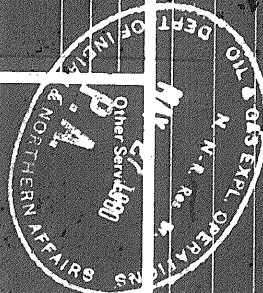


0A078  
Schlumberger

PRODUCTION LOGGING SERVICES  
SCHLUMBERGER OF CANADA Co. Inc. A Div.

PROVINCE YUKON TERRITORY  
FIELD WILDCAT  
WELL COLUMBIA GAS ET AL KOTANEELEE YT H-38  
COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

LOCATION  
LTD H-38 SEC. TWP. RANGE  
FIELD WILDCAT  
PROVINCE YUKON TERRITORY  
COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.  
WELL COLUMBIA GAS ET AL KOTANEELEE YT H-38



Perment Datum: GL KB 7.6 m Above Perm. Datum Elev. 678.4 m  
Log Measured From KB KB Elev. K.B. 686.0 m  
Drilling Measured From KB KB D.F. GL 678.4 m

Date 10 FEB 80  
Run No. ONE  
P.B.T.D. Driller 3866.2 m  
Depth-Logger (Schl.) 3700.0 m  
Btm. Log Interval 3700.0 m  
Top Log Interval 3550.0 m  
Open Hole Size 5823 Unit District TAGGART DC  
Bottom Hole Temp. Recorded By TAGGART  
Witnessed By MacDONALD

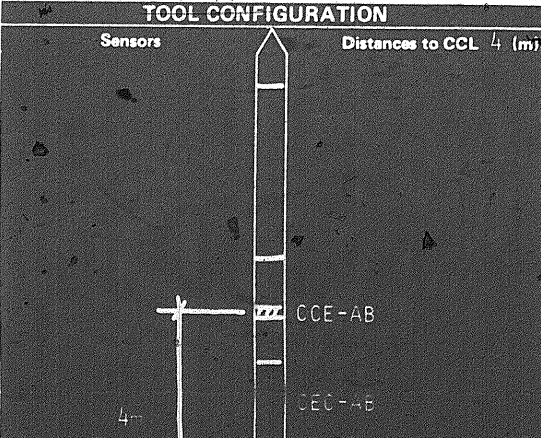
TUBING & CASING RECORD			
Surface Casing	Size (mm)	Wt. (kg/m)	Grade
Protection Casing			Type Joint
Production Casing	148		Top (m)
Lines			Bottom (m)
Tubing			
Tubing			

MISCELLANEOUS  
Production Packer 49.33 mm  
Minimum I.D. = 49.33 mm  
EXISTING PERFORATIONS FROM TO FROM TO NONE  
SEE REMARKS

Service Order No. 200034

CORRELATION LOG -  
Type: COMPLETION RECORD  
Curve: COLLAR LOCATOR  
Service Co. SCHLUMBERGER  
Date: 29 OCT 77  
Other: CNL

- Services Run  PCT  PLT
- Thermometer
  - Manometer
  - Caliper
  - Gradiomanometer
  - Continuous Flowmeter
  - Fullbore Flowmeter
  - Radioactive Tracer
  - 
  - 
  -



INTERPRETATION DATA		
WELL PRODUCTION DATA	CHOKE SIZE	
	Surface Production Rate <input checked="" type="checkbox"/> Injection Rate <input type="checkbox"/>	
	Oil m <sup>3</sup> /d =	
	Water m <sup>3</sup> /d =	
	Gas m <sup>3</sup> /d = 23 (7.7 DURING LOGGING)	
PRODUCTION FLUIDS DATA	Total GOR [1] =	
	Water Cut [1] =	
	Well Sketch is Presented on Composite Log.	
	WATER	
	Salinity or Surface Density kg/m <sup>3</sup>	
	Formation Volume Factor Bw	
	Bottom Hole Density kg/m <sup>3</sup>	
	Bottom Hole Viscosity mPa-s	
	OIL	
	Surface Gravity kg/m <sup>3</sup>	
	Solution GOR [1]	
	Formation Volume Factor Bo	
	Bottom Hole Density kg/m <sup>3</sup>	
	Bottom Hole Viscosity mPa-s	
	Bubble Point Pressure kPa	
GAS		
Relative Density [Air = 1.0]		
Gas Density Ratio [1]		
Bottom Hole Density kg/m <sup>3</sup>		
Bottom Hole Viscosity μPa-s		

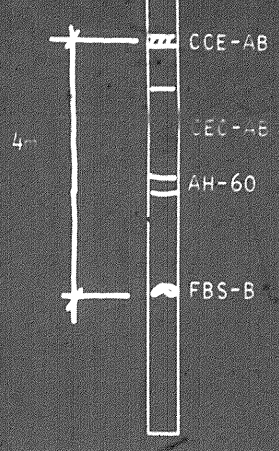
REMARKS 19 MAR 80 EDM BB & SB

PERFORATIONS:

3549.0 - 3556.4	3614.9 - 3617.98
3557.3 - 3563.1	3619.2 - 3620.1
3567.0 - 3573.1	3625.0 - 3628.0
3575.0 - 3578.0	3632.0 - 3635.0

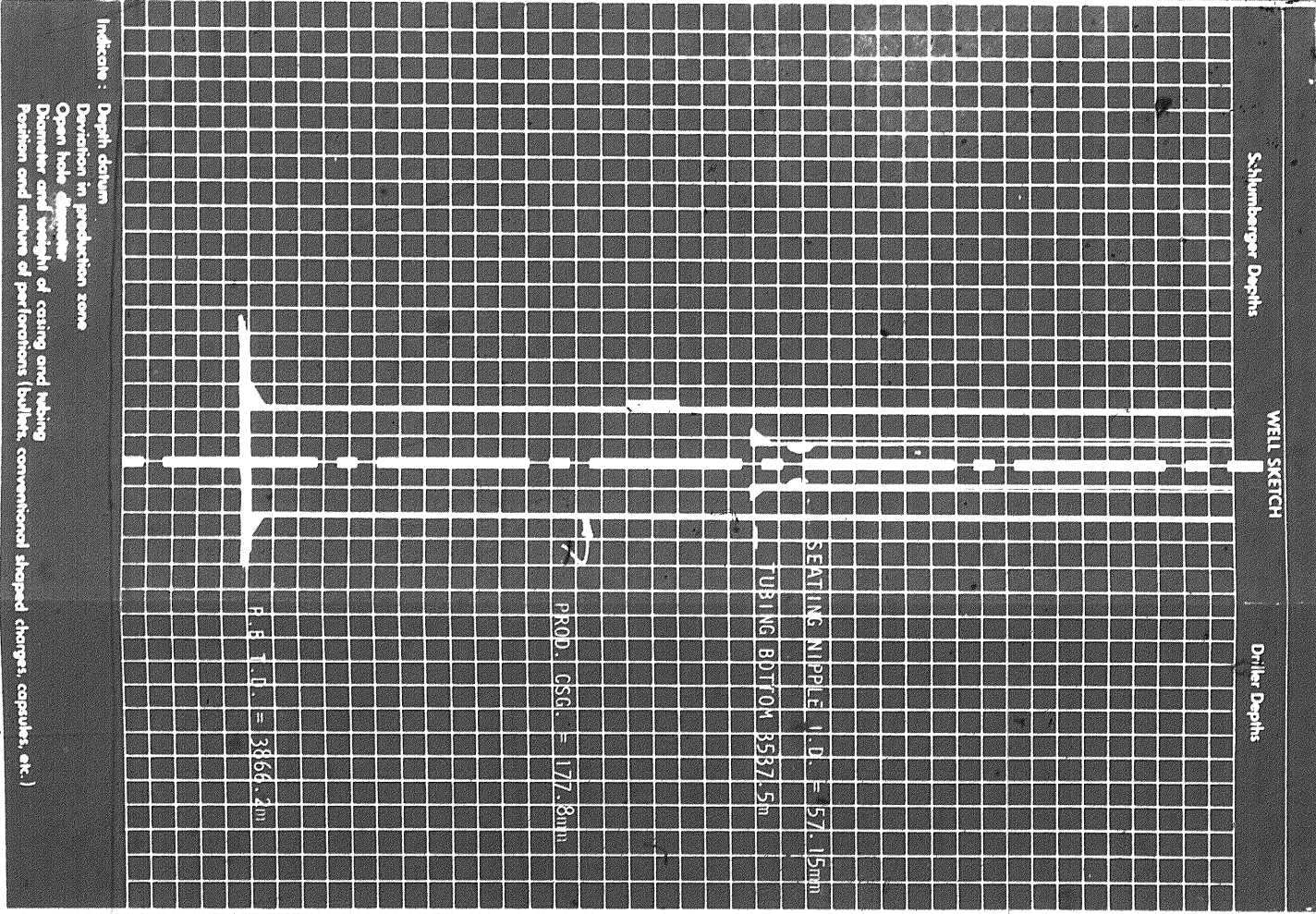
Bottom Hole Density kg/m<sup>3</sup>  
 Bottom Hole Viscosity  $\mu$ pa-s

N/A



REMARKS	
19 MAR 80 EDM BB & SB	
PERFORATIONS:	
3549.0 - 3556.4	3614.9 - 3617.98
3557.3 - 3563.1	3619.2 - 3620.1
3567.0 - 3573.1	3625.0 - 3628.0
3575.9 - 3579.9	3682.9 - 3669.5
3586.2 - 3591.5	
3594.2 - 3595.12	
3596.0 - 3596.95	
3598.4 - 3599.4	
3600.3 - 3603.0	
3604.9 - 3607.0	
3611.9 - 3612.9	

X4014



## PRODUCTION LOGGING INTERPRETATION

**PROBLEM:** TO EVALUATE RELATIVE PRODUCTION OF EXISTING PERFORATIONS.

**TECHNIQUE:** THREE SETS OF PASSES (UP AND DOWN) AT THREE DIFFERENT CABLE SPEEDS.  
 - PASSES 1 & 2 : CABLE SPEED OF 2000 ft./hr.; PASSES 3 & 4 : CABLE SPEED OF 4000 ft./hr.; PASSES 5 & 6 : CABLE SPEED OF 6000 ft./hr.  
 TIME DRIVE READINGS WERE TAKEN AT SEVERAL DEPTHS.  
 THE WELL WAS PRODUCING 7.7 mmcf/d WHILE LOGGING.

**INTERPRETATION:** THE TOP FIVE SETS OF PERFORATIONS ARE PRODUCING 85% OF THE SURFACE PRODUCTION. THE NINE SETS OF PERFORATIONS BETWEEN 3594m AND 3629m ARE NOT PRODUCING.

**TECHNIQUE:** THREE SETS OF PASSES (UP AND DOWN) AT THREE DIFFERENT CABLE SPEEDS.  
 - PASSES 1 & 2 : CABLE SPEED OF 2000 ft./hr.; PASSES 3 & 4 : CABLE SPEED OF 4000 ft./hr.;  
 PASSES 5 & 6 : CABLE SPEED OF 6000 ft./hr.  
 TIME DRIVE READINGS WERE TAKEN AT SEVERAL DEPTHS.  
 THE WELL WAS PRODUCING 7.7 mmcf/d WHILE LOGGING.

**INTERPRETATION:** THE TOP FIVE SETS OF PERFORATIONS ARE PRODUCING 85% OF THE SURFACE PRODUCTION.  
 THE NINE SETS OF PERFORATIONS BETWEEN 3594m AND 3629m ARE NOT PRODUCING.

## PRODUCTION LOGGING INTERPRETATION

**PROBLEM:** TO EVALUATE RELATIVE PRODUCTION OF EXISTING PERFORATIONS.

**TECHNIQUE:** THREE SETS OF PASSES (UP AND DOWN) AT THREE DIFFERENT CABLE SPEEDS.  
 - PASSES 1 & 2 : CABLE SPEED OF 2000 ft./hr.; PASSES 3 & 4 : CABLE SPEED OF 4000 ft./hr.;  
 PASSES 5 & 6 : CABLE SPEED OF 6000 ft./hr.  
 TIME DRIVE READINGS WERE TAKEN AT SEVERAL DEPTHS.  
 THE WELL WAS PRODUCING 7.7 mmcf/d WHILE LOGGING.

**INTERPRETATION:** THE TOP FIVE SETS OF PERFORATIONS ARE PRODUCING 85% OF THE SURFACE PRODUCTION.  
 THE NINE SETS OF PERFORATIONS BETWEEN 3594m AND 3629m ARE NOT PRODUCING.  
 THERE APPEARS TO BE A THIEF BETWEEN 3648m AND 3652m CAUSED BY A CIRCULATING WATER COLUMN.  
 THE BOTTOM SET OF PERFORATIONS ARE PRODUCING 15% OF THE SURFACE PRODUCTION.

In making any interpretation of logs, whether the interpretations are made directly from the original log or after transmitting the digital log data by electronic process for computation by a computer and retransmission by electronic process, or from a log received at another location by electronic process, hereinafter referred to as "INTERPRETATIONS", or in the case where our employees make recommendations or give advice as to further procedures, completion methods or well treatment, taking into consideration such INTERPRETATIONS, as well as other matters, hereinafter referred to generally as "RECOMMENDATIONS", our employees will give Customer the benefit of their best judgment; nevertheless, since all INTERPRETATIONS and RECOMMENDATIONS referred to above are opinions based on inferences from electrical impulses and other measurements, as well as empirical factors, and such INTERPRETATIONS are subject to error in transmission and computation, we cannot and do not warrant the accuracy or correctness of any such INTERPRETATIONS or RECOMMENDATIONS and we shall not, except in the case of willful negligence or willful misconduct on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by Customer or any other person, firm or corporation, resulting from such INTERPRETATIONS or RECOMMENDATIONS made by any of our officers, agents or employees and Customer shall absolve and hold us harmless from all liability in connection therewith, except where such liabilities arise through our willful negligence or willful misconduct.

X4014A

### PERFORATION STATISTICS

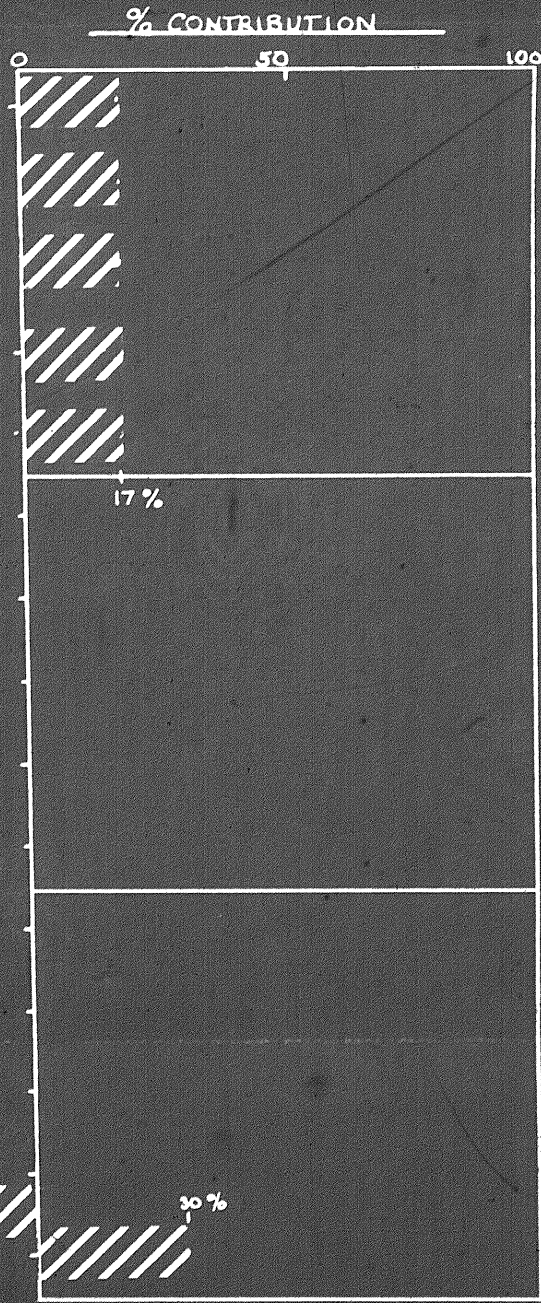
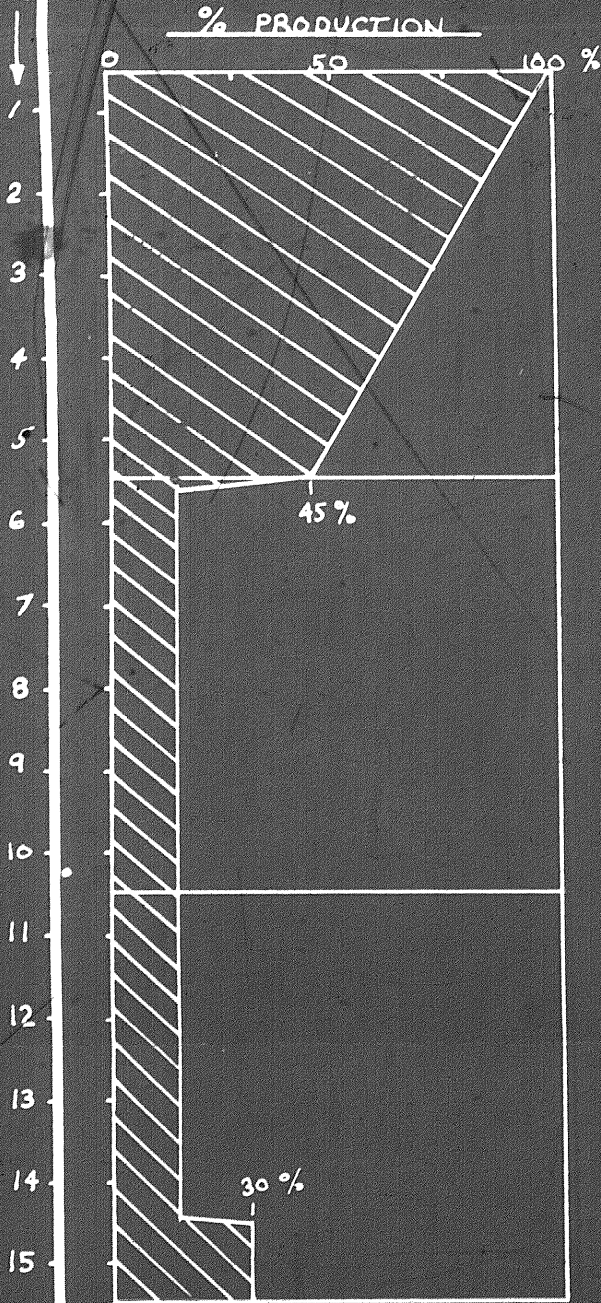
PERFORATION

% PRODUCTION

% CONTRIBUTION

PERFORATION STATISTICS

PERFORATION  
↓



DEPTHS

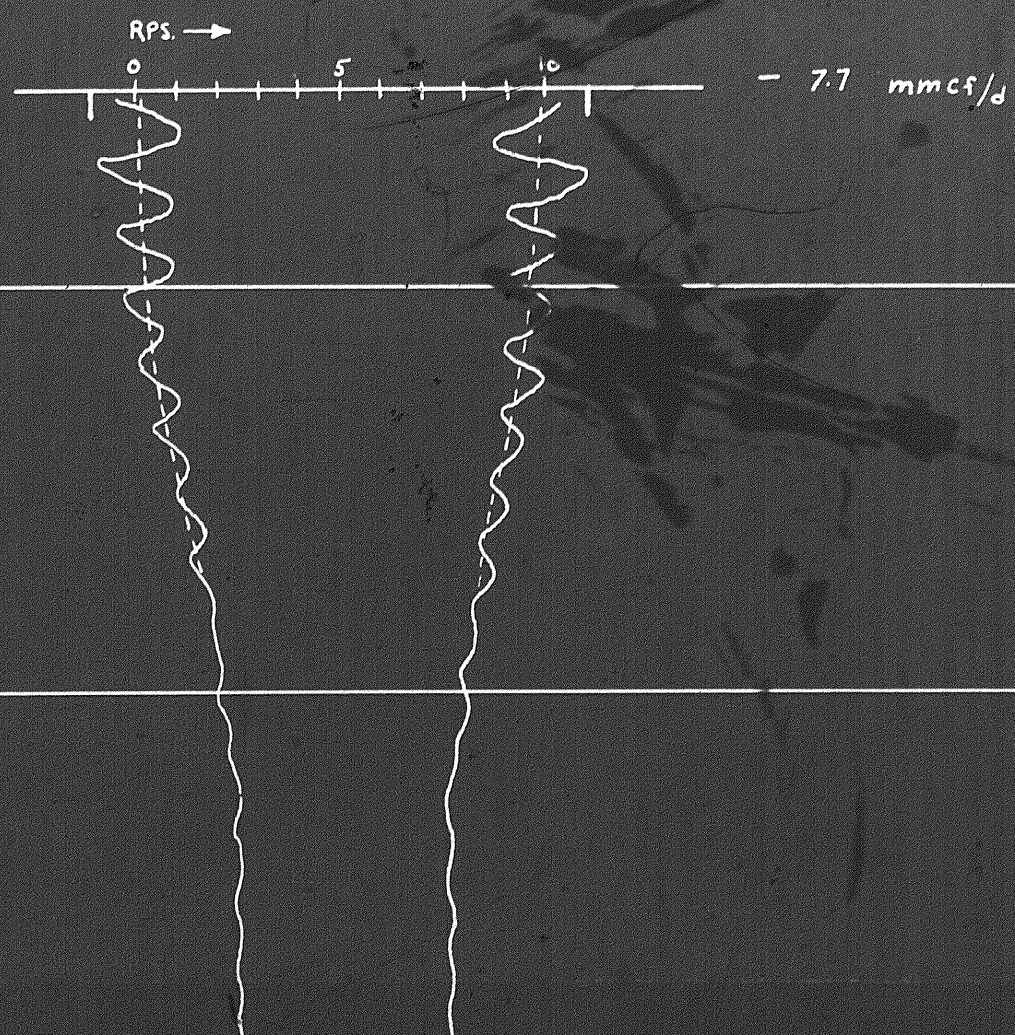
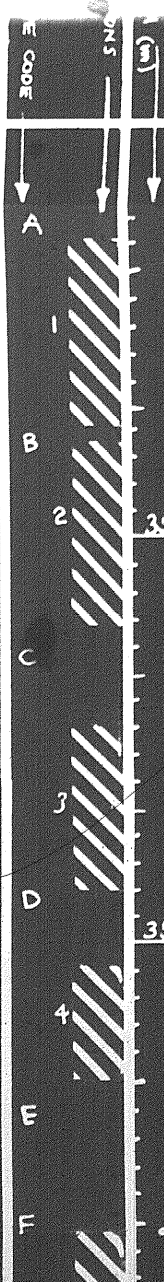
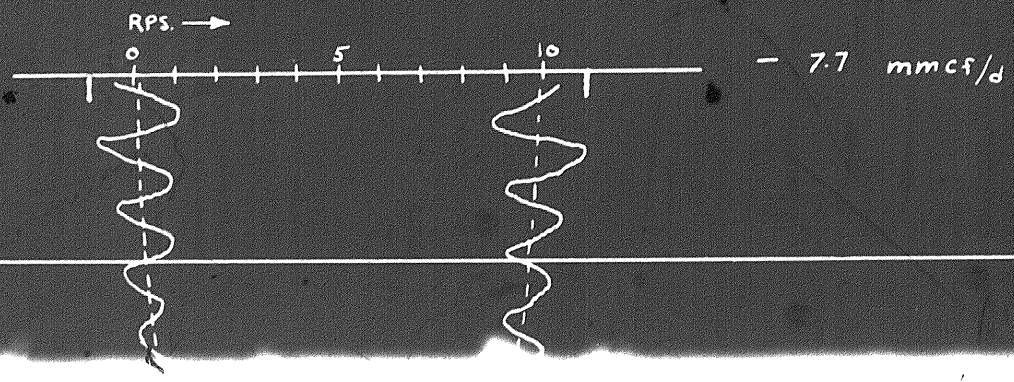
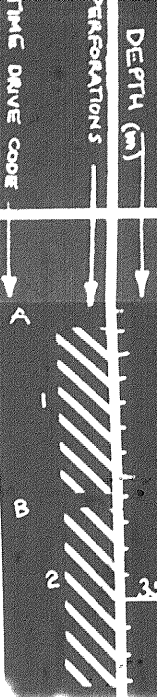
TIME DRIVE CODE

PERFORATIONS

DEPTH (m)

FLOWMETER SURVEYS

# FLOWMETER SURVEYS



E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P  
Q  
R  
S  
T

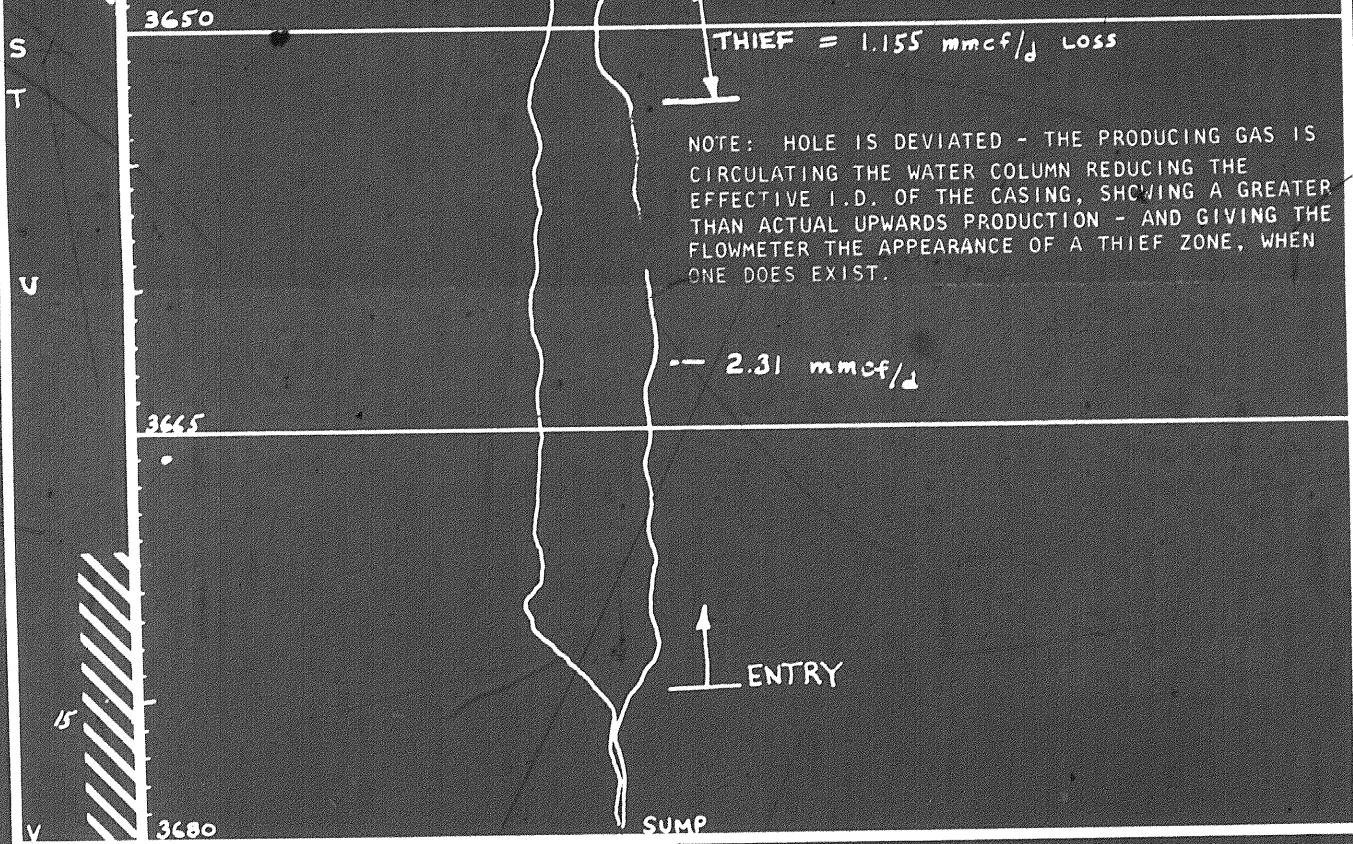
3570  
3605  
3620  
3635  
3650

↑ ENTRY  
- 1.155 mmcf/d  
↓ NO ENTRY

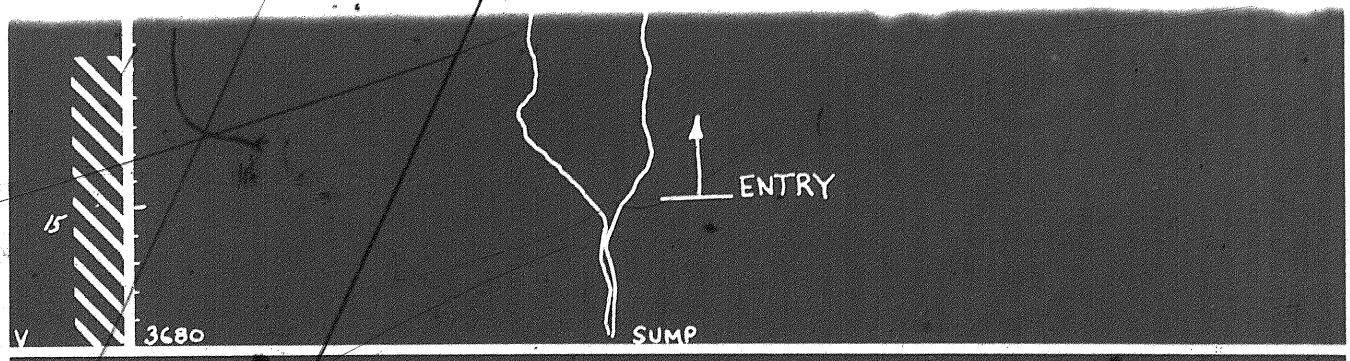
- 1.155 mmcf/d

↑ NO ENTRY  
↓ THIEF = 1.155 mmcf/d Loss

NOTE: HOLE IS DEVIATED - THE PRODUCING GAS IS CIRCULATING THE WATER COLUMN REDUCING THE EFFECTIVE I.D. OF THE CASING, SHOWING A GREATER THAN ACTUAL UPWARDS PRODUCTION - AND GIVING THE FLOWMETER THE APPEARANCE OF A THIEF ZONE, WHEN

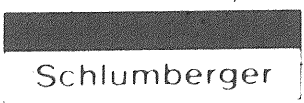


In making any interpretation of logs, whether the interpretations are made directly from the original log or after transmitting the digital log data by electronic process for computation by a computer and retransmission by electronic process, or from a log received at another location by electronic process, hereinafter referred to as "INTERPRETATIONS", or in the case where our employees make recommendations or give advice as to further procedures, completion methods or well treatment, taking into consideration such INTERPRETATIONS, as well as other matters, hereinafter referred to generally as "RECOMMENDATIONS", our employees will give Customer the benefit of their best judgment; nevertheless, since all INTERPRETATIONS and RECOMMENDATIONS referred to above are opinions based on inferences from electrical impulses and other measurements, as well as empirical factors, and such INTERPRETATIONS are subject to error in transmission and computation, we cannot and do not warrant the accuracy or correctness of any such INTERPRETATIONS or RECOMMENDATIONS and we shall not, except in the case of willful negligence or willful misconduct on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by Customer or any other person, firm or corporation, resulting from such INTERPRETATIONS or RECOMMENDATIONS made by any of our officers, agents or employees and Customer shall absolve and hold us harmless from all liability in connection therewith, except where such liabilities arise through our willful negligence or willful misconduct.



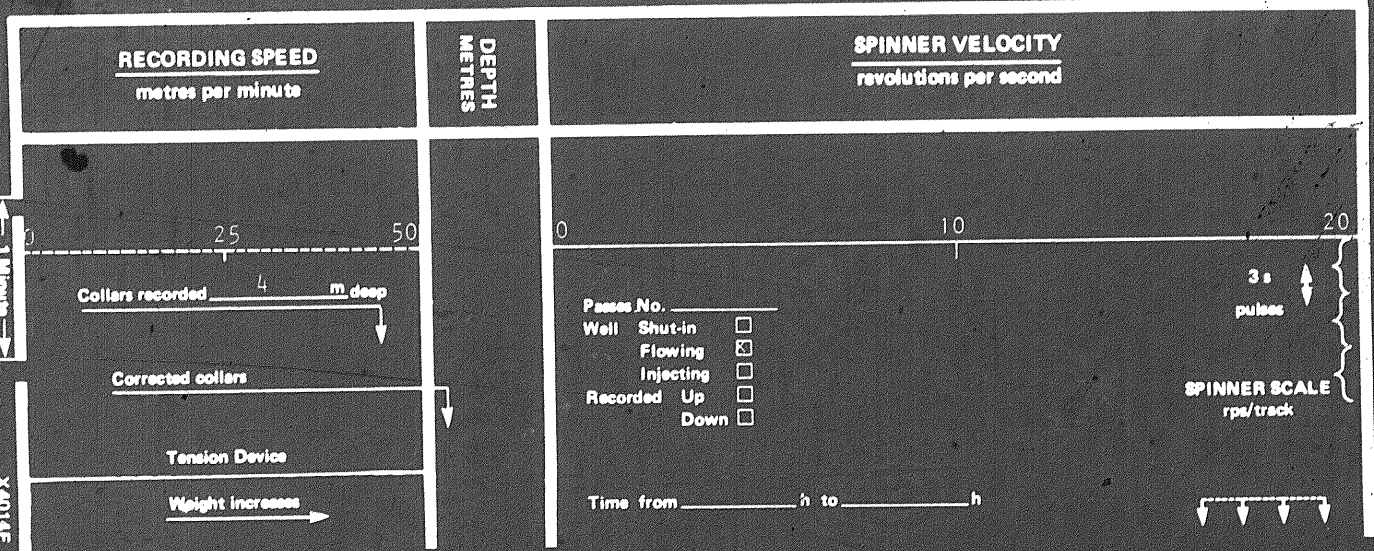
In making any interpretation of logs, whether the interpretations are made directly from the original log or after transmitting the digital log data by electronic process for computation by a computer and retransmission by electronic process, or from a log received at another location by electronic process, hereinafter referred to as "INTERPRETATIONS", or in the case where our employees make recommendations or give advice as to further procedures, completion methods or well treatment, taking into consideration such INTERPRETATIONS, as well as other matters, hereinafter referred to generally as "RECOMMENDATIONS", our employees will give Customer the benefit of their best judgment; nevertheless, since all INTERPRETATIONS and RECOMMENDATIONS referred to above are opinions based on inferences from electrical impulses and other measurements, as well as empirical factors, and such INTERPRETATIONS are subject to error in transmission and computation, we cannot and do not warrant the accuracy or correctness of any such INTERPRETATIONS or RECOMMENDATIONS and we shall not, except in the case of willful negligence or willful misconduct on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by Customer or any other person, firm or corporation, resulting from such INTERPRETATIONS or RECOMMENDATIONS made by any of our officers, agents or employees and Customer shall absolve and hold us harmless from all liability in connection therewith, except where such liabilities arise through our willful negligence or willful misconduct.

INTERPRETATIONS, or in the future our employees in connection with the production logging method herein described, taking into consideration such INTERPRETATIONS, as well as other matters, hereinafter referred to generally as "RECOMMENDATIONS", our employees will give Customer the benefit of their best judgment; nevertheless, since all INTERPRETATIONS and RECOMMENDATIONS referred to above are opinions based on inferences from electrical impulses and other measurements, as well as empirical factors, and such INTERPRETATIONS are subject to error in transmission and computation, we can not and do not warrant the accuracy or correctness of any such INTERPRETATIONS or RECOMMENDATIONS and we shall not, except in the case of willful negligence or willful misconduct on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by Customer or any other person, firm or corporation, resulting from such INTERPRETATIONS or RECOMMENDATIONS made by any of our officers, agents or employees and Customer shall absolve and hold us harmless from all liability in connection therewith, except where such liabilities arise through our willful negligence or willful misconduct.



# PRODUCTION LOGGING FULLBORE FLOWMETER

SCHEMATIC OF THE FULLBORE FLOWMETER



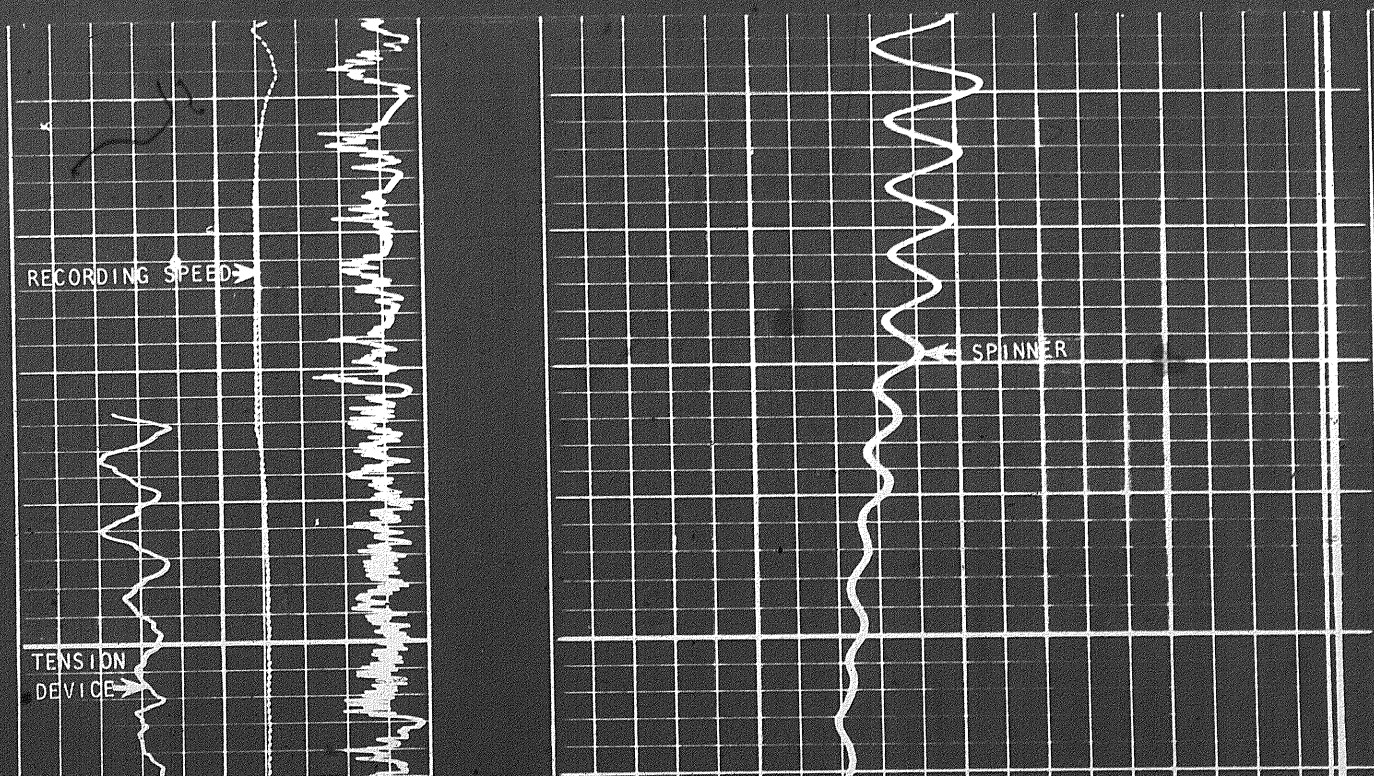
PASSES NOS. 6

WELL SHUT-IN   
 FLOWING   
 INJECTING

RECORDED UP   
 DOWN

TIME FROM 14:16 h TO 14:17 h

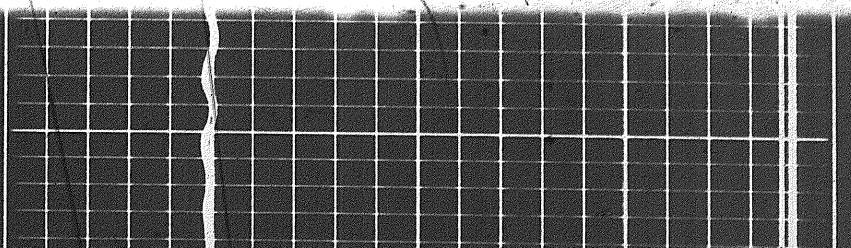
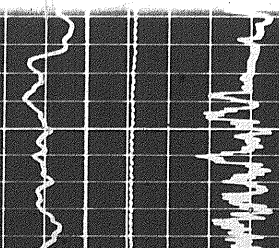
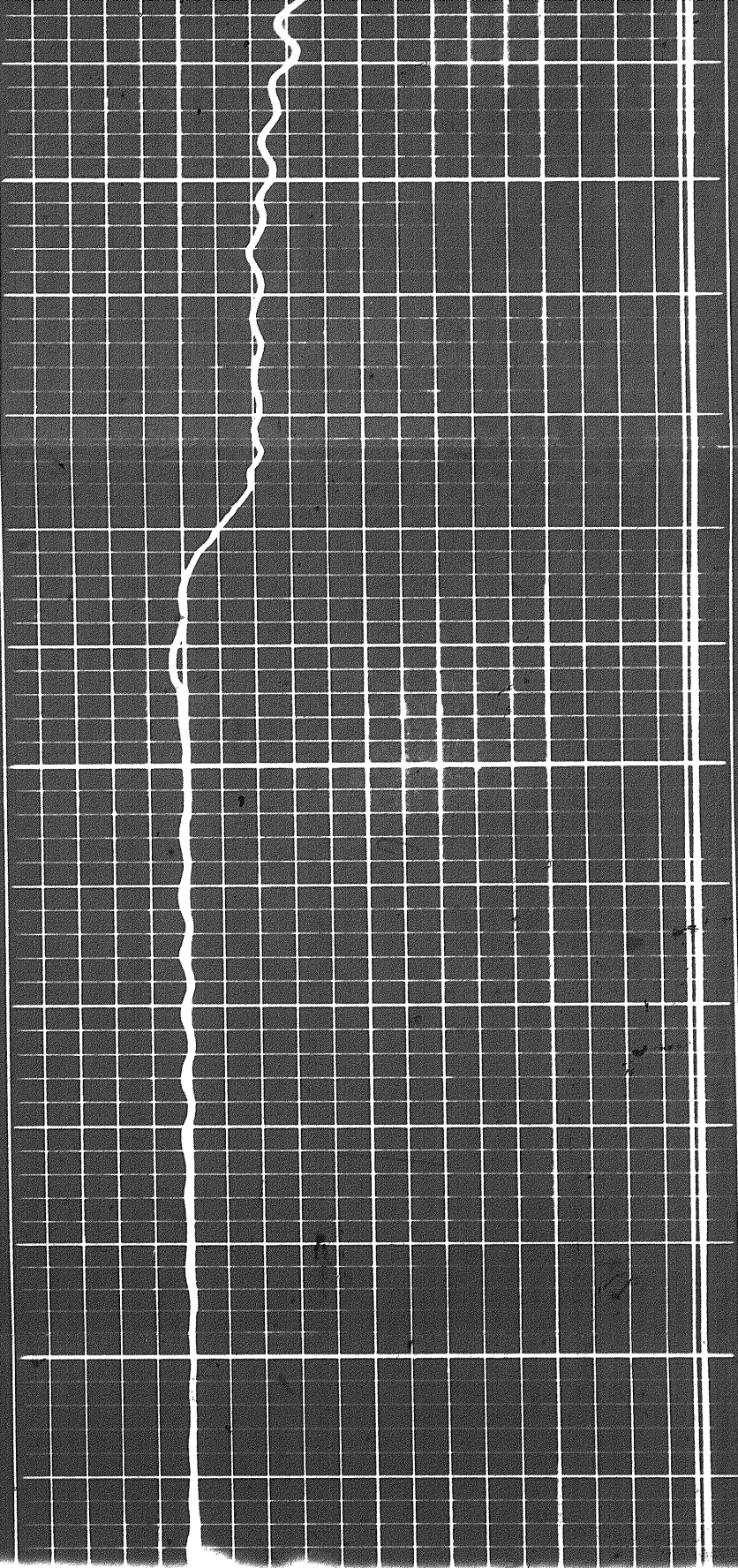
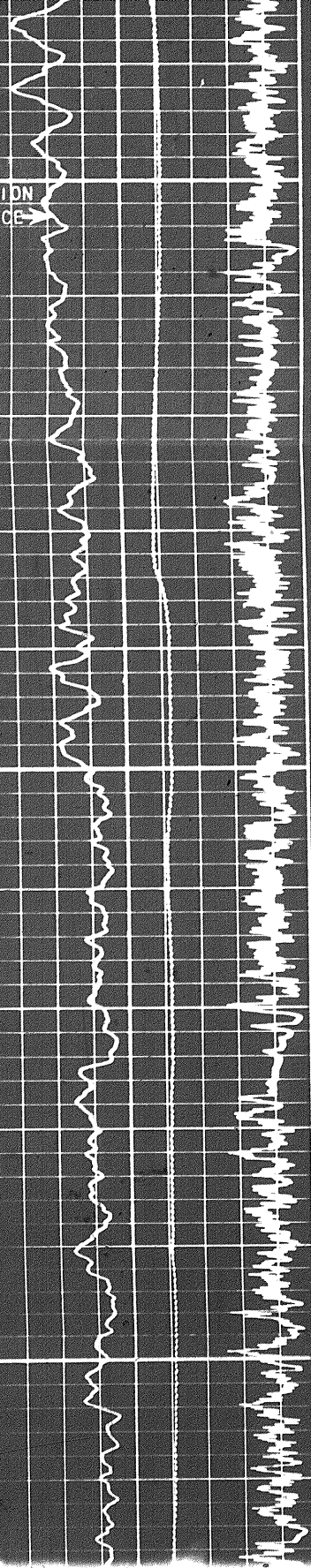
X4014H



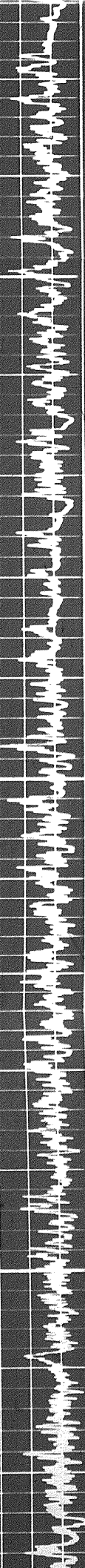
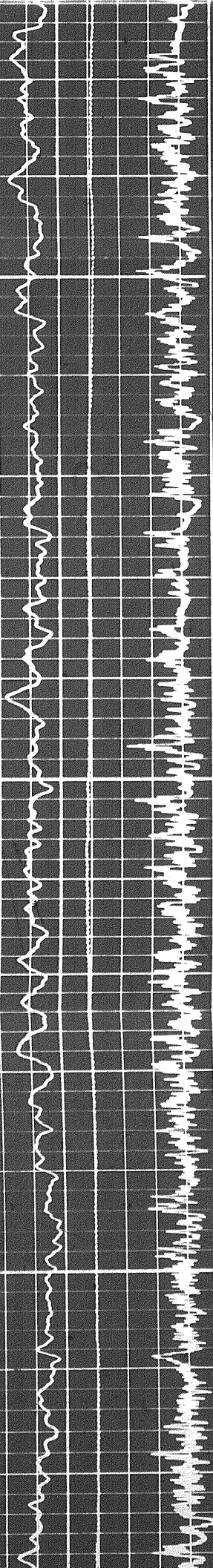


TENSION  
DEVICE

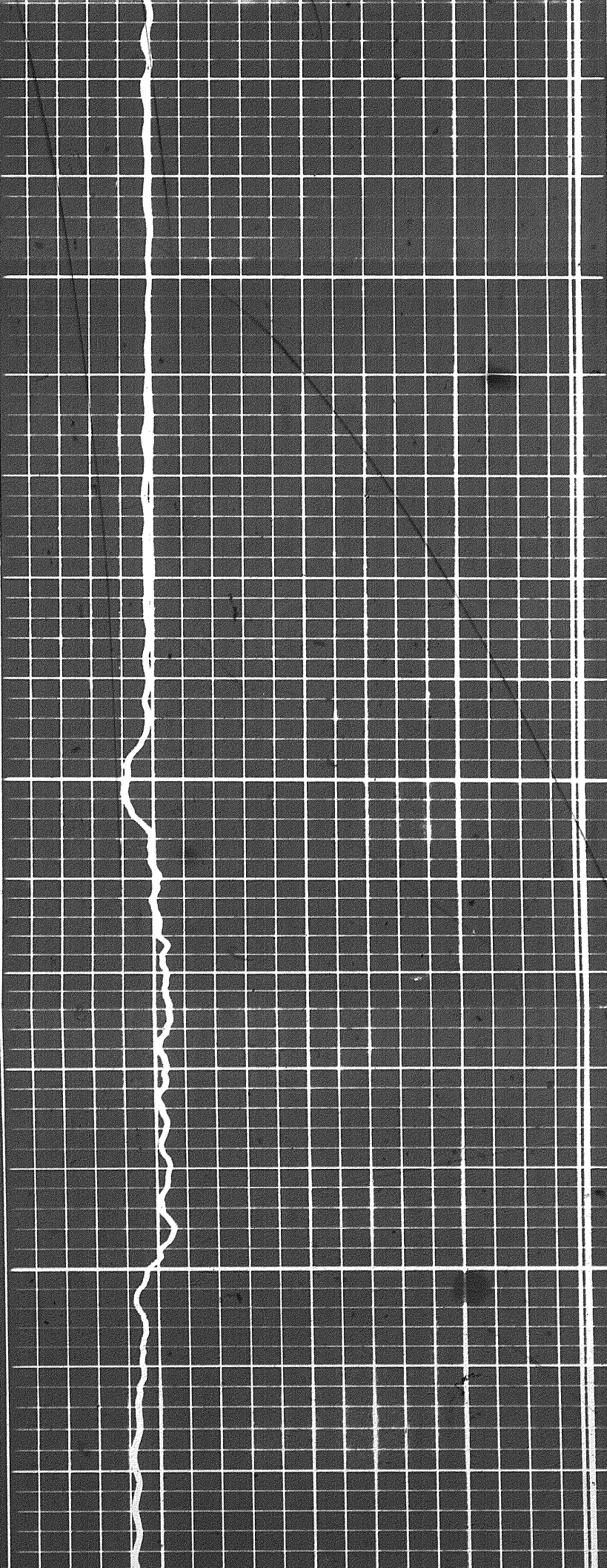
3600

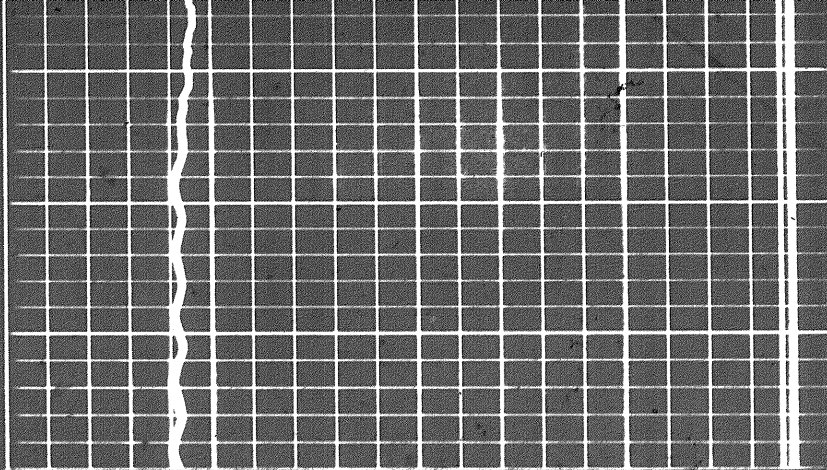
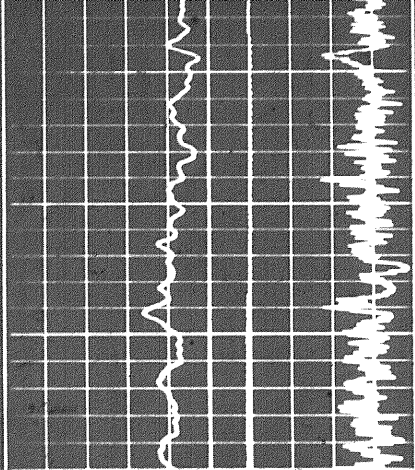


7



3650





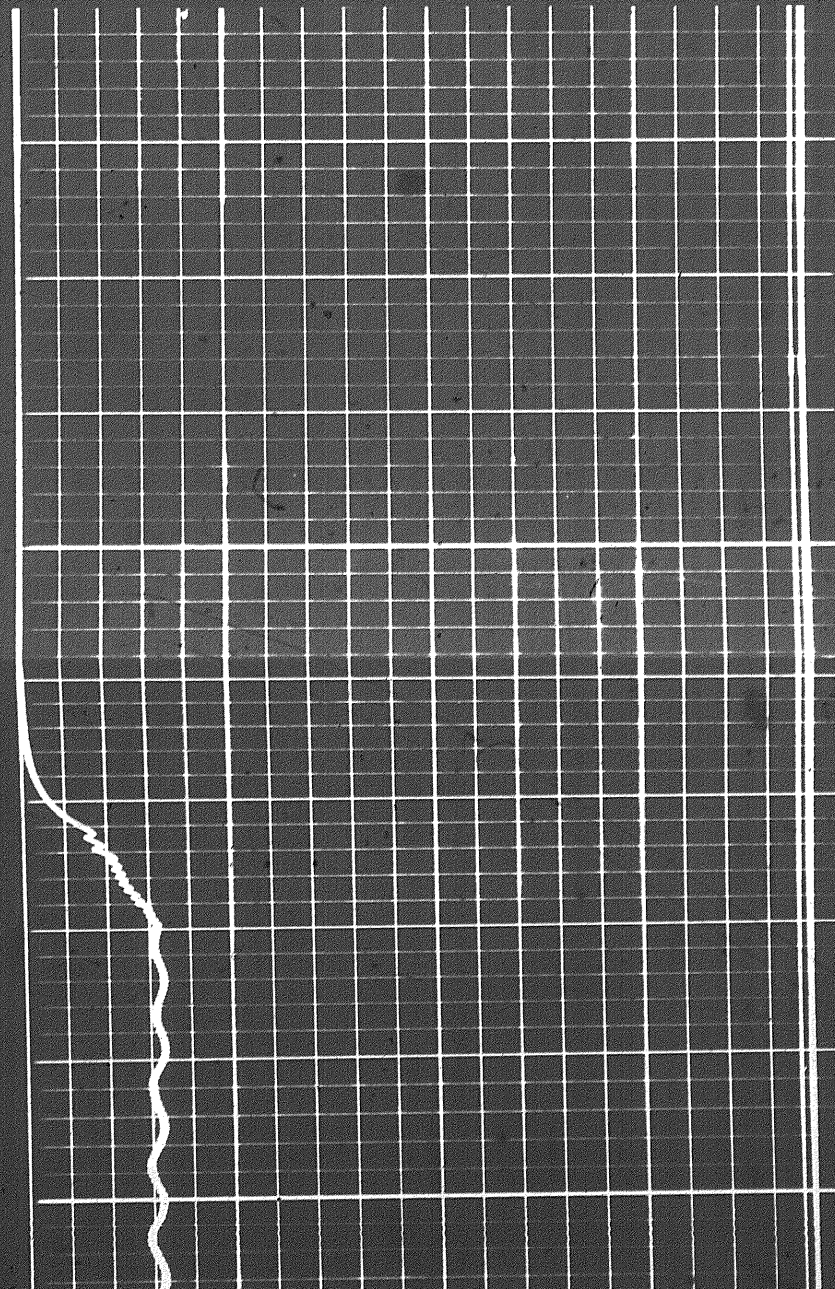
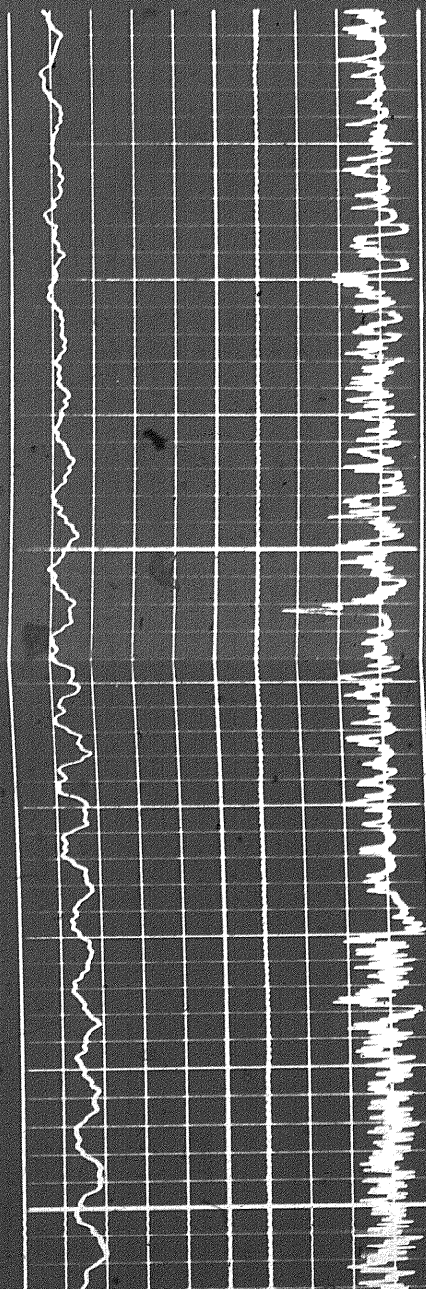
PASSES NOS. 5

WELL            SHUT-IN      
                 FLOWING      
                 INJECTING  

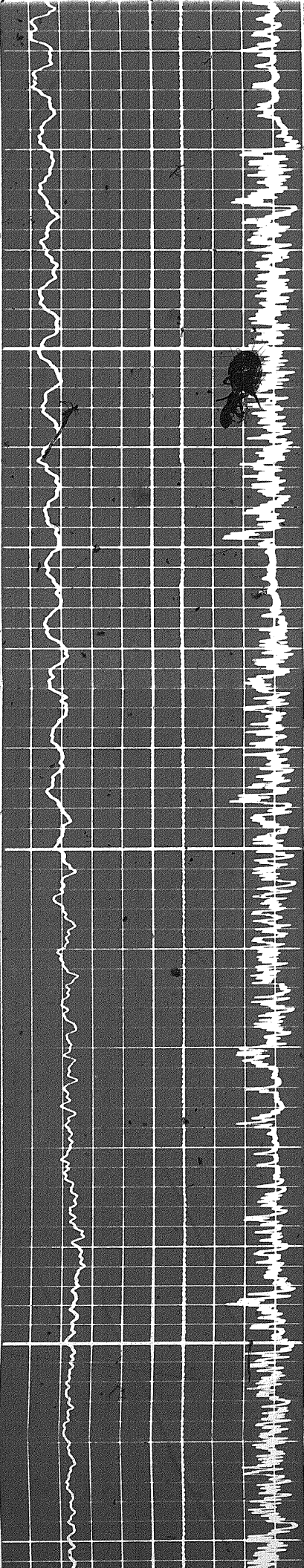
RECORDED      UP          
                 DOWN     

TIME FROM 1405 h TO 1411 h

X4014H

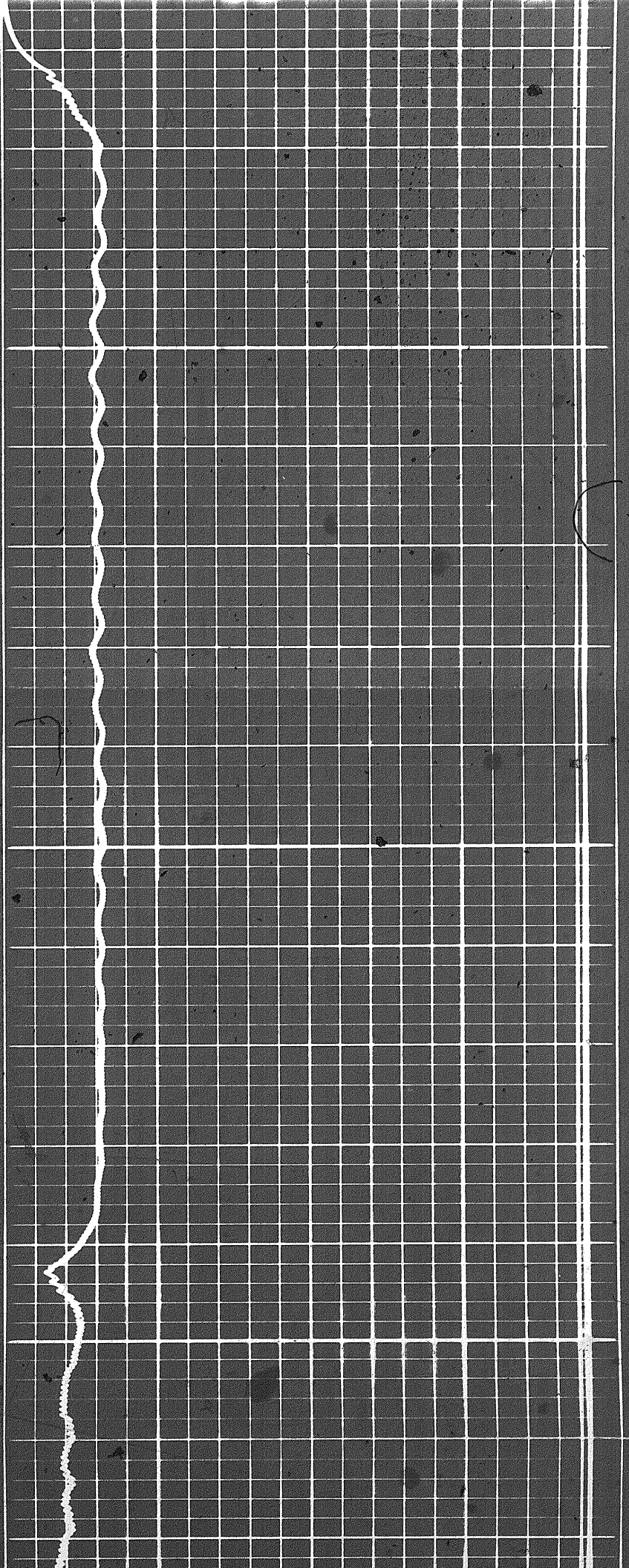


009E

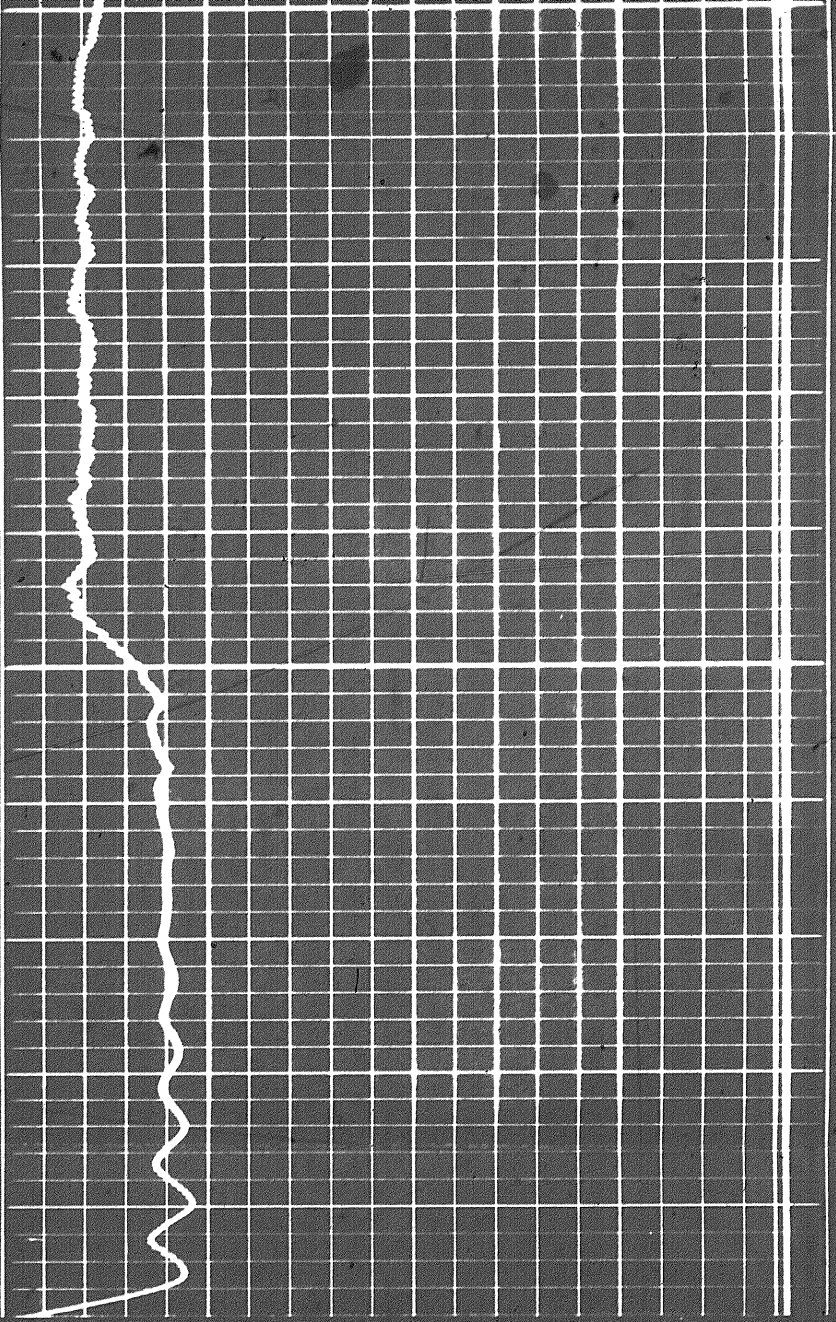
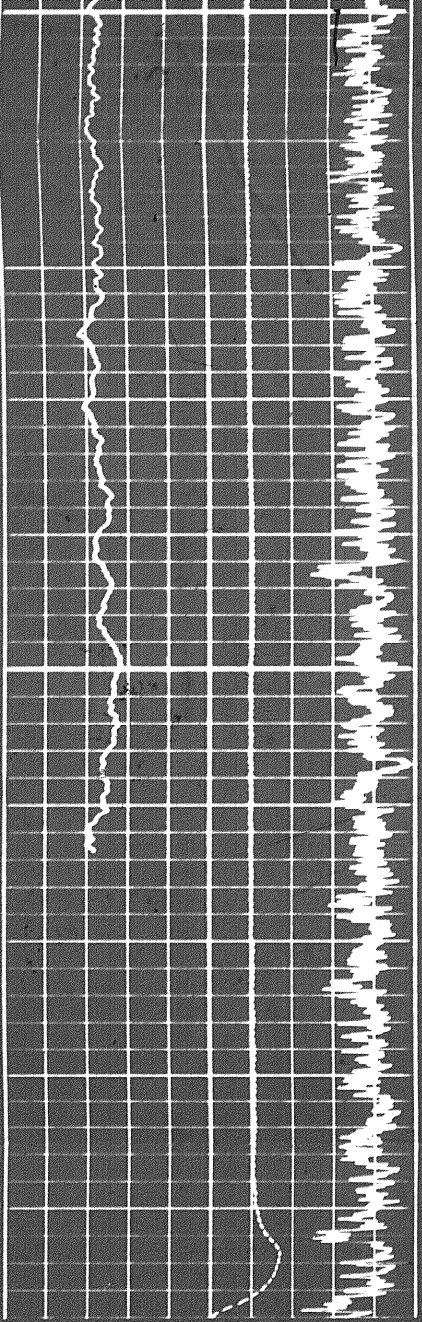


3600

3650



050



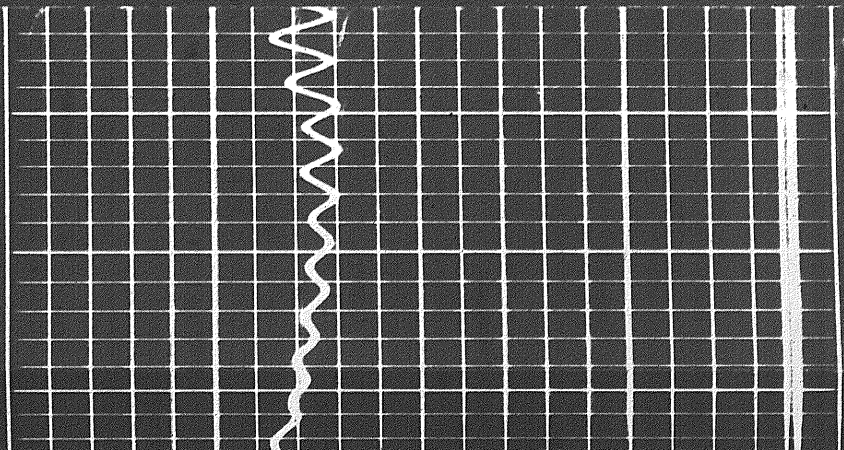
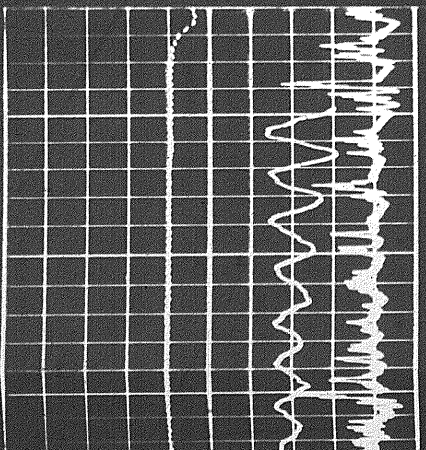
PASSES NOS. 4

WELL            SHUT-IN   
                   FLOWING   
                   INJECTING

RECORDED      UP   
                   DOWN

TIME FROM 1358 h TO 1405 h

X4014H



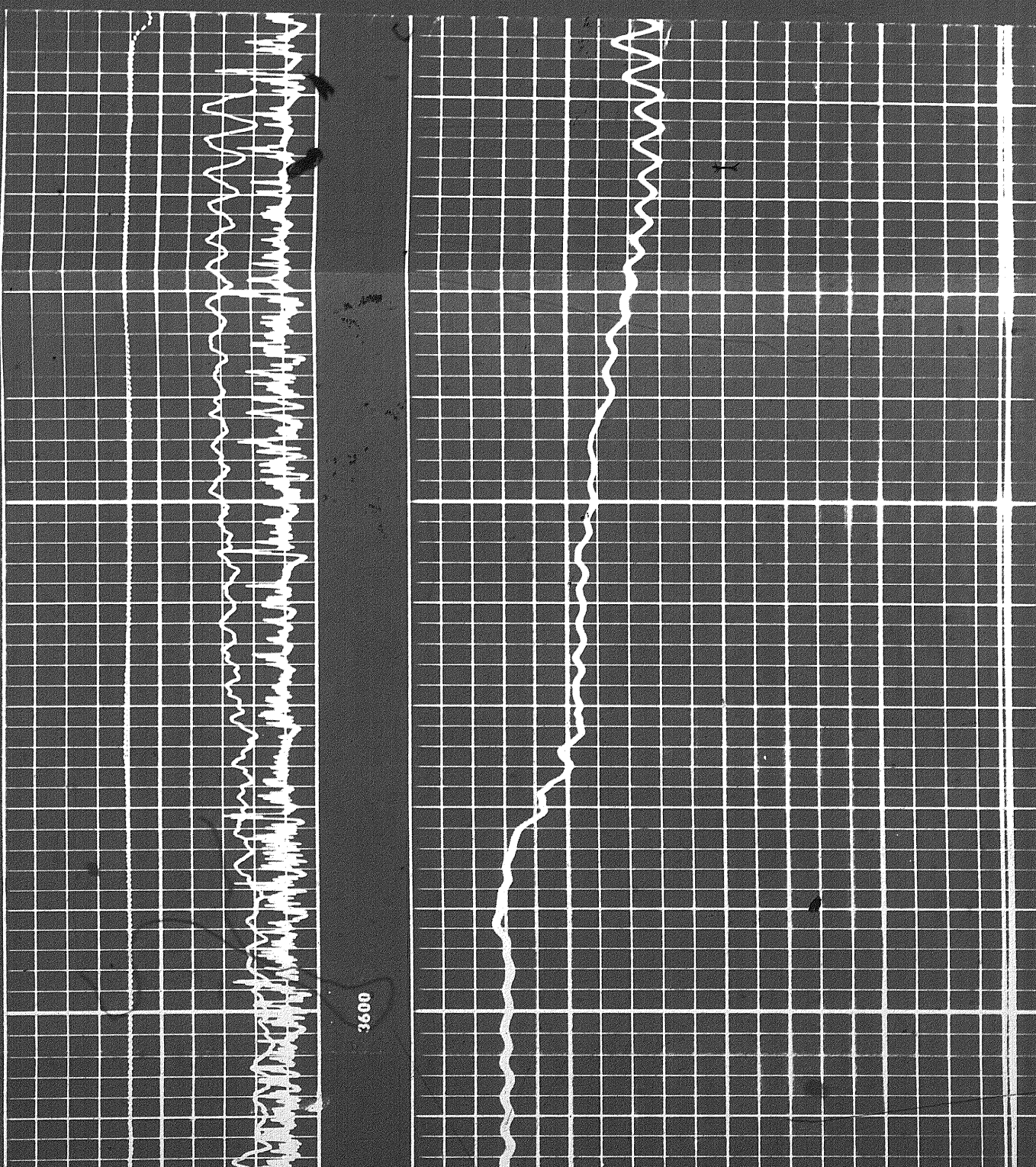
TIME FROM 1358 h TO 1405 h

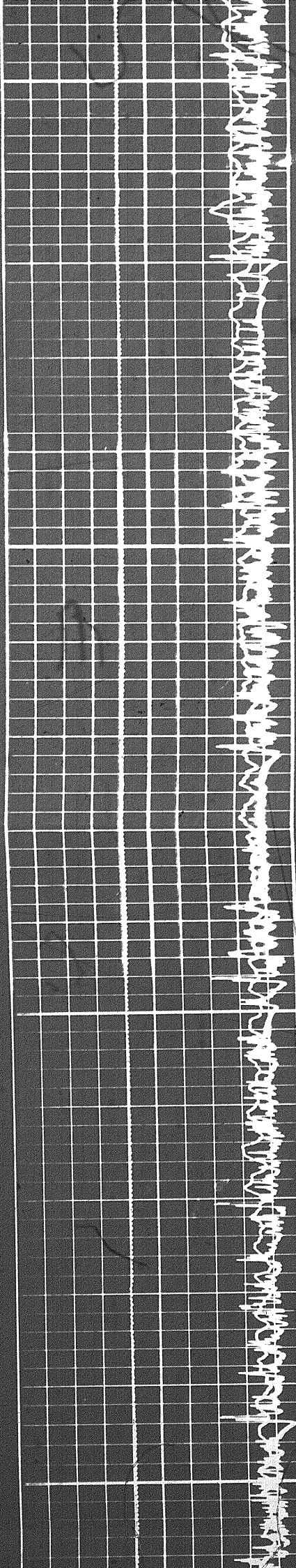
X4014H

01

02

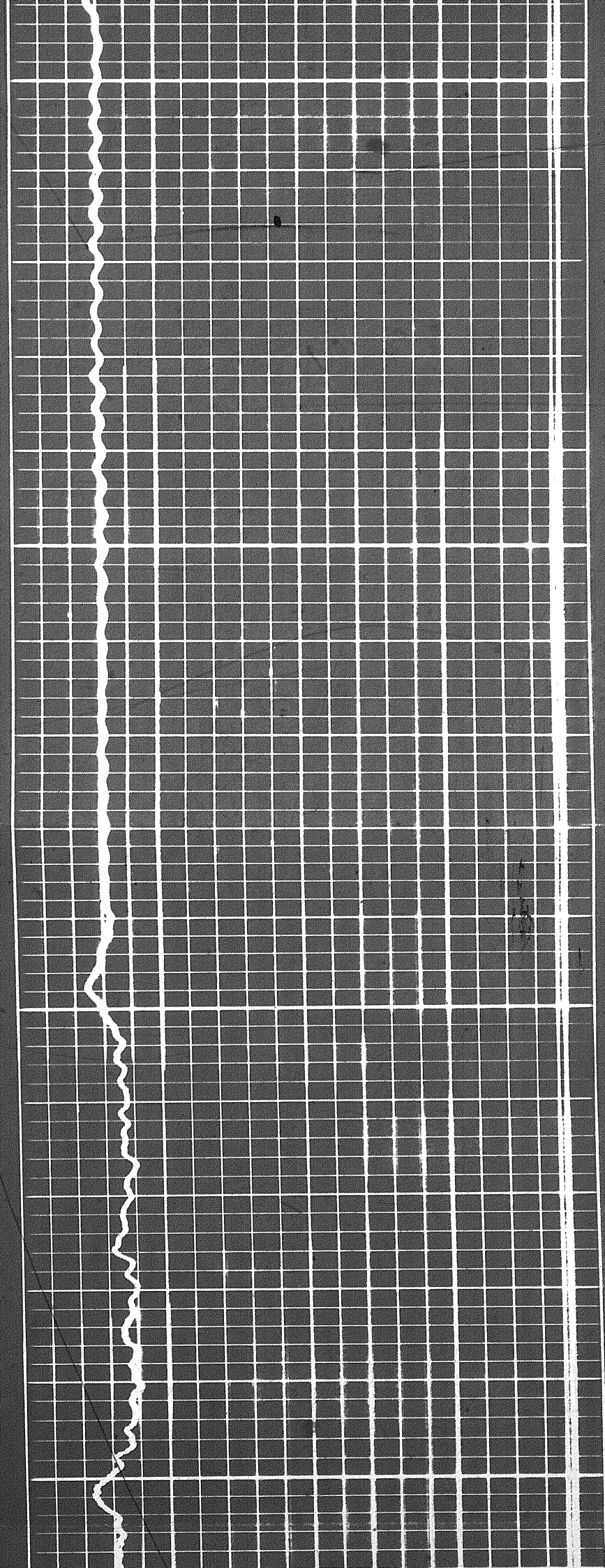
3600

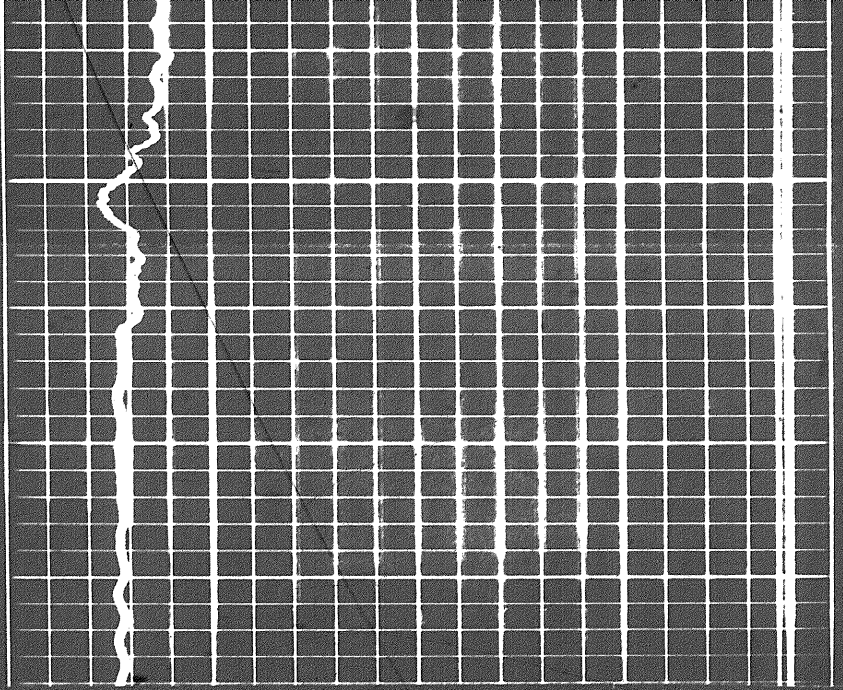
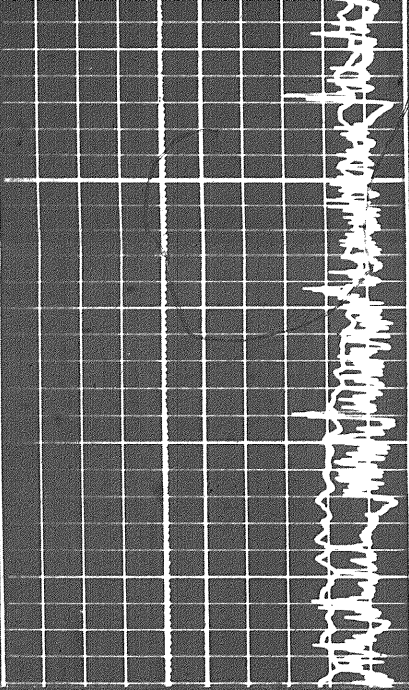




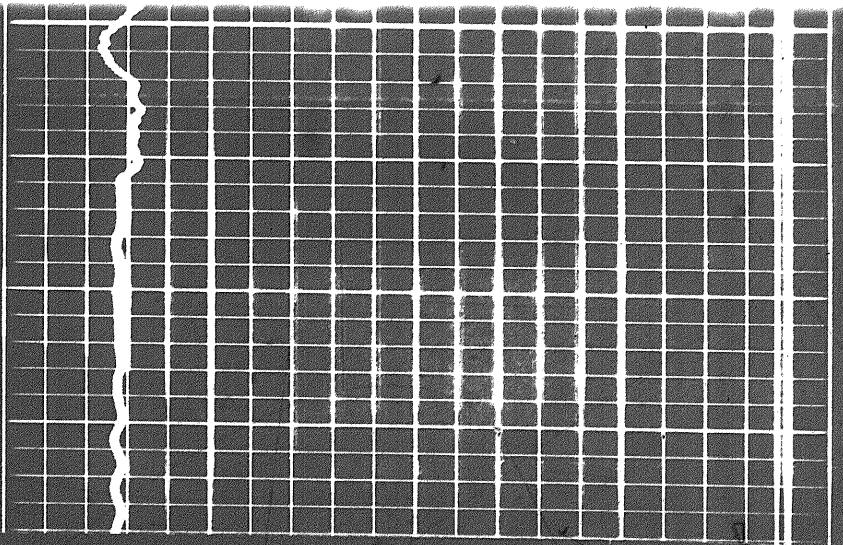
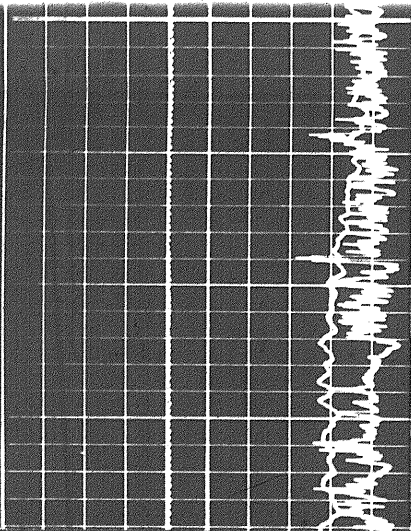
3600

3650





PASSES NOS. 3



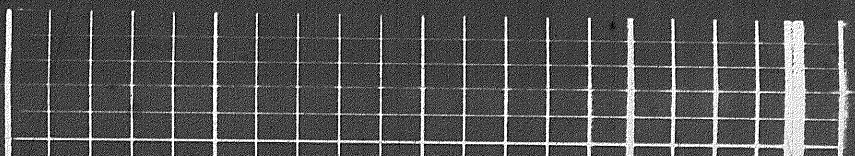
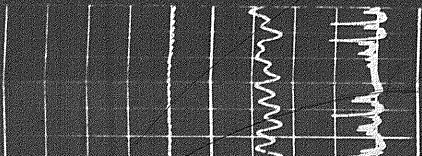
PASSES NOS. 3

WELL            SHUT-IN      
                 FLOWING      
                 INJECTING  

RECORDED       UP          
                 DOWN     

TIME FROM 1350 h TO 1358 h

X4014H





RECORDED

UP

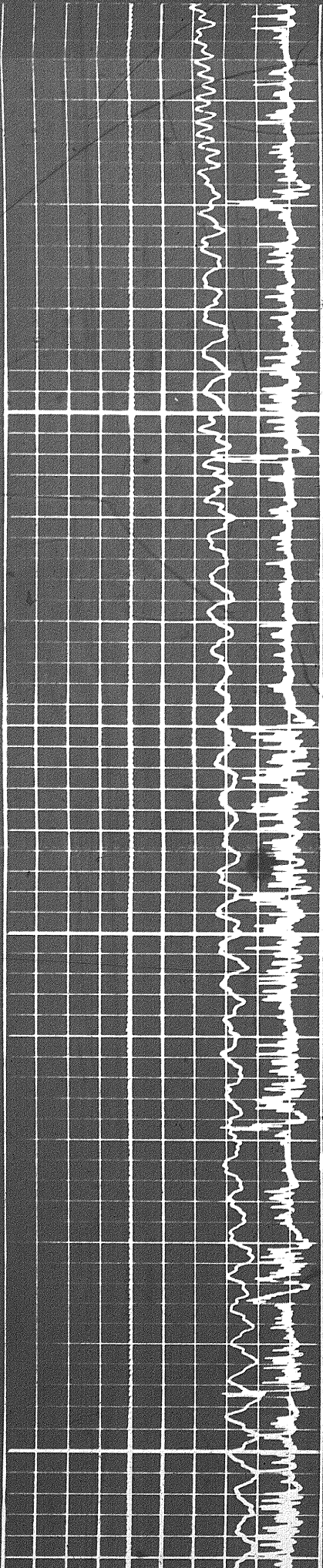


DOWN

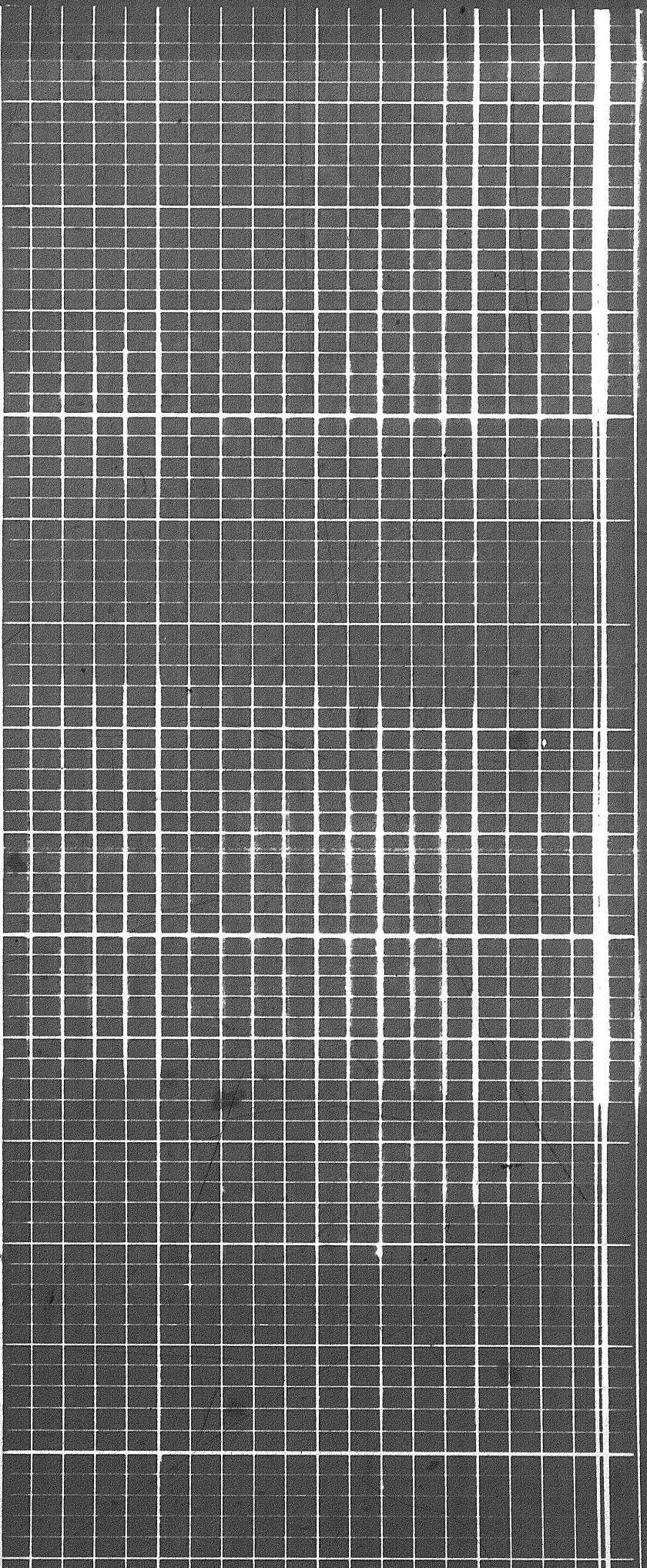


TIME FROM 1350 h TO 1358 h

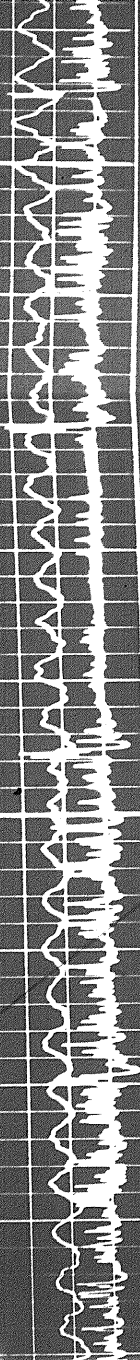
X4014H



0095



2



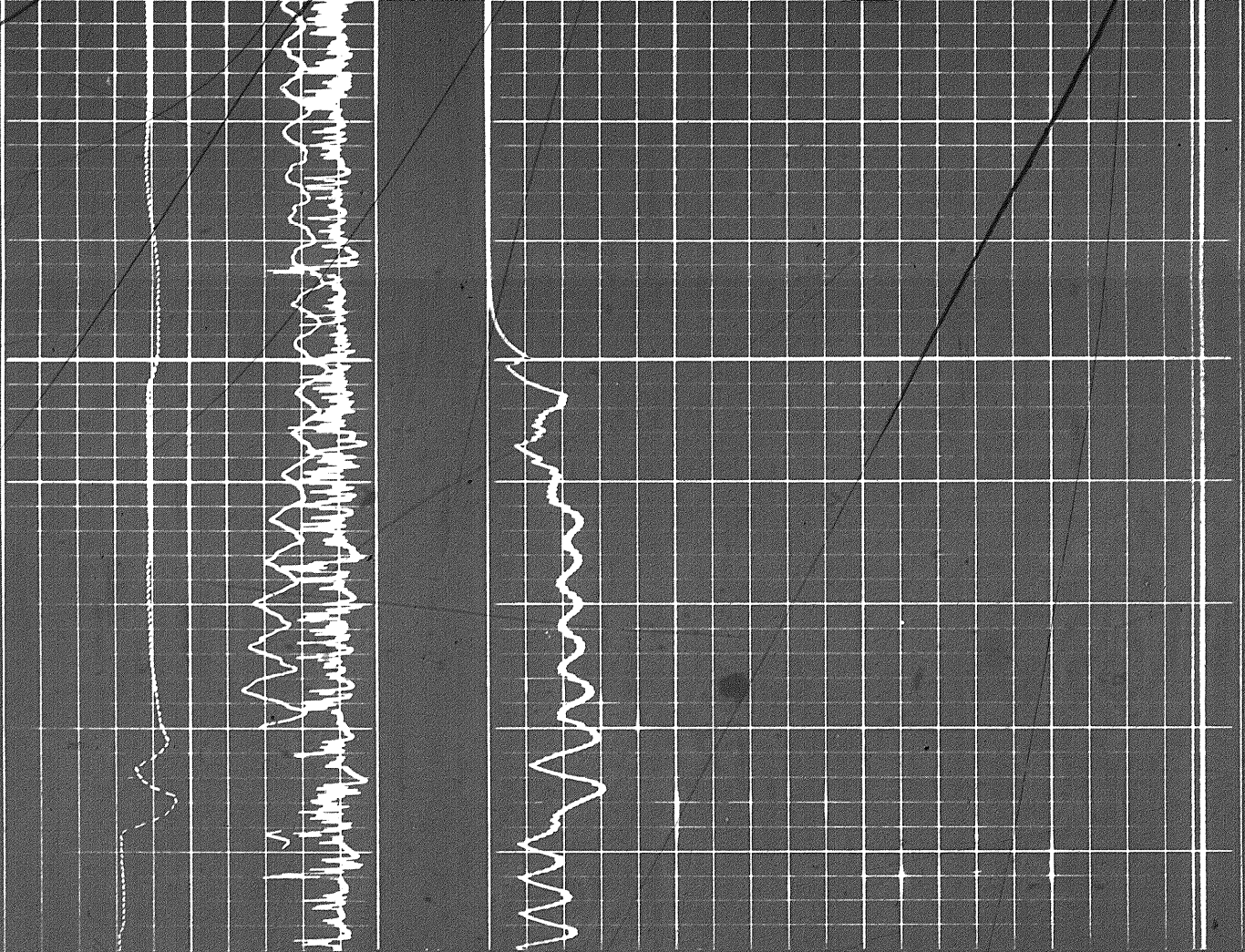
3650

8



3650

8



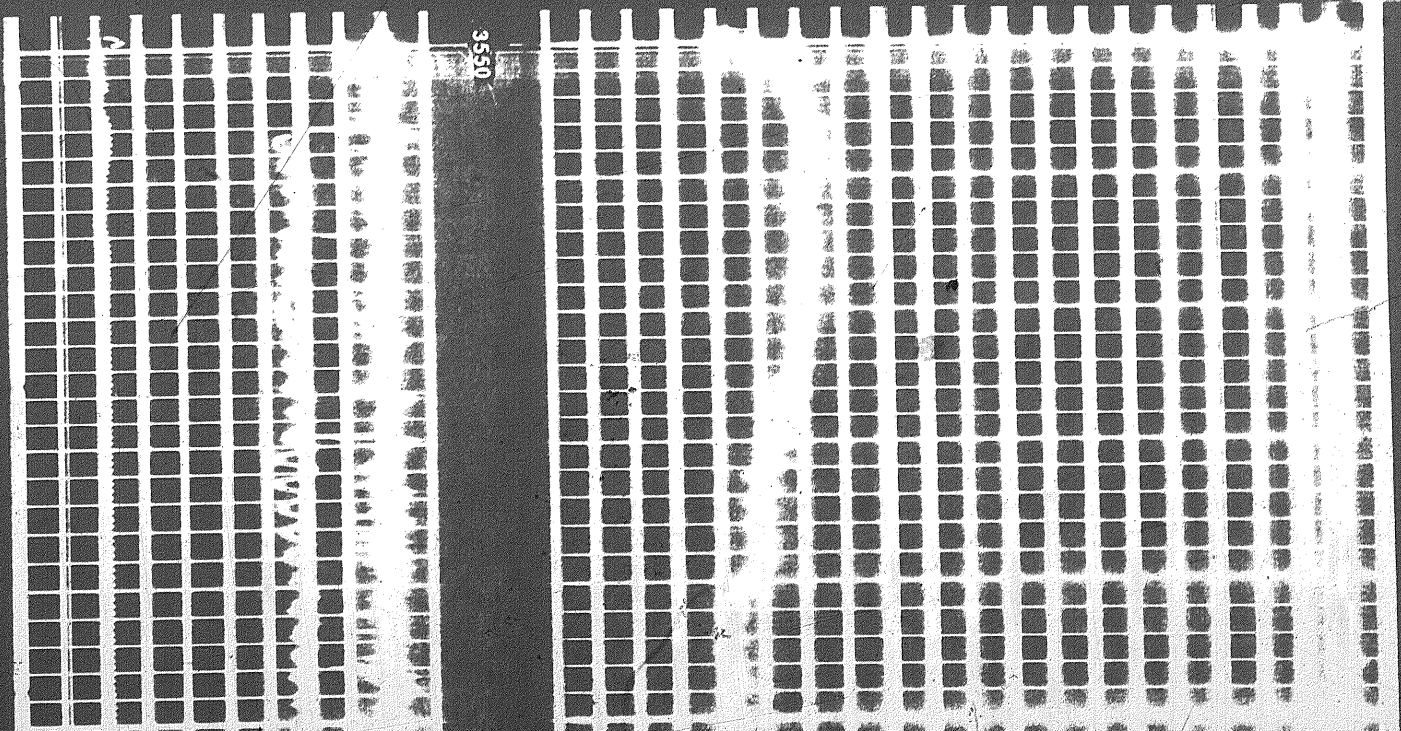
PASSES NOS. 2

WELL                      SHUT-IN   
                              FLOWING   
                              INJECTING

RECORDED                UP   
                              DOWN

TIME FROM 1325 h TO 1350 h

X4014H



Vertical text columns on the right side of the page, appearing to be bleed-through from the reverse side. The text is mostly illegible due to the high contrast and grain of the scan.

Vertical text columns on the left side of the page, appearing to be bleed-through from the reverse side. The text is mostly illegible due to the high contrast and grain of the scan.

Vertical text on the right edge of the page, likely bleed-through from the reverse side.

Main body of vertical text on the right side of the page, appearing as bleed-through from the reverse side.

3650

Vertical text on the left side of the page, appearing as bleed-through from the reverse side.

Main body of vertical text on the left side of the page, appearing as bleed-through from the reverse side.

0

1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20  
 21  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 29  
 30  
 31  
 32  
 33  
 34  
 35  
 36  
 37  
 38  
 39  
 40  
 41  
 42  
 43  
 44  
 45  
 46  
 47  
 48  
 49  
 50  
 51  
 52  
 53  
 54  
 55  
 56  
 57  
 58  
 59  
 60  
 61  
 62  
 63  
 64  
 65  
 66  
 67  
 68  
 69  
 70  
 71  
 72  
 73  
 74  
 75  
 76  
 77  
 78  
 79  
 80  
 81  
 82  
 83  
 84  
 85  
 86  
 87  
 88  
 89  
 90  
 91  
 92  
 93  
 94  
 95  
 96  
 97  
 98  
 99  
 100

PASSES NOS. \_\_\_\_\_

WELL \_\_\_\_\_ SHUT-IN   
 FLOWING   
 INJECTING

RECORDED \_\_\_\_\_ UP   
 DOWN

TIME FROM 1312 h TO 1325 h

X4014H

1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20  
 21  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 29  
 30  
 31  
 32  
 33  
 34  
 35  
 36  
 37  
 38  
 39  
 40  
 41  
 42  
 43  
 44  
 45  
 46  
 47  
 48  
 49  
 50  
 51  
 52  
 53  
 54  
 55  
 56  
 57  
 58  
 59  
 60  
 61  
 62  
 63  
 64  
 65  
 66  
 67  
 68  
 69  
 70  
 71  
 72  
 73  
 74  
 75  
 76  
 77  
 78  
 79  
 80  
 81  
 82  
 83  
 84  
 85  
 86  
 87  
 88  
 89  
 90  
 91  
 92  
 93  
 94  
 95  
 96  
 97  
 98  
 99  
 100

91

1. 凡在本行開辦之各項業務，均應遵照本行章程辦理。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

2. 本行辦理各項業務，應以誠實、信用為宗旨，不得有欺詐、隱瞞等情事。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

3. 本行辦理各項業務，應遵守國家法律及金融監督機關之規定。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

4. 本行辦理各項業務，應注意顧客之利益，不得有損害顧客利益之行為。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

5. 本行辦理各項業務，應注意社會公益，不得有損害社會公益之行為。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

6. 本行辦理各項業務，應注意環境衛生，不得有損害環境衛生之行為。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

7. 本行辦理各項業務，應注意社會治安，不得有損害社會治安之行為。如有違反者，本行得隨時取消其資格，並得向有關機關報告。

0000

3000

RECORDING SPEED

SPINNER VELOCITY

Schlumberger

# PRODUCTION LOGGING FULLBORE FLOWMETER

SCHEMATIC OF THE FULLBORE FLOWMETER

RECORDING SPEED metres per minute	DEPTH METRES	SPINNER VELOCITY revolutions per second
<p>0 25 50</p> <p>Collars recorded 4 m deep</p> <p>Corrected collars</p> <p>1 Minute</p> <p>X4014F</p>		<p>0 10 20</p> <p>3 s pulses</p> <p>SPINNER SCALE rps/track</p> <p>Passes No. _____</p> <p>Well Shut-in <input type="checkbox"/></p> <p>Flowing <input checked="" type="checkbox"/></p> <p>Injecting <input type="checkbox"/></p> <p>Recorded Up <input type="checkbox"/></p> <p>Down <input type="checkbox"/></p>
TIME DRIVE		
A		

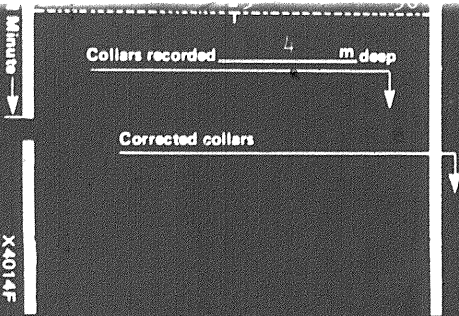
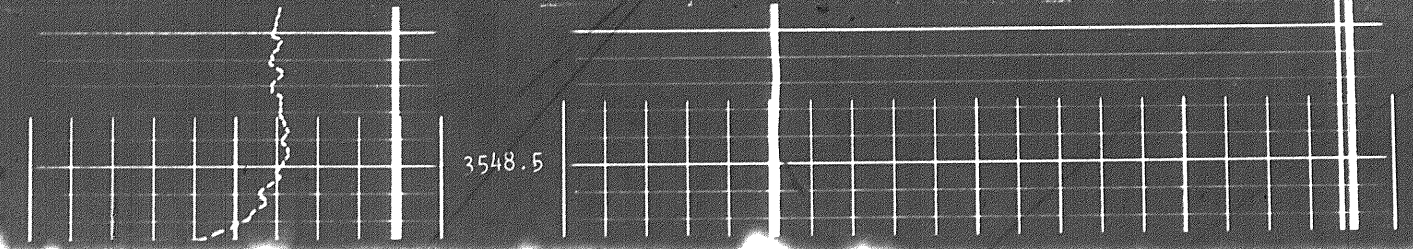


4014F

TIME DRIVE

A

3548.5



- Passes N- \_\_\_\_\_
- Well Shut-in
  - Flowing
  - Injecting
  - Recorded Up
  - Down

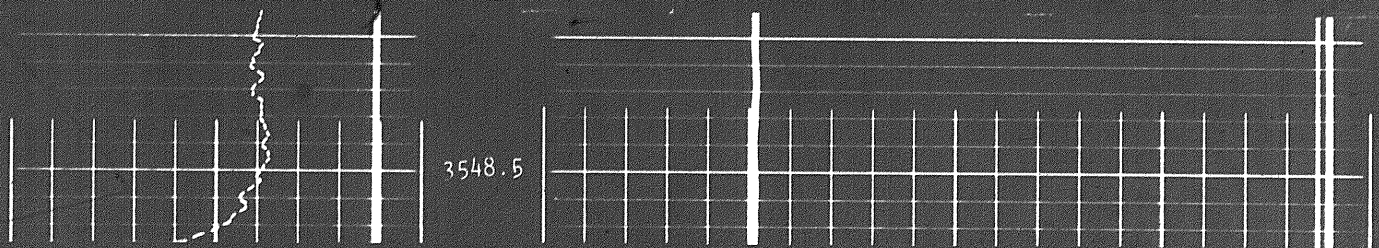
3 s pulses

SPINNER SCALE  
rps/track

TIME DRIVE

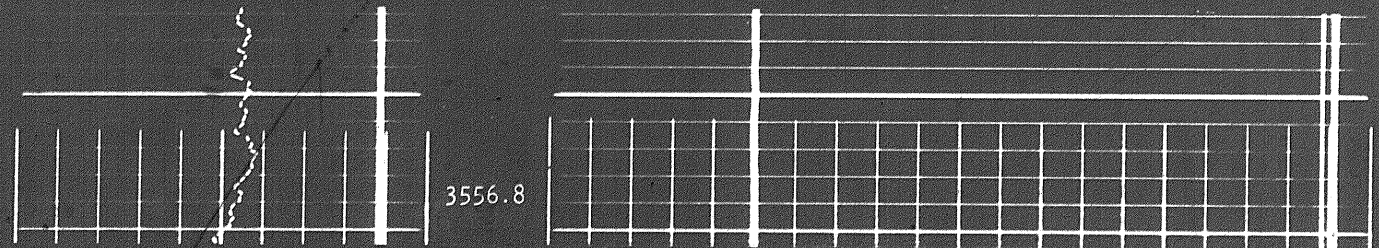
A

3548.5



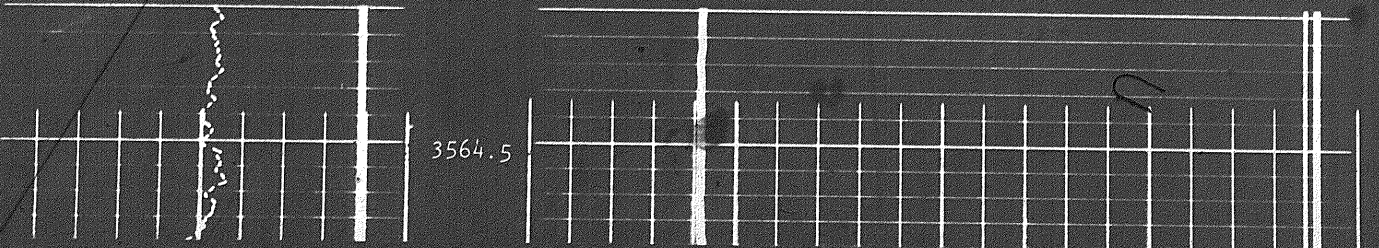
B

3556.8



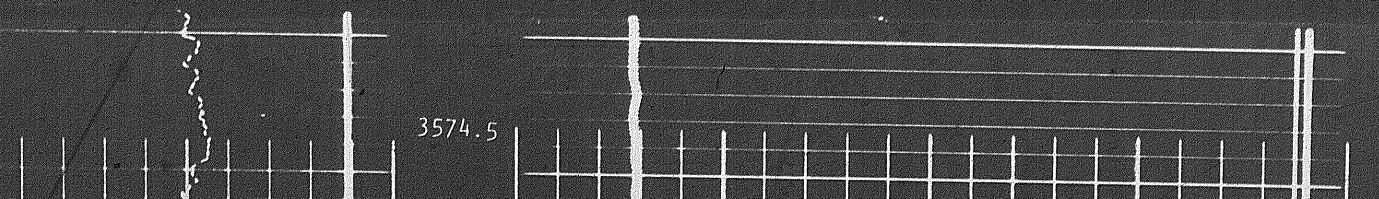
C

3564.5



D

3574.5



D

3574.5

E

3581.1

F

3585.0

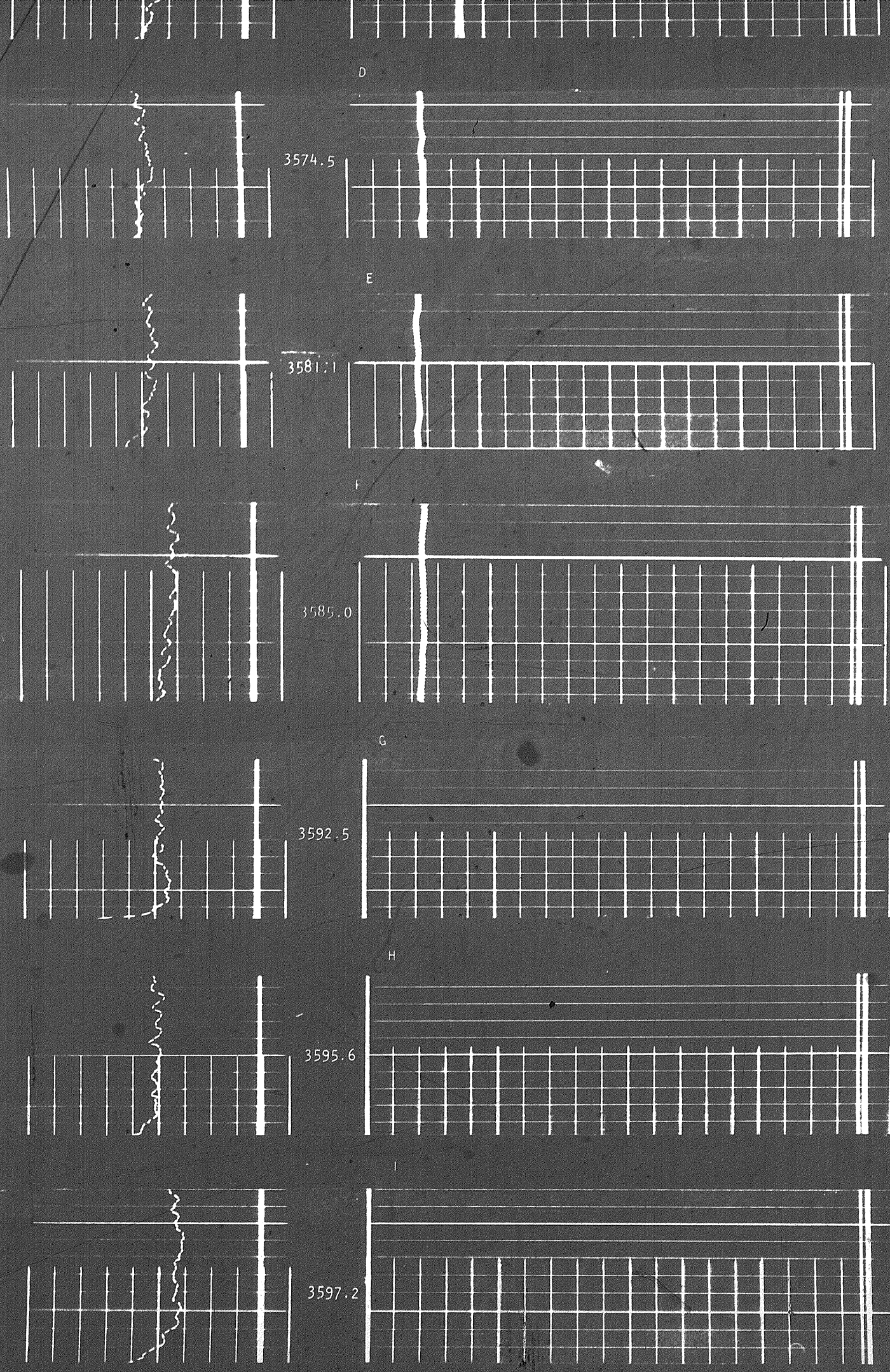
G

3592.5

H

3595.6

3597.2



3597.2

3600.0

3602.5

3600.0

3602.5

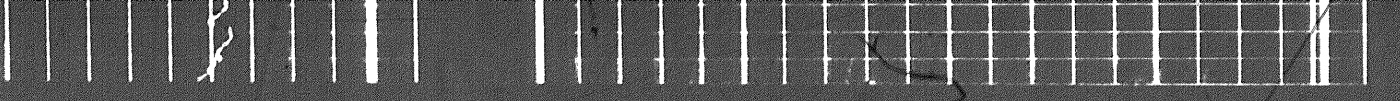
3606.0

K

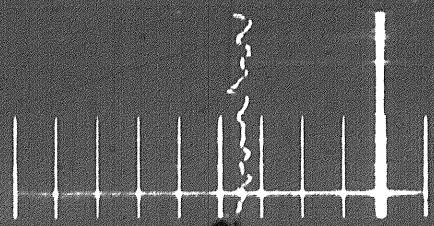
K

L

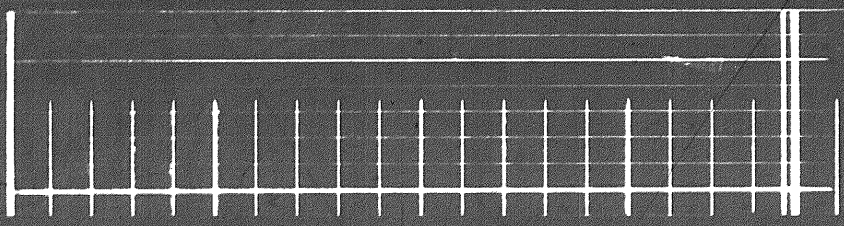
M



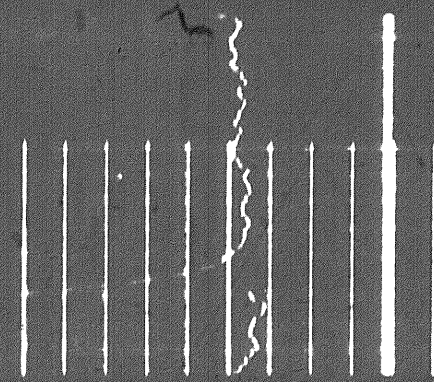
M



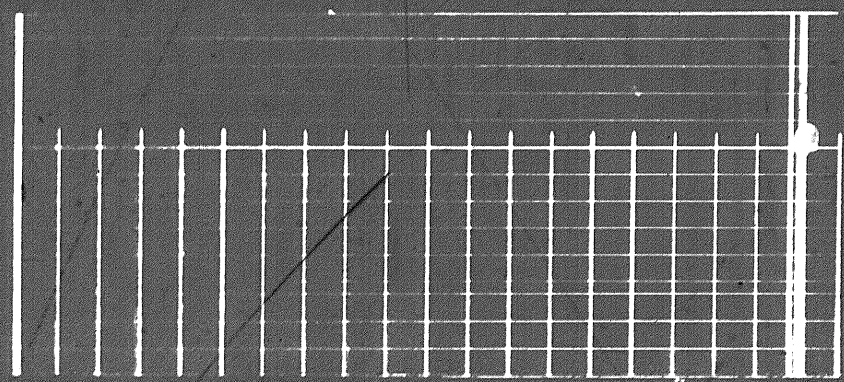
3610.5



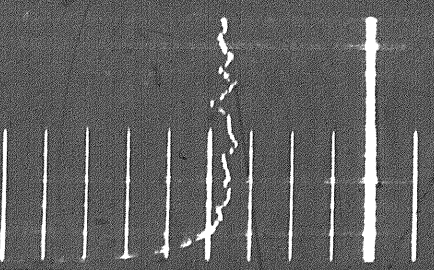
N



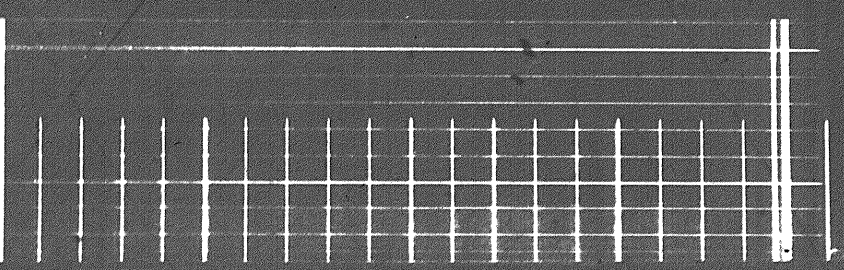
3613.7



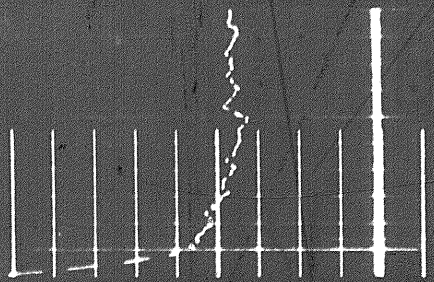
O



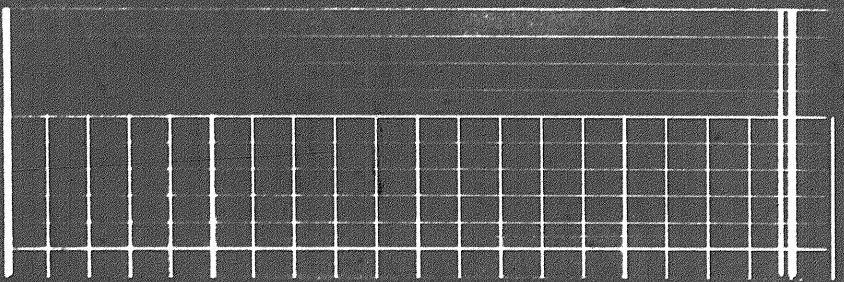
3618.5



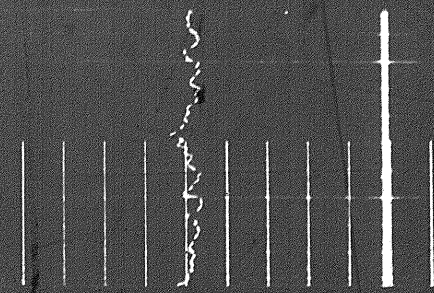
P



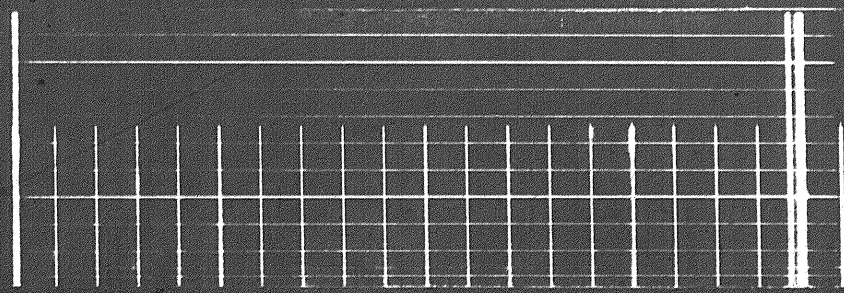
3621.0



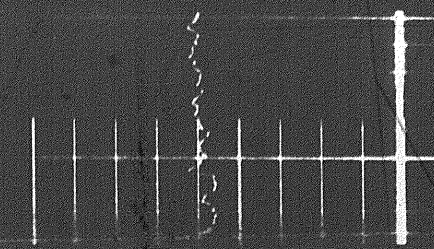
Q



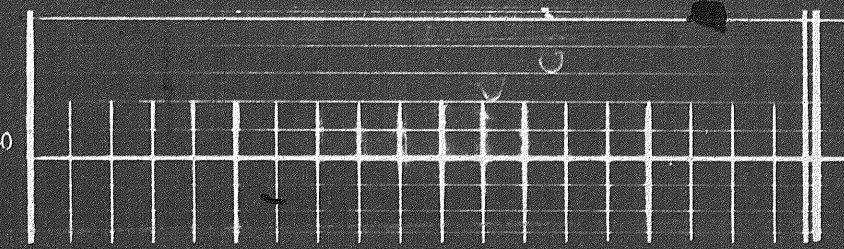
3624.1



R



3629.0



3629.0

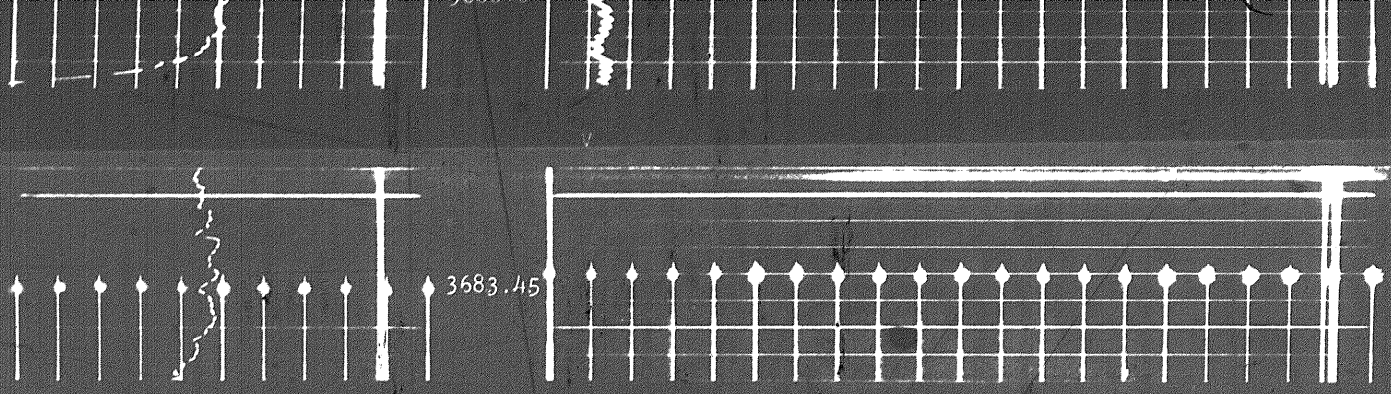
3650.0

3652.45

3660.0

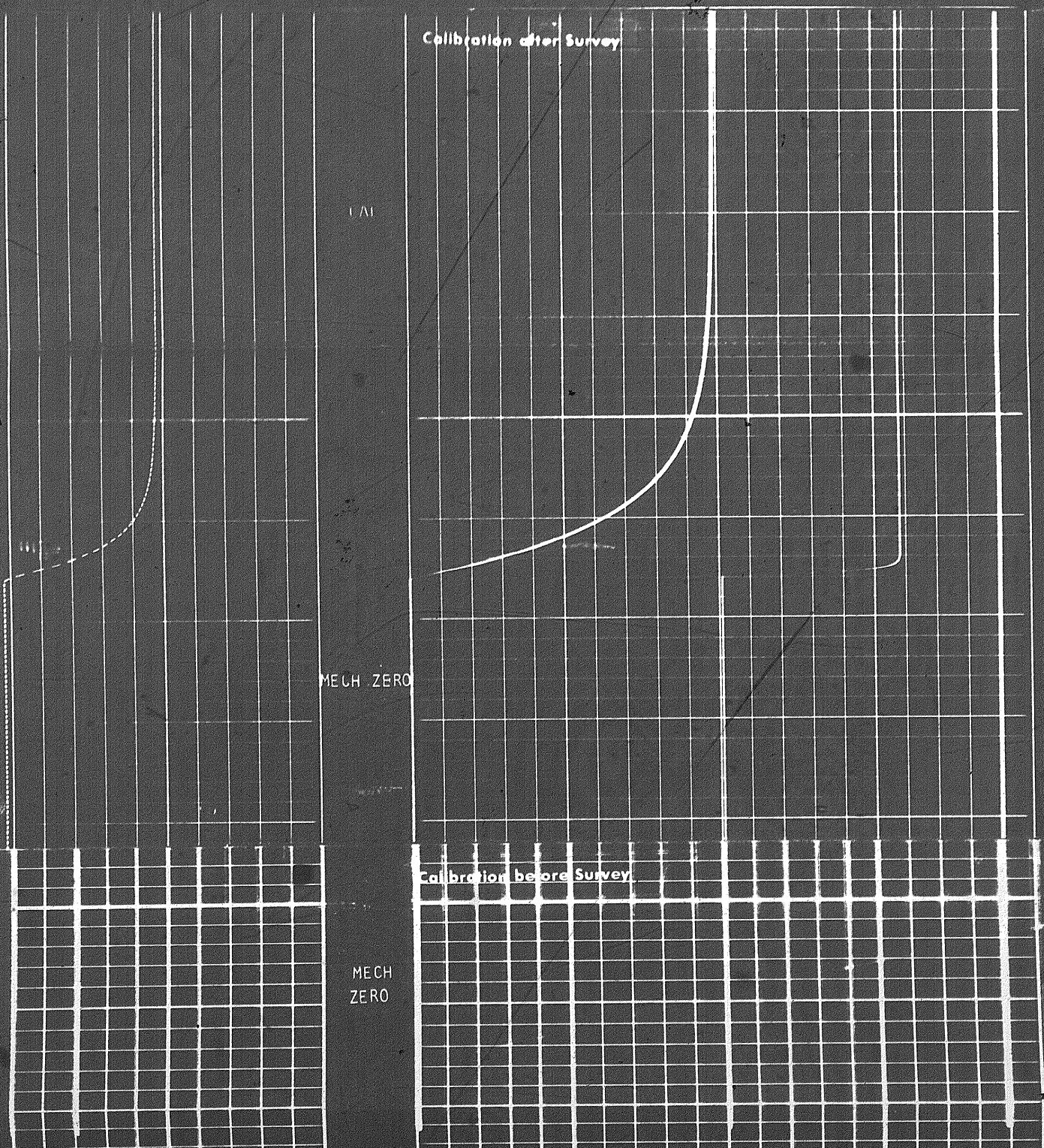
3683.45

3660.0



# CALIBRATION RECORD

↓



MECH  
ZERO

CAL

↑  
**CALIBRATION RECORD**

**THERMOMETER CALIBRATION CODING**

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. 0°C CALIBRATION SIGNAL
4. 100°C CALIBRATION SIGNAL

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.  
WELL COLUMBIA GAS ET AL KOTANEELEE YT H-38  
FIELD WILDCAT  
PROVINCE YUKON TERRITORY

SCHL. FR 3700.0 m  
SCHL. TD 3700.0 m  
DRLR. TD 3866.2 m  
Elev.: KB 686.0 m  
DF \_\_\_\_\_ m  
GL 678.4 m

X4013A