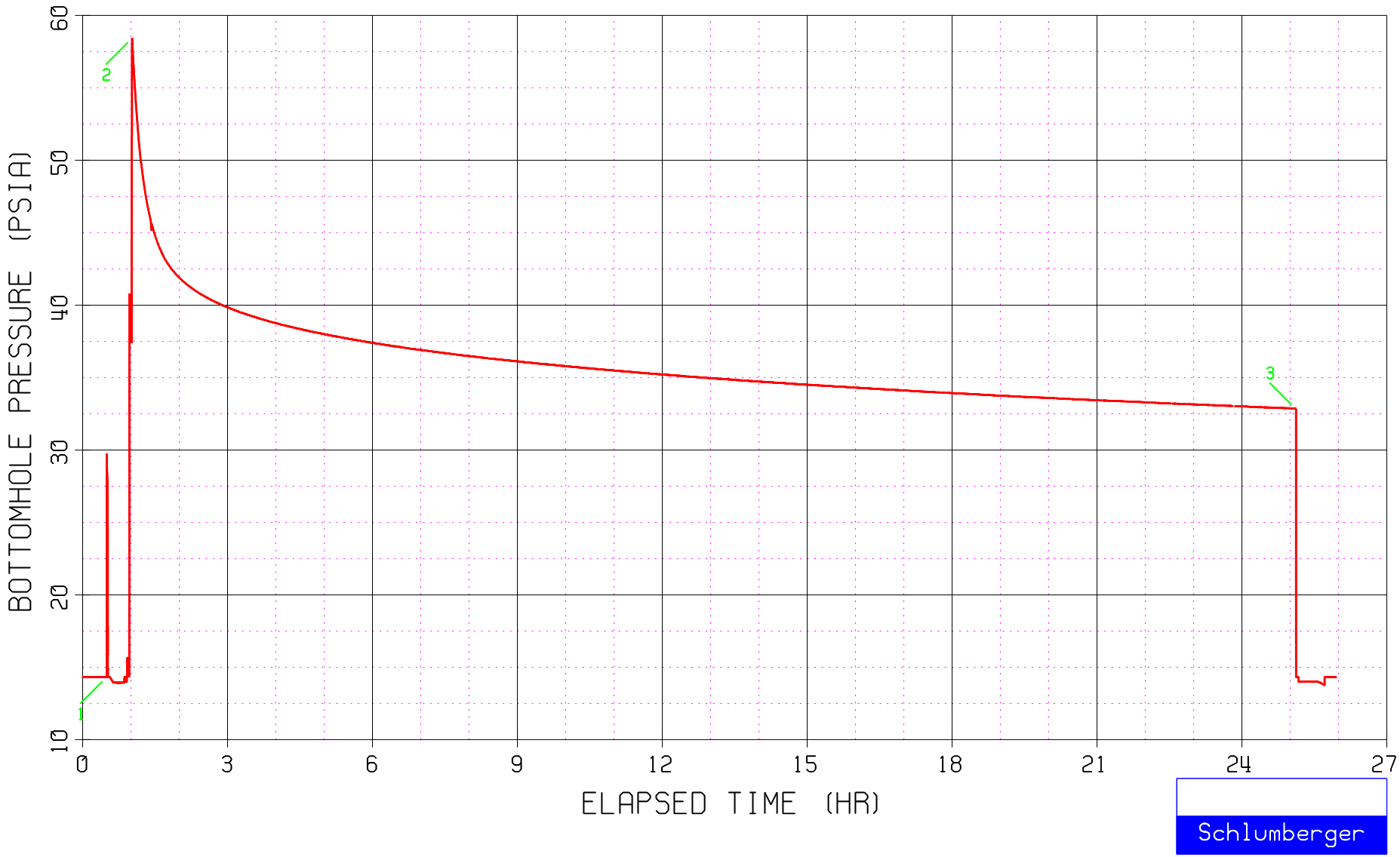
BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. WW3FT11
INSTRUMENT NO. SN5888
DEPTH : 400 FT
CAPACITY : 0 PSI
PORT OPENING : OUTSIDE

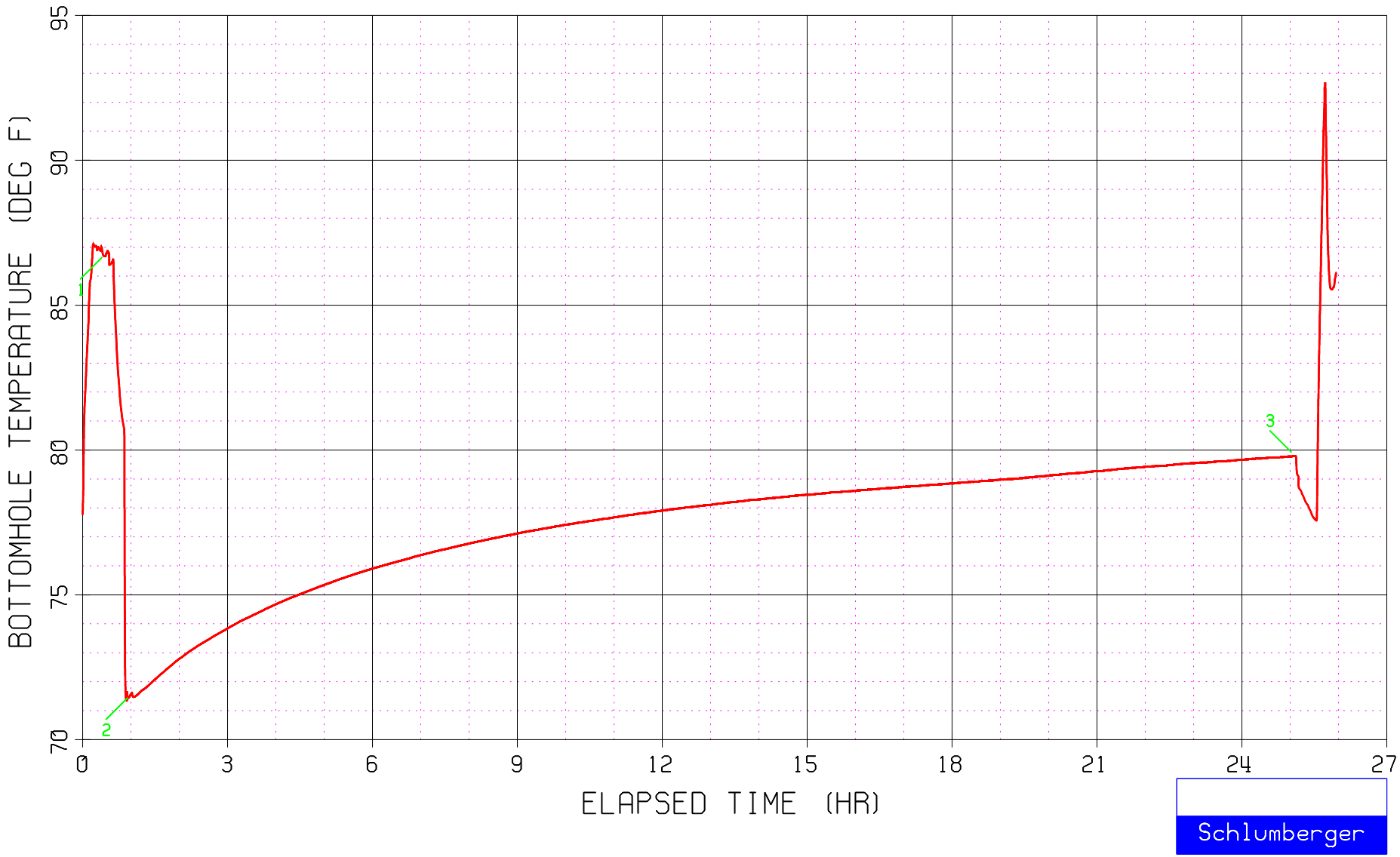
COMPANY : CHEVRON N.AMERICA EXPL. & PROD.
WELL : SEC 30 WW3



BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. WW3FT11
INSTRUMENT NO. SN5888
DEPTH : 400 FT

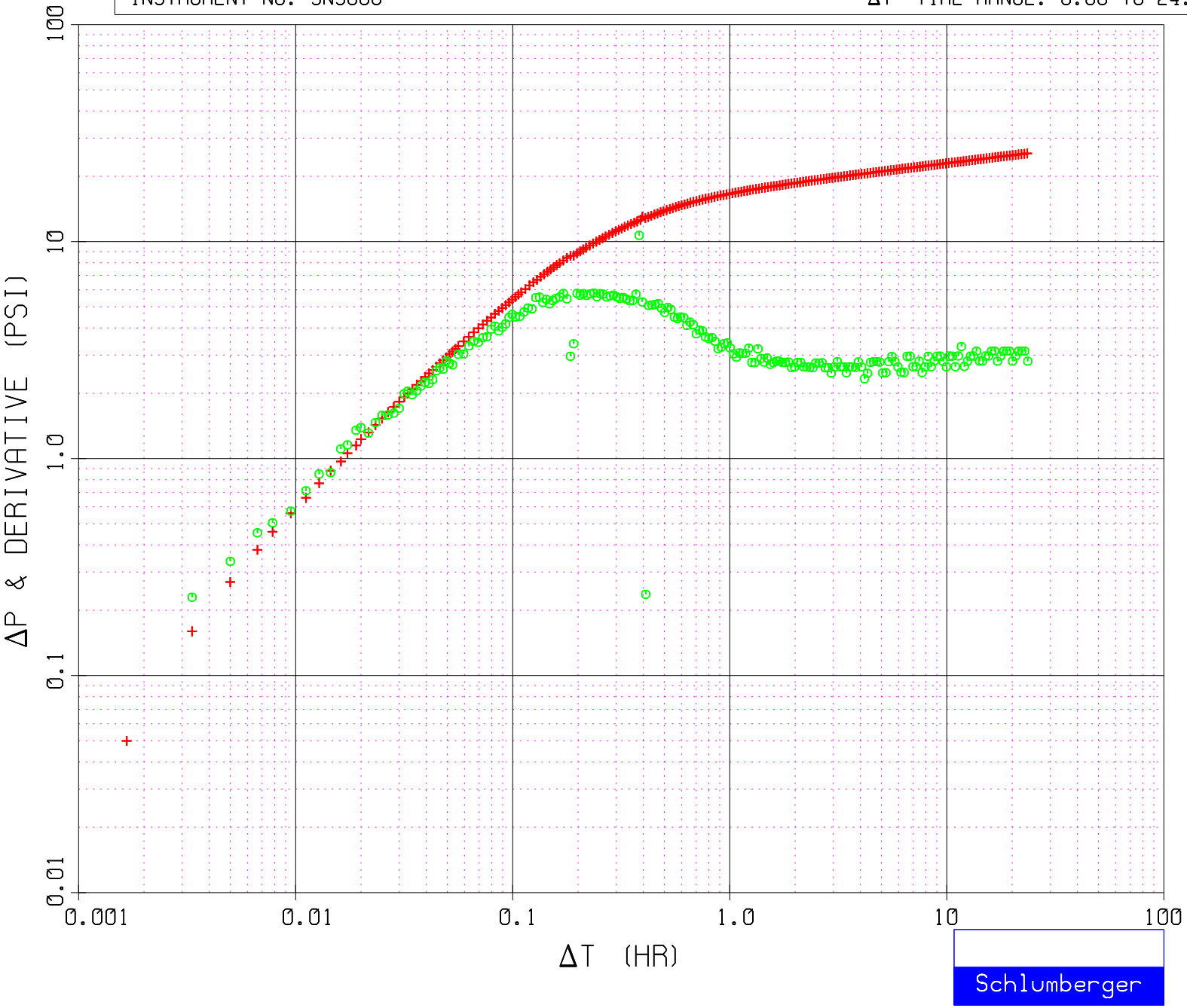
COMPANY : CHEVRON N.AMERICA EXPL. & PROD.
WELL : SEC 30 WW3

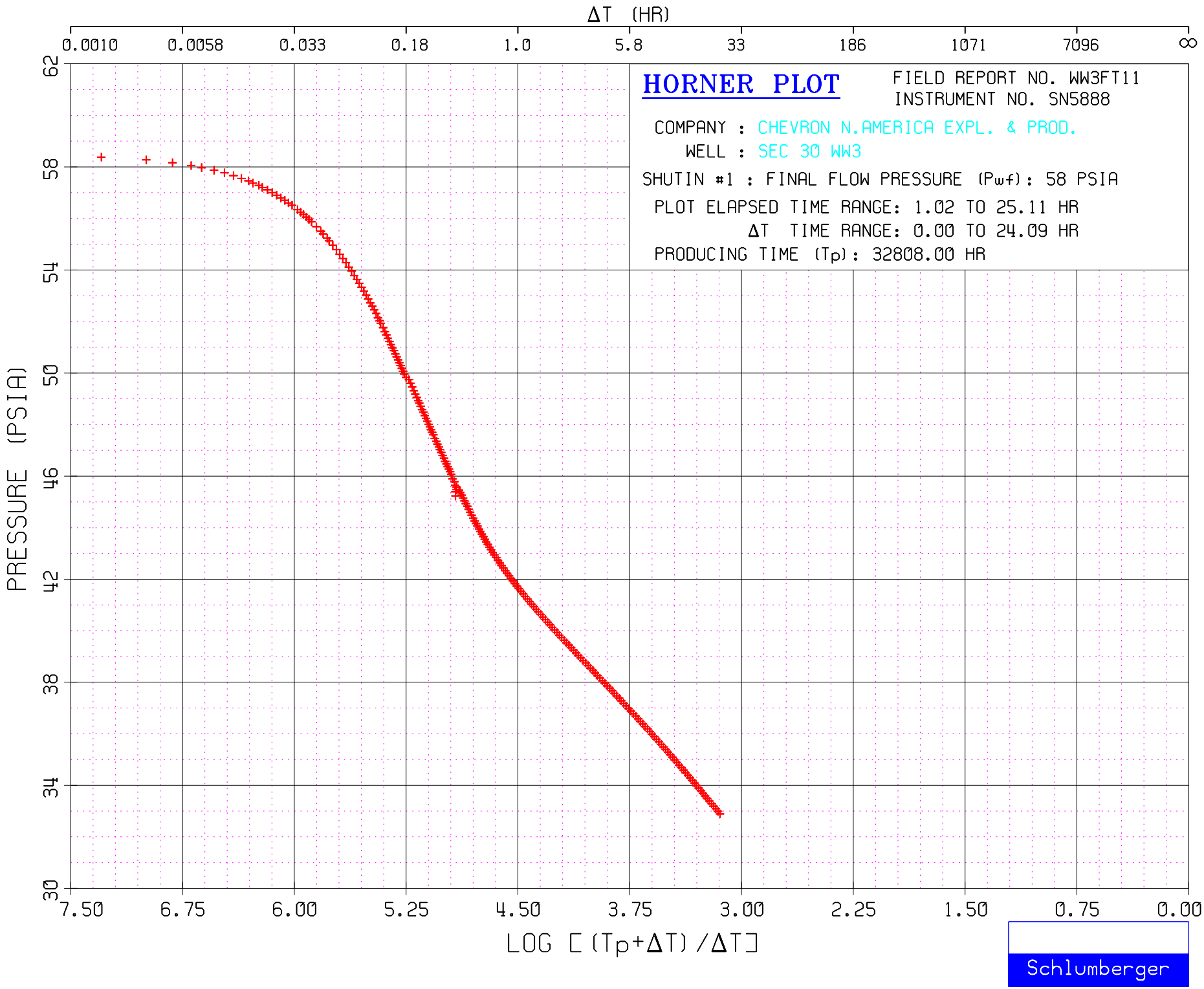


LOG LOG PLOT

COMPANY : CHEVRON N.AMERICA EXPL. & PROD.
WELL : SEC 30 WW3
FIELD REPORT NO. WW3FT11
INSTRUMENT NO. SN5888

SHUTIN #1 : PRODUCING TIME (Tp): 32808.00 HR
FINAL FLOW PRESSURE (Pwf): 58 PSIA
PLOT ELAPSED TIME RANGE: 1.02 TO 25.11 HR
ΔT TIME RANGE: 0.00 TO 24.09 HR




ΔT (HR)
0.0010
0.0058
0.033
0.18
1.0
5.8
33
186
1071
7096
∞
HORNER PLOT
FIELD REPORT NO. WW3FT11
INSTRUMENT NO. SN5888
COMPANY : CHEVRON N.AMERICA EXPL. & PROD.
WELL : SEC 30 WW3
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 58 PSIA
PLOT ELAPSED TIME RANGE: 1.02 TO 25.11 HR
ΔT TIME RANGE: 0.00 TO 24.09 HR
PRODUCING TIME (Tp): 32808.00 HR
PRESSURE (PSIA)
62
58
54
50
46
42
38
34
30
7.50
6.75
6.00
5.25
4.50
3.75
3.00
2.25
1.50
0.75
0.00
LOG [(Tp+ΔT)/ΔT]
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