FIGURE 1

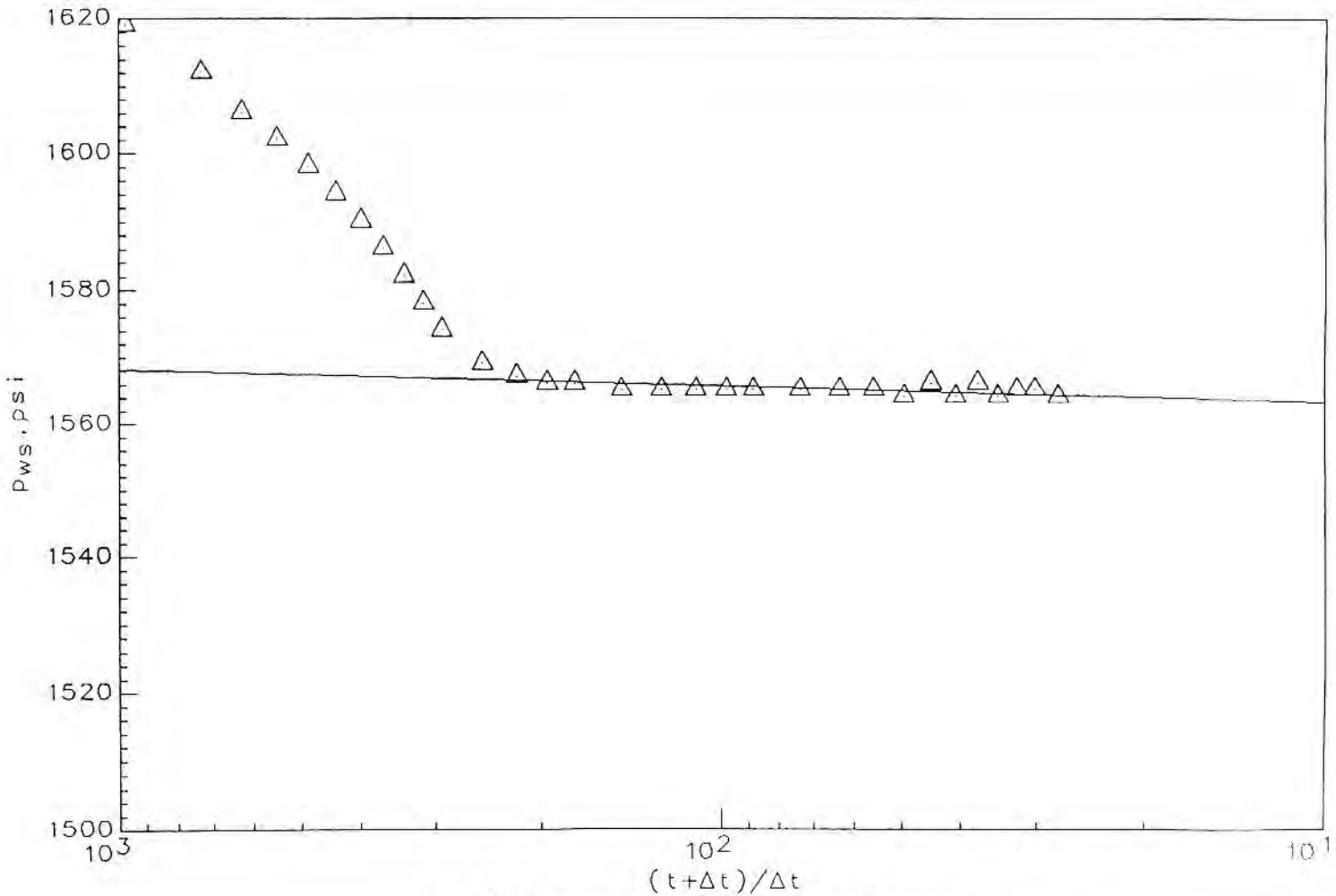
HORNER

PRESSURE FALLOFF PLOT

HOECHST CELANESE VAY CITY
WDW14#2

PRESSURE FALL-OFF
OCTOBER 1990

$[k_1/u]_t$=598.41 k_1=424.87 md s=29.6 p*=1560.9



GOLDEN ENVIRONMENTAL SERVICES, INC.
AFFILIATE OF GOLDEN STRATASERVICES, INC

FIGURE 2

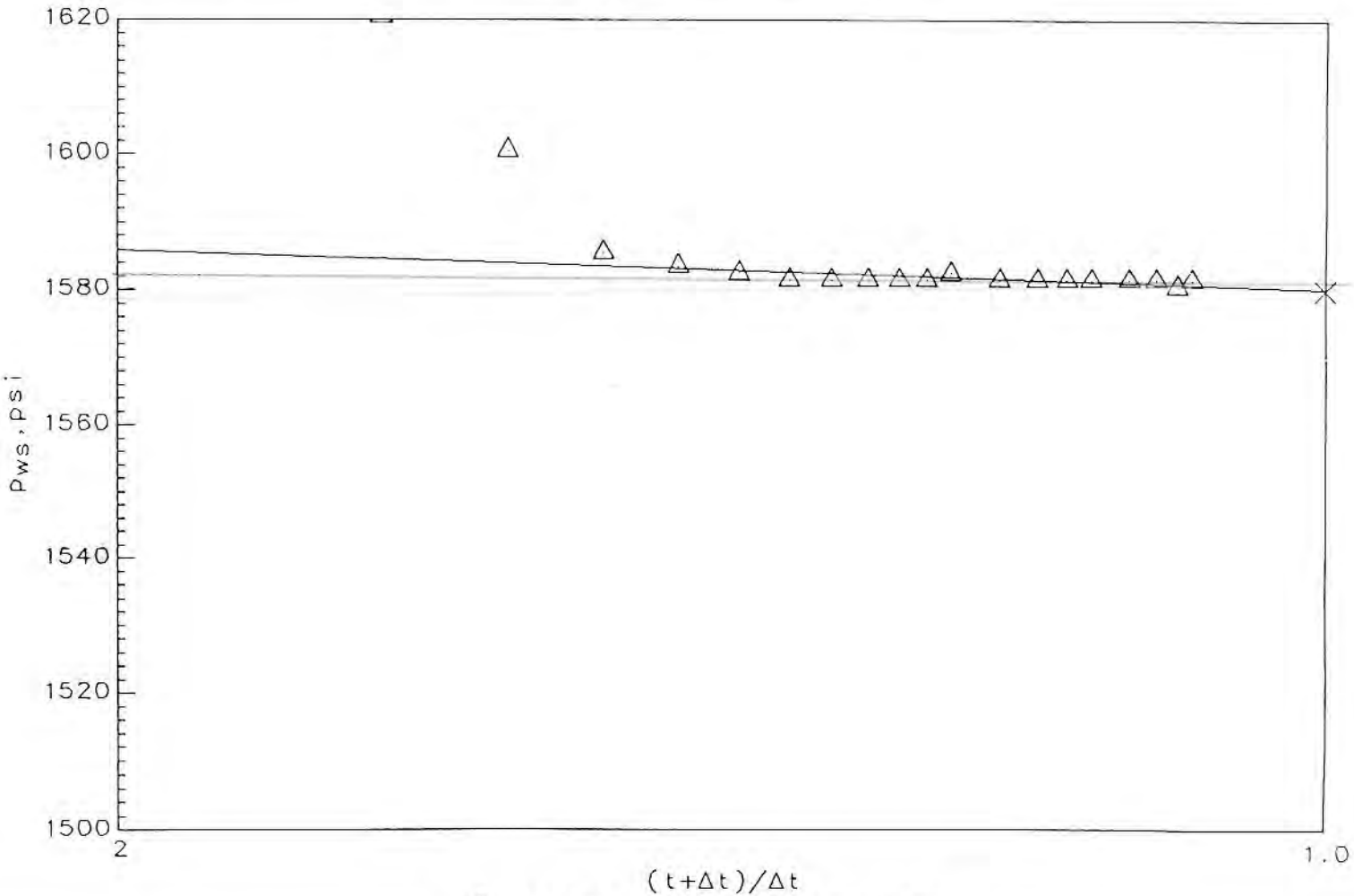
HORNER

PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49#4

PRESSURE FALL-OFF TEST
OCTOBER 29-30, 1991

$[k_1/u]_t$=142.55 k_1=101.21 md s=23.0 p*=1580.2



GOLDEN ENVIRONMENTAL SERVICES, INC.
AFFILIATE OF GOLDEN STRATASERVICES, INC

ANALYSIS OF 1992 FALL-OFF TEST IN WDW-49

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19,1992

Production And Times

Cumulative Production (water)	=	-	bbl	<DEF>
Corrected Flow Time	tc =	8040.000	hr	<DEF>
Final Water Rate	qw =	-2725.70	bbl/d	

Fluid Properties

Reference Pressure	pRef =	1500.0	psi	<DEF>
Water Formation Vol Factor	Bw =	1.00		<DEF>
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	0.710	cp	
Oil Formation Vol Factor	Bo =	1.15		<DEF>
Oil Compressibility	co =	1.898×10^{-04}	psi^{-1}	<DEF>
Oil Viscosity	muo =	3.875	cp	<DEF>
Solution Gas Oil Ratio	Rso =	279.2	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	1.51×10^{-03}		<DEF>
Gas Compressibility	cg =	7.772×10^{-04}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19,1992

Reservoir Parameters

Net Pay	h =	210.00	ft
Total Porosity	phit =	33.00	%
Water Saturation	Sw =	100.00	%
Oil Saturation	So =	0.00	%
Gas Saturation	Sg =	0.00	%
Wellbore Radius	rw =	0.28	ft
Formation Temperature	T =	98.00	deg F
Formation Compressibility	cf =	3.000×10^{-06}	psi^{-1}
Total Compressibility	ct =	6.000×10^{-06}	psi^{-1} <DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19,1992

Zone 1

Pressures

Initial Pressure	pi =	1500.0	psi
Extrapolated Pressure	p* =	1526.2	psi
Average Reservoir Pressure	pR =	-	psi
Final Flowing Pressure	pwfo =	1832.8	psi

Straight Line Results

Total Sandface Rate	QTBT =	-2725.70	bbl/d
Semilog Slope	msl =	3.6	psi/cycle
Transmissivity (Total)	kh/mu =	122063.28	md.ft/cp
Mobility (Total)	k/mu =	581.254	md/cp
Flow Capacity (Water)	kh =	86664.93	md.ft
Permeability (Water)	k =	412.69	md
Skin Effect (Total)	s =	85.424	
Pressure Drop Due To Skin	delps =	269.3	psi
Flow Efficiency	FE =	0.87	
Damage Ratio	DR =	1.15	
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19,1992

Zone 1

Extended Rates

3 - Month Constant Rate	=	-	bbl/d
6 - Month Constant Rate	=	-	bbl/d

Stabilized Rate

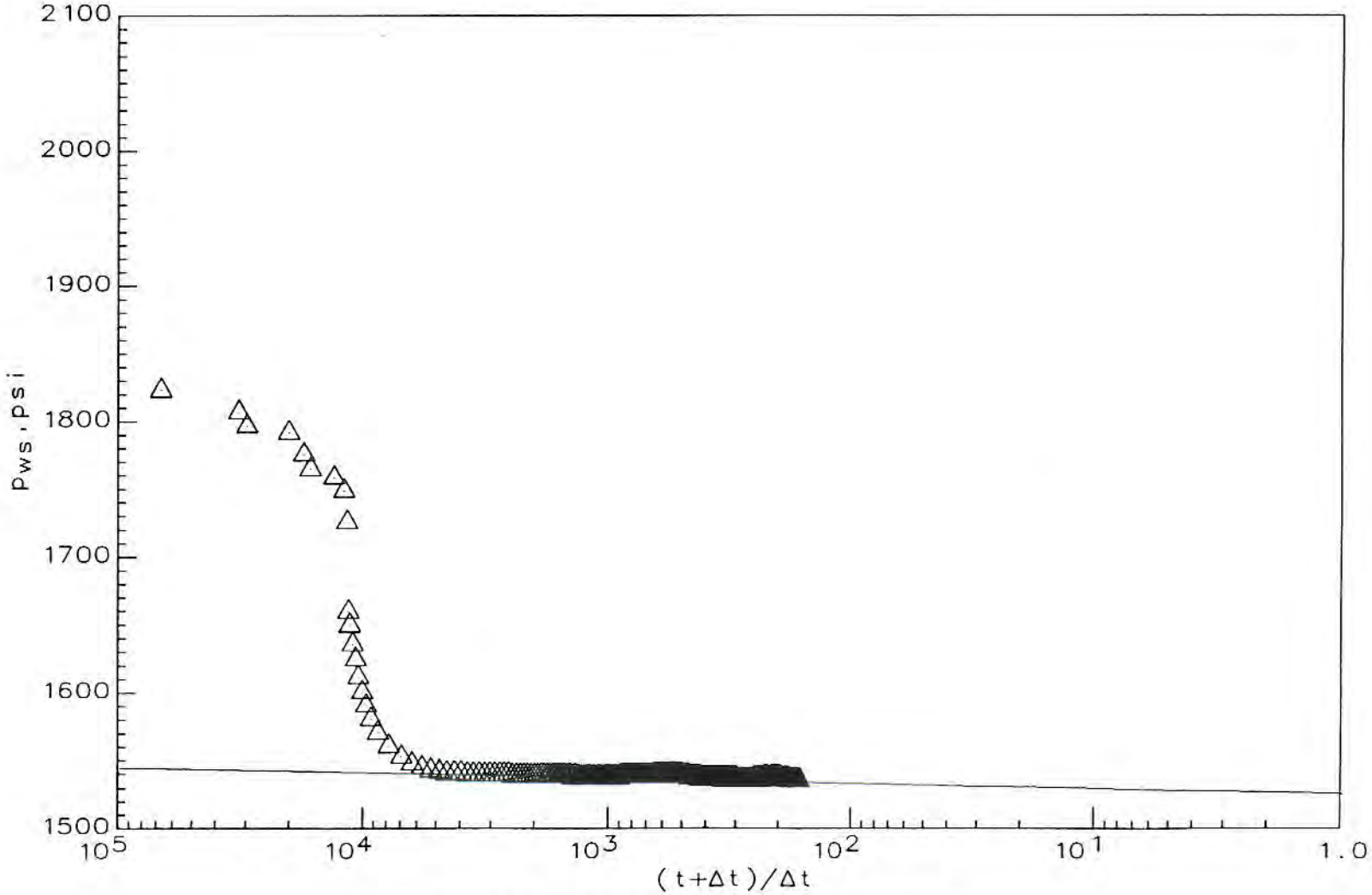
Shape Code	=	R1A		<DEF>
Drainage Area	A =	160.0	acres	<DEF>
Time To Stabilize	ts =	9.003	hr	
Stabilized Rate @ Current Skin	qs =	-18999.56	bbl/d	
Stabilized Rate @ Skin Of 0	qs =	-210998.14	bbl/d	
Stabilized Rate @ Skin Of -4	qs =	-400517.98	bbl/d	

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19, 1992

$[k_1/u]_t$=581.25 ; k_1=412.69 md s=85.4 p*=1526.2



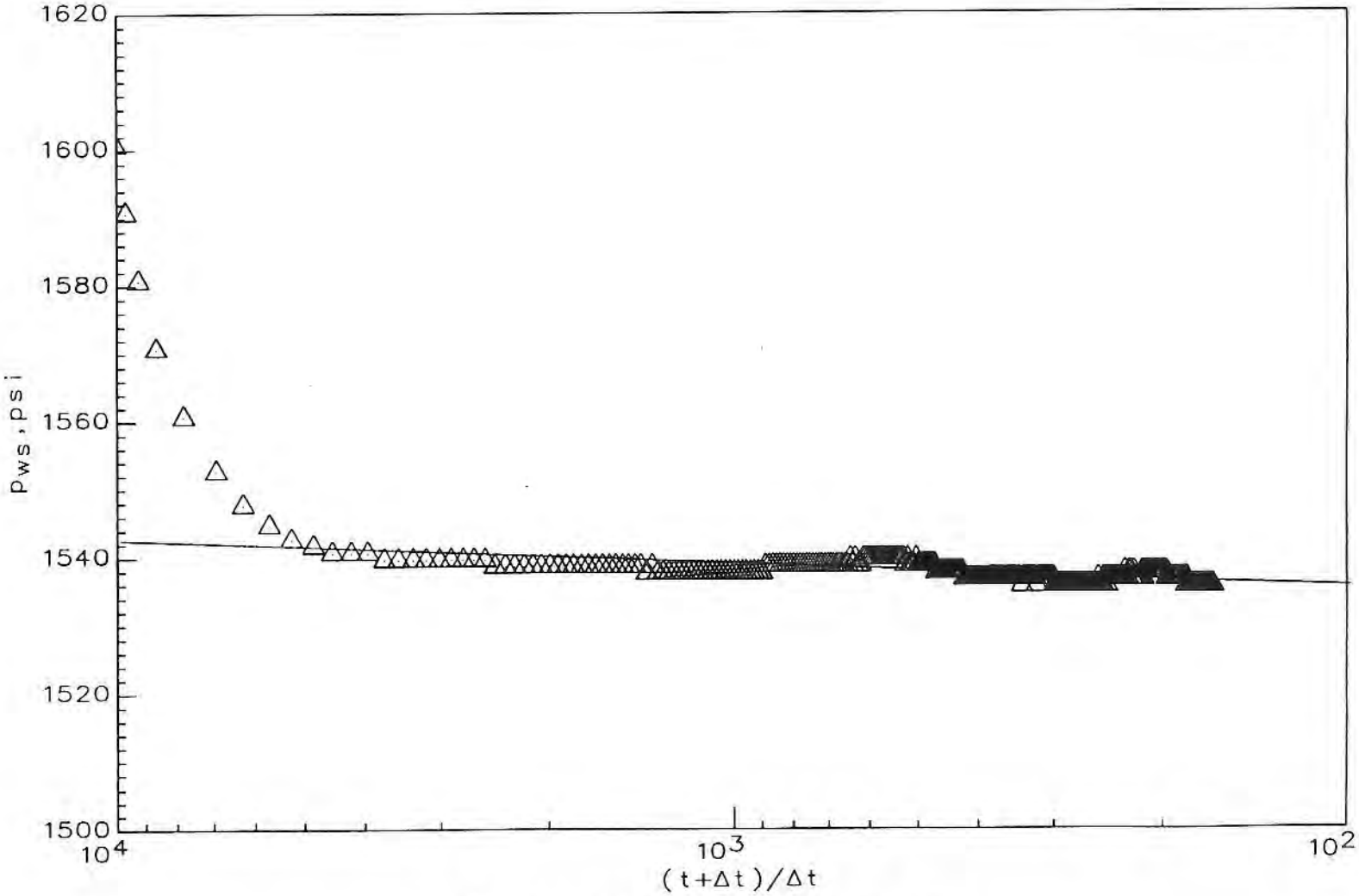
GOLDEN ENVIRONMENTAL SERVICES, INC.
AFFILIATE OF GOLDEN STRATASERVICES, INC.

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49-4

PRESSURE FALL-OFF TEST
SEPTEMBER 19, 1992

$[k_1/u]_t$=590.30 k_1=419.11 md s=86.2 p*=1528.4



SECTION 2
COPY OF EPA OCTOBER 27, 1992
NOTICE OF DEFICIENCIES NO. 2
1990 AND 1991 ANNUAL PRESSURE TESTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

October 27, 1992

CERTIFIED MAIL P 399 862 228 RETURN RECEIPT REQUESTED

Ms. Kaymartha Williams
Hoechst Celanese Corporation
Bay City Plant
P.O. Box 509
Highway 3057
Bay City, TX 77404-0509

Dear Ms. Williams:

The EPA has reviewed the responses to the September 2, 1992 Notice of Deficiencies on the falloff tests for the Celanese Bay City injection wells. These responses are not considered to be adequate. One of the primary reasons for running the falloff tests is to compare existing bottomhole pressures with those predicted by the computer model in the petition to insure that the maximum predicted pressure is not exceeded. The September 2, 1992 deficiencies requested Celanese to compare flowing reservoir pressure with that determined in the approved petition demonstration. Celanese has not provided this response. Celanese should specifically address the attached deficiencies by November 9, 1992 or notify the EPA as to the reasons why this deadline cannot be met.

Please contact Phil Dellinger or Joe Kordzi at (214) 655-7160 if you have any questions.

Sincerely,

Philip Dellinger

for Mac A. Weaver, P.E.
Chief
UIC State Programs Section

Enclosure

cc: Ben Knape, TWC

Printed on Recycled Paper

HOECHST CELANESE BAY CITY PLANT
Notice of Deficiencies No. 2
1990 and 1991 Annual Pressure Tests
October 27, 1992

1. Celanese should provide an expanded Horner plot for WDW-14 and WDW-49. The semilog straight line should be included on the plot.

2. Celanese states that due to the model used in the petition demonstration and limited output, a fair comparison between actual and predicted pressures is not possible. Celanese should compare the flowing reservoir pressure less delta P due to skin with the maximum pressure buildup predicted at the end of the operational period. Celanese should also compare the calculated transmissivity and permeability with that used in the petition. EPA suggests Celanese to refer to Section 2 of their approved petition for data input into the model. If Celanese is unable to compare data then a new pressure buildup model should be run in which pressures, transmissivity and permeability can be checked.

3. Celanese was requested to include the injection rates of the wells in the same formation prior to and during the falloff test of WDW-49.

HOECHST CELANESE CHEMICAL GROUP, INC.

Bay City, Texas Plant

NOTICE OF DEFICIENCIES FOR THE 1992 AND 1993 FALL-OFF TESTS JUNE 25, 1993

RECEIVED
JUL 14 1993
6 W-SU

GES JOB NO. 033-022-93

Prepared by:

GOLDEN ENVIRONMENTAL SERVICES, INC.
711 Louisiana Street, Suite 1600
Houston, Texas 77002
Telephone No.: (713) 228-7000
Fax No.: (713) 222-9900

July 8, 1993

HOECHST CELANESE CHEMICAL GROUP, INC.
BAY CITY, TEXAS PLANT

NOTICE OF DEFICIENCIES FOR THE 1992 AND 1993
FALL-OFF TESTS
JUNE 25, 1993

GES JOB NO. 033-022-93

1993 Fall-off Test for WDW-110:

1. Celanese should provide a delta p (psi) vs. delta t (hours) log-log plot with derivative. This plot should be scaled to include all analyzed data. The start of radial flow should be identified on the plot. A dimensionless pressure vs. dimensionless time scaled log-log plot represents a problem to the reviewer in that time can not be directly read and converted for use on the Horner plot. In addition, calculation of the dimensionless parameters required knowing quantities which are functions, in part, of the kh/μ product.

Response:

A delta p vs delta t log-log plot with derivative is included as Attachment 1.

2. Celanese should provide a diskette containing the unedited fall-off test data. Celanese should specify the parameter and units for each column of data submitted.

Response:

A 3 1/2" diskette containing the unedited fall-off test data is enclosed.

WDW-32 (Well No. 3) September 14-15, 1992 Fall-Off Test:

1. The May 3, 1993 Deficiency No. 1 requested Celanese to state and justify the injection time interval used to calculate the Horner time of the semilog plot and the Agarwal equivalent time on the log-log plot. The response by Celanese did not address this deficiency. For the September, 1992 test for WDW-32, Celanese should state the value used for the injection time (t), used to determine Horner time [(t + delta t)/delta t] and agarwal equivalent time [(* delta t)/(t + delta t)]. Celanese reported a corrected flow time of 8,760 hours for the test in the analysis. Using the final shut-in delta t of 46.46 hours and an injection time, t = 8,760 hours, the corresponding Horner time would be 189.5 and the

corresponding Agarwal equivalent time would be 46.2, neither of which appeared as the final points on the corresponding plots. Celanese should verify the values assigned for delta t and injection time (t). Celanese should revise the log-log plot, semilog plot, and fall-off test analysis submitted.

Response:

A revised log-log plot, semilog plot, and fall-off test analysis is included as Attachment 2. The revision to the time interval is included on the plots and analysis. The plot originally submitted to the EPA plotted minutes rather than hours and thus created the confusion.

2. Celanese should provide a diskette containing the unedited fall-off test data. Celanese should specify the parameter and units for each column of data submitted.

Response:

A 3 1/2" diskette containing the unedited fall-off test data is enclosed.

WDW-49 (Well No. 4) September 19-22, 1992 Fall-Off Test:

1. Celanese stated in the response to the March 3, 1993 Deficiency No. 2, that the corrected flow time of 8,760 hours injection time (t) and a final fall-off time of 48 hours (delta t), the resulting Horner time and Agarwal equivalent time do not correspond to the end points observed on the semilog and log-log plots shown for Well WDW-49. Celanese should verify that the proper units were assigned to the input data. Celanese should provide a revised log-log plot, semilog plot, and analysis for the WDW-49, 1992 fall-off test.

Response:

A revised log-log plot, semilog plot, and fall-off test analysis is included as Attachment 3. The revision to the time interval is included on the plots and analysis. The plot originally submitted to the EPA plotted minutes rather than hours and thus created the confusion.

2. Celanese should provide a diskette containing the unedited fall-off test data. Celanese should specify the parameter and units for each column of data submitted.

Response:

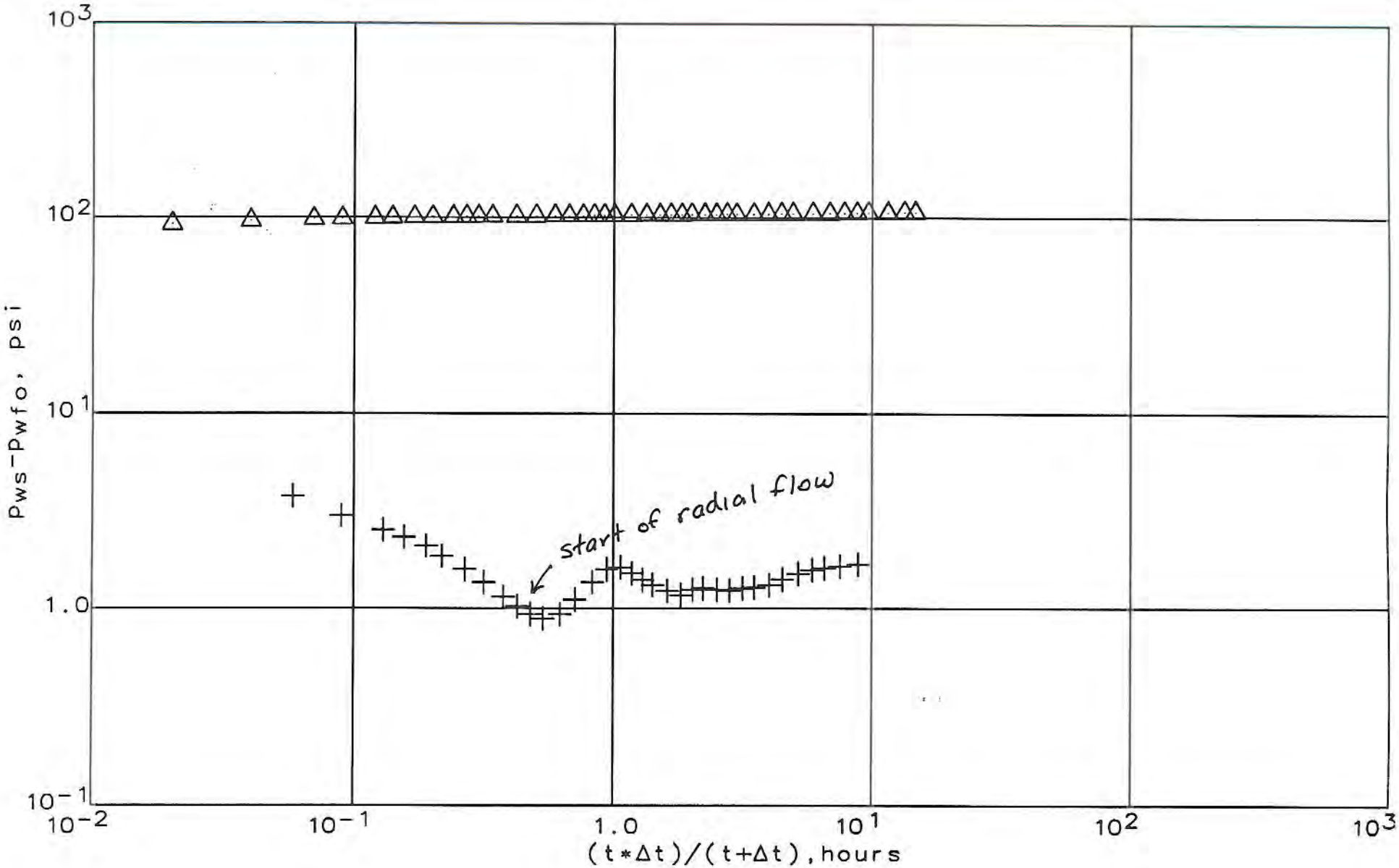
A 3 1/2" diskette containing the unedited fall-off test data is enclosed.

ATTACHMENT 1

DIAGNOSTIC PREPLOT TYPECURVE
PRESSURE FALLOFF PLOT

HOECHST CELANESE (BAY CITY)
WDW 110

PRESSURE FALL-OFF
FEBRUARY 1993



ATTACHMENT 2

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Production And Times

Cumulative Production (water)	=	-	bbl	<DEF>
Corrected Flow Time	tc =	48.000	hr	<DEF>
Final Water Rate	qw =	-2982.80	bbl/d	

Fluid Properties

Reference Pressure	pRef =	1500.0	psi	<DEF>
Water Formation Vol Factor	Bw =	~~0.71~~ 1.00		
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	~~1.000~~ .71 cp		<DEF>
Oil Formation Vol Factor	Bo =	1.16		<DEF>
Oil Compressibility	co =	2.010×10^{-04}	psi^{-1}	<DEF>
Oil Viscosity	muo =	2.516	cp	<DEF>
Solution Gas Oil Ratio	Rso =	265.0	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	1.62×10^{-03}		<DEF>
Gas Compressibility	cg =	7.587×10^{-04}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Reservoir Parameters

Net Pay	h =	210.00	ft	
Total Porosity	phit =	33.00	%	
Water Saturation	Sw =	100.00	%	
Oil Saturation	So =	0.00	%	
Gas Saturation	Sg =	0.00	%	
Wellbore Radius	rw =	0.28	ft	
Formation Temperature	T =	120.00	deg F	<DEF>
Formation Compressibility	cf =	2.962×10^{-06}	psi^{-1}	<DEF>
Total Compressibility	ct =	5.962×10^{-06}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Zone 1

Pressures

Initial Pressure	pi =	1500.0	psi
Extrapolated Pressure	p* =	1558.7	psi
Average Reservoir Pressure	pR =	-	psi
Final Flowing Pressure	pwfo =	1864.9	psi

Straight Line Results

Total Sandface Rate	QTBT =	-2982.80	bbl/d
Semilog Slope	msl =	1.5	psi/cycle
Transmissivity (Total)	kh/mu =	314426.14	md.ft/cp
Mobility (Total)	k/mu =	1497.267	md/cp
Flow Capacity (Water)	kh =	223242.56	md.ft
Permeability (Water)	k =	1063.06	md
Skin Effect (Total)	s =	218.772	
Pressure Drop Due To Skin	delps =	293.0	psi
Flow Efficiency	FE =	0.07	
Damage Ratio	DR =	14.20	
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Zone 1

Extended Rates

3 - Month Constant Rate	=	-	bbl/d
6 - Month Constant Rate	=	-	bbl/d

Stabilized Rate

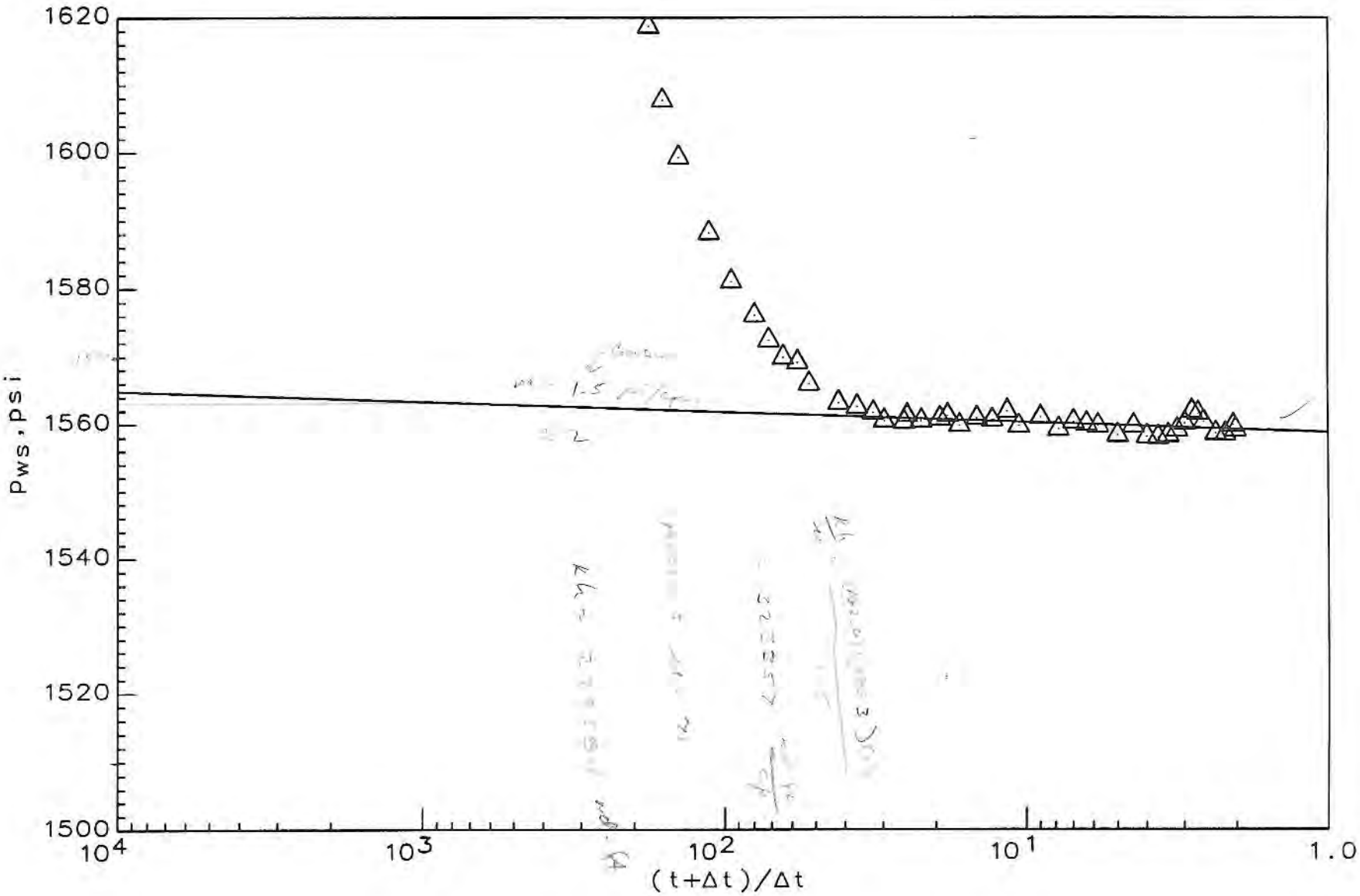
Shape Code	=	R1A		<DEF>
Drainage Area	A =	160.0	acres	<DEF>
Time To Stabilize	ts =	3.473	hr	
Stabilized Rate @ Current Skin	qs =	-3089.34	bbl/d	
Stabilized Rate @ Skin Of 0	qs =	-83007.78	bbl/d	
Stabilized Rate @ Skin Of -4	qs =	-157506.25	bbl/d	

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15, 1992

$[k_1/u]_t$=1497.27 k_1=1063.06 md s=218.8 p*=1558.7

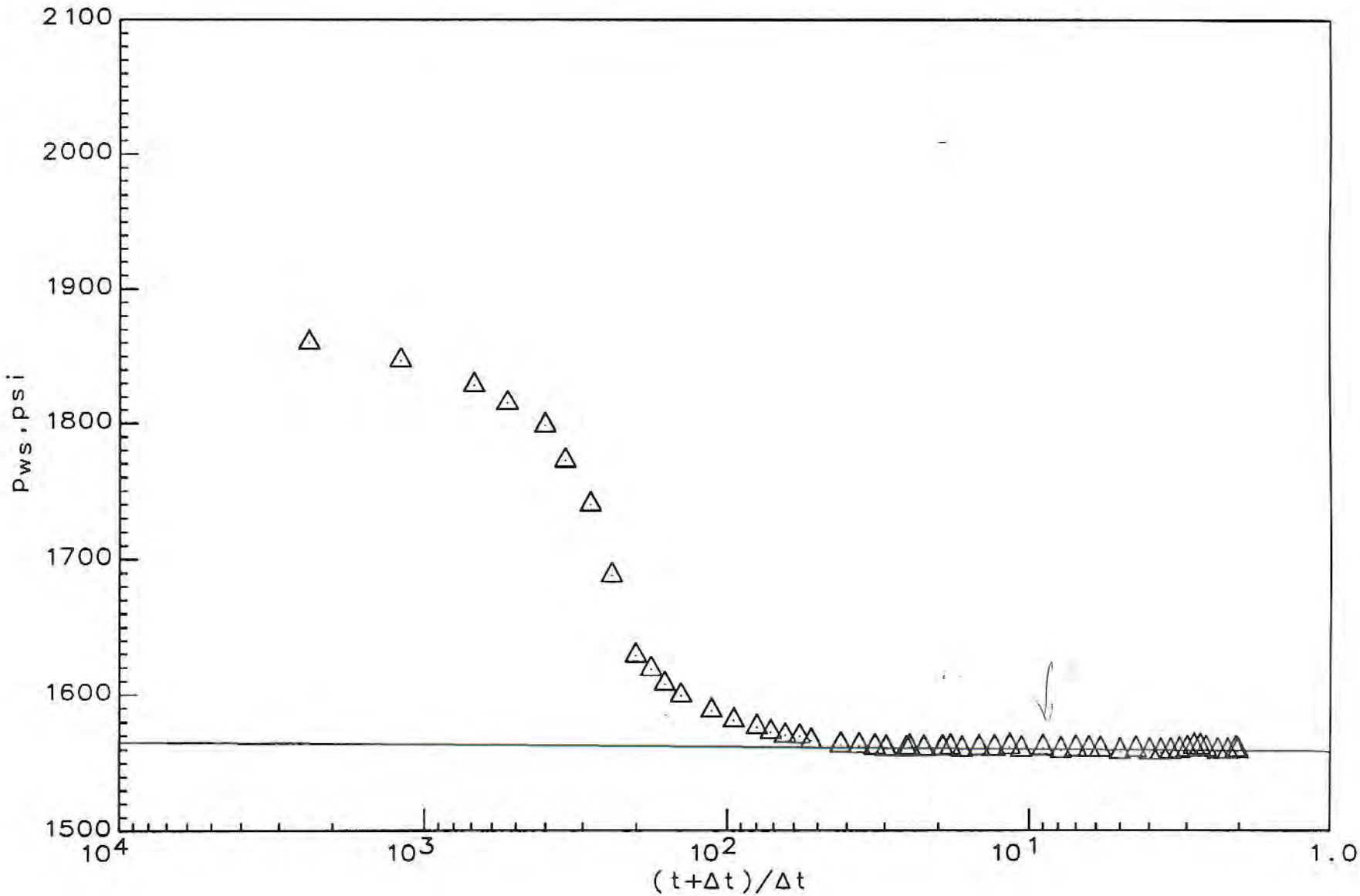


HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15, 1992

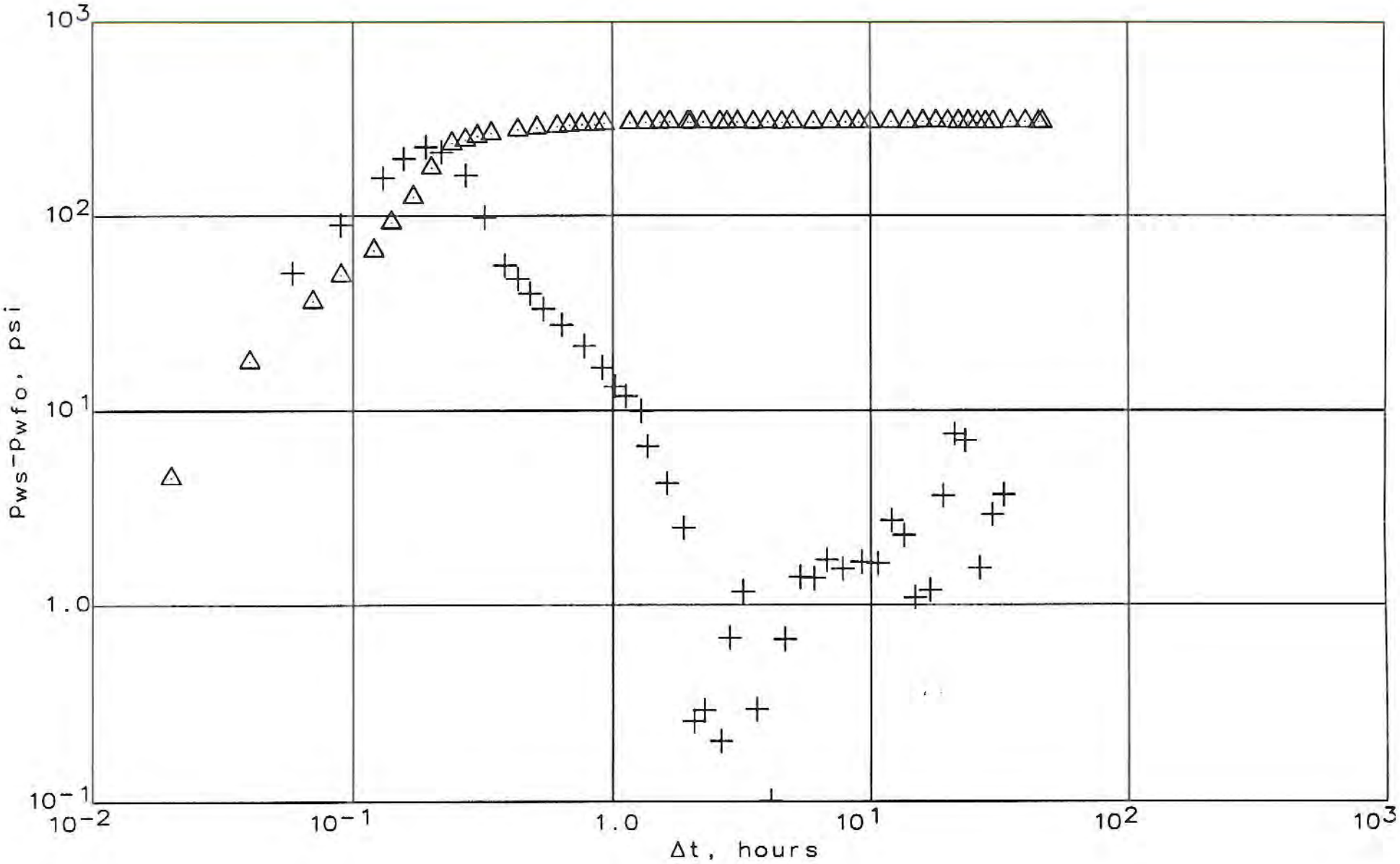
$[k_1/u]_t$=1497.27 k_1=1063.06 md s=218.8 p*=1558.7



DIAGNOSTIC PREPLOT TYPECURVE
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15, 1992



Water Well Test - SYNTHESIZER

Model Parameters

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Synthetic Initial Pressure	=	1557.0	psi

Formation Parameters

Transmissivity (Total)	kh/mu =	396452.35	md.ft/cp
Mobility (Total)	k/mu =	1887.868	md/cp
Flow Capacity (Water)	kh =	281481.17	md.ft
Permeability (Water)	k =	1340.39	md
Skin	s =	279.959	
Wellbore Storage Constant (dim.)	CD =	2669.38	
Inter Porosity Coeff	Lambda =	-	
Storativity Ratio	Omega =	-	

N. B. Origin At Lower Left Corner

Reservoir Length	(xe) =	100000	ft
Reservoir Width	(ye) =	100000	ft
Active Well At	xw =	50000	ft
Active Well At	yw =	50000	ft

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Production And Pressure

Final Water Rate	qw =	-2982.80	bbl/d	
Final Flowing Pressure	Pwfo =	1864.9	psi	

Fluid Properties

Reference Pressure	pRef =	1500.0	psi	<DEF>
Water Formation Vol Factor	Bw =	0.71		
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	1.000	cp	<DEF>
Oil Formation Vol Factor	Bo =	1.16		<DEF>
Oil Compressibility	co =	2.010×10^{-04}	psi^{-1}	<DEF>
Oil Viscosity	muo =	2.516	cp	<DEF>
Solution Gas Oil Ratio	Rso =	265.0	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	1.62×10^{-03}		<DEF>
Gas Compressibility	cg =	7.587×10^{-04}	psi^{-1}	<DEF>

Reservoir Parameters

Net Pay	h =	210.00	ft
Total Porosity	phit =	33.00	%
Water Saturation	Sw =	100.00	%
Oil Saturation	So =	0.00	%
Gas Saturation	Sg =	0.00	%
Wellbore Radius	rw =	0.28	ft

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW32

PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Formation Temperature	T =	120.00 deg F	<DEF>
Formation Compressibility	cf =	2.962×10^{-06} psi^{-1}	<DEF>
Total Compressibility	ct =	5.962×10^{-06} psi^{-1}	<DEF>

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW32

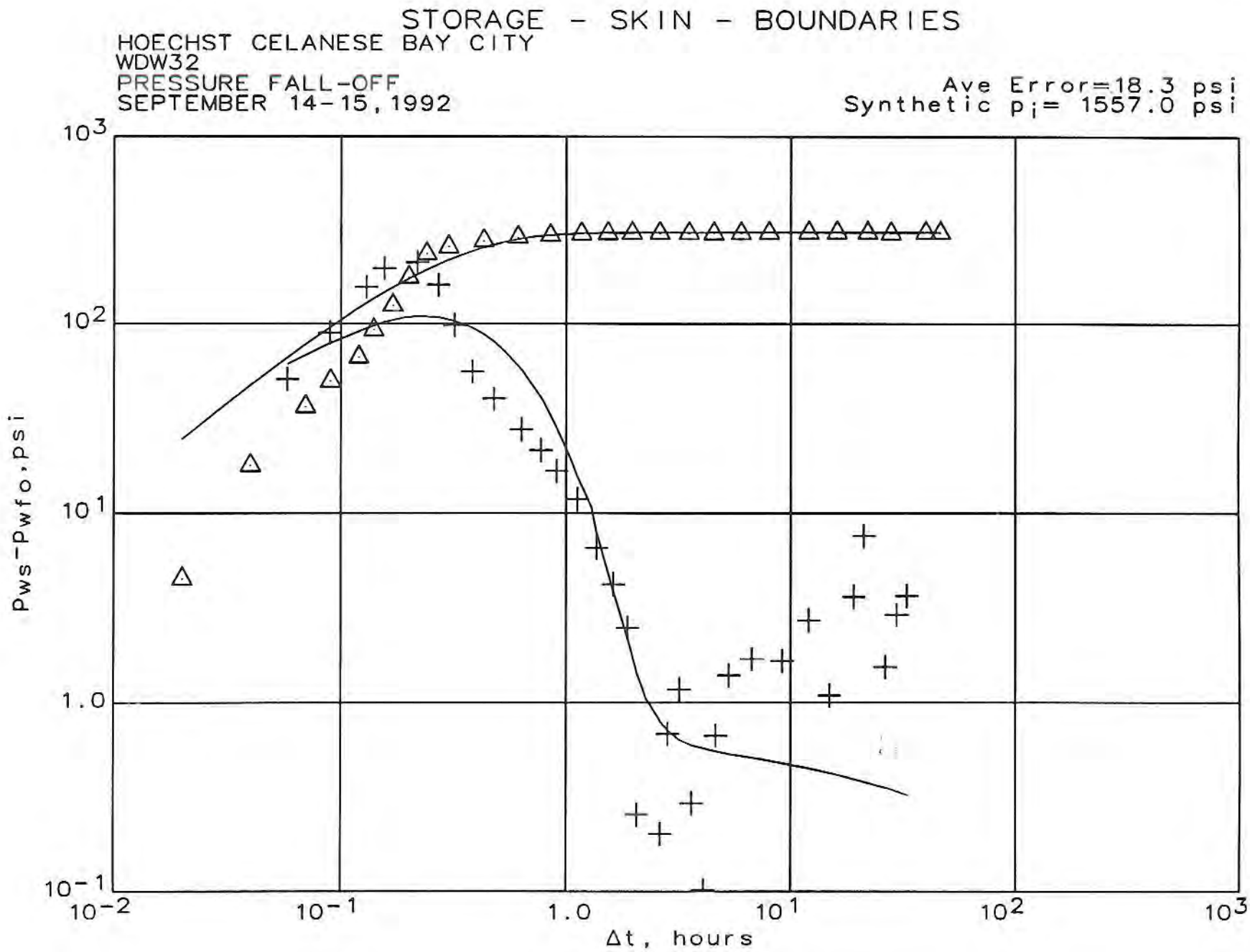
PRESSURE FALL-OFF
SEPTEMBER 14-15,1992

Synthesis Results

Average Error	=	18.3	psi
Initial Pressure	pi =	1500.0	psi
Average Reservoir Pressure	pR =	1557.0	psi
Pressure Drop Due To Skin	delps =	-	psi
Flow Efficiency	FE =	1.97	
Damage Ratio	DR =	0.51	

Extended Rates

3 - Month Constant Rate	=	-2963.15	bbl/d
6 - Month Constant Rate	=	-2958.93	bbl/d
1 - Year Constant Rate	=	-2951.82	bbl/d
1 - Year Constant Rate @ Skin Of 0	=	-67168.61	bbl/d
1 - Year Constant Rate @ Skin Of -4	=	-97463.12	bbl/d

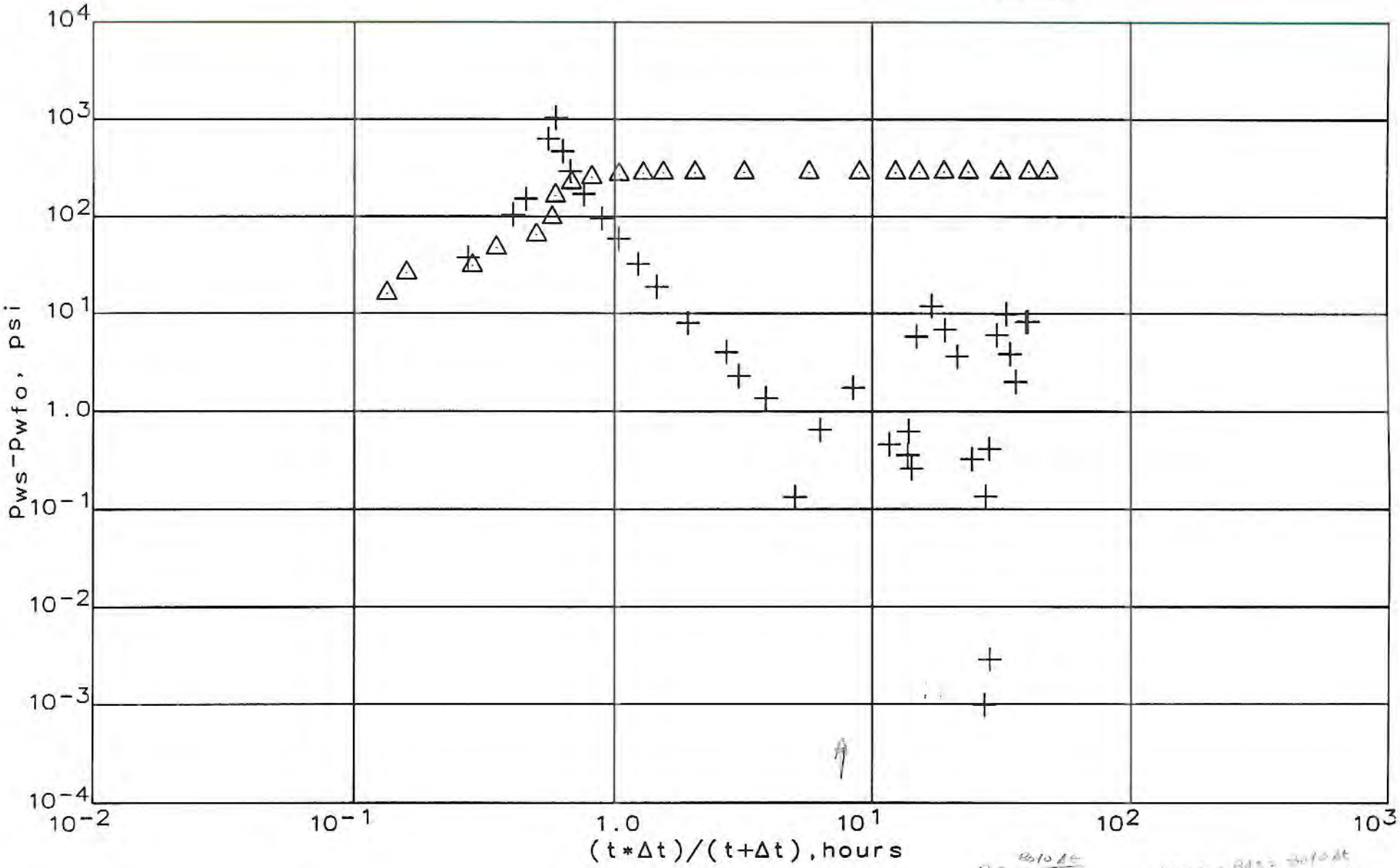

STORAGE - SKIN - BOUNDARIES
HOECHST CELANESE BAY CITY
WDW32
PRESSURE FALL-OFF
SEPTEMBER 14-15, 1992
Ave Error=18.3 psi
Synthetic pi= 1557.0 psi
10^3
10^2
10^1
1.0
10^-1
10^-2
10^-1
1.0
10^1
10^2
10^3
Pws-Pwfo, psi
Δt, hours

ATTACHMENT 3

DIAGNOSTIC PREPLOT TYPECURVE
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19, 1992



b = 1.967

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Production And Times

Cumulative Production (water)	=	-	bbl	<DEF>
Corrected Flow Time	tc =	8040.000	hr	<DEF>
Final Water Rate	qw =	-2725.70	bbl/d	

Fluid Properties

Reference Pressure	pRef =	150.0	psi	<DEF>
Water Formation Vol Factor	Bw =	~~0.71~~ 1.00		
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	~~1.000~~ cp .719		<DEF>
Oil Formation Vol Factor	Bo =	1.06		<DEF>
Oil Compressibility	co =	2.747×10^{-03}	psi^{-1}	<DEF>
Oil Viscosity	muo =	7.716	cp	<DEF>
Solution Gas Oil Ratio	Rso =	21.4	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	0.02		<DEF>
Gas Compressibility	cg =	7.005×10^{-03}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Reservoir Parameters

Net Pay	h =	210.00	ft	
Total Porosity	phit =	33.00	%	
Water Saturation	Sw =	100.00	%	
Oil Saturation	So =	0.00	%	
Gas Saturation	Sg =	0.00	%	
Wellbore Radius	rw =	0.28	ft	
Formation Temperature	T =	120.00	deg F	<DEF>
Formation Compressibility	cf =	2.962×10^{-06}	psi^{-1}	<DEF>
Total Compressibility	ct =	5.962×10^{-06}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Zone 1

Pressures

Initial Pressure	pi =	150.0	psi
Extrapolated Pressure	p* =	1528.8	psi
Average Reservoir Pressure	pR =	-	psi
Final Flowing Pressure	pwfo =	1822.8	psi

Straight Line Results

Total Sandface Rate	QTBT =	-2725.70	bbl/d
Semilog Slope	msl =	3.4	psi/cycle
Transmissivity (Total)	kh/mu =	131795.53	md.ft/cp
Mobility (Total)	k/mu =	627.598	md/cp
Flow Capacity (Water)	kh =	93574.83	md.ft
Permeability (Water)	k =	445.59	md
Skin Effect (Total)	s =	88.828	
Pressure Drop Due To Skin	delps =	259.4	psi
Flow Efficiency	FE =	0.87	
Damage Ratio	DR =	1.14	
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Zone 1

Extended Rates

3 - Month Constant Rate	=	-	bbl/d
6 - Month Constant Rate	=	-	bbl/d

Stabilized Rate

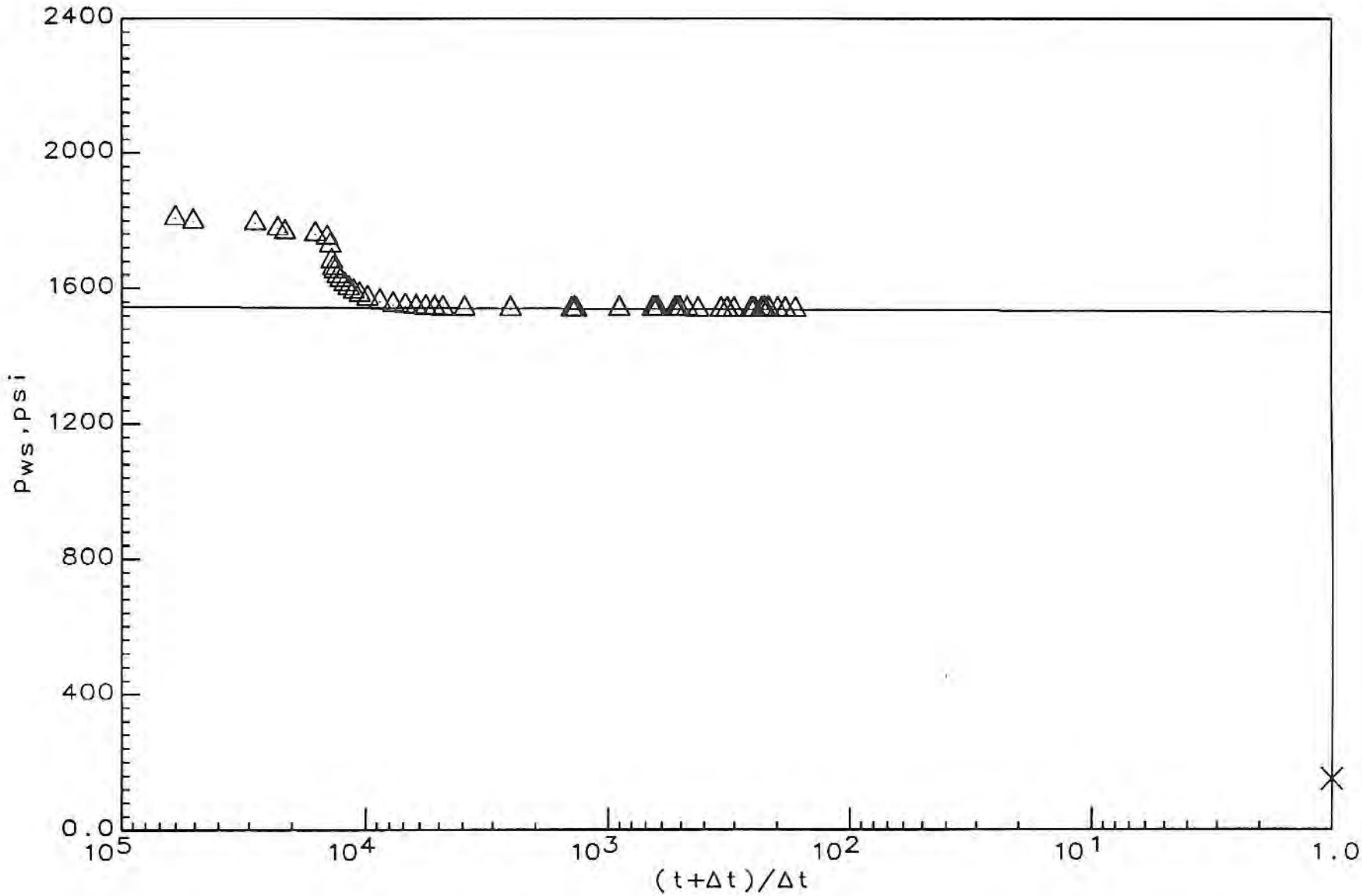
Shape Code	=	R1A		<DEF>
Drainage Area	A =	160.0	acres	<DEF>
Time To Stabilize	ts =	8.286	hr	
Stabilized Rate @ Current Skin	qs =	-19789.81	bbl/d	
Stabilized Rate @ Skin Of 0	qs =	-227654.69	bbl/d	
Stabilized Rate @ Skin Of -4	qs =	-431971.98	bbl/d	

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19, 1992

$[k_1/u]_t$=627.60 k_1=445.59 md s=88.8 p*=1528.8

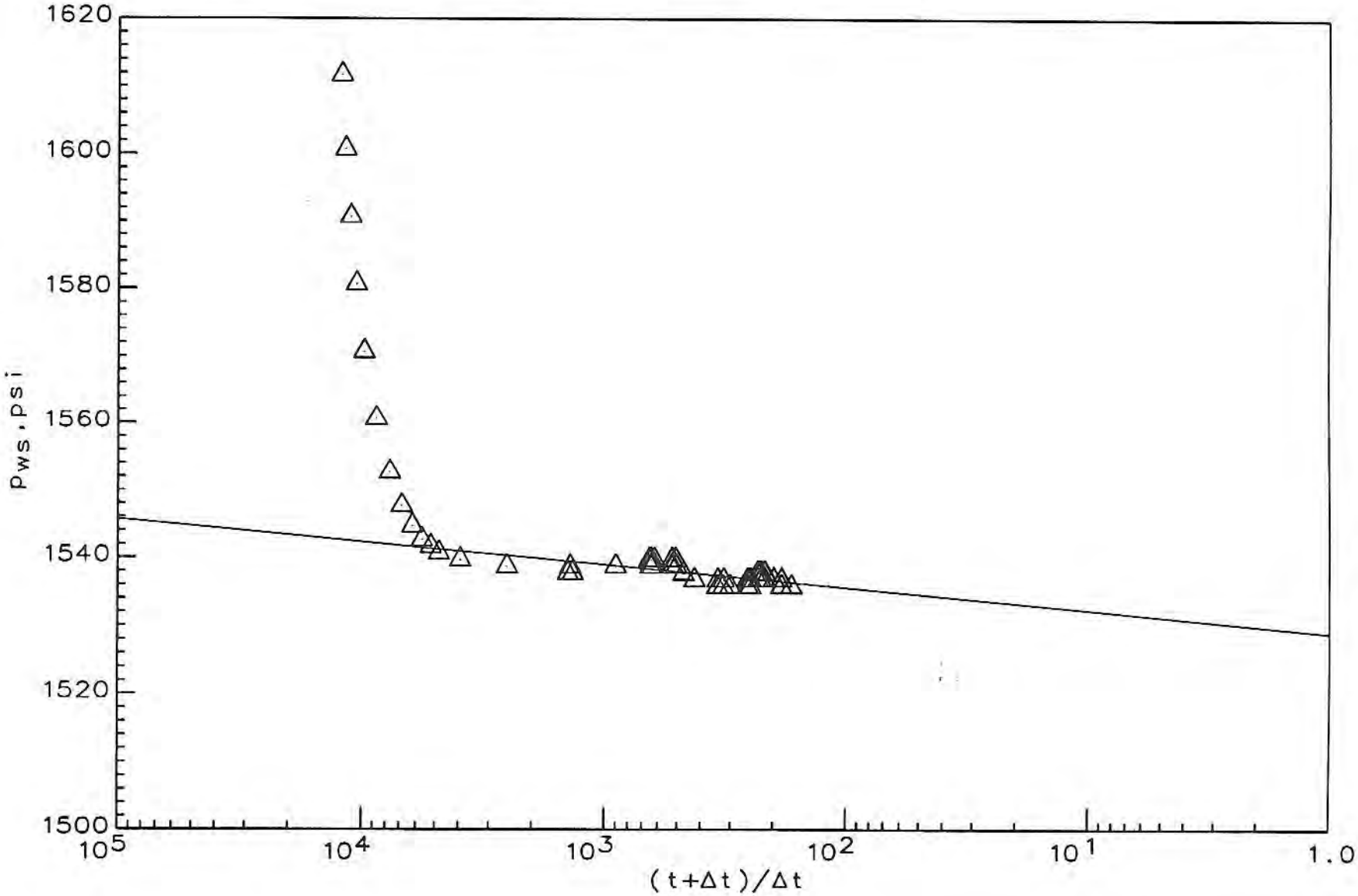


HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19, 1992

$[k_1/u]_t$=627.60 k_1=445.59 md s=88.8 p*=1528.8



Water Well Test - SYNTHESIZER

Model Parameters

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Synthetic Initial Pressure	=	1526.3	psi

Formation Parameters

Transmissivity (Total)	kh/mu =	158005.79	md.ft/cp
Mobility (Total)	k/mu =	752.409	md/cp
Flow Capacity (Water)	kh =	112184.11	md.ft
Permeability (Water)	k =	534.21	md
Skin	s =	109.754	
Wellbore Storage Constant (dim.)	CD =	7339.40	
Inter Porosity Coeff	Lambda =	-	
Storativity Ratio	Omega =	-	

N. B. Origin At Lower Left Corner

Reservoir Length	(xe) =	100000	ft
Reservoir Width	(ye) =	100000	ft
Active Well At	xw =	50000	ft
Active Well At	yw =	50000	ft

HOECHS
WDW49

P

Final

Final

Refer

Wate

Wate

Wate

Oil

Oil

Oil

S

HOECH
WDW49

Final

Final

Refer

Wate

Wate

Wat

Oil

Oil

Oi

S

HOECH
WDW49

P

Final

Final

Refer

Water

Water

Wate

Oil

Oil

Oi

S

HOECHS
WDW49

Pr

Final W

Final

Refer

Water

Water

Water

Oil

Oil

Oil

SO

G

G

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Formation Temperature	T =	120.00 deg F	<DEF>
Formation Compressibility	cf =	2.962×10^{-06} psi^{-1}	<DEF>
Total Compressibility	ct =	5.962×10^{-06} psi^{-1}	<DEF>

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Synthesis Results

Average Error	=	28.8	psi
Initial Pressure	pi =	150.0	psi
Average Reservoir Pressure	pR =	1527.6	psi
Pressure Drop Due To Skin	delps =	-	psi
Flow Efficiency	FE =	1.91	
Damage Ratio	DR =	0.52	

Extended Rates

3 - Month Constant Rate	=	-2740.86	bbl/d
6 - Month Constant Rate	=	-2733.00	bbl/d
1 - Year Constant Rate	=	-2724.52	bbl/d
1 - Year Constant Rate @ Skin Of 0	=	-27620.66	bbl/d
1 - Year Constant Rate @ Skin Of -4	=	-41412.14	bbl/d

Water Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

HOECHST CELANESE BAY CITY
WDW49

PRESSURE FALL-OFF
SEPTEMBER 19,1992

Production And Pressure

Final Water Rate	qw =	-2725.70	bbl/d	
Final Flowing Pressure	Pwfo =	1822.8	psi	

Fluid Properties

Reference Pressure	pRef =	150.0	psi	<DEF>
Water Formation Vol Factor	Bw =	0.71	1.00	
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	1.000	cp .71	<DEF>
Oil Formation Vol Factor	Bo =	1.06		<DEF>
Oil Compressibility	co =	2.747×10^{-03}	psi^{-1}	<DEF>
Oil Viscosity	muo =	7.716	cp	<DEF>
Solution Gas Oil Ratio	Rso =	21.4	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	0.02		<DEF>
Gas Compressibility	cg =	7.005×10^{-03}	psi^{-1}	<DEF>

Reservoir Parameters

Net Pay	h =	210.00	ft
Total Porosity	phit =	33.00	%
Water Saturation	Sw =	100.00	%
Oil Saturation	So =	0.00	%
Gas Saturation	Sg =	0.00	%
Wellbore Radius	rw =	0.28	ft

Su

Dear Mr

The enc
Environm
Services,
provide ac
predicted
submitted

Don't hesita
have any com
response docu

Very truly your

I. O. Coleman, Jr

cjs
attachment

Hoechst Celanese

Chemical Group
Hoechst Celanese Corporation
Bay City Plant
PO Box 509
Highway 3057
Bay City, TX 77404-0509

MAR 1 8 19

March 12, 1993
IOC-022-93

Mr. Mac A. Weaver, P. E.
Chief
UIC State Program Section (6W-SU)
EPA Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Subject: Response To EPA's Request For Additional Information Associated With The NO. 2 Notice Of Deficiency Relative To 1992 Injection Well Falloff Testing Results/Data [References: (1) Your Letter To Ms.Kaymartha Williams Dated October 27, 1992 And (2) A December 8, 1992 Meeting With Mr. Joe Kordzi And Ms. Susie Lopez]

Dear Mr. Weaver:

The enclosed document, generated by our consultants, DuPont Environmental Remediation Services, Inc., and Golden Environmental Services, Inc., is: (1) provided in response to EPA's requests to provide additional Horner plots and a graph of the petition model predicted pressures for the life of the petition exemption and (2) submitted for your review and approval.

Don't hesitate to contact me by telephone at 409/241-4197 if you have any comments or questions regarding the information in the response document.

Very truly yours,

I. O. Coleman, Jr.

I. O. Coleman, Jr.

cjs
attachment

HOECHST CELANESE CHEMICAL GROUP

BAY CITY PLANT
MATAGORDA COUNTY, TEXAS

COMPARISON OF UPPER MIOCENE INJECTION INTERVAL WELL TEST DATA WITH PETITION DATA

RECEIVED
MAR 19 1993

Prepared by:

Dupont Environmental Remediation Services
and
Golden Environmental Services, Inc.
711 Louisiana, Suite 1600
Houston, Texas 77002
(713)228-7000

March 11, 1993

GOLDEN ENVIRONMENTAL SERVICES, INC.
SUBSIDIARY OF GOLDEN STRATASERVICES, INC.

TABLE OF CONTENTS

1.0 COMPARISON OF UPPER MIOCENE INJECTION INTERVAL WELL TEST DATA WITH PETITION DATA 1

Table 1.2 Static Formation Pressures From Well Tests 2

Figure 1.1 WDW-14 Upper Miocene Injection Sand 4
Figure 1.2 WDW-49 Upper Miocene Injection Sand 5
Figure 1.3 WDW-110 Upper Miocene Injection Sand 6

2.0 BOTTOM HOLE PRESSURE FALL-OFF TEST 7

Table 2.1 Analysis of Pressure Fall-off Data 8
Table 2.2 Injection Rates Prior to Shut-in 8

Figure 2.1 Storage and Skin Typecurve 9
Figure 2.2 Horner Pressure Fall-off Plot 10

3.0 REFERENCES 11

ATTACHMENTS

ATTACHMENT A BOTTOM HOLE PRESSURE FALL-OFF DATA

RECEIVED
MAR 19 1993

1.0 COMPARISON OF UPPER MIOCENE INJECTION INTERVAL WELL TEST DATA WITH PETITION DATA

The reservoir properties (pressure, permeability, etc.) Of the upper miocene injection interval were determined through fall-off tests in WDW-14, and WDW-49 in 1992, and in WDW-110 (recompletion) in 1993. The flowing or operational formation pressures from the tests can be compared with the modeled operational pressures by converting the measured pressures to a depth of 3440 feet below ground level and removing the pressure increase due to skin effects. The formation pressures predicted by the model assume no formation damage effects or other near-bore well conditions. The measured flowing pressures corrected for skin effects and maximum predicted operational pressures are presented in Table 1.1.

Table 1.1
Formation Pressures

Well	Flowing Formation Pressure (psi)	Skin Pressure Loss (psi)	Revised Formation Pressure (psi)	Maximum Modeled Pressure (psi)
WDW-32	1865	293	1572	
WDW-14	1756	127	1629	1641
WDW-49	1870	269	1601	1640
WDW-110	1672	81	1591	---

The measured flowing pressure is below the maximum modeled operational pressure by more than ten (10) psi for both WDW-14 (12 psi) and WDW-49 (39 psi). The modeled operational pressure for WDW-110 was not reported because WDW-110 was modeled as a completion in the lower Miocene injection interval. The modeled operational pressure for the other wells should be applicable to WDW-110. In order to assist future comparisons of measured flowing pressures and modeled operational pressures in the upper Miocene injection interval, graphs of the modeled operational pressures versus time for WDW-14, WDW-32, and WDW-49 have been prepared (Figures 1.1 - 1.3). These graphs show the yearly predicted operational formation pressure (1991 through end of 2000) for each well using maximum modeled injection rates (250 gallons per minute in each well). All predicted operational pressures correspond to a depth of 3440 feet below ground level and an original estimated formation pressure for the upper Miocene injection interval of 1555 psi.

The measured static formation pressures from the well tests, corrected to a depth of 3440 feet below ground level, Table 1.2, show a formation pressure increase range

from 7 psi (WDW-110) to a maximum of 25 psi (WDW-32). This illustrates that injection operations at the plant have had limited impact on formation pressures and should continue to have limited impact on formation pressures in the future.

Table 1.2
Static Formation Pressures From Well Tests

Well	Static Formation Pressure (psi)	Formation Pressure Increase (psi)
WDW-14	1577	22
WDW-32	1580	25
WDW-49	1574	19
WDW-110	1562	7

The fall-off tests in each of the wells were analyzed to derive a transmissivity and permeability values for the upper Miocene injection interval. A comparison of the test permeability and transmissivity values with the modeled values of permeability and transmissivity is presented below. The test permeabilities range from 413 millidarcies (md) to 1,175 md with an average of 730 md. The test transmissivities range from 122,100 millidarcy-feet per centipoise (md-ft/cp) to 348,600 md-ft/cp with an average of 216,200 md-ft/cp. The test permeability and transmissivity derived from the recompletion of WDW-110 compare very favorably with the modeled values with the test transmissivity being slightly greater that the modeled value. The increased permeability and transmissivity derived in the WDW-110 test in comparison to the other well tests may indicate an area of reduced permeability around the other wells due to previous injection. In contrast, the area around WDW-110 is relatively unaffected by previous injection and therefore the derived properties from the well test may be more representative of the true reservoir properties.

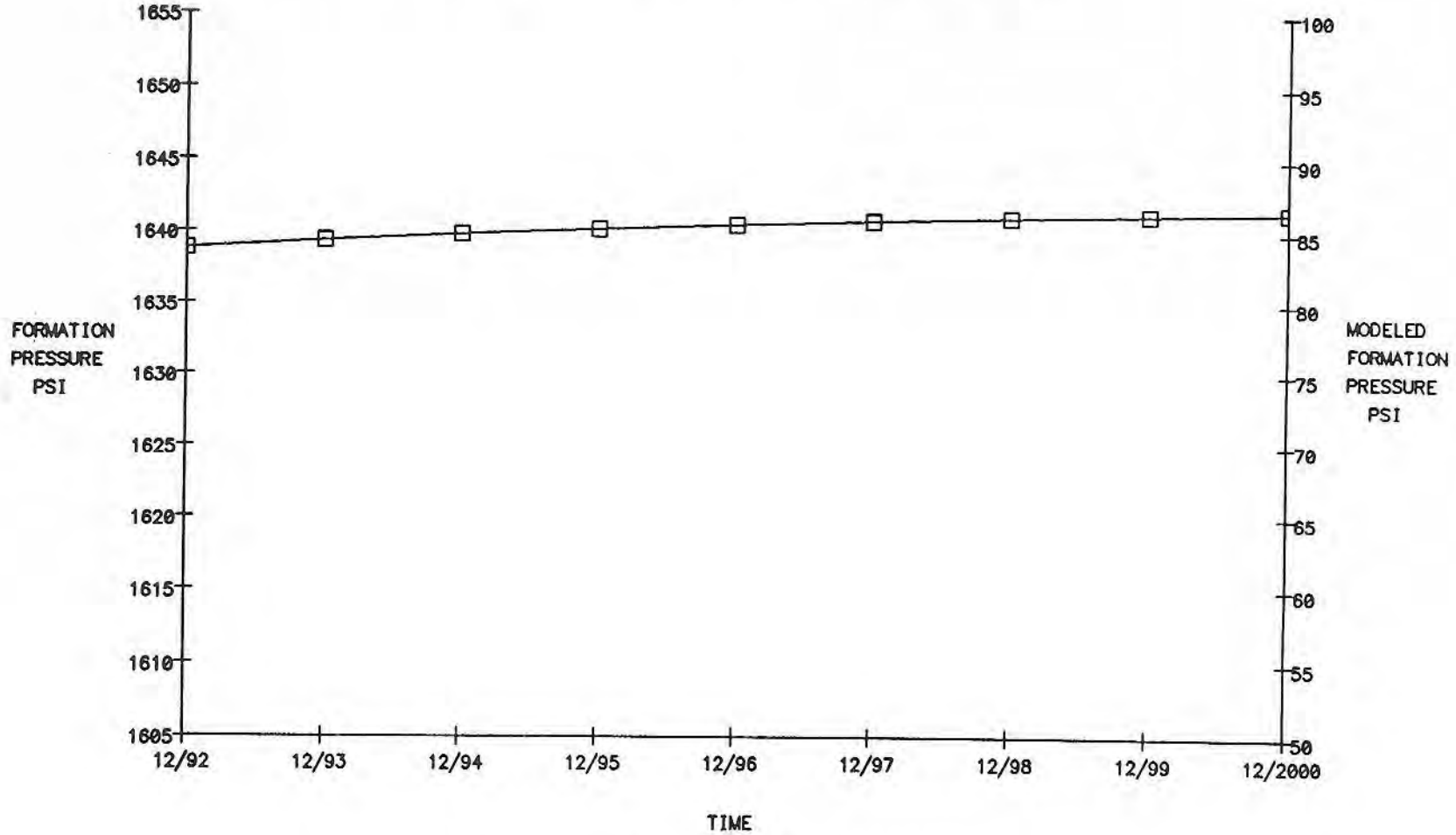
Table 1.3
Permeability and Transmissivity

Well	Test Permeability (mds)	Petition Permeability (mds)	Test Transmissivity (md-ft/cp)	Petition Transmissivity md-ft/cp)
WDW-14	602	1350	177,900	313,700
WDW-49	413	1350	122,100	313,700
WDW-110	1175	1350	348,600	313,700

Even though the modeled values for permeability and transmissivity for the upper Miocene injection interval are greater than the average values derived from recent well tests, the maximum predicted operational pressure has not been exceeded in any of the wells and the static formation pressure measurements indicate that injection operations have not greatly impacted formation pressures.

FIGURE 1.1

UPPER MIOCENE INJECTION SAND - WDW-14

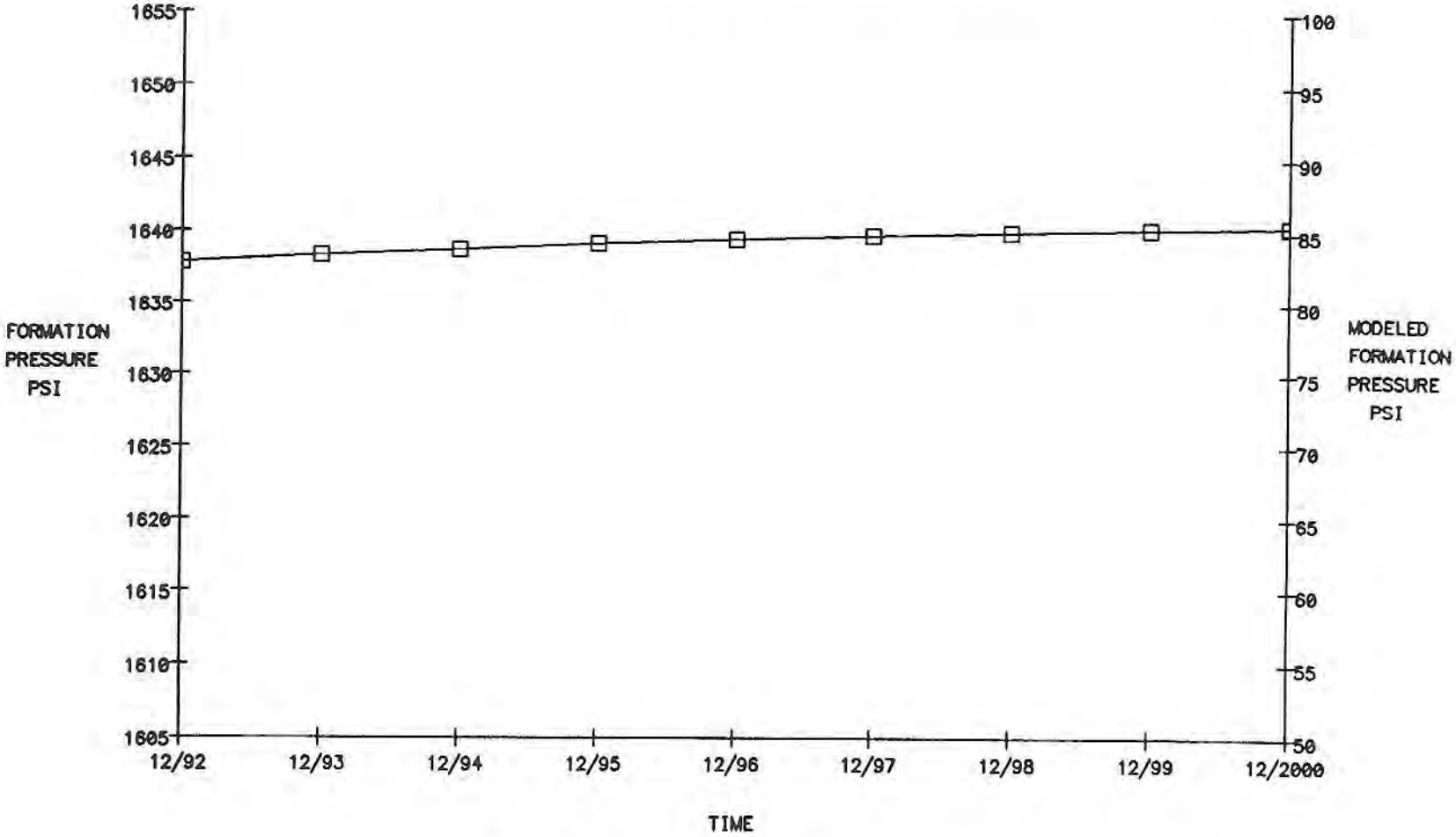


—□— MODELED FORMATION PRESSURES

MODELED OPERATIONAL FORMATION PRESSURES IN WDW-14 (1992 - 2000)

FIGURE 1.2

UPPER MIOCENE INJECTION SAND - WDW-49

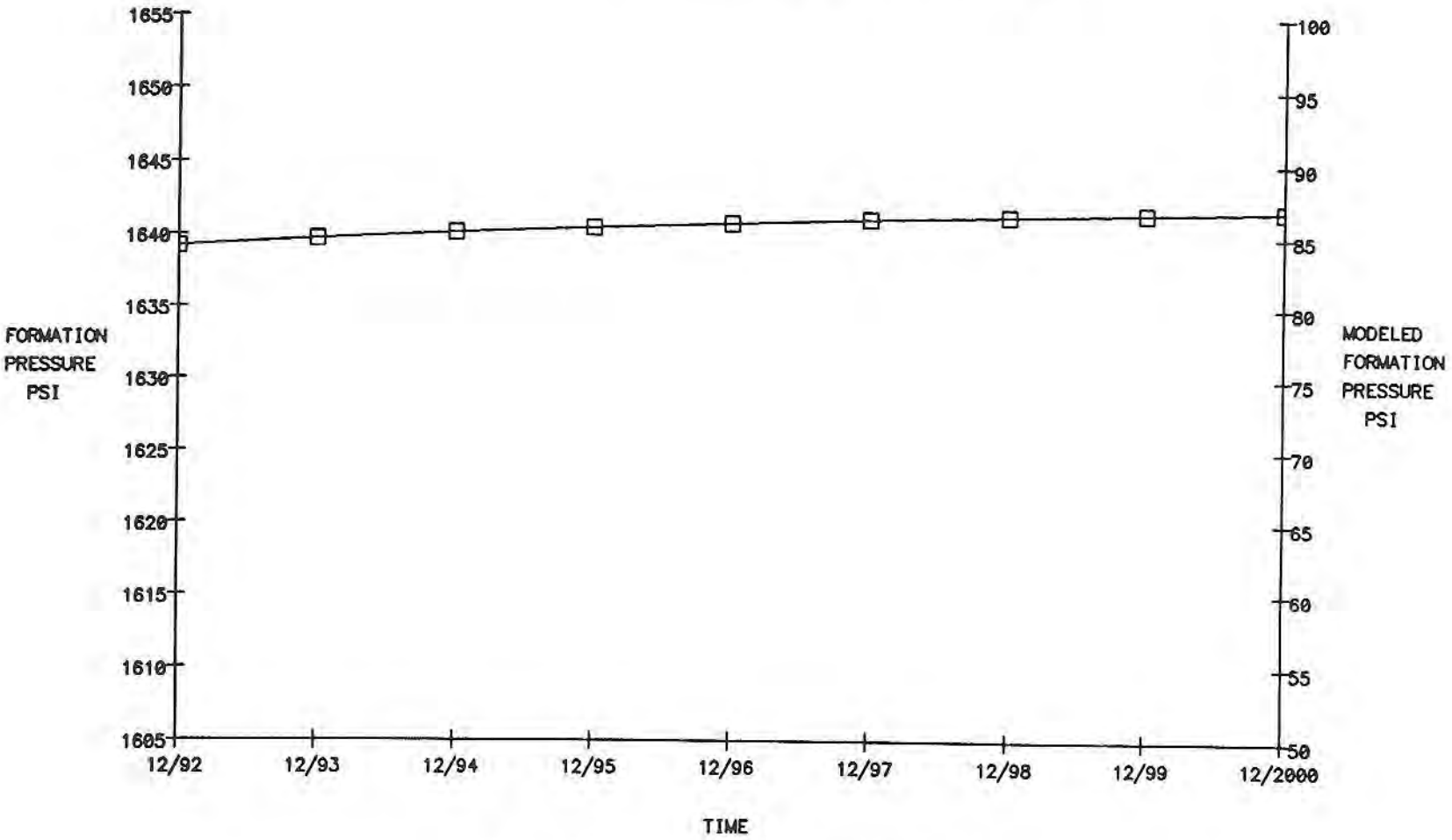


—□— MODELED FORMATION PRESSURES

MODELED OPERATIONAL FORMATION PRESSURES IN WDW-49 (1992 - 2000)

FIGURE 1.3

UPPER MIOCENE INJECTION SAND - WDW-32



—□— MODELED FORMATION PRESSURES

MODELED OPERATIONAL FORMATION PRESSURES IN WDW-32 (1992 - 2000)

2.0 BOTTOM HOLE PRESSURE FALL-OFF TEST

Pressure fall-off data from a test conducted on WDW-110 (Well #1-A) on February 16 - 17, 1993 have been analyzed using the FAST™ software system developed by Fekete Associates, Inc. Data used in this analysis are included in Appendix B, and the results of this analysis are summarized in Table 2.1.

One can approximate the shut-in time at which the straight-line portion or middle-time region begins as follows:

$$\Delta t = \frac{170{,}000Ce^{.14S}}{T}$$

where:
- t = shut-in time at start of straight line (hrs)
- C = wellbore storage constant (bbls/psi)
- S = skin effect
- T = transmissivity (md-ft/cp)

using:
- C = .06 md-ft/psi
- S = 30
- T = 350,000 md-ft/cp, then
- t = 1.95 hours; hence, the proper straight-line portion has been selected for analysis.

Table 2.2 lists the flow rates and times prior to shutting-in the well. Injection rates in WDW-49 and WDW-32 were held constant at 74 gpm each prior to and during the fall-off test. The injection rate for WDW-14 was held constant at 200 gpm prior to and during the test.

Table 2.1
Analysis of Pressure Fall-off Data

	Horner Analysis	Type Curve
Transmissivity (md-ft/cp)	348,600	351,900
Flow capacity (md-ft)	193,800	195,700
Permeability (md)	1,175	1,186
Skin effect	29.1	30.7
Pressure Drop Caused by skin (psi)	81	85
Dimensionless Storage Constant	--	1942.5
Wellbore storage constant (bbls/psi)	--	0.06
Start of infinite acting period (hrs)	1	1
p* (psia)	1537.6	--

Table 2.2
Injection Rates Prior to Shut-in
Total Shut-in Time = 265.5 hours

Dates	Elapsed Time (hours)	Injection Rate (gpm)
2/5-6/93	34	200
2/7-8/93	48	116.6
2/9-16/93	183.5	200
Total Shut-in Time	265.5	

FIGURE 2.1

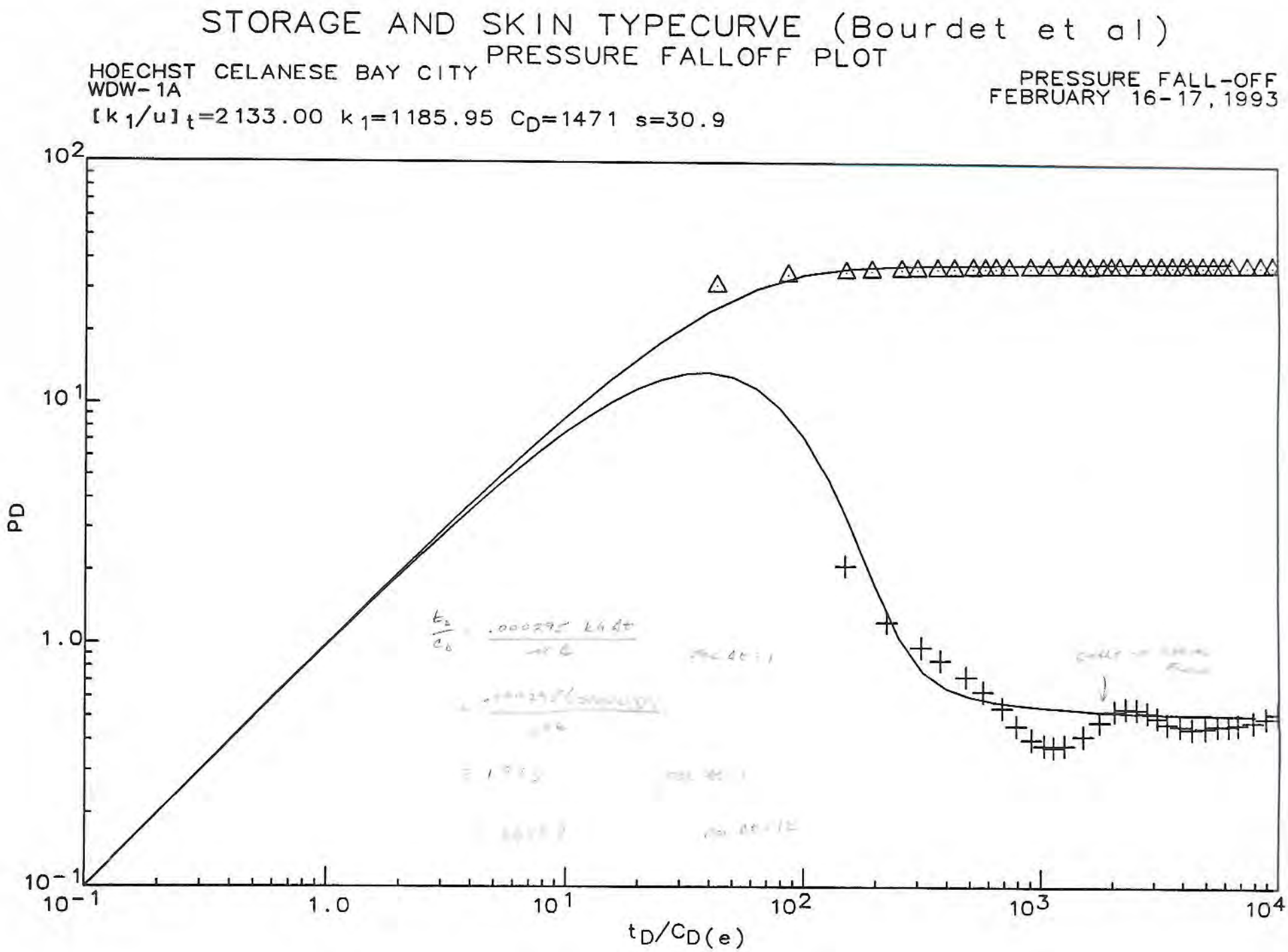

STORAGE AND SKIN TYPECURVE (Bourdet et al)
PRESSURE FALLOFF PLOT
HOECHST CELANESE BAY CITY
WDW-1A
[k1/u]t=2133.00 k1=1185.95 CD=1471 s=30.9
PRESSURE FALL-OFF
FEBRUARY 16-17, 1993
PD
tD/CD(e)
10^2
10^1
1.0
10^-1
10^-1
1.0
10^1
10^2
10^3
10^4

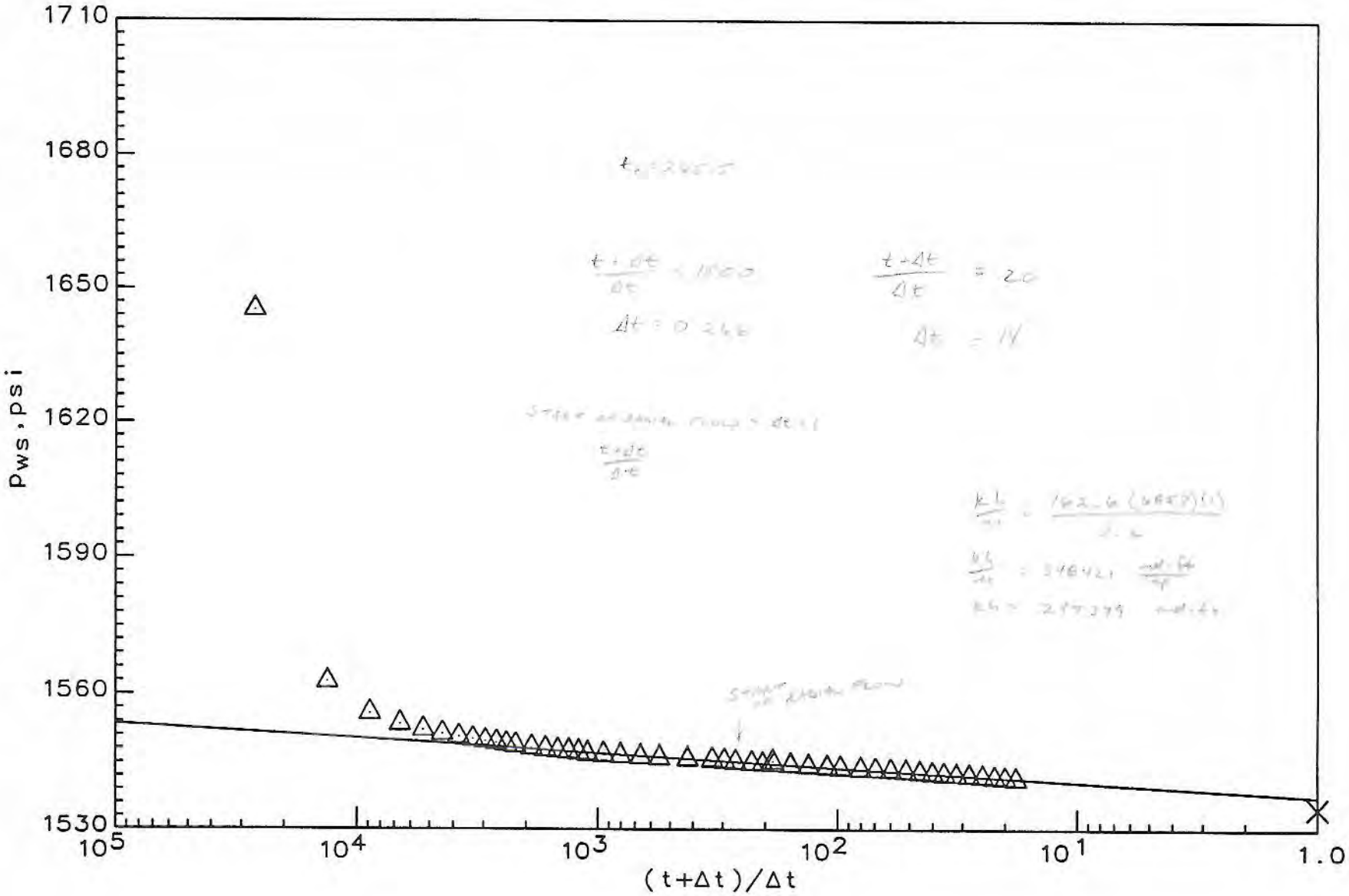
FIGURE 2.2

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17, 1993

$[k_1/u]_t$=2112.86 k_1=1174.75 md s=29.1 p*=1537.6



3.0 REFERENCES

DuPont Environmental Remediation Services, Comparison of Upper Miocene Injection Interval Well Test Data with Petition Data, 1993.

Golden Environmental Services, Inc., Recompletion of WDW-110 (Well No. 1-A) in the Upper Miocene, 1993.

3.0 REFERENCES

DuPont Environmental Remediation Services, Comparison of Upper Miocene Injection Interval Well Test Data with Petition Data, 1993.

Golden Environmental Services, Inc., Recompletion of WDW-110 (Well No. 1-A) in the Upper Miocene, 1993.

ATTACHMENT A

FALL-OFF DATA

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Production And Times

Cumulative Production (water)	=	-	bbl	<DEF>
Corrected Flow Time	tc =	265.500	hr	<DEF>
Final Water Rate	qw =	-6857.00	bbl/d	

Fluid Properties

Reference Pressure	pRef =	1535.0	psi	<DEF>
Water Formation Vol Factor	Bw =	1.00		<DEF>
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	0.556	cp	
Oil Formation Vol Factor	Bo =	1.16		<DEF>
Oil Compressibility	co =	1.921×10^{-04}	psi^{-1}	<DEF>
Oil Viscosity	muo =	2.640	cp	<DEF>
Solution Gas Oil Ratio	Rso =	274.2	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	1.56×10^{-03}		<DEF>
Gas Compressibility	cg =	7.429×10^{-04}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Zone 1

Pressures

Initial Pressure	pi =	1535.0	psi
Extrapolated Pressure	p* =	1537.6	psi
Average Reservoir Pressure	pR =	-	psi
Final Flowing Pressure	pwfo =	1648.2	psi

Straight Line Results

Total Sandface Rate	QTBT =	-6857.00	bbl/d
Semilog Slope	msl =	3.2	psi/cycle
Transmissivity (Total)	kh/mu =	348621.22	md.ft/cp
Mobility (Total)	k/mu =	2112.856	md/cp
Flow Capacity (Water)	kh =	193833.40	md.ft
Permeability (Water)	k =	1174.75	md
Skin Effect (Total)	s =	29.148	
Pressure Drop Due To Skin	delps =	81.0	psi
Flow Efficiency	FE =	0.72	
Damage Ratio	DR =	1.39	
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Zone 1

Extended Rates

3 - Month Constant Rate	=	-	bbl/d
6 - Month Constant Rate	=	-	bbl/d

Stabilized Rate

Shape Code	=	R1A		<DEF>
Drainage Area	A =	160.0	acres	<DEF>
Time To Stabilize	ts =	2.477	hr	
Stabilized Rate @ Current Skin	qs =	-19048.82	bbl/d	
Stabilized Rate @ Skin Of 0	qs =	-85244.43	bbl/d	
Stabilized Rate @ Skin Of -4	qs =	-162953.20	bbl/d	

Water Well Test - FALLOFF

Bourdet Et Al Type Curve Analysis

(Equivalent Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Inner Zone

Match Curve	CDe2s =	1.00×10^{30}	
Match Point (pressure Ratio)	=	2.8	psi
Match Point (time Ratio)	=	6.154×10^{-04}	hr
Dimensionless Storage Constant	CD =	1942.52	
Wellbore Storage Constant	C =	0.06	bbl/psi
Transmissivity (Total)	kh/mu =	351944.29	md.ft/cp
Mobility (Total)	k/mu =	2132.996	md/cp
Flow Capacity	kh =	195681.03	md.ft
Permeability	k =	1185.95	md
Skin Effect (Total)	s =	30.753	
Pressure Drop Due To Skin	delps =	84.6	psi
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr
Number Of Points In Derivative	=	7	

Dual Porosity

Inter Porosity Coeff	Lambda =	-
Storativity Ratio	Omega =	-

E REALITY ASCII FILE SURVEY BY DRESSER ATLAS
COLDEN STRATA
NJ. WELL , GL DEPTH 3334
CURVES ARE TEMP,SPINNER,TIME,HP,HR

0 0
16 FEB 1993 12 7 7 3360
5

TEMP	SPDN	TIME	HP	CPHOUR
93.51	4.98	60.00	1653.00	0.02
93.51	5.04	120.00	1652.08	0.03
93.52	5.17	180.00	1651.18	0.05
93.52	5.38	210.00	1650.92	0.06
90.74	196.93	240.00	1650.62	0.07
93.53	5.11	270.00	1650.32	0.08
93.54	5.18	300.00	1650.00	0.08
93.53	5.46	360.00	1649.57	0.10
93.51	5.39	420.00	1649.38	0.12
93.51	5.30	480.00	1649.11	0.13
93.48	5.25	540.00	1648.98	0.15
93.48	5.44	600.00	1648.76	0.17
93.46	5.41	660.00	1648.71	0.18
93.45	5.46	720.00	1648.55	0.20
93.45	5.30	780.00	1648.50	0.22
93.45	5.29	840.00	1648.33	0.23
93.47	5.29	900.00	1648.22	0.25
93.46	5.32	960.00	1648.07	0.27
93.47	5.22	1020.00	1647.89	0.28
93.48	5.19	1080.00	1647.82	0.30
93.48	5.24	1140.00	1647.77	0.32
93.48	5.11	1200.00	1647.88	0.33
93.48	5.13	1260.00	1647.77	0.35
93.50	5.47	1320.00	1647.79	0.37
85.54	5.61	1380.00	1647.99	0.38
93.51	5.56	1440.00	1647.72	0.40
93.52	5.54	1500.00	1647.61	0.42
93.53	5.57	1560.00	1647.53	0.43
93.53	5.60	1620.00	1647.64	0.45
93.54	5.49	1680.00	1647.64	0.47
93.55	5.33	1740.00	1647.65	0.48
93.56	5.59	1800.00	1647.61	0.50
93.55	5.51	1860.00	1647.59	0.52
93.54	5.55	1920.00	1647.56	0.53
115.32	5.43	1980.00	1646.82	0.55
93.52	5.51	2040.00	1647.66	0.57
93.52	5.29	2100.00	1647.73	0.58
93.53	5.49	2160.00	1647.73	0.60
93.55	5.40	2220.00	1647.63	0.62
93.56	5.33	2280.00	1647.58	0.63
93.57	5.40	2340.00	1647.58	0.65
93.57	5.43	2400.00	1647.60	0.67
93.56	5.37	2460.00	1647.56	0.68
93.57	5.32	2520.00	1647.67	0.70
93.54	5.42	2580.00	1647.67	0.72
93.52	5.42	2640.00	1647.69	0.73
93.49	5.49	2700.00	1647.83	0.75
93.48	5.63	2760.00	1647.74	0.77

93.47	5.55	2820.00	1647.89	0.78
93.47	5.61	2880.00	1647.84	0.80
93.47	5.64	2940.00	1647.85	0.82
93.47	5.54	3000.00	1647.86	0.83
93.48	5.65	3060.00	1647.75	0.85
93.49	5.66	3120.00	1647.76	0.87
93.52	5.50	3180.00	1647.63	0.88
0.00	6452.96	3240.00	1649.74	0.90
93.57	5.63	3300.00	1647.42	0.92
93.57	5.51	3360.00	1647.41	0.93
93.56	5.64	3420.00	1647.44	0.95
93.55	5.62	3480.00	1647.45	0.97
93.55	5.64	3540.00	1647.60	0.98
93.53	5.60	3600.00	1647.59	1.00
93.50	5.55	3660.00	1647.72	1.02
93.49	5.63	3720.00	1647.75	1.03
93.49	5.70	3780.00	1647.60	1.05
93.50	5.59	3840.00	1647.59	1.07
93.52	5.67	3900.00	1647.60	1.08
93.54	5.71	3960.00	1647.53	1.10
93.53	5.58	4020.00	1647.47	1.12
93.54	5.64	4080.00	1647.41	1.13
93.55	5.64	4140.00	1647.41	1.15
93.56	5.60	4200.00	1647.45	1.17
93.55	5.62	4260.00	1647.48	1.18
93.55	5.63	4320.00	1647.46	1.20
93.53	5.60	4380.00	1647.50	1.22
93.53	5.66	4440.00	1647.47	1.23
93.52	5.60	4500.00	1647.56	1.25
93.51	5.58	4560.00	1647.63	1.27
93.50	5.59	4620.00	1647.71	1.28
93.49	5.55	4680.00	1647.68	1.30
93.47	5.60	4740.00	1647.77	1.32
93.46	5.70	4800.00	1647.58	1.33
93.49	5.57	4860.00	1647.66	1.35
93.50	5.73	4920.00	1647.55	1.37
93.51	5.52	4980.00	1647.48	1.38
93.52	5.56	5040.00	1647.46	1.40
93.53	5.74	5100.00	1647.27	1.42
93.53	5.62	5160.00	1647.29	1.43
93.55	5.66	5220.00	1647.31	1.45
93.55	5.72	5280.00	1647.34	1.47
93.55	5.66	5340.00	1647.34	1.48
652.92	5.53	5400.00	1898.86	1.50
93.54	5.72	5460.00	1647.45	1.52
74.82	1490.99	5520.00	1648.08	1.53
93.54	5.66	5580.00	1647.45	1.55
93.53	5.60	5640.00	1647.49	1.57
93.54	5.61	5700.00	1647.46	1.58
93.55	5.60	5760.00	1647.47	1.60
93.56	5.64	5820.00	1647.38	1.62
93.58	5.51	5880.00	1647.38	1.63
93.59	5.68	5940.00	1647.30	1.65
93.60	5.51	6000.00	1647.21	1.67
93.60	5.64	6060.00	1647.30	1.68
93.59	5.56	6120.00	1647.38	1.70
93.58	5.65	6180.00	1647.42	1.72
93.58	5.68	6240.00	1647.44	1.73
93.58	5.71	6300.00	1646.85	1.75
93.57	5.70	6360.00	1647.05	1.77

93.59	5.72	6420.00	1647.14	1.78
93.61	5.74	6480.00	1647.12	1.80
93.61	5.58	6540.00	1647.13	1.82
93.63	5.70	6600.00	1647.13	1.83
93.64	5.69	6660.00	1647.13	1.85
93.63	5.59	6720.00	1647.23	1.87
93.62	5.60	6780.00	1647.28	1.88
93.61	5.54	6840.00	1647.37	1.90
93.59	5.66	6900.00	1647.47	1.92
93.58	5.64	6960.00	1647.53	1.93
93.59	5.66	7020.00	1647.35	1.95
93.59	5.74	7080.00	1647.40	1.97
93.59	5.63	7140.00	1647.35	1.98
93.59	5.73	7200.00	1647.36	2.00
93.59	5.65	7260.00	1647.39	2.02
93.59	5.72	7320.00	1647.43	2.03
93.59	5.71	7380.00	1647.43	2.05
93.58	5.63	7440.00	1647.40	2.07
93.57	5.69	7500.00	1647.51	2.08
93.56	5.77	7560.00	1647.52	2.10
93.57	5.76	7620.00	1647.48	2.12
93.58	5.74	7680.00	1647.51	2.13
93.58	5.65	7740.00	1647.41	2.15
93.57	5.72	7800.00	1647.48	2.17
93.56	5.80	7860.00	1647.56	2.18
93.55	5.84	7920.00	1647.54	2.20
93.55	5.77	7980.00	1647.53	2.22
93.54	5.74	8040.00	1647.59	2.23
93.56	5.70	8100.00	1647.58	2.25
93.57	5.90	8160.00	1647.44	2.27
93.56	5.80	8220.00	1647.41	2.28
93.55	5.74	8280.00	1647.48	2.30
93.55	5.78	8316.00	1647.47	2.31
93.55	5.82	8317.00	1647.48	2.31
93.55	5.83	8318.00	1647.49	2.31
93.55	5.82	8319.00	1647.49	2.31
93.55	5.78	8320.00	1647.50	2.31
93.55	5.74	8321.00	1647.49	2.31
93.54	5.70	8322.00	1647.50	2.31
93.54	5.68	8323.00	1647.49	2.31
93.54	5.67	8324.00	1647.49	2.31
93.54	5.68	8325.00	1647.49	2.31
93.54	5.70	8326.00	1647.49	2.31
93.54	5.70	8327.00	1647.48	2.31
93.54	5.69	8328.00	1647.47	2.31
93.54	5.68	8329.00	1647.46	2.31
93.54	5.67	8330.00	1647.46	2.31
93.54	5.68	8331.00	1647.47	2.31
93.54	5.70	8332.00	1647.47	2.31
93.54	5.71	8333.00	1647.49	2.31
93.54	5.73	8334.00	1647.50	2.32
93.54	5.73	8335.00	1647.50	2.32
93.54	5.73	8336.00	1647.50	2.32
93.54	5.73	8337.00	1647.50	2.32
93.54	5.73	8338.00	1647.50	2.32
93.55	5.73	8339.00	1647.49	2.32
93.55	5.73	8340.00	1647.50	2.32
93.55	5.71	8341.00	1647.50	2.32
93.55	5.68	8342.00	1647.51	2.32
93.55	5.65	8343.00	1647.51	2.32

93.56	5.65	8344.00	1647.52	2.32
93.56	5.66	8345.00	1647.53	2.32
93.56	5.69	8346.00	1647.54	2.32
93.56	5.71	8347.00	1647.54	2.32
93.56	5.72	8348.00	1647.54	2.32
93.56	5.70	8349.00	1647.54	2.32
93.56	5.69	8350.00	1647.53	2.32
93.56	5.68	8351.00	1647.53	2.32
93.56	5.71	8352.00	1647.54	2.32
93.56	5.75	8353.00	1647.55	2.32
93.56	5.79	8354.00	1647.56	2.32
93.56	5.82	8355.00	1647.57	2.32
93.56	5.82	8356.00	1647.57	2.32
93.56	5.80	8357.00	1647.57	2.32
93.56	5.77	8358.00	1647.56	2.32
93.56	5.75	8359.00	1647.55	2.32
93.56	5.74	8360.00	1647.54	2.32
93.56	5.74	8361.00	1647.53	2.32
93.56	5.76	8362.00	1647.51	2.32
93.56	5.78	8363.00	1647.49	2.32
93.56	5.79	8364.00	1647.48	2.32
93.56	5.78	8365.00	1647.47	2.32
93.56	5.77	8366.00	1647.47	2.32
93.56	5.75	8367.00	1647.48	2.32
93.56	5.74	8368.00	1647.49	2.32
93.56	5.73	8369.00	1647.49	2.32
93.56	5.72	8370.00	1647.49	2.33
93.56	5.70	8371.00	1647.49	2.33
93.56	5.67	8372.00	1647.48	2.33
93.56	5.64	8373.00	1647.47	2.33
93.56	5.63	8374.00	1647.46	2.33
93.56	5.63	8375.00	1647.46	2.33
93.56	5.66	8376.00	1647.47	2.33
93.56	5.69	8377.00	1647.48	2.33
93.56	5.73	8378.00	1647.50	2.33
93.56	5.75	8379.00	1647.51	2.33
93.56	5.77	8380.00	1647.52	2.33
93.56	5.77	8381.00	1647.53	2.33
93.56	5.76	8382.00	1647.54	2.33
93.56	5.75	8383.00	1647.54	2.33
93.56	5.75	8384.00	1647.54	2.33
93.56	5.76	8385.00	1647.53	2.33
93.56	5.78	8386.00	1647.52	2.33
93.56	5.80	8387.00	1647.52	2.33
93.56	5.82	8388.00	1647.53	2.33
93.56	5.84	8389.00	1647.53	2.33
93.56	5.84	8390.00	1647.54	2.33
93.56	5.85	8391.00	1647.54	2.33
93.55	5.85	8392.00	1647.54	2.33
93.55	5.85	8393.00	1647.54	2.33
93.55	5.85	8394.00	1647.54	2.33
93.55	5.86	8395.00	1647.53	2.33
93.55	5.87	8396.00	1647.53	2.33
93.55	5.87	8397.00	1647.53	2.33
93.55	5.85	8398.00	1647.52	2.33
93.55	5.82	8399.00	1647.51	2.33
93.55	5.78	8400.00	1647.50	2.33
93.55	5.74	8401.00	1647.49	2.33
93.55	5.72	8402.00	1647.47	2.33
93.55	5.71	8403.00	1647.46	2.33

93.57	5.62	8524.00	1647.37	2.37
93.57	5.58	8525.00	1647.36	2.37
93.57	5.57	8526.00	1647.35	2.37
93.57	5.59	8527.00	1647.36	2.37
93.57	5.64	8528.00	1647.37	2.37
93.58	5.70	8530.00	1647.38	2.37
93.58	5.86	8540.00	1647.44	2.37
93.57	5.80	8550.00	1647.42	2.38
93.57	5.64	8560.00	1647.38	2.38
93.57	5.84	8570.00	1647.37	2.38
93.57	5.78	8580.00	1647.33	2.38
93.57	5.93	8590.00	1647.39	2.39
93.57	5.76	8600.00	1647.36	2.39
93.57	5.75	8601.00	1647.37	2.39
93.57	5.72	8602.00	1647.37	2.39
93.57	5.70	8603.00	1647.37	2.39
93.56	5.70	8604.00	1647.37	2.39
93.56	5.71	8605.00	1647.37	2.39
93.56	5.74	8606.00	1647.38	2.39
93.56	5.78	8607.00	1647.38	2.39
93.56	5.80	8608.00	1647.39	2.39
93.56	5.81	8609.00	1647.39	2.39
93.56	5.79	8610.00	1647.39	2.39
93.56	5.77	8611.00	1647.39	2.39
93.56	5.75	8612.00	1647.39	2.39
93.56	5.75	8613.00	1647.39	2.39
93.56	5.77	8614.00	1647.39	2.39
93.56	5.81	8615.00	1647.39	2.39
93.56	5.86	8616.00	1647.41	2.39
93.56	5.89	8617.00	1647.41	2.39
93.56	5.89	8618.00	1647.42	2.39
93.56	5.88	8619.00	1647.42	2.39
93.56	5.85	8620.00	1647.41	2.39
93.56	5.81	8621.00	1647.40	2.39
93.56	5.78	8622.00	1647.39	2.40
93.56	5.75	8623.00	1647.38	2.40
93.56	5.73	8624.00	1647.37	2.40
93.56	5.73	8625.00	1647.37	2.40
93.56	5.74	8626.00	1647.37	2.40
93.56	5.76	8627.00	1647.38	2.40
93.56	5.77	8628.00	1647.39	2.40
93.56	5.79	8629.00	1647.39	2.40
93.56	5.79	8630.00	1647.40	2.40
93.56	5.80	8631.00	1647.40	2.40
93.56	5.80	8632.00	1647.40	2.40
93.56	5.79	8633.00	1647.40	2.40
93.56	5.78	8634.00	1647.40	2.40
93.56	5.76	8635.00	1647.40	2.40
93.56	5.73	8636.00	1647.41	2.40
93.56	5.71	8637.00	1647.42	2.40
93.56	5.71	8638.00	1647.42	2.40
93.56	5.74	8639.00	1647.43	2.40
93.56	5.78	8640.00	1647.44	2.40
93.56	5.83	8641.00	1647.45	2.40
93.56	5.85	8642.00	1647.46	2.40
93.56	5.85	8643.00	1647.46	2.40
93.56	5.83	8644.00	1647.45	2.40
93.56	5.81	8645.00	1647.45	2.40
93.56	5.80	8646.00	1647.45	2.40
93.56	5.81	8647.00	1647.45	2.40

93.56	5.84	8648.00	1647.46	2.40
93.56	5.85	8649.00	1647.46	2.40
93.56	5.85	8650.00	1647.46	2.40
93.56	5.83	8651.00	1647.44	2.40
93.56	5.80	8652.00	1647.42	2.40
93.56	5.77	8653.00	1647.39	2.40
93.56	5.75	8654.00	1647.38	2.40
93.56	5.75	8655.00	1647.37	2.40
93.56	5.76	8656.00	1647.37	2.40
93.56	5.78	8657.00	1647.38	2.40
93.56	5.80	8658.00	1647.38	2.41
93.56	5.81	8659.00	1647.39	2.41
93.56	5.80	8660.00	1647.39	2.41
93.56	5.77	8661.00	1647.39	2.41
93.56	5.72	8662.00	1647.40	2.41
93.56	5.67	8663.00	1647.40	2.41
93.56	5.65	8664.00	1647.40	2.41
93.56	5.65	8665.00	1647.40	2.41
93.56	5.68	8666.00	1647.41	2.41
93.56	5.72	8667.00	1647.42	2.41
93.56	5.76	8668.00	1647.43	2.41
93.56	5.80	8669.00	1647.45	2.41
93.56	5.83	8670.00	1647.48	2.41
93.56	5.83	8671.00	1647.49	2.41
93.56	5.83	8672.00	1647.50	2.41
93.56	5.81	8673.00	1647.50	2.41
93.56	5.80	8674.00	1647.50	2.41
93.56	5.80	8675.00	1647.50	2.41
93.56	5.80	8676.00	1647.50	2.41
93.56	5.82	8677.00	1647.50	2.41
93.56	5.83	8678.00	1647.50	2.41
93.56	5.84	8679.00	1647.50	2.41
93.56	5.83	8680.00	1647.49	2.41
93.56	5.81	8681.00	1647.48	2.41
93.56	5.79	8682.00	1647.47	2.41
93.56	5.77	8683.00	1647.46	2.41
93.56	5.77	8684.00	1647.46	2.41
93.56	5.77	8685.00	1647.46	2.41
93.56	5.78	8686.00	1647.45	2.41
93.56	5.78	8687.00	1647.46	2.41
93.56	5.78	8688.00	1647.46	2.41
93.56	5.78	8689.00	1647.48	2.41
93.56	5.78	8690.00	1647.49	2.41
93.56	5.79	8691.00	1647.50	2.41
93.56	5.81	8692.00	1647.52	2.41
93.56	5.83	8693.00	1647.52	2.41
93.55	5.84	8694.00	1647.52	2.42
93.55	5.83	8695.00	1647.51	2.42
93.55	5.80	8696.00	1647.49	2.42
93.55	5.78	8697.00	1647.48	2.42
93.55	5.76	8698.00	1647.46	2.42
93.55	5.76	8699.00	1647.45	2.42
93.56	5.77	8700.00	1647.44	2.42
93.56	5.79	8701.00	1647.43	2.42
93.56	5.82	8702.00	1647.43	2.42
93.55	5.84	8703.00	1647.43	2.42
93.55	5.85	8704.00	1647.44	2.42
93.55	5.84	8705.00	1647.46	2.42
93.55	5.82	8706.00	1647.48	2.42
93.55	5.78	8707.00	1647.50	2.42

93.55	5.76	8708.00	1647.51	2.42
93.55	5.75	8709.00	1647.52	2.42
93.56	5.75	8710.00	1647.52	2.42
93.56	5.76	8711.00	1647.51	2.42
93.56	5.76	8712.00	1647.51	2.42
93.56	5.75	8713.00	1647.49	2.42
93.57	5.73	8714.00	1647.48	2.42
93.57	5.72	8715.00	1647.46	2.42
93.57	5.71	8716.00	1647.43	2.42
93.57	5.71	8717.00	1647.42	2.42
93.57	5.70	8718.00	1647.41	2.42
93.57	5.68	8719.00	1647.40	2.42
93.57	5.66	8720.00	1647.40	2.42
93.57	5.64	8721.00	1647.40	2.42
93.57	5.61	8722.00	1647.41	2.42
93.57	5.60	8723.00	1647.41	2.42
93.57	5.61	8724.00	1647.41	2.42
93.57	5.64	8725.00	1647.41	2.42
93.57	5.68	8726.00	1647.40	2.42
93.57	5.73	8727.00	1647.39	2.42
93.57	5.76	8728.00	1647.38	2.42
93.57	5.75	8729.00	1647.38	2.42
93.56	5.73	8730.00	1647.38	2.43
93.56	5.70	8731.00	1647.38	2.43
93.56	5.68	8732.00	1647.38	2.43
93.56	5.69	8733.00	1647.39	2.43
93.56	5.73	8734.00	1647.39	2.43
93.56	5.79	8735.00	1647.40	2.43
93.56	5.84	8736.00	1647.42	2.43
93.56	5.86	8737.00	1647.44	2.43
93.56	5.87	8738.00	1647.45	2.43
93.56	5.85	8739.00	1647.47	2.43
93.56	5.81	8740.00	1647.47	2.43
93.56	5.78	8741.00	1647.46	2.43
93.56	5.76	8742.00	1647.45	2.43
93.56	5.76	8743.00	1647.44	2.43
93.56	5.77	8744.00	1647.43	2.43
93.56	5.76	8745.00	1647.42	2.43
93.56	5.73	8746.00	1647.42	2.43
93.56	5.70	8747.00	1647.43	2.43
93.56	5.68	8748.00	1647.42	2.43
93.56	5.68	8749.00	1647.43	2.43
93.56	5.70	8750.00	1647.43	2.43
93.56	5.72	8751.00	1647.43	2.43
93.56	5.76	8752.00	1647.44	2.43
93.55	5.78	8753.00	1647.45	2.43
93.55	5.79	8754.00	1647.46	2.43
93.55	5.79	8755.00	1647.47	2.43
93.55	5.78	8756.00	1647.47	2.43
93.55	5.77	8757.00	1647.46	2.43
93.55	5.76	8758.00	1647.45	2.43
93.55	5.75	8759.00	1647.44	2.43
93.55	5.77	8760.00	1647.42	2.43
93.55	5.79	8761.00	1647.40	2.43
93.55	5.83	8762.00	1647.40	2.43
93.55	5.85	8763.00	1647.39	2.43
93.55	5.87	8764.00	1647.39	2.43
93.55	5.86	8765.00	1647.39	2.43
93.55	5.84	8766.00	1647.39	2.43
93.55	5.81	8767.00	1647.39	2.44

93.55	5.78	8768.00	1647.41	2.44
93.55	5.77	8769.00	1647.41	2.44
93.55	5.76	8770.00	1647.41	2.44
93.55	5.76	8771.00	1647.41	2.44
93.55	5.75	8772.00	1647.41	2.44
93.55	5.67	8780.00	1647.42	2.44
93.55	5.86	8790.00	1647.36	2.44
93.55	5.86	8800.00	1647.37	2.44
93.55	5.75	8810.00	1647.35	2.45
93.54	5.80	8820.00	1647.39	2.45
93.55	5.79	8830.00	1647.31	2.45
93.54	5.77	8840.00	1647.29	2.46
93.54	5.76	8850.00	1647.25	2.46
93.54	5.64	8858.00	1647.16	2.46
93.54	5.63	8859.00	1647.14	2.46
93.54	5.62	8860.00	1647.12	2.46
93.54	5.61	8861.00	1647.08	2.46
93.54	5.60	8862.00	1647.03	2.46
93.55	5.60	8863.00	1646.97	2.46
93.55	5.60	8864.00	1646.89	2.46
93.55	5.61	8865.00	1646.78	2.46
93.55	5.62	8866.00	1646.65	2.46
93.54	5.62	8867.00	1646.49	2.46
93.54	5.61	8868.00	1646.31	2.46
93.54	5.57	8869.00	1646.10	2.46
93.54	5.52	8870.00	1645.86	2.46
93.54	5.46	8871.00	1645.57	2.46
93.54	5.39	8872.00	1645.25	2.46
93.54	5.33	8873.00	1644.88	2.46
93.54	5.28	8874.00	1644.45	2.46
93.54	5.23	8875.00	1643.94	2.47
93.54	5.15	8876.00	1643.29	2.47
93.54	5.00	8877.00	1642.42	2.47
93.54	4.73	8878.00	1641.19	2.47
93.54	4.27	8879.00	1639.37	2.47
93.54	3.63	8880.00	1636.65	2.47
93.54	2.85	8881.00	1632.74	2.47
93.54	2.02	8882.00	1627.54	2.47
93.54	1.27	8883.00	1621.24	2.47
93.53	0.70	8884.00	1614.31	2.47
93.53	0.33	8885.00	1607.34	2.47
93.53	0.15	8886.00	1600.91	2.47
93.53	0.07	8887.00	1595.37	2.47
93.53	0.05	8888.00	1590.79	2.47
93.53	0.04	8889.00	1587.06	2.47
93.53	0.04	8890.00	1583.99	2.47
93.53	0.04	8891.00	1581.38	2.47
93.53	0.04	8892.00	1579.13	2.47
93.53	0.03	8893.00	1577.15	2.47
93.53	0.02	8894.00	1575.40	2.47
93.53	0.02	8895.00	1573.82	2.47
93.53	0.01	8896.00	1572.42	2.47
93.53	0.00	8897.00	1571.16	2.47
93.53	0.00	8898.00	1570.02	2.47
93.53	0.00	8899.00	1568.99	2.47
93.53	0.00	8900.00	1568.05	2.47
93.53	0.00	8901.00	1567.19	2.47
93.53	0.00	8902.00	1566.41	2.47
93.53	0.00	8903.00	1565.69	2.47
93.53	0.00	8904.00	1565.02	2.47

93.53	0.00	8905.00	1564.42	2.47
93.53	0.00	8906.00	1563.85	2.47
93.53	0.00	8907.00	1563.33	2.47
93.53	0.00	8908.00	1562.85	2.47
93.53	0.00	8909.00	1562.39	2.47
93.53	0.00	8910.00	1561.97	2.47
93.53	0.00	8911.00	1561.58	2.48
93.53	0.00	8912.00	1561.21	2.48
93.53	0.00	8913.00	1560.86	2.48
93.53	0.00	8914.00	1560.52	2.48
93.53	0.00	8915.00	1560.21	2.48
93.53	0.00	8916.00	1559.92	2.48
93.53	0.00	8917.00	1559.63	2.48
93.53	0.00	8918.00	1559.37	2.48
93.53	0.00	8919.00	1559.10	2.48
93.53	0.00	8920.00	1558.86	2.48
93.53	0.00	8921.00	1558.63	2.48
93.53	0.00	8922.00	1558.40	2.48
93.53	0.00	8923.00	1558.19	2.48
93.53	0.00	8924.00	1557.98	2.48
93.53	0.00	8925.00	1557.78	2.48
93.53	0.00	8926.00	1557.59	2.48
93.53	0.00	8927.00	1557.41	2.48
93.53	0.00	8928.00	1557.24	2.48
93.53	0.00	8929.00	1557.08	2.48
93.53	0.00	8930.00	1556.93	2.48
93.53	0.00	8931.00	1556.78	2.48
93.53	0.00	8932.00	1556.64	2.48
93.53	0.00	8933.00	1556.51	2.48
93.54	0.00	8934.00	1556.38	2.48
93.54	0.00	8935.00	1556.25	2.48
93.54	0.00	8936.00	1556.13	2.48
93.54	0.00	8937.00	1556.00	2.48
93.54	0.00	8938.00	1555.89	2.48
93.54	0.00	8939.00	1555.78	2.48
93.54	0.00	8940.00	1555.66	2.48
93.54	0.00	8941.00	1555.55	2.48
93.54	0.00	8942.00	1555.45	2.48
93.54	0.00	8943.00	1555.34	2.48
93.54	0.00	8944.00	1555.25	2.48
93.54	0.00	8945.00	1555.15	2.48
93.54	0.00	8946.00	1555.05	2.48
93.54	0.00	8947.00	1554.96	2.49
93.54	0.00	8948.00	1554.88	2.49
93.54	0.00	8949.00	1554.79	2.49
93.54	0.00	8950.00	1554.70	2.49
93.54	0.00	8951.00	1554.62	2.49
93.54	0.00	8952.00	1554.54	2.49
93.54	0.00	8953.00	1554.46	2.49
93.54	0.00	8954.00	1554.38	2.49
93.54	0.00	8955.00	1554.30	2.49
93.54	0.00	8956.00	1554.23	2.49
93.54	0.00	8957.00	1554.15	2.49
93.54	0.00	8958.00	1554.08	2.49
93.54	0.00	8959.00	1554.01	2.49
93.54	0.00	8960.00	1553.94	2.49
93.54	0.00	8961.00	1553.88	2.49
93.54	0.00	8962.00	1553.81	2.49
93.54	0.00	8963.00	1553.74	2.49
93.54	0.00	8964.00	1553.69	2.49

93.54	0.00	8965.00	1553.62	2.49
93.54	0.00	8966.00	1553.56	2.49
93.54	0.00	8967.00	1553.50	2.49
93.54	0.00	8968.00	1553.44	2.49
93.54	0.00	8969.00	1553.38	2.49
93.54	0.00	8970.00	1553.33	2.49
93.54	0.00	8971.00	1553.27	2.49
93.54	0.00	8972.00	1553.22	2.49
93.54	0.00	8973.00	1553.16	2.49
93.54	0.00	8974.00	1553.11	2.49
93.54	0.00	8975.00	1553.05	2.49
93.54	0.00	8976.00	1553.00	2.49
93.54	0.00	8977.00	1552.95	2.49
93.54	0.00	8978.00	1552.90	2.49
93.54	0.00	8979.00	1552.85	2.49
93.54	0.00	8980.00	1552.81	2.49
93.54	0.00	8981.00	1552.76	2.49
93.54	0.00	8982.00	1552.71	2.49
93.54	0.00	8983.00	1552.67	2.50
93.54	0.00	8984.00	1552.62	2.50
93.54	0.00	8985.00	1552.57	2.50
93.54	0.00	8986.00	1552.53	2.50
93.54	0.00	8987.00	1552.49	2.50
93.54	0.00	8988.00	1552.44	2.50
93.54	0.00	8989.00	1552.40	2.50
93.54	0.00	8990.00	1552.36	2.50
93.54	0.00	8991.00	1552.32	2.50
93.54	0.00	8992.00	1552.28	2.50
93.54	0.00	8993.00	1552.24	2.50
93.54	0.00	8994.00	1552.20	2.50
93.54	0.00	8995.00	1552.16	2.50
93.54	0.00	8996.00	1552.12	2.50
93.54	0.00	8997.00	1552.08	2.50
93.54	0.00	8998.00	1552.05	2.50
93.54	0.00	8999.00	1552.01	2.50
93.54	0.00	9000.00	1551.97	2.50
93.54	0.00	9001.00	1551.93	2.50
93.54	0.00	9002.00	1551.89	2.50
93.54	0.00	9003.00	1551.86	2.50
93.54	0.00	9004.00	1551.83	2.50
93.54	0.00	9005.00	1551.79	2.50
93.54	0.00	9006.00	1551.75	2.50
93.54	0.00	9007.00	1551.72	2.50
93.54	0.00	9008.00	1551.69	2.50
93.54	0.00	9009.00	1551.65	2.50
93.54	0.00	9010.00	1551.62	2.50
93.54	0.00	9011.00	1551.59	2.50
93.54	0.00	9012.00	1551.56	2.50
93.54	0.00	9013.00	1551.52	2.50
93.54	0.00	9014.00	1551.49	2.50
93.54	0.00	9015.00	1551.46	2.50
93.54	0.00	9016.00	1551.42	2.50
93.54	0.00	9017.00	1551.40	2.50
93.54	0.00	9018.00	1551.37	2.51
93.54	0.00	9019.00	1551.34	2.51
93.54	0.00	9020.00	1551.31	2.51
93.54	0.00	9021.00	1551.28	2.51
93.54	0.00	9022.00	1551.25	2.51
93.54	0.00	9023.00	1551.23	2.51
93.54	0.00	9024.00	1551.20	2.51

93.54	0.00	9025.00	1551.17	2.51
93.54	0.00	9026.00	1551.14	2.51
93.54	0.00	9027.00	1551.12	2.51
93.54	0.00	9028.00	1551.09	2.51
93.54	0.00	9029.00	1551.06	2.51
93.54	0.00	9030.00	1551.03	2.51
93.54	0.00	9031.00	1551.01	2.51
93.54	0.00	9032.00	1550.99	2.51
93.54	0.00	9033.00	1550.96	2.51
93.54	0.00	9034.00	1550.93	2.51
93.54	0.00	9035.00	1550.91	2.51
93.54	0.00	9036.00	1550.88	2.51
93.54	0.00	9037.00	1550.86	2.51
93.54	0.00	9038.00	1550.83	2.51
93.54	0.00	9039.00	1550.81	2.51
93.54	0.00	9040.00	1550.78	2.51
93.54	0.00	9041.00	1550.76	2.51
93.54	0.00	9042.00	1550.74	2.51
93.55	0.00	9043.00	1550.71	2.51
93.55	0.00	9044.00	1550.69	2.51
93.55	0.00	9045.00	1550.67	2.51
93.55	0.00	9046.00	1550.64	2.51
93.55	0.00	9047.00	1550.62	2.51
93.55	0.00	9048.00	1550.60	2.51
93.55	0.00	9049.00	1550.57	2.51
93.55	0.00	9050.00	1550.56	2.51
93.55	0.00	9051.00	1550.53	2.51
93.55	0.00	9052.00	1550.51	2.51
93.55	0.00	9053.00	1550.49	2.51
93.55	0.00	9054.00	1550.47	2.52
93.55	0.00	9055.00	1550.45	2.52
93.55	0.00	9056.00	1550.43	2.52
93.55	0.00	9057.00	1550.40	2.52
93.55	0.00	9058.00	1550.38	2.52
93.55	0.00	9059.00	1550.36	2.52
93.55	0.00	9060.00	1550.34	2.52
93.56	0.00	9061.00	1550.32	2.52
93.56	0.00	9062.00	1550.30	2.52
93.56	0.00	9063.00	1550.28	2.52
93.56	0.00	9064.00	1550.26	2.52
93.56	0.00	9065.00	1550.24	2.52
93.56	0.00	9066.00	1550.22	2.52
93.56	0.00	9067.00	1550.20	2.52
93.56	0.00	9068.00	1550.18	2.52
93.56	0.00	9069.00	1550.16	2.52
93.56	0.00	9070.00	1550.14	2.52
93.56	0.00	9071.00	1550.13	2.52
93.56	0.00	9072.00	1550.10	2.52
93.56	0.00	9073.00	1550.09	2.52
93.56	0.00	9074.00	1550.07	2.52
93.56	0.00	9075.00	1550.05	2.52
93.56	0.00	9076.00	1550.03	2.52
93.56	0.00	9077.00	1550.02	2.52
93.55	0.00	9078.00	1549.99	2.52
93.55	0.00	9079.00	1549.98	2.52
93.55	0.00	9080.00	1549.96	2.52
93.55	0.00	9081.00	1549.94	2.52
93.55	0.00	9082.00	1549.93	2.52
93.56	0.00	9083.00	1549.91	2.52
93.56	0.00	9084.00	1549.89	2.52

93.57	5.62	8524.00	1647.37	2.37
93.57	5.58	8525.00	1647.36	2.37
93.57	5.57	8526.00	1647.35	2.37
93.57	5.59	8527.00	1647.36	2.37
93.57	5.64	8528.00	1647.37	2.37
93.58	5.70	8530.00	1647.38	2.37
93.58	5.86	8540.00	1647.44	2.37
93.57	5.80	8550.00	1647.42	2.38
93.57	5.64	8560.00	1647.38	2.38
93.57	5.84	8570.00	1647.37	2.38
93.57	5.78	8580.00	1647.33	2.38
93.57	5.93	8590.00	1647.39	2.39
93.57	5.76	8600.00	1647.36	2.39
93.57	5.75	8601.00	1647.37	2.39
93.57	5.72	8602.00	1647.37	2.39
93.57	5.70	8603.00	1647.37	2.39
93.56	5.70	8604.00	1647.37	2.39
93.56	5.71	8605.00	1647.37	2.39
93.56	5.74	8606.00	1647.38	2.39
93.56	5.78	8607.00	1647.38	2.39
93.56	5.80	8608.00	1647.39	2.39
93.56	5.81	8609.00	1647.39	2.39
93.56	5.79	8610.00	1647.39	2.39
93.56	5.77	8611.00	1647.39	2.39
93.56	5.75	8612.00	1647.39	2.39
93.56	5.75	8613.00	1647.39	2.39
93.56	5.77	8614.00	1647.39	2.39
93.56	5.81	8615.00	1647.39	2.39
93.56	5.86	8616.00	1647.41	2.39
93.56	5.89	8617.00	1647.41	2.39
93.56	5.89	8618.00	1647.42	2.39
93.56	5.88	8619.00	1647.42	2.39
93.56	5.85	8620.00	1647.41	2.39
93.56	5.81	8621.00	1647.40	2.39
93.56	5.78	8622.00	1647.39	2.40
93.56	5.75	8623.00	1647.38	2.40
93.56	5.73	8624.00	1647.37	2.40
93.56	5.73	8625.00	1647.37	2.40
93.56	5.74	8626.00	1647.37	2.40
93.56	5.76	8627.00	1647.38	2.40
93.56	5.77	8628.00	1647.39	2.40
93.56	5.79	8629.00	1647.39	2.40
93.56	5.79	8630.00	1647.40	2.40
93.56	5.80	8631.00	1647.40	2.40
93.56	5.80	8632.00	1647.40	2.40
93.56	5.79	8633.00	1647.40	2.40
93.56	5.78	8634.00	1647.40	2.40
93.56	5.76	8635.00	1647.40	2.40
93.56	5.73	8636.00	1647.41	2.40
93.56	5.71	8637.00	1647.42	2.40
93.56	5.71	8638.00	1647.42	2.40
93.56	5.74	8639.00	1647.43	2.40
93.56	5.78	8640.00	1647.44	2.40
93.56	5.83	8641.00	1647.45	2.40
93.56	5.85	8642.00	1647.46	2.40
93.56	5.85	8643.00	1647.46	2.40
93.56	5.83	8644.00	1647.45	2.40
93.56	5.81	8645.00	1647.45	2.40
93.56	5.80	8646.00	1647.45	2.40
93.56	5.81	8647.00	1647.45	2.40

93.54	0.00	8965.00	1553.62	2.49
93.54	0.00	8966.00	1553.56	2.49
93.54	0.00	8967.00	1553.50	2.49
93.54	0.00	8968.00	1553.44	2.49
93.54	0.00	8969.00	1553.38	2.49
93.54	0.00	8970.00	1553.33	2.49
93.54	0.00	8971.00	1553.27	2.49
93.54	0.00	8972.00	1553.22	2.49
93.54	0.00	8973.00	1553.16	2.49
93.54	0.00	8974.00	1553.11	2.49
93.54	0.00	8975.00	1553.05	2.49
93.54	0.00	8976.00	1553.00	2.49
93.54	0.00	8977.00	1552.95	2.49
93.54	0.00	8978.00	1552.90	2.49
93.54	0.00	8979.00	1552.85	2.49
93.54	0.00	8980.00	1552.81	2.49
93.54	0.00	8981.00	1552.76	2.49
93.54	0.00	8982.00	1552.71	2.49
93.54	0.00	8983.00	1552.67	2.50
93.54	0.00	8984.00	1552.62	2.50
93.54	0.00	8985.00	1552.57	2.50
93.54	0.00	8986.00	1552.53	2.50
93.54	0.00	8987.00	1552.49	2.50
93.54	0.00	8988.00	1552.44	2.50
93.54	0.00	8989.00	1552.40	2.50
93.54	0.00	8990.00	1552.36	2.50
93.54	0.00	8991.00	1552.32	2.50
93.54	0.00	8992.00	1552.28	2.50
93.54	0.00	8993.00	1552.24	2.50
93.54	0.00	8994.00	1552.20	2.50
93.54	0.00	8995.00	1552.16	2.50
93.54	0.00	8996.00	1552.12	2.50
93.54	0.00	8997.00	1552.08	2.50
93.54	0.00	8998.00	1552.05	2.50
93.54	0.00	8999.00	1552.01	2.50
93.54	0.00	9000.00	1551.97	2.50
93.54	0.00	9001.00	1551.93	2.50
93.54	0.00	9002.00	1551.89	2.50
93.54	0.00	9003.00	1551.86	2.50
93.54	0.00	9004.00	1551.83	2.50
93.54	0.00	9005.00	1551.79	2.50
93.54	0.00	9006.00	1551.75	2.50
93.54	0.00	9007.00	1551.72	2.50
93.54	0.00	9008.00	1551.69	2.50
93.54	0.00	9009.00	1551.65	2.50
93.54	0.00	9010.00	1551.62	2.50
93.54	0.00	9011.00	1551.59	2.50
93.54	0.00	9012.00	1551.56	2.50
93.54	0.00	9013.00	1551.52	2.50
93.54	0.00	9014.00	1551.49	2.50
93.54	0.00	9015.00	1551.46	2.50
93.54	0.00	9016.00	1551.42	2.50
93.54	0.00	9017.00	1551.40	2.50
93.54	0.00	9018.00	1551.37	2.51
93.54	0.00	9019.00	1551.34	2.51
93.54	0.00	9020.00	1551.31	2.51
93.54	0.00	9021.00	1551.28	2.51
93.54	0.00	9022.00	1551.25	2.51
93.54	0.00	9023.00	1551.23	2.51
93.54	0.00	9024.00	1551.20	2.51

93.54	0.00	9025.00	1551.17	2.51
93.54	0.00	9026.00	1551.14	2.51
93.54	0.00	9027.00	1551.12	2.51
93.54	0.00	9028.00	1551.09	2.51
93.54	0.00	9029.00	1551.06	2.51
93.54	0.00	9030.00	1551.03	2.51
93.54	0.00	9031.00	1551.01	2.51
93.54	0.00	9032.00	1550.99	2.51
93.54	0.00	9033.00	1550.96	2.51
93.54	0.00	9034.00	1550.93	2.51
93.54	0.00	9035.00	1550.91	2.51
93.54	0.00	9036.00	1550.88	2.51
93.54	0.00	9037.00	1550.86	2.51
93.54	0.00	9038.00	1550.83	2.51
93.54	0.00	9039.00	1550.81	2.51
93.54	0.00	9040.00	1550.78	2.51
93.54	0.00	9041.00	1550.76	2.51
93.54	0.00	9042.00	1550.74	2.51
93.55	0.00	9043.00	1550.71	2.51
93.55	0.00	9044.00	1550.69	2.51
93.55	0.00	9045.00	1550.67	2.51
93.55	0.00	9046.00	1550.64	2.51
93.55	0.00	9047.00	1550.62	2.51
93.55	0.00	9048.00	1550.60	2.51
93.55	0.00	9049.00	1550.57	2.51
93.55	0.00	9050.00	1550.56	2.51
93.55	0.00	9051.00	1550.53	2.51
93.55	0.00	9052.00	1550.51	2.51
93.55	0.00	9053.00	1550.49	2.51
93.55	0.00	9054.00	1550.47	2.52
93.55	0.00	9055.00	1550.45	2.52
93.55	0.00	9056.00	1550.43	2.52
93.55	0.00	9057.00	1550.40	2.52
93.55	0.00	9058.00	1550.38	2.52
93.55	0.00	9059.00	1550.36	2.52
93.55	0.00	9060.00	1550.34	2.52
93.56	0.00	9061.00	1550.32	2.52
93.56	0.00	9062.00	1550.30	2.52
93.56	0.00	9063.00	1550.28	2.52
93.56	0.00	9064.00	1550.26	2.52
93.56	0.00	9065.00	1550.24	2.52
93.56	0.00	9066.00	1550.22	2.52
93.56	0.00	9067.00	1550.20	2.52
93.56	0.00	9068.00	1550.18	2.52
93.56	0.00	9069.00	1550.16	2.52
93.56	0.00	9070.00	1550.14	2.52
93.56	0.00	9071.00	1550.13	2.52
93.56	0.00	9072.00	1550.10	2.52
93.56	0.00	9073.00	1550.09	2.52
93.56	0.00	9074.00	1550.07	2.52
93.56	0.00	9075.00	1550.05	2.52
93.56	0.00	9076.00	1550.03	2.52
93.56	0.00	9077.00	1550.02	2.52
93.55	0.00	9078.00	1549.99	2.52
93.55	0.00	9079.00	1549.98	2.52
93.55	0.00	9080.00	1549.96	2.52
93.55	0.00	9081.00	1549.94	2.52
93.55	0.00	9082.00	1549.93	2.52
93.56	0.00	9083.00	1549.91	2.52
93.56	0.00	9084.00	1549.89	2.52

93.57	5.62	8524.00	1647.37	2.37
93.57	5.58	8525.00	1647.36	2.37
93.57	5.57	8526.00	1647.35	2.37
93.57	5.59	8527.00	1647.36	2.37
93.57	5.64	8528.00	1647.37	2.37
93.58	5.70	8530.00	1647.38	2.37
93.58	5.86	8540.00	1647.44	2.37
93.57	5.80	8550.00	1647.42	2.38
93.57	5.64	8560.00	1647.38	2.38
93.57	5.84	8570.00	1647.37	2.38
93.57	5.78	8580.00	1647.33	2.38
93.57	5.93	8590.00	1647.39	2.39
93.57	5.76	8600.00	1647.36	2.39
93.57	5.75	8601.00	1647.37	2.39
93.57	5.72	8602.00	1647.37	2.39
93.57	5.70	8603.00	1647.37	2.39
93.56	5.70	8604.00	1647.37	2.39
93.56	5.71	8605.00	1647.37	2.39
93.56	5.74	8606.00	1647.38	2.39
93.56	5.78	8607.00	1647.38	2.39
93.56	5.80	8608.00	1647.39	2.39
93.56	5.81	8609.00	1647.39	2.39
93.56	5.79	8610.00	1647.39	2.39
93.56	5.77	8611.00	1647.39	2.39
93.56	5.75	8612.00	1647.39	2.39
93.56	5.75	8613.00	1647.39	2.39
93.56	5.77	8614.00	1647.39	2.39
93.56	5.81	8615.00	1647.39	2.39
93.56	5.86	8616.00	1647.41	2.39
93.56	5.89	8617.00	1647.41	2.39
93.56	5.89	8618.00	1647.42	2.39
93.56	5.88	8619.00	1647.42	2.39
93.56	5.85	8620.00	1647.41	2.39
93.56	5.81	8621.00	1647.40	2.39
93.56	5.78	8622.00	1647.39	2.40
93.56	5.75	8623.00	1647.38	2.40
93.56	5.73	8624.00	1647.37	2.40
93.56	5.73	8625.00	1647.37	2.40
93.56	5.74	8626.00	1647.37	2.40
93.56	5.76	8627.00	1647.38	2.40
93.56	5.77	8628.00	1647.39	2.40
93.56	5.79	8629.00	1647.39	2.40
93.56	5.79	8630.00	1647.40	2.40
93.56	5.80	8631.00	1647.40	2.40
93.56	5.80	8632.00	1647.40	2.40
93.56	5.79	8633.00	1647.40	2.40
93.56	5.78	8634.00	1647.40	2.40
93.56	5.76	8635.00	1647.40	2.40
93.56	5.73	8636.00	1647.41	2.40
93.56	5.71	8637.00	1647.42	2.40
93.56	5.71	8638.00	1647.42	2.40
93.56	5.74	8639.00	1647.43	2.40
93.56	5.78	8640.00	1647.44	2.40
93.56	5.83	8641.00	1647.45	2.40
93.56	5.85	8642.00	1647.46	2.40
93.56	5.85	8643.00	1647.46	2.40
93.56	5.83	8644.00	1647.45	2.40
93.56	5.81	8645.00	1647.45	2.40
93.56	5.80	8646.00	1647.45	2.40
93.56	5.81	8647.00	1647.45	2.40

93.55	5.71	8404.00	1647.45	2.33
93.55	5.72	8405.00	1647.45	2.33
93.55	5.74	8406.00	1647.47	2.34
93.55	5.76	8407.00	1647.48	2.34
93.55	5.78	8408.00	1647.49	2.34
93.55	5.79	8409.00	1647.49	2.34
93.55	5.80	8410.00	1647.49	2.34
93.55	5.78	8411.00	1647.48	2.34
93.55	5.76	8412.00	1647.47	2.34
93.55	5.74	8413.00	1647.45	2.34
93.55	5.72	8414.00	1647.45	2.34
93.55	5.72	8415.00	1647.45	2.34
93.55	5.73	8416.00	1647.45	2.34
93.55	5.75	8417.00	1647.45	2.34
93.55	5.77	8418.00	1647.43	2.34
93.55	5.78	8419.00	1647.41	2.34
93.55	5.78	8420.00	1647.40	2.34
93.55	5.78	8421.00	1647.39	2.34
93.55	5.76	8422.00	1647.38	2.34
93.55	5.74	8423.00	1647.39	2.34
93.55	5.71	8424.00	1647.40	2.34
93.55	5.69	8425.00	1647.40	2.34
93.55	5.69	8426.00	1647.39	2.34
93.55	5.71	8427.00	1647.38	2.34
93.55	5.73	8428.00	1647.38	2.34
93.55	5.75	8429.00	1647.38	2.34
93.56	5.76	8430.00	1647.38	2.34
93.56	5.75	8431.00	1647.40	2.34
93.56	5.74	8432.00	1647.41	2.34
93.56	5.72	8433.00	1647.42	2.34
93.57	5.71	8434.00	1647.43	2.34
93.57	5.69	8435.00	1647.43	2.34
93.57	5.67	8436.00	1647.43	2.34
93.57	5.65	8437.00	1647.43	2.34
93.57	5.62	8438.00	1647.43	2.34
93.57	5.61	8439.00	1647.45	2.34
93.57	5.60	8440.00	1647.46	2.34
93.57	5.61	8441.00	1647.47	2.34
93.57	5.63	8442.00	1647.47	2.35
93.57	5.66	8443.00	1647.48	2.35
93.57	5.68	8444.00	1647.47	2.35
93.57	5.69	8445.00	1647.46	2.35
93.57	5.68	8446.00	1647.44	2.35
93.57	5.65	8447.00	1647.42	2.35
93.57	5.62	8448.00	1647.41	2.35
93.57	5.60	8449.00	1647.40	2.35
93.57	5.62	8450.00	1647.41	2.35
93.57	5.67	8451.00	1647.41	2.35
93.57	5.75	8452.00	1647.43	2.35
93.57	5.82	8453.00	1647.45	2.35
93.57	5.87	8454.00	1647.46	2.35
93.57	5.87	8455.00	1647.46	2.35
93.57	5.83	8456.00	1647.45	2.35
93.57	5.76	8457.00	1647.44	2.35
93.57	5.69	8458.00	1647.44	2.35
93.57	5.64	8459.00	1647.43	2.35
93.57	5.62	8460.00	1647.43	2.35
93.57	5.63	8461.00	1647.42	2.35
93.57	5.66	8462.00	1647.41	2.35
93.57	5.70	8463.00	1647.40	2.35

93.57	0.00	9085.00	1549.87	2.52
93.58	0.00	9086.00	1549.85	2.52
93.58	0.00	9087.00	1549.84	2.52
93.59	0.00	9088.00	1549.82	2.52
93.59	0.00	9089.00	1549.81	2.52
93.59	0.00	9090.00	1549.79	2.53
93.59	0.00	9091.00	1549.78	2.53
93.59	0.00	9092.00	1549.75	2.53
93.59	0.00	9093.00	1549.74	2.53
93.59	0.00	9094.00	1549.72	2.53
93.59	0.00	9095.00	1549.71	2.53
93.60	0.00	9096.00	1549.69	2.53
93.60	0.00	9097.00	1549.67	2.53
93.60	0.00	9098.00	1549.66	2.53
93.60	0.00	9099.00	1549.64	2.53
93.60	0.00	9100.00	1549.63	2.53
93.60	0.00	9101.00	1549.61	2.53
93.60	0.00	9102.00	1549.60	2.53
93.59	0.00	9103.00	1549.58	2.53
93.59	0.00	9104.00	1549.57	2.53
93.59	0.00	9105.00	1549.55	2.53
93.59	0.00	9106.00	1549.54	2.53
93.59	0.00	9107.00	1549.53	2.53
93.59	0.00	9108.00	1549.51	2.53
93.59	0.00	9109.00	1549.50	2.53
93.59	0.00	9110.00	1549.48	2.53
93.60	0.00	9111.00	1549.46	2.53
93.60	0.00	9112.00	1549.45	2.53
93.60	0.00	9113.00	1549.44	2.53
93.60	0.00	9114.00	1549.42	2.53
93.60	0.00	9115.00	1549.41	2.53
93.60	0.00	9116.00	1549.39	2.53
93.60	0.00	9117.00	1549.38	2.53
93.60	0.00	9118.00	1549.37	2.53
93.60	0.00	9119.00	1549.35	2.53
93.60	0.00	9120.00	1549.34	2.53
93.60	0.00	9121.00	1549.33	2.53
93.60	0.00	9122.00	1549.31	2.53
93.59	0.00	9123.00	1549.30	2.53
93.59	0.00	9124.00	1549.29	2.53
93.59	0.00	9125.00	1549.27	2.53
93.59	0.00	9126.00	1549.26	2.54
93.59	0.00	9127.00	1549.24	2.54
93.59	0.00	9128.00	1549.23	2.54
93.58	0.00	9129.00	1549.22	2.54
93.58	0.00	9130.00	1549.21	2.54
93.58	0.00	9131.00	1549.19	2.54
93.58	0.00	9132.00	1549.18	2.54
93.58	0.00	9133.00	1549.16	2.54
93.58	0.00	9134.00	1549.15	2.54
93.58	0.00	9135.00	1549.15	2.54
93.58	0.00	9136.00	1549.13	2.54
93.58	0.00	9137.00	1549.12	2.54
93.58	0.00	9138.00	1549.11	2.54
93.58	0.00	9139.00	1549.09	2.54
93.58	0.00	9140.00	1549.08	2.54
93.58	0.00	9141.00	1549.07	2.54
93.58	0.00	9142.00	1549.06	2.54
93.58	0.00	9143.00	1549.05	2.54
93.58	0.00	9144.00	1549.03	2.54

93.58	0.00	9145.00	1549.02	2.54
93.58	0.00	9146.00	1549.01	2.54
93.58	0.00	9147.00	1549.00	2.54
93.58	0.00	9148.00	1548.99	2.54
93.58	0.00	9149.00	1548.97	2.54
93.58	0.00	9150.00	1548.97	2.54
93.58	0.00	9151.00	1548.95	2.54
93.59	0.00	9152.00	1548.94	2.54
93.59	0.00	9153.00	1548.93	2.54
93.59	0.00	9154.00	1548.92	2.54
93.60	0.00	9155.00	1548.91	2.54
93.60	0.00	9156.00	1548.90	2.54
93.60	0.00	9157.00	1548.89	2.54
93.60	0.00	9158.00	1548.87	2.54
93.60	0.00	9159.00	1548.86	2.54
93.60	0.00	9160.00	1548.85	2.54
93.60	0.00	9161.00	1548.84	2.54
93.59	0.00	9170.00	1548.74	2.55
93.61	0.00	9180.00	1548.64	2.55
93.65	0.00	9190.00	1548.53	2.55
93.66	0.00	9200.00	1548.44	2.56
93.65	0.00	9210.00	1548.34	2.56
93.64	0.00	9220.00	1548.26	2.56
93.67	0.00	9230.00	1548.18	2.56
93.70	0.00	9240.00	1548.09	2.57
93.67	0.00	9250.00	1548.02	2.57
93.66	0.00	9260.00	1547.95	2.57
93.68	0.00	9270.00	1547.88	2.58
93.67	0.00	9280.00	1547.82	2.58
93.67	0.00	9290.00	1547.76	2.58
90.88	192.32	9300.00	1547.79	2.58
93.68	0.00	9310.00	1547.63	2.59
93.69	0.00	9320.00	1547.58	2.59
93.69	0.00	9330.00	1547.52	2.59
93.70	0.00	9340.00	1547.47	2.59
93.69	0.00	9350.00	1547.42	2.60
93.75	0.00	9360.00	1547.38	2.60
93.74	0.00	9370.00	1547.32	2.60
93.75	0.00	9380.00	1547.27	2.61
93.74	0.00	9390.00	1547.23	2.61
93.73	0.00	9400.00	1547.18	2.61
93.72	0.00	9410.00	1547.14	2.61
93.75	0.00	9420.00	1547.09	2.62
93.74	0.00	9450.00	1546.98	2.63
93.74	0.00	9460.00	1546.93	2.63
93.76	0.00	9480.00	1546.86	2.63
93.77	0.00	9500.00	1546.80	2.64
93.79	0.00	9520.00	1546.73	2.64
93.84	0.00	9540.00	1546.66	2.65
93.82	0.00	9560.00	1546.60	2.66
93.81	0.00	9580.00	1546.55	2.66
93.83	0.00	9600.00	1546.50	2.67
93.86	0.00	9620.00	1546.45	2.67
93.84	0.00	9640.00	1546.39	2.68
93.84	0.00	9660.00	1546.35	2.68
93.84	0.00	9680.00	1546.29	2.69
93.87	0.00	9700.00	1546.24	2.69
93.87	0.00	9720.00	1546.18	2.70
93.88	0.00	9740.00	1546.15	2.71
93.90	0.00	9760.00	1546.12	2.71

93.89	0.00	9780.00	1546.08	2.72
93.96	0.00	9800.00	1546.06	2.72
93.95	0.00	9820.00	1546.04	2.73
93.92	0.00	9840.00	1545.99	2.73
93.91	0.00	9860.00	1545.97	2.74
93.93	0.00	9880.00	1545.94	2.74
93.95	0.00	9900.00	1545.92	2.75
93.95	0.00	9920.00	1545.90	2.76
93.96	0.00	9940.00	1545.86	2.76
93.99	0.00	9960.00	1545.83	2.77
93.97	0.00	9980.00	1545.82	2.77
94.00	0.00	10020.00	1545.77	2.78
94.01	0.00	10050.00	1545.72	2.79
94.01	0.00	10080.00	1545.68	2.80
94.05	0.00	10110.00	1545.65	2.81
94.05	0.00	10140.00	1545.64	2.82
94.13	0.00	10170.00	1545.62	2.83
94.08	0.00	10200.00	1545.61	2.83
94.06	0.00	10230.00	1545.60	2.84
94.09	0.00	10260.00	1545.56	2.85
94.09	0.00	10290.00	1545.52	2.86
94.14	0.00	10320.00	1545.49	2.87
94.11	0.00	10350.00	1545.47	2.88
94.16	0.00	10380.00	1545.44	2.88
94.17	0.00	10410.00	1545.42	2.89
94.18	0.00	10440.00	1545.41	2.90
94.19	0.00	10470.00	1545.40	2.91
94.21	0.00	10500.00	1545.39	2.92
94.18	0.00	10530.00	1545.36	2.93
94.18	0.00	10560.00	1545.33	2.93
94.19	0.00	10590.00	1545.30	2.94
94.19	0.00	10620.00	1545.29	2.95
94.25	0.00	10650.00	1545.28	2.96
94.24	0.00	10680.00	1545.26	2.97
94.25	0.00	10710.00	1545.24	2.97
94.26	0.00	10740.00	1545.23	2.98
94.26	0.00	10770.00	1545.22	2.99
94.29	0.00	10800.00	1545.20	3.00
94.31	0.00	10830.00	1545.19	3.01
94.29	0.00	10860.00	1545.19	3.02
94.28	0.00	10890.00	1545.18	3.03
94.36	0.00	10920.00	1545.16	3.03
94.39	0.00	10980.00	1545.15	3.05
94.38	0.00	11040.00	1545.15	3.07
94.42	0.00	11100.00	1545.13	3.08
94.41	0.00	11160.00	1545.11	3.10
94.40	0.00	11220.00	1545.08	3.12
94.45	0.00	11280.00	1545.07	3.13
94.44	0.00	11340.00	1545.06	3.15
94.46	0.00	11400.00	1545.03	3.17
94.52	0.00	11460.00	1544.99	3.18
94.49	0.00	11520.00	1544.96	3.20
94.58	0.00	11580.00	1544.98	3.22
94.58	0.00	11640.00	1544.96	3.23
94.59	0.00	11700.00	1544.91	3.25
94.62	0.00	11760.00	1544.87	3.27
94.65	0.00	11820.00	1544.86	3.28
94.71	0.00	11880.00	1544.82	3.30
94.74	0.00	11940.00	1544.78	3.32
94.76	0.00	12000.00	1544.75	3.33

94.82	0.00	12060.00	1544.71	3.35
94.81	0.00	12120.00	1544.68	3.37
94.86	0.00	12180.00	1544.65	3.38
94.87	0.00	12240.00	1544.62	3.40
94.91	0.00	12300.00	1544.58	3.42
94.94	0.00	12360.00	1544.53	3.43
94.98	0.00	12420.00	1544.50	3.45
95.01	0.00	12480.00	1544.48	3.47
95.02	0.00	12540.00	1544.45	3.48
95.07	0.00	12600.00	1544.42	3.50
95.10	0.00	12660.00	1544.40	3.52
95.10	0.00	12720.00	1544.39	3.53
95.13	0.00	12780.00	1544.38	3.55
95.17	0.00	12840.00	1544.39	3.57
95.21	0.00	12900.00	1544.34	3.58
95.23	0.00	12960.00	1544.32	3.60
95.26	0.00	13020.00	1544.28	3.62
95.28	0.00	13080.00	1544.26	3.63
95.29	0.00	13140.00	1544.23	3.65
95.34	0.00	13200.00	1544.21	3.67
95.36	0.00	13260.00	1544.19	3.68
95.40	0.00	13320.00	1544.16	3.70
95.42	0.00	13380.00	1544.14	3.72
95.45	0.00	13440.00	1544.09	3.73
95.48	0.00	13500.00	1544.06	3.75
95.50	0.00	13560.00	1544.05	3.77
95.51	0.00	13620.00	1544.02	3.78
95.56	0.00	13680.00	1544.02	3.80
95.59	0.00	13740.00	1544.01	3.82
95.62	0.00	13800.00	1544.01	3.83
95.65	0.00	13860.00	1544.01	3.85
95.66	0.00	13920.00	1544.00	3.87
77.56	3831.50	13980.00	1544.60	3.88
95.72	0.00	14040.00	1543.98	3.90
95.76	0.00	14100.00	1543.95	3.92
95.78	0.00	14160.00	1543.93	3.93
95.80	0.00	14220.00	1543.91	3.95
95.82	0.00	14280.00	1543.90	3.97
95.86	0.00	14340.00	1543.90	3.98
95.88	817.03	14400.00	1543.89	4.00
95.91	0.00	14460.00	1543.88	4.02
95.95	0.00	14520.00	1543.87	4.03
95.95	0.00	14580.00	1543.85	4.05
95.98	0.00	14640.00	1543.85	4.07
96.00	0.00	14700.00	1543.83	4.08
96.04	0.00	14760.00	1543.83	4.10
96.06	0.00	14820.00	1543.82	4.12
96.09	0.00	14880.00	1543.80	4.13
96.11	0.00	14940.00	1543.78	4.15
96.14	0.00	15000.00	1543.76	4.17
96.17	0.00	15060.00	1543.76	4.18
96.19	0.00	15120.00	1543.76	4.20
96.21	0.00	15180.00	1543.75	4.22
96.23	0.00	15240.00	1543.73	4.23
96.25	0.00	15300.00	1543.71	4.25
96.28	0.00	15360.00	1543.69	4.27
96.31	0.00	15420.00	1543.68	4.28
96.33	0.00	15480.00	1543.68	4.30
96.35	0.00	15540.00	1543.65	4.32
96.38	0.00	15600.00	1543.64	4.33

96.41	0.00	15660.00	1543.63	4.35
96.43	0.00	15720.00	1543.62	4.37
96.46	0.00	15780.00	1543.61	4.38
96.48	0.00	15840.00	1543.61	4.40
96.51	0.00	15900.00	1543.59	4.42
96.51	0.00	15960.00	1543.59	4.43
96.54	0.00	16020.00	1543.59	4.45
96.57	0.00	16080.00	1543.56	4.47
96.59	0.00	16140.00	1543.55	4.48
96.62	0.00	16200.00	1543.54	4.50
96.65	0.00	16260.00	1543.53	4.52
96.66	0.00	16320.00	1543.52	4.53
96.67	0.00	16380.00	1543.51	4.55
96.72	0.00	16440.00	1543.51	4.57
96.73	0.00	16500.00	1543.50	4.58
96.76	0.00	16560.00	1543.49	4.60
96.77	0.00	16620.00	1543.48	4.62
96.80	0.00	16680.00	1543.48	4.63
96.81	0.00	16740.00	1543.46	4.65
96.84	0.00	16800.00	1543.45	4.67
96.87	0.00	16860.00	1543.45	4.68
96.89	0.00	16920.00	1543.43	4.70
96.91	0.00	16980.00	1543.43	4.72
96.94	0.00	17040.00	1543.42	4.73
96.95	0.00	17100.00	1543.42	4.75
96.97	0.00	17160.00	1543.41	4.77
97.01	0.00	17220.00	1543.40	4.78
97.02	0.00	17280.00	1543.40	4.80
97.06	0.00	17340.00	1543.38	4.82
97.07	0.00	17400.00	1543.37	4.83
97.10	0.00	17460.00	1543.37	4.85
97.11	0.00	17520.00	1543.36	4.87
97.14	0.00	17580.00	1543.35	4.88
97.16	0.00	17640.00	1543.34	4.90
97.18	0.00	17700.00	1543.33	4.92
97.21	0.00	17760.00	1543.31	4.93
97.23	0.00	17820.00	1543.31	4.95
97.25	0.00	17880.00	1543.30	4.97
97.27	0.00	17940.00	1543.29	4.98
97.29	0.00	18000.00	1543.29	5.00
97.30	0.00	18060.00	1543.28	5.02
97.34	0.00	18120.00	1543.28	5.03
97.37	0.00	18180.00	1543.26	5.05
97.38	0.00	18240.00	1543.26	5.07
97.42	0.00	18300.00	1543.25	5.08
97.43	0.00	18360.00	1543.23	5.10
97.45	0.00	18420.00	1543.23	5.12
97.47	0.00	18480.00	1543.22	5.13
97.49	0.00	18540.00	1543.18	5.15
97.51	0.00	18600.00	1543.20	5.17
97.54	0.00	18660.00	1543.17	5.18
97.55	0.00	18720.00	1543.16	5.20
97.60	0.00	18780.00	1543.15	5.22
97.61	0.00	18840.00	1543.14	5.23
97.62	0.00	18900.00	1543.14	5.25
97.65	0.00	18960.00	1543.13	5.27
97.66	0.00	19020.00	1543.12	5.28
97.67	0.00	19080.00	1543.12	5.30
97.70	0.00	19140.00	1543.12	5.32
97.72	0.00	19200.00	1543.11	5.33

98.89	0.00	22860.00	1542.76	6.35
98.91	0.00	22920.00	1542.75	6.37
98.93	0.00	22980.00	1542.75	6.38
98.94	0.00	23040.00	1542.74	6.40
98.96	0.00	23100.00	1542.74	6.42
99.00	0.00	23160.00	1542.73	6.43
99.02	0.00	23220.00	1542.72	6.45
99.03	0.00	23280.00	1542.72	6.47
99.05	0.00	23340.00	1542.71	6.48
99.06	0.00	23400.00	1542.71	6.50
99.08	0.00	23460.00	1542.70	6.52
99.10	0.00	23520.00	1542.69	6.53
99.12	0.00	23580.00	1542.69	6.55
99.13	0.00	23640.00	1542.69	6.57
99.16	0.00	23700.00	1542.67	6.58
99.17	0.00	23760.00	1542.67	6.60
99.18	0.00	23820.00	1542.65	6.62
99.20	0.00	23880.00	1542.66	6.63
99.21	0.00	23940.00	1542.66	6.65
99.24	0.00	24000.00	1542.65	6.67
99.24	0.00	24060.00	1542.65	6.68
99.26	0.00	24120.00	1542.64	6.70
99.27	0.00	24180.00	1542.63	6.72
99.29	0.00	24240.00	1542.63	6.73
99.32	0.00	24300.00	1542.62	6.75
99.33	0.00	24360.00	1542.62	6.77
99.35	0.00	24420.00	1542.61	6.78
99.39	0.00	24480.00	1542.61	6.80
99.40	0.00	24540.00	1542.61	6.82
99.42	0.00	24600.00	1542.60	6.83
99.43	0.00	24660.00	1542.59	6.85
99.45	0.00	24720.00	1542.59	6.87
99.47	0.00	24780.00	1542.59	6.88
99.49	0.00	24840.00	1542.58	6.90
99.51	0.00	24900.00	1542.57	6.92
99.51	0.00	24960.00	1542.57	6.93
99.54	0.00	25020.00	1542.56	6.95
99.54	0.00	25080.00	1542.55	6.97
99.57	0.00	25140.00	1542.55	6.98
99.59	0.00	25200.00	1542.55	7.00
99.60	0.00	25260.00	1542.54	7.02
99.61	0.00	25320.00	1542.54	7.03
99.63	0.00	25380.00	1542.53	7.05
99.65	0.00	25440.00	1542.53	7.07
99.66	0.00	25500.00	1542.53	7.08
99.68	0.00	25560.00	1542.52	7.10
99.69	0.00	25620.00	1542.50	7.12
99.71	0.00	25680.00	1542.46	7.13
99.72	0.00	25740.00	1542.44	7.15
99.75	0.00	25800.00	1542.42	7.17
99.77	0.00	25860.00	1542.41	7.18
99.78	0.00	25920.00	1542.42	7.20
99.80	0.00	25980.00	1542.42	7.22
99.82	0.00	26040.00	1542.42	7.23
99.83	0.00	26100.00	1542.42	7.25
99.85	0.00	26160.00	1542.42	7.27
99.86	0.00	26220.00	1542.42	7.28
99.88	0.00	26280.00	1542.43	7.30
99.88	0.00	26340.00	1542.43	7.32
99.91	0.00	26400.00	1542.43	7.33

99.92	0.00	26460.00	1542.43	7.35
99.94	0.00	26520.00	1542.42	7.37
99.96	0.00	26580.00	1542.42	7.38
99.97	0.00	26640.00	1542.42	7.40
99.99	0.00	26700.00	1542.42	7.42
100.01	0.00	26760.00	1542.42	7.43
100.01	0.00	26820.00	1542.41	7.45
100.04	0.00	26880.00	1542.41	7.47
100.06	0.00	26940.00	1542.40	7.48
100.07	0.00	27000.00	1542.40	7.50
100.07	0.00	27060.00	1542.40	7.52
100.10	0.00	27120.00	1542.39	7.53
100.10	0.00	27180.00	1542.39	7.55
100.12	0.00	27240.00	1542.39	7.57
100.15	0.00	27300.00	1542.38	7.58
100.16	0.00	27360.00	1542.38	7.60
100.18	0.00	27420.00	1542.38	7.62
100.18	0.00	27480.00	1542.38	7.63
100.20	0.00	27540.00	1542.37	7.65
100.22	0.00	27600.00	1542.36	7.67
100.23	0.00	27660.00	1542.36	7.68
100.25	0.00	27720.00	1542.36	7.70
100.26	0.00	27780.00	1542.35	7.72
100.29	0.00	27840.00	1542.34	7.73
100.29	0.00	27900.00	1542.34	7.75
100.31	0.00	27960.00	1542.34	7.77
100.32	0.00	28020.00	1542.33	7.78
100.33	0.00	28080.00	1542.33	7.80
100.36	0.00	28140.00	1542.33	7.82
100.37	0.00	28200.00	1542.32	7.83
100.39	0.00	28260.00	1542.32	7.85
100.40	0.00	28320.00	1542.32	7.87
100.41	0.00	28380.00	1542.31	7.88
100.45	0.00	28440.00	1542.30	7.90
100.44	0.00	28500.00	1542.30	7.92
100.45	0.00	28560.00	1542.29	7.93
100.48	0.00	28620.00	1542.29	7.95
100.49	0.00	28680.00	1542.29	7.97
100.50	0.00	28740.00	1542.28	7.98
100.52	0.00	28800.00	1542.28	8.00
100.54	0.00	28860.00	1542.27	8.02
100.55	0.00	28920.00	1542.26	8.03
100.57	0.00	28980.00	1542.26	8.05
100.57	0.00	29040.00	1542.26	8.07
100.61	0.00	29100.00	1542.25	8.08
100.61	0.00	29160.00	1542.25	8.10
100.62	0.00	29220.00	1542.24	8.12
100.64	0.00	29280.00	1542.24	8.13
100.65	0.00	29340.00	1542.24	8.15
100.66	0.00	29400.00	1542.23	8.17
100.68	0.00	29460.00	1542.23	8.18
100.70	0.00	29520.00	1542.22	8.20
100.72	0.00	29580.00	1542.22	8.22
100.73	0.00	29640.00	1542.22	8.23
100.75	0.00	29700.00	1542.21	8.25
100.76	0.00	29760.00	1542.20	8.27
100.78	0.00	29820.00	1542.20	8.28
100.79	0.00	29880.00	1542.20	8.30
100.80	0.00	29940.00	1542.19	8.32
100.81	0.00	30000.00	1542.19	8.33

100.82	0.00	30060.00	1542.18	8.35
100.84	0.00	30120.00	1542.18	8.37
100.85	0.00	30180.00	1542.17	8.38
100.86	0.00	30240.00	1542.17	8.40
100.87	0.00	30300.00	1542.17	8.42
100.90	0.00	30360.00	1542.16	8.43
100.90	0.00	30420.00	1542.15	8.45
100.92	0.00	30480.00	1542.15	8.47
100.93	0.00	30540.00	1542.14	8.48
100.94	0.00	30600.00	1542.14	8.50
100.95	0.00	30660.00	1542.14	8.52
100.97	0.00	30720.00	1542.13	8.53
100.99	0.00	30780.00	1542.13	8.55
101.01	0.00	30840.00	1542.12	8.57
101.02	0.00	30900.00	1542.11	8.58
101.03	0.00	30960.00	1542.11	8.60
101.03	0.00	31020.00	1542.11	8.62
101.05	0.00	31080.00	1542.10	8.63
101.08	0.00	31140.00	1542.10	8.65
101.09	0.00	31200.00	1542.09	8.67
101.10	0.00	31260.00	1542.09	8.68
101.13	0.00	31320.00	1542.08	8.70
101.14	0.00	31380.00	1542.08	8.72
101.15	0.00	31440.00	1542.08	8.73
101.17	0.00	31500.00	1542.07	8.75
101.18	0.00	31560.00	1542.07	8.77
101.19	0.00	31620.00	1542.07	8.78
101.20	0.00	31680.00	1542.06	8.80
101.22	0.00	31740.00	1542.05	8.82
101.23	0.00	31800.00	1542.05	8.83
101.25	0.00	31860.00	1542.05	8.85
101.26	0.00	31920.00	1542.04	8.87
101.27	0.00	31980.00	1542.04	8.88
101.29	0.00	32040.00	1542.04	8.90
101.29	0.00	32100.00	1542.03	8.92
101.31	0.00	32160.00	1542.02	8.93
101.32	0.00	32220.00	1542.02	8.95
101.33	0.00	32280.00	1542.02	8.97
101.35	0.00	32340.00	1542.01	8.98
101.36	0.00	32400.00	1542.01	9.00
101.37	0.00	32460.00	1542.01	9.02
101.38	0.00	32520.00	1542.01	9.03
101.40	0.00	32580.00	1542.00	9.05
101.42	0.00	32640.00	1542.00	9.07
101.42	0.00	32700.00	1541.99	9.08
101.44	0.00	32760.00	1541.99	9.10
101.44	0.00	32820.00	1541.99	9.12
101.46	0.00	32880.00	1541.98	9.13
101.47	0.00	32940.00	1541.98	9.15
101.48	0.00	33000.00	1541.98	9.17
101.49	0.00	33060.00	1541.97	9.18
101.50	0.00	33120.00	1541.97	9.20
101.51	0.00	33180.00	1541.96	9.22
101.53	0.00	33240.00	1541.96	9.23
101.55	0.00	33300.00	1541.95	9.25
101.56	0.00	33360.00	1541.95	9.27
101.57	0.00	33420.00	1541.95	9.28
101.58	0.00	33480.00	1541.93	9.30
101.59	0.00	33540.00	1541.93	9.32
101.60	0.00	33600.00	1541.93	9.33

101.61	0.00	33660.00	1541.93	9.35
101.63	0.00	33720.00	1541.92	9.37
101.65	0.00	33780.00	1541.92	9.38
101.66	0.00	33840.00	1541.92	9.40
101.68	0.00	33900.00	1541.91	9.42
101.68	0.00	33960.00	1541.91	9.43
101.70	0.00	34020.00	1541.91	9.45
101.71	0.00	34080.00	1541.90	9.47
101.72	0.00	34140.00	1541.89	9.48
101.74	0.00	34200.00	1541.89	9.50
101.76	0.00	34260.00	1541.89	9.52
101.77	0.00	34320.00	1541.89	9.53
101.79	0.00	34380.00	1541.88	9.55
101.80	0.00	34440.00	1541.88	9.57
101.81	0.00	34500.00	1541.88	9.58
101.81	0.00	34560.00	1541.88	9.60
101.84	0.00	34620.00	1541.87	9.62
101.84	0.00	34680.00	1541.87	9.63
101.86	0.00	34740.00	1541.86	9.65
101.87	0.00	34800.00	1541.85	9.67
101.88	0.00	34860.00	1541.85	9.68
101.90	0.00	34920.00	1541.85	9.70
101.90	0.00	34980.00	1541.84	9.72
101.90	0.00	35040.00	1541.84	9.73
101.92	0.00	35100.00	1541.83	9.75
101.94	0.00	35160.00	1541.83	9.77
101.94	0.00	35220.00	1541.83	9.78
101.97	0.00	35280.00	1541.83	9.80
101.96	0.00	35340.00	1541.82	9.82
101.99	0.00	35400.00	1541.82	9.83
102.00	0.00	35460.00	1541.81	9.85
102.00	0.00	35520.00	1541.81	9.87
102.01	0.00	35580.00	1541.81	9.88
102.03	0.00	35640.00	1541.80	9.90
102.04	0.00	35700.00	1541.80	9.92
102.05	0.00	35760.00	1541.80	9.93
102.05	0.00	35820.00	1541.79	9.95
102.08	0.00	35880.00	1541.79	9.97
102.08	0.00	35940.00	1541.79	9.98
102.10	0.00	36000.00	1541.79	10.00
102.11	0.00	36060.00	1541.78	10.02
102.13	0.00	36120.00	1541.76	10.03
102.15	0.00	36180.00	1541.74	10.05
102.14	0.00	36240.00	1541.73	10.07
102.16	0.00	36300.00	1541.73	10.08
102.17	0.00	36360.00	1541.73	10.10
102.18	0.00	36420.00	1541.73	10.12
102.19	0.00	36480.00	1541.72	10.13
102.20	0.00	36540.00	1541.72	10.15
102.21	0.00	36600.00	1541.72	10.17
102.23	0.00	36660.00	1541.71	10.18
102.24	0.00	36720.00	1541.71	10.20
102.25	0.00	36780.00	1541.71	10.22
102.26	0.00	36840.00	1541.71	10.23
102.28	0.00	36900.00	1541.71	10.25
102.29	0.00	36960.00	1541.70	10.27
102.30	0.00	37020.00	1541.70	10.28
102.31	0.00	37080.00	1541.70	10.30
102.31	0.00	37140.00	1541.69	10.32
102.33	0.00	37200.00	1541.69	10.33

102.35	0.00	37260.00	1541.68	10.35
102.36	0.00	37320.00	1541.68	10.37
102.37	0.00	37380.00	1541.68	10.38
102.37	0.00	37440.00	1541.67	10.40
102.38	0.00	37500.00	1541.67	10.42
102.39	0.00	37560.00	1541.67	10.43
102.41	0.00	37620.00	1541.67	10.45
102.42	0.00	37680.00	1541.67	10.47
102.45	0.00	37740.00	1541.66	10.48
102.46	0.00	37800.00	1541.66	10.50
102.46	0.00	37860.00	1541.66	10.52
102.46	0.00	37920.00	1541.66	10.53
102.48	0.00	37980.00	1541.65	10.55
102.49	0.00	38040.00	1541.64	10.57
102.51	0.00	38100.00	1541.64	10.58
102.52	0.00	38160.00	1541.64	10.60
102.52	0.00	38220.00	1541.64	10.62
102.52	0.00	38280.00	1541.64	10.63
102.52	0.00	38340.00	1541.63	10.65
102.55	0.00	38400.00	1541.63	10.67
102.56	0.00	38460.00	1541.62	10.68
102.59	0.00	38520.00	1541.62	10.70
102.60	0.00	38580.00	1541.62	10.72
102.60	0.00	38640.00	1541.61	10.73
102.61	0.00	38700.00	1541.61	10.75
102.62	0.00	38760.00	1541.60	10.77
102.62	0.00	38820.00	1541.60	10.78
102.63	0.00	38880.00	1541.60	10.80
102.65	0.00	38940.00	1541.59	10.82
102.66	0.00	39000.00	1541.59	10.83
102.66	0.00	39060.00	1541.59	10.85
102.68	0.00	39120.00	1541.59	10.87
102.69	0.00	39180.00	1541.58	10.88
102.69	0.00	39240.00	1541.58	10.90
102.71	0.00	39300.00	1541.58	10.92
102.71	0.00	39360.00	1541.58	10.93
102.75	0.00	39420.00	1541.58	10.95
102.75	0.00	39480.00	1541.57	10.97
102.77	0.00	39540.00	1541.57	10.98
102.78	0.00	39600.00	1541.57	11.00
102.79	0.00	39660.00	1541.56	11.02
102.80	0.00	39720.00	1541.56	11.03
102.81	0.00	39780.00	1541.55	11.05
102.81	0.00	39840.00	1541.55	11.07
102.83	0.00	39900.00	1541.55	11.08
102.82	0.00	39960.00	1541.55	11.10
102.84	0.00	40020.00	1541.55	11.12
102.85	0.00	40080.00	1541.54	11.13
102.86	0.00	40140.00	1541.54	11.15
102.87	0.00	40200.00	1541.54	11.17
102.88	0.00	40260.00	1541.53	11.18
102.89	0.00	40320.00	1541.53	11.20
102.90	0.00	40380.00	1541.53	11.22
102.90	0.00	40440.00	1541.52	11.23
102.92	0.00	40500.00	1541.52	11.25
102.92	0.00	40560.00	1541.52	11.27
102.95	0.00	40620.00	1541.52	11.28
102.96	0.00	40680.00	1541.51	11.30
102.98	0.00	40740.00	1541.51	11.32
102.98	0.00	40800.00	1541.51	11.33

102.99	0.00	40860.00	1541.51	11.35
103.00	0.00	40920.00	1541.50	11.37
103.01	0.00	40980.00	1541.50	11.38
103.03	0.00	41040.00	1541.50	11.40
103.04	0.00	41100.00	1541.50	11.42
103.03	0.00	41160.00	1541.49	11.43
103.05	0.00	41220.00	1541.48	11.45
103.06	0.00	41280.00	1541.48	11.47
103.06	0.00	41340.00	1541.48	11.48
103.08	0.00	41400.00	1541.48	11.50
103.08	0.00	41460.00	1541.47	11.52
103.08	0.00	41520.00	1541.47	11.53
103.09	0.00	41580.00	1541.47	11.55
103.11	0.00	41640.00	1541.46	11.57
103.11	0.00	41700.00	1541.46	11.58
103.12	0.00	41760.00	1541.46	11.60
103.13	0.00	41820.00	1541.46	11.62
103.14	0.00	41880.00	1541.45	11.63
103.16	0.00	41940.00	1541.45	11.65
103.16	0.00	42000.00	1541.44	11.67
103.17	0.00	42060.00	1541.44	11.68
103.17	0.00	42120.00	1541.44	11.70
103.19	0.00	42180.00	1541.44	11.72
103.20	0.00	42240.00	1541.44	11.73
103.21	0.00	42300.00	1541.43	11.75
103.21	0.00	42360.00	1541.43	11.77
103.22	0.00	42420.00	1541.43	11.78
103.24	0.00	42480.00	1541.43	11.80
103.25	0.00	42540.00	1541.42	11.82
103.26	0.00	42600.00	1541.42	11.83
103.28	0.00	42660.00	1541.42	11.85
103.28	0.00	42720.00	1541.42	11.87
103.29	0.00	42780.00	1541.41	11.88
103.29	0.00	42840.00	1541.41	11.90
103.30	0.00	42900.00	1541.40	11.92
103.31	0.00	42960.00	1541.40	11.93
103.32	0.00	43020.00	1541.40	11.95
103.32	0.00	43080.00	1541.39	11.97
103.33	0.00	43140.00	1541.39	11.98
103.36	0.00	43200.00	1541.39	12.00
103.35	0.00	43260.00	1541.38	12.02
103.36	0.00	43320.00	1541.38	12.03
103.37	0.00	43380.00	1541.39	12.05
103.38	0.00	43440.00	1541.38	12.07
103.38	0.00	43500.00	1541.38	12.08
103.39	0.00	43560.00	1541.38	12.10
103.40	0.00	43620.00	1541.38	12.12
103.41	0.00	43680.00	1541.38	12.13
103.43	0.00	43740.00	1541.37	12.15
103.43	0.00	43800.00	1541.37	12.17
103.44	0.00	43860.00	1541.37	12.18
103.45	0.00	43920.00	1541.36	12.20
103.46	0.00	43980.00	1541.36	12.22
103.47	0.00	44040.00	1541.35	12.23
103.48	0.00	44100.00	1541.35	12.25
103.49	0.00	44160.00	1541.35	12.27
103.50	0.00	44220.00	1541.35	12.28
103.50	0.00	44280.00	1541.35	12.30
103.51	0.00	44340.00	1541.34	12.32
103.54	0.00	44400.00	1541.34	12.33

103.54	0.00	44460.00	1541.34	12.35
103.55	0.00	44520.00	1541.34	12.37
103.54	0.00	44580.00	1541.33	12.38
103.56	0.00	44640.00	1541.33	12.40
103.57	0.00	44700.00	1541.33	12.42
103.58	0.00	44760.00	1541.33	12.43
103.59	0.00	44820.00	1541.32	12.45
103.60	0.00	44880.00	1541.32	12.47
103.61	0.00	44940.00	1541.32	12.48
103.61	0.00	45000.00	1541.32	12.50
103.62	0.00	45060.00	1541.32	12.52
103.63	0.00	45120.00	1541.31	12.53
103.64	0.00	45180.00	1541.31	12.55
103.65	0.00	45240.00	1541.31	12.57
103.65	0.00	45300.00	1541.30	12.58
103.66	0.00	45360.00	1541.31	12.60
103.67	0.00	45420.00	1541.30	12.62
103.68	0.00	45480.00	1541.30	12.63
103.69	0.00	45540.00	1541.30	12.65
103.73	0.00	45600.00	1541.29	12.67
103.72	0.00	45660.00	1541.29	12.68
103.73	0.00	45720.00	1541.29	12.70
103.74	0.00	45780.00	1541.28	12.72
103.76	0.00	45840.00	1541.28	12.73
103.77	0.00	45900.00	1541.28	12.75
103.77	0.00	45960.00	1541.28	12.77
103.78	0.00	46020.00	1541.27	12.78
103.79	0.00	46080.00	1541.27	12.80
103.80	0.00	46140.00	1541.27	12.82
103.81	0.00	46200.00	1541.26	12.83
103.82	0.00	46260.00	1541.26	12.85
103.82	0.00	46320.00	1541.26	12.87
103.83	0.00	46380.00	1541.26	12.88
103.85	0.00	46440.00	1541.25	12.90
103.85	0.00	46500.00	1541.25	12.92
103.86	0.00	46560.00	1541.25	12.93
103.87	0.00	46620.00	1541.25	12.95
103.87	0.00	46680.00	1541.24	12.97
103.89	0.00	46740.00	1541.24	12.98
103.90	0.00	46800.00	1541.24	13.00
103.90	0.00	46860.00	1541.23	13.02
103.91	0.00	46920.00	1541.23	13.03
103.92	0.00	46980.00	1541.22	13.05
103.92	0.00	47040.00	1541.22	13.07
103.93	0.00	47100.00	1541.22	13.08
103.94	0.00	47160.00	1541.22	13.10
103.95	0.00	47220.00	1541.22	13.12
103.96	0.00	47280.00	1541.22	13.13
103.97	0.00	47340.00	1541.22	13.15
103.98	0.00	47400.00	1541.21	13.17
103.98	0.00	47460.00	1541.21	13.18
103.99	0.00	47520.00	1541.21	13.20
104.00	0.00	47580.00	1541.21	13.22
104.00	0.00	47640.00	1541.21	13.23
104.00	0.00	47700.00	1541.21	13.25
104.00	0.00	47760.00	1541.21	13.27
104.00	0.00	47820.00	1541.21	13.28
104.03	0.00	47880.00	1541.20	13.30
104.02	0.00	47940.00	1541.20	13.32
104.04	0.00	48000.00	1541.19	13.33

104.05	0.00	48060.00	1541.19	13.35
104.06	0.00	48120.00	1541.19	13.37
104.07	0.00	48180.00	1541.19	13.38
104.08	0.00	48240.00	1541.19	13.40
104.09	0.00	48300.00	1541.18	13.42
104.09	0.00	48360.00	1541.18	13.43
104.10	0.00	48420.00	1541.18	13.45
104.10	0.00	48480.00	1541.18	13.47
104.12	0.00	48540.00	1541.18	13.48
104.13	0.00	48600.00	1541.17	13.50
104.13	0.00	48660.00	1541.17	13.52
104.13	0.00	48720.00	1541.17	13.53
104.14	0.00	48780.00	1541.17	13.55
104.15	0.00	48840.00	1541.17	13.57
104.16	0.00	48900.00	1541.17	13.58
104.18	0.00	48960.00	1541.16	13.60
104.18	0.00	49020.00	1541.16	13.62
104.20	0.00	49080.00	1541.15	13.63
104.20	0.00	49140.00	1541.15	13.65
104.21	0.00	49200.00	1541.15	13.67
104.20	0.00	49260.00	1541.14	13.68
104.22	0.00	49320.00	1541.14	13.70
104.23	0.00	49380.00	1541.14	13.72
104.25	0.00	49440.00	1541.14	13.73
104.24	0.00	49500.00	1541.14	13.75
104.26	0.00	49560.00	1541.14	13.77
104.26	0.00	49620.00	1541.12	13.78
104.27	0.00	49680.00	1541.12	13.80
104.30	0.00	49740.00	1541.12	13.82
104.29	0.00	49800.00	1541.12	13.83
104.29	0.00	49860.00	1541.12	13.85
104.31	0.00	49920.00	1541.12	13.87
104.33	0.00	49980.00	1541.11	13.88
104.33	0.00	50040.00	1541.11	13.90
104.34	0.00	50100.00	1541.11	13.92
104.34	0.00	50160.00	1541.11	13.93
104.34	0.00	50220.00	1541.10	13.95
104.36	0.00	50280.00	1541.10	13.97
104.37	0.00	50340.00	1541.10	13.98
104.38	0.00	50400.00	1541.10	14.00
104.39	0.00	50460.00	1541.10	14.02
104.39	0.00	50520.00	1541.10	14.03
104.39	0.00	50580.00	1541.09	14.05
104.39	0.00	50640.00	1541.09	14.07
104.41	0.00	50700.00	1541.09	14.08
104.41	0.00	50760.00	1541.09	14.10
104.42	0.00	50820.00	1541.08	14.12
104.42	0.00	50880.00	1541.08	14.13
104.45	0.00	50940.00	1541.08	14.15
104.45	0.00	51000.00	1541.07	14.17
104.45	0.00	51060.00	1541.07	14.18
104.46	0.00	51120.00	1541.07	14.20
104.47	0.00	51180.00	1541.07	14.22
104.47	0.00	51240.00	1541.07	14.23
104.48	0.00	51300.00	1541.07	14.25
104.49	0.00	51360.00	1541.07	14.27
104.50	0.00	51420.00	1541.06	14.28
104.51	0.00	51480.00	1541.06	14.30
104.51	0.00	51540.00	1541.05	14.32
104.53	0.00	51600.00	1541.05	14.33

104.54	0.00	51660.00	1541.05	14.35
104.54	0.00	51720.00	1541.05	14.37
104.56	0.00	51780.00	1541.05	14.38
104.55	0.00	51840.00	1541.05	14.40
104.56	0.00	51900.00	1541.05	14.42
104.57	0.00	51960.00	1541.05	14.43
104.58	0.00	52020.00	1541.04	14.45
104.59	0.00	52080.00	1541.04	14.47
104.60	0.00	52140.00	1541.03	14.48
104.60	0.00	52200.00	1541.03	14.50
104.61	0.00	52260.00	1541.03	14.52
104.62	0.00	52320.00	1541.02	14.53
104.63	0.00	52380.00	1541.02	14.55
104.63	0.00	52440.00	1541.02	14.57
104.65	0.00	52500.00	1541.02	14.58
104.65	0.00	52560.00	1541.01	14.60
104.66	0.00	52620.00	1541.01	14.62
104.67	0.00	52680.00	1541.01	14.63
104.66	0.00	52740.00	1541.01	14.65
104.67	0.00	52800.00	1541.01	14.67
104.68	0.00	52860.00	1541.01	14.68
104.69	0.00	52920.00	1541.01	14.70
104.70	0.00	52980.00	1541.01	14.72
104.70	0.00	53040.00	1541.00	14.73
104.71	0.00	53100.00	1541.00	14.75
104.72	0.00	53160.00	1541.00	14.77
104.73	0.00	53220.00	1541.00	14.78
104.73	0.00	53280.00	1541.00	14.80
104.75	0.00	53340.00	1540.99	14.82
104.75	0.00	53400.00	1540.99	14.83
104.75	0.00	53460.00	1540.99	14.85
104.76	0.00	53520.00	1540.99	14.87
104.76	0.00	53580.00	1540.99	14.88
104.77	0.00	53640.00	1540.98	14.90
104.79	0.00	53700.00	1540.98	14.92
104.78	0.00	53760.00	1540.98	14.93
104.80	0.00	53820.00	1540.98	14.95
104.81	0.00	53880.00	1540.97	14.97
104.82	0.00	53940.00	1540.97	14.98
104.82	0.00	54000.00	1540.96	15.00
104.83	0.00	54060.00	1540.96	15.02
104.83	0.00	54120.00	1540.96	15.03
104.84	0.00	54180.00	1540.96	15.05
104.84	0.00	54240.00	1540.96	15.07
104.85	0.00	54300.00	1540.96	15.08
104.86	0.00	54360.00	1540.96	15.10
104.87	0.00	54420.00	1540.96	15.12
104.89	0.00	54480.00	1540.94	15.13
104.87	0.00	54540.00	1540.94	15.15
104.89	0.00	54600.00	1540.94	15.17
104.90	0.00	54660.00	1540.94	15.18
104.91	0.00	54720.00	1540.94	15.20
104.90	0.00	54780.00	1540.93	15.22
104.91	0.00	54840.00	1540.94	15.23
104.91	0.00	54900.00	1540.93	15.25
104.93	0.00	54960.00	1540.93	15.27
104.93	0.00	55020.00	1540.93	15.28
104.95	0.00	55080.00	1540.93	15.30
104.96	0.00	55140.00	1540.93	15.32
104.99	0.00	55200.00	1540.93	15.33

104.98	0.00	55260.00	1540.93	15.35
104.97	0.00	55320.00	1540.93	15.37
104.99	0.00	55380.00	1540.92	15.38
104.99	0.00	55440.00	1540.91	15.40
104.99	0.00	55500.00	1540.91	15.42
104.99	0.00	55560.00	1540.92	15.43
105.00	0.00	55620.00	1540.92	15.45
105.01	0.00	55680.00	1540.91	15.47
105.02	0.00	55740.00	1540.91	15.48
105.02	0.00	55800.00	1540.91	15.50
105.03	0.00	55860.00	1540.90	15.52
105.04	0.00	55920.00	1540.90	15.53
105.04	0.00	55980.00	1540.90	15.55
105.05	0.00	56040.00	1540.90	15.57
105.07	0.00	56100.00	1540.89	15.58
105.07	0.00	56160.00	1540.89	15.60
105.07	0.00	56220.00	1540.89	15.62
105.08	0.00	56280.00	1540.88	15.63
105.08	0.00	56340.00	1540.88	15.65
105.09	0.00	56400.00	1540.88	15.67
105.09	0.00	56460.00	1540.89	15.68
105.10	0.00	56520.00	1540.88	15.70
105.11	0.00	56580.00	1540.88	15.72
105.13	0.00	56640.00	1540.88	15.73
105.14	0.00	56700.00	1540.87	15.75
105.13	0.00	56760.00	1540.87	15.77
105.14	0.00	56820.00	1540.86	15.78
105.16	0.00	56880.00	1540.86	15.80
105.14	0.00	56940.00	1540.86	15.82
105.17	0.00	57000.00	1540.87	15.83
105.16	0.00	57060.00	1540.86	15.85
105.17	0.00	57120.00	1540.86	15.87
105.17	0.00	57180.00	1540.86	15.88
105.18	0.00	57240.00	1540.86	15.90
105.20	0.00	57300.00	1540.85	15.92
105.20	0.00	57360.00	1540.85	15.93
105.21	0.00	57420.00	1540.85	15.95
105.22	0.00	57480.00	1540.84	15.97
105.23	0.00	57540.00	1540.84	15.98
105.23	0.00	57600.00	1540.84	16.00
105.25	0.00	57660.00	1540.84	16.02
105.24	0.00	57720.00	1540.83	16.03
105.25	0.00	57780.00	1540.83	16.05
105.25	0.00	57840.00	1540.83	16.07
105.27	0.00	57900.00	1540.82	16.08
105.26	0.00	57960.00	1540.82	16.10
105.27	0.00	58020.00	1540.82	16.12
105.28	0.00	58080.00	1540.82	16.13
105.29	0.00	58140.00	1540.82	16.15
105.30	0.00	58200.00	1540.82	16.17
105.30	0.00	58260.00	1540.82	16.18
105.30	0.00	58320.00	1540.82	16.20
105.31	0.00	58380.00	1540.81	16.22
105.32	0.00	58440.00	1540.81	16.23
105.33	0.00	58500.00	1540.81	16.25
105.35	0.00	58560.00	1540.81	16.27
105.34	0.00	58620.00	1540.80	16.28
105.35	0.00	58680.00	1540.78	16.30
105.36	0.00	58740.00	1540.81	16.32
105.36	0.00	58800.00	1540.80	16.33

105.37	0.00	58860.00	1540.80	16.35
105.40	0.00	58920.00	1540.78	16.37
105.41	0.00	58980.00	1540.76	16.38
105.42	0.00	59040.00	1540.74	16.40
105.43	0.00	59100.00	1540.78	16.42
105.42	0.00	59160.00	1540.78	16.43
105.43	0.00	59220.00	1540.78	16.45
105.42	0.00	59280.00	1540.77	16.47
105.42	0.00	59340.00	1540.79	16.48
105.42	0.00	59400.00	1540.80	16.50
105.42	0.00	59460.00	1540.80	16.52
105.44	0.00	59520.00	1540.78	16.53
105.46	0.00	59580.00	1540.78	16.55
105.46	0.00	59640.00	1540.78	16.57
105.47	0.00	59700.00	1540.78	16.58
105.47	0.00	59760.00	1540.78	16.60
105.47	0.00	59820.00	1540.77	16.62
105.49	0.00	59880.00	1540.77	16.63
105.49	0.00	59940.00	1540.77	16.65
105.50	0.00	60000.00	1540.77	16.67
105.50	0.00	60060.00	1540.76	16.68
105.51	0.00	60120.00	1540.76	16.70
105.52	0.00	60180.00	1540.76	16.72
105.52	0.00	60240.00	1540.76	16.73
105.52	0.00	60300.00	1540.76	16.75
105.53	0.00	60360.00	1540.76	16.77
105.53	0.00	60420.00	1540.76	16.78
105.54	0.00	60480.00	1540.76	16.80
105.55	0.00	60540.00	1540.76	16.82
105.56	0.00	60600.00	1540.76	16.83
105.56	0.00	60660.00	1540.75	16.85
105.57	0.00	60720.00	1540.75	16.87
105.57	0.00	60780.00	1540.74	16.88
105.58	0.00	60840.00	1540.75	16.90
105.59	0.00	60900.00	1540.74	16.92
105.60	0.00	60960.00	1540.73	16.93
105.60	0.00	61020.00	1540.73	16.95
105.60	0.00	61080.00	1540.73	16.97
105.61	0.00	61140.00	1540.73	16.98
105.62	0.00	61200.00	1540.73	17.00
105.63	0.00	61260.00	1540.73	17.02
105.63	0.00	61320.00	1540.73	17.03
105.63	0.00	61380.00	1540.71	17.05
105.64	0.00	61440.00	1540.71	17.07
105.66	0.00	61500.00	1540.71	17.08
105.66	0.00	61560.00	1540.71	17.10
105.65	0.00	61620.00	1540.71	17.12
105.67	0.00	61680.00	1540.69	17.13
105.67	0.00	61740.00	1540.70	17.15
105.67	0.00	61800.00	1540.70	17.17
105.68	0.00	61860.00	1540.70	17.18
105.70	0.00	61920.00	1540.70	17.20
105.70	0.00	61980.00	1540.70	17.22
105.70	0.00	62040.00	1540.70	17.23
105.71	0.00	62100.00	1540.70	17.25
105.71	0.00	62160.00	1540.69	17.27
105.72	0.00	62220.00	1540.69	17.28
105.72	0.00	62280.00	1540.69	17.30
105.73	0.00	62340.00	1540.69	17.32
105.74	0.00	62400.00	1540.69	17.33

105.75	0.00	62460.00	1540.69	17.35
105.75	0.00	62520.00	1540.69	17.37
105.75	0.00	62580.00	1540.68	17.38
105.76	0.00	62640.00	1540.68	17.40
105.76	0.00	62700.00	1540.68	17.42
105.78	0.00	62760.00	1540.68	17.43
105.78	0.00	62820.00	1540.66	17.45
105.79	0.00	62880.00	1540.66	17.47
105.78	0.00	62940.00	1540.66	17.48
105.78	0.00	63000.00	1540.66	17.50
105.80	0.00	63060.00	1540.65	17.52
105.80	0.00	63120.00	1540.65	17.53
105.79	0.00	63180.00	1540.65	17.55
105.81	0.00	63240.00	1540.65	17.57
105.81	0.00	63300.00	1540.64	17.58
105.82	0.00	63360.00	1540.65	17.60
105.82	0.00	63420.00	1540.63	17.62
105.83	0.00	63480.00	1540.63	17.63
105.85	0.00	63540.00	1540.63	17.65
105.84	0.00	63600.00	1540.63	17.67
105.85	0.00	63660.00	1540.63	17.68
105.86	0.00	63720.00	1540.63	17.70
105.86	0.00	63780.00	1540.63	17.72
105.87	0.00	63840.00	1540.62	17.73
105.87	0.00	63900.00	1540.63	17.75
105.88	0.00	63960.00	1540.64	17.77
105.89	0.00	64020.00	1540.63	17.78
105.90	0.00	64080.00	1540.64	17.80
105.89	0.00	64140.00	1540.64	17.82
105.90	0.00	64200.00	1540.63	17.83
105.91	0.00	64260.00	1540.63	17.85
105.91	0.00	64320.00	1540.63	17.87
105.92	0.00	64380.00	1540.62	17.88
105.93	0.00	64440.00	1540.62	17.90
105.93	0.00	64500.00	1540.61	17.92
105.93	0.00	64560.00	1540.61	17.93
105.96	0.00	64620.00	1540.61	17.95
105.94	0.00	64680.00	1540.61	17.97
105.95	0.00	64740.00	1540.61	17.98
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00

105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00

ECO SOLUTIONS, INC.

HOECHST CELANESE CHEMICAL GROUP

BAY CITY PLANT

MECHANICAL INTEGRITY TEST

WDW-32 WELL NO. 3

RECEIVED
DEC 10 1993

NOVEMBER 1993

Hoechst Celanese

Chemical Group
Hoechst Celanese Corporation
Bay City Plant
PO Box 509
Highway 3057
Bay City, TX 77404-0509

December 6, 1993
IOC-095-93

RECEIVED
DEC 10 1993
6 W-S

CERTIFIED MAIL

Mr. Laurence G. Walker, Geologist
UIC Team
UIC, Uranium and Radioactive Waste Section
Industrial and Hazardous Waste Division
Texas Natural Resource Conservation Commission
P. O. Box 13087
1700 North Congress Avenue
Austin, Texas 78711-3087

Subject: **MECHANICAL INTEGRITY TEST (MIT) REPORT FOR WDW-32**

Dear Mr. Walker:

Enclosed are two copies of the MIT report for WDW-32 which are provided for your review and approval. As you are aware the testing occurred between October 25th and October 28th 1993 and was performed by our contractor, ECO Solutions, Inc., Houston, Texas.

Please don't hesitate to contact me at 409/241-4197 if you have comments and/or questions concerning the report.

Very truly yours,

I. O. Coleman, Jr./cjs

I. O. Coleman, Jr.
Environmental Section Leader

IOC/cjs
attachment

cc: Mr. Ben K. Knape, Head - w/o
UIC Team
Industrial and Hazardous Waste Division
Texas Natural Resource Conservation Commission
P. O. Box 13087
Austin, Texas 78711-3087

Mr. Phil Dellinger - **CERTIFIED MAIL** - w/report
Underground Injection Control Program
Environmental Protection Agency
1445 Ross Avenue, Suite #1200
Dallas, Texas 75202-2733

TABLE OF CONTENTS

INTRODUCTION

BACKGROUND
TEST ANALYSIS

FIGURE 1 WDW-32 (WELL NO. 3) SCHEMATIC

FIELD ACTIVITY SUMMARY

PRESSURE FALLOFF TESTING REPORT SUMMARY OF TEST DATA

FALLOFF TEST DATA

FALL-OFF TEST ANALYSIS AND PLOTS

FIGURE 2 SEMI-LOG (M.D.H.)
FIGURE 3 SEMI-LOG (HORNER)
FIGURE 4 SEMI-LOG EXPANDED (HORNER)
FIGURE 5 DIMENSIONLESS (TYPE CURVE)
FIGURE 6 DERIVATIVE (TYPE CURVE)
FIGURE 7 DERIVATIVE (TYPE CURVE)
FIGURE 8 SEMI-LOG (HORNER) (SIMULATED TEST)
FIGURE 9 CARTESIAN (P vs ΔT)
FIGURE 10 CARTESIAN (P vs Time)
FIGURE 11 INJECTION RATE vs TIME
FIGURE 12 WDW-32 INJECTION RATE HISTORY

ANNULUS PRESSURE TEST

STATIC GRADIENT SURVEY

DEC 1 0
6 W-SU

RADIOACTIVE TRACER SURVEY ANALYSIS AND LOG

GAUGE CALIBRATION CERTIFICATE

TWC MECHANICAL INTEGRITY TESTING REPORT FORM

WELL LOG STRIP

RECEIVED
DEC 10 1993
8 W-SU

INTRODUCTION

INTRODUCTION

BACKGROUND

ECO Solutions, Inc. (ECO) was retained by Hoechst Celanese Chemical Group (HCCG) to conduct mechanical integrity and pressure falloff testing on WDW-32 (Well No. 3) located at the Bay City, Texas Plant. The testing occurred between October 25, 1993 and October 28, 1993. Mr. Robert M. Hall supervised the field operations for ECO.

The mechanical integrity testing (MIT) was divided into the following three (3) parts:

1. Annulus Pressure Test (APT) to meet annual MIT requirements.

2. Radioactive Tracer Survey (RAT) to meet annual MIT requirements.

3. Temperature Log to meet five (5) year MIT requirements.

The pressure falloff testing was performed to meet the Federal ambient monitoring requirements. The test objectives included:

1. To obtain a representative bottom hole pressure measurement of the injection interval to evaluate the effects of waste fluid injection on the receiving formation.

2. To calculate key reservoir properties to allow for comparison against values determined from previous testing and input into the no-migration petition.

TEST ANALYSIS

The attached report details the information gathered during the testing of the well and confirms the successful results. ECO Solutions reached the following conclusions regarding the mechanical integrity of WDW-32 (Well No. 3):

1. The annulus pressure test confirmed that there are no leaks in the tubing, protection casing, packer, or wellhead.

2. The radioactive tracer survey demonstrated that there is no significant upward fluid movement from the injection interval.

3. The temperature log showed no anomalies that may indicate the presence of interformational fluid transfer.

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

FIELD ACTIVITY SUMMARY

FIELD ACTIVITY SUMMARY

Monday, October 25, 1993

Arrived at Bay City Plant. Moved in and rigged up Milton Cooke. Prepared for Falloff Test. Ran in hole and tagged packer at 3,192'. Shut down injection at 1605 hrs and begin falloff test.

Tuesday, October 26, 1993

Monitored downhole injection pressure. Gathered petition data for falloff test.

Wednesday, October 27, 1993

Completed falloff test at 0839 hrs. Go down hole and tagged bottom at 3,353'. Pulled out of hole making static gradient stops every 500'. Rigged down Milton Cooke and moved out equipment.

Thursday, October 28, 1993

Moved in and rigged up Western Atlas. Ran in hole with Radioactive Tracer (RAT) / Temperature in tandem. Ran differential/absolute log from surface to 3,248'. Ran API Gamma Ray (GR) from 3,248' - 2,865'. Pressurized annulus to 993 psig at 1:00 p.m. with N_2 bottle. Pressured up to 1099 psi at 1:27 p.m. Began test at 2:00 p.m. with pressure at 1095.4 psi, pressure decreased to 1092.2 psi over a 30 minute period. Ran two Gamma Ray base logs from 3,248' - 2,850', ran RAT survey, and ran final base log. Rigged down Western Atlas.

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

PRESSURE FALLOFF TESTING
SUMMARY OF TEST DATA

PRESSURE FALLOFF TESTING REPORT SUMMARY OF TEST DATA

HOECHST CELANESE CHEMICAL GROUP
BAY CITY PLANT
WDW-32 (WELL NO. 3)

FALLOFF TEST DATA

General Information

1. Date of test: 10/25/93
2. Time since reservoir pressure was stabilized: . 9/16/92
3. Cumulative injection into completed interval: . 1846 E+06 gal
4. Wellbore radius: . . . . . 3179'
5. Completed interval: . . . . . 3,315' - 3,553'
6. Type of completion: . . . . . Screen and Gravel Pack
7. Depth to fill: . . . . . 3,248'
8. Justified interval thickness: . . . . . 165'
9. Composition of inj. interval
   a. Single massive unit: . . . . . yes (see log strip)
   b. Hydraulically isolated sand unit: . . . . . no
10. Copy of selected SP or GR strip log of inj. interval: . . . . . Included
11. Avg. historical waste fluid viscosity: 0.60
12. Formation fluid viscosity: 0.71
13. Porosity: 33%
14. Total compressibility: 5.0000 E-06

Injection Period

1. Time of injection period: . . . . . Well shut in for 30 hours beginning @ 1605 hrs., 10/25/93 and ending @ 0840 hrs., 10/27/93.
2. Test fluid: . . . . . Wastestream
3. Inj. rate graph for all wells completed into test interval: . . . . . included.
4. Pumps used for test: . . . . . GSJM, centrifugal process pump
5. Injection fluid viscosity: 0.60
6. Method & times tested: . . . . . Specific Gravity (PT-005) using a Reischauer Pycnometer, Fluid Viscosity using a Brookfield Viscometer. Two days before test, every four hours.
7. Final injection pressure & temperature: . . . . 1476 psi, 104° F
8. Gauge type: GPG-520
9. Gauge resolution & calibration check: . . . . 0.01 psi, 4/27/93
10. Gauge depth: . . . . . 3192'

Falloff Period

1. Total shutin time: . . . . . 30 hours
2. Final shutin pressure & temperature: . . . . . 1476 psi, 104°F

Information on Nearby Injectors

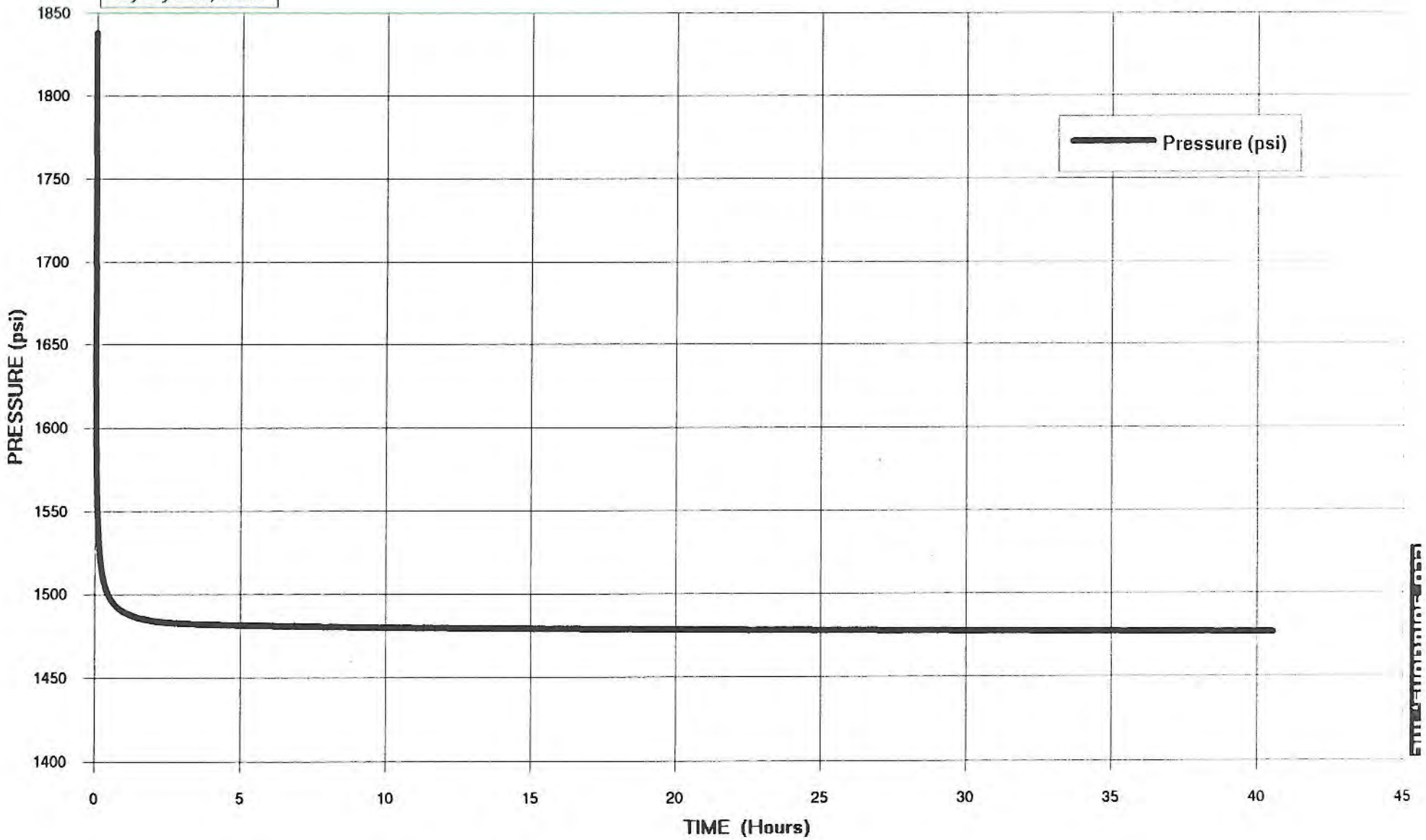
1. WDW-14 Well No. 2
   a. avg. rate prior to falloff: . . . . . shut in 10/23/93 @ 0530 hrs.
   b. avg rate during falloff: . . . . . shut in
2. WDW-49 Well No. 4
   a. avg. rate prior to falloff: . . . . . Shut in 7/16/93
   b. avg. rate during falloff: . . . . . Shut in

3 WDW-110 Well No. 1-A
   a. avg. rate prior to falloff: . . . . . shut in 10/23/93 @ 0600 hrs.
   b. avg. rate prior to falloff: . . . . . shut in

11/19/93 10:39 AM
WDW32.FAL Chart 1

PRESSURE FALLOFF TEST
Pressure vs Hours
WDW-32 (Well #3)

HOECHST CELANESE
Bay City Plant, Texas



ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

FALLOFF TEST ANALYSIS AND PLOTS

EPA FALLOFF TEST REPORT

(Analysis Test Results)

1. Distance to waste front:		4105 ft.
2. Time to exit waste front:		2.76 hrs
3. Radius of investigation:		3179 ft.
4. Time to beginning of infinite acting portion of test:		4.62 hrs
5. Horner time to beginning of infinite portion of test:		2921
6. Slope or slopes from Horner Plot:	(psi/cycle)	4.558
7. Transmissibility (kh/u):	(md-ft/cp)	163594
8. Permeability:		696 md
9. Skin:		83

(Other Parameters)

1. Injection volume (07/67 - 10/93)	1846 E+06 gal
2. Injection Pressure @ 3300 ft	1885 psi
3. Static Pressure @ 3300 ft.	1523 psi
4. Injection Pump Type (GSMJ, centrifugal process pump)	BYRON JACKSON
5. Fluid sampling (2 days before test, every 4 hours)	
6. Method: Specific Gravity (using a Reischauer Pycnometer)	PT-005
7. Method: Fluid Viscosity (using a Brookfield Viscometer)	PT-025
8. Waste viscosity (@ 102 ^{o}F)	0.60
9. Formation fluid viscosity	0.71
10. Date of Last Shut-in	09/16/92

HOECHST CELANESE CHEMICAL
WDW-32 (Well #3)
Bay City Plant, Texas

Test Date: 10/25/1993

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas 10/25/1993

Perforations: 3202' - 3553' (Gravel pack screen)
Gauge Depth ..... 3192.0 feet

[INPUT PARAMETERS]
(Fall-off Analysis)

Well Type - INJECTION

Reservoir Pressure	psia	P	1562
Reservoir Temperature	Deg F	T	104
Final Static Pressure	psia	Psi	1476
Final Injection Pressure	psia	Pinj	1838
H2O Flow Rate	gal/min	Qw	-133
Sand Thickness	feet	hnet	165
Wellbore Radius	feet	rw	0.5830
Formation Porosity	%	POR	33
Extrapolated Pressure	psia	P*	1466
Extrapolated Press @ 1hr	psia	P1hr	1484
Semi-Log Slope	psi/cycle	M	4.558
Production Time	hrs	tp	9672.00
Shut-in Time	hrs	tsi	40.00

Uw (cp)	7.0166E-01	Bw (RB/STB)	1.0057E+00
Cw (1/psi)	3.0369E-06	Ct (1/psi)	5.9994E-06

[TYPE CURVE MATCH POINTS]

dP	363.078		Pd	93.633
dt	4.642	Cde2S 1E +80	tD/Cd	6449.474

[CALCULATED RESULTS]

(Semi-Log) Analysis			Pressure Method
Transmissibility	md-ft/cp	kh/u	163594.813
Flow Capacity	md-ft	kh	114788.750
Permeability	md	k	695.689
Skin Damage	total	S	+82.56
Pressure Drop due to Skin	psia	dP	+326.77
Flow Efficiency	%	FE	+0.00
Drainage Radius	feet	rd	4105

Type Curve (Log-Log) Analysis			
Transmissibility	md-ft/cp	kh/u	166988.672
Flow Capacity	md-ft	kh	117170.102
Permeability	md	k	710.122
Skin Damage	total	S	+89.28
Pressure Drop due to Skin	psia	dP	+346.18
Flow Efficiency	%	FE	+0.00

[ECO SOLUTIONS, Inc.]

K+E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6210

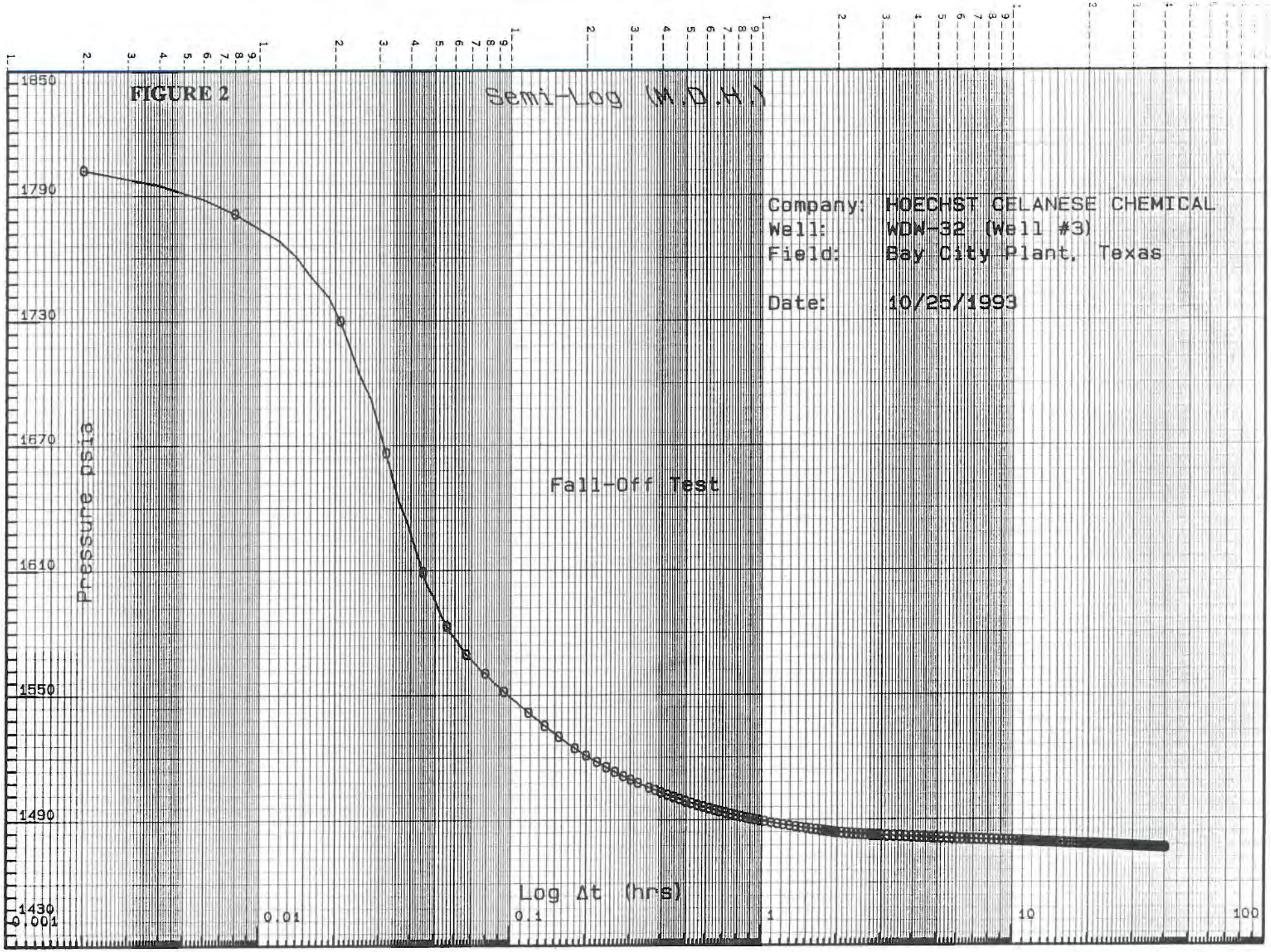
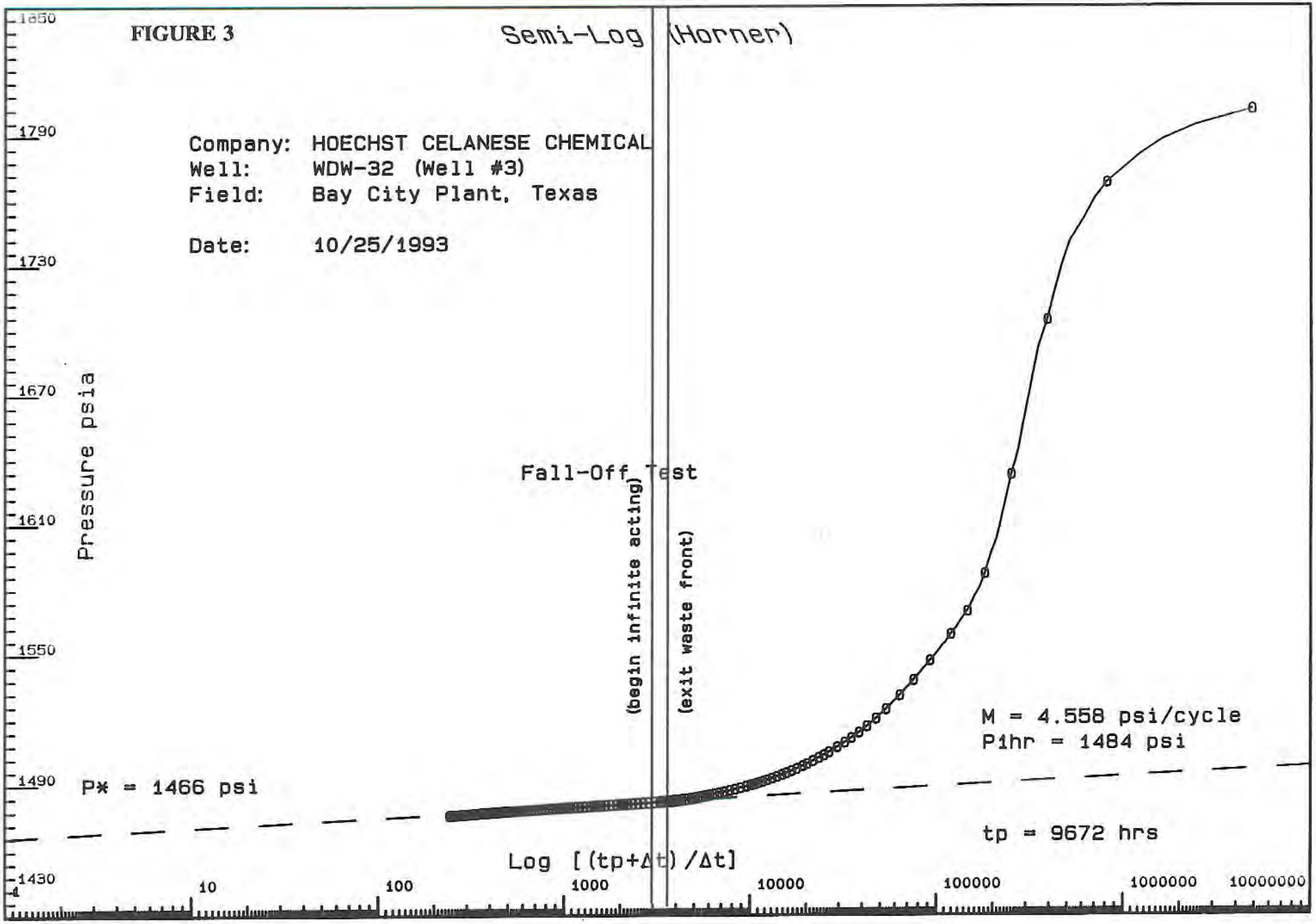


FIGURE 3


Semi-Log (Horner)
Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas
Date: 10/25/1993
Fall-Off Test
(begin infinite acting)
(exit waste front)
M = 4.558 psi/cycle
P1hr = 1484 psi
P* = 1466 psi
tp = 9672 hrs
Pressure psia
1850
1790
1730
1670
1610
1550
1490
1430
Log [(tp+Δt)/Δt]
10
100
1000
10000
100000
1000000
10000000

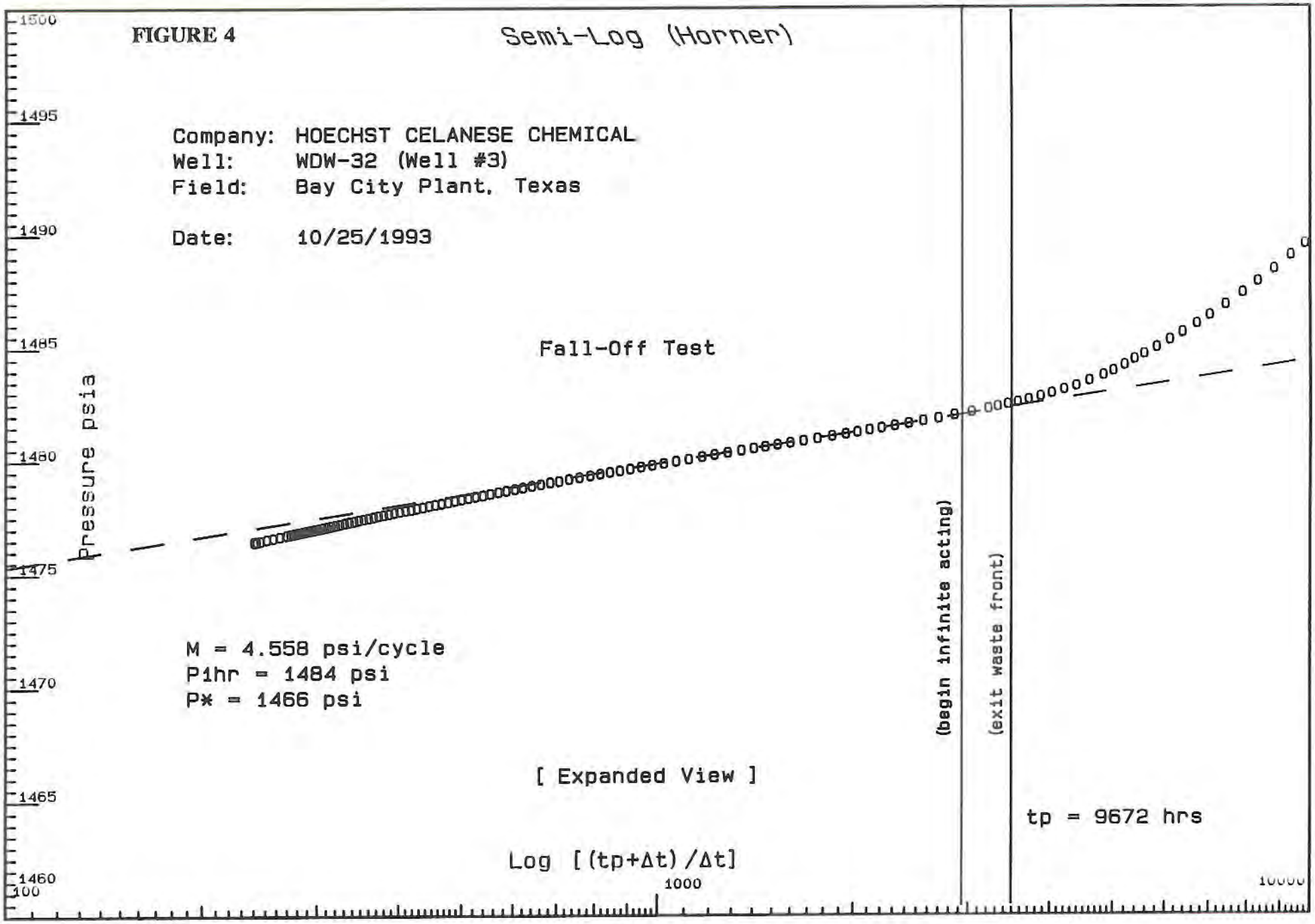
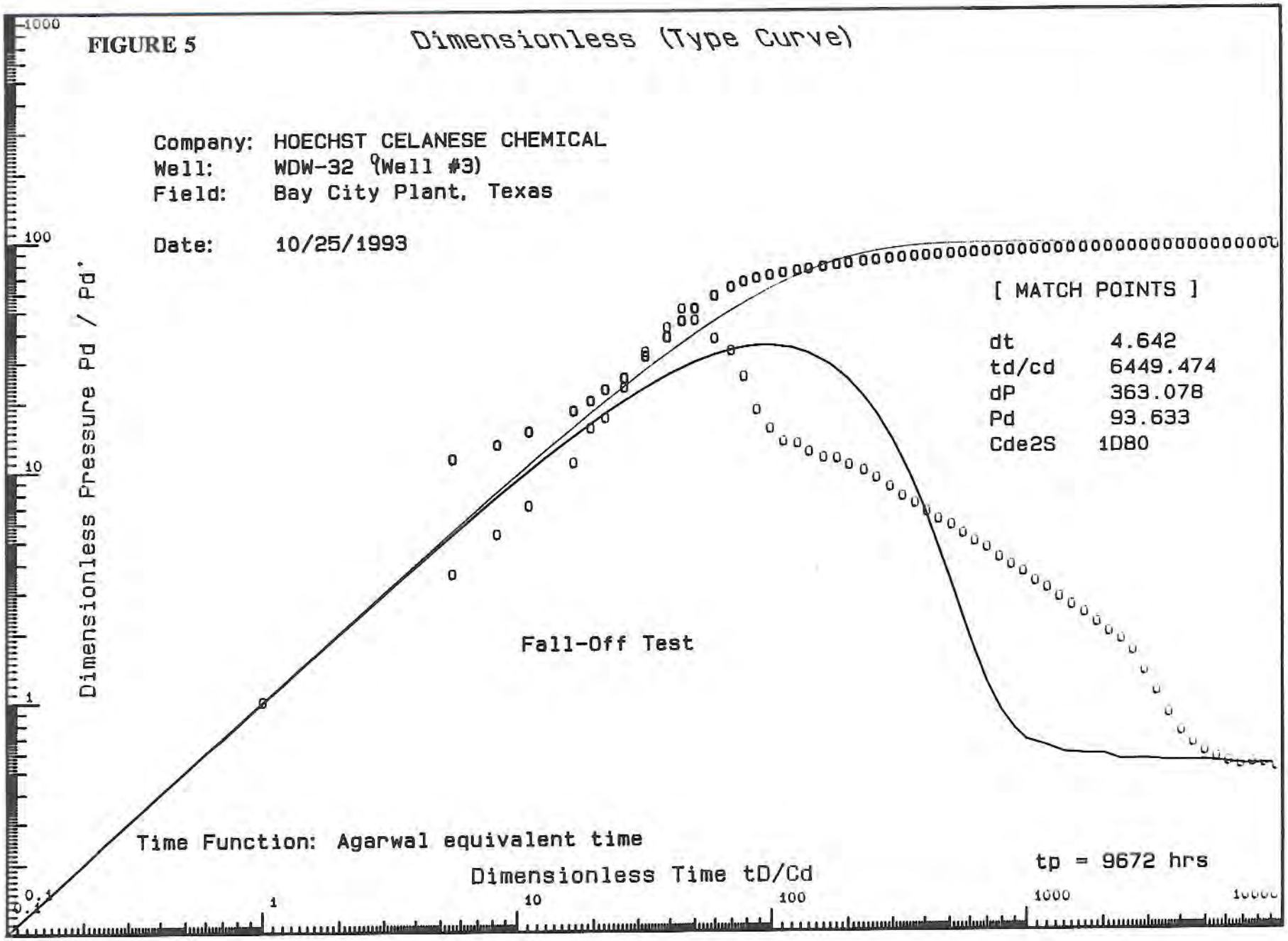


FIGURE 4
Semi-Log (Horner)
Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas
Date: 10/25/1993
Fall-Off Test
Pressure psia
1500
1495
1490
1485
1480
1475
1470
1465
1460
M = 4.558 psi/cycle
P1hr = 1484 psi
P* = 1466 psi
(begin infinite acting)
(exit waste front)
[Expanded View]
tp = 9672 hrs
Log [(tp+Δt)/Δt]
100
1000
10000

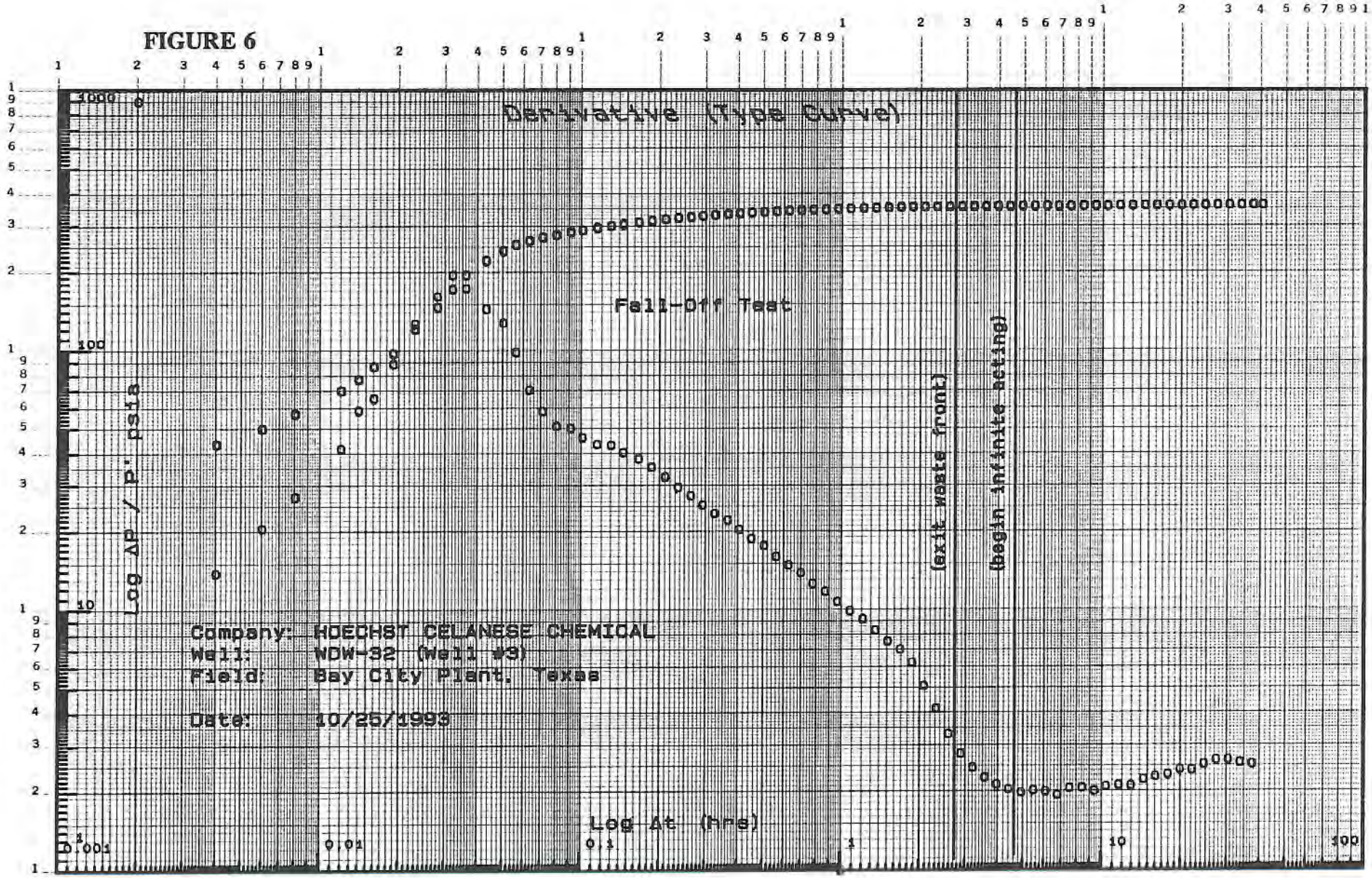
FIGURE 5


Dimensionless (Type Curve)
Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas
Date: 10/25/1993
[MATCH POINTS]
dt 4.642
td/cd 6449.474
dP 363.078
Pd 93.633
Cde2S 1D80
Fall-Off Test
Time Function: Agarwal equivalent time
tp = 9672 hrs
Dimensionless Time tD/Cd
Dimensionless Pressure Pd / Pd'
1000
100
10
1
0.1
1
10
100
1000
10000

K+E LOGARITHMIC 3 X 5 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

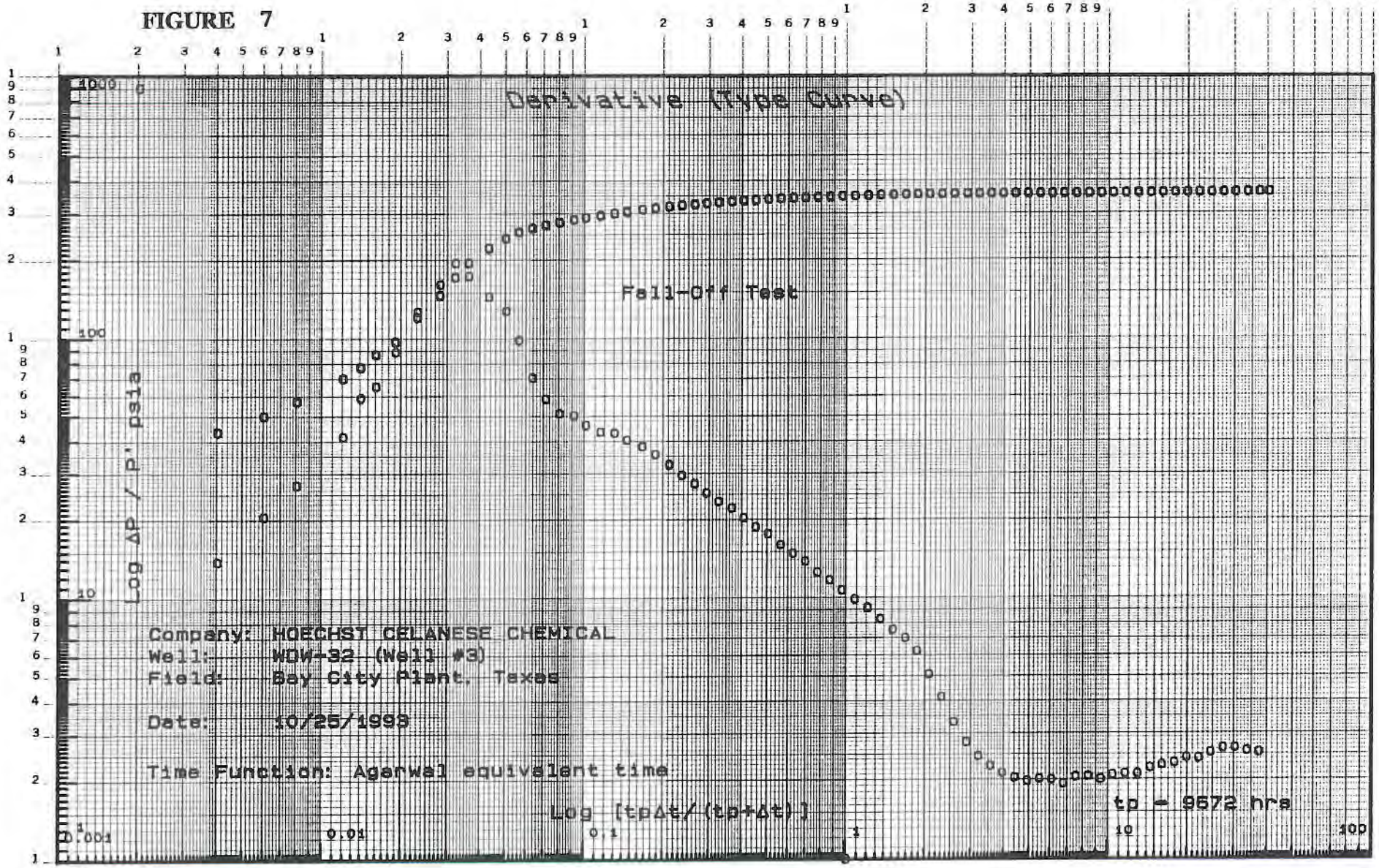
46 7520

FIGURE 6



K+E LOGARITHMIC 3 x 5 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

FIGURE 7



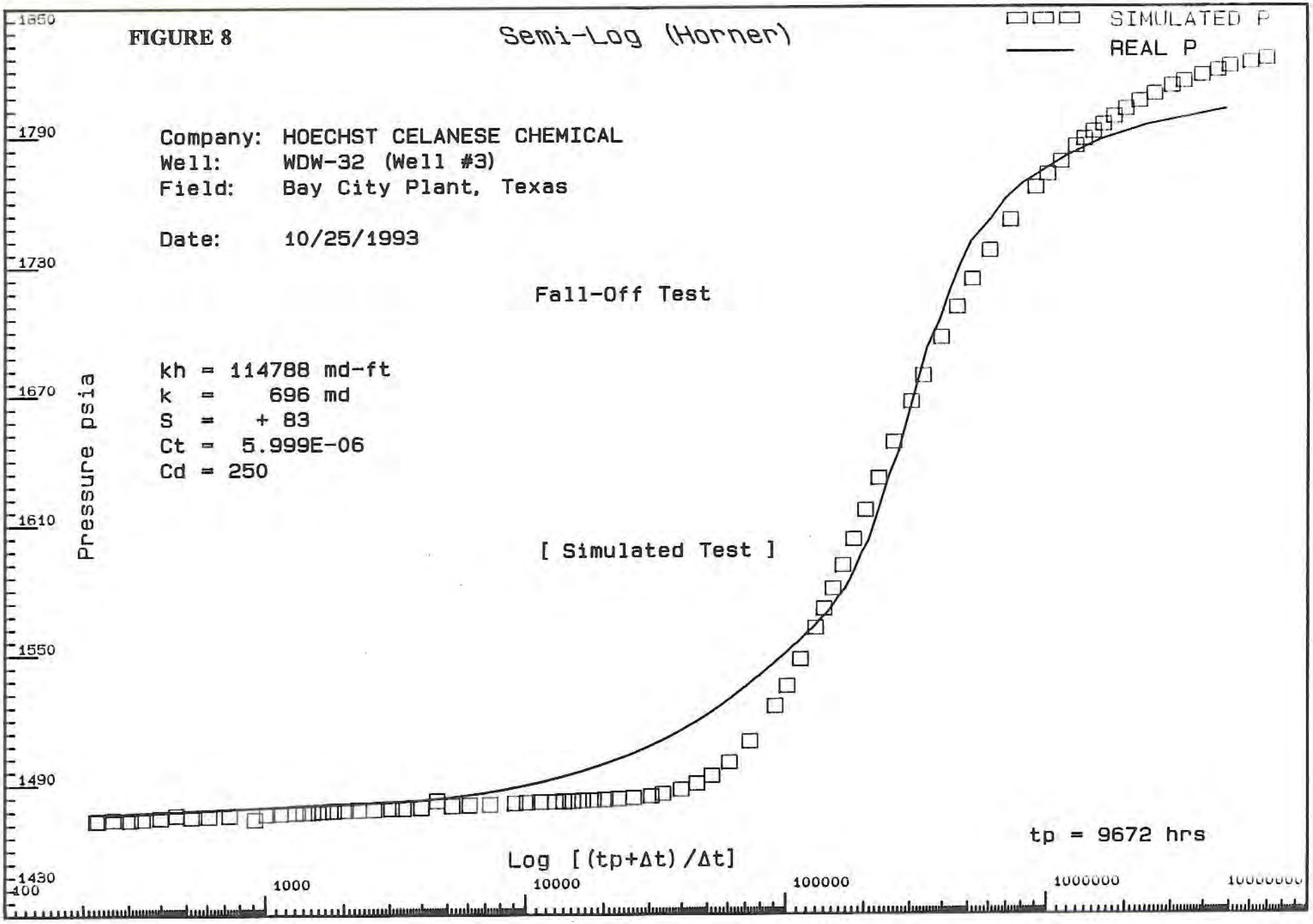


FIGURE 8
Semi-Log (Horner)
SIMULATED P
REAL P
Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas
Date: 10/25/1993
Fall-Off Test
kh = 114788 md-ft
k = 696 md
S = + 83
Ct = 5.999E-06
Cd = 250
[Simulated Test]
tp = 9672 hrs
Pressure psia
1850
1790
1730
1670
1610
1550
1490
1430
Log [(tp+Δt)/Δt]
100
1000
10000
100000
1000000
10000000

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

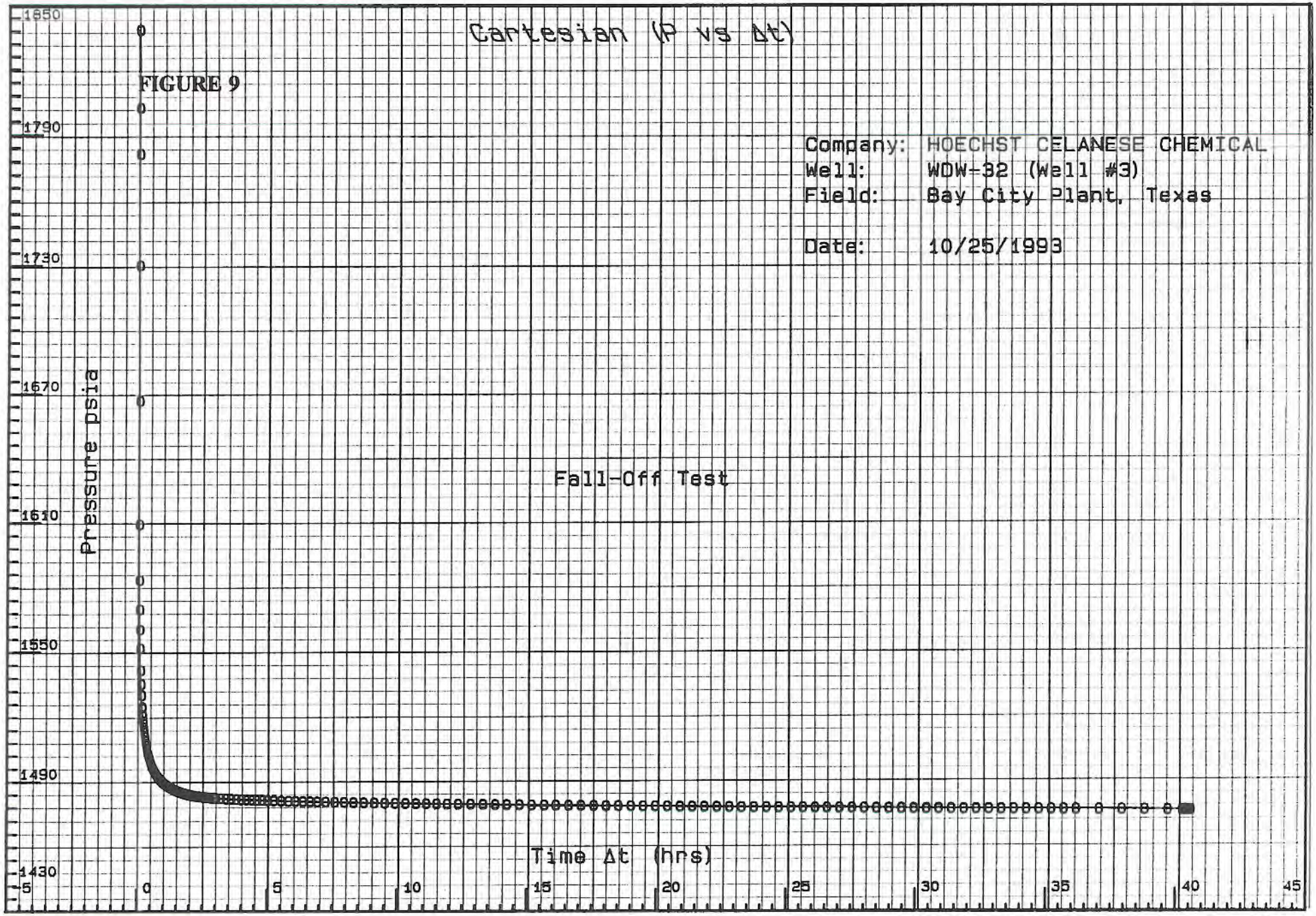
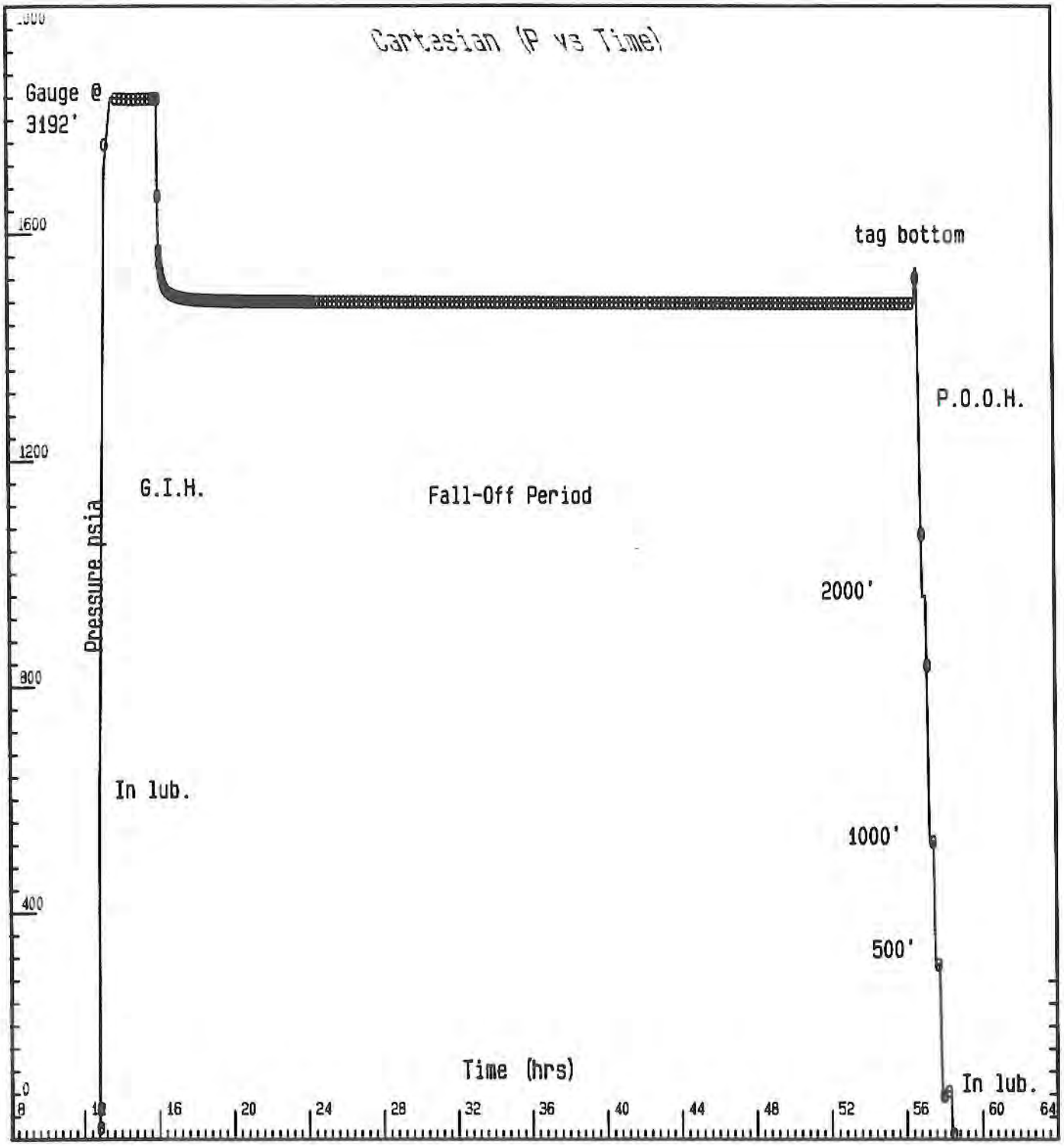


FIGURE 10



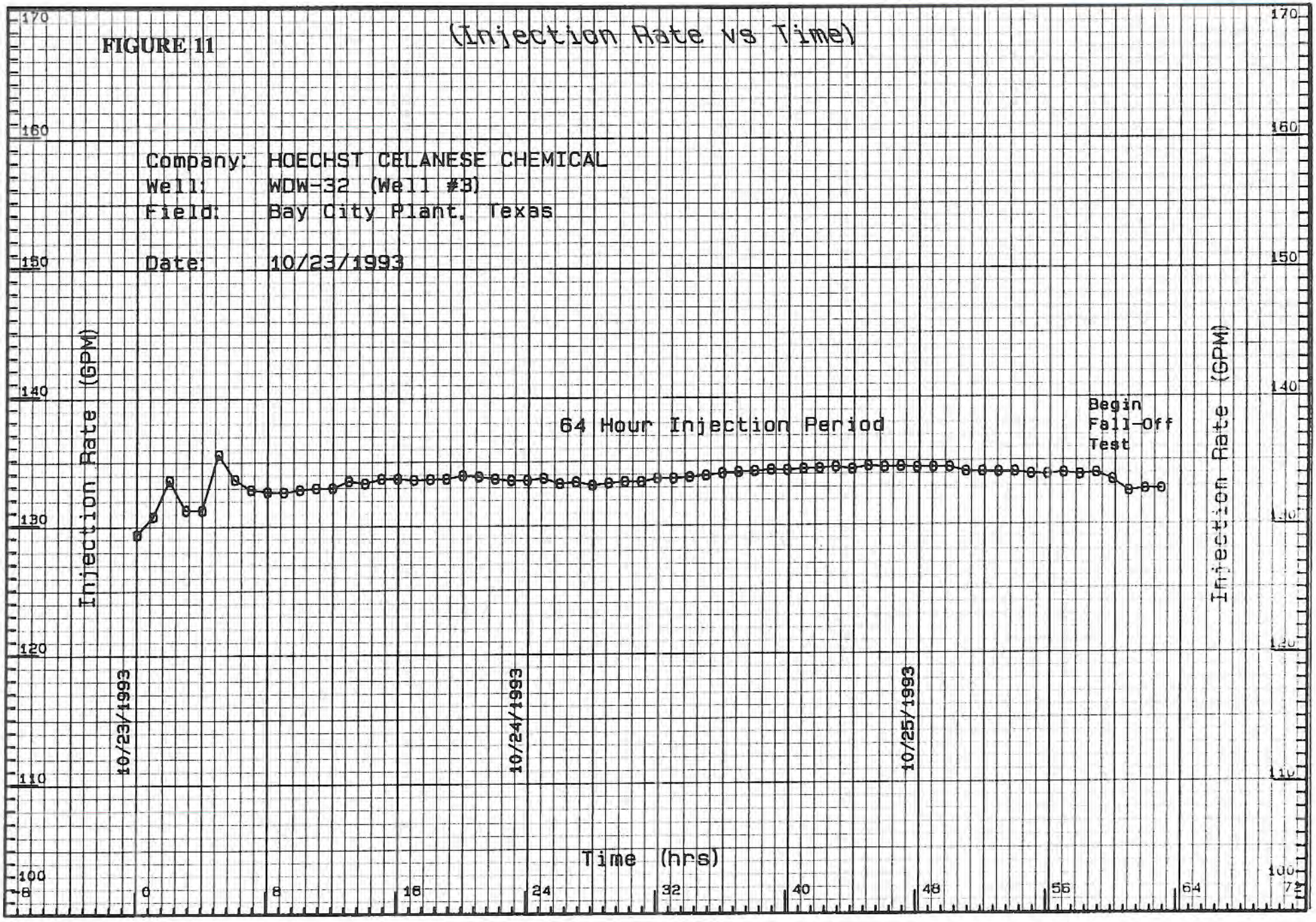
Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

Date: 10/25/1993

Begin Time: 12:47:50 10/25/1993
End Time: 10:26:00 10/27/1993

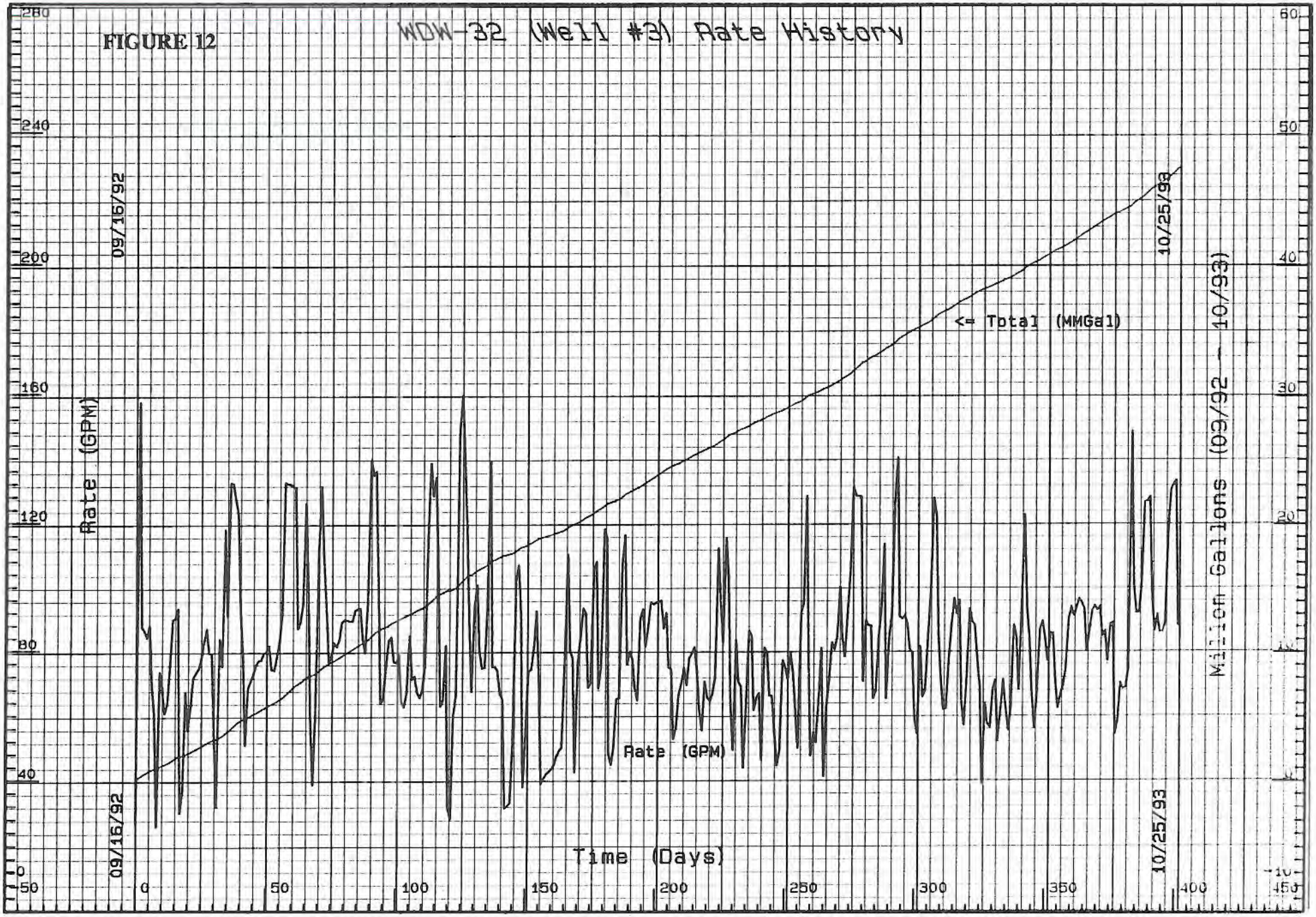
Injection Pressure = 1838 psi
Static Pressure = 1476 psi
Injection Rate = 133 GPM

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

FIGURE 12



Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3) [Monday: Oct. 25, 1993]
Field: Bay City Plant, Texas

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
		Injection period of 133 GPM, prepare to go in hole			
		EPG-520 (SRO) ... MicroSmart SP-200 (Memory Gauge)			
1	0	12:47:50	0.0000	20.08	0.00
3	0	12:49:45	0.0320	604.79	90.11
		Going in hole with SRO and Memory Gauge			
4	0	12:50:43	0.0480	627.04	93.37
5	0	12:51:40	0.0640	624.25	101.56
7	0	12:54: 4	0.1040	684.58	104.08
9	0	13:11:25	0.3930	1472.70	103.94
10	0	13:12:51	0.4170	1536.42	103.90
12	0	13:14:46	0.4490	1623.85	103.89
14	0	13:16:42	0.4810	1714.41	103.91
		Gauge @ 3200 ft. , tag packer ... correct to 3192'			
		Monitor downhole injection pressure			
16	0	13:38:39	0.0000	1839.49	104.05
18	0	13:40:34	0.0320	1838.61	104.02
20	0	13:42:30	0.0640	1839.28	104.01
22	0	13:44:25	0.0960	1839.01	104.00
24	0	13:48:12	0.1590	1839.92	104.04
26	0	13:50: 7	0.1910	1839.36	104.03
28	0	13:52: 2	0.2230	1839.28	104.02
30	0	13:53:57	0.2550	1838.46	103.99
31	0	13:55:24	0.2790	1838.44	103.98
33	0	13:57:19	0.3110	1838.25	103.92
35	0	13:59:14	0.3430	1838.29	103.89
37	0	14: 1: 9	0.3750	1838.30	103.89
39	0	14: 3: 4	0.4070	1838.19	103.90
41	0	14: 5: 0	0.4390	1838.49	103.93
43	0	14: 6:55	0.4710	1838.49	103.97
45	0	14: 8:50	0.5030	1838.13	103.97
47	0	14:10:45	0.5350	1838.04	103.95
49	0	14:12:40	0.5670	1838.01	103.92
51	0	14:14:36	0.5990	1837.90	103.87
53	0	14:16:31	0.6310	1838.02	103.84
55	0	14:18:26	0.6630	1838.24	103.87
57	0	14:20:21	0.6950	1837.68	103.89
59	0	14:22:16	0.7270	1837.70	103.90
61	0	14:24:12	0.7590	1837.70	103.88
62	0	14:25:38	0.7830	1837.38	103.87
64	0	14:27:33	0.8150	1837.37	103.88
66	0	14:29:28	0.8470	1837.46	103.88
68	0	14:31:24	0.8790	1837.18	103.90
70	0	14:33:19	0.9110	1837.11	103.93
72	0	14:35:14	0.9430	1837.28	103.94
74	0	14:37: 9	0.9750	1837.44	103.97
75	0	14:38:36	0.9990	1837.06	103.97
77	0	14:40:31	1.0310	1837.27	103.97
79	0	14:42:26	1.0630	1837.28	103.96
81	0	14:44:50	1.1030	1837.32	103.96
83	0	14:46:45	1.1350	1837.33	103.98
85	0	14:48:40	1.1670	1837.52	104.01
87	0	14:50:36	1.1990	1837.52	104.04
88	0	14:52: 2	1.2230	1837.39	104.05
90	0	14:53:57	1.2550	1837.30	104.02
92	0	14:55:52	1.2870	1837.35	103.98

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3) [Monday: Oct. 25, 1993]
Field: Bay City Plant, Texas Page 2

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
94	0	14:57:48	1.3190	1837.28	103.94
96	0	14:59:43	1.3510	1837.43	103.92
98	0	15: 1:38	1.3830	1837.53	103.91
100	0	15: 3:33	1.4150	1837.59	103.92
102	0	15: 5:28	1.4470	1837.63	103.92
104	0	15: 7:24	1.4790	1837.59	103.91
106	0	15: 9:19	1.5110	1837.43	103.90
108	0	15:11:14	1.5430	1837.47	103.89
110	0	15:13: 9	1.5750	1837.61	103.89
112	0	15:15: 4	1.6070	1837.58	103.91
114	0	15:17: 0	1.6390	1837.37	103.93
116	0	15:18:55	1.6710	1837.49	103.97
118	0	15:20:50	1.7030	1837.32	104.00
120	0	15:22:45	1.7350	1837.51	104.03
122	0	15:24:40	1.7670	1837.45	104.05
124	0	15:26:36	1.7990	1837.52	104.06
126	0	15:28:31	1.8310	1837.44	104.06
127	0	15:29:57	1.8550	1837.40	104.06
129	0	15:31:52	1.8870	1837.45	104.05
131	0	15:33:48	1.9190	1837.48	104.02
133	0	15:35:43	1.9510	1837.61	103.99
135	0	15:37:38	1.9830	1837.60	103.96
137	0	15:39:33	2.0150	1837.71	103.97
139	0	15:41:28	2.0470	1837.62	103.97
141	0	15:43:24	2.0790	1837.91	104.00
143	0	15:45:19	2.1110	1838.08	104.02
145	0	15:47:14	2.1430	1838.34	104.03
147	0	15:49: 9	2.1750	1838.13	104.04
148	0	15:50:14	2.1930	1838.27	104.05
155	0	15:51:19	2.2110	1838.31	104.05
162	0	15:52:20	2.2280	1838.33	104.05
170	0	15:53:25	2.2460	1838.24	104.04
177	0	15:54:26	2.2630	1838.22	104.03
185	0	15:55:34	2.2820	1838.26	104.02
192	0	15:56:36	2.2990	1838.18	104.00
199	0	15:57:37	2.3160	1838.11	103.99
207	0	15:58:42	2.3340	1837.99	103.97
214	0	15:59:46	2.3520	1838.13	103.95
222	0	16: 0:48	2.3690	1838.08	103.94
229	0	16: 1:52	2.3870	1838.02	103.93
236	0	16: 2:54	2.4040	1838.10	103.93
244	0	16: 3:58	2.4220	1838.50	103.93
250	0	16: 4:52	2.4370	1838.41	103.93
251	0	16: 5: 0	2.4390	1838.44	103.93
252	0	16: 5:10	2.4420	1838.37	103.94
253	0	16: 5:18	2.4440	1838.33	103.93
254	0	16: 5:25	2.4460	1838.40	103.94
255	0	16: 5:32	2.4480	1838.33	103.93
		Stop injection, Begin Fall-Off Test			
256	0	16: 5:43	0.0000	1838.29	103.93
257	0	16: 5:50	0.0020	1802.07	103.94
258	0	16: 5:57	0.0040	1794.89	103.93
259	0	16: 6: 4	0.0060	1788.28	103.93
260	0	16: 6:12	0.0080	1781.21	103.93
261	0	16: 6:26	0.0120	1768.22	103.93

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
262	0	16: 6:33	0.0140	1760.82	103.93
263	0	16: 6:40	0.0160	1751.41	103.93
264	0	16: 6:51	0.0190	1741.06	103.93
265	0	16: 6:58	0.0210	1729.86	103.93
266	0	16: 7: 6	0.0230	1717.54	103.93
267	0	16: 7:13	0.0250	1704.76	103.92
268	0	16: 7:24	0.0280	1691.99	103.92
269	0	16: 7:31	0.0300	1678.99	103.92
270	0	16: 7:38	0.0320	1666.48	103.92
271	0	16: 7:45	0.0340	1654.66	103.92
272	0	16: 7:52	0.0360	1643.38	103.92
273	0	16: 8: 3	0.0390	1633.14	103.91
274	0	16: 8:18	0.0430	1616.54	103.91
275	0	16: 8:25	0.0450	1609.01	103.91
276	0	16: 8:32	0.0470	1602.36	103.90
277	0	16: 8:43	0.0500	1596.53	103.90
278	0	16: 8:50	0.0520	1591.49	103.90
279	0	16: 8:57	0.0540	1586.98	103.90
280	0	16: 9: 4	0.0560	1583.10	103.90
281	0	16: 9:12	0.0580	1579.81	103.89
282	0	16: 9:22	0.0610	1576.79	103.89
283	0	16: 9:30	0.0630	1574.15	103.89
284	0	16: 9:37	0.0650	1571.79	103.89
285	0	16: 9:44	0.0670	1569.62	103.89
286	0	16: 9:58	0.0710	1566.52	103.89
287	0	16:10: 6	0.0730	1564.98	103.89
288	0	16:10:13	0.0750	1563.34	103.89
289	0	16:10:20	0.0770	1561.80	103.89
290	0	16:10:31	0.0800	1560.32	103.89
291	0	16:10:38	0.0820	1558.91	103.89
292	0	16:10:45	0.0840	1557.57	103.89
293	0	16:10:52	0.0860	1556.28	103.88
294	0	16:11: 0	0.0880	1555.04	103.88
295	0	16:11:10	0.0910	1553.83	103.89
296	0	16:11:18	0.0930	1552.68	103.89
297	0	16:11:25	0.0950	1551.56	103.89
298	0	16:11:32	0.0970	1550.48	103.88
299	0	16:11:46	0.1010	1548.69	103.88
300	0	16:11:54	0.1030	1547.68	103.89
301	0	16:12: 4	0.1060	1546.74	103.89
302	0	16:12:12	0.1080	1545.81	103.89
303	0	16:12:19	0.1100	1544.89	103.89
304	0	16:12:26	0.1120	1544.01	103.89
305	0	16:12:37	0.1150	1543.11	103.89
306	0	16:12:44	0.1170	1542.26	103.89
307	0	16:12:51	0.1190	1541.44	103.89
308	0	16:12:58	0.1210	1540.63	103.89
309	0	16:13: 6	0.1230	1539.84	103.88
310	0	16:13:16	0.1260	1539.08	103.89
311	0	16:13:31	0.1300	1537.76	103.88
312	0	16:13:38	0.1320	1537.10	103.89
313	0	16:13:45	0.1340	1536.40	103.88
314	0	16:13:52	0.1360	1535.73	103.88
315	0	16:14: 0	0.1380	1535.07	103.88
316	0	16:14:10	0.1410	1534.43	103.88

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
317	0	16:14:18	0.1430	1533.77	103.88
318	0	16:14:25	0.1450	1533.17	103.89
319	0	16:14:32	0.1470	1532.55	103.89
320	0	16:14:43	0.1500	1531.95	103.89
321	0	16:14:50	0.1520	1531.37	103.88
322	0	16:14:57	0.1540	1530.80	103.88
323	0	16:15: 8	0.1570	1529.99	103.88
324	0	16:15:40	0.1660	1527.91	103.88
325	0	16:15:55	0.1700	1527.01	103.88
326	0	16:16: 9	0.1740	1526.13	103.88
327	0	16:16:24	0.1780	1525.32	103.88
328	0	16:16:38	0.1820	1524.48	103.88
329	0	16:16:52	0.1860	1523.72	103.88
330	0	16:17: 7	0.1900	1522.97	103.88
331	0	16:17:21	0.1940	1522.24	103.88
332	0	16:17:36	0.1980	1521.56	103.88
333	0	16:17:50	0.2020	1520.86	103.88
334	0	16:18: 4	0.2060	1520.23	103.88
335	0	16:18:19	0.2100	1519.60	103.88
336	0	16:18:37	0.2150	1518.82	103.88
337	0	16:18:51	0.2190	1518.33	103.88
338	0	16:19: 6	0.2230	1517.75	103.88
339	0	16:19:20	0.2270	1517.22	103.88
340	0	16:19:34	0.2310	1516.69	103.88
341	0	16:19:49	0.2350	1516.17	103.88
342	0	16:20: 3	0.2390	1515.70	103.88
343	0	16:20:18	0.2430	1515.19	103.88
344	0	16:20:32	0.2470	1514.74	103.88
345	0	16:20:46	0.2510	1514.28	103.88
346	0	16:21: 1	0.2550	1513.83	103.88
347	0	16:21:15	0.2590	1513.41	103.88
348	0	16:21:30	0.2630	1512.98	103.88
349	0	16:21:48	0.2680	1512.47	103.88
350	0	16:22: 2	0.2720	1512.07	103.88
351	0	16:22:16	0.2760	1511.68	103.88
352	0	16:22:31	0.2800	1511.31	103.88
353	0	16:22:45	0.2840	1510.93	103.88
354	0	16:23: 0	0.2880	1510.58	103.88
355	0	16:23:14	0.2920	1510.23	103.88
356	0	16:23:28	0.2960	1509.89	103.88
357	0	16:23:43	0.3000	1509.56	103.88
358	0	16:23:57	0.3040	1509.22	103.88
359	0	16:24:12	0.3080	1508.91	103.88
360	0	16:24:26	0.3120	1508.60	103.88
361	0	16:24:40	0.3160	1508.21	103.88
362	0	16:24:55	0.3200	1507.95	103.88
363	0	16:25:13	0.3250	1507.64	103.89
364	0	16:25:24	0.3280	1507.37	103.89
365	0	16:25:42	0.3330	1507.09	103.88
366	0	16:25:52	0.3360	1506.81	103.89
367	0	16:26: 7	0.3400	1506.54	103.88
368	0	16:26:25	0.3450	1506.27	103.88
369	0	16:26:36	0.3480	1506.02	103.89
370	0	16:26:54	0.3530	1505.76	103.89
371	0	16:27: 4	0.3560	1505.51	103.89

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
372	0	16:27:19	0.3600	1505.27	103.88
373	0	16:27:37	0.3650	1505.01	103.89
374	0	16:27:51	0.3690	1504.74	103.88
375	0	16:28: 6	0.3730	1504.50	103.88
376	0	16:28:20	0.3770	1504.28	103.89
377	0	16:28:34	0.3810	1504.06	103.89
378	0	16:28:49	0.3850	1503.84	103.89
379	0	16:29: 3	0.3890	1503.62	103.89
380	0	16:29:18	0.3930	1503.40	103.89
381	0	16:29:32	0.3970	1503.20	103.89
382	0	16:29:46	0.4010	1503.00	103.89
383	0	16:30: 1	0.4050	1502.79	103.89
384	0	16:30:15	0.4090	1502.59	103.88
385	0	16:30:30	0.4130	1502.40	103.89
386	0	16:30:48	0.4180	1502.19	103.88
387	0	16:30:58	0.4210	1502.01	103.89
388	0	16:31:16	0.4260	1501.83	103.88
389	0	16:31:31	0.4300	1501.65	103.88
390	0	16:31:45	0.4340	1501.47	103.89
391	0	16:32: 0	0.4380	1501.30	103.89
392	0	16:32:10	0.4410	1501.12	103.89
393	0	16:32:28	0.4460	1500.94	103.89
394	0	16:32:43	0.4500	1500.78	103.89
395	0	16:32:57	0.4540	1500.62	103.89
396	0	16:33:12	0.4580	1500.45	103.89
397	0	16:33:22	0.4610	1500.30	103.89
398	0	16:33:40	0.4660	1500.13	103.89
399	0	16:33:55	0.4700	1499.94	103.89
400	0	16:34:13	0.4750	1499.79	103.89
401	0	16:34:24	0.4780	1499.63	103.89
402	0	16:34:38	0.4820	1499.48	103.89
403	0	16:34:52	0.4860	1499.34	103.89
404	0	16:35: 7	0.4900	1499.19	103.89
405	0	16:35:25	0.4950	1499.05	103.89
406	0	16:35:36	0.4980	1498.90	103.89
407	0	16:35:50	0.5020	1498.77	103.89
408	0	16:36: 4	0.5060	1498.63	103.89
409	0	16:36:19	0.5100	1498.50	103.89
410	0	16:36:55	0.5200	1498.20	103.89
411	0	16:37:13	0.5250	1497.99	103.89
412	0	16:37:34	0.5310	1497.81	103.89
413	0	16:37:56	0.5370	1497.62	103.89
414	0	16:38:18	0.5430	1497.44	103.89
415	0	16:38:43	0.5500	1497.25	103.89
416	0	16:39: 1	0.5550	1497.08	103.89
417	0	16:39:22	0.5610	1496.90	103.89
418	0	16:39:44	0.5670	1496.73	103.89
419	0	16:40: 6	0.5730	1496.57	103.89
420	0	16:40:31	0.5800	1496.40	103.89
421	0	16:40:49	0.5850	1496.24	103.89
422	0	16:41:10	0.5910	1496.08	103.89
423	0	16:41:32	0.5970	1495.92	103.89
424	0	16:41:54	0.6030	1495.77	103.89
425	0	16:42:19	0.6100	1495.62	103.89
426	0	16:42:37	0.6150	1495.48	103.89

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
427	0	16:43:13	0.6250	1495.28	103.89
428	0	16:43:31	0.6300	1495.12	103.89
429	0	16:43:52	0.6360	1494.98	103.89
430	0	16:44:14	0.6420	1494.84	103.89
431	0	16:44:36	0.6480	1494.71	103.90
432	0	16:45: 1	0.6550	1494.58	103.90
433	0	16:45:19	0.6600	1494.45	103.90
434	0	16:45:40	0.6660	1494.32	103.90
435	0	16:46: 2	0.6720	1494.20	103.90
436	0	16:46:24	0.6780	1494.04	103.90
437	0	16:46:49	0.6850	1493.95	103.90
438	0	16:47: 7	0.6900	1493.83	103.90
439	0	16:47:28	0.6960	1493.71	103.90
440	0	16:47:50	0.7020	1493.60	103.90
441	0	16:48:12	0.7080	1493.48	103.90
442	0	16:48:37	0.7150	1493.37	103.90
443	0	16:48:55	0.7200	1493.26	103.90
444	0	16:49:16	0.7260	1493.15	103.90
445	0	16:49:38	0.7320	1493.04	103.90
446	0	16:50: 0	0.7380	1492.93	103.90
447	0	16:50:25	0.7450	1492.83	103.90
448	0	16:50:43	0.7500	1492.72	103.90
449	0	16:51: 4	0.7560	1492.62	103.90
450	0	16:51:26	0.7620	1492.52	103.90
451	0	16:51:48	0.7680	1492.42	103.90
452	0	16:52:13	0.7750	1492.32	103.90
453	0	16:52:31	0.7800	1492.23	103.90
454	0	16:52:52	0.7860	1492.13	103.90
455	0	16:53:14	0.7920	1492.04	103.90
456	0	16:53:36	0.7980	1491.94	103.90
457	0	16:54: 1	0.8050	1491.85	103.90
458	0	16:54:19	0.8100	1491.76	103.90
459	0	16:54:40	0.8160	1491.67	103.90
460	0	16:55: 2	0.8220	1491.58	103.90
461	0	16:55:24	0.8280	1491.48	103.90
462	0	16:55:49	0.8350	1491.41	103.90
463	0	16:56: 7	0.8400	1491.33	103.90
464	0	16:56:28	0.8460	1491.24	103.90
465	0	16:56:50	0.8520	1491.15	103.90
466	0	16:57:12	0.8580	1491.07	103.90
467	0	16:57:37	0.8650	1490.99	103.90
468	0	16:57:55	0.8700	1490.91	103.90
469	0	16:58:16	0.8760	1490.83	103.90
470	0	16:58:38	0.8820	1490.76	103.90
471	0	16:59: 0	0.8880	1490.68	103.90
472	0	16:59:25	0.8950	1490.61	103.90
473	0	16:59:43	0.9000	1490.53	103.90
474	0	17: 0: 4	0.9060	1490.45	103.90
475	0	17: 0:26	0.9120	1490.39	103.90
476	0	17: 0:48	0.9180	1490.31	103.90
477	0	17: 1:13	0.9250	1490.24	103.90
478	0	17: 1:31	0.9300	1490.17	103.90
479	0	17: 1:52	0.9360	1490.10	103.90
480	0	17: 2:14	0.9420	1490.03	103.90
481	0	17: 2:46	0.9510	1489.92	103.90

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
482	0	17: 3: 8	0.9570	1489.85	103.90
483	0	17: 3:30	0.9630	1489.78	103.90
484	0	17: 3:55	0.9700	1489.72	103.91
485	0	17: 4:13	0.9750	1489.66	103.91
486	0	17: 4:34	0.9810	1489.58	103.90
487	0	17: 4:56	0.9870	1489.53	103.91
488	0	17: 5:18	0.9930	1489.46	103.90
489	0	17: 5:43	1.0000	1489.40	103.91
490	0	17: 6: 1	1.0050	1489.34	103.91
491	0	17: 6:22	1.0110	1489.28	103.91
492	0	17: 6:44	1.0170	1489.22	103.91
493	0	17: 7: 6	1.0230	1489.16	103.91
494	0	17: 7:31	1.0300	1489.09	103.91
495	0	17: 8: 0	1.0380	1489.02	103.91
496	0	17: 8:25	1.0450	1488.94	103.91
497	0	17: 8:43	1.0500	1488.89	103.91
498	0	17: 9: 4	1.0560	1488.84	103.91
499	0	17: 9:30	1.0630	1488.78	103.91
504	0	17:11:46	1.1010	1488.42	103.91
509	0	17:14:10	1.1410	1488.07	103.91
514	0	17:16:34	1.1810	1487.75	103.91
519	0	17:18:58	1.2210	1487.45	103.91
524	0	17:21:22	1.2610	1487.16	103.91
528	0	17:23:36	1.2980	1486.91	103.91
533	0	17:26: 0	1.3380	1486.66	103.92
536	0	17:28: 6	1.3730	1486.44	103.92
541	0	17:30:30	1.4130	1486.20	103.91
546	0	17:32:54	1.4530	1485.98	103.91
550	0	17:35: 7	1.4900	1485.80	103.91
555	0	17:37:31	1.5300	1485.60	103.92
559	0	17:39:40	1.5660	1485.43	103.92
564	0	17:42: 4	1.6060	1485.26	103.92
568	0	17:44:10	1.6410	1485.10	103.92
573	0	17:46:34	1.6810	1484.94	103.93
578	0	17:49:16	1.7260	1484.76	103.93
583	0	17:51:40	1.7660	1484.62	103.93
587	0	17:53:46	1.8010	1484.48	103.93
592	0	17:56:10	1.8410	1484.31	103.92
596	0	17:58:24	1.8780	1484.18	103.93
601	0	18: 0:48	1.9180	1484.05	103.92
606	0	18: 3:12	1.9580	1483.93	103.93
611	0	18: 5:36	1.9980	1483.82	103.93
615	0	18: 7:42	2.0330	1483.73	103.93
620	0	18:10: 6	2.0730	1483.64	103.93
625	0	18:12:30	2.1130	1483.54	103.93
630	0	18:14:54	2.1530	1483.44	103.93
635	0	18:17:18	2.1930	1483.35	103.93
639	0	18:19:31	2.2300	1483.28	103.93
644	0	18:21:55	2.2700	1483.21	103.93
649	0	18:24:19	2.3100	1483.14	103.93
654	0	18:26:43	2.3500	1483.07	103.93
659	0	18:29: 7	2.3900	1483.00	103.93
664	0	18:31:31	2.4300	1482.95	103.93
669	0	18:33:55	2.4700	1482.89	103.93
674	0	18:36:19	2.5100	1482.83	103.93

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
679	0	18:38:43	2.5500	1482.77	103.93
683	0	18:40:52	2.5860	1482.73	103.94
688	0	18:43:16	2.6260	1482.68	103.94
693	0	18:45:40	2.6660	1482.63	103.94
698	0	18:48: 4	2.7060	1482.59	103.94
703	0	18:50:28	2.7460	1482.55	103.94
708	0	18:52:52	2.7860	1482.50	103.94
713	0	18:55:16	2.8260	1482.47	103.94
718	0	18:57:40	2.8660	1482.43	103.94
723	0	19: 0: 4	2.9060	1482.39	103.94
728	0	19: 2:28	2.9460	1482.35	103.94
733	0	19: 4:52	2.9860	1482.31	103.94
738	0	19: 7:16	3.0260	1482.29	103.94
743	0	19: 9:40	3.0660	1482.25	103.94
748	0	19:12: 4	3.1060	1482.21	103.94
753	0	19:14:28	3.1460	1482.19	103.95
758	0	19:16:52	3.1860	1482.15	103.95
763	0	19:19:16	3.2260	1482.12	103.94
768	0	19:21:40	3.2660	1482.09	103.95
773	0	19:24: 4	3.3060	1482.06	103.95
778	0	19:26:28	3.3460	1482.03	103.95
783	0	19:28:52	3.3860	1482.01	103.95
788	0	19:31:16	3.4260	1481.98	103.96
793	0	19:33:40	3.4660	1481.95	103.95
797	0	19:35:46	3.5010	1481.92	103.95
802	0	19:38:10	3.5410	1481.90	103.96
807	0	19:40:34	3.5810	1481.87	103.95
812	0	19:42:58	3.6210	1481.85	103.94
817	0	19:45:22	3.6610	1481.82	103.95
822	0	19:47:46	3.7010	1481.80	103.95
827	0	19:50:10	3.7410	1481.78	103.95
832	0	19:52:34	3.7810	1481.76	103.96
837	0	19:54:58	3.8210	1481.73	103.96
842	0	19:57:22	3.8610	1481.71	103.95
847	0	19:59:46	3.9010	1481.69	103.96
852	0	20: 2:10	3.9410	1481.67	103.96
857	0	20: 4:34	3.9810	1481.65	103.97
862	0	20: 6:58	4.0210	1481.63	103.96
867	0	20: 9:22	4.0610	1481.61	103.96
872	0	20:11:46	4.1010	1481.58	103.96
877	0	20:14:10	4.1410	1481.56	103.96
882	0	20:16:34	4.1810	1481.54	103.96
887	0	20:18:58	4.2210	1481.52	103.96
892	0	20:21:22	4.2610	1481.50	103.96
897	0	20:23:46	4.3010	1481.48	103.96
902	0	20:26:10	4.3410	1481.47	103.96
907	0	20:28:34	4.3810	1481.45	103.96
911	0	20:30:48	4.4180	1481.42	103.97
916	0	20:33:12	4.4580	1481.41	103.97
921	0	20:35:36	4.4980	1481.40	103.97
926	0	20:38: 0	4.5380	1481.38	103.97
931	0	20:40:24	4.5780	1481.37	103.97
936	0	20:42:48	4.6180	1481.35	103.97
941	0	20:45:12	4.6580	1481.33	103.97
946	0	20:47:36	4.6980	1481.31	103.97

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
951	0	20:50: 0	4.7380	1481.31	103.97
956	0	20:52:24	4.7780	1481.27	103.97
961	0	20:54:48	4.8180	1481.26	103.97
966	0	20:57:12	4.8580	1481.24	103.97
971	0	20:59:36	4.8980	1481.22	103.98
976	0	21: 2: 0	4.9380	1481.21	103.98
981	0	21: 4:24	4.9780	1481.19	103.98
986	0	21: 6:48	5.0180	1481.18	103.98
991	0	21: 9:12	5.0580	1481.16	103.98
996	0	21:11:36	5.0980	1481.14	103.98
1001	0	21:14: 0	5.1380	1481.13	103.98
1006	0	21:16:24	5.1780	1481.11	103.98
1011	0	21:18:48	5.2180	1481.10	103.98
1016	0	21:21:12	5.2580	1481.08	103.99
1021	0	21:23:36	5.2980	1481.07	103.98
1026	0	21:26: 0	5.3380	1481.05	103.98
1031	0	21:28:24	5.3780	1481.04	103.98
1036	0	21:30:48	5.4180	1481.02	103.97
1041	0	21:33:12	5.4580	1481.01	103.98
1046	0	21:35:36	5.4980	1480.98	103.98
1051	0	21:38: 0	5.5380	1480.97	103.98
1056	0	21:40:24	5.5780	1480.96	103.98
1061	0	21:42:48	5.6180	1480.95	103.98
1066	0	21:45:12	5.6580	1480.94	103.99
1071	0	21:47:36	5.6980	1480.91	103.99
1076	0	21:50: 0	5.7380	1480.91	103.99
1081	0	21:52:24	5.7780	1480.90	103.99
1086	0	21:54:48	5.8180	1480.88	103.99
1091	0	21:57:12	5.8580	1480.87	103.99
1096	0	21:59:36	5.8980	1480.86	103.99
1101	0	22: 2: 0	5.9380	1480.83	103.99
1106	0	22: 4:24	5.9780	1480.83	103.99
1111	0	22: 6:48	6.0180	1480.81	103.99
1115	0	22: 8:54	6.0530	1480.81	104.00
1120	0	22:11:18	6.0930	1480.79	104.00
1125	0	22:13:42	6.1330	1480.78	104.00
1130	0	22:16: 6	6.1730	1480.76	104.00
1135	0	22:18:30	6.2130	1480.76	104.00
1140	0	22:20:54	6.2530	1480.74	104.00
1145	0	22:23:18	6.2930	1480.73	104.00
1150	0	22:25:42	6.3330	1480.72	104.00
1155	0	22:28: 6	6.3730	1480.70	104.00
1160	0	22:30:30	6.4130	1480.69	104.01
1165	0	22:32:54	6.4530	1480.68	104.01
1170	0	22:35:18	6.4930	1480.67	104.01
1175	0	22:37:42	6.5330	1480.65	104.01
1180	0	22:40: 6	6.5730	1480.65	104.01
1185	0	22:42:30	6.6130	1480.64	104.01
1189	0	22:44:43	6.6500	1480.62	104.01
1194	0	22:47: 7	6.6900	1480.61	104.01
1199	0	22:49:31	6.7300	1480.59	104.01
1204	0	22:51:55	6.7700	1480.58	104.01
1209	0	22:54:19	6.8100	1480.57	104.01
1214	0	22:56:43	6.8500	1480.56	104.01
1219	0	22:59: 7	6.8900	1480.55	104.01

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Monday: Oct. 25, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
1224	0	23: 1:31	6.9300	1480.55	104.01
1229	0	23: 3:55	6.9700	1480.53	104.01
1234	0	23: 6:19	7.0100	1480.52	104.01
1239	0	23: 8:43	7.0500	1480.50	104.02
1244	0	23:11: 7	7.0900	1480.50	104.02
1249	0	23:13:31	7.1300	1480.49	104.02
1254	0	23:15:55	7.1700	1480.47	104.02
1259	0	23:18:19	7.2100	1480.46	104.02
1264	0	23:20:43	7.2500	1480.45	104.02
1269	0	23:23: 7	7.2900	1480.44	104.02
1274	0	23:25:31	7.3300	1480.43	104.02
1279	0	23:27:55	7.3700	1480.42	104.02
1284	0	23:30:19	7.4100	1480.41	104.02
1289	0	23:32:43	7.4500	1480.40	104.02
1294	0	23:35: 7	7.4900	1480.39	104.03
1299	0	23:37:31	7.5300	1480.37	104.03
1304	0	23:39:55	7.5700	1480.36	104.03
1309	0	23:42:19	7.6100	1480.35	104.03
1314	0	23:44:43	7.6500	1480.34	104.03
1319	0	23:47: 7	7.6900	1480.33	104.03
1324	0	23:49:31	7.7300	1480.32	104.03
1329	0	23:51:55	7.7700	1480.31	104.03
1334	0	23:54:19	7.8100	1480.31	104.03
1339	0	23:56:43	7.8500	1480.29	104.03
1344	0	23:59: 7	7.8900	1480.28	104.03
[Tuesday: Oct. 26, 1993]					
1349	1	0: 1:31	7.9300	1480.27	104.03
1354	1	0: 3:55	7.9700	1480.26	104.04
1359	1	0: 6:19	8.0100	1480.25	104.04
1364	1	0: 8:43	8.0500	1480.24	104.04
1369	1	0:11: 7	8.0900	1480.23	104.04
1374	1	0:13:31	8.1300	1480.22	104.04
1379	1	0:15:55	8.1700	1480.22	104.04
1384	1	0:18:19	8.2100	1480.20	104.04
1389	1	0:20:43	8.2500	1480.19	104.04
1394	1	0:23: 7	8.2900	1480.19	104.04
1399	1	0:25:31	8.3300	1480.17	104.04
1401	1	0:27:55	8.3700	1480.15	104.04
1404	1	0:30:48	8.4180	1480.14	104.04
1407	1	0:33:40	8.4660	1480.12	104.04
1410	1	0:36:30	8.5130	1480.11	104.04
1413	1	0:39:22	8.5610	1480.10	104.04
1416	1	0:42:19	8.6100	1480.09	104.04
1419	1	0:45:12	8.6580	1480.08	104.04
1422	1	0:48: 4	8.7060	1480.07	104.04
1425	1	0:50:54	8.7530	1480.06	104.04
1428	1	0:53:46	8.8010	1480.05	104.05
1431	1	0:56:43	8.8500	1480.04	104.05
1434	1	0:59:36	8.8980	1480.03	104.05
1437	1	1: 2:28	8.9460	1480.01	104.05
1440	1	1: 5:18	8.9930	1480.00	104.05
1443	1	1: 8:10	9.0410	1479.99	104.05
1446	1	1:11: 7	9.0900	1479.98	104.05
1449	1	1:14: 0	9.1380	1479.97	104.05
1452	1	1:16:52	9.1860	1479.96	104.06

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
1455	1	1:19:42	9.2330	1479.94	104.06
1458	1	1:22:34	9.2810	1479.94	104.05
1461	1	1:25:31	9.3300	1479.93	104.05
1464	1	1:28:24	9.3780	1479.92	104.06
1467	1	1:31:16	9.4260	1479.91	104.05
1470	1	1:34: 6	9.4730	1479.90	104.06
1473	1	1:36:58	9.5210	1479.89	104.06
1476	1	1:39:55	9.5700	1479.87	104.06
1479	1	1:42:48	9.6180	1479.87	104.06
1482	1	1:45:40	9.6660	1479.86	104.07
1485	1	1:48:30	9.7130	1479.85	104.06
1488	1	1:51:22	9.7610	1479.84	104.07
1491	1	1:54:19	9.8100	1479.83	104.07
1494	1	1:57:12	9.8580	1479.82	104.07
1497	1	2: 0: 4	9.9060	1479.81	104.07
1500	1	2: 2:54	9.9530	1479.80	104.07
1503	1	2: 5:46	10.0010	1479.78	104.07
1506	1	2: 8:43	10.0500	1479.78	104.07
1509	1	2:11:36	10.0980	1479.77	104.07
1512	1	2:14:28	10.1460	1479.76	104.08
1515	1	2:17:18	10.1930	1479.75	104.07
1518	1	2:20:10	10.2410	1479.74	104.07
1521	1	2:23: 7	10.2900	1479.73	104.07
1524	1	2:26: 0	10.3380	1479.72	104.08
1527	1	2:28:52	10.3860	1479.71	104.08
1530	1	2:31:42	10.4330	1479.70	104.08
1533	1	2:34:34	10.4810	1479.69	104.08
1536	1	2:37:31	10.5300	1479.69	104.08
1539	1	2:40:24	10.5780	1479.67	104.07
1542	1	2:43:16	10.6260	1479.66	104.08
1545	1	2:46: 6	10.6730	1479.66	104.08
1548	1	2:48:58	10.7210	1479.65	104.08
1551	1	2:51:55	10.7700	1479.64	104.08
1554	1	2:54:48	10.8180	1479.63	104.08
1557	1	2:57:40	10.8660	1479.62	104.09
1560	1	3: 0:30	10.9130	1479.61	104.09
1563	1	3: 3:22	10.9610	1479.60	104.09
1566	1	3: 6:19	11.0100	1479.59	104.09
1569	1	3: 9:12	11.0580	1479.58	104.09
1572	1	3:12: 4	11.1060	1479.57	104.09
1575	1	3:14:54	11.1530	1479.56	104.09
1578	1	3:17:46	11.2010	1479.56	104.09
1581	1	3:20:43	11.2500	1479.55	104.09
1584	1	3:23:36	11.2980	1479.54	104.09
1587	1	3:26:28	11.3460	1479.53	104.10
1590	1	3:29:18	11.3930	1479.52	104.10
1593	1	3:32:10	11.4410	1479.51	104.10
1596	1	3:35: 7	11.4900	1479.51	104.10
1599	1	3:38: 0	11.5380	1479.50	104.10
1602	1	3:40:52	11.5860	1479.48	104.10
1605	1	3:43:42	11.6330	1479.48	104.10
1608	1	3:46:34	11.6810	1479.47	104.10
1611	1	3:49:31	11.7300	1479.46	104.10
1614	1	3:52:24	11.7780	1479.45	104.10
1617	1	3:55:16	11.8260	1479.44	104.11

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
1620	1	3:58: 6	11.8730	1479.43	104.11
1623	1	4: 0:58	11.9210	1479.42	104.11
1626	1	4: 3:55	11.9700	1479.42	104.11
1629	1	4: 6:48	12.0180	1479.41	104.11
1632	1	4: 9:40	12.0660	1479.40	104.11
1635	1	4:12:30	12.1130	1479.39	104.11
1638	1	4:15:22	12.1610	1479.39	104.11
1641	1	4:18:15	12.2090	1479.37	104.11
1644	1	4:21:12	12.2580	1479.37	104.11
1647	1	4:24: 4	12.3060	1479.36	104.11
1650	1	4:26:54	12.3530	1479.35	104.11
1653	1	4:29:46	12.4010	1479.34	104.11
1656	1	4:32:43	12.4500	1479.33	104.11
1659	1	4:35:36	12.4980	1479.32	104.12
1662	1	4:38:28	12.5460	1479.31	104.12
1665	1	4:41:18	12.5930	1479.31	104.12
1668	1	4:44:10	12.6410	1479.29	104.12
1671	1	4:47: 7	12.6900	1479.29	104.11
1674	1	4:50: 0	12.7380	1479.28	104.12
1677	1	4:52:52	12.7860	1479.28	104.12
1680	1	4:55:42	12.8330	1479.27	104.12
1683	1	4:58:34	12.8810	1479.25	104.12
1686	1	5: 1:31	12.9300	1479.25	104.12
1689	1	5: 4:24	12.9780	1479.24	104.12
1692	1	5: 7:16	13.0260	1479.24	104.12
1695	1	5:10: 6	13.0730	1479.23	104.12
1698	1	5:12:58	13.1210	1479.22	104.13
1701	1	5:15:55	13.1700	1479.21	104.13
1704	1	5:18:48	13.2180	1479.20	104.12
1707	1	5:21:40	13.2660	1479.20	104.13
1710	1	5:24:30	13.3130	1479.19	104.13
1713	1	5:27:22	13.3610	1479.19	104.13
1716	1	5:30:19	13.4100	1479.17	104.13
1719	1	5:33:12	13.4580	1479.17	104.13
1722	1	5:36: 4	13.5060	1479.16	104.14
1725	1	5:38:54	13.5530	1479.15	104.14
1728	1	5:41:46	13.6010	1479.14	104.14
1731	1	5:44:43	13.6500	1479.14	104.14
1734	1	5:47:36	13.6980	1479.13	104.14
1737	1	5:50:54	13.7530	1479.12	104.14
1740	1	5:53:46	13.8010	1479.11	104.14
1742	1	5:56:10	13.8410	1479.10	104.14
1745	1	5:59: 7	13.8900	1479.09	104.14
1747	1	6: 1:31	13.9300	1479.08	104.15
1750	1	6: 4:52	13.9860	1479.08	104.15
1753	1	6: 7:42	14.0330	1479.07	104.14
1756	1	6:10:34	14.0810	1479.07	104.14
1758	1	6:12:58	14.1210	1479.06	104.15
1761	1	6:15:55	14.1700	1479.05	104.15
1764	1	6:18:48	14.2180	1479.05	104.15
1767	1	6:21:40	14.2660	1479.04	104.15
1769	1	6:24:30	14.3130	1479.03	104.15
1772	1	6:27:22	14.3610	1479.02	104.15
1775	1	6:30:19	14.4100	1479.02	104.15
1778	1	6:33:12	14.4580	1479.01	104.15

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3) [Tuesday: Oct. 26, 1993]
Field: Bay City Plant, Texas

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
1781	1	6:36: 4	14.5060	1479.00	104.16
1784	1	6:38:54	14.5530	1478.99	104.16
1787	1	6:41:46	14.6010	1478.98	104.16
1790	1	6:44:43	14.6500	1478.97	104.15
1793	1	6:47:36	14.6980	1478.97	104.15
1796	1	6:50:28	14.7460	1478.96	104.15
1799	1	6:53:18	14.7930	1478.95	104.15
1802	1	6:56:10	14.8410	1478.95	104.16
1805	1	6:59: 7	14.8900	1478.94	104.16
1808	1	7: 2: 0	14.9380	1478.93	104.16
1811	1	7: 4:52	14.9860	1478.93	104.16
1814	1	7: 8:10	15.0410	1478.91	104.16
1817	1	7:11: 7	15.0900	1478.91	104.16
1820	1	7:14: 0	15.1380	1478.90	104.17
1823	1	7:16:52	15.1860	1478.89	104.16
1826	1	7:19:42	15.2330	1478.89	104.17
1829	1	7:22:34	15.2810	1478.88	104.17
1832	1	7:25:31	15.3300	1478.88	104.17
1835	1	7:28:24	15.3780	1478.87	104.17
1838	1	7:31:16	15.4260	1478.86	104.17
1841	1	7:34: 6	15.4730	1478.85	104.17
1844	1	7:36:58	15.5210	1478.85	104.17
1847	1	7:39:55	15.5700	1478.84	104.17
1850	1	7:42:48	15.6180	1478.83	104.17
1852	1	7:45:12	15.6580	1478.83	104.17
1855	1	7:48: 4	15.7060	1478.82	104.18
1857	1	7:50:28	15.7460	1478.81	104.18
1860	1	7:53:18	15.7930	1478.81	104.18
1862	1	7:55:42	15.8330	1478.80	104.18
1865	1	7:58:34	15.8810	1478.79	104.18
1867	1	8: 0:58	15.9210	1478.78	104.18
1870	1	8: 3:55	15.9700	1478.78	104.18
1873	1	8: 6:48	16.0180	1478.77	104.18
1876	1	8: 9:40	16.0660	1478.77	104.19
1879	1	8:12:30	16.1130	1478.76	104.18
1882	1	8:15:22	16.1610	1478.75	104.18
1885	1	8:18:48	16.2180	1478.74	104.18
1888	1	8:21:40	16.2660	1478.73	104.18
1891	1	8:24:30	16.3130	1478.73	104.19
1894	1	8:27:22	16.3610	1478.72	104.18
1897	1	8:30:19	16.4100	1478.72	104.18
1900	1	8:33:12	16.4580	1478.71	104.18
1903	1	8:36: 4	16.5060	1478.70	104.18
1906	1	8:38:54	16.5530	1478.70	104.19
1909	1	8:41:46	16.6010	1478.69	104.19
1912	1	8:44:43	16.6500	1478.69	104.19
1915	1	8:47:36	16.6980	1478.68	104.19
1918	1	8:50:28	16.7460	1478.67	104.19
1921	1	8:53:18	16.7930	1478.66	104.19
1924	1	8:56:10	16.8410	1478.66	104.19
1927	1	8:59: 7	16.8900	1478.65	104.19
1930	1	9: 2: 0	16.9380	1478.65	104.19
1933	1	9: 4:52	16.9860	1478.64	104.20
1936	1	9: 7:42	17.0330	1478.64	104.20
1939	1	9:10:34	17.0810	1478.63	104.20

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
1942	1	9:13:31	17.1300	1478.62	104.20
1945	1	9:16:24	17.1780	1478.62	104.20
1948	1	9:19:16	17.2260	1478.61	104.20
1951	1	9:22:34	17.2810	1478.60	104.21
1954	1	9:25:31	17.3300	1478.59	104.20
1957	1	9:28:24	17.3780	1478.59	104.20
1960	1	9:31:16	17.4260	1478.58	104.20
1963	1	9:34: 6	17.4730	1478.57	104.21
1966	1	9:36:58	17.5210	1478.57	104.21
1969	1	9:39:55	17.5700	1478.56	104.21
1972	1	9:42:48	17.6180	1478.56	104.21
1975	1	9:45:40	17.6660	1478.55	104.21
1978	1	9:48:30	17.7130	1478.54	104.21
1981	1	9:51:22	17.7610	1478.54	104.21
1984	1	9:54:19	17.8100	1478.54	104.21
1987	1	9:57:12	17.8580	1478.53	104.21
1990	1	10: 0: 4	17.9060	1478.52	104.21
1993	1	10: 2:54	17.9530	1478.51	104.21
1996	1	10: 6:19	18.0100	1478.50	104.22
1999	1	10: 9:12	18.0580	1478.49	104.21
2002	1	10:12: 4	18.1060	1478.49	104.22
2005	1	10:14:54	18.1530	1478.49	104.22
2008	1	10:17:46	18.2010	1478.48	104.22
2011	1	10:20:43	18.2500	1478.48	104.22
2014	1	10:23:36	18.2980	1478.47	104.22
2017	1	10:26:28	18.3460	1478.46	104.22
2020	1	10:29:18	18.3930	1478.45	104.23
2023	1	10:32:10	18.4410	1478.45	104.22
2026	1	10:35: 7	18.4900	1478.44	104.22
2029	1	10:38: 0	18.5380	1478.43	104.23
2032	1	10:40:52	18.5860	1478.43	104.22
2035	1	10:43:42	18.6330	1478.42	104.22
2038	1	10:46:34	18.6810	1478.42	104.22
2041	1	10:49:31	18.7300	1478.41	104.22
2044	1	10:52:24	18.7780	1478.41	104.22
2047	1	10:55:16	18.8260	1478.40	104.23
2050	1	10:58: 6	18.8730	1478.39	104.23
2053	1	11: 0:58	18.9210	1478.39	104.23
2056	1	11: 3:55	18.9700	1478.38	104.23
2059	1	11: 6:48	19.0180	1478.38	104.23
2062	1	11: 9:40	19.0660	1478.37	104.23
2065	1	11:12:30	19.1130	1478.36	104.23
2067	1	11:14:54	19.1530	1478.35	104.23
2070	1	11:17:46	19.2010	1478.35	104.24
2073	1	11:20:43	19.2500	1478.34	104.24
2076	1	11:23:36	19.2980	1478.34	104.24
2079	1	11:26:28	19.3460	1478.33	104.24
2082	1	11:29:18	19.3930	1478.33	104.24
2085	1	11:32:10	19.4410	1478.32	104.24
2088	1	11:35: 7	19.4900	1478.32	104.25
2091	1	11:38: 0	19.5380	1478.31	104.24
2093	1	11:40:24	19.5780	1478.30	104.24
2096	1	11:43:16	19.6260	1478.30	104.24
2099	1	11:46: 6	19.6730	1478.30	104.25
2102	1	11:49:31	19.7300	1478.29	104.25

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2105	1	11:52:24	19.7780	1478.28	104.25
2108	1	11:55:16	19.8260	1478.27	104.24
2111	1	11:58: 6	19.8730	1478.27	104.24
2114	1	12: 1:31	19.9300	1478.26	104.24
2117	1	12: 4:24	19.9780	1478.26	104.25
2119	1	12: 6:48	20.0180	1478.25	104.25
2122	1	12: 9:40	20.0660	1478.24	104.25
2125	1	12:12:30	20.1130	1478.24	104.25
2128	1	12:15:22	20.1610	1478.23	104.25
2131	1	12:18:19	20.2100	1478.23	104.26
2134	1	12:21:12	20.2580	1478.22	104.25
2136	1	12:23:36	20.2980	1478.21	104.25
2139	1	12:26:28	20.3460	1478.21	104.26
2142	1	12:29:18	20.3930	1478.20	104.25
2145	1	12:32:10	20.4410	1478.20	104.25
2147	1	12:34:34	20.4810	1478.19	104.26
2150	1	12:37:31	20.5300	1478.19	104.26
2153	1	12:40:24	20.5780	1478.18	104.26
2155	1	12:42:48	20.6180	1478.18	104.26
2158	1	12:45:40	20.6660	1478.17	104.26
2160	1	12:48: 4	20.7060	1478.17	104.26
2163	1	12:50:54	20.7530	1478.16	104.26
2165	1	12:53:46	20.8010	1478.15	104.26
2168	1	12:56:43	20.8500	1478.16	104.26
2171	1	12:59:36	20.8980	1478.14	104.26
2174	1	13: 2:28	20.9460	1478.15	104.26
2177	1	13: 5:18	20.9930	1478.14	104.26
2180	1	13: 8:10	21.0410	1478.13	104.26
2183	1	13:11: 7	21.0900	1478.13	104.26
2186	1	13:14: 0	21.1380	1478.12	104.26
2189	1	13:16:52	21.1860	1478.11	104.27
2191	1	13:19:16	21.2260	1478.11	104.27
2194	1	13:22: 6	21.2730	1478.11	104.27
2197	1	13:24:58	21.3210	1478.10	104.27
2200	1	13:27:55	21.3700	1478.09	104.27
2203	1	13:30:48	21.4180	1478.09	104.27
2206	1	13:33:40	21.4660	1478.08	104.27
2209	1	13:36:30	21.5130	1478.07	104.27
2212	1	13:39:22	21.5610	1478.07	104.27
2215	1	13:42:19	21.6100	1478.06	104.27
2218	1	13:45:12	21.6580	1478.06	104.27
2221	1	13:48: 4	21.7060	1478.06	104.27
2223	1	13:50:28	21.7460	1478.05	104.28
2226	1	13:53:18	21.7930	1478.04	104.28
2229	1	13:56:10	21.8410	1478.04	104.28
2232	1	13:59: 7	21.8900	1478.03	104.27
2235	1	14: 2: 0	21.9380	1478.03	104.28
2238	1	14: 4:52	21.9860	1478.03	104.28
2241	1	14: 7:42	22.0330	1478.02	104.28
2244	1	14:10:34	22.0810	1478.01	104.28
2247	1	14:13:31	22.1300	1478.01	104.28
2250	1	14:16:24	22.1780	1478.00	104.28
2253	1	14:19:16	22.2260	1477.99	104.28
2256	1	14:22: 6	22.2730	1477.99	104.28
2259	1	14:24:58	22.3210	1477.98	104.28

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2262	1	14:27:55	22.3700	1477.98	104.29
2265	1	14:30:48	22.4180	1477.97	104.28
2268	1	14:33:40	22.4660	1477.97	104.29
2271	1	14:36:30	22.5130	1477.96	104.29
2274	1	14:39:22	22.5610	1477.96	104.29
2277	1	14:42:19	22.6100	1477.96	104.29
2280	1	14:45:12	22.6580	1477.95	104.29
2283	1	14:48: 4	22.7060	1477.94	104.29
2286	1	14:50:54	22.7530	1477.94	104.29
2289	1	14:53:46	22.8010	1477.93	104.29
2292	1	14:56:43	22.8500	1477.92	104.29
2295	1	14:59:36	22.8980	1477.92	104.29
2297	1	15: 2: 0	22.9380	1477.91	104.29
2300	1	15: 4:52	22.9860	1477.91	104.29
2303	1	15: 7:42	23.0330	1477.91	104.29
2306	1	15:10:34	23.0810	1477.90	104.30
2309	1	15:13:31	23.1300	1477.90	104.29
2312	1	15:16:24	23.1780	1477.90	104.30
2315	1	15:19:16	23.2260	1477.89	104.30
2318	1	15:22: 6	23.2730	1477.88	104.30
2320	1	15:24:30	23.3130	1477.88	104.29
2323	1	15:27:22	23.3610	1477.87	104.29
2326	1	15:30:19	23.4100	1477.87	104.30
2329	1	15:33:12	23.4580	1477.86	104.30
2332	1	15:36: 4	23.5060	1477.86	104.30
2335	1	15:38:54	23.5530	1477.85	104.30
2338	1	15:41:46	23.6010	1477.85	104.30
2341	1	15:44:43	23.6500	1477.85	104.30
2344	1	15:47:36	23.6980	1477.84	104.30
2347	1	15:50:28	23.7460	1477.84	104.30
2350	1	15:53:18	23.7930	1477.83	104.30
2353	1	15:56:10	23.8410	1477.82	104.31
2356	1	15:59: 7	23.8900	1477.82	104.31
2359	1	16: 2:28	23.9460	1477.81	104.31
2362	1	16: 5:18	23.9930	1477.81	104.31
2365	1	16: 8:10	24.0410	1477.80	104.31
2368	1	16:11: 7	24.0900	1477.80	104.31
2371	1	16:14: 0	24.1380	1477.80	104.31
2374	1	16:16:52	24.1860	1477.79	104.31
2377	1	16:19:42	24.2330	1477.79	104.31
2380	1	16:22:34	24.2810	1477.78	104.31
2383	1	16:25:31	24.3300	1477.78	104.32
2386	1	16:28:24	24.3780	1477.77	104.32
2389	1	16:31:16	24.4260	1477.76	104.32
2392	1	16:34: 6	24.4730	1477.76	104.32
2394	1	16:36:30	24.5130	1477.76	104.32
2397	1	16:39:22	24.5610	1477.75	104.31
2400	1	16:42:19	24.6100	1477.74	104.32
2403	1	16:45:12	24.6580	1477.75	104.32
2406	1	16:48: 4	24.7060	1477.74	104.32
2409	1	16:50:54	24.7530	1477.73	104.32
2412	1	16:53:46	24.8010	1477.73	104.32
2415	1	16:56:43	24.8500	1477.72	104.32
2418	1	16:59:36	24.8980	1477.72	104.32
2421	1	17: 2:28	24.9460	1477.71	104.32

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2423	1	17: 4:52	24.9860	1477.71	104.32
2426	1	17: 7:42	25.0330	1477.71	104.33
2429	1	17:10:34	25.0810	1477.70	104.32
2432	1	17:13:31	25.1300	1477.70	104.32
2435	1	17:16:24	25.1780	1477.69	104.33
2438	1	17:19:16	25.2260	1477.68	104.32
2441	1	17:22: 6	25.2730	1477.68	104.32
2443	1	17:24:30	25.3130	1477.67	104.32
2446	1	17:27:22	25.3610	1477.67	104.33
2448	1	17:29:46	25.4010	1477.66	104.32
2451	1	17:32:43	25.4500	1477.67	104.33
2454	1	17:35:36	25.4980	1477.65	104.33
2457	1	17:38:28	25.5460	1477.65	104.33
2459	1	17:40:52	25.5860	1477.65	104.33
2462	1	17:44:10	25.6410	1477.64	104.33
2465	1	17:47: 7	25.6900	1477.64	104.33
2468	1	17:50: 0	25.7380	1477.64	104.33
2471	1	17:52:52	25.7860	1477.63	104.33
2474	1	17:55:42	25.8330	1477.62	104.33
2477	1	17:58:34	25.8810	1477.62	104.34
2480	1	18: 1:31	25.9300	1477.62	104.34
2483	1	18: 4:24	25.9780	1477.61	104.34
2485	1	18: 7:16	26.0260	1477.60	104.34
2486	1	18: 9:40	26.0660	1477.60	104.33
2489	1	18:12:30	26.1130	1477.60	104.34
2491	1	18:14:54	26.1530	1477.59	104.34
2494	1	18:17:46	26.2010	1477.59	104.34
2496	1	18:22:38	26.2820	1477.57	104.33
2499	1	18:25:31	26.3300	1477.57	104.34
2501	1	18:27:55	26.3700	1477.57	104.35
2504	1	18:30:48	26.4180	1477.57	104.35
2506	1	18:33:12	26.4580	1477.56	104.35
2509	1	18:36: 4	26.5060	1477.55	104.34
2512	1	18:38:57	26.5540	1477.55	104.35
2515	1	18:41:50	26.6020	1477.55	104.35
2518	1	18:44:43	26.6500	1477.54	104.35
2521	1	18:47:36	26.6980	1477.54	104.35
2524	1	18:50:28	26.7460	1477.53	104.35
2527	1	18:53:21	26.7940	1477.53	104.35
2530	1	18:56:14	26.8420	1477.52	104.35
2533	1	18:59: 7	26.8900	1477.52	104.35
2536	1	19: 2: 0	26.9380	1477.52	104.35
2539	1	19: 4:52	26.9860	1477.51	104.35
2542	1	19: 7:45	27.0340	1477.50	104.35
2545	1	19:10:38	27.0820	1477.50	104.35
2548	1	19:13:31	27.1300	1477.49	104.35
2551	1	19:16:24	27.1780	1477.49	104.36
2554	1	19:19:16	27.2260	1477.48	104.36
2557	1	19:22: 9	27.2740	1477.48	104.36
2560	1	19:25: 2	27.3220	1477.47	104.36
2563	1	19:27:55	27.3700	1477.47	104.35
2566	1	19:30:48	27.4180	1477.47	104.36
2569	1	19:33:40	27.4660	1477.46	104.36
2572	1	19:36:33	27.5140	1477.46	104.36
2574	1	19:38:57	27.5540	1477.45	104.36

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2577	1	19:41:50	27.6020	1477.45	104.36
2580	1	19:44:43	27.6500	1477.44	104.36
2583	1	19:47:36	27.6980	1477.44	104.36
2586	1	19:50:28	27.7460	1477.44	104.36
2589	1	19:53:21	27.7940	1477.43	104.36
2592	1	19:56:14	27.8420	1477.42	104.36
2595	1	19:59: 7	27.8900	1477.42	104.36
2598	1	20: 2: 0	27.9380	1477.42	104.36
2601	1	20: 4:52	27.9860	1477.41	104.37
2604	1	20: 7:45	28.0340	1477.41	104.37
2607	1	20:10:38	28.0820	1477.40	104.37
2610	1	20:13:31	28.1300	1477.40	104.37
2613	1	20:16:24	28.1780	1477.40	104.37
2616	1	20:19:16	28.2260	1477.39	104.37
2619	1	20:22: 9	28.2740	1477.38	104.37
2622	1	20:25: 2	28.3220	1477.37	104.37
2625	1	20:27:55	28.3700	1477.37	104.38
2628	1	20:30:48	28.4180	1477.37	104.37
2631	1	20:33:40	28.4660	1477.37	104.37
2634	1	20:36:33	28.5140	1477.36	104.38
2637	1	20:39:26	28.5620	1477.36	104.37
2640	1	20:42:19	28.6100	1477.35	104.37
2643	1	20:45:12	28.6580	1477.35	104.38
2646	1	20:48: 4	28.7060	1477.34	104.38
2649	1	20:50:57	28.7540	1477.34	104.38
2652	1	20:53:50	28.8020	1477.33	104.38
2655	1	20:56:43	28.8500	1477.33	104.38
2658	1	20:59:36	28.8980	1477.32	104.38
2661	1	21: 2:28	28.9460	1477.32	104.38
2664	1	21: 5:21	28.9940	1477.31	104.38
2667	1	21: 8:14	29.0420	1477.31	104.38
2670	1	21:11: 7	29.0900	1477.31	104.38
2673	1	21:14: 0	29.1380	1477.30	104.38
2676	1	21:16:52	29.1860	1477.30	104.38
2679	1	21:19:45	29.2340	1477.29	104.38
2682	1	21:22:38	29.2820	1477.29	104.38
2685	1	21:25:31	29.3300	1477.28	104.38
2688	1	21:28:24	29.3780	1477.28	104.38
2691	1	21:31:16	29.4260	1477.28	104.39
2694	1	21:34: 9	29.4740	1477.27	104.39
2697	1	21:37: 2	29.5220	1477.27	104.39
2700	1	21:39:55	29.5700	1477.26	104.39
2703	1	21:42:48	29.6180	1477.26	104.39
2706	1	21:45:40	29.6660	1477.26	104.38
2709	1	21:48:33	29.7140	1477.24	104.39
2712	1	21:51:26	29.7620	1477.25	104.39
2715	1	21:54:19	29.8100	1477.24	104.39
2718	1	21:57:12	29.8580	1477.24	104.39
2721	1	22: 0: 4	29.9060	1477.23	104.39
2724	1	22: 2:57	29.9540	1477.23	104.40
2727	1	22: 5:50	30.0020	1477.22	104.39
2730	1	22: 8:43	30.0500	1477.22	104.39
2733	1	22:11:36	30.0980	1477.22	104.40
2736	1	22:14:28	30.1460	1477.21	104.40
2739	1	22:17:21	30.1940	1477.21	104.39

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Tuesday: Oct. 26, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2742	1	22:20:14	30.2420	1477.20	104.39
2745	1	22:23: 7	30.2900	1477.20	104.40
2748	1	22:26: 0	30.3380	1477.20	104.39
2751	1	22:28:52	30.3860	1477.19	104.40
2754	1	22:31:45	30.4340	1477.19	104.40
2757	1	22:34:38	30.4820	1477.19	104.40
2760	1	22:37:31	30.5300	1477.18	104.40
2763	1	22:40:24	30.5780	1477.18	104.40
2766	1	22:43:16	30.6260	1477.17	104.40
2769	1	22:46: 9	30.6740	1477.17	104.40
2772	1	22:49: 2	30.7220	1477.16	104.40
2775	1	22:51:55	30.7700	1477.16	104.41
2778	1	22:54:48	30.8180	1477.16	104.40
2781	1	22:57:40	30.8660	1477.15	104.41
2784	1	23: 0:33	30.9140	1477.15	104.41
2787	1	23: 3:26	30.9620	1477.14	104.41
2790	1	23: 6:19	31.0100	1477.14	104.41
2793	1	23: 9:12	31.0580	1477.14	104.41
2796	1	23:12: 4	31.1060	1477.13	104.41
2799	1	23:14:57	31.1540	1477.13	104.41
2802	1	23:17:50	31.2020	1477.13	104.42
2805	1	23:20:43	31.2500	1477.12	104.42
2808	1	23:23:36	31.2980	1477.11	104.41
2811	1	23:26:28	31.3460	1477.11	104.42
2814	1	23:29:21	31.3940	1477.11	104.41
2817	1	23:32:14	31.4420	1477.10	104.42
2820	1	23:35: 7	31.4900	1477.10	104.42
2823	1	23:38: 0	31.5380	1477.10	104.42
2826	1	23:40:52	31.5860	1477.10	104.43
2829	1	23:43:45	31.6340	1477.09	104.42
2832	1	23:46:38	31.6820	1477.08	104.42
2835	1	23:49:31	31.7300	1477.08	104.42
2838	1	23:52:24	31.7780	1477.08	104.42
2841	1	23:55:16	31.8260	1477.07	104.43
2844	1	23:58: 9	31.8740	1477.07	104.42
[Wednesday: Oct. 27, 1993]					
2847	2	0: 1: 2	31.9220	1477.06	104.42
2850	2	0: 3:55	31.9700	1477.06	104.42
2853	2	0: 6:48	32.0180	1477.05	104.42
2856	2	0: 9:40	32.0660	1477.05	104.43
2859	2	0:12:33	32.1140	1477.05	104.43
2862	2	0:15:26	32.1620	1477.04	104.43
2865	2	0:18:19	32.2100	1477.04	104.43
2868	2	0:21:12	32.2580	1477.04	104.43
2871	2	0:24: 4	32.3060	1477.03	104.43
2874	2	0:26:57	32.3540	1477.03	104.43
2877	2	0:29:50	32.4020	1477.03	104.43
2880	2	0:32:43	32.4500	1477.02	104.43
2883	2	0:35:36	32.4980	1477.02	104.43
2886	2	0:38:28	32.5460	1477.01	104.43
2889	2	0:41:21	32.5940	1477.00	104.43
2892	2	0:44:14	32.6420	1477.00	104.43
2895	2	0:47: 7	32.6900	1477.00	104.43
2898	2	0:50: 0	32.7380	1477.00	104.43
2901	2	0:52:52	32.7860	1477.00	104.43

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Wednesday: Oct. 27, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
2904	2	0:55:45	32.8340	1476.99	104.44
2907	2	0:58:38	32.8820	1476.99	104.44
2910	2	1: 1:31	32.9300	1476.98	104.44
2913	2	1: 4:24	32.9780	1476.98	104.44
2916	2	1: 7:16	33.0260	1476.98	104.44
2919	2	1:10: 9	33.0740	1476.97	104.44
2922	2	1:13: 2	33.1220	1476.97	104.44
2925	2	1:15:55	33.1700	1476.96	104.44
2928	2	1:18:48	33.2180	1476.96	104.44
2931	2	1:21:40	33.2660	1476.95	104.45
2934	2	1:24:33	33.3140	1476.95	104.44
2937	2	1:27:26	33.3620	1476.95	104.44
2940	2	1:30:19	33.4100	1476.94	104.45
2943	2	1:33:12	33.4580	1476.94	104.44
2946	2	1:36: 4	33.5060	1476.93	104.44
2949	2	1:38:57	33.5540	1476.94	104.44
2952	2	1:41:50	33.6020	1476.93	104.45
2955	2	1:44:43	33.6500	1476.93	104.45
2958	2	1:47:36	33.6980	1476.93	104.44
2961	2	1:50:28	33.7460	1476.92	104.45
2964	2	1:53:21	33.7940	1476.92	104.45
2967	2	1:56:14	33.8420	1476.91	104.45
2970	2	1:59: 7	33.8900	1476.91	104.45
2973	2	2: 2: 0	33.9380	1476.90	104.45
2976	2	2: 4:52	33.9860	1476.90	104.45
2979	2	2: 7:45	34.0340	1476.90	104.45
2982	2	2:10:38	34.0820	1476.89	104.45
2985	2	2:13:31	34.1300	1476.89	104.45
2988	2	2:16:24	34.1780	1476.89	104.45
2991	2	2:19:16	34.2260	1476.88	104.45
2994	2	2:22: 9	34.2740	1476.88	104.45
2997	2	2:25: 2	34.3220	1476.88	104.45
3000	2	2:27:55	34.3700	1476.88	104.45
3003	2	2:30:48	34.4180	1476.87	104.45
3006	2	2:33:40	34.4660	1476.87	104.45
3009	2	2:36:33	34.5140	1476.86	104.46
3012	2	2:39:26	34.5620	1476.86	104.46
3015	2	2:42:19	34.6100	1476.86	104.46
3018	2	2:45:12	34.6580	1476.85	104.46
3021	2	2:48: 4	34.7060	1476.85	104.46
3024	2	2:50:57	34.7540	1476.85	104.46
3027	2	2:53:50	34.8020	1476.84	104.46
3030	2	2:56:43	34.8500	1476.83	104.46
3033	2	2:59:36	34.8980	1476.83	104.46
3036	2	3: 2:28	34.9460	1476.83	104.46
3039	2	3: 5:21	34.9940	1476.83	104.46
3042	2	3: 8:14	35.0420	1476.83	104.46
3045	2	3:11: 7	35.0900	1476.82	104.47
3048	2	3:14: 0	35.1380	1476.82	104.47
3051	2	3:16:52	35.1860	1476.81	104.47
3054	2	3:19:45	35.2340	1476.80	104.46
3057	2	3:22:38	35.2820	1476.81	104.46
3060	2	3:25:31	35.3300	1476.81	104.46
3063	2	3:28:24	35.3780	1476.80	104.47
3066	2	3:31:16	35.4260	1476.80	104.47

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Wednesday: Oct. 27, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
3069	2	3:34: 9	35.4740	1476.79	104.47
3072	2	3:37: 2	35.5220	1476.79	104.47
3075	2	3:39:55	35.5700	1476.79	104.47
3078	2	3:42:48	35.6180	1476.78	104.47
3081	2	3:45:40	35.6660	1476.78	104.47
3084	2	3:48:33	35.7140	1476.78	104.47
3087	2	3:51:26	35.7620	1476.77	104.48
3090	2	3:54:19	35.8100	1476.78	104.47
3093	2	3:57:12	35.8580	1476.76	104.47
3096	2	4: 0: 4	35.9060	1476.76	104.47
3099	2	4: 2:57	35.9540	1476.76	104.47
3102	2	4: 5:50	36.0020	1476.76	104.48
3105	2	4: 8:43	36.0500	1476.75	104.48
3108	2	4:11:36	36.0980	1476.75	104.48
3111	2	4:14:28	36.1460	1476.75	104.48
3114	2	4:17:21	36.1940	1476.75	104.48
3117	2	4:20:14	36.2420	1476.74	104.48
3120	2	4:23: 7	36.2900	1476.73	104.48
3123	2	4:26: 0	36.3380	1476.73	104.48
3126	2	4:28:52	36.3860	1476.73	104.48
3129	2	4:31:45	36.4340	1476.72	104.48
3132	2	4:34:38	36.4820	1476.72	104.48
3135	2	4:37:31	36.5300	1476.72	104.48
3138	2	4:40:24	36.5780	1476.72	104.49
3141	2	4:43:16	36.6260	1476.71	104.49
3144	2	4:46: 9	36.6740	1476.71	104.49
3147	2	4:49: 2	36.7220	1476.71	104.50
3150	2	4:51:55	36.7700	1476.70	104.49
3153	2	4:54:48	36.8180	1476.70	104.50
3156	2	4:57:40	36.8660	1476.69	104.50
3159	2	5: 0:33	36.9140	1476.69	104.49
3162	2	5: 3:26	36.9620	1476.69	104.50
3165	2	5: 6:19	37.0100	1476.68	104.49
3168	2	5: 9:12	37.0580	1476.68	104.49
3171	2	5:12: 4	37.1060	1476.67	104.49
3174	2	5:14:57	37.1540	1476.67	104.49
3177	2	5:17:50	37.2020	1476.67	104.49
3180	2	5:20:43	37.2500	1476.67	104.49
3183	2	5:23:36	37.2980	1476.66	104.50
3186	2	5:26:28	37.3460	1476.66	104.50
3189	2	5:29:21	37.3940	1476.66	104.50
3192	2	5:32:14	37.4420	1476.66	104.50
3195	2	5:35: 7	37.4900	1476.65	104.50
3198	2	5:38: 0	37.5380	1476.65	104.50
3201	2	5:40:52	37.5860	1476.65	104.50
3204	2	5:43:45	37.6340	1476.65	104.50
3207	2	5:46:38	37.6820	1476.64	104.51
3210	2	5:49:31	37.7300	1476.64	104.51
3213	2	5:52:24	37.7780	1476.63	104.50
3216	2	5:55:16	37.8260	1476.63	104.50
3219	2	5:58: 9	37.8740	1476.62	104.51
3222	2	6: 1: 2	37.9220	1476.62	104.51
3225	2	6: 3:55	37.9700	1476.62	104.51
3228	2	6: 6:48	38.0180	1476.61	104.51
3231	2	6: 9:40	38.0660	1476.61	104.51

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3)
Field: Bay City Plant, Texas

[Wednesday: Oct. 27, 1993]

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
3234	2	6:12:33	38.1140	1476.61	104.51
3237	2	6:15:55	38.1700	1476.60	104.51
3240	2	6:18:48	38.2180	1476.60	104.50
3243	2	6:21:40	38.2660	1476.59	104.51
3246	2	6:24:33	38.3140	1476.60	104.51
3249	2	6:27:26	38.3620	1476.59	104.51
3252	2	6:30:19	38.4100	1476.58	104.51
3255	2	6:33:12	38.4580	1476.58	104.51
3258	2	6:36: 4	38.5060	1476.58	104.51
3261	2	6:38:57	38.5540	1476.58	104.51
3264	2	6:41:50	38.6020	1476.57	104.51
3267	2	6:44:43	38.6500	1476.57	104.51
3270	2	6:47:36	38.6980	1476.57	104.51
3273	2	6:50:28	38.7460	1476.56	104.51
3276	2	6:53:21	38.7940	1476.56	104.52
3279	2	6:56:14	38.8420	1476.56	104.52
3282	2	6:59: 7	38.8900	1476.55	104.52
3285	2	7: 2: 0	38.9380	1476.55	104.52
3288	2	7: 4:52	38.9860	1476.55	104.52
3291	2	7: 7:45	39.0340	1476.54	104.52
3294	2	7:10:38	39.0820	1476.54	104.52
3297	2	7:13:31	39.1300	1476.54	104.52
3300	2	7:16:24	39.1780	1476.54	104.52
3303	2	7:19:16	39.2260	1476.53	104.52
3306	2	7:22: 9	39.2740	1476.53	104.52
3309	2	7:25: 2	39.3220	1476.52	104.53
3312	2	7:27:55	39.3700	1476.52	104.53
3315	2	7:30:48	39.4180	1476.52	104.52
3318	2	7:33:40	39.4660	1476.52	104.53
3321	2	7:36:33	39.5140	1476.51	104.53
3324	2	7:39:26	39.5620	1476.51	104.53
3327	2	7:42:19	39.6100	1476.51	104.53
3330	2	7:45:12	39.6580	1476.50	104.53
3333	2	7:48: 4	39.7060	1476.50	104.52
3336	2	7:50:57	39.7540	1476.49	104.52
3339	2	7:53:50	39.8020	1476.49	104.53
3342	2	7:56:43	39.8500	1476.49	104.53
3345	2	7:59:36	39.8980	1476.48	104.53
3348	2	8: 2:28	39.9460	1476.48	104.54
3351	2	8: 5:21	39.9940	1476.48	104.54
3354	2	8: 8:14	40.0420	1476.48	104.54
3357	2	8:11: 7	40.0900	1476.47	104.54
3360	2	8:14: 0	40.1380	1476.47	104.53
3363	2	8:16:52	40.1860	1476.47	104.54
3366	2	8:19:45	40.2340	1476.46	104.54
3369	2	8:22:38	40.2820	1476.46	104.54
3372	2	8:25:31	40.3300	1476.46	104.54
3375	2	8:28:24	40.3780	1476.45	104.54
3378	2	8:31:16	40.4260	1476.45	104.54
3381	2	8:34: 9	40.4740	1476.44	104.54
3384	2	8:37: 2	40.5220	1476.45	104.54
		End of Fall-Off Test, go down and tag bottom			
3387	2	8:39:55	0.0000	1476.45	104.54
3390	2	8:42:48	0.0480	1521.85	104.37
3393	2	8:45:40	0.0960	1545.46	102.34

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (Well #3) [Wednesday: Oct. 27, 1993]
Field: Bay City Plant, Texas

REC #	DAY	REAL TIME	DT (HRS)	BHP (PSIA)	BHT (Deg.F)
		Tag bottom @ 3353 ft.			
		Pulling out of hole making static gradient stops			
3394	2	8:46:38	0.1120	1538.62	101.90
3396	2	8:48:33	0.1440	1494.98	102.89
3399	2	8:51:26	0.1920	1368.07	103.91
3402	2	8:54:19	0.2400	1219.83	102.50
3405	2	8:57:12	0.2880	1068.83	100.79
3408	2	9: 0: 4	0.3360	958.21	99.17
3411	2	9: 2:57	0.3840	958.84	99.02
3414	2	9: 6:19	0.4400	958.93	99.03
		End of 2000 ft. stop			
3417	2	9: 9:12	0.4880	958.95	99.03
3420	2	9:12: 4	0.5360	837.04	98.02
3423	2	9:14:57	0.5840	661.80	96.30
3426	2	9:17:50	0.6320	523.99	94.51
3429	2	9:20:43	0.6800	524.77	94.28
3432	2	9:23:36	0.7280	524.87	94.27
3435	2	9:26:28	0.7760	524.89	94.25
		End of 1000 ft. stop			
3438	2	9:29:21	0.8240	524.91	94.23
3441	2	9:32:14	0.8720	420.41	93.81
3444	2	9:35: 7	0.9200	307.48	93.01
3447	2	9:38: 0	0.9680	307.78	92.82
3450	2	9:40:52	1.0160	307.85	92.79
3453	2	9:43:45	1.0640	307.87	92.78
		End of 500 ft. stop			
3456	2	9:46:38	1.1120	307.89	92.77
3459	2	9:49:31	1.1600	212.10	92.43
3462	2	9:52:24	1.2080	99.15	90.46
3465	2	9:55:16	1.2560	75.66	69.84
3468	2	9:58: 9	1.3040	82.34	68.45
3471	2	10: 1: 2	1.3520	83.35	67.86
3474	2	10: 3:55	1.4000	83.68	67.38
3477	2	10: 6:48	1.4480	83.87	66.94
3480	2	10: 9:40	1.4960	84.00	66.55
3483	2	10:12:33	1.5440	84.08	66.20
3486	2	10:15:26	1.5920	84.14	65.89
3489	2	10:18:19	1.6400	84.21	65.64
		End of surface stop			
3490	2	10:19:16	1.6560	84.22	65.56
3492	2	10:21:12	1.6880	8.54	65.43
3495	2	10:24: 4	1.7360	8.64	65.20
		Power down gauge, end of pressure survey			
3497	2	10:26: 0	1.7680	15.89	65.12

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

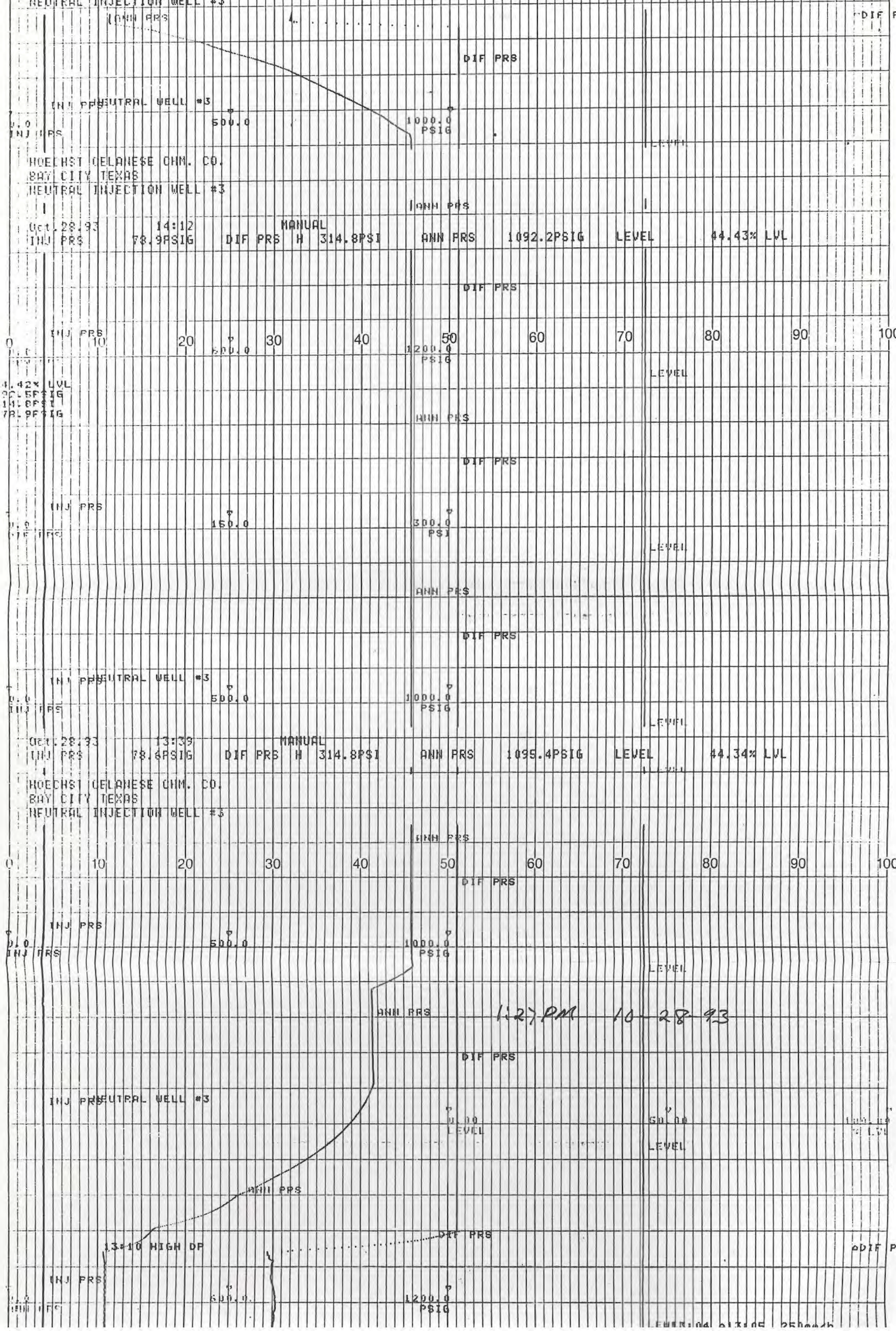
ANNULUS PRESSURE TEST

ANNULUS PRESSURE TEST

1. Date of test 10/28/93
2. Injection pressure . . . . . 78.9 psig
3. Annulus pressure (start) . . . . . 1092.2 psig
4. Differential pressure . . . . . 314.8 psig
5. Annulus pressure (end) . . . . . 1095.4 psig
6. Percent pressure increase/decrease 0.004%

Oct.28.93 14:23 MANUAL
INJ PRS 78.9PSIG DIF PRS 192.2PSI ANN PRS 271.6PSIG LEVEL 44.46% LVL

HOECHST CELANESE CHM. CO.
BAY CITY TEXAS
NEUTRAL INJECTION WELL #3



ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

STATIC GRADIENT SURVEY

Company: HOECHST CELANESE CHEMICAL
Well: WDW-32 (WELL #3)
Field: BAY CITY PLANT, TX

County: MATAGORDA
State: TEXAS

Engineer: RAY HORTON
Gauge Type: EPG-520 (ELECTRONIC)
Serial No.: 69490
Gauge Range: 0 - 5,000 PSI
Gauge Depth: 3192 ft

Date: 10/05/1993
Well Type: INJECTION
Test Type: GRADIENT SURVEY
Well Status: STATIC

Shut-in Time 40 hrs

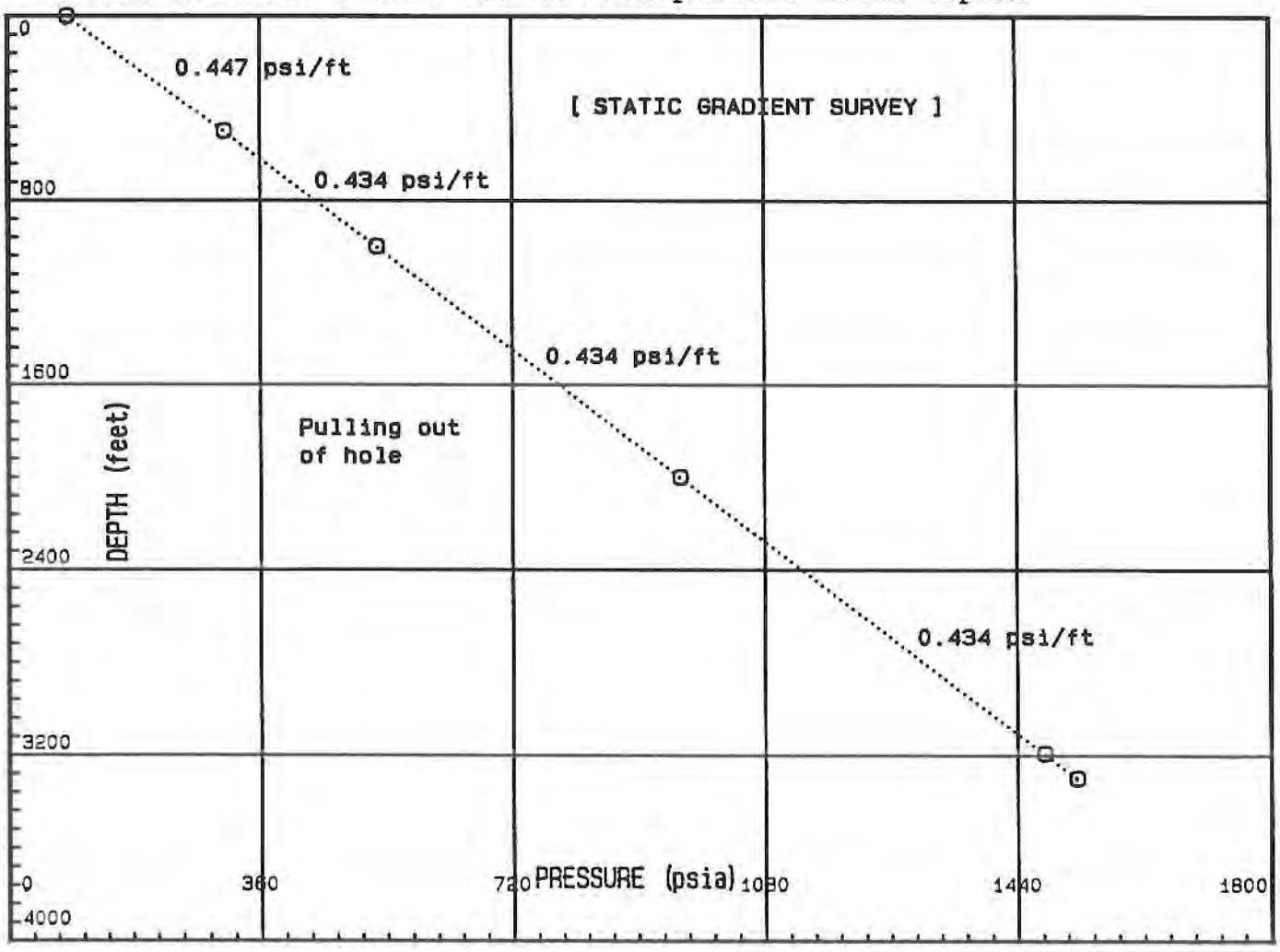
Prod. Time 9672 hrs

Shut-in BHP	1476	@	3192 ft	Shut-in BHT	105 F	@	3192 ft
Flowing BHP	1838	@	3192 ft	Flowing BHT	104 F	@	3192 ft
Shut-in WHP	84			Shut-in WHT	66 F		
Flowing WHP	605			Flowing WHT	90 F		

[GRADIENT DATA]

#	MD	TVD	PRESSURE	PSI/ft
1	0	0	84.22	
2	500	500	307.89	0.447
3	1000	1000	524.91	0.434
4	2000	2000	958.91	0.434
5	3192	3192	1476.45	0.434
6	3300	3300	1523.34	0.434

Remarks: Pressure @ 3300 ft. is extrapolated Datum depth.



ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

RADIOACTIVE TRACER SURVEY ANALYSIS AND LOG

DIAGNOSTIC PRODUCTION LOG ANALYSIS

HOECHST CELANESE CORPORATION
WDW NO. 32
BAY CITY PLANT
MATAGORDA COUNTY, TEXAS

Prepared for
Robert Hall
ECO SOLUTIONS, INC.
Houston, Texas

ATLAS WIRELINE SERVICES
WESTERN ATLAS INTERNATIONAL

October 28, 1993

DISCLAIMER

In making interpretations of logs, our employees will give Customer the benefit of their best judgement, but since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or the correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages or expenses whatsoever incurred or sustained by the Customer resulting from any interpretation made/by any of our employees.

Western Atlas International

ATLAS WIRELINE SERVICES

November 17, 1993

ECO Solutions, Inc.
10333 Richmond
Houston, TX 77042

Attention: Robert Hall
Subject : Hoechst Celanese Corp., WDW No. 32 BAY CITY PLANT

Dear Mr. Hall:

Following are interpretations of the logs performed by Atlas Wireline Services on the referenced well. This includes the Differential Temperature Log and a Radioactive Tracerlog.

Well Information:

Casing Record	From:	To:
13-3/8"	0	1302'
9-5/8"	0	3192'
5-1/2" Injection Tbg.	0	3316'
4-1/2" Gravel Pack Screen	3202'	3553'

Differential Temperature Log (1 Gamma Ray):

Purpose: Survey Temperature profile to record any flow migration of fluids out of targeted disposal zone. Gamma Ray used to correlate to lithology for depth control.

Procedure: Log Differential Temperature from surface down to T.D. Log Gamma Ray to correlate lithology to collars.

Analyses: The temperature gradient is consistent with slight changes in reference to the lithology changes (shales and sands). We do see a shift in the temperature at 414 ft. I believe this to be lithology effect, also this area is still close to the surface which will exhibit varying temperature drifts due to the nature of the shallow depth. The temperature gradient is approximately $.5^0/100$ ft.

Conclusion: I interpret the Differential Temperature Survey as demonstrating a consistent gradient without any indication of flow migration occurring. Thus, the temperature log demonstrates mechanical integrity.

10205 Westheimer, Ste. 940, P.O. Box 1407, Houston, Texas 77251-1407, (713) 972-4000

Radio-Active Tracerlog (2 Detectors: 1 above/1 below injector):

Purpose: Release radioactive slugs into the wellbore while the well is being injected into at varying rates. The Radio-Active Tracerlog is then used to trace or monitor the "slugs" movement and distribution. Detecting is done in two modes, 1) following the slug downhole and 2) tool remaining stationary while "slug" is released.

Procedure:
1. Log two before radioactive injection gamma ray surveys (Base Log)
2. Release slug and monitor descent (Pump-in rate 25 GPM)
3. Repeat Step 2 (Pump-in rate 15 GPM)
4. Repeat Step 2 (Pump-in rate 10 GPM)
5. Release slug and monitor in stationary mode. Depth 3180 ft. (Pump-in rate 98 GPM)
6. Log after radioactive injection gamma ray survey.

Analyses:
1. No anomalies seen on either of the logs. Tool statistics within acceptable levels assuring tool operation good.

2. Slug was released in a pump-in rate of 25 GPM

(BDET) (Mid.Pt.)	Logging Pass	File No.	Depth Ft.	Comment
	1	4	3045	Slug
	2	5	3205	Slug
	3	6	> 3204	Dissipating
	4	7	> 3204	Dissipating
	5	8	> 3204	Dissipating
	6	9	> 3204	Dissipating

No Anomalies noted.

3. Slug was released in a pump-in rate of 15 GPM

(BDET) (Mid.Pt.)	Logging Pass	File No.	Depth Ft.	Comment
	1	10	3048	Slug
	2	11	3163	Slug
	3	12	> 3204	Dissipating
	4	13	> 3204	Dissipating
	5	14	> 3204	Dissipating

No Anomalies noted.

4. Slug was released in a pump-in rate of 10 GPM

(BDET) (Mid.Pt.)	Logging Pass	File No.	Depth Ft.	Comment
	1	15	3023	Slug
	2	16	3114	Slug
	3	17	> 3203	Spreading
	4	18	> 3203	Dissipating
	5	19	> 3203	Dissipating
	6	20	> 3203	
	7	21	> 3203	
	8	22	> 3203	
	9	23	> 3203	

No Anomalies noted.

5. Slug released in stationary mode (injection depth 3180 ft.). Slug monitored on Bottom Detector. Station monitored for approximately 17 minutes. The tool detected (bottom detector) the slug being released and flowing downhole. After the initial response from bottom detector, as just described, the slug was not detected again. Thus, the "slug" was released and the slug or trace of the slug was not detected in the area again. This indicates that there is no flow back around casing, no fluid migration from targeted injection zone.

No Anomalies noted.

5b. Repeat Test. Same Analyses.

6. Logged after survey gamma ray. No significant anomalies noted above 3202 ft.

Conclusion:

The Hoechst Celanese Corporation's WDW No.32 located at the Bay City Plant in Matagorda County Texas, does not appear to have any integrity problems that would result in disposed fluids migrating to intervals other than the targeted disposal interval located below 3202 feet. Both the Differential Temperature Log and the Radio-Active Tracerlog indicate zone isolation of the targeted injection zone. The logging program and interpretation of that data should confirm the mechanical integrity of the well.

Western Atlas International

ATLAS WIRELINE SERVICES

PRODUCTION LOGGING SERVICES

FILE NO.

API NO.

R.A.T

FINAL PRINT

COMPANY HOECHST CELANESE CORP.

WELL WASTE DISPOSAL WELL #32

FIELD BAY CITY PLANT

COUNTY MATAGORDA STATE TX.

LOCATION:
BAY CITY PLANT

SEC N/A TWP N/A RGE N/A

OTHER SERVICES
TEMP/GR

PERMANENT DATUM GL ELEV. N/A

LOGGING MEASURED FROM KB 11 FT. ABOVE P.D.

DRILLING MEASURED FROM KB

ELEVATIONS
KB N/A
DF N/A
GL N/A

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

DATE	10-28-93	
RUN	1	
SERVICE ORDER	131189	
DEPTH-DRILLER	3553	
DEPTH-LOGGER	3248	
BOTTOM LOGGED INTERVAL	3248	
TOP LOGGED INTERVAL	30	
TYPE FLUID IN HOLE	BRINE	
SALINITY PPM CL.	N/A	
DENSITY LB/GAL.	N/A	
LEVEL	FULL	
MAX. REC. TEMP. DEG. F	103 F	
OPR. RIG TIME	CRANE	
EQUIP. NO. / LOC.	6301 HOUSTON	
RECORDED BY	T. FERGUSON	
WITNESSED BY	B. HALL	

BOREHOLE RECORD

NO.	BIT	FROM	TO

FOLD HERE

CASING RECORD

SIZE	WGT	FROM	TO
13 3/8	48	0	1302
9 5/8	40	0	3192
5 1/2	20	0	3316
4 1/2	316SS	3202	3553

REMARKS RUN (1)

PURPOSE OF SURVEY:
TEST THE MECHANICAL INTEGRITY

PURPOSE OF SURVEY:
TEST THE MECHANICAL INTEGRITY OF WELL NO. 3 (WDW-32).

CONCLUSION:
AT THE TIME OF THIS SURVEY THE PACKER WAS INTACT AND ALL INJECTED FLUIDS WERE ENTERING THE COMPLETION ZONE BELOW 3202 WITH NO UPWARD CHANNELING INDICATED.

GR AFTER LOG (BASE)

****

FILE: 26

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE CORP. RUN: 1

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3 TRIP: 1

COMPANY: HOECHST CELANESE CORP.

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3

SERVICE: F 150A FILE: 26 DATE: 10/26/93

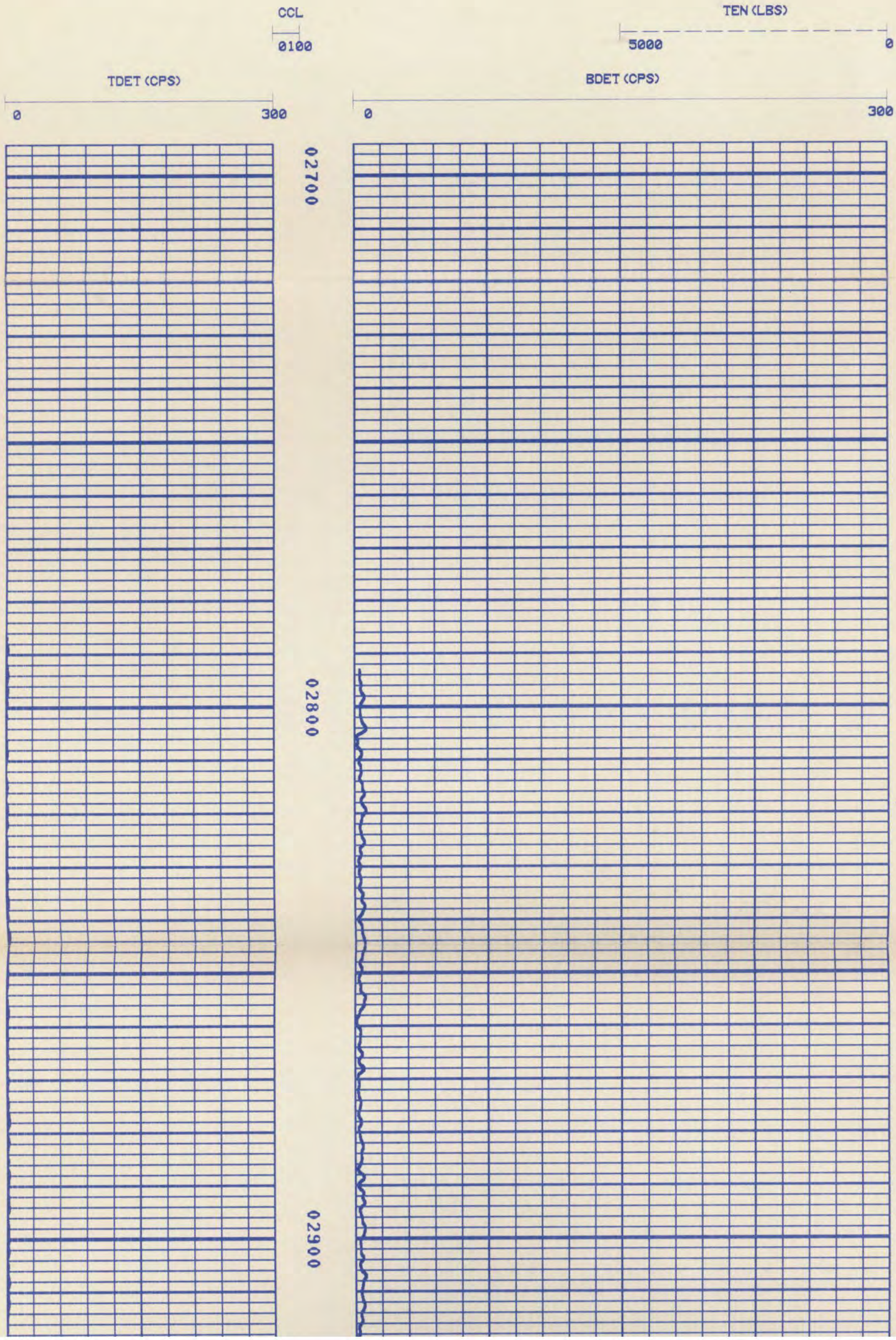
REVISION: FSYS256 REV:G002 VER:2.0

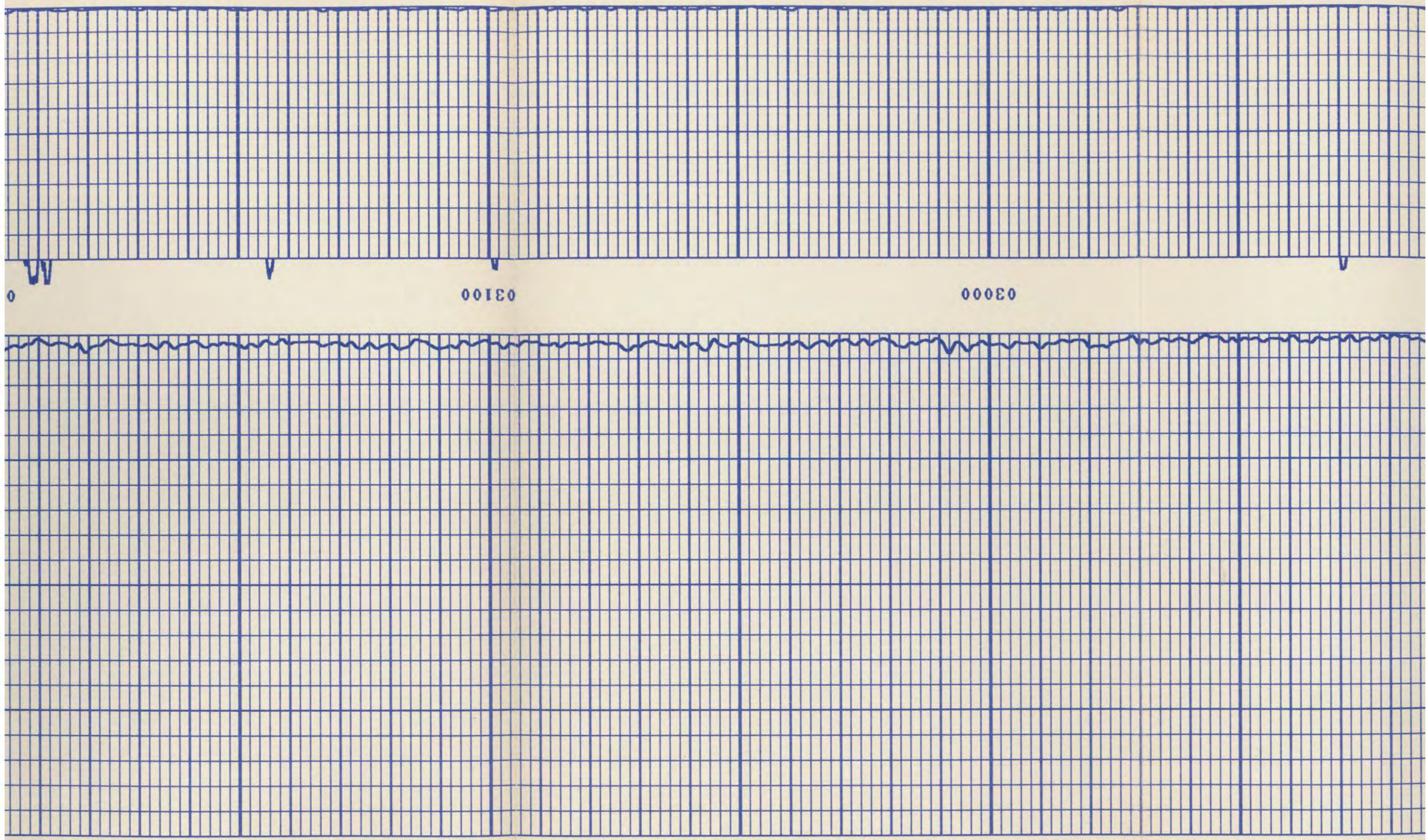
RUN: 1

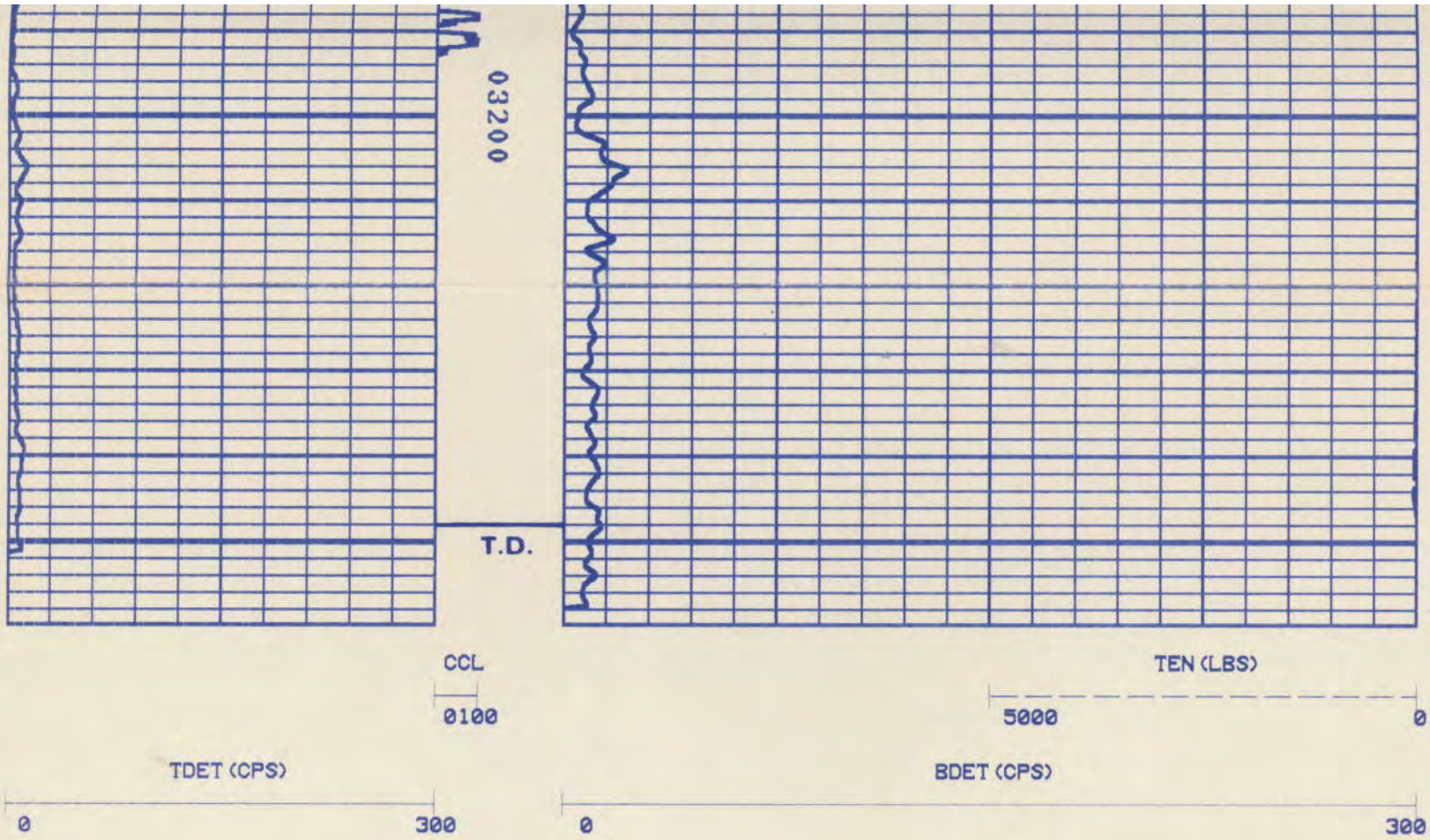
TRIP: 1

TIME: 21:23:09

MODE: RECORD




0
03100
03000



FILE: 26

****

FILES 24 & 25 ARE STATIONARY SHOTS TAKEN AT 1650 & 1710 HRS. RESPECTIVELY AT A PUMP-IN RATE OF 98 GPM... DEPTH WAS 3180'.

****

FILE: 24

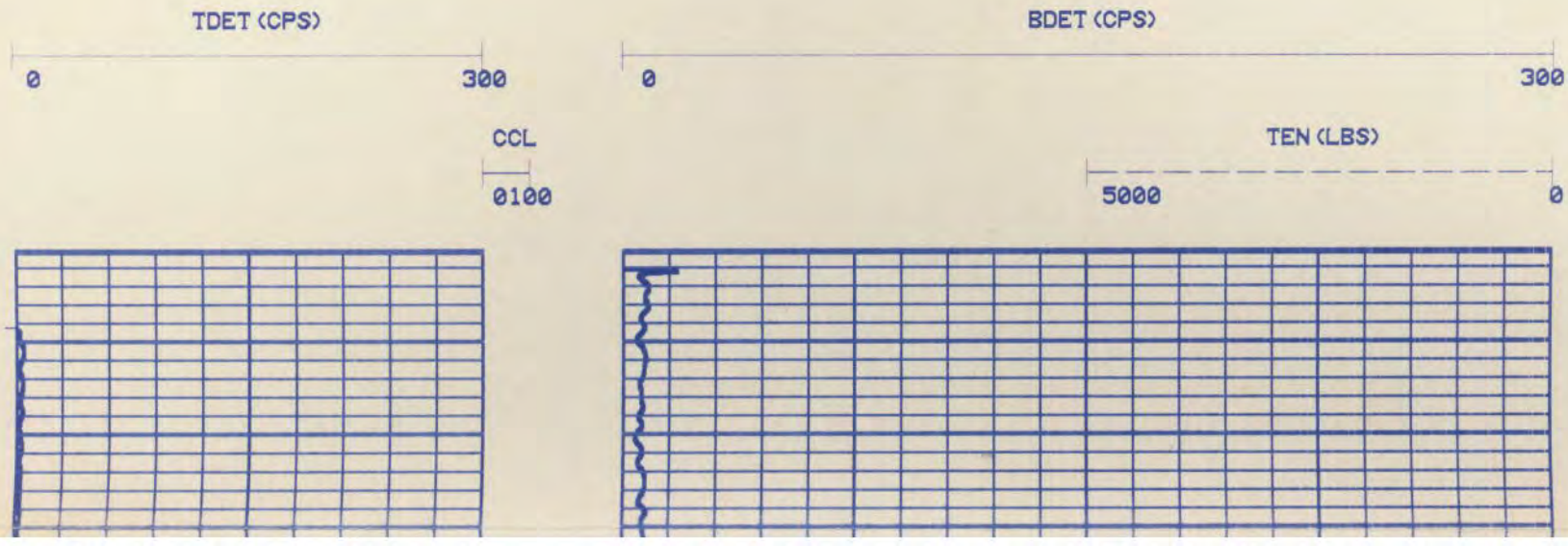
COMPANY: HOECHST CELANESE CORP. RUN: 1

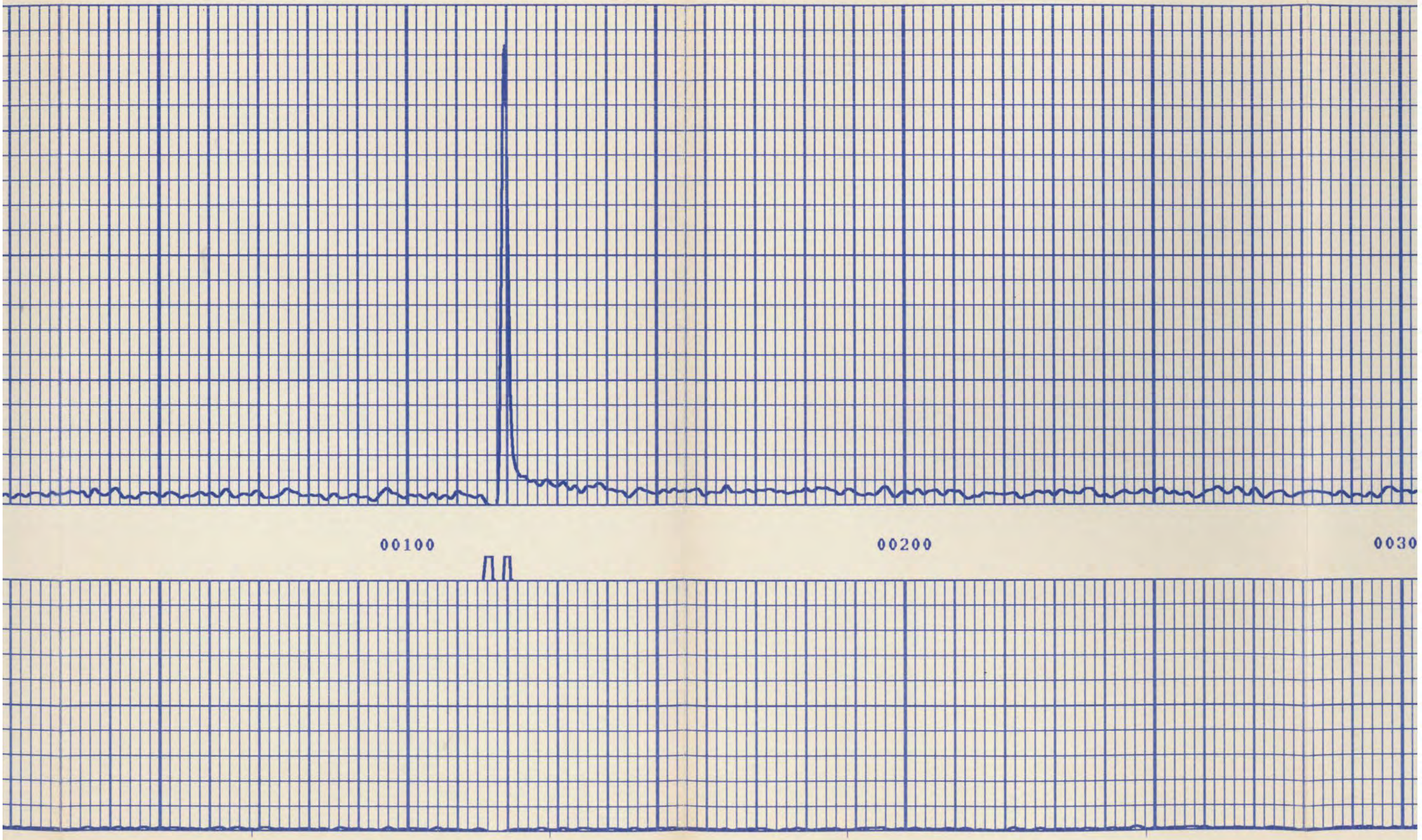
WELL NAME: EFFLUENT DISPOSAL WELL NO. 3 TRIP: 1

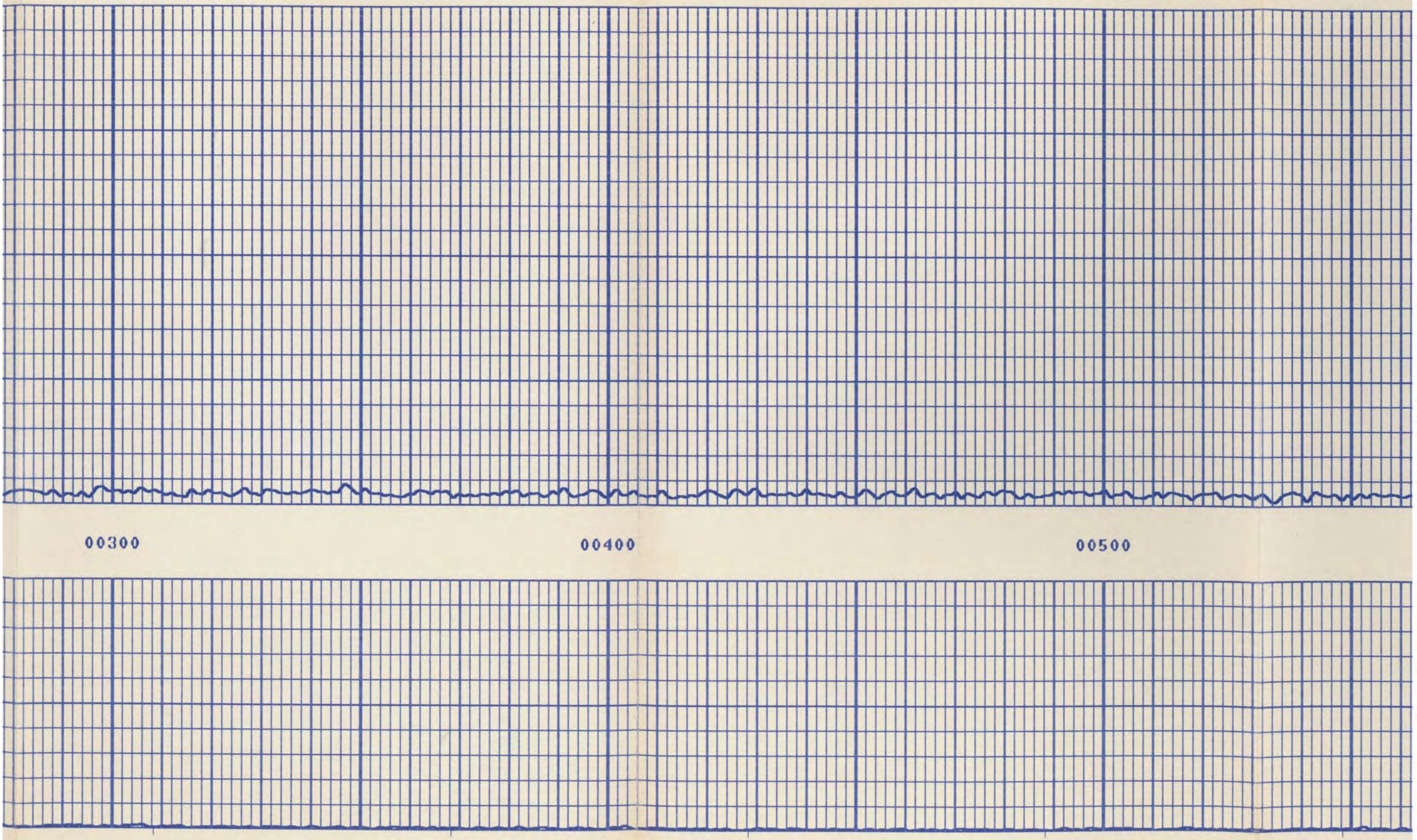
SERVICE: F 150A FILE: 24 DATE: 10/26/93 TIME: 20:40:04

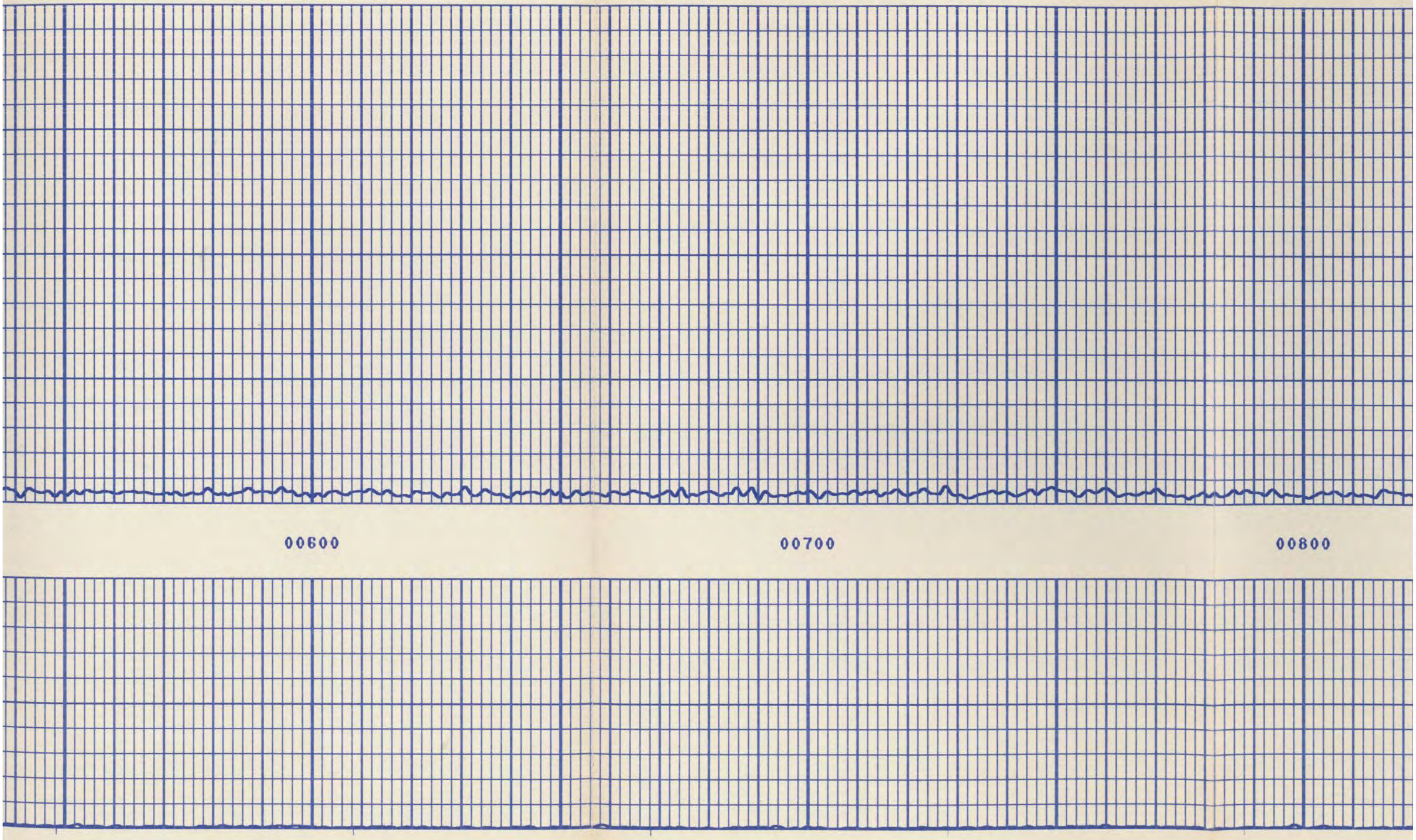
REVISION: FSYS256 REV:G002 VER:2.0 MODE: RECORD

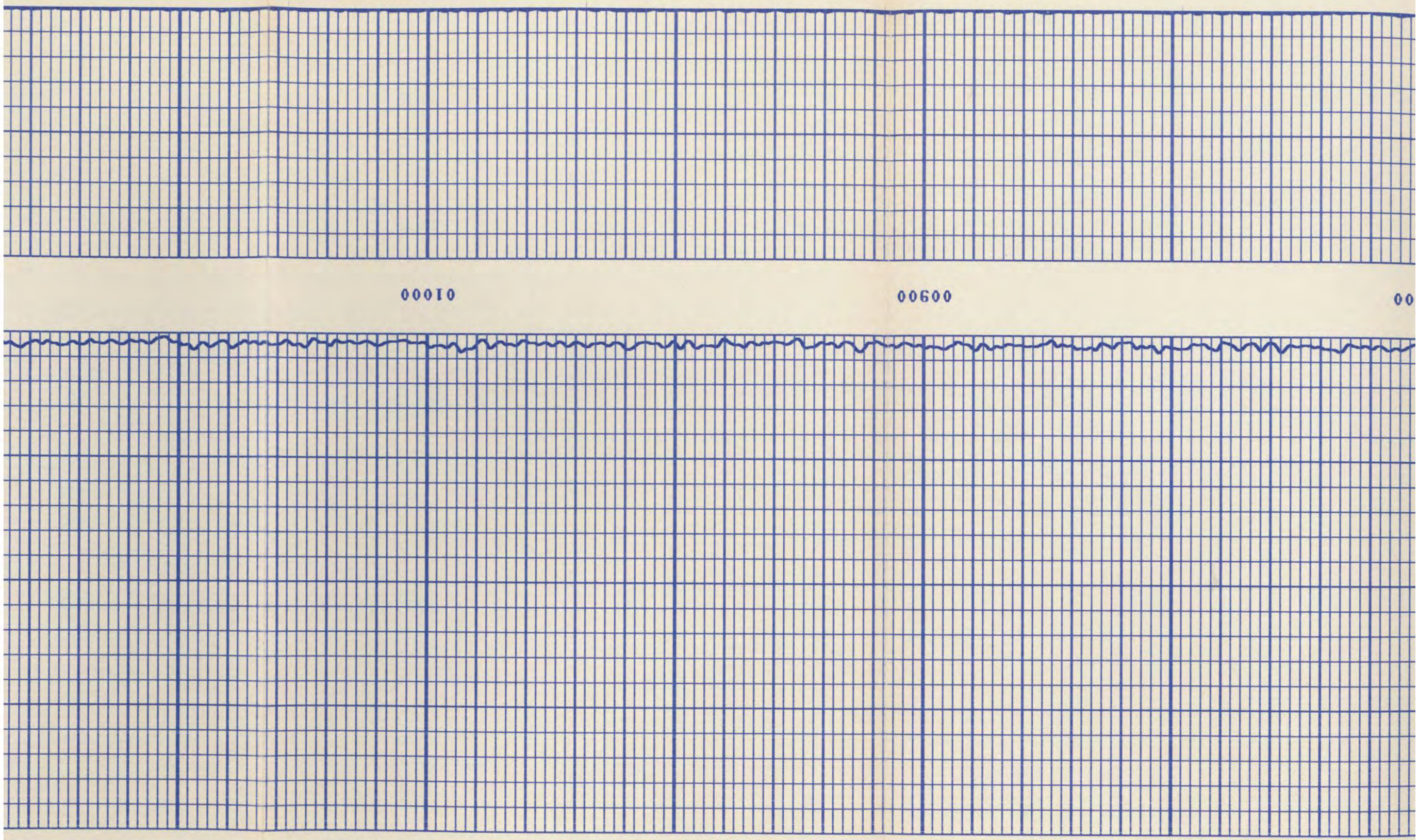
DEPTH: 3186

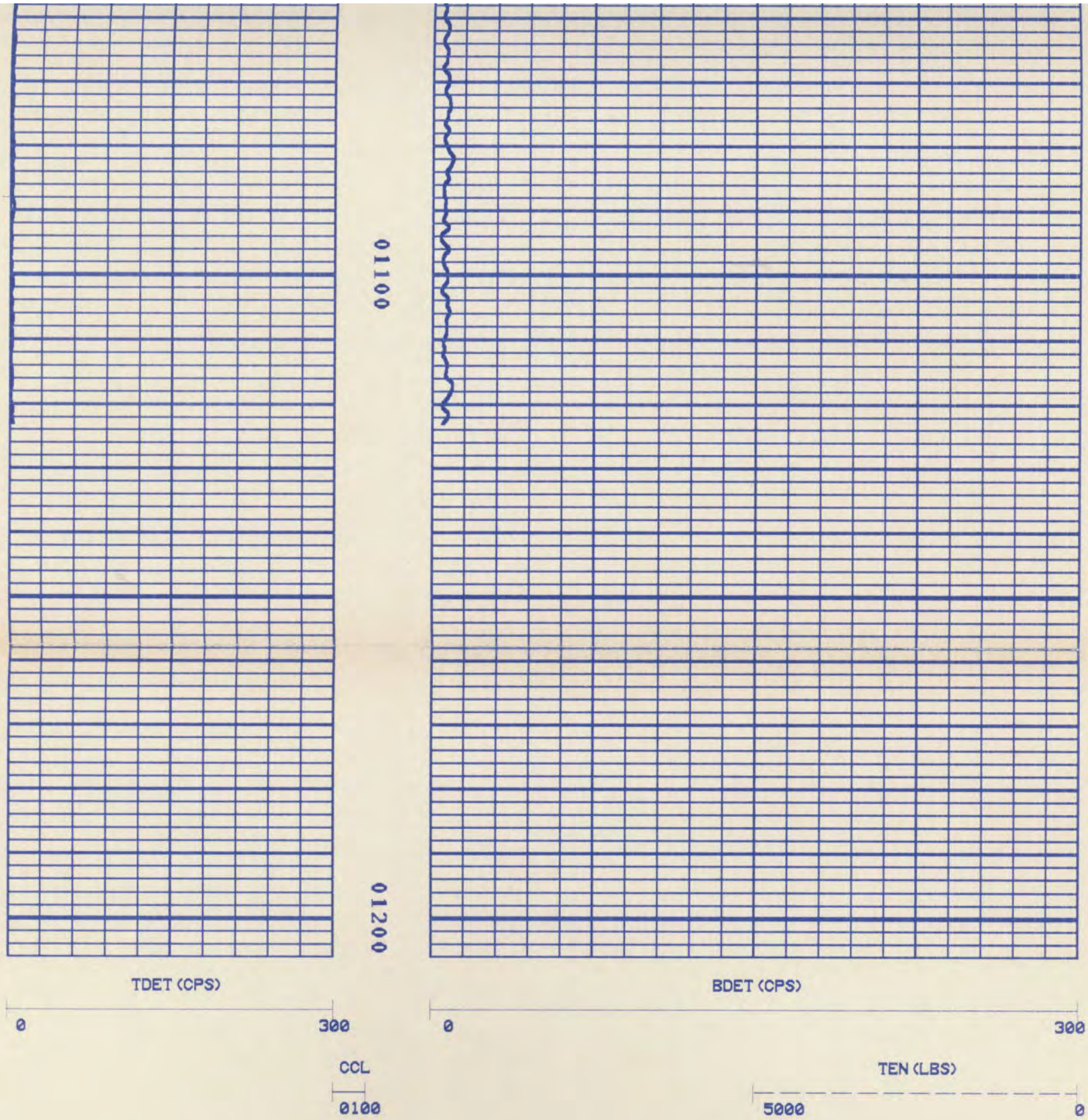



00100
00200
0030


00300
00400
00500


00600
00700
00800


00010
00600
00



DISPLAY SCALE CHANGES

*** NONE ***

PARAMETERS

*** NONE ***

FILE: 24

****
****

FILE: 25

COMPANY: HOECHST CELANESE CORP. RUN: 1

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3 TRIP: 1

SERVICE: F 150A FILE: 25 DATE: 10/26/93 TIME: 21:00:03

COMPANY: HOECHST CELANESE CORP.

RUN: 1

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3

TRIP: 1

SERVICE: F 150A FILE: 25 DATE: 10/26/93

TIME: 21:00:03

REVISION: FSYS256 REV:G002 VER:2.0

MODE: RECORD

DEPTH: 3186

TDET (CPS)

0 300

BDET (CPS)

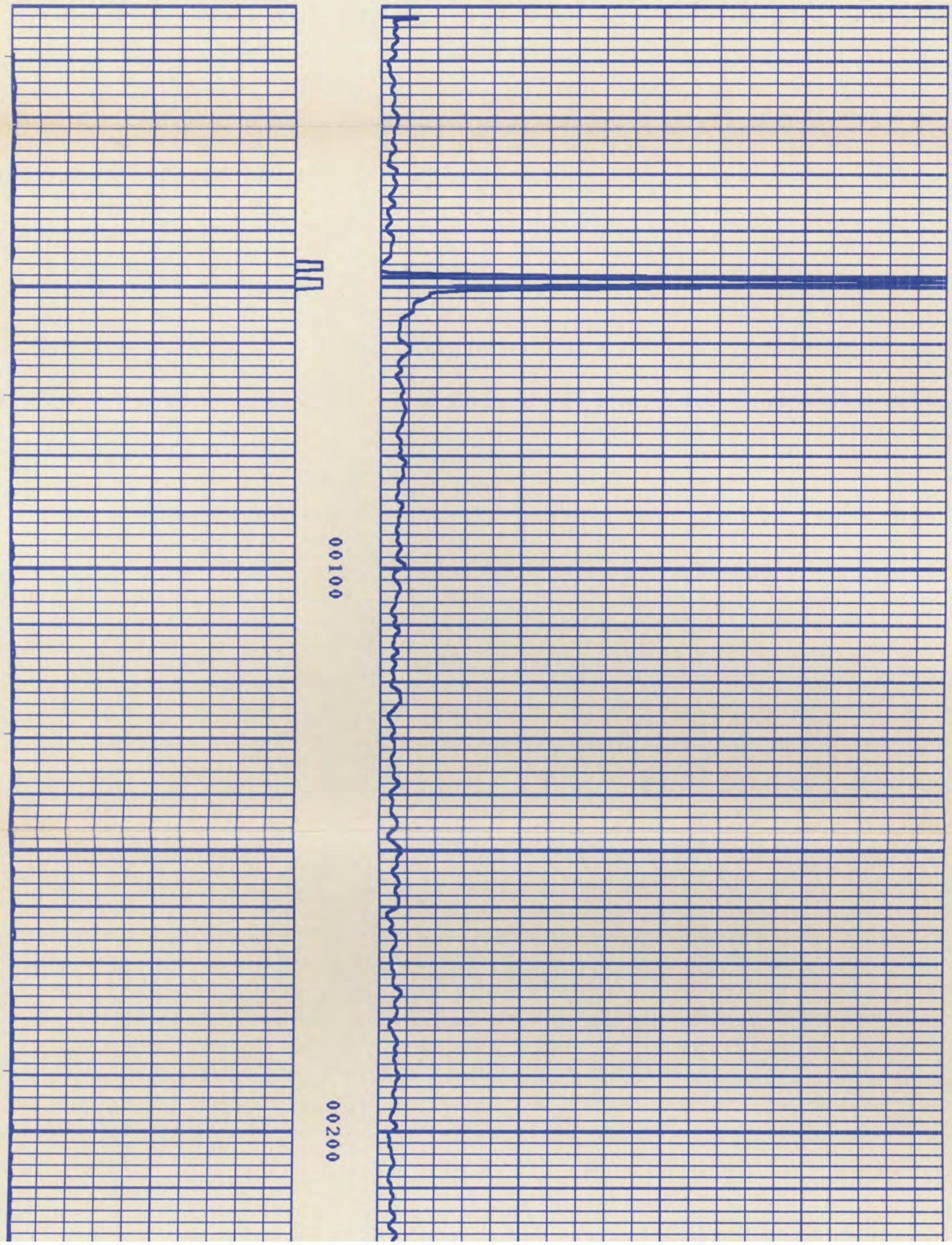
0 300

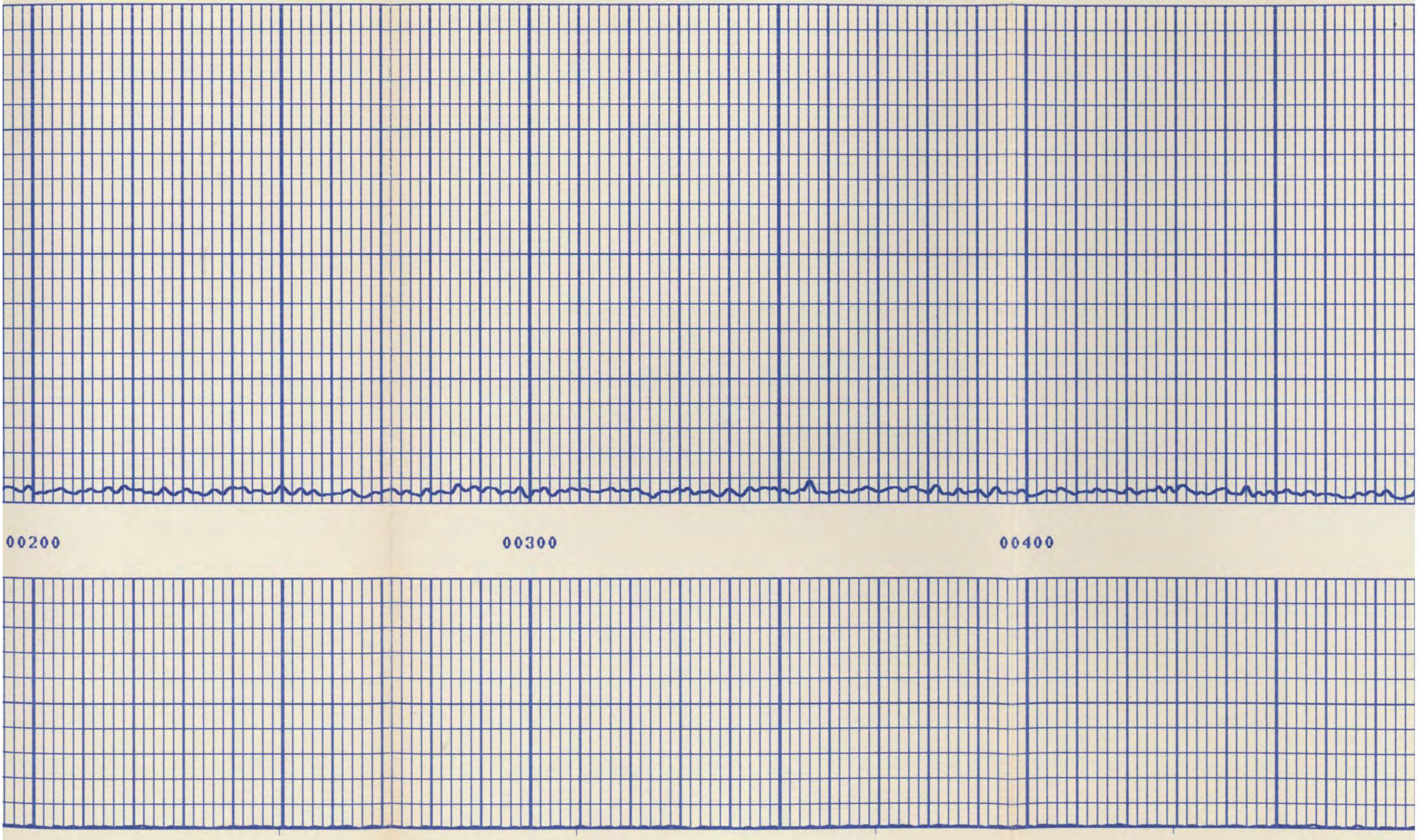
CCL

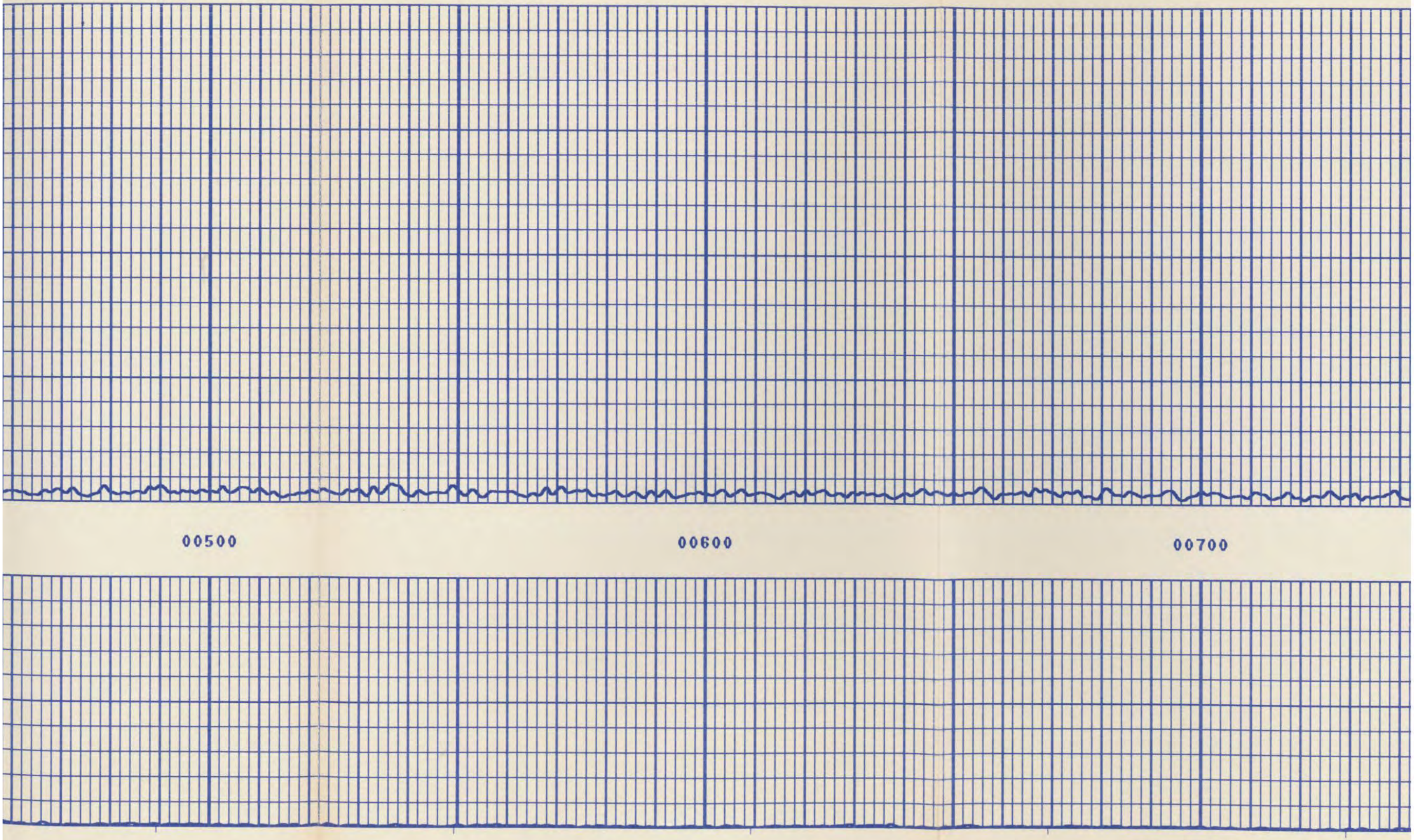
0100

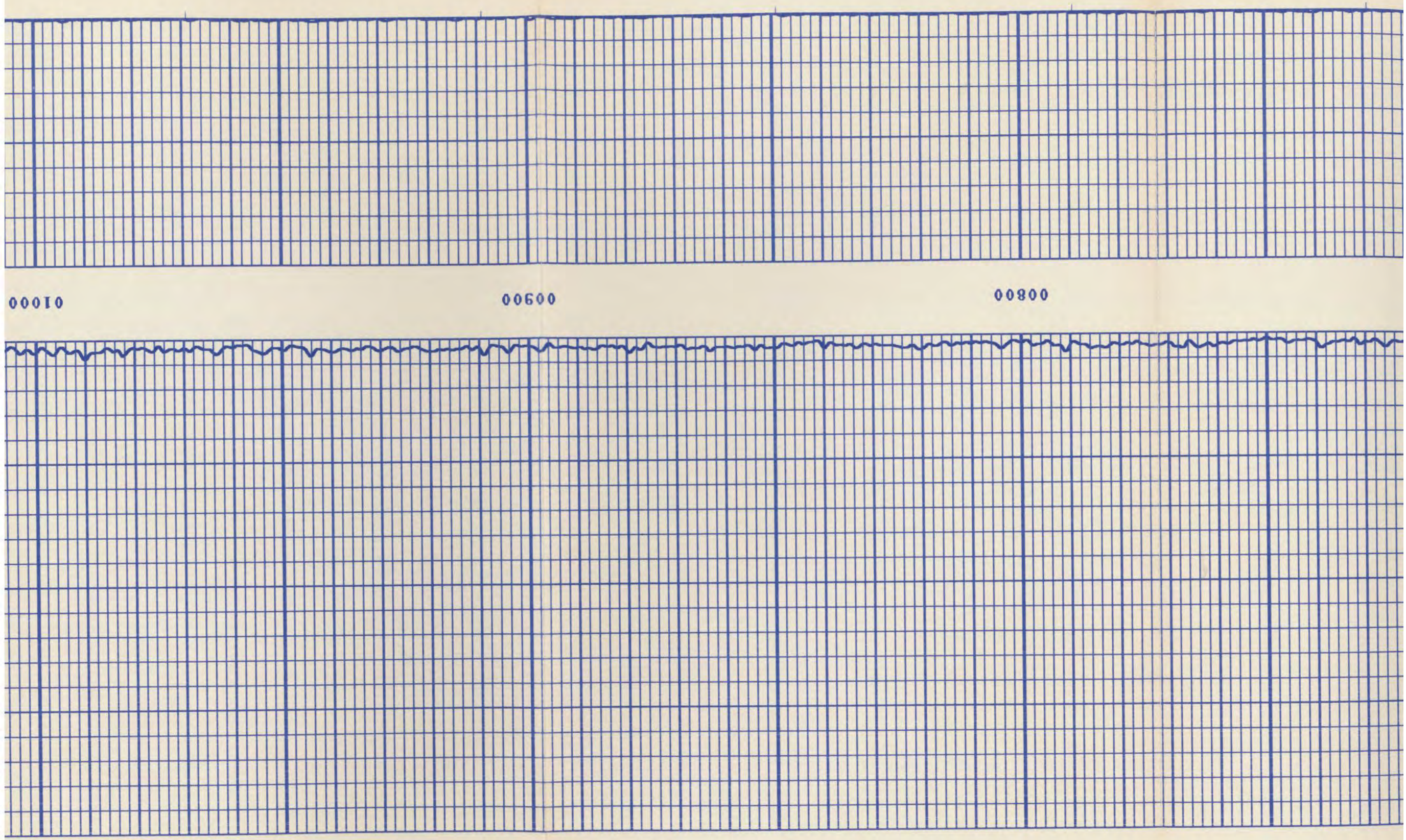
TEN (LBS)

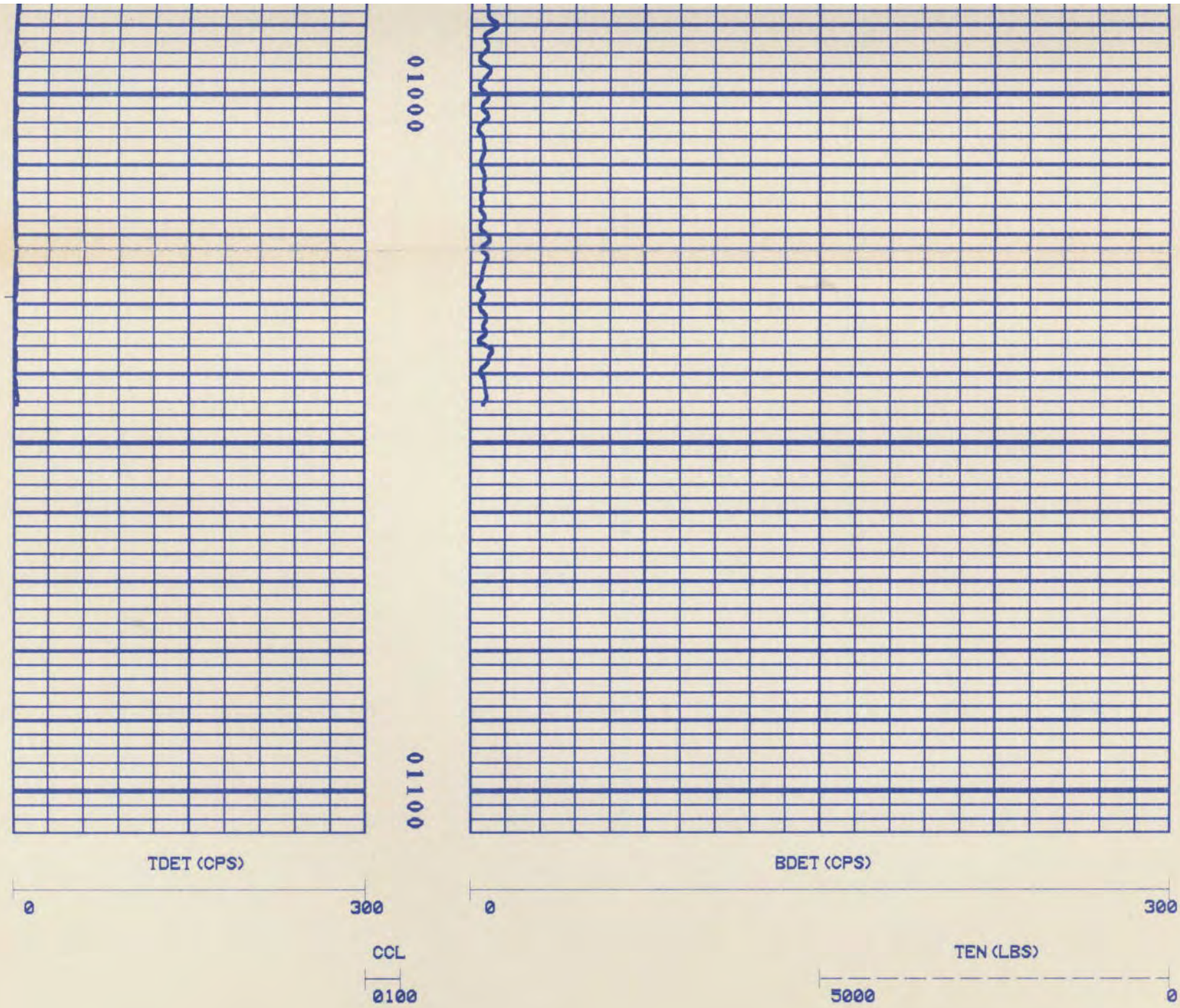
5000 0




00200
00300
00400


00500
00600
00700


01000
00600
00800



DISPLAY SCALE CHANGES

*** NONE ***

PARAMETERS

*** NONE ***

FILE: 25

****

FILES 15-23 THIRD CHASE

FILES 15-23 THIRD CHASE DOWN WITH A PUMP-IN RATE OF 10 GPM. TIME 1640 HRS.

****

FILE: 23

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE CORP.

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3

SERVICE: F 150A FILE: 23 DATE: 10/26/93

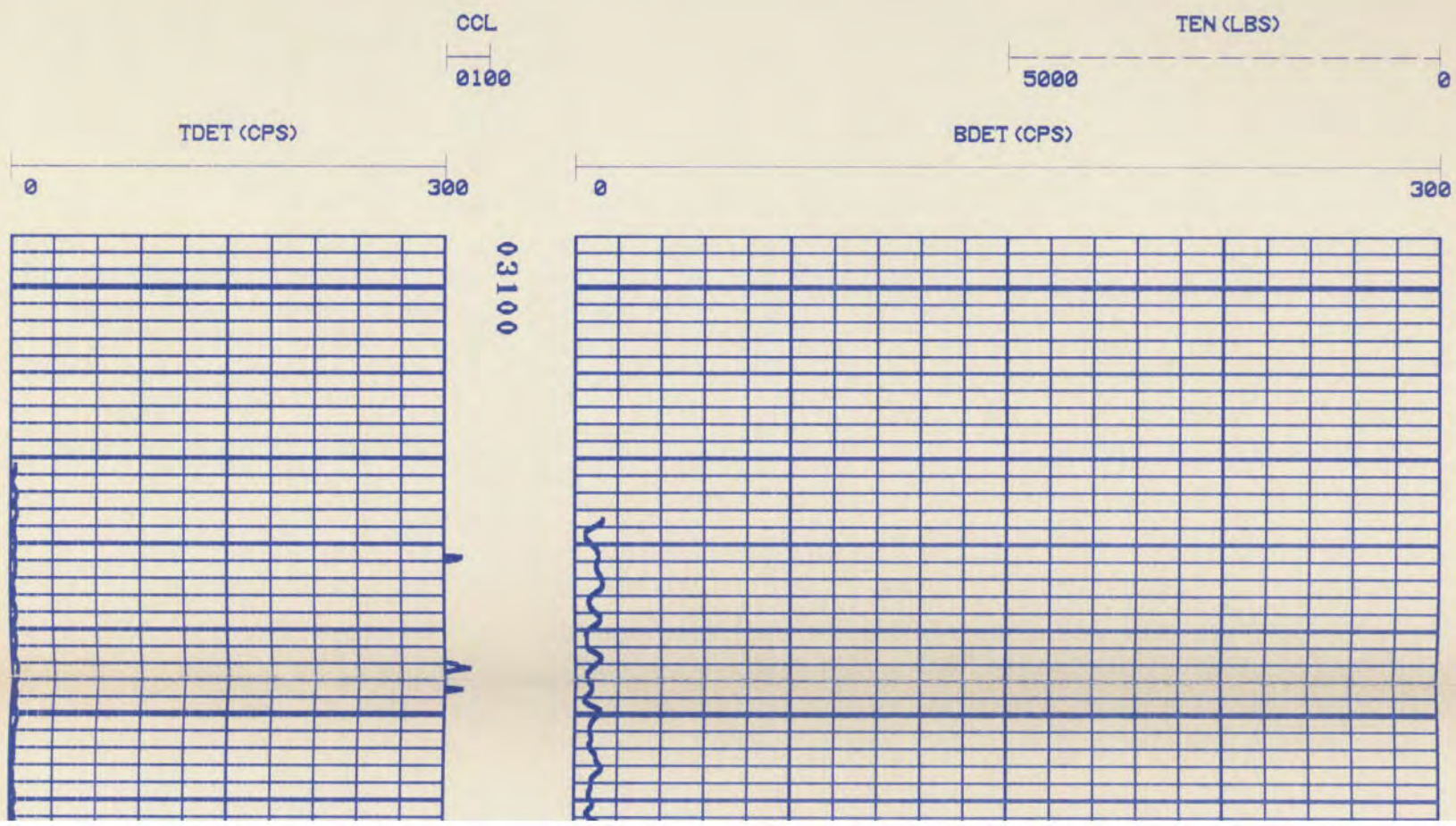
REVISION: FSYS256 REV:G002 VER:2.0

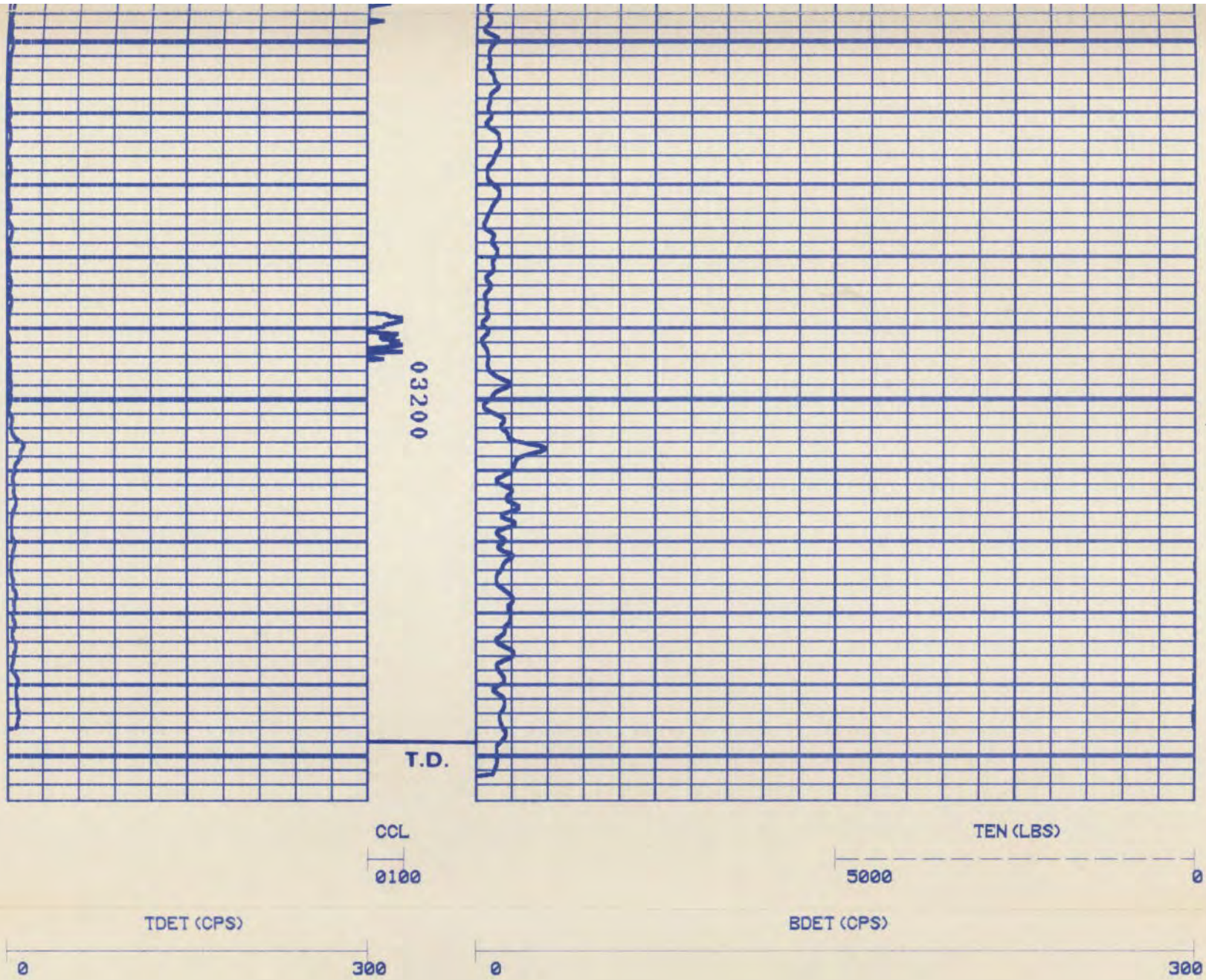
RUN: 1

TRIP: 1

TIME: 20:34:44

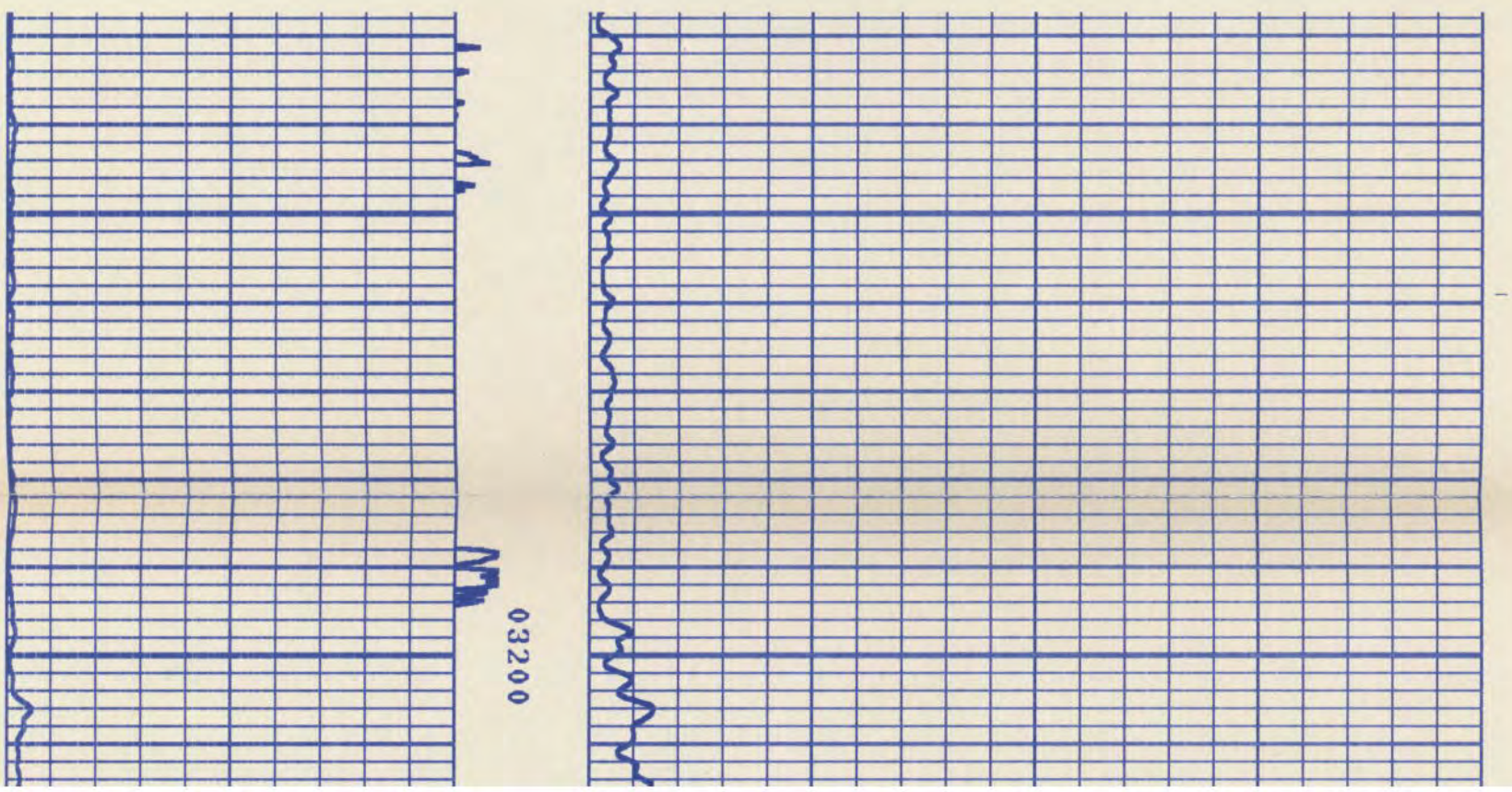
MODE: RECORD

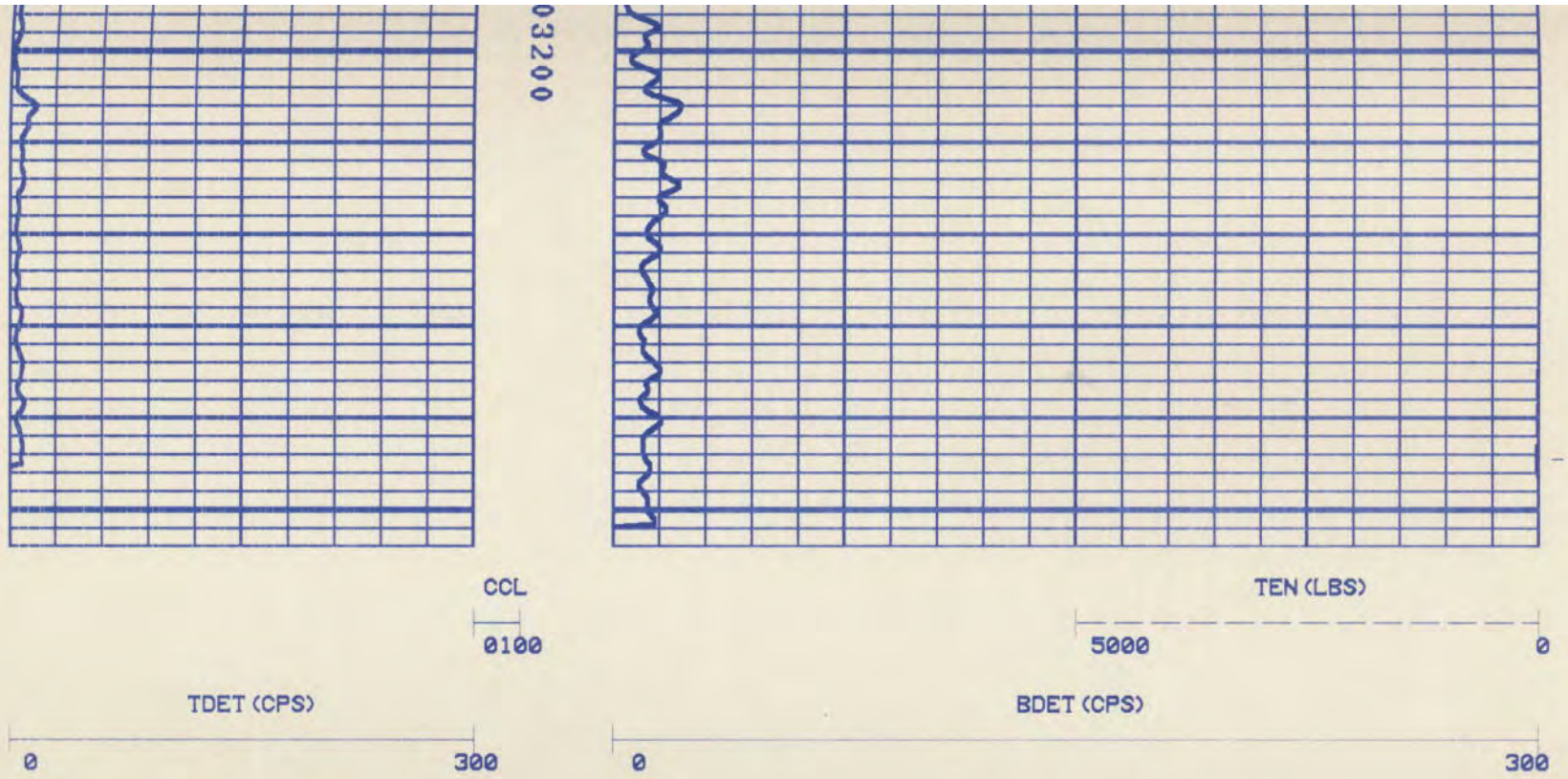



03200
T.D.
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 23

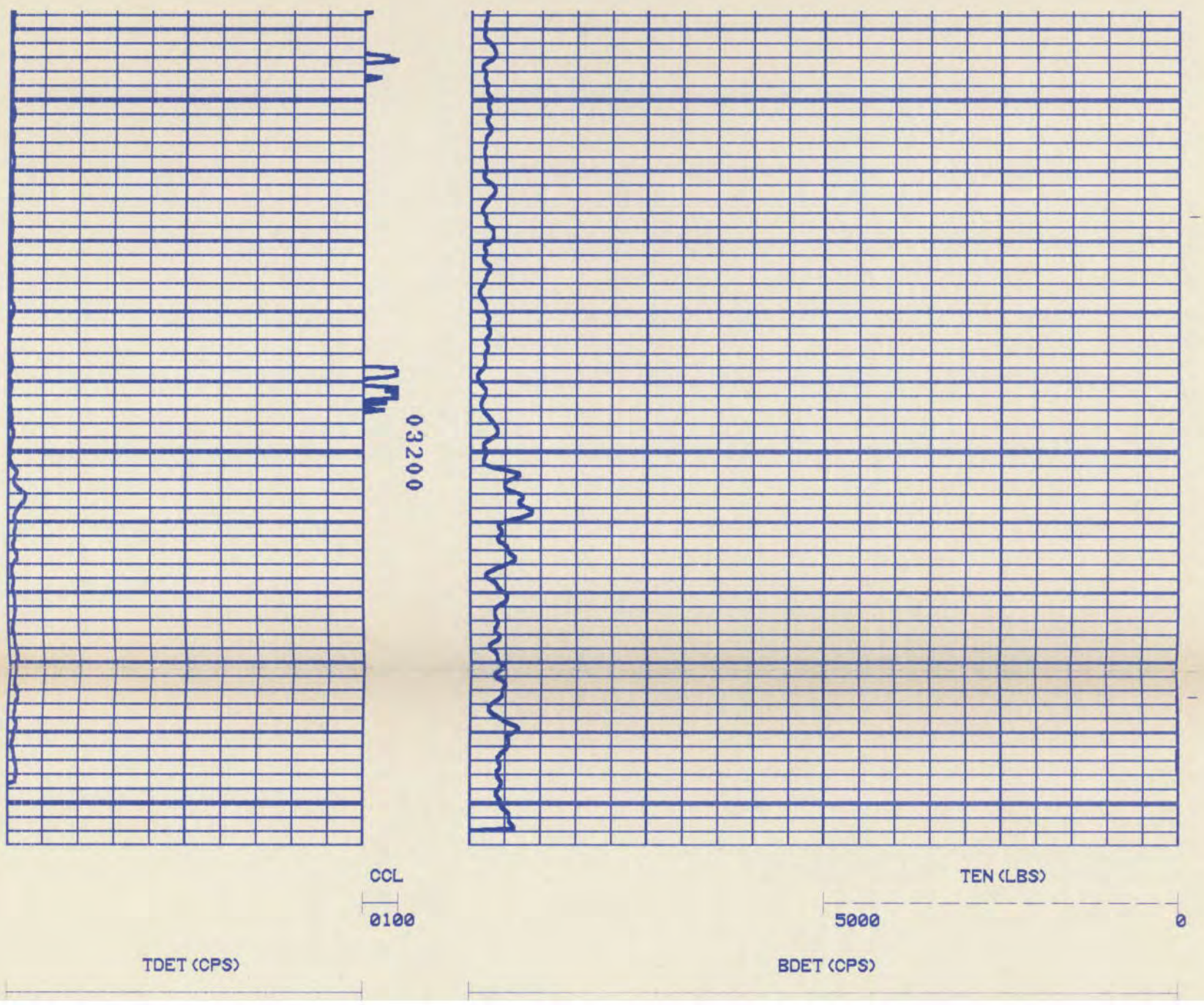
****


03200


03200
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

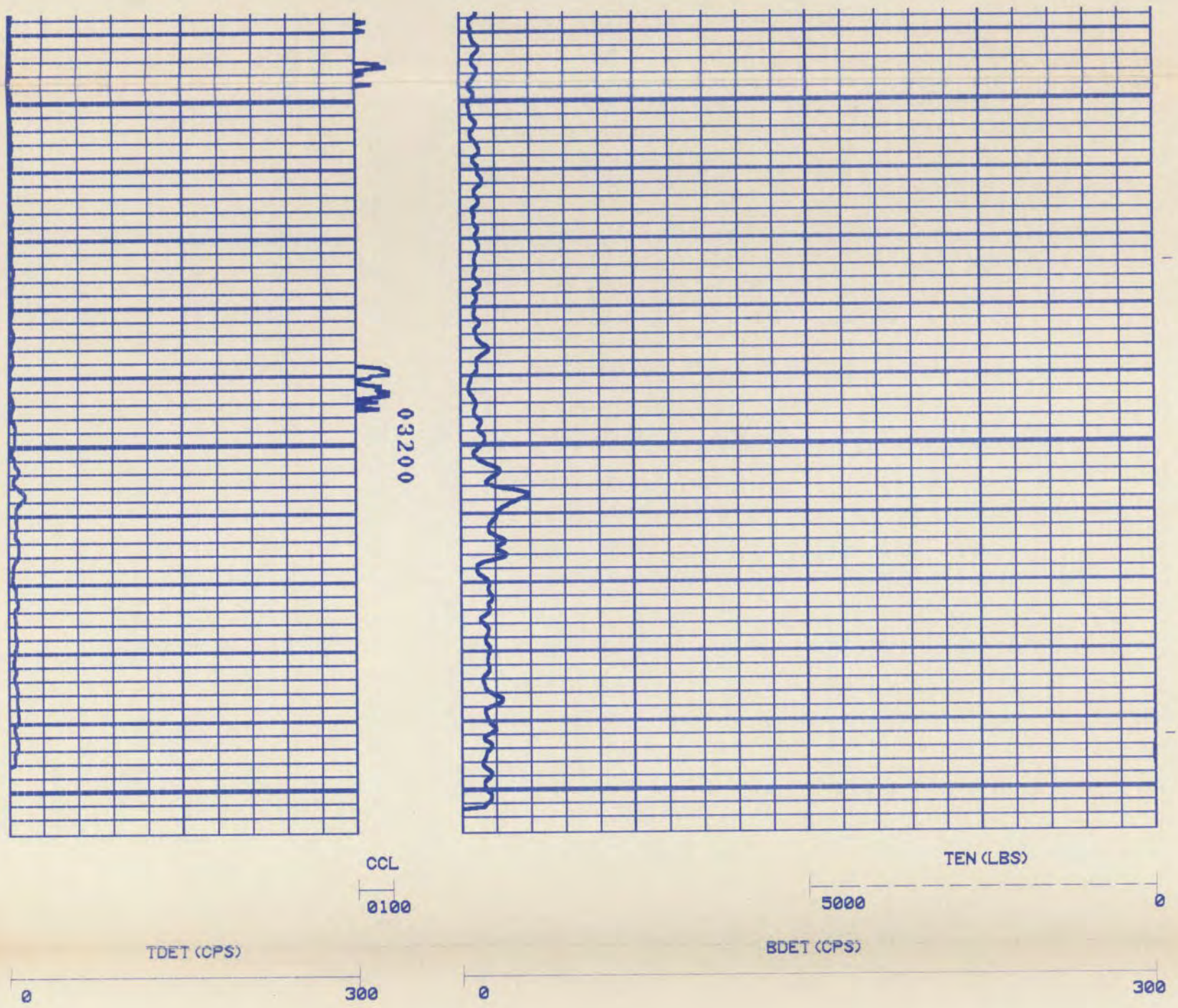
FILE: 22

****


03200
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
BDET (CPS)

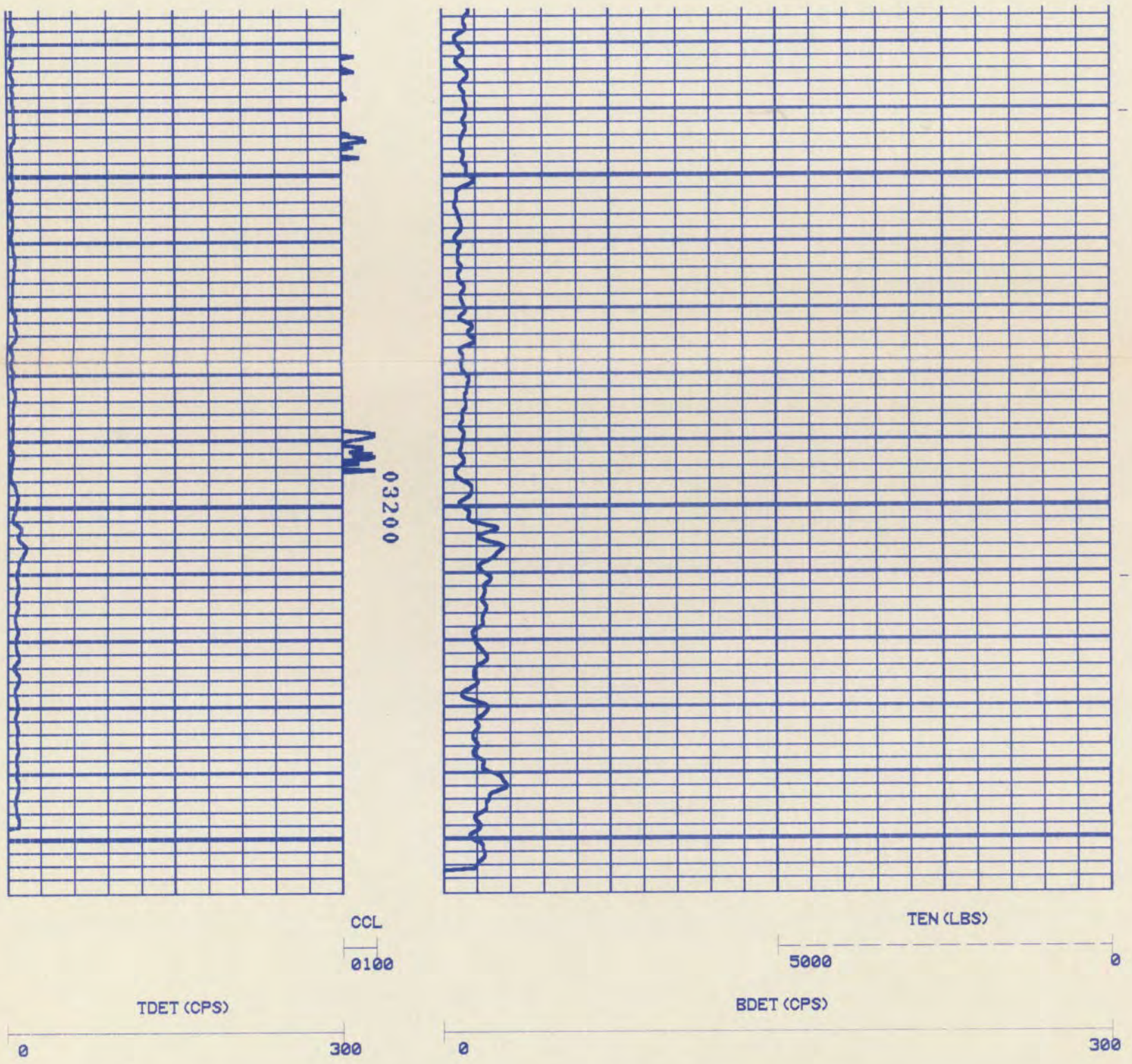
FILE: 21

****



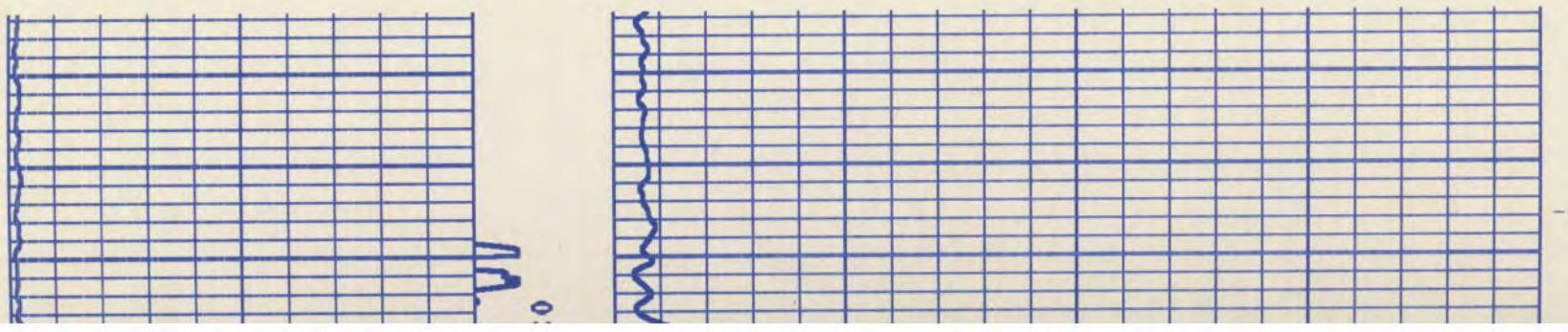
FILE: 20

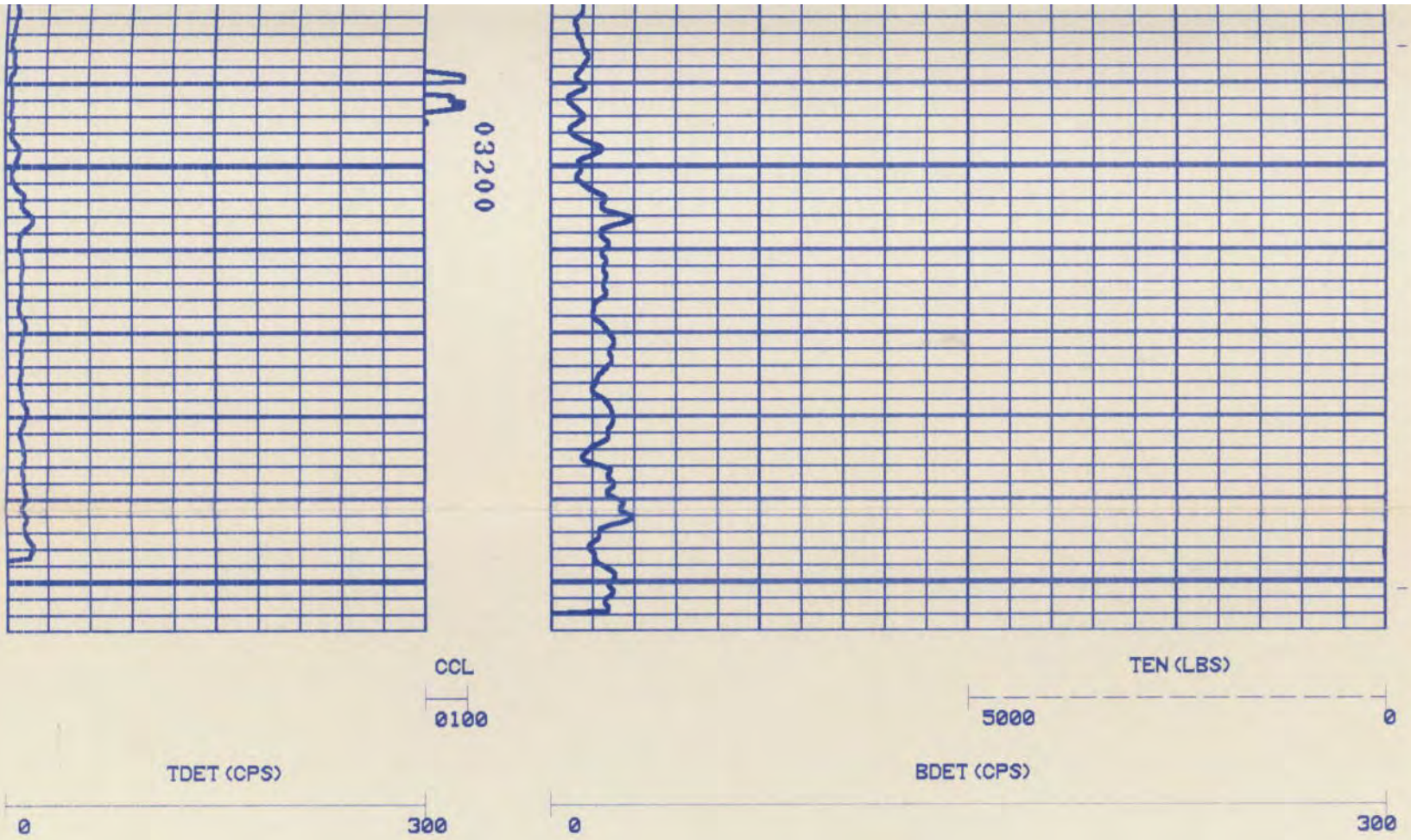
****



FILE: 19

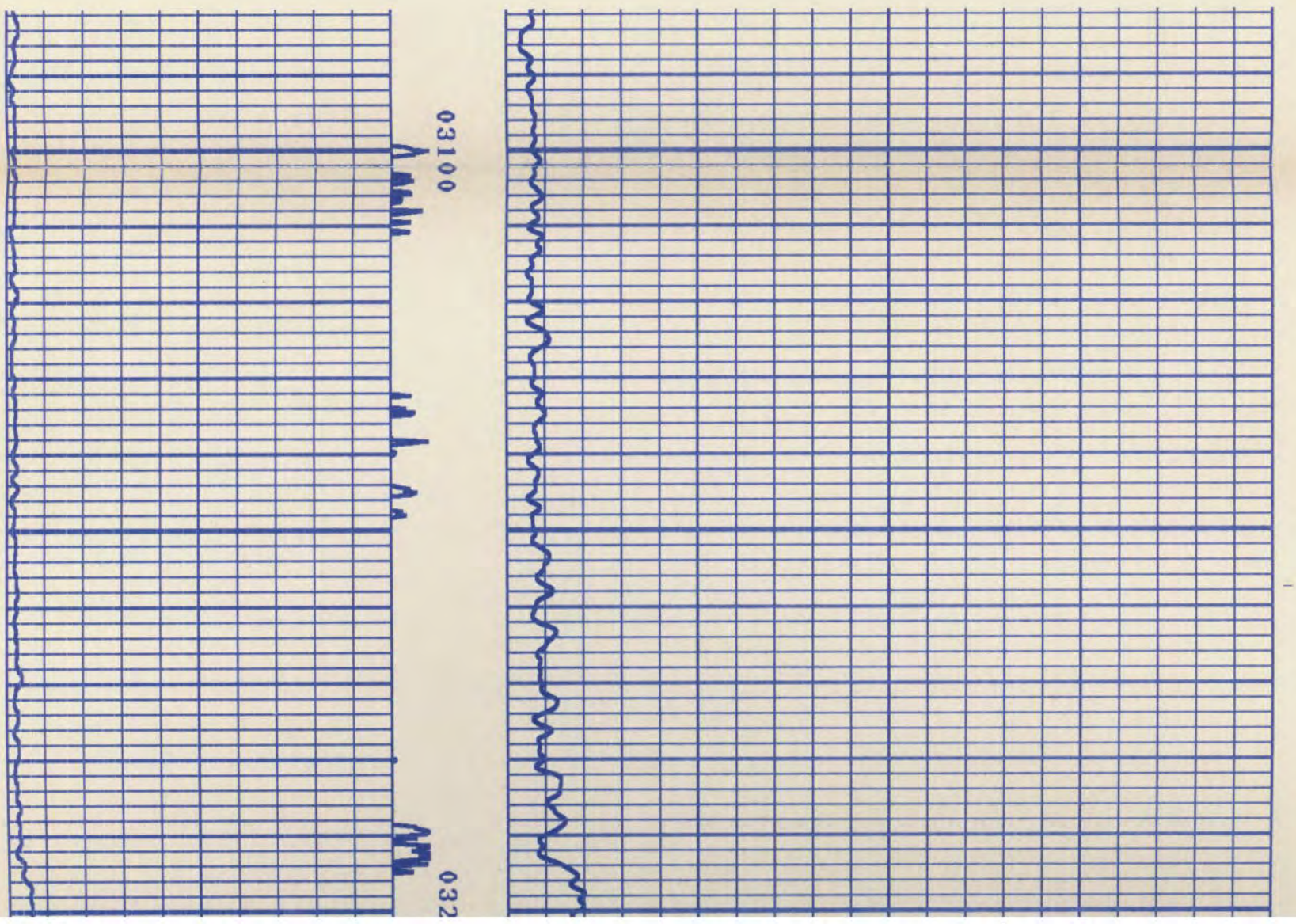
****

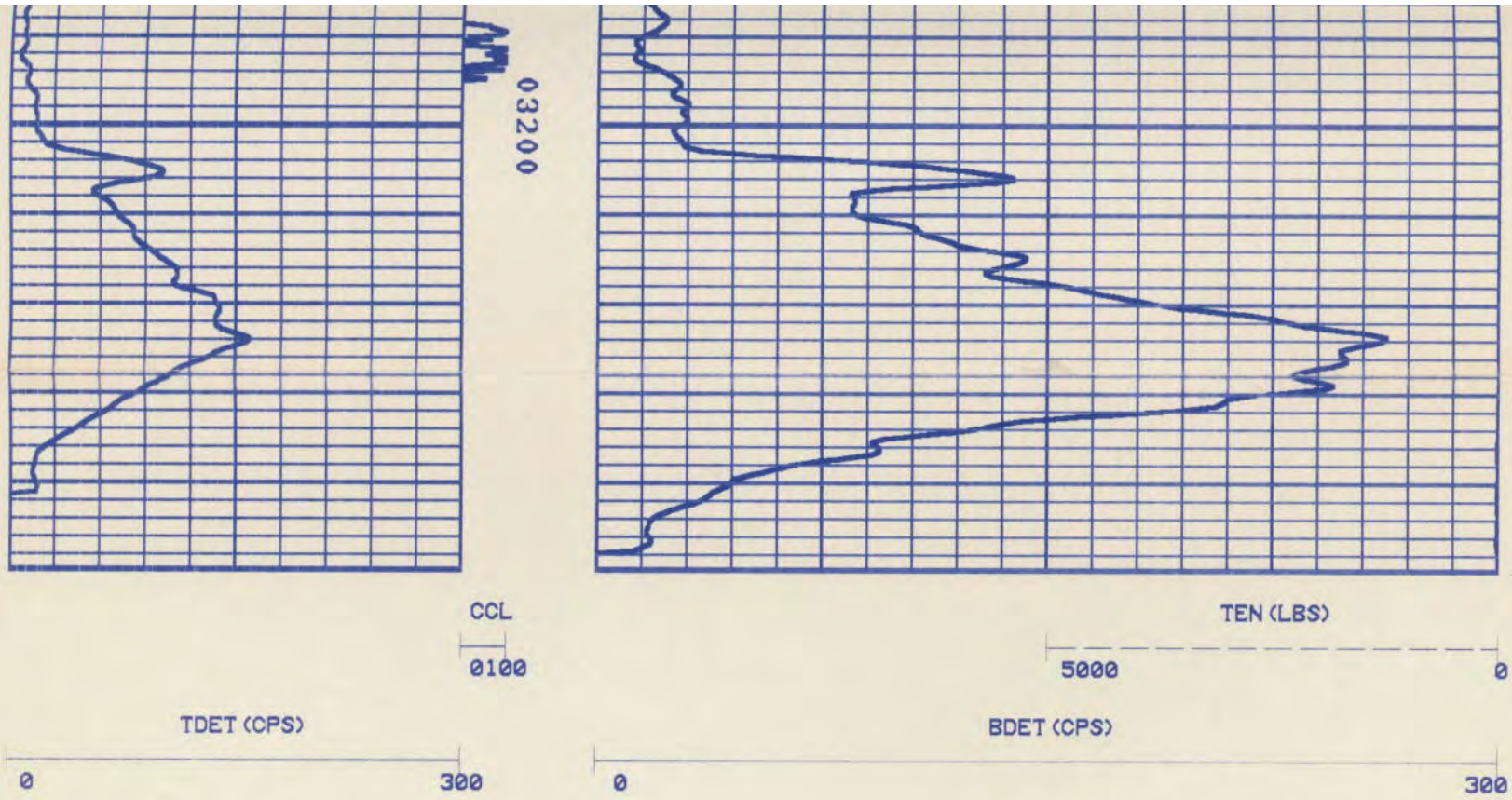



03200
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 18

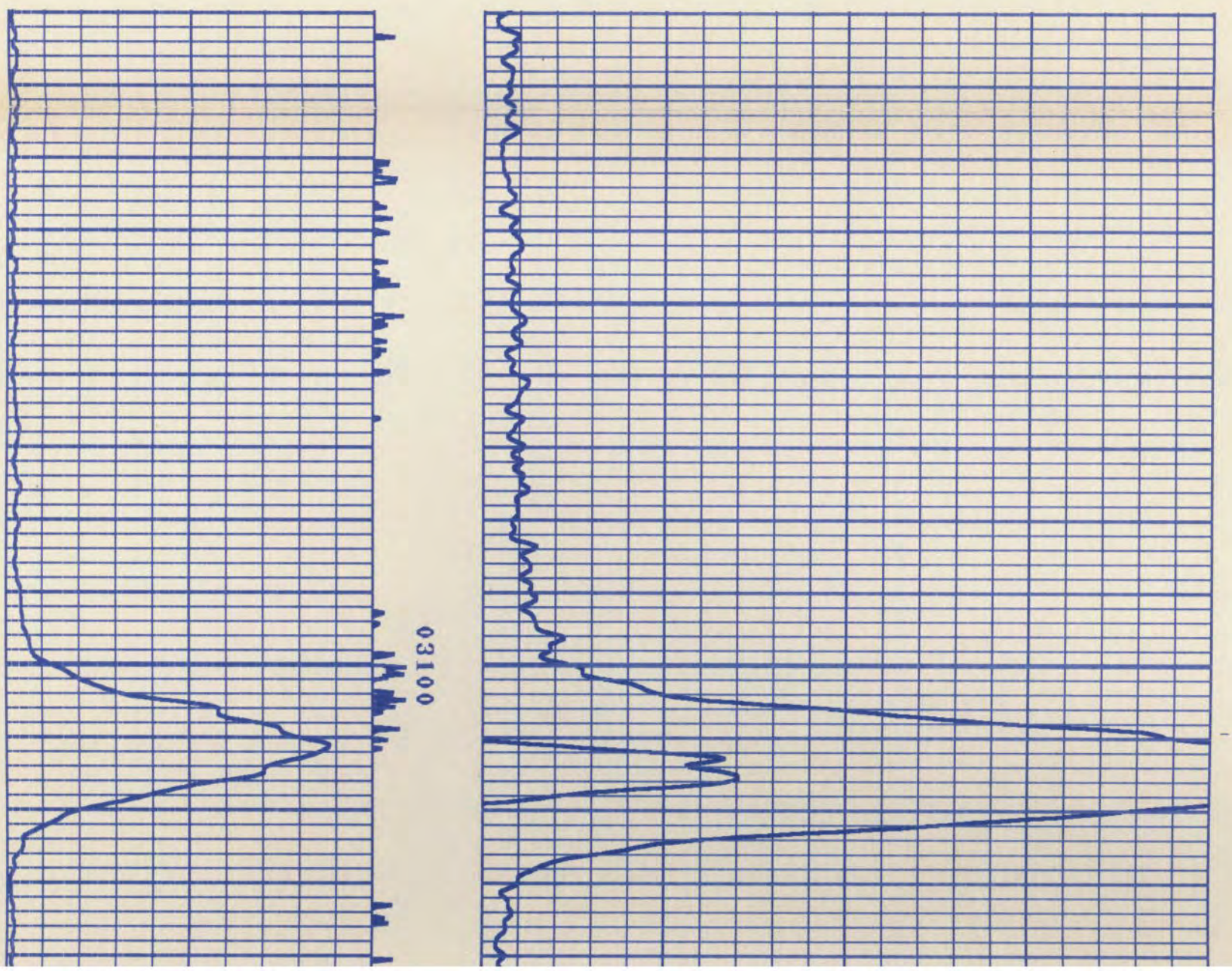
****

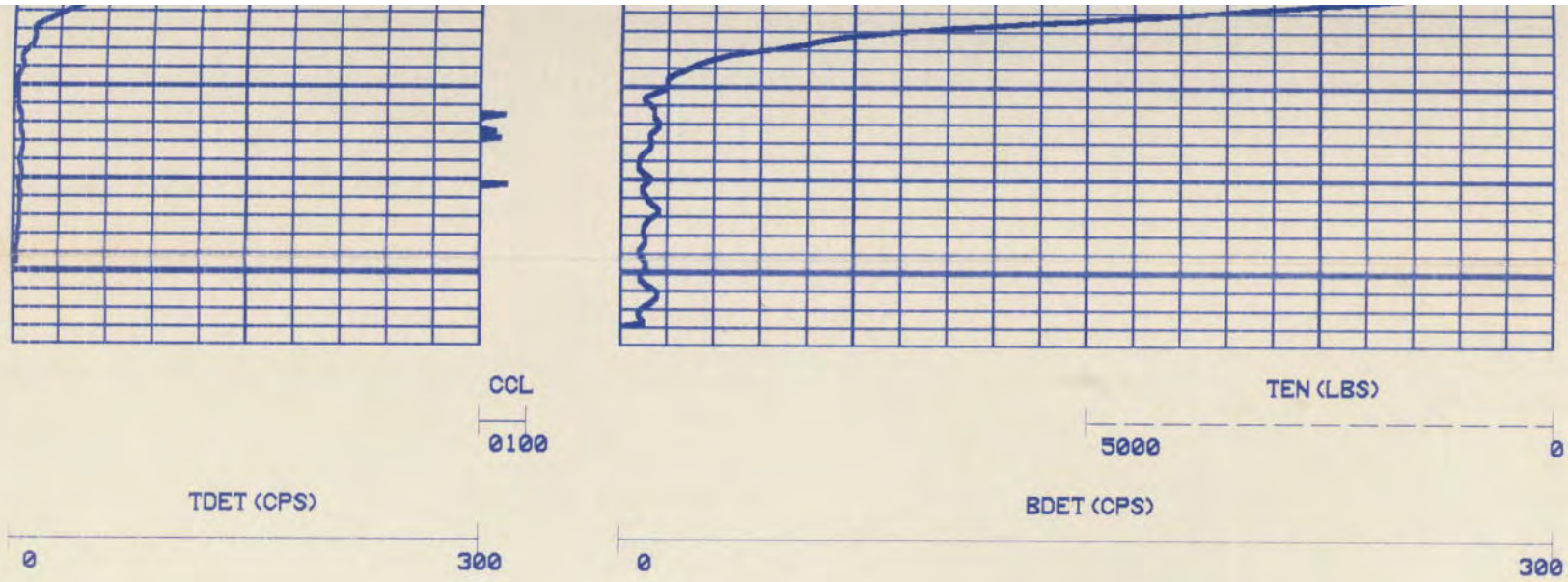

03100
032


03200
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 17

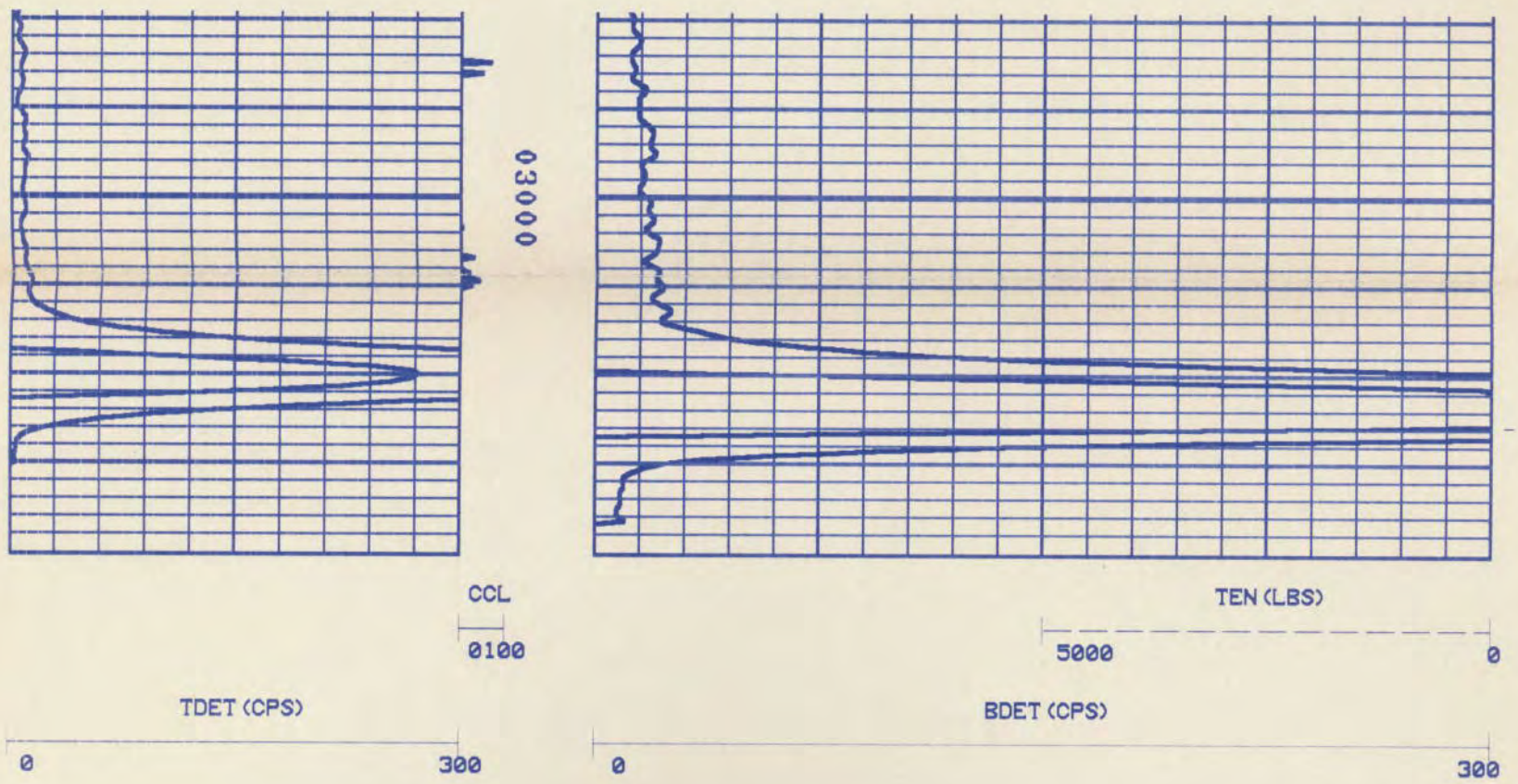
****


03100



FILE: 16

****



FILE: 15

****

SECOND CHASE DOWN WITH A
PUMP-IN RATE OF 15 GPM.
TIME 1610 HRS.

****

FILE: 14

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE CORP.

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3

SERVICE: F 150A FILE: 14 DATE: 10/26/93

REVISION: FSYS256 REV:G002 VER:2.0

RUN: 1

TRIP: 1

TIME: 20:04:59

MODE: RECORD

CCL

0100

TEN (LBS)

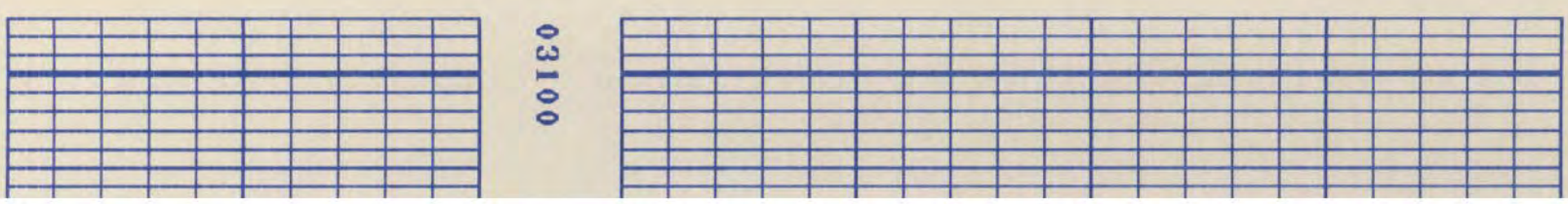
5000 0

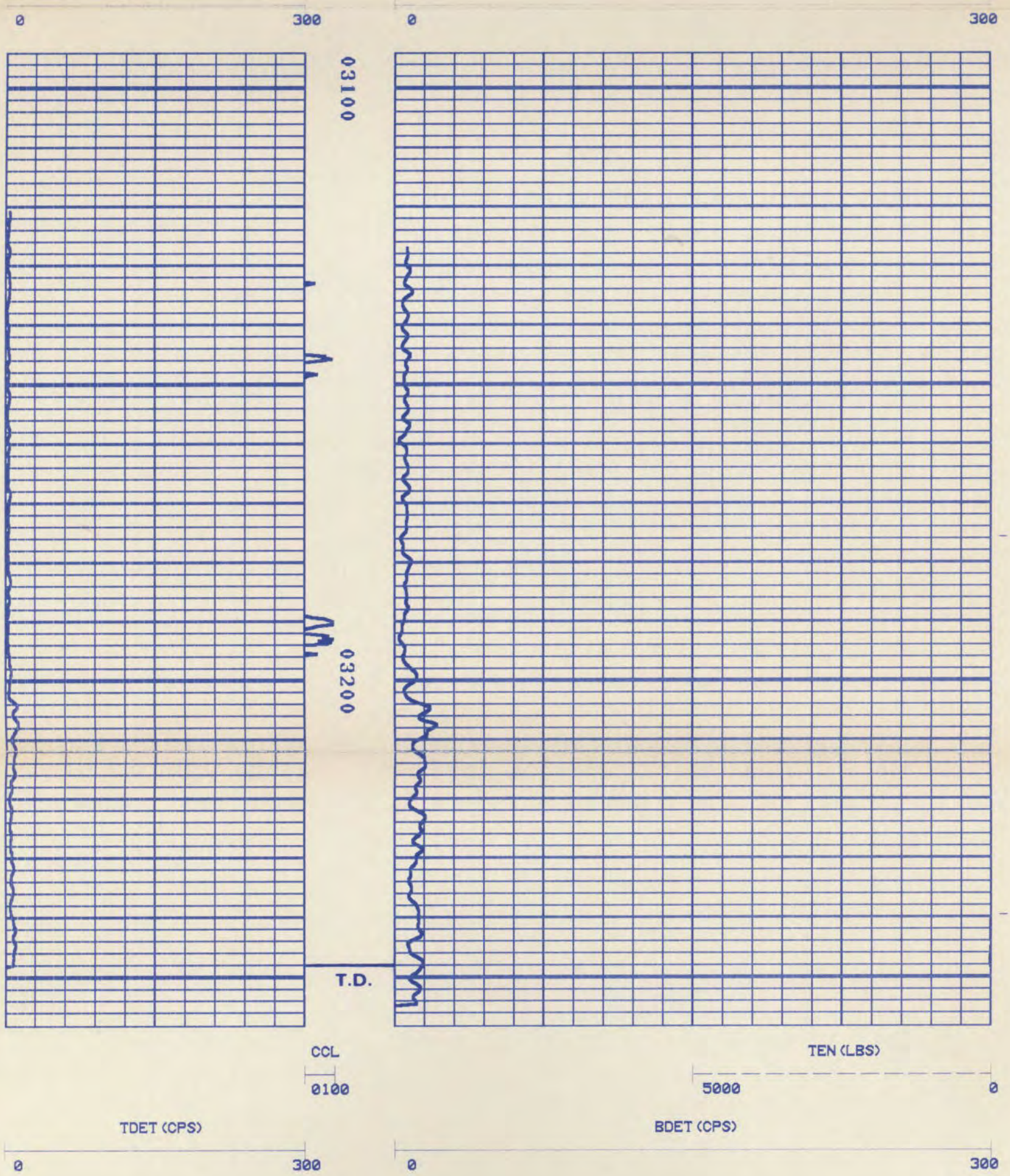
TDET (CPS)

0 300

BDET (CPS)

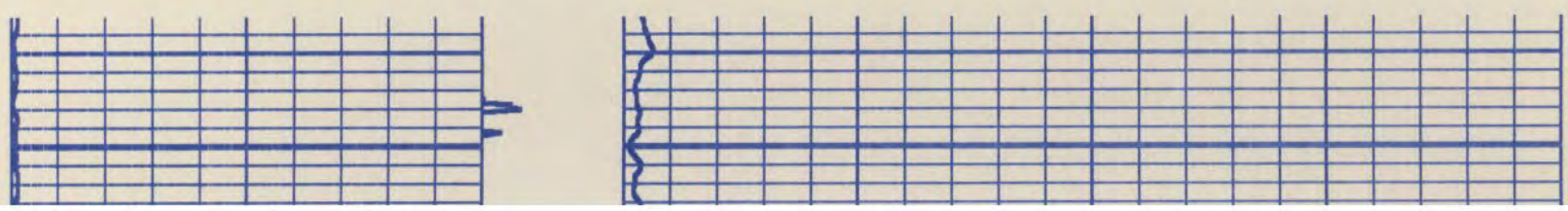
0 300

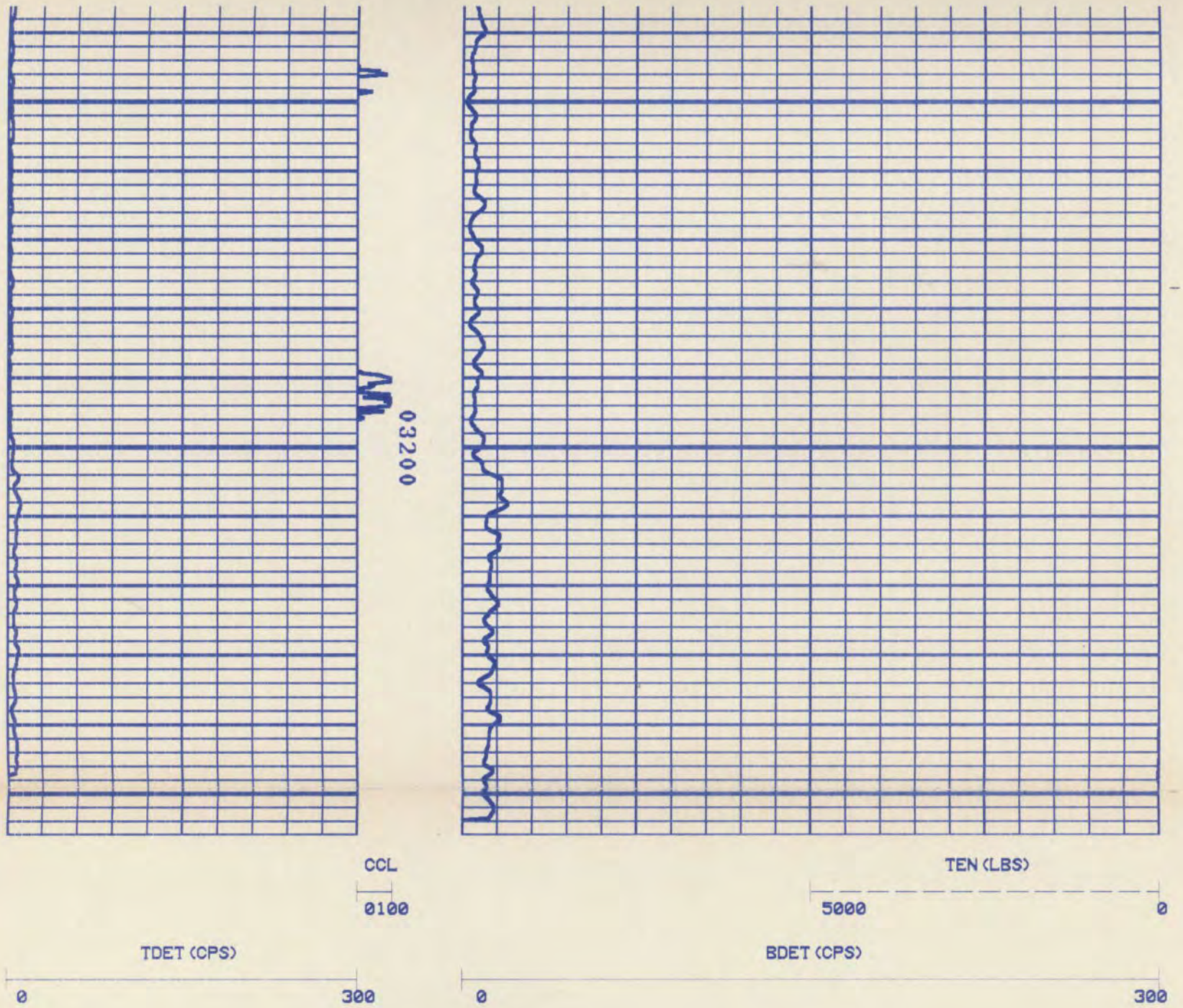



0
300
03100
03200
T.D.
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 14

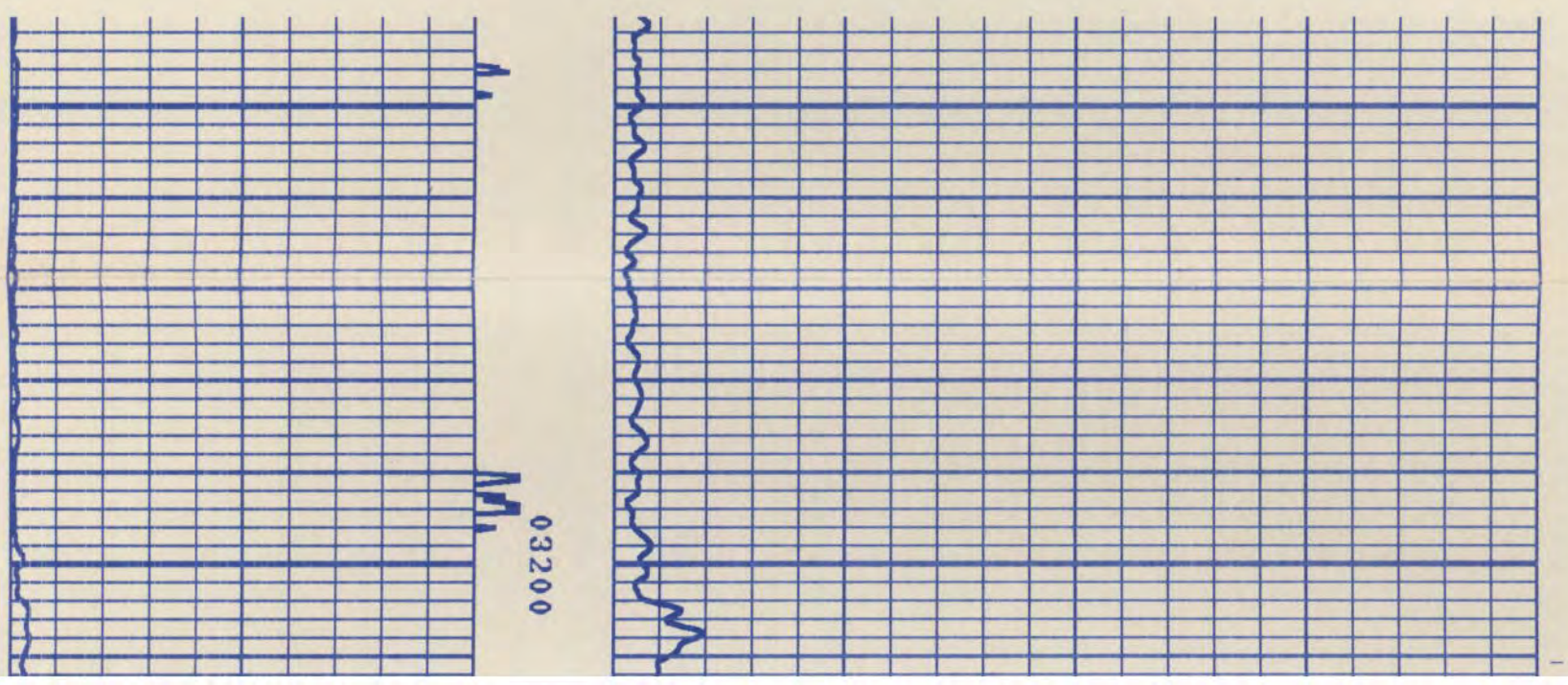
****

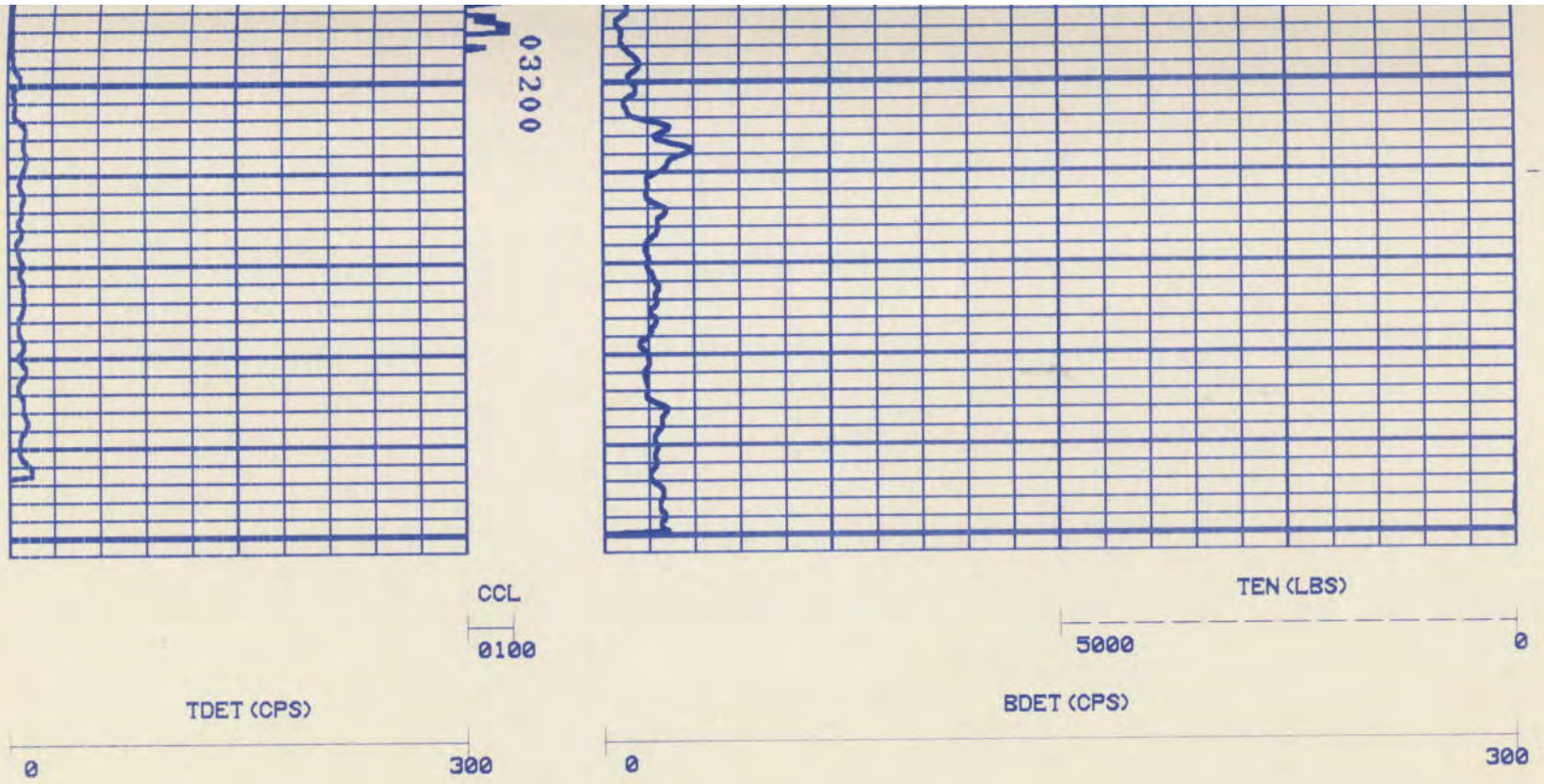



03200
CCL
0100
TDET (CPS)
0
300
TEN (LBS)
5000
0
BDET (CPS)
0
300

FILE: 13

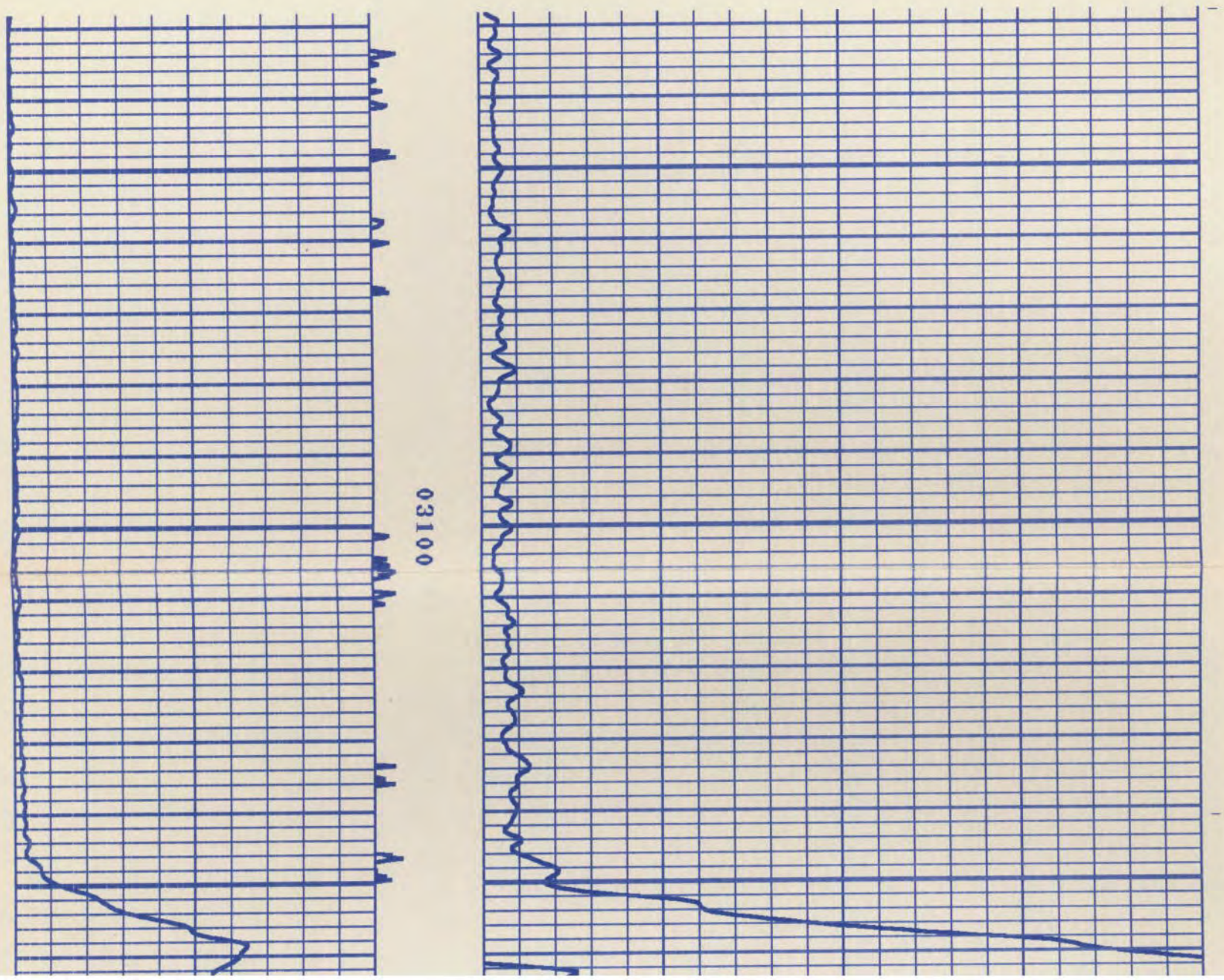
****

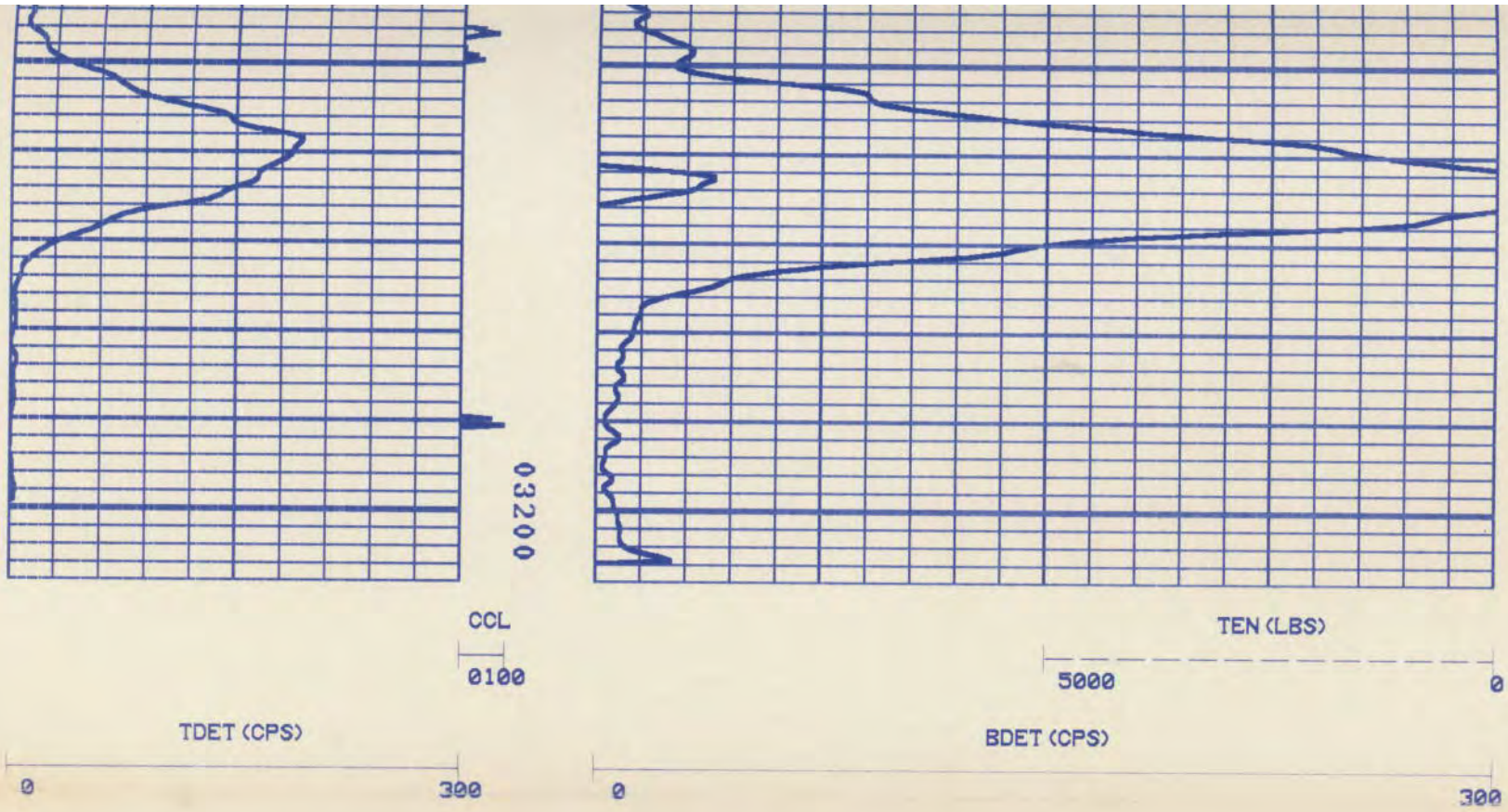

03200


03200
CCL
0100
TDET (CPS)
0
300
TEN (LBS)
5000
0
BDET (CPS)
0
300

FILE: 12

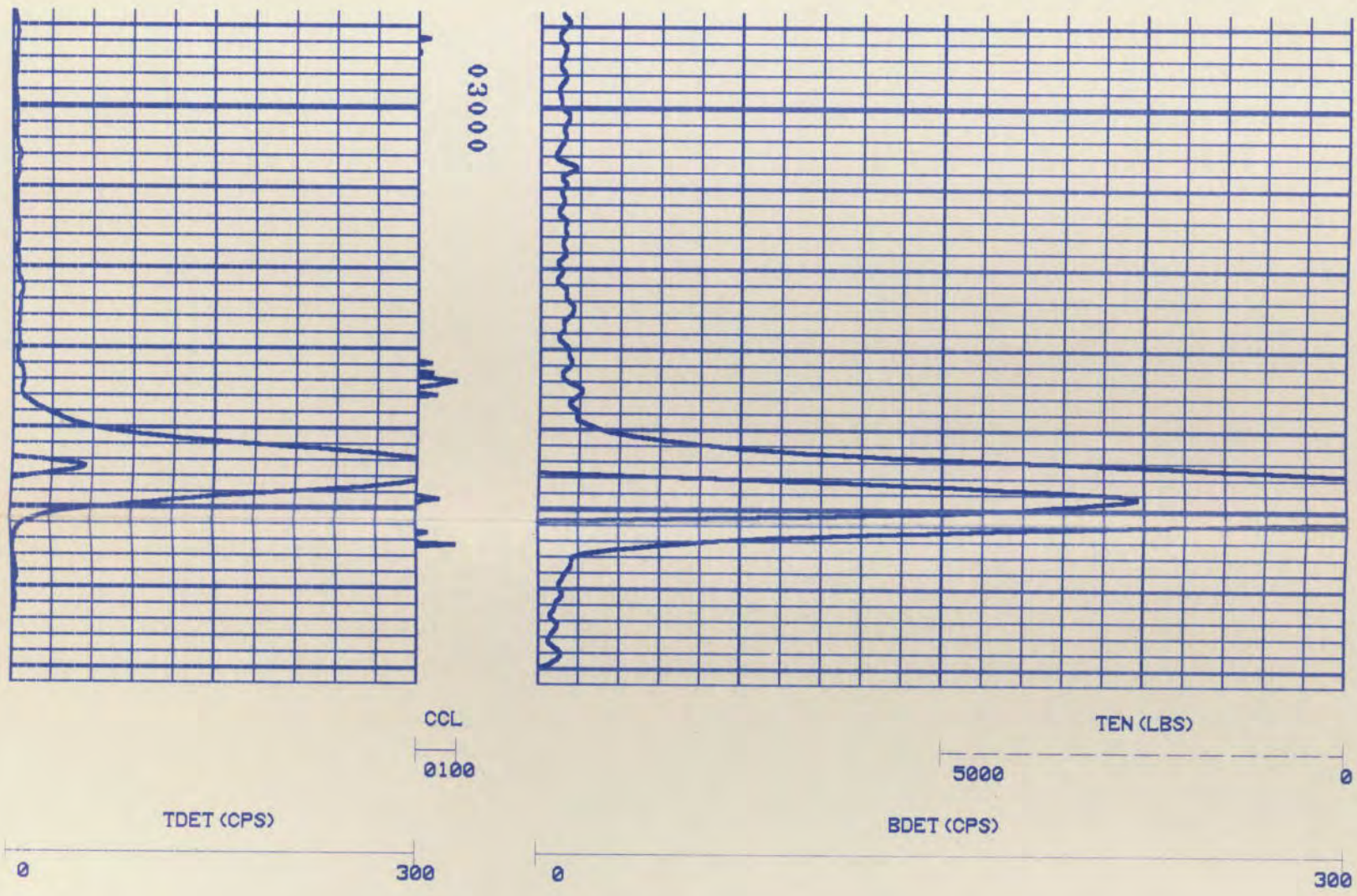
****


03100



FILE: 11

****



FILE: 10

****

FILE: 10

****

FILES 4-9 CHASE DOWN
WITH A PUMP-IN RATE OF
25 GPM AT 1530 HRS.

****

FILE: 9

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE CORP.

WELL NAME: EFFLUENT DISPOSAL WELL NO. 3

SERVICE: F 150A FILE: 9 DATE: 10/26/93

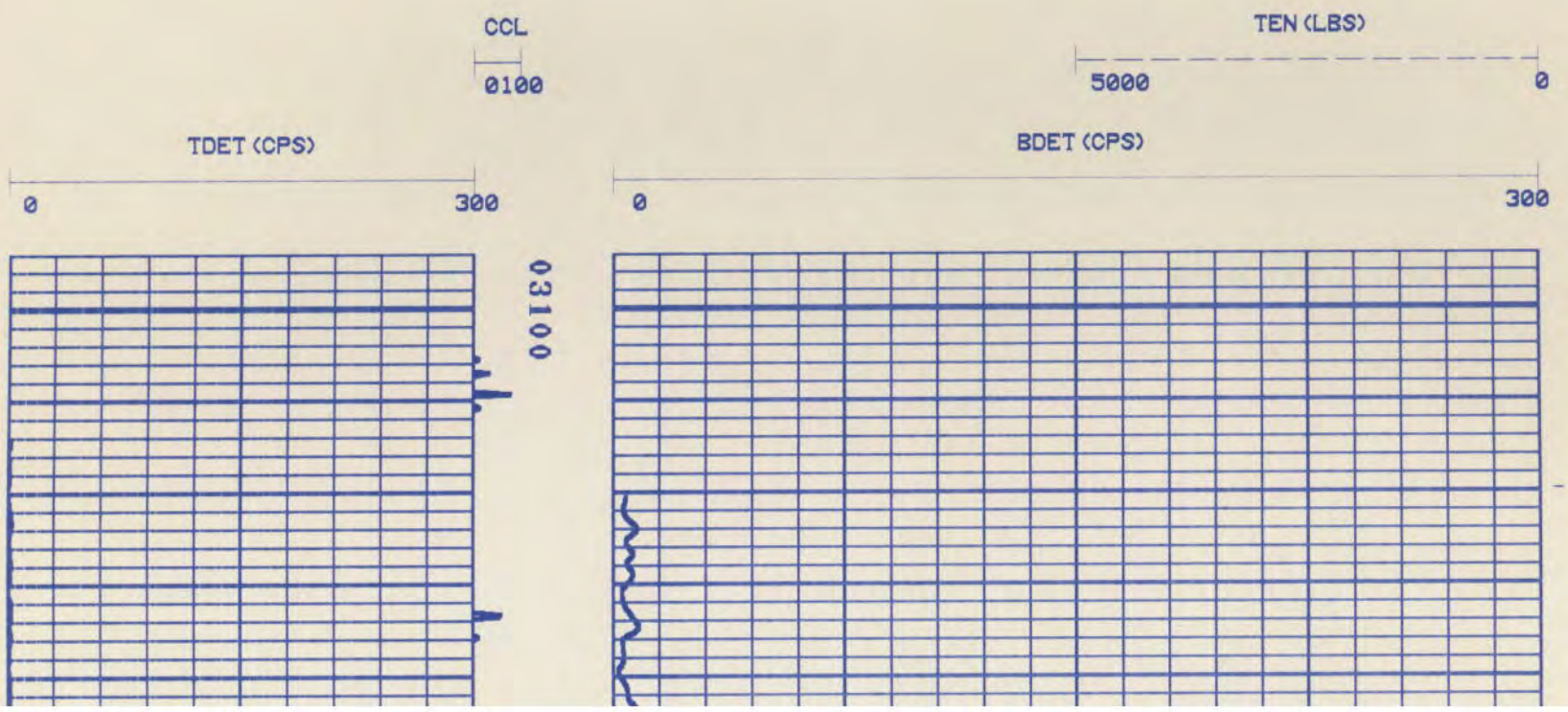
REVISION: FSYS256 REV:G002 VER:2.0

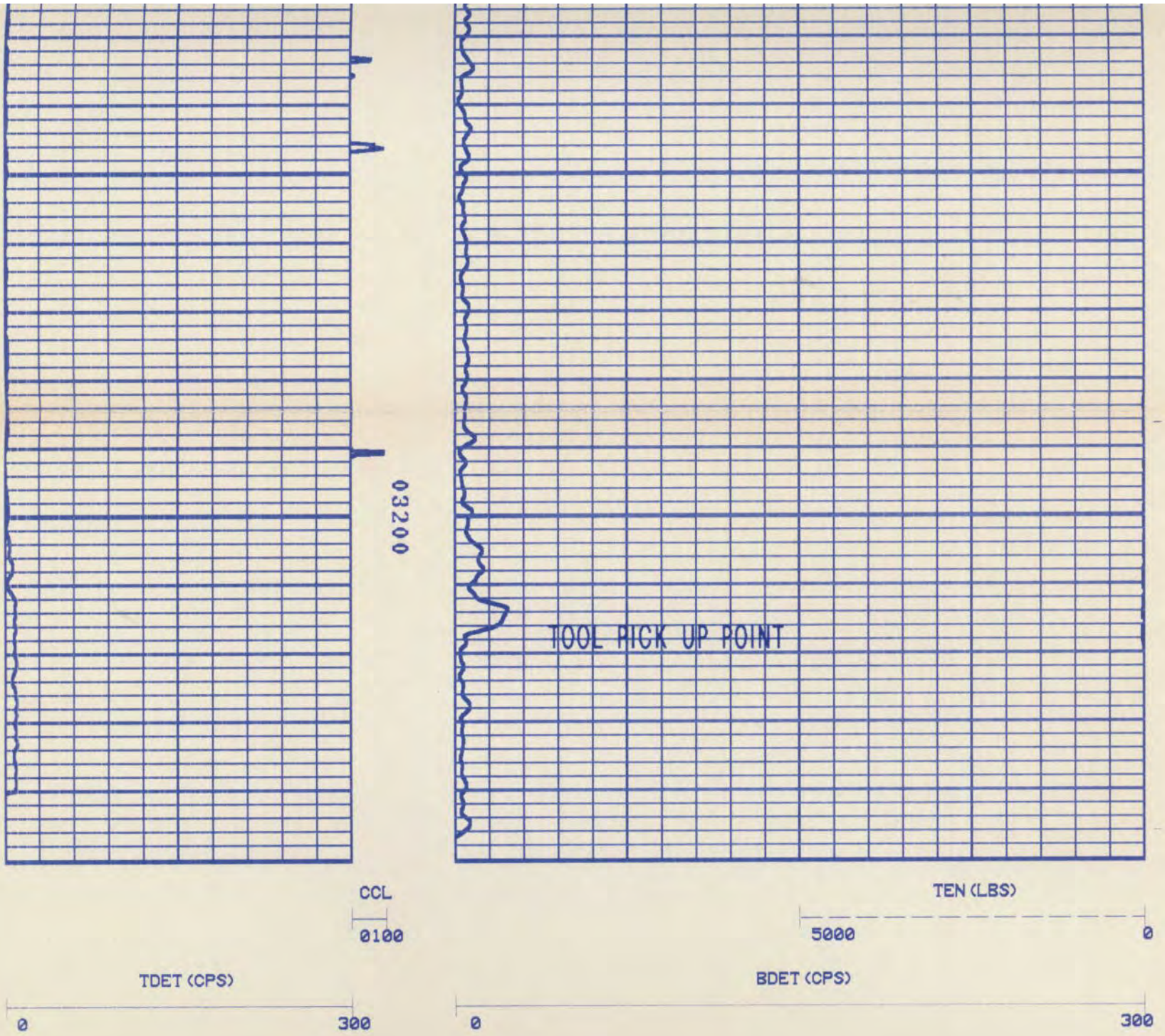
RUN: 1

TRIP: 1

TIME: 19:49:18

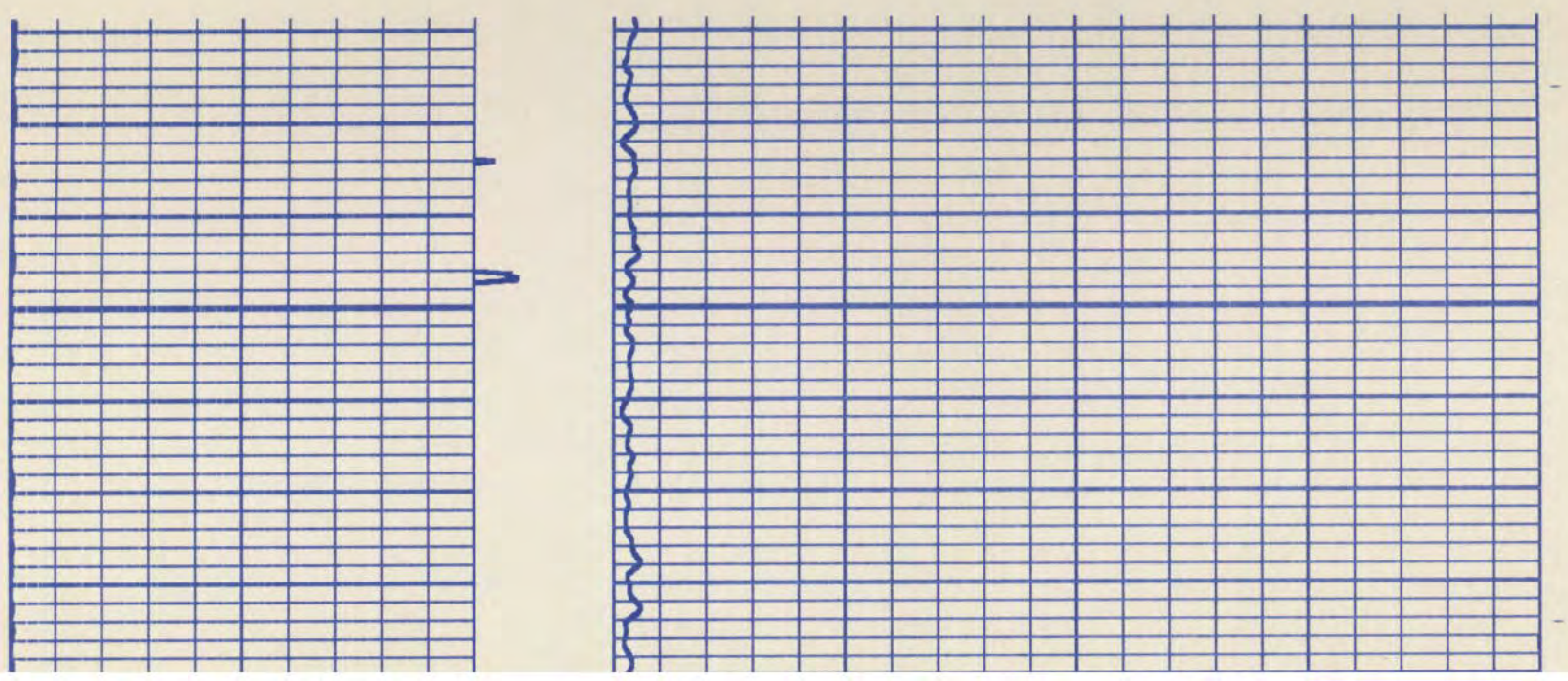
MODE: RECORD

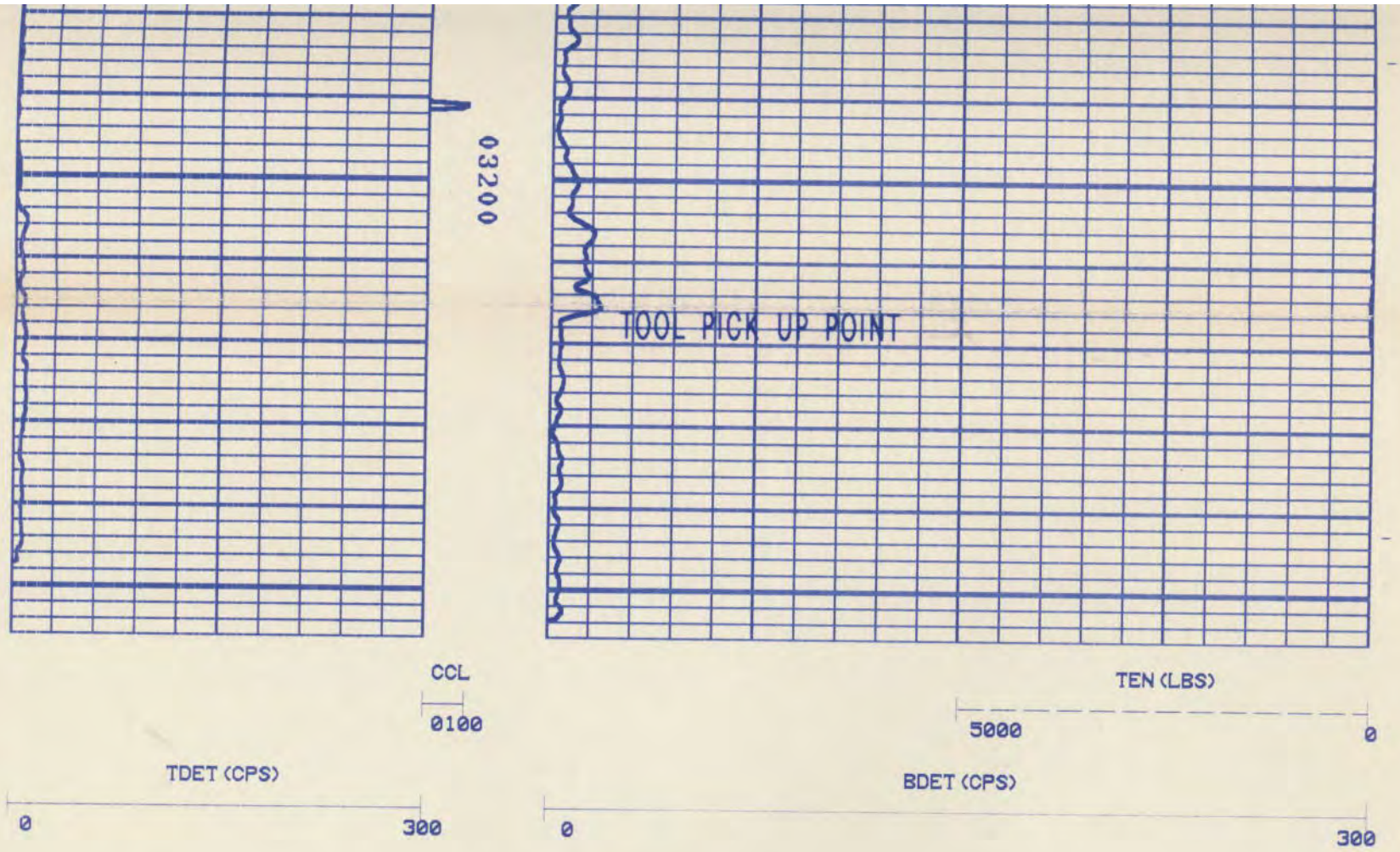



03200
TOOL PICK UP POINT
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 9

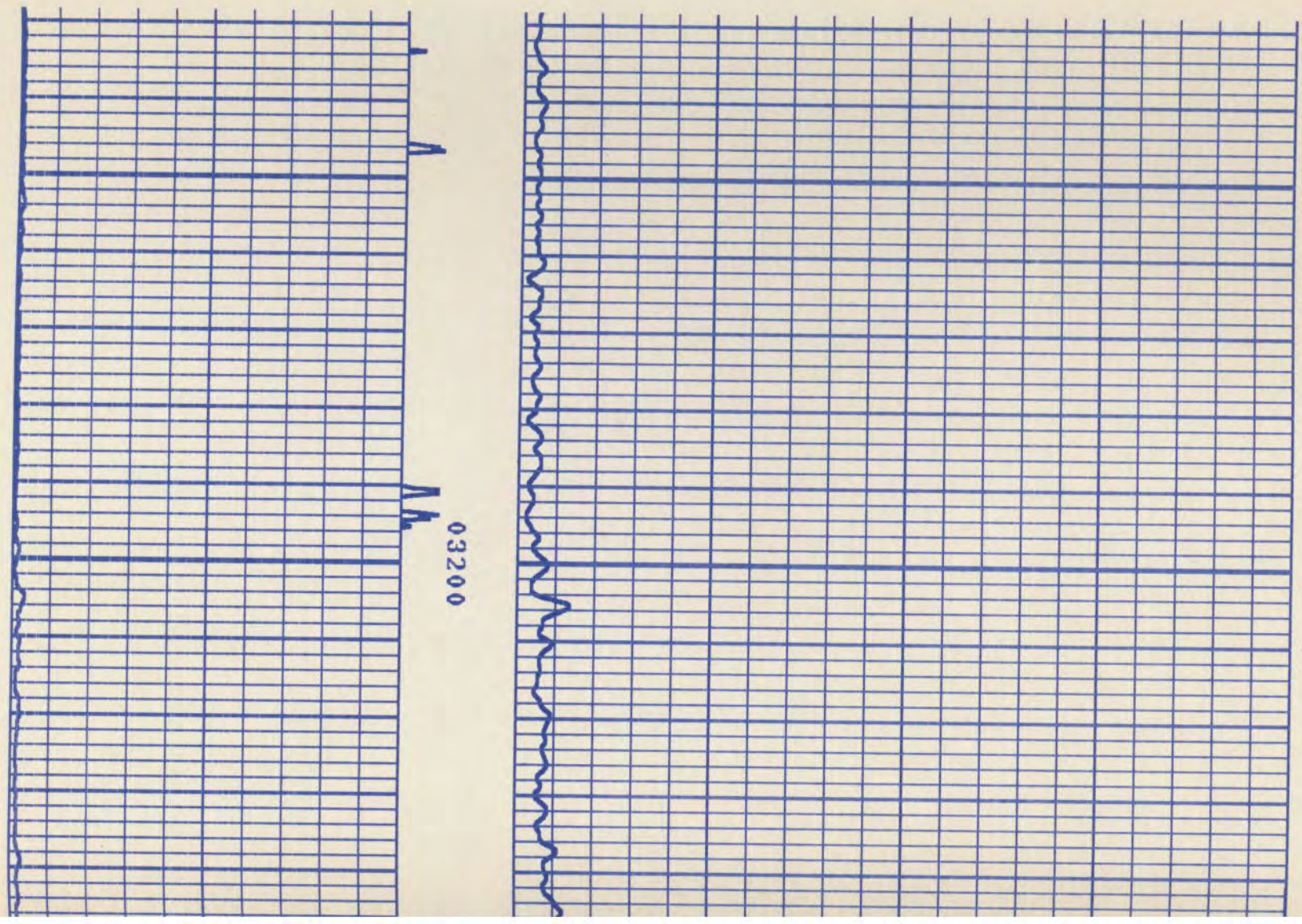
****

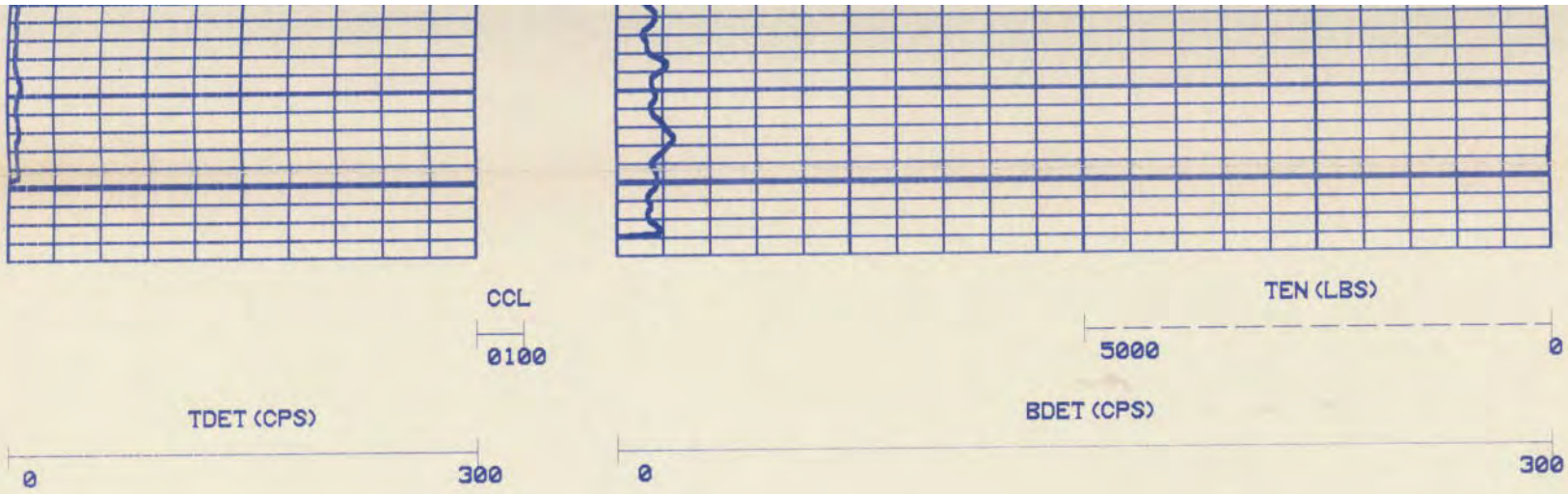



03200
TOOL PICK UP POINT
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

FILE: 8

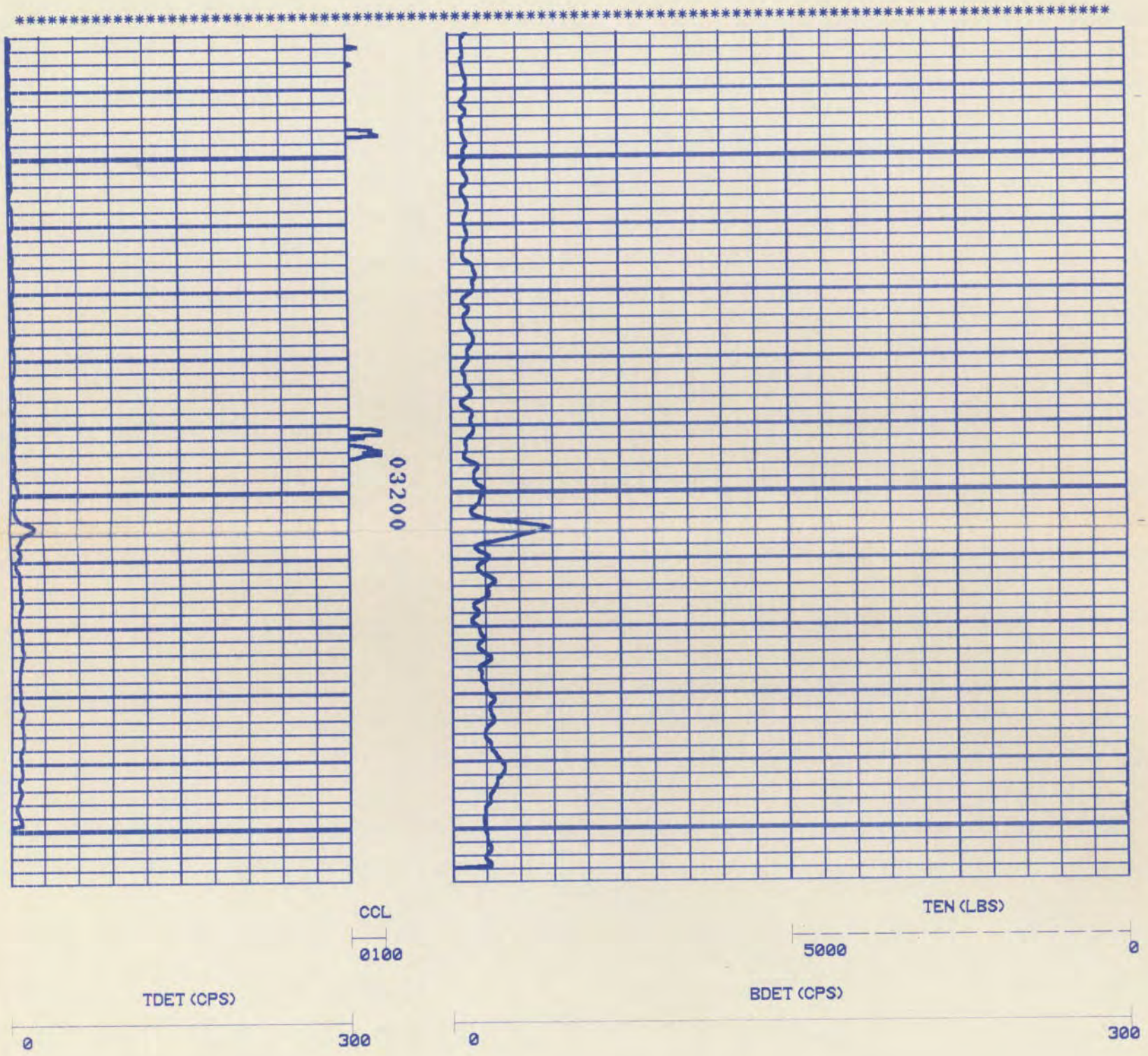
****


03200


CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

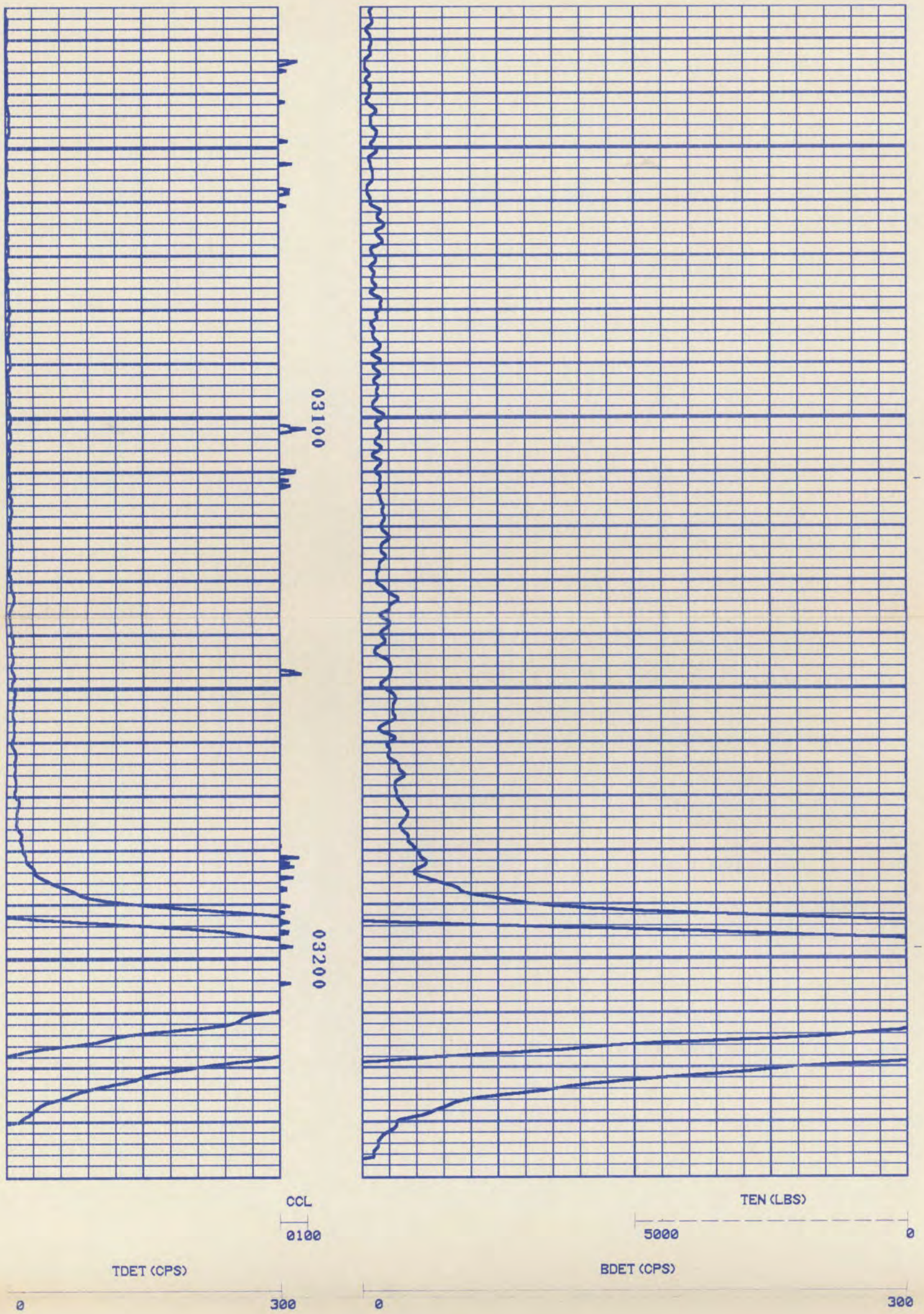
FILE: 7

****


03200
CCL
0100
TEN (LBS)
5000
0
TDET (CPS)
0
300
BDET (CPS)
0
300

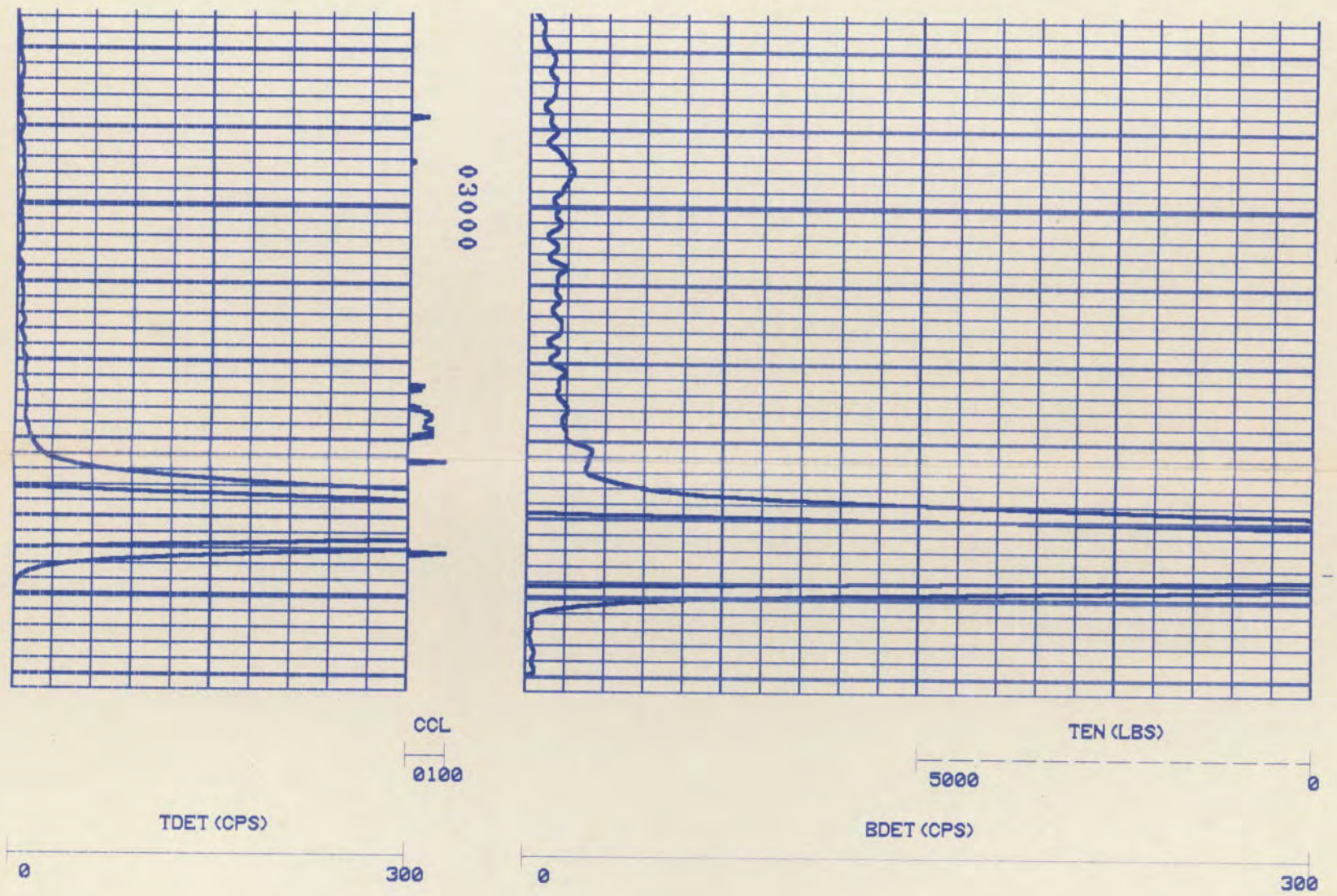
FILE: 6

****


03100
03200
CCL
0100
TDET (CPS)
0
300
TEN (LBS)
5000
0
BDET (CPS)
0
300

FILE: 5

****



FILE: 4

****

SECOND GR BEFORE LOG PASS
TIME 1340 HRS.

****

FILE: 3

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

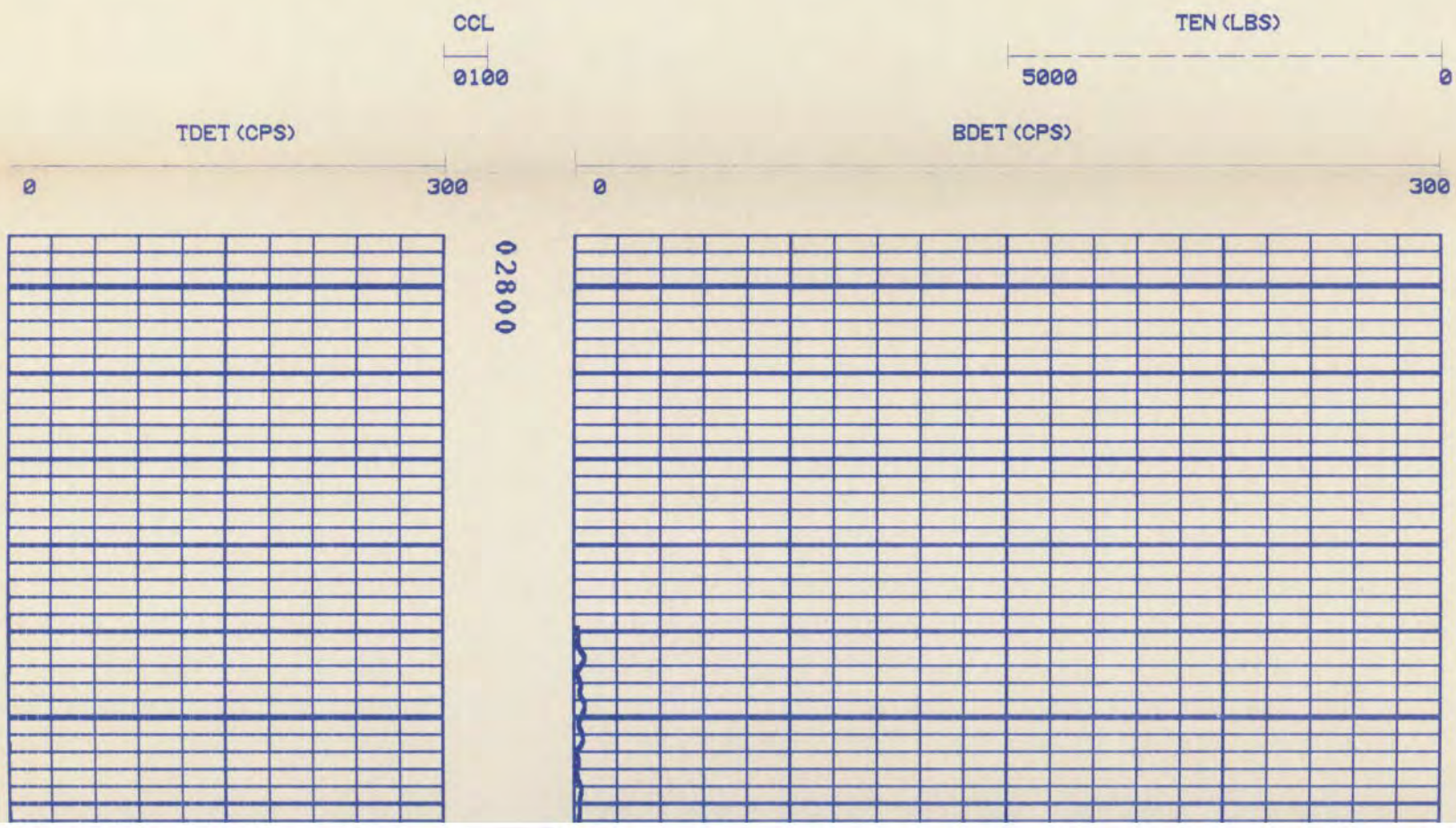
*** NONE ***

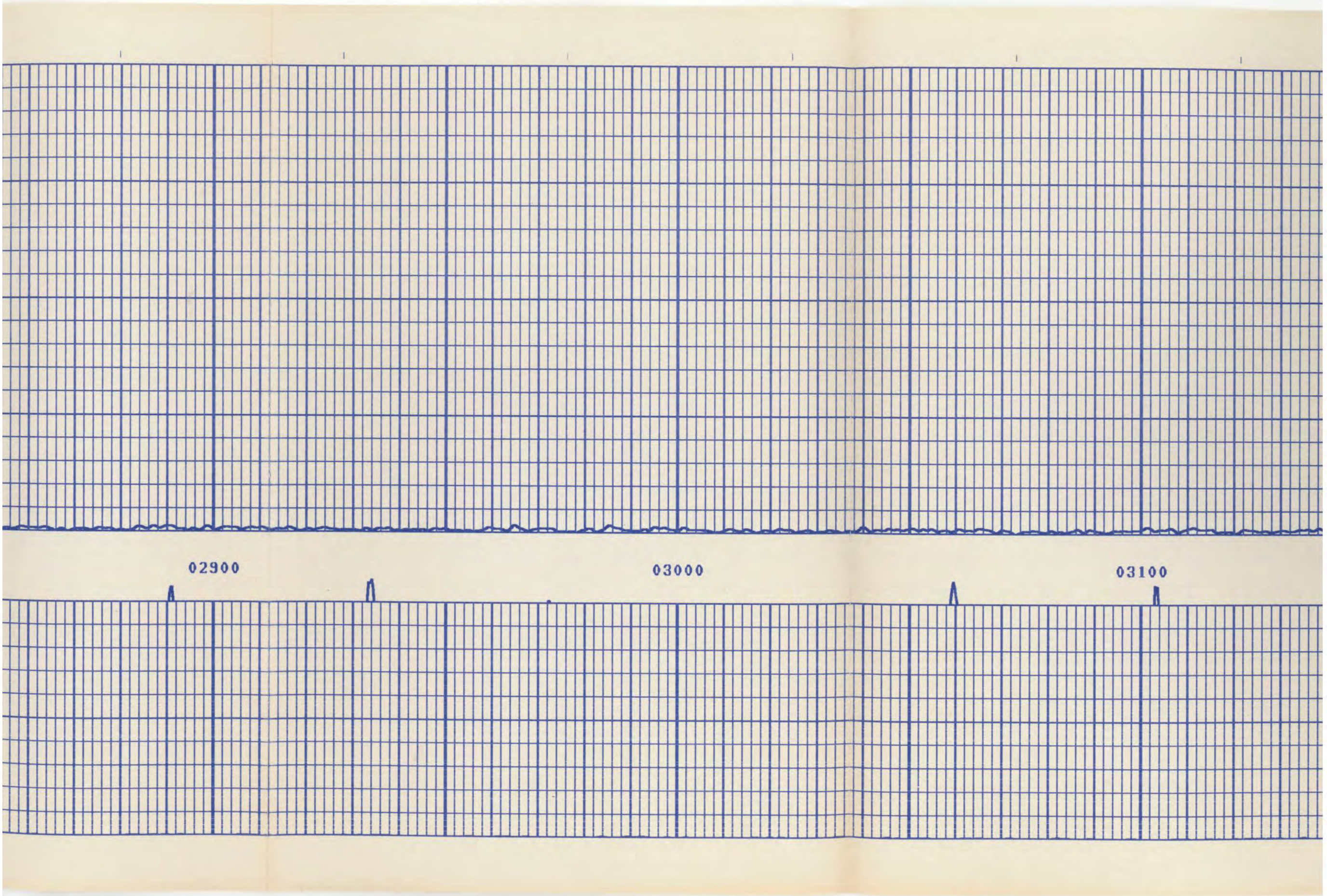
DISPLAY SCALE CHANGES

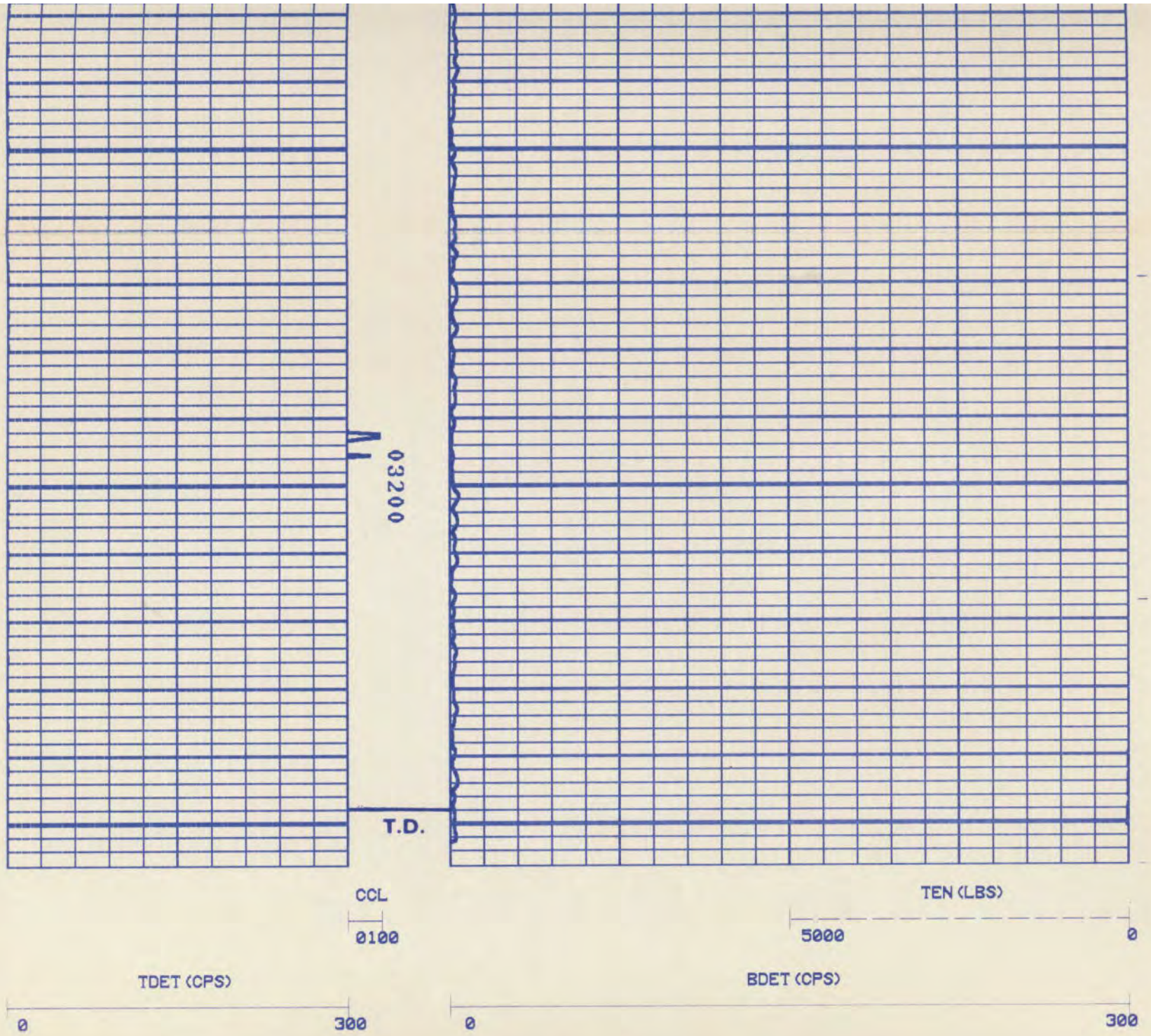
*** NONE ***

COMPANY: HOECHST CELANESE CORP.
WELL NAME: EFFLUENT DISPOSAL WELL NO. 3
SERVICE: F 150A FILE: 3 DATE: 10/26/93
REVISION: FSYS256 REV:G002 VER:2.0

RUN: 1
TRIP: 1
TIME: 17:17:19
MODE: RECORD




02900
03000
03100



FILE: 3

****

FIRST GR BEFORE LOG PASS
TIME 1320 HRS.

****

FILE: 2

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	6,6	FT,IN
BDET	0	FT,IN
CCL	16,0	FT,IN

PARAMETERS

*** NONE ***

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY:	HOECHST CELANESE CORP.			RUN:	1
WELL NAME:	EFFLUENT DISPOSAL WELL NO. 3			TRIP:	1
SERVICE:	F 150A	FILE: 2	DATE: 10/26/93	TIME:	17:06:01
REVISION:	FSYS256 REV:G002 VER:2.0			MODE:	RECORD

CCL

0100

TEN (LBS)

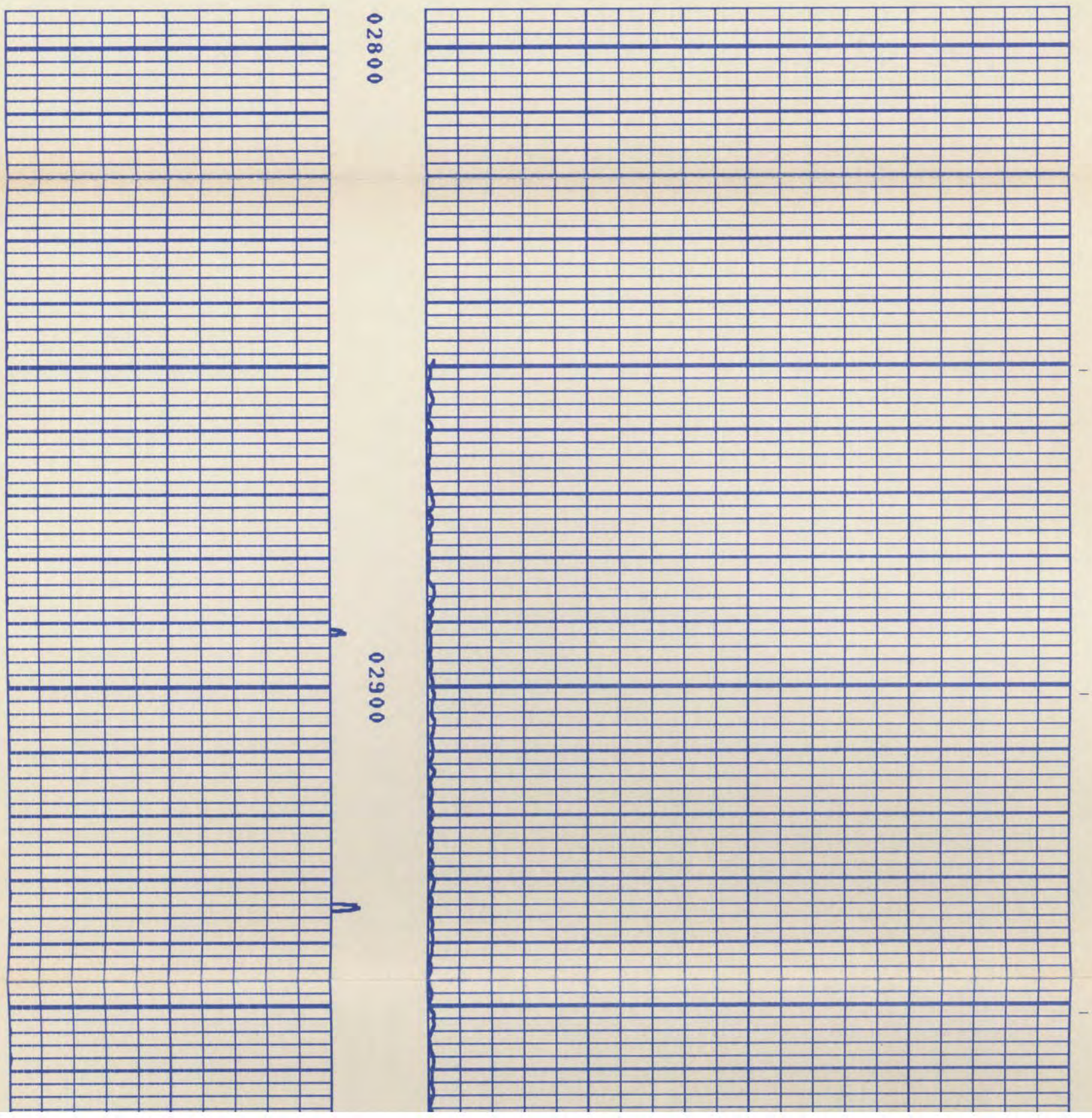
5000 0

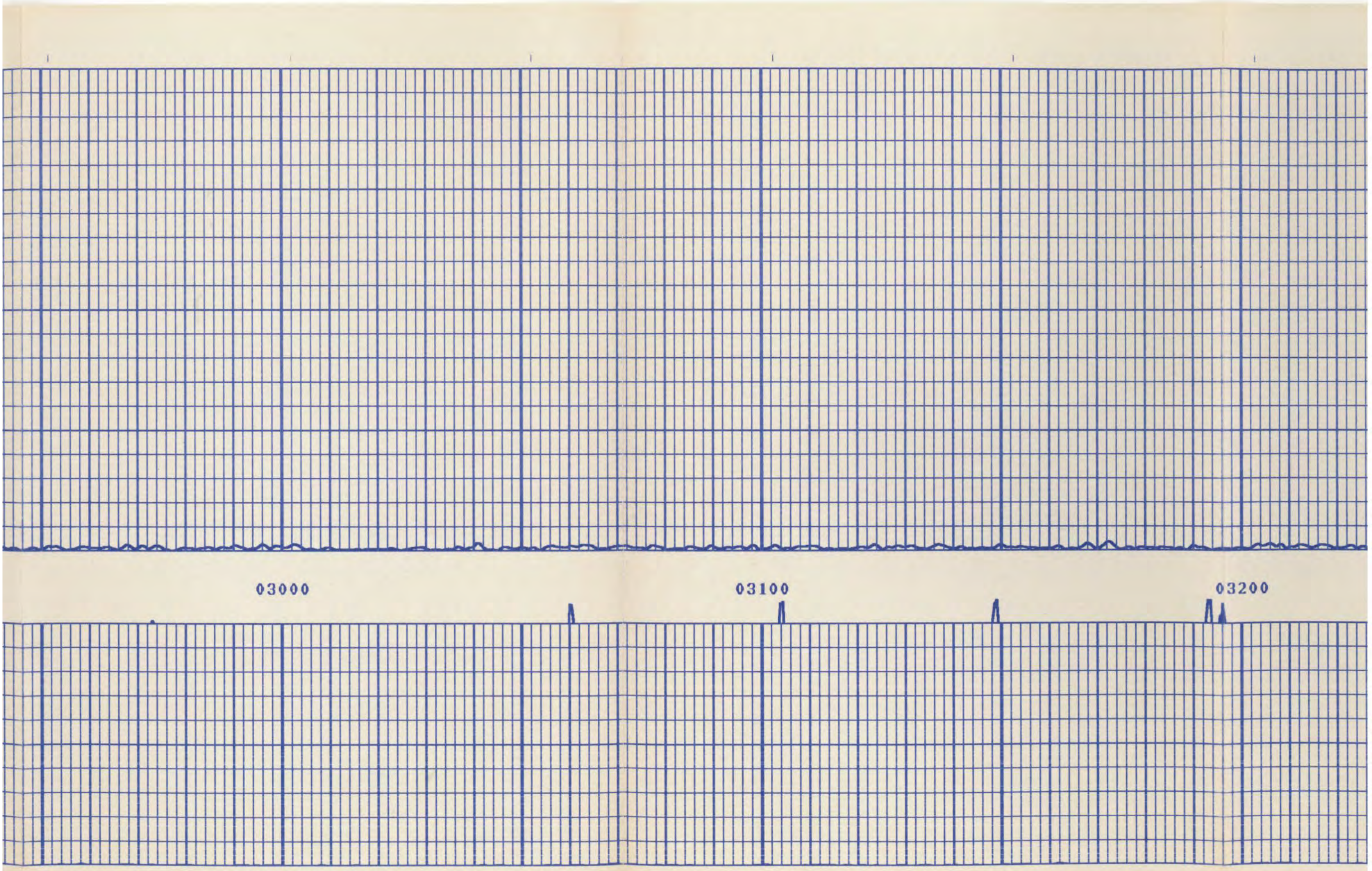
TDET (CPS)

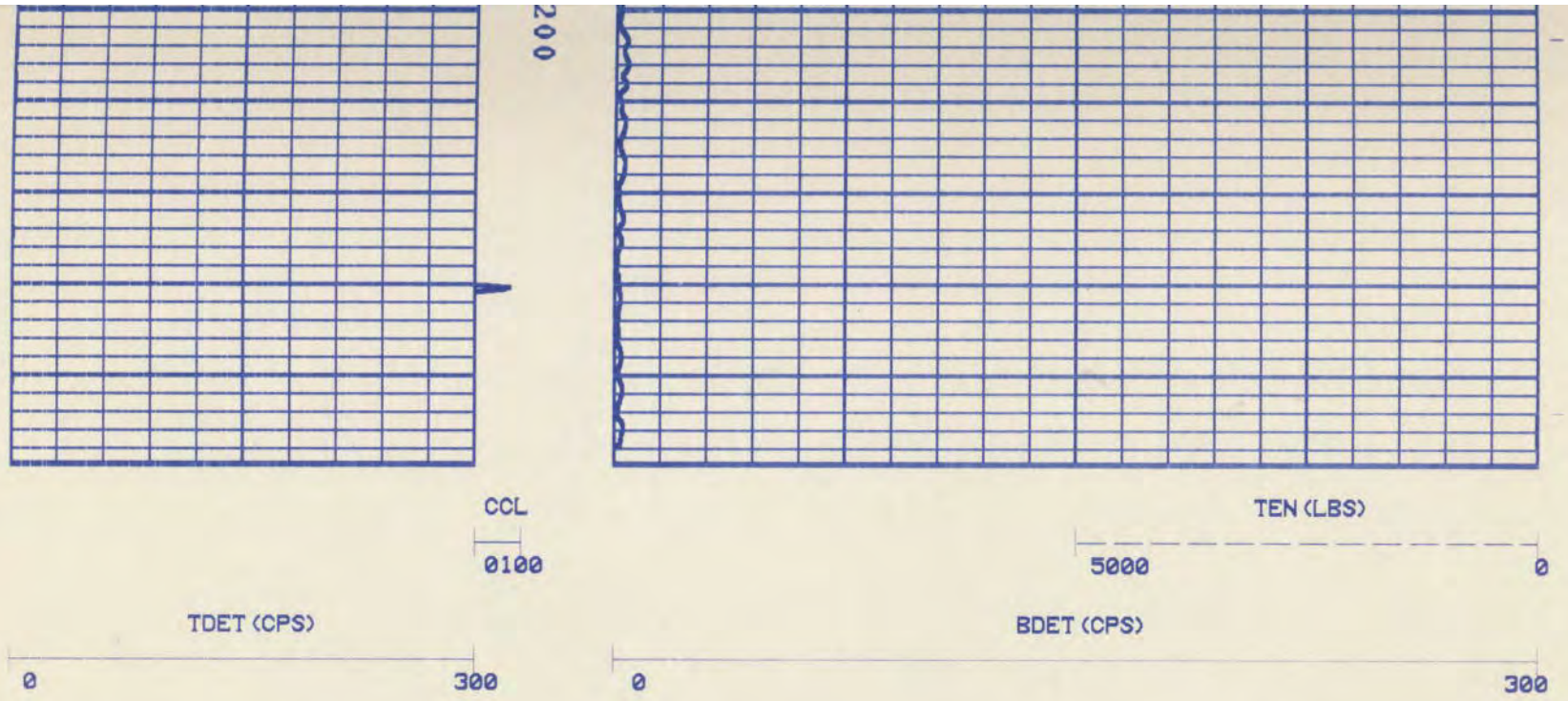
0 300

BDET (CPS)

0 300




03000
03100
03200



FILE: 2

****

TEMPERATURE LOG DOWN PASS AT 1000 HRS.

****

FILE: 2

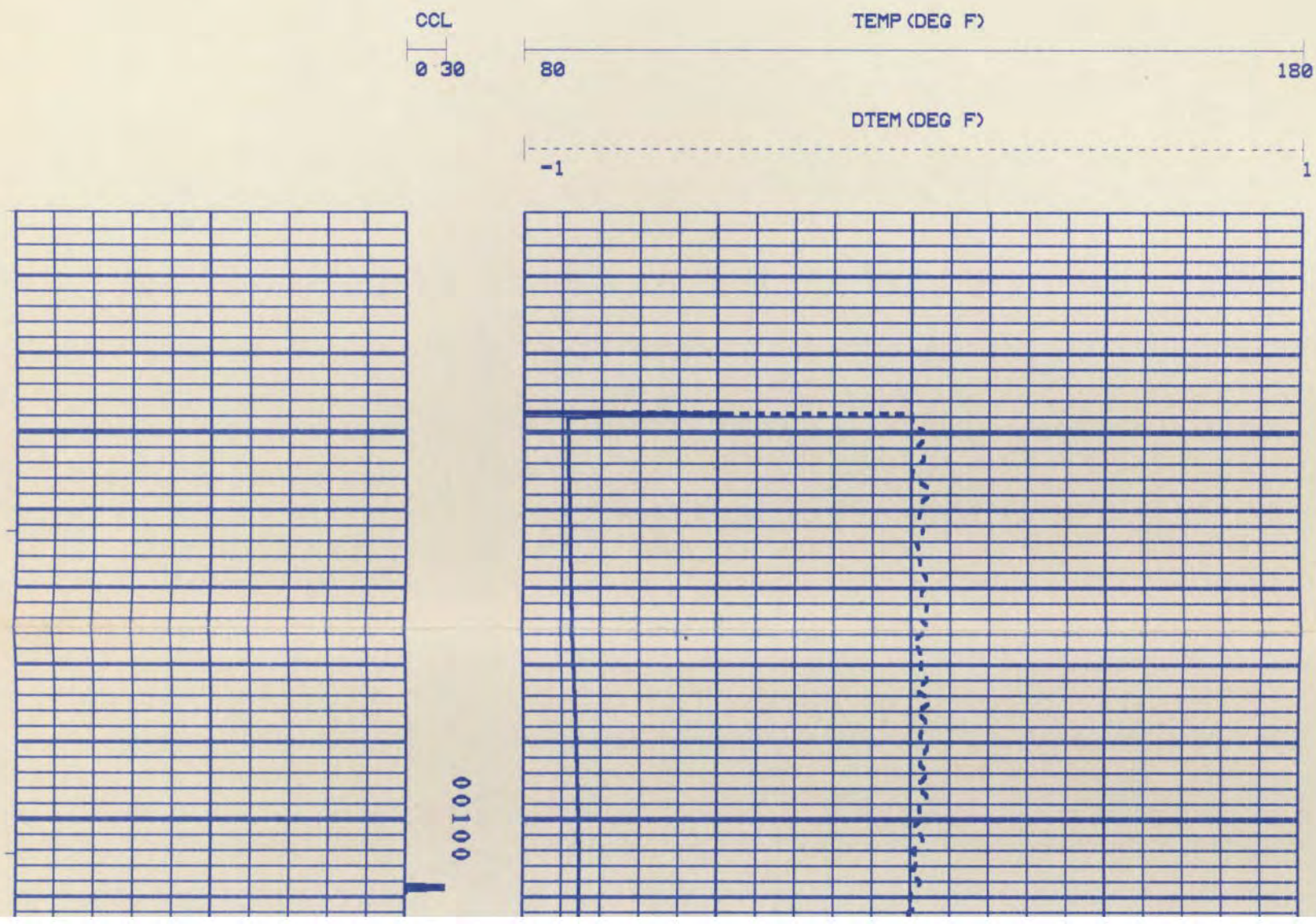
COMPANY: HOECHST CELANESE CORPORATION RUN: 1

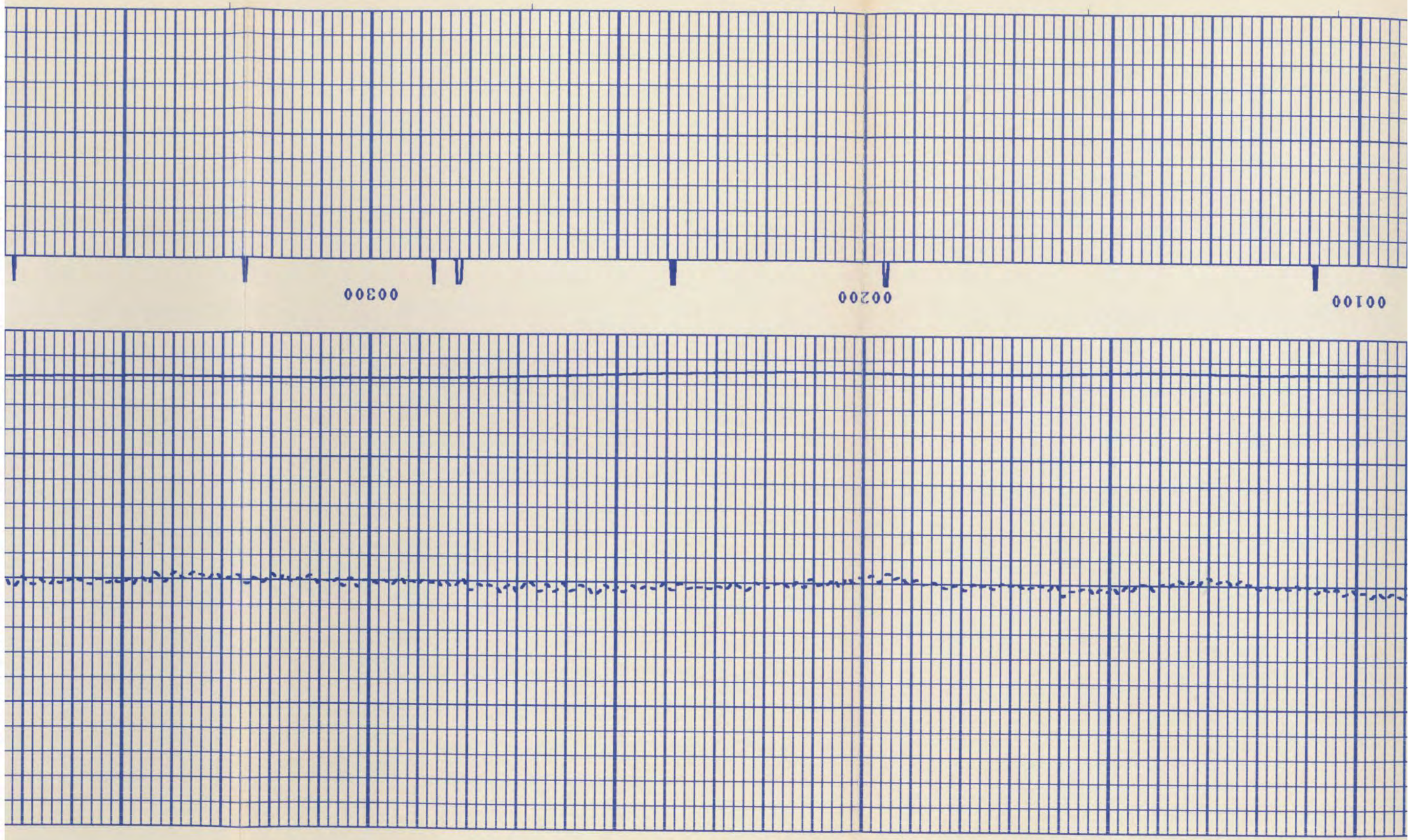
WELL NAME: EFFLUENT DISPOSAL WELL NO. 3 TRIP: 1

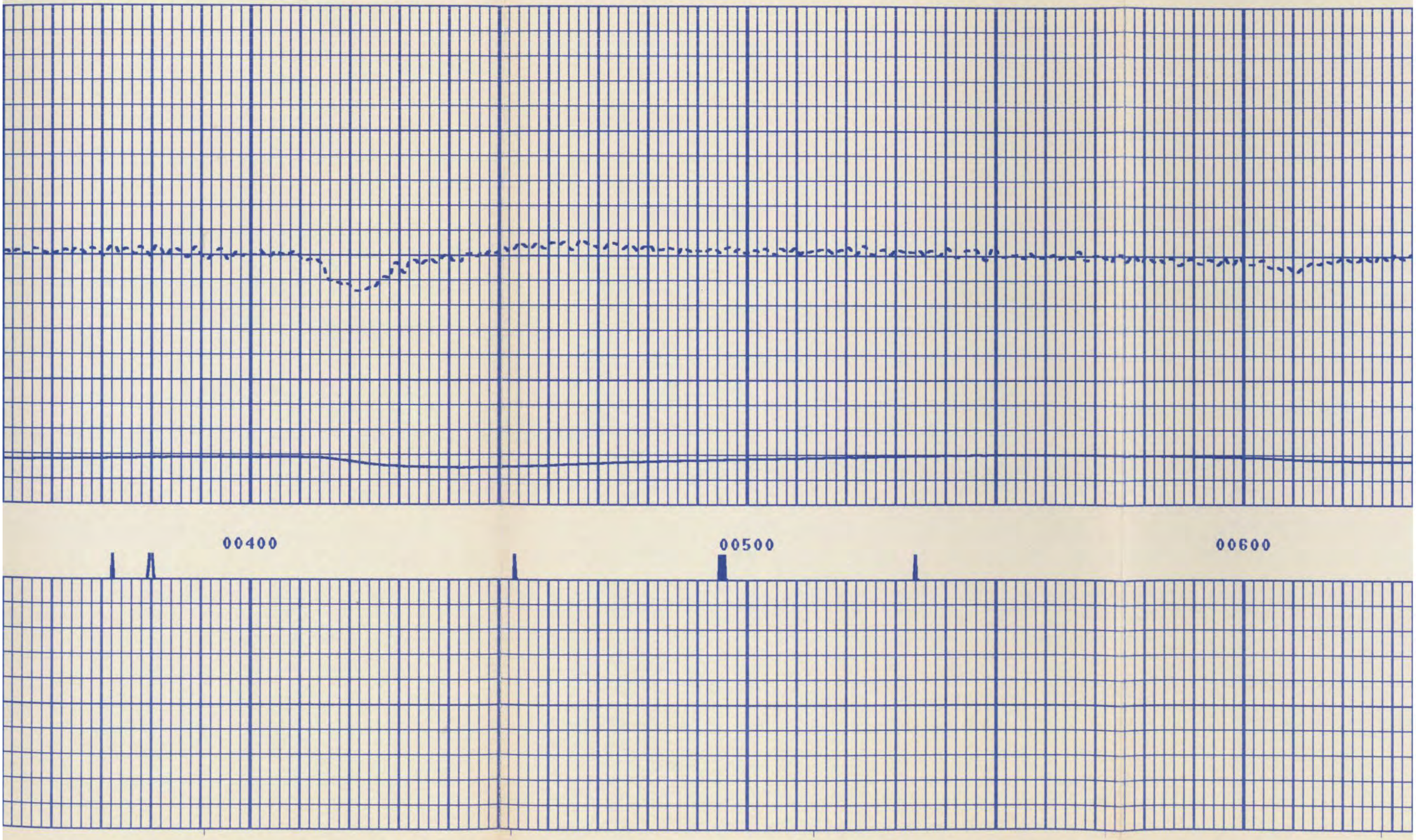
SERVICE: F 159P FILE: 2 DATE: 10/26/93 TIME: 15:34:59

REVISION: FSYS256 REV:G002 VER:2.0 MODE: RECORD

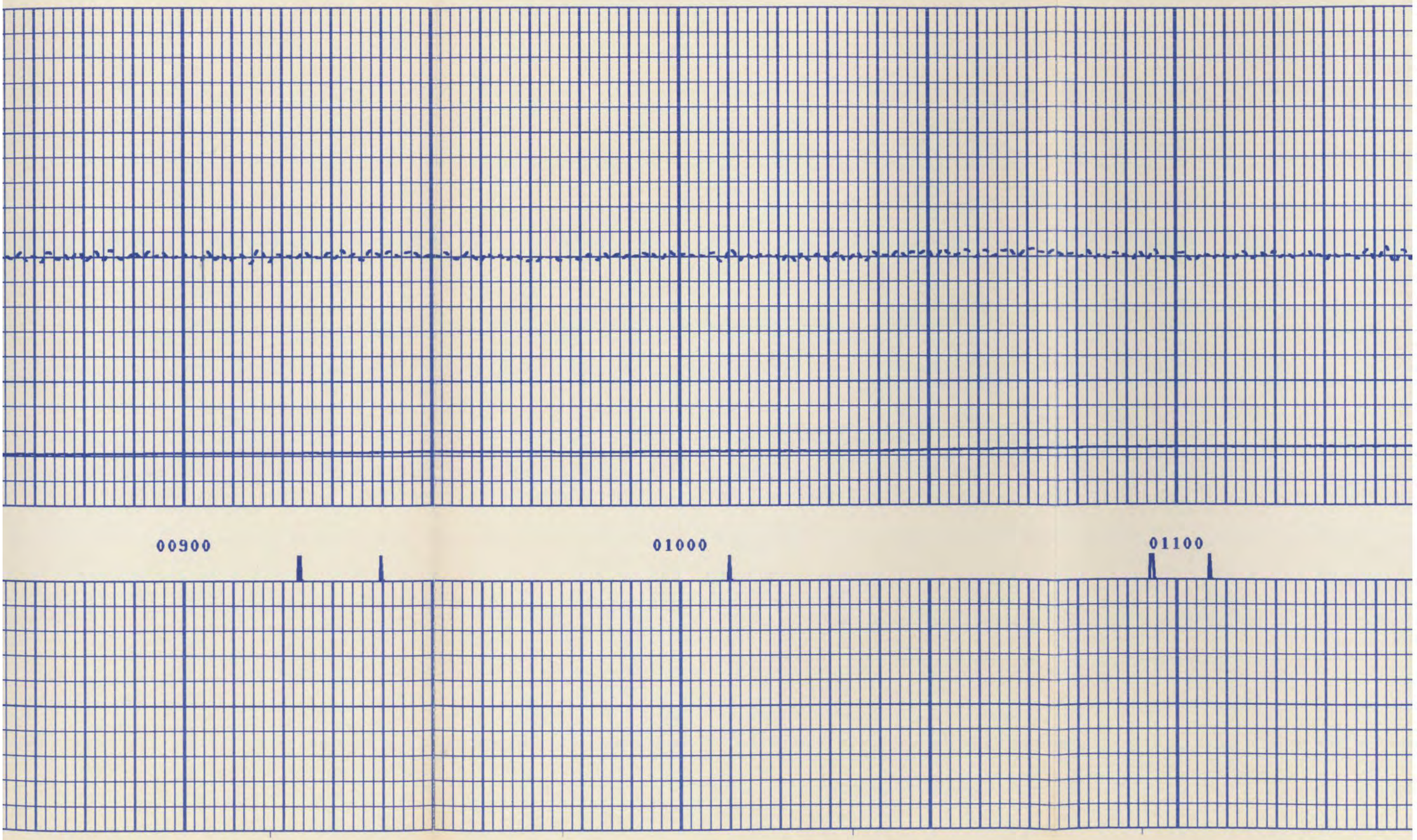
DOWN

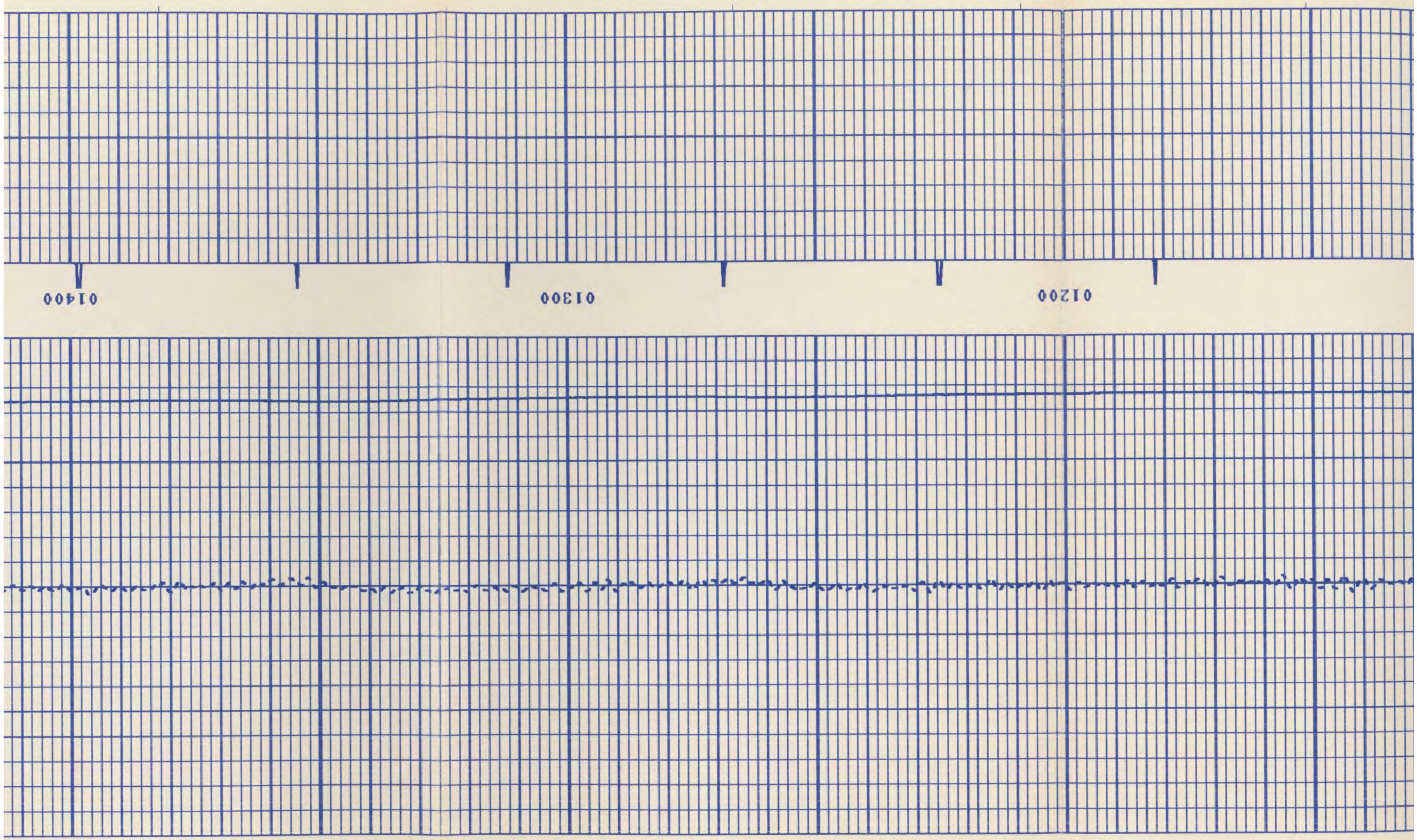


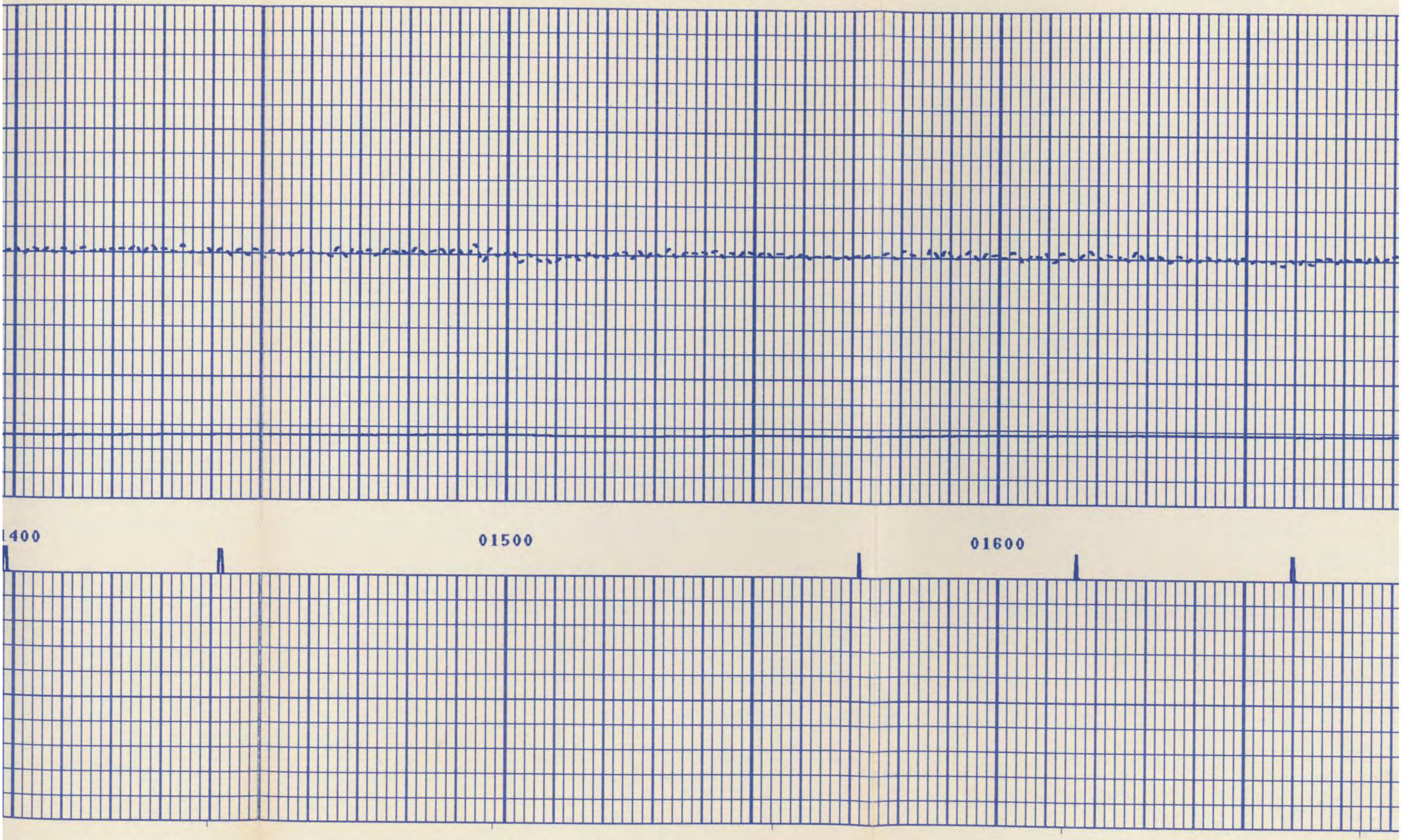

00300
00200
00100

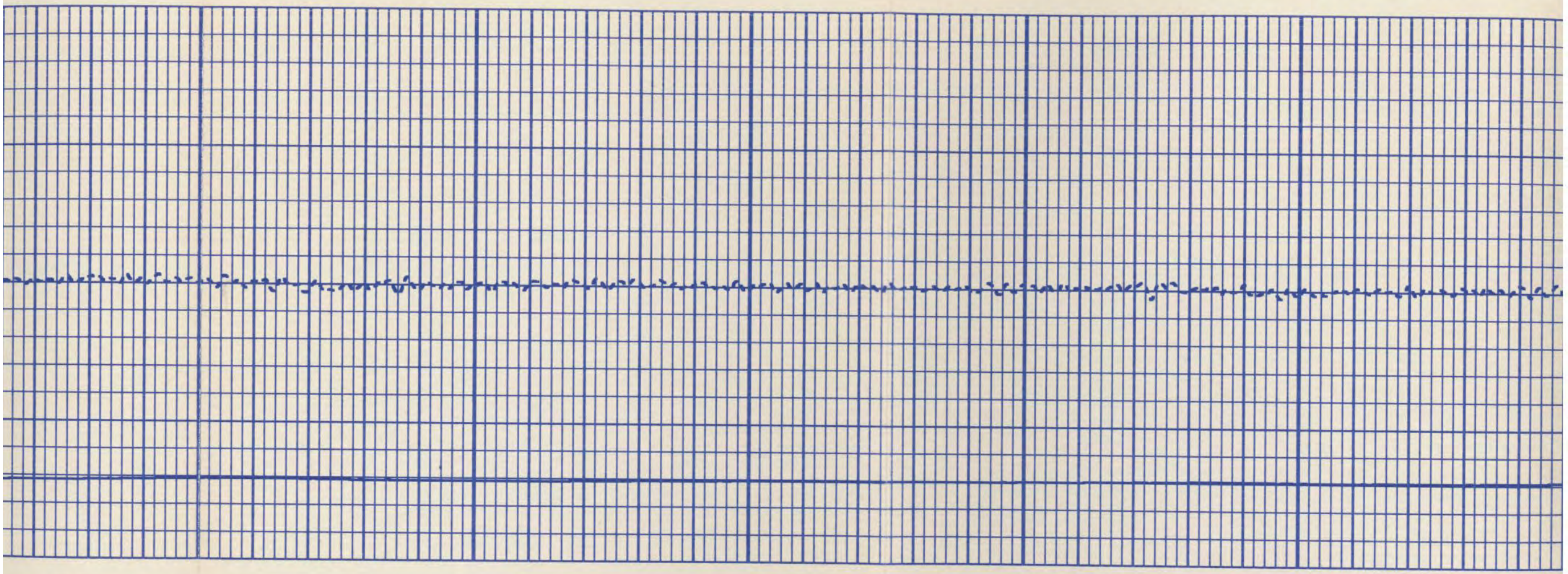

00400
00500
00600

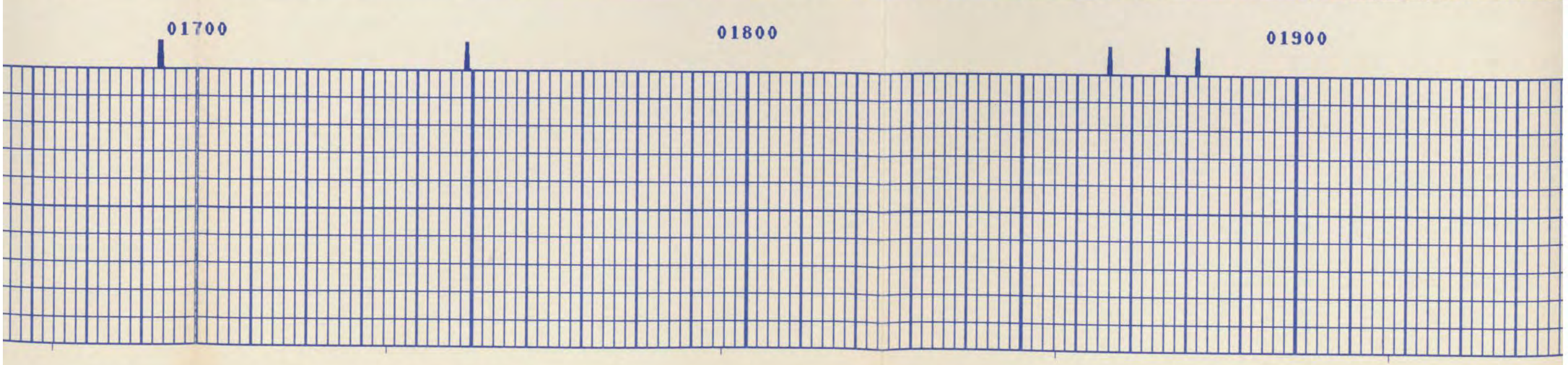
00
00700
00800

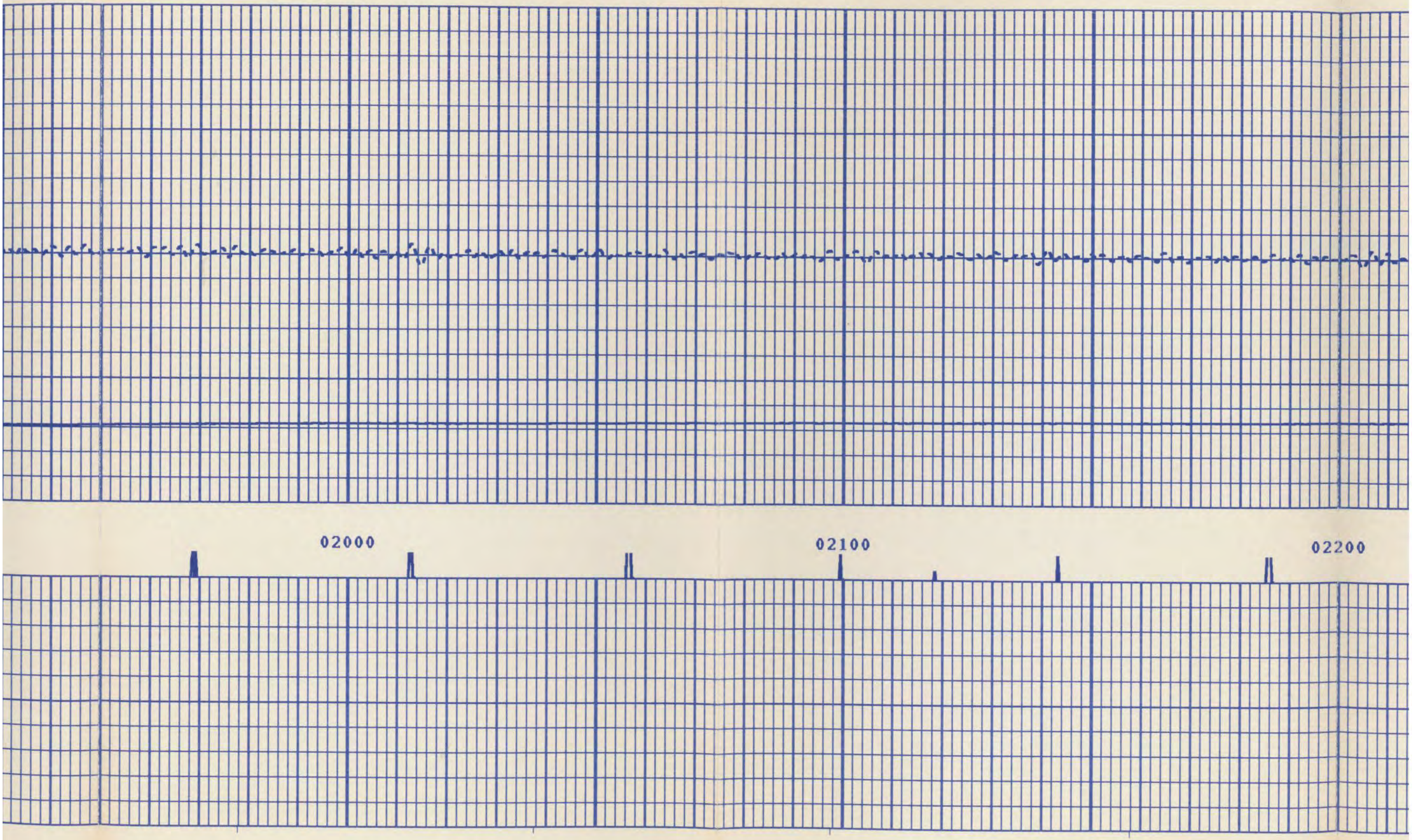

00900
01000
01100

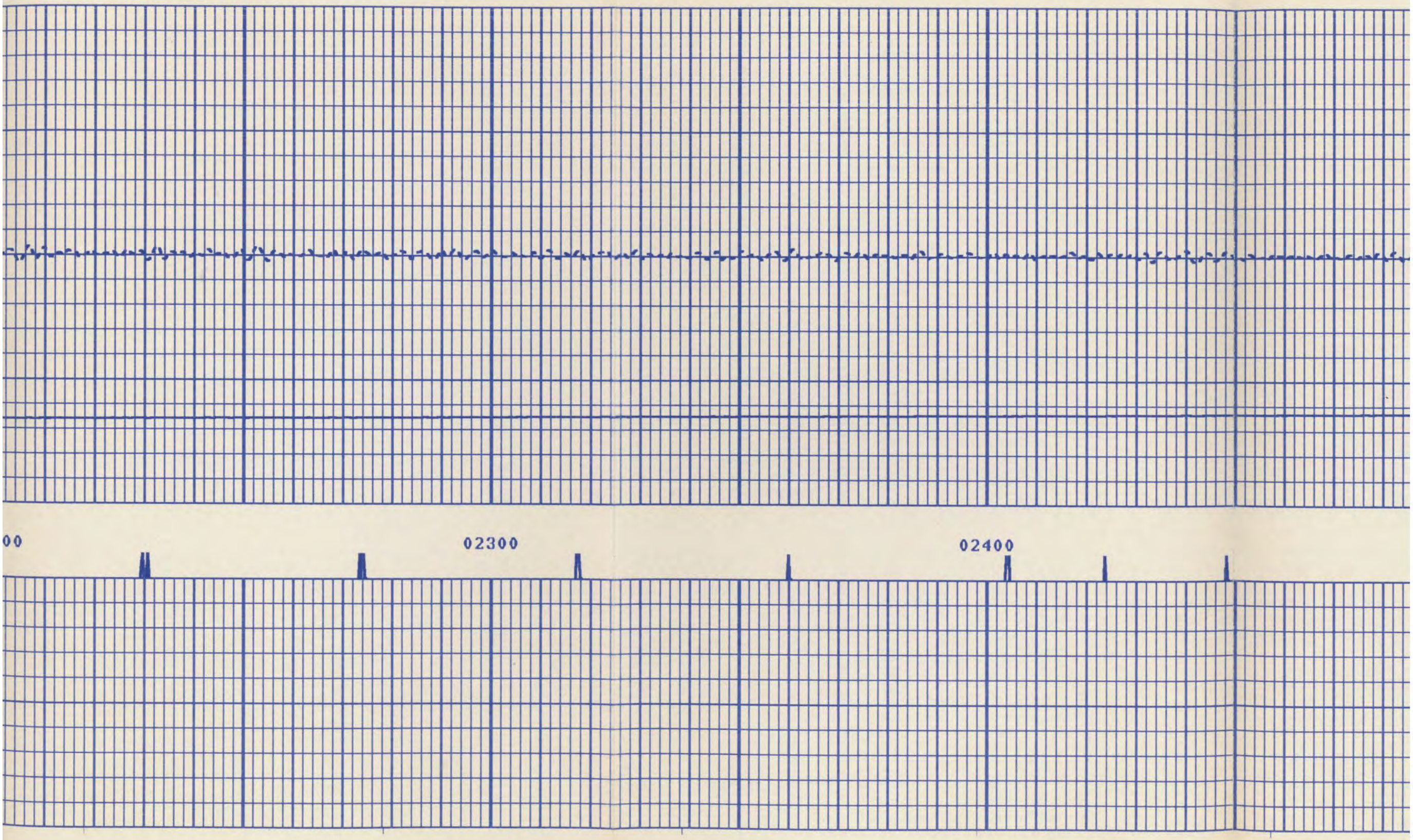

01400
01300
01200

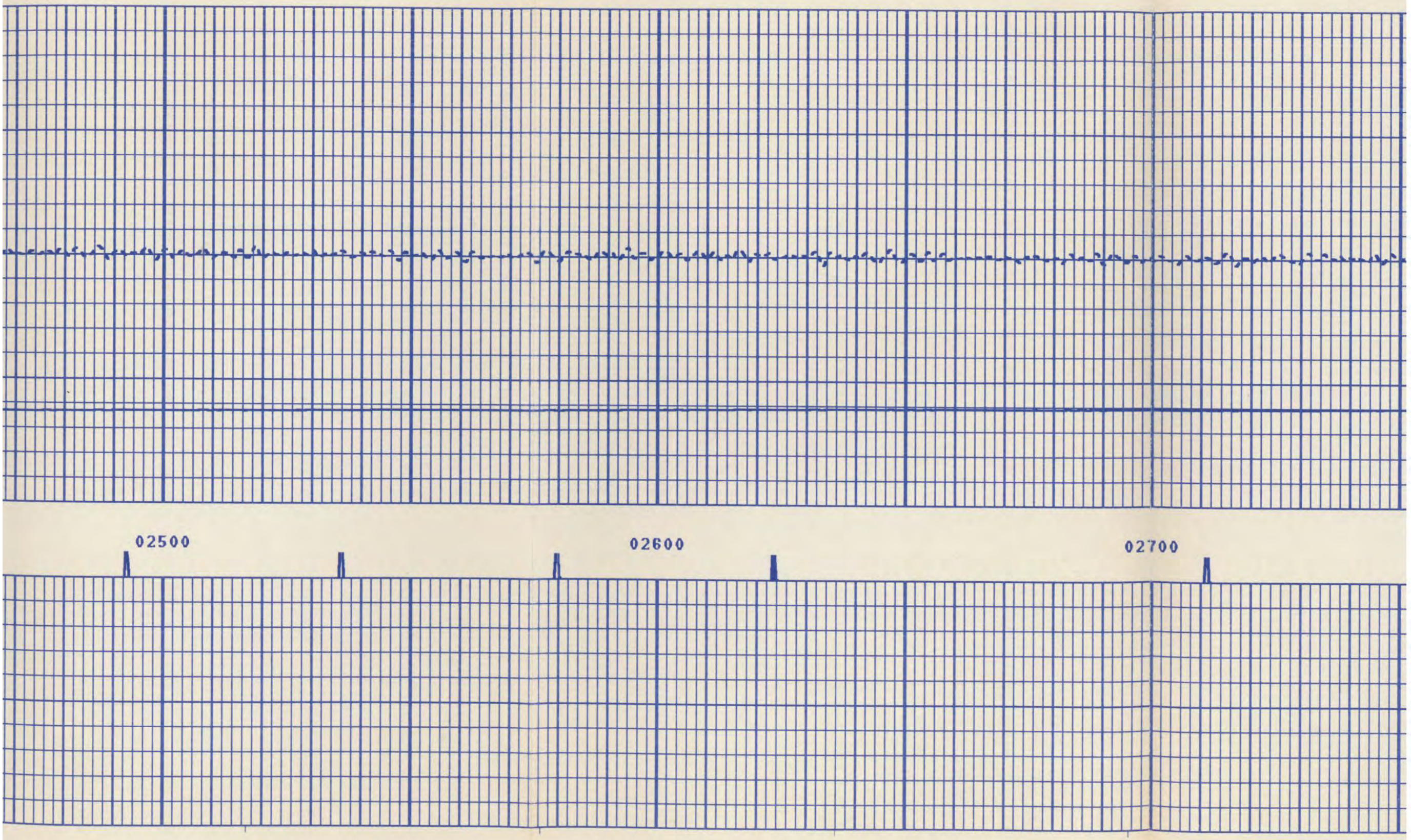

1400
01500
01600

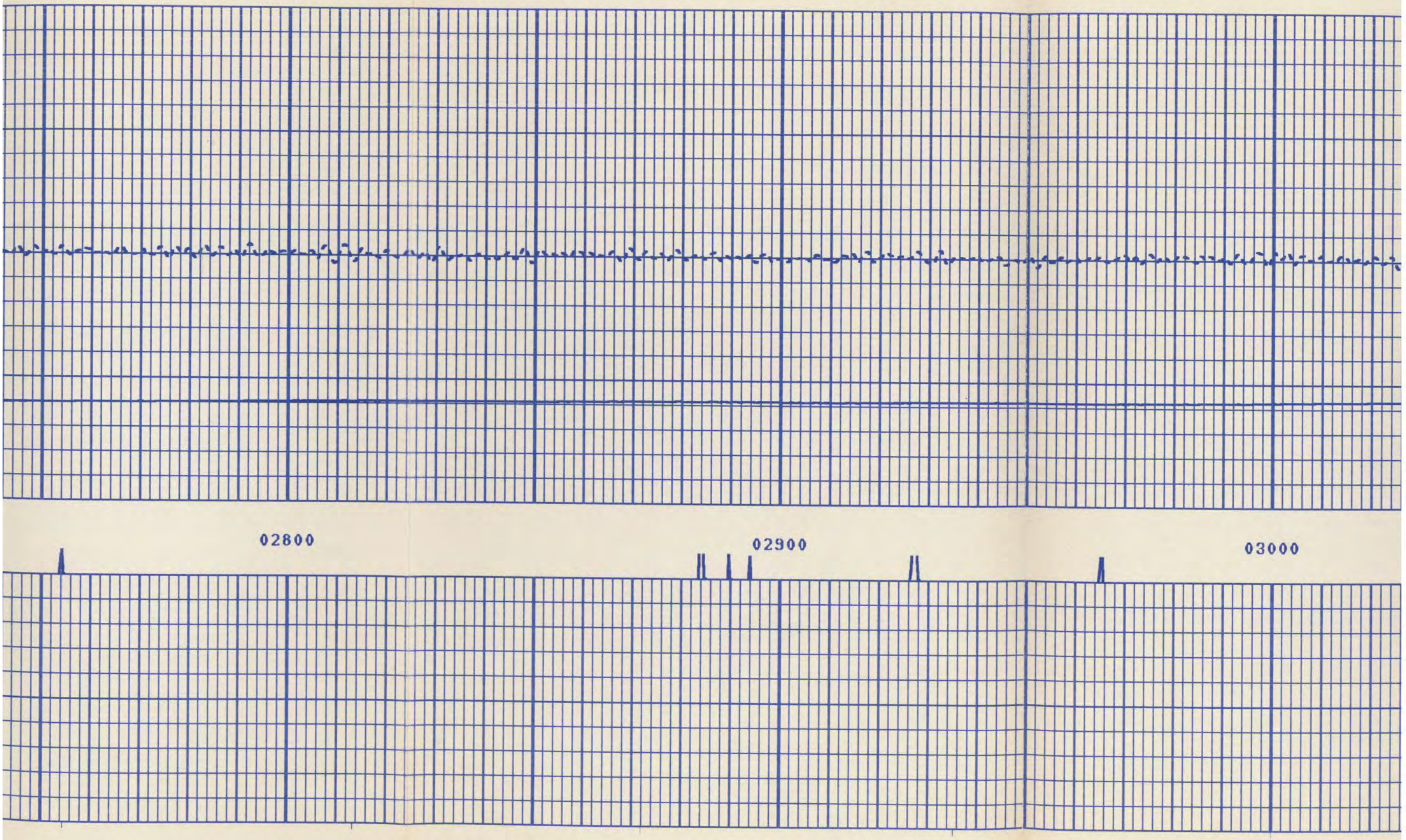


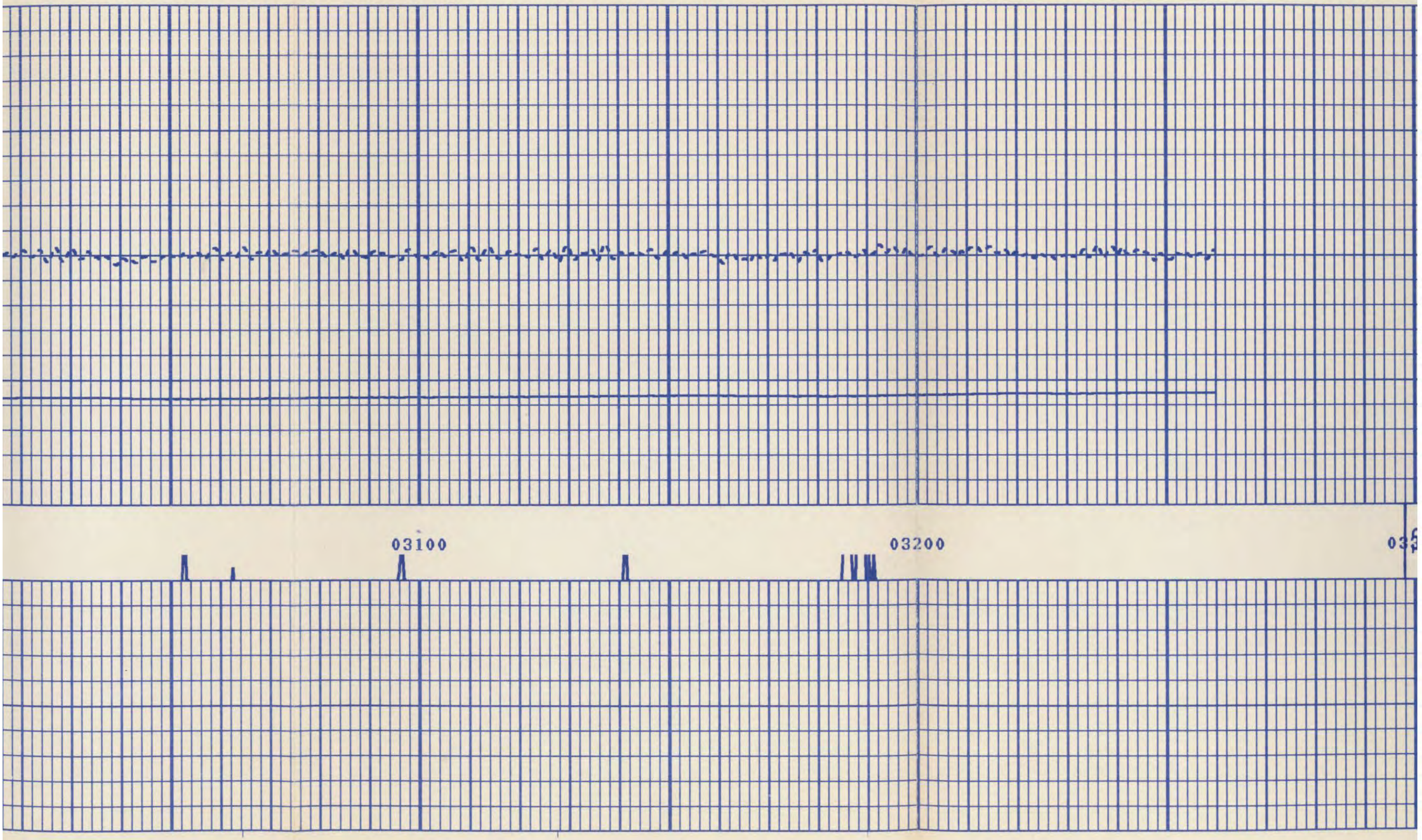

01700
01800
01900

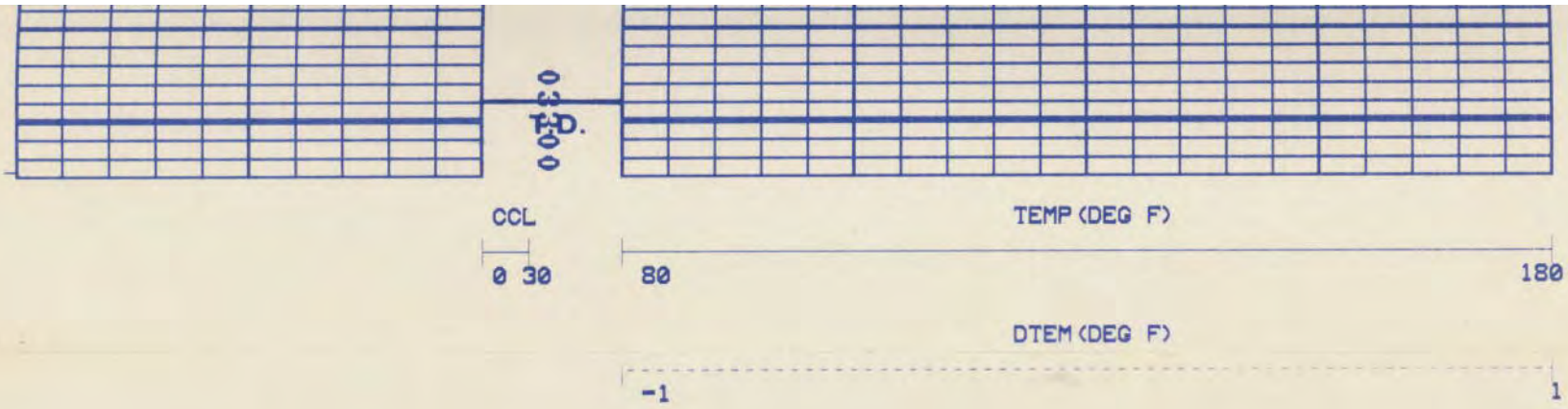

02000
02100
02200


00
02300
02400


02500
02600
02700


02800
02900
03000


03100
03200



DISPLAY SCALE CHANGES

*** NONE ***

PARAMETERS

*** NONE ***

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
RPS	22,3	FT,IN
TEMP	22,3	FT,IN
RDN	22,3	FT,IN
GR	7,3	FT,IN
CCL	0	FT,IN

FILE: 2

****

GR TIE-IN LOG

****

FILE: 3

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
RPS	0	FT,IN
TEMP	0	FT,IN
RDN	0	FT,IN
GR	15,0	FT,IN
CCL	22,3	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

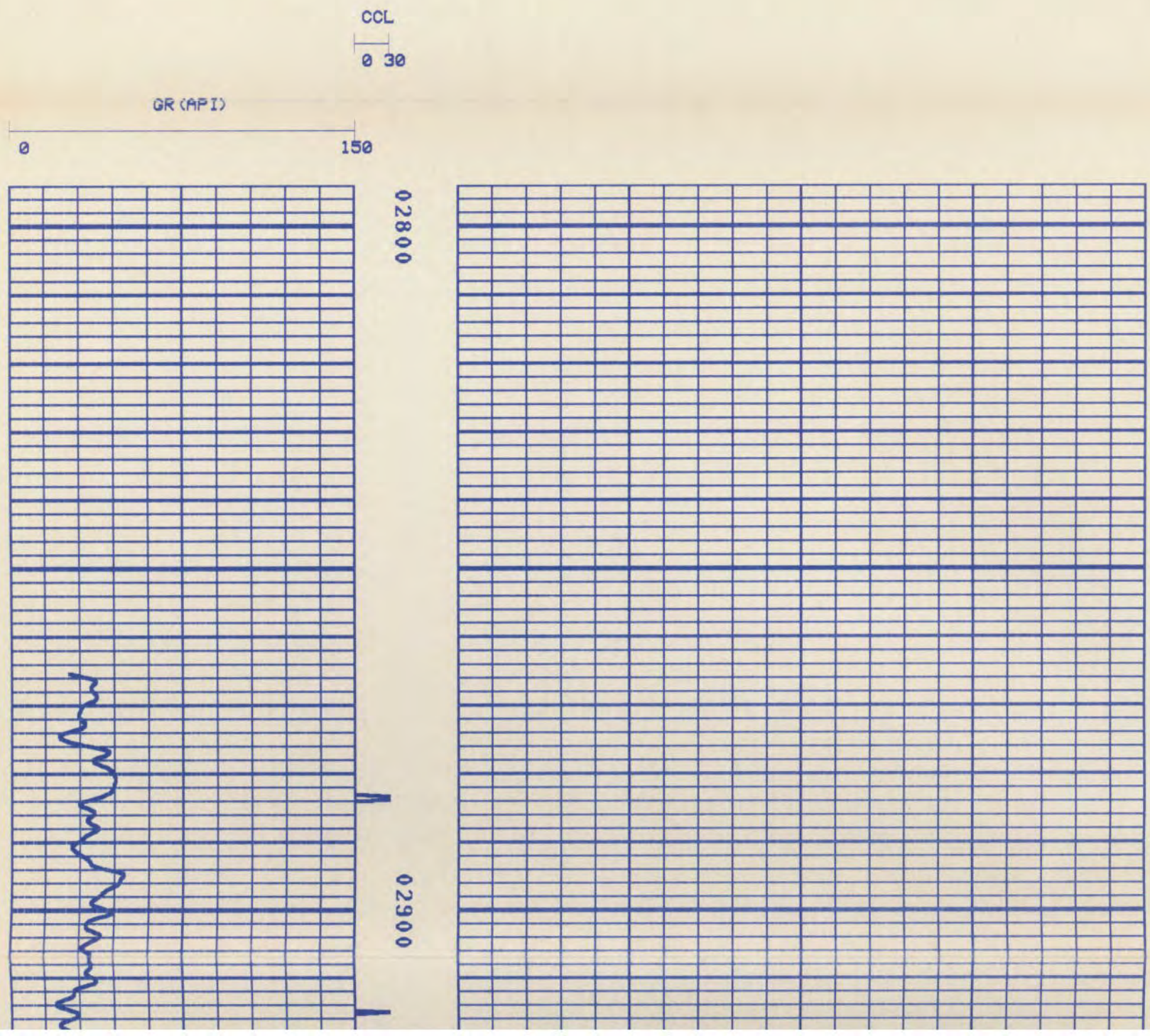
*** NONE ***

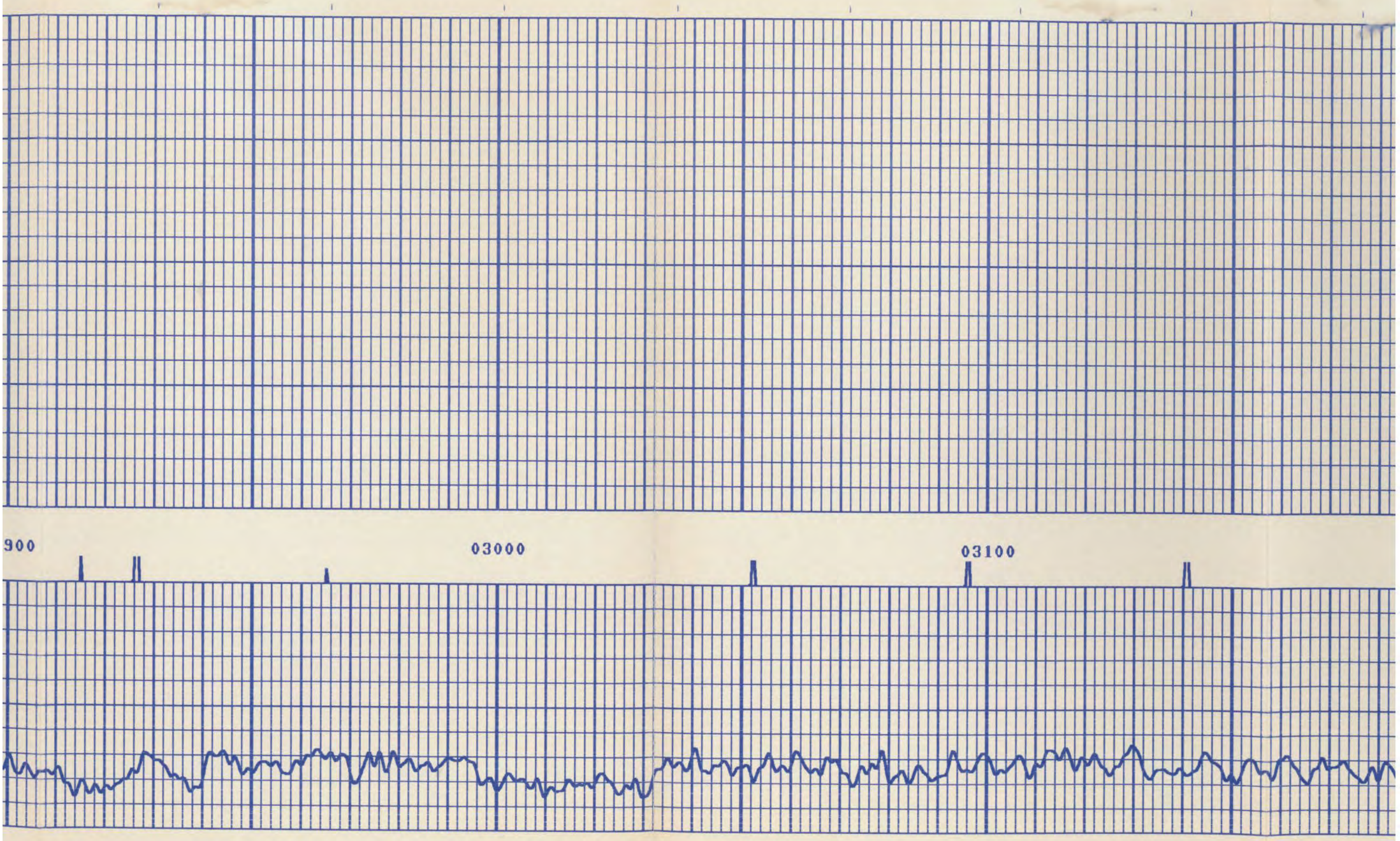
COMPANY: HOECHST CELANESE CORPORATION RUN: 1

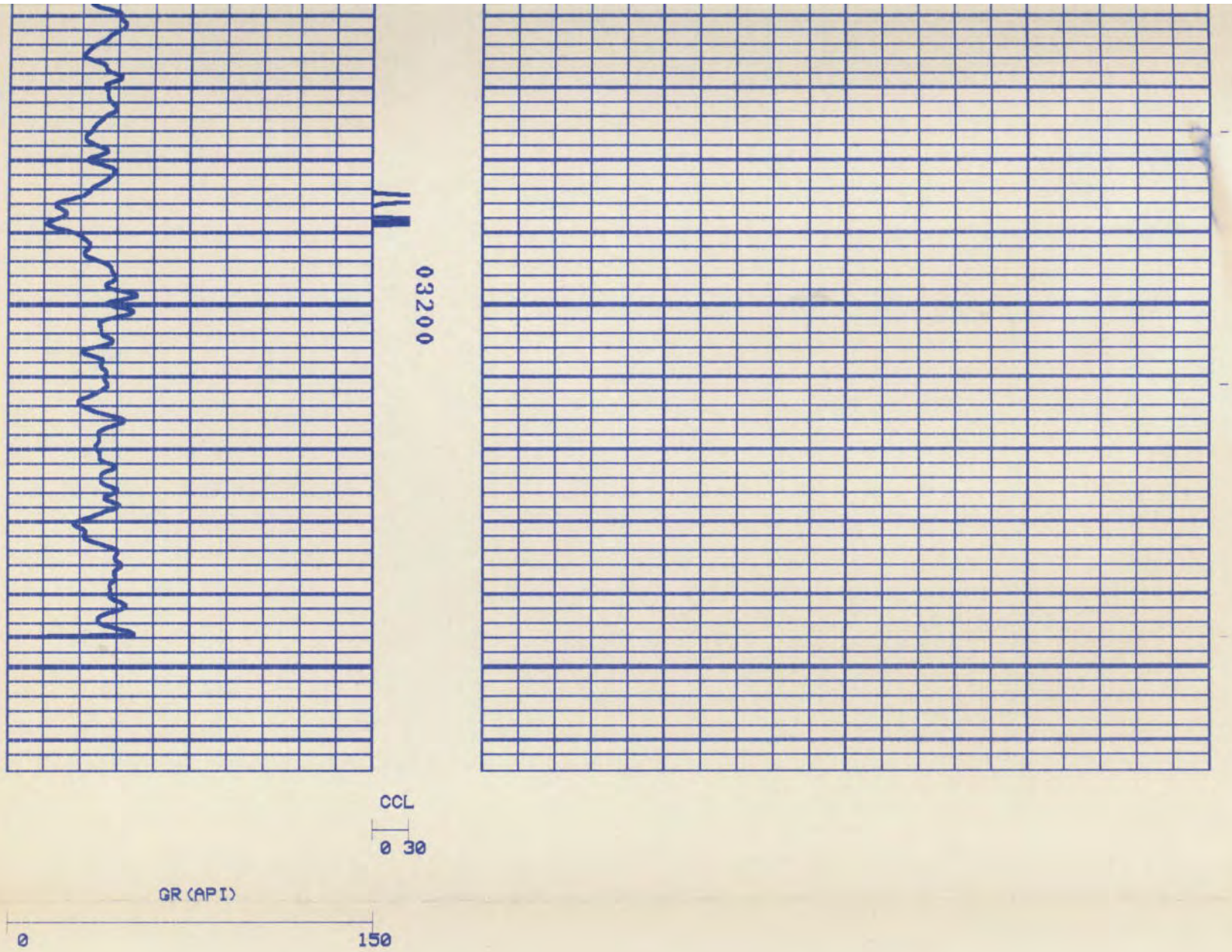
WELL NAME: EFFLUENT DISPOSAL WELL NO. 3 TRIP: 1

SERVICE: F 159P FILE: 3 DATE: 10/26/93 TIME: 16:34:46

REVISION: FSYS256 REV:G002 VER:2.0 MODE: RECORD




900
03000
03100



FILE: 3

****

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

GAUGE CALIBRATION CERTIFICATE

EPA FALLOFF TEST REPORT

(Gauge Information)

1. Gauge Type:	GPG-520
2. Resolution:	0.01 psi
3. Gauge Depth:	3192 ft.
4. Last Calibration:	04/27/1993

(Test Gauge Information)

1. Gauge Type:	Micro Smart SP-2000
2. Resolution:	0.01 psi
3. Last Calibration:	10/14/1993

(Calibration Check)

Time of Test	SP-2000	EPG-520	Diff.
Surface Pressure Before Test (10/25/1993)	610.98	604.79	6.19
Surface Pressure After Test (10/27/1993	91.78	84.22	7.56

HOECHST CELANESE CHEMICAL
WDW-32 (Well #3)
Bay City Plant, Texas

Test Date: 10/25/1993

***** ELECTRONIC GAUGE CALIBRATION DATA *****

GAUGE S/N: 69490
DIAPHRAGM NUMBER: 11501
RANGE: 5,000 PSIA
DATE CALIBRATED: 4-27-93
GAUGE TYPE: EPG-520

*** TEMPERATURE SUMMARY ***

MAXIMUM POSITIVE ERROR:	0.213 Deg F
MAXIMUM NEGATIVE ERROR:	-0.388 Deg F
SENSITIVITY:	0.083 Deg F/Hz
SENSITIVITY:	12.063 Hz/Deg F

*** PRESSURE SUMMARY ***

MAXIMUM POSITIVE ERROR:	0.678 PSIA
OCCURS AT:	211.908 Deg F
AND AT:	4015.378 PSIA
MAXIMUM NEGATIVE ERROR:	-0.416 PSIA
OCCURS AT:	211.908 Deg F
AND AT:	2014.284 PSIA
MAXIMUM HYSTERESIS:	0.069 PSIA
OCCURS AT:	211.892 Deg F
AND AT:	2014.700 PSIA

LONG TERM REPEATABILITY AT 212 Deg F:	0.910 PSIA
PRESSURE:	2014.700 PSIA
SENSITIVITY:	2.548 PSIA/Hz
SENSITIVITY:	0.392 Hz/PSIA

ACCURACY VERIFICATION

Gauge Model SP-2000 Transducer S/N 174

Pressure Range 10K PSI Recorder S/N 174

Accuracy +/- .05% Full Scale

INCREASING				DECREASING			
APPLIED PRESSURE psig	RECORDED PRESSURE psig	DIFFERENCE psi	%	APPLIED PRESSURE psig	RECORDED PRESSURE psig	DIFFERENCE psi	%
0.01	0.01	+0.00	+.0000	8739.79	8741.35	+1.56	+.0156
1498.24	1497.07	-1.17	-.0117	7291.54	7293.21	+1.67	+.0167
2946.53	2945.40	-1.13	-.0113	5843.24	5844.78	+1.54	+.0154
4394.87	4393.89	-0.98	-.0098	4394.87	4396.45	+1.58	+.0158
5843.24	5842.56	-0.68	-.0068	2946.53	2947.57	+1.04	+.0104
7291.54	7291.57	+0.03	+.0003	1498.24	1498.67	+0.43	+.0043
8739.79	8740.45	+0.66	+.0066	0.01	0.15	+0.14	+.0014
10188.04	10189.34	+1.30	+.0130				

Oven Temperature 275.2 °F Recorded Temperature 275.2 °F

Smart Gauge calibration accuracy is confirmed.

Calibrated with RUSKA Pressure Standard, model # 2451-710,
serial # 24577, Mass Set serial # 24395.
Compensated to local acceleration due to gravity.

Date: 14 Oct 1993 Verified by: L Topis

MICRO SMART SYSTEMS

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

TNRCC MECHANICAL INTEGRITY TESTING REPORT FORM

TWC MECHANICAL INTEGRITY TESTING (MIT) REPORT FORM

Date 10/28/93 WDW- 032 Co. Well No. 3 Date of Last MIT [illegible]/92
UIC Unit Representative Witnessing Test Larry Walker
Company Name and Location Hoechst Celanese - Bay City
Hazardous/Non-Hazardous _____ Logging Co. Western Reason for MIT annual
Arrived on Location [illegible] Departed Location _____

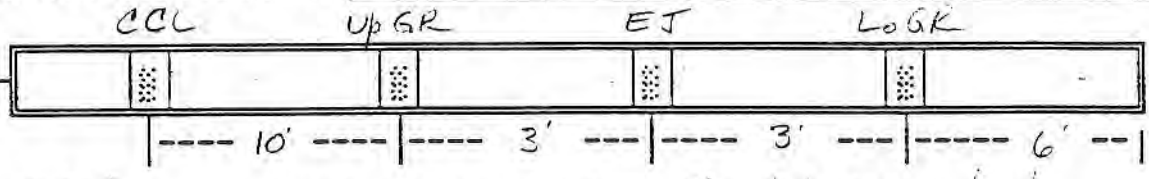
ANNULUS PRESSURE TEST (APT)

Well Shut-In Pressure 0 Beginning Time 1:39 Beginning Pressure 10[illegible].4
Ending Time [illegible] Ending Pressure 10[illegible] % Loss/Gain _____

RADIOACTIVE TRACER (RAT)

Logs Referenced for Correlation RAT [illegible]

Tool Info:



Packer Depth 3192' _____ Type of Completion Open hole gravel pack
Permitted/Petitioned Injection Interval 3350-3600
Top of Screen/Perfs/Open Hole 3202' Bottom of Casing 3245
Well TD 3553 PBTD _____ Tubing Size 5½"
Beginning and Ending Time of Base Line Gamma Ray Log 1:20 1:40 Repeat? Y
Interval of Base Line Gamma Ray Log 2850'-3248'
Depths of Statisticals (if any) _____

MOVING SURVEY

Time & Depth of First Slug Release 3:38 pm 2990 Size of Slug 3 sec
Pump Rate 25 gpm Injection Pressure 230 psi MASIP 775 psi
Depths Top of Slug Encountered 3030 / 3170' / _____ / _____ / _____ /
_____ / _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____
Total Number of Above Passes (At least two required) 2
Time & Depth of Second Slug Release 4:01 pm 2990' Size of Slug 3 sec
Pump Rate 15 gpm Injection Pressure 230 MASIP 775 psi
Depths Top of Slug Encountered 3030 / 3145 / _____ / _____ / _____ /
_____ / _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____
Total Number of Above Passes (At least two required) 2

STATIONARY

Reviewed Open Log Before Selecting Depth for Stationary (Y/N) ? N
Time & Depth of First Slug Release 4:50 3180 Size of Slug 2
Pump Rate 98 Injection Pressure 519 No. of Minutes 15
Comments OK

Time & Depth of Repeat Slug Release 5:09 3180 Size of Slug 2
Pump Rate 98 Injection Pressure 519 No. of Minutes 15
Comments OK

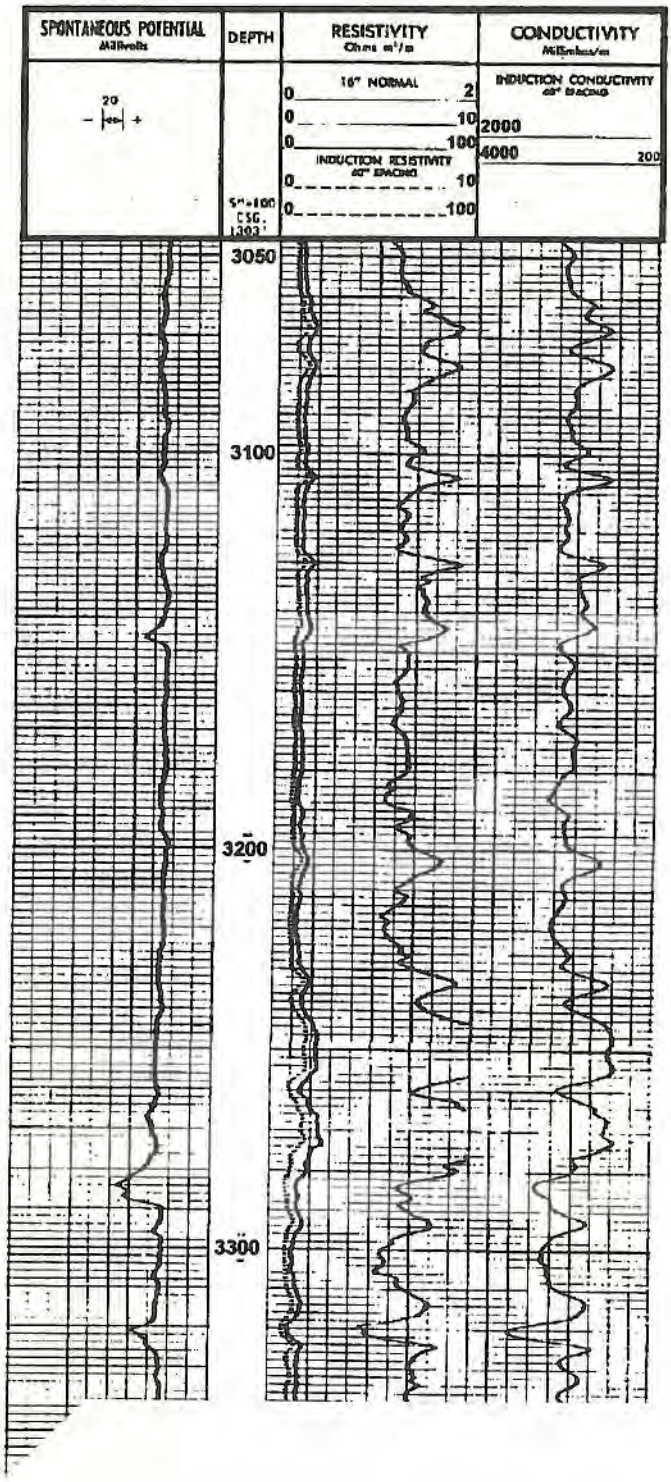
Beginning and Ending Time of Final Base Log 5:30 _____ Repeat? N
Interval of Final Base Line Gamma Ray Log 2850 - 3248

COMMENTS Top of fill (?) @ 3248'

Revised 6-29-92

ECO Solutions, Inc.
Hoechst Celanese Chemical Group
Falloff Test Report

WELL LOG STRIP


SPONTANEOUS POTENTIAL
Millivolts
20
DEPTH
RESISTIVITY
Ohms m²/m
16" NORMAL
0 2
0 10
0 100
INDUCTION RESISTIVITY
60" SPACING
0 10
0 100
CSG.
1203'
CONDUCTIVITY
Millimhos/m
INDUCTION CONDUCTIVITY
60" SPACING
2000
4000 200
3050
3100
3200
3300

14

TWC DISTRICT 07 TWC# 30134

P

INSPECTION COVER SHEET

RCRA PERMITTED FACILITIES

HW Permit: 50153
EPA ID#:TX D026040709

Name ofCompany: Hoechst Celanese Chemical Group Bay City
Mailing Address: P.O Box 509, Bay City TX 77404
Site Address : 10 Miles Southwest of Bay City on HWY 3057
County: Matagorda Type of Industry: Petrochemical Manufacturing.

C.O.Use only

GEN/FAC. CLASSIFICATION: Industrial ✓ Municipal ___

FACILITY CLASSIFICATION: Government ___ Commercial ___

OPERATIONAL STATUS : Active

Current Waste Management:

H = Hazardous
I = Class I Non-hazardous
II = Class II Non-haz.
III = Class III Non-haz.

Generator H, I, III, II
Treatment I, H, II
Storage H, I, III, II
Disposal H, I, II, III
Transporter
Pending Notification and Waste Determination

H W Permitted F(circle codes): C T SI WP LT LF I TT TR WDW (closed) (closed)

H W Interim St. Fac.(circle): C T SI WP LT LF I TT TR WDW (Boilers)

H W Permit-Exempt Facilities : SA C T

N HO FACILITIES (circle codes): C T SI WP LT LF I TT TR WDW
(double circle if permitted)

TYPE OF INSPECTION (circle) : CEI SPL NRR CME CSE CDI OAM CAO

OTH (+ reason)

04 = complaint 06 = closure insp.
22 = SPL results 34 = UIC insp.
46 = DOD insp 50 = multi-media In
61 = state fee bill insp.

Inspector's Name and Title Nadia Hameed, Field Investigator

Inspection Participants Kaymartha Williams, Environmental Engineer

Date(s) of Inspection March 31, 93 (begin) April 15, 93 (end)

Signed: N. Hameed May 10, 93 (date) Approved: Bruce Zapatoze 5/13/93 (date)
for Susan Bredehoeft

11/91

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 14 Inspection Date(s) March 31, April 15, 93

TWC Inspector(s) Nadia Hameed. (Print) District 07

Permittee Name Hoechst Celanese Company Well # 2

Inspection Type: (Regular) Follow up
Facility Type: Commercial (Non-commercial)

Company Reps/Guides	Title	Phone
Kay Martha Williams	Environmental Engineer	409-241-4123

Section 1 PRE-INJECTION FACILITIES

1. Are facilities managing hazardous wastes? There are interim status tanks which are waiting for an exemption as a totally enclosed treatment system (Yes) No NA
2. Facilities covered under RCRA Permit? Yes (No) NA
3. Are facilities exempted from permitting requirements? Yes (No) NA
4. Description of preinjection facilities Preinjection facilities consist of: Two Storage Tanks 1210 and 1211, Two neutralization Tanks - V-693 and V-1224, Primary filters V-151 and V-150, Polishing filters V-152, V-153, V-662, V-663 and a surge Tank V-1226.
5. Evidence of leaks or spills? (If yes, note in comments) Yes (No) NA
6. In the permit for this facility, are the 31 TAC Chapter 331 rules incorporated by reference? (Yes) No

Note to the inspector: If the answer to the above question is "No", then only the provisions specifically stated in the permit are required to be met. In these cases any reference for a potential violation must cite the permit provision, not the rules.

Section 2 UIC FACILITIES

	COMPLIANT?
1. Is a legible sign with company name, company well number and TWC permit number posted at the well site? *TAC 331.66(a)(1)*	(Yes) No NA
2. Is an all weather road to the well installed and maintained? *TAC 331.66(a)(2)*	(Yes) No NA
3. Is wellhead painted (if appropriate), maintained in good working order, without leaks? *TAC 331.66(a)(3)*	(Yes) No NA
4. Whenever the well is operating, are trained staff on location and able to operate the well and respond to alarms? *TAC 331.64(c)(2)*	(Yes) No NA

Note: All noncompliances must include comments.

(Revised 10/1/91)

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 14 Inspection Date(s) March 31, + April 15,

Section 2 UIC FACILITIES (continued)

	GAUGE	RECORDER	PERMIT LIMIT	COMPLIANT?
5. Inj. Pressure *TAC 331.63(a); 331.64(b); 331.64(c)*	510	510	900 psig	Yes No NA
6. Annulus Pressure *TAC 331.64(b); 331.64(c)*	720	702	– psig	Yes No NA
7. Differential Press. *TAC 331.63(c)*	210	192	min 100 psi	Yes No NA
8. Injection Rate *TAC 331.63(d); 331.64(c)*	(Red)	200	750 gpm (max)	Yes No NA
9. Inj. Fluid Temperature *TAC 331.64(c)*	(Blue)	104 °F		Yes No NA

	VALUE	HOW MEASURED	PERMIT LIMIT	COMPLIANT?
10. pH *TAC 331.63(f)*	7.05	Strip Chart	5.0 min	Yes No NA
11. Fluid Density *TAC 331.63(f)*	1.007	Grab	1.10 max	Yes No NA

12. Are annulus fluid volume continuous recorders used? *TAC 331.62(d)(4); 331.64(c)* — Yes No NA

13. Are injection fluids sampled and analyzed sufficiently to yield representative data about characteristics? *TAC 331.64(a); 331.65(b)(3)(C); 331.67(a)(2)(A)* — Yes No NA

14. Are gauges installed and maintained in proper working order at all times? *TAC 331.64(b)* — Yes No NA

15. Are recorders installed and maintained in proper working order at all times? *TAC 331.64(c)* — Yes No NA

16. Are recorders and other required instruments housed in weatherproof enclosures? *TAC 331.64(c)* — Yes No NA

17. Are Automatic alarms and shutoff devices installed and operational? (Auto shutoff not required if owner/operator certifies to TWC that trained operators are always present when well is operating.) *TAC 331.64(c)(1)* — Yes No NA

18. Are quarterly corrosion monitoring tests performed and recorded? *TAC 331.64(f)(1)* — Yes No NA

19. Are all gauges, pressure sensing and recording devices tested and calibrated quarterly? *TAC 331.63(e)* — Yes No NA

Note: All noncompliances must include comments.

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 14 Inspection Date(s) March 31, April 15, 9

Section 3 RECORDS REVIEW

	COMPLIANT?		
1. Are self reported data submitted as required by permit and rules? *TAC 331.65(b)(1) or 331.65(b)(2)*	Yes	No	NA
2. Are complete and accurate records maintained as required by permit and rules? *TAC 331.67(a), (b) and (c)*	Yes	No	NA
3. Are records available for review by Commission representative? *TAC 331.67(b)*	Yes	No	NA
4. Are all records retained throughout the life of the well? *TAC 331.67(c)*	Yes	No	NA
5. Has an injection zone annual report been submitted with December self reported data? *TAC 331.65(b)(3)*	Yes	No	NA
6. Did permittee notify TWC and get approval before beginning any well workovers that require taking well out of service? *TAC 331.63(g)*	Yes	No	NA
7. Was mechanical integrity test performed following any well workovers? *TAC 331.63(h)*	Yes	No	NA
8. Has an annual mechanical integrity test been performed? *TAC 331.64(d)*	Yes	No	NA

Date of last MIT Dec 1, 1992 Due date of next MIT Dec 1993

9. Has an annual pressure falloff test been performed? *TAC 331.64(g)(2)* Dec 1, 1992	Yes	No	NA
10. Does permittee currently have sufficient financial assurance to meet permit requirements? Amount of financial security required by permit $82,000.00	Yes	No	NA
11. Does permittee comply with land disposal restriction regulations for UIC wells? *40CFR part 148*	Yes	No	NA

Section 4 ABANDONED WELLS

1. Is a permanent marker with permit number, date abandoned, and company name placed at the plugged well? *TAC 331.46(k)*	Yes	No	NA
2. Are all required monitoring parameters for abandoned wells performed and reported? *TAC 331.46, 331.68*	Yes	No	NA
3. Are all records retained for 5 years after abandonment?	Yes	No	NA

Note: All noncompliances must include comments.

(Revised 10/1/91)

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 14 Inspection Date(s) March 31, April 5, 9

Section 5 SELF REPORTED DATA-RECORDS REVIEW

NOTE: Complete one page per monthly review of records

1. Review of self reported data for October, 1992 (month, year)

	REPORTED VALUE	OBSERVED VALUE	PERMIT LIMIT	COMPLIANT?
2. Max. Inj. Pressure *331.63(a); 331.64(b),(c); 331.67(a)(1)(A)*	514	518	900 psig	Yes No NA
3. Min. Annulus Press *TAC 331.64(b),(c); 331.67(a)(1)(B)*	620	620	N/A psig	Yes No NA
4. Min. Differential *TAC 331.63(c)*	148	146	100 psi	Yes No NA
5. Max. Injection Rate *331.63(d); 331.64 (c); 331.67(a)(1)(C)*	205	206	750 gpm	Yes No NA
6. Average Inj. Rate			N/A gpm	Yes No NA
7. Total Injection Vol. *TAC 331.67(a)(1)(D)*	8.7941	8.79	33.48 million gal	Yes No NA
8. Minimum pH *TAC 331.63(f)*	6.55	6.55	5.0 SU	Yes No NA
9. Max. Fluid Density *TAC 331.63(f)*	1.0075	1.0075	1.100	Yes No NA
10. Inj. Fluid Temp. *TAC 331.64(c)*	N/A	N/A		Yes No NA
11. Other Permit Param.	N/A	N/A		Yes No NA

Pen Colors and Conversion Factors (optional)

Comments

The facility is required by permit Provision VIII.E to measure "fluid density" every 8 hours. It was noted in the inspection that the facility was only measuring the fluid density every 12 hours. This is a violation of the above permit provision

(Use additional comment sheet if necessary)

Lead Inspector Nadia Hameed (Date) N. Hameed (Sign) May 10, 1993 (Print)

Note: All noncompliances must include comments.

(Revised 10/1/91)

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 14 Inspection Date(s) March 31, April 15, 93

Section 6 EPA NO-MIGRATION PETITION APPROVAL CONDITIONS

1. Is the operator disposing of more waste volume than is allowed in the petition conditions ? **YES** (NO)

   Petition Value 33,480,000 gal Cumulative for 14, 32 + 49.

   Observed Value 8.794 (WDW-14) gal Time Period October
   3.5712 (WDW-32)
   5.0443 (WDW-49)
   Total 17,4095

2. Is the operator's waste stream complying with the specific gravity or density conditions of the petition ? (YES) **NO**

   Petition Value or Range 1.00 to 1.1

   Observed Value or Range 1.007 Date(s) April 15, 93.

3. Is the operator disposing of any hazardous waste that has a waste code that is not included in the petition condition list of approved waste codes ? **YES** (NO)

   List wastes being disposed that aren't on the approved list:

Comments:

Note: If the answer to any of the above questions is the **bolded** answer, this means that the operator may be out of compliance with the EPA approved no-migration petition and the EPA needs to be notified of this situation as soon as possible.

1963016006

ADDENDUM I

TEXAS WATER COMMISSION

Paul Hopkins, Chairman
Ralph Roming, Commissioner
John O. Houchins, Commissioner

Larry R. Soward, Executive Director
Mary Ann Hefner, Chief Clerk
James K. Rourke, Jr., General Counsel

January 20, 1987

Celanese Chemical Company, Inc.
P.O. Box 509
Bay City, Texas 77414

RE: Amendment to Permit No. WDW-14

Dear Sirs:

Enclosed is a copy of the referenced permit issued pursuant to your application and Chapter 26 of the Texas Water Code. The permit constitutes an official document which should be kept in your permanent records.

Please continue using the self-reporting forms you have on hand until new forms are forwarded by the Water Quality Division.

Should you have any questions, please contact us.

Very truly yours,

TEXAS WATER COMMISSION

By Mary Ann Hefner
Mary Ann Hefner
Chief Clerk

MAH:lm
Enclosures
cc w/enclosure:
TWC District No. 12
Plant Manager, Celanese Chemical Company

1 9 6 3 0 7 6 0 0 0 7

PERMIT NO. WDW-14

This permit supersedes and replaces TWC Permit No. WDW-14 issued September 18, 1964 and amended on June 28, 1965 and September 15, 1972.

TEXAS WATER COMMISSION
Stephen F. Austin State Office Building
Austin, Texas

PERMIT to conduct underground injection under provisions of Chapter 26 & 27, Texas Water Code (for hazardous waste disposal wells) and Article 4477-7, Texas Solid Waste Disposal Act

I. Name of Permittee:

A. Name Celanese Chemical Company, Inc.

B. Address P. O. Box 509
Bay City, Texas 77414

II. Type of Permit: Regular _____ Amended X

III. Nature of Business: Petro-chemical Plant

IV. General Description and Location of Injection Activity

The injection well will be used to dispose of industrial waste from the Bay City Plant. The well is located 5230 feet south and 2220 feet west of the most northerly northwest corner of the company property which is located on the

CONTINUED on Pages 2 through 8.

The permittee is authorized to conduct injection activity in accordance with limitations, requirements, and other conditions set forth herein. This permit is granted subject to the rules and orders of the Commission, and the laws of the State of Texas. This permit is valid for a period of 10 years or until amended or revoked by the Commission.

APPROVED, ISSUED AND EFFECTIVE this 13th day of January, 19 87.

ATTEST: Marylene Hefner

Pane Hopkins
For the Commission

1963016008

James Moore League, Abstract No. 62, Matagorda County, Texas, approximately 10 miles southwest of Bay City, Texas; 28°51'19" North latitude, 96°01'15" West longitude. Injection will be into the Miocene sands in the approximate subsurface interval between 3300 and 3700 feet.

V. Construction Requirements

A permit for the drilling and operation of this disposal well was issued on September 28, 1964. The permittee set and cemented surface casing to a subsurface depth of 1,369 feet, and long-string casing from the surface into the injection zone to 3,750 feet to properly protect usable quality ground water. Cementing was by the pump and plug method. Cement was circulated outside both casings back to the surface. Except as specifically required in terms of the original permit, construction of the well and the associated facilities was done in accordance with the plans and specifications contained in the permit application. Any proposed changes to the plans and specifications must be certified in writing by the Executive Director that said changes provide equivalent or greater protection than the original design criteria and standards. Any change in well operational parameters will require a permit amendment as specified in 31 TAC Section 305.62.

VI. Character of the Waste Streams

A. Industrial waste permitted to be injected shall consist of the following waste streams; however, wastes not authorized to be stored, processed or handled in associated solid waste surface facilities are expressly not authorized.

1. Wastes generated during closure of the well and associated facilities that are compatible with permitted wastes and the reservoir.

2. Wastes associated with the production of Acetaldehyde, Vinyl Acetate, n-Butyl Alcohol, n-Propyl Alcohol, Iso-Butyl Alcohol, Heptanoic Acid, Nonanoic Acid, Hydrogen, Synthesis Gas, C_7 and C_9 Aldehydes, Propionic Acid, and Fatty Alcohols.

3. Contaminated rainfall runoff, slab wash water, contaminated products, contaminated raw materials, tank car heels, and spillage and wash water from tank car-tank truck cleaning and loading areas.

1 9 6 3 0 1 6 0 0 0 9

4. Wastes normally injected into WDW-110, when it is out of service for workover, provided that the pH of injected fluids is adjusted to be no less than 5.0.

B. The pH of injected waste streams shall not be less than 5.0.

C. Except as authorized by the Executive Director for purposes of performing a workover or shutting in the well, the density of injected fluids shall not exceed a specific gravity of 1.10.

VII. Injection Rates and Volumes

A. The combined maximum instantaneous rate of injection into this well, WDW-32 and WDW-49 shall not exceed 750 gallons per minute.

B. The cumulative volume of wastewater injected into this well, WDW-32 and WDW-49 shall not exceed 33,480,000 gallons per month. (Based on 750 gals/min. and a 31 day month)

C. The cumulative volume of wastewater injected into this well, WDW-32 and WDW-49 shall not exceed 394,200,000 gallons per year. (Based on 750 gals/min. and 365 days)

VIII. Operating Parameters

A. The operating surface injection pressure shall not exceed 900 psig.

B. The tubing-long string casing annulus shall be filled with a corrosion inhibiting fluid. A positive pressure with a differential from injection pressure of at least 100 psi shall be maintained on the annulus to detect well malfunctions. Instrumentation shall be installed to detect well malfunctions by both annulus pressure changes and annulus volume changes.

C. Pressure gauges shall be installed and maintained in proper operating conditions at all times on the injection tubing and tubing-long string casing annulus at the wellhead.

D. Continuous recording devices shall be installed and maintained in proper operating conditions at all times to record injection tubing pressure, injection flow rate, injection volumes and tubing-long string casing annulus pressure. The instruments shall be housed in weatherproof enclosures.

1 9 6 3 0 1 6 0 0 1 0

Grab samples from every 12 hours required every 8 hours

E. The pH and density of the injected waste shall be monitored continuously or on a batch basis or by grab sample once every 8 hours. Annulus volumes shall be monitored a minimum once each work shift.

F. Mechanical integrity was demonstrated on December 1, 1983 and shall be demonstrated thereafter once every five years for the life of the well.

IX. Reporting Requirements

A. The permittee shall submit to the Commission within twenty (20) days after the last day of March, June, September and December of each year a Report of Injection Operation on forms supplied by the Commission.

B. The permittee shall submit to the Commission annually, with the December operating report, an acceptable report of the pressure effects of the well upon its injection zone, including a direct measurement of bottom-hole pressure, or a calculation of bottom-hole pressure using the specific gravity of fluid in the wellbore and the static fluid level. To the extent such information is reasonably available, the report shall also include:

1. Locations of newly constructed and discovered wells within the Area of Review if such wells were not included in the Technical Report accompanying the permit application or in later reports.

2. A tabulation of data for all newly constructed and discovered wells within 1/2 mile of the injection well and for all such wells within the Area of Review that penetrate to within 300 feet of the top of the injection zone as required by 31 TAC Section 331.65(b) (2) (B).

3. Annual injection fluid analysis.

C. The permittee shall notify the Austin Office of the Commission within twenty-four (24) hours of any change in monitoring parameters or of any other observations which could reasonably be attributed to a leak or other failure in well equipment.

D. The permittee shall submit to the Commission within forty-five (45) days after completion of the following tests a report including both data and interpretation of the results of:

1 9 5 3 0 0 6 0 0 1 1

1. Periodic tests of mechanical integrity; and

2. Any other test of the injection well or injection zone if required by the Executive Director.

X. Well Workovers

A. The permittee shall notify the Austin Office of the Commission of any workover or corrective maintenance operation:

1. For major workovers or corrective maintenance operations which involve removal of injection tubing the permittee shall obtain approval of the Executive Director prior to beginning work. Notification shall be in writing and shall include plans for the proposed work. The Executive Director may grant an exception to prior written notification when immediate action is required.

2. For other workovers or corrective maintenance operations the permittee shall notify the Austin Office of the Commission and obtain approval before beginning work.

B. Within sixty (60) days after completion of any workover, a completion report shall be submitted to the Commission including the reason for the well workover and details of the work performed.

C. During major workovers, the bottom-hole pressure shall be determined either by direct measurement using conventional techniques or by calculation using specific gravity of fluid in the wellbore and the static fluid level.

D. All phases of any workover shall be supervised by a person knowledgeable and experienced in practical well engineering, who is familiar with the special conditions and requirements of injection well construction and operation.

E. Mechanical integrity shall be demonstrated following major workovers or corrective maintenance operations which involve removal of injection tubing or perforating.

1 9 6 3 0 7 6 0 0 1 2

XI. Plugging

A. Upon final abandonment the well shall be plugged in accordance with plans and specifications contained in the application after mechanical integrity of the well is verified by a program approved by the Executive Director. Any proposed changes to plans and specifications must be certified in writing by the Executive Director that said changes provide protection equivalent to or greater than the original design criteria and standards.

B. The permittee shall notify the Austin Office of the Commission in writing thirty (30) days prior to commencing plugging operations. Within thirty (30) days of completion of plugging operations the permittee shall submit to the Austin Office of the Commission a plugging report on forms provided by the Commission.

C. The permittee shall secure and maintain in full force and effect at all times a performance bond or other form of financial security, in accordance with 31 TAC Section 305.153 (relating to Financial Responsibility), to provide for proper plugging and abandonment of the permitted waste disposal well. The bond or other form of financial security shall be in the amount of $82,000.00. The amount of financial security may, at the discretion of the Texas Water Commission, be altered at a future date to provide for adequate plugging subject to prevailing general economic conditions, as provided by 31 TAC Section 305.62 (pertaining to the amendment of permits). The injection of fluids is not authorized until the permittee secures the performance bond or other form of financial security as described above.

XII. Monitoring and Record Keeping

A. The permittee shall keep complete and accurate records of:

1. All monitoring required in the permit, including:

a. Continuous records of surface injection pressures,
b. Continuous records of the tubing-long string annulus pressures,
c. Continuous records of injection flow rates,
d. Monthly total volume of injected fluids,
e. Annulus volume,

1 9 6 3 0 3 6 0 0 1 3

f. Injection fluid pH,
g. Injection fluid density,

2. All periodic well tests, including but not limited to:

a. Injection fluid analysis,
b. Bottom-hole pressure readings,
c. Mechanical integrity.

3. All shut-in periods and times that emergency measures were used for handling waste; and

4. Any additional information on conditions that might reasonably affect the operation of the injection well.

B. All records shall be made available for review upon request from a representative of the Commission.

C. The permittee shall retain, for a period of five (5) years following abandonment, records of all information resulting from any monitoring activities or records required by this permit.

XIV. Other Requirements

A. A sign shall be posted at the well site which shall show the name of the company, company well number and permit number. The sign and identification shall be in the English language, clearly legible and shall be in numbers and letters at least one (1) inch high.

B. An all-weather road shall be installed and maintained to allow access to the disposal well and related facilities.

C. The wellhead and associated facilities shall be painted, where appropriate, and maintained in good working order without leaks.

D. The following rules are incorporated in this permit by reference:

Permit Characteristics and Conditions,
31 TAC Subchapter F, Sections 305.121-128
Additional Conditions for Injection Well Permits,
31 TAC Subchapter H, Sections 305.151-160

1 9 6 3 0 1 6 0 0 1 4

E. No discharge of wastes, other than those waste streams specified in Paragraph VI of this permit injected into the Miocene Sands in the subsurface between approximately 3300 and 3700 feet is authorized by this permit from this facility into water in the State.

F. Within thirty (30) days after permit approval, the permittee shall provide written notice to the Executive Director that a copy of the permit has been filed with the health and pollution control authorities of the county, city or town where the well is located.

G. All solid waste managed at the facility shall be managed in accordance with 31 TAC Chapter 335, Rules for Industrial Solid Waste and Municipal Hazardous Waste.

H. The permittee is subject to the provisions of 31 TAC 305.125.

1 9 6 3 0 0 6 0 0 1 5

Texas Water Commission

INTEROFFICE MEMORANDUM

To: FILE Date: May 14, 1993

Thru: Ben Wesley, UIC Coordinator, Program Services Unit
Field Operations Division

From: Nadia Hameed, Field Investigator
District 7 - Houston

Subject: Hoechst Celanese - Permit No. WDW-14
TWC Registration No. 30134
Underground Injection Control Inspection
Conducted March 31 and April 15, 1993

1 9 6 3 0 0 6 0 0 1 6

I. INTRODUCTION

On March 31 and April 15, 1993, Nadia Hameed of the Texas Water Commission (TWC) District 7 office conducted an Underground Injection Control (UIC) inspection at the above referenced facility. Participating in the inspection on behalf of Hoechst Celanese was Kaymartha Williams.

II. WASTES GENERATED

The facility is presently only using one deep well WDW-14 for hazardous waste injection. The wastes sent into this well primarily originate from the acetaldehyde unit. These consist mainly of K009 and K010, listed wastes and any makeup water from the acetaldehyde unit. In addition the well is approved to dispose of D001, D002, U001, U002, U031, U112, U123, U140, U154, U197, U226, F001, F002 and hexavalent chromium.

III. WASTE MANAGEMENT FACILITIES

The pre-injection facilities mainly consist of:

Two storage tanks 1210 and 1211, where the waste is stored initially. From here it is sent to two neutralization tanks V-693 and V-1224 and then it is routed via primary filters V-151 and V-150 and polishing filters V-152, V-153, V-662 and V-663 to surge tank V-1226 and then into the deep well.

Presently these tanks that are associated with this system are interim status tanks. The facility, however, has applied

to the TWC for an exemption of these tanks from RCRA regulation as they consider these tanks to be part of a totally enclosed system. No decision has yet been reached.

IV. VIOLATION

o The facility is required by the Permit Provision VIII. E. to measure the fluid density every 8 hours. It was noted in the inspection that the facility was measuring the fluid density once every 12 hours (i.e once per shift) for the well above.

This information is submitted as file data.

Signed: _____
Nadia Hameed
Field Investigator

Approved: _____
for Susan D. Bredehoeft
Program Manager
Industrial and Hazardous Waste Program
District 7 - Houston

SDB/NH/tl

1963016017

WDW-32

TWC DISTRICT 07

TWC# 30134

INSPECTION COVER SHEET

P

RCRA PERMITTED FACILITIES

HW Permit: 50153

EPA ID#: TXD026040709

Name of Company: Hoechst Celanese Chemical Group Bay City

Mailing Address: P.O Box 509 Bay City TX 77404

Site Address : 10 Miles Southwest of Bay City on HW 3257

County: Matagorda Type of Industry: Petrochemical Manufacturing

C.O. Use only

GEN/FAC. CLASSIFICATION: Industrial ✓ Municipal ___

FACILITY CLASSIFICATION: Government ___ Commercial ___

OPERATIONAL STATUS : Active

Current Waste Management:

H = Hazardous
I = Class I Non-hazardous
II = Class II Non-haz.
III = Class III Non-haz.

Generator	H, I III, II
Treatment	I, H, II
Storage	H, I, III II
Disposal	H, I, II, III
Transporter	
Pending Notification and Waste Determination	

closed closed

H W Permitted F(circle codes): (C) T (SI) WP LT (LF) I TT TR (WDW)

H W Interim St. Fac.(circle): C (T) SI WP LT LF I TT TR WDW (Boilers)

H W Permit-Exempt Facilities : SA (C) (T)

N HW FACILITIES (circle codes): (C) (T) (SI) WP (LT) (LF) (I) TT TR (WDW)
(double circle if permitted)

TYPE OF INSPECTION (circle) : CEI, SPL NRR CME CSE CDI OAM CAO

(OTH (+ reason)) 04 = complaint 06 = closure insp.
22 = SPL results (34 = UIC insp) WDW-110, 32 + 49
46 = DOD insp 50 = multi-media In
61 = state fee bill insp.

Inspector's Name and Title Nadia Hamed, Field Investigator

Inspection Participants Kaymartha Williams, Environmental Engineer

Date(s) of Inspection March 31, 93 (begin) April 15, 93 (end)

Signed: N. Hamed May 10, 93 (date) Approved: Billie Zagotza for Susan Bredehoft 5/13/93 (date)

11/91

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 32 Inspection Date(s) March 31, April 15, 9

TWC Inspector(s) Nadia Hameed (Print) District 07

Permittee Name Hoechst Celanese Company Well # 3

Inspection Type: (Regular) Follow up

Facility Type: Commercial (Non-commercial)

Company Reps/Guides	Title	Phone
Kaymartha Williams	Environmental Engineer	409-241-4123

Section 1 PRE-INJECTION FACILITIES

1. Are facilities managing hazardous wastes? Yes (No) NA

2. Facilities covered under RCRA Permit? The tanks are interim status and are waiting for the approval of an exemption from RCRA Yes (No) NA

3. Are facilities exempted from permitting requirements? Yes (No) NA

4. Description of preinjection facilities Preinjection facilities consist of: Storage vessel V-680, two neutralization vessels 1216 and 1217, Primary filters V-1061, V-1062, V-1059 and V-1060, Polishing filters V-162, V-163, V-656, V-657, V-758 and V-757 and surge vessel 159

5. Evidence of leaks or spills? (If yes, note in comments) Yes (No) NA

6. In the permit for this facility, are the 31 TAC Chapter 331 rules incorporated by reference? (Yes) No

Note to the inspector: If the answer to the above question is "No", then only the provisions specifically stated in the permit are required to be met. In these cases any reference for a potential violation must cite the permit provision, not the rules.

Section 2 UIC FACILITIES

	COMPLIANT?		
1. Is a legible sign with company name, company well number and TWC permit number posted at the well site? *TAC 331.66(a)(1)*	(Yes)	No	NA
2. Is an all weather road to the well installed and maintained? *TAC 331.66(a)(2)*	(Yes)	No	NA
3. Is wellhead painted (if appropriate), maintained in good working order, without leaks? *TAC 331.66(a)(3)*	(Yes)	No	NA
4. Whenever the well is operating, are trained staff on location and able to operate the well and respond to alarms? *TAC 331.64(c)(2)*	(Yes)	No	NA

Note: All noncompliances must include comments.

(Revised 10/1/91)

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 32 Inspection Date(s) March 31, April 15,

Section 2 UIC FACILITIES (continued)

	GAUGE	RECORDER	PERMIT LIMIT	COMPLIANT?
5. Inj. Pressure *TAC 331.63(a); 331.64(b); 331.64(c)*	345	320	900 psig	Yes No NA
6. Annulus Pressure *TAC 331.64(b); 331.64(c)*	530	516	– psig	Yes No NA
7. Differential Press. *TAC 331.63(c)*	185	196	Min 100 psi	Yes No NA
8. Injection Rate *TAC 331.63(d); 331.64(c)*	(Red)	73	750 gpm (max)	Yes No NA
9. Inj. Fluid Temperature *TAC 331.64(c)*		92 °F		Yes No NA

	VALUE	HOW MEASURED	PERMIT LIMIT	COMPLIANT?
10. pH *TAC 331.63(f)*	7.2	Strip Chart	5.0 min	Yes No NA
11. Fluid Density *TAC 331.63(f)*	1.0045 (Bar)	Grab	1.10 max	Yes No NA

12. Are annulus fluid volume continuous recorders used? *TAC 331.62(d)(4); 331.64(c)* Yes No NA

13. Are injection fluids sampled and analyzed sufficiently to yield representative data about characteristics? *TAC 331.64(a); 331.65(b)(3)(C); 331.67(a)(2)(A)* Yes No NA

14. Are gauges installed and maintained in proper working order at all times? *TAC 331.64(b)* Yes No NA

15. Are recorders installed and maintained in proper working order at all times? *TAC 331.64(c)* Yes No NA

16. Are recorders and other required instruments housed in weatherproof enclosures? *TAC 331.64(c)* Yes No NA

17. Are Automatic alarms and shutoff devices installed and operational? (Auto shutoff not required if owner/operator certifies to TWC that trained operators are always present when well is operating.) *TAC 331.64(c)(1)* Yes No NA

18. Are quarterly corrosion monitoring tests performed and recorded? *TAC 331.64(f)(1)* Yes No NA

19. Are all gauges, pressure sensing and recording devices tested and calibrated quarterly? *TAC 331.63(e)* Yes No NA

Note: All noncompliances must include comments.

UIC

TEXAS WATER COMMISSION

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 32 Inspection Date(s) March 31, April 15, 9.

Section 3 RECORDS REVIEW

	COMPLIANT?
1. Are self reported data submitted as required by permit and rules? *TAC 331.65(b)(1) or 331.65(b)(2)*	Yes No NA
2. Are complete and accurate records maintained as required by permit and rules? *TAC 331.67(a), (b) and (c)*	Yes No NA
3. Are records available for review by Commission representative? *TAC 331.67(b)*	Yes No NA
4. Are all records retained throughout the life of the well? *TAC 331.67(c)*	Yes No NA
5. Has an injection zone annual report been submitted with December self reported data? *TAC 331.65(b)(3)*	Yes No NA
6. Did permittee notify TWC and get approval before beginning any well workovers that require taking well out of service? *TAC 331.63(g)*	Yes No NA
7. Was mechanical integrity test performed following any well workovers? *TAC 331.63(h)*	Yes No NA
8. Has an annual mechanical integrity test been performed? *TAC 331.64(d)*	Yes No NA

Date of last MIT Sept 16, 1992 Due date of next MIT Sept 16, 1993

5 year Testing last done Nov 1989 Due Date - Nov 1993

9. Has an annual pressure falloff test been performed? *TAC 331.64(g)(2)*	Yes No NA

Sept 16, 1992

10. Does permittee currently have sufficient financial assurance to meet permit requirements?	Yes No NA

Amount of financial security required by permit $82,000

11. Does permittee comply with land disposal restriction regulations for UIC wells? *40CFR part 148*	Yes No NA

Section 4 ABANDONED WELLS

1. Is a permanent marker with permit number, date abandoned, and company name placed at the plugged well? *TAC 331.46(k)*	Yes No NA
2. Are all required monitoring parameters for abandoned wells performed and reported? *TAC 331.46, 331.68*	Yes No NA
3. Are all records retained for 5 years after abandonment?	Yes No NA

Note: All noncompliances must include comments.

(Revised 10/1/91)

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 32 Inspection Date(s) March 31, April 15

Section 5 SELF REPORTED DATA-RECORDS REVIEW

NOTE: Complete one page per monthly review of records

1. Review of self reported data for December, 1992 (month, year)

	REPORTED VALUE	OBSERVED VALUE	PERMIT LIMIT	COMPLIANT?		
2. Max. Inj. Pressure *331.63(a); 331.64(b),(c); 331.67(a)(1)(A)*	66	66.6	900 psig	Yes	No	NA
3. Min. Annulus Press *TAC 331.64(b),(c); 331.67(a)(1)(B)*	260	260	N/A psig	Yes	No	NA
4. Min. Differential *TAC 331.63(c)*	172	170	100 psi	Yes	No	NA
5. Max. Injection Rate *331.63(d); 331.64 (c); 331.67(a)(1)(C)*	159	159	750 gpm	Yes	No	NA
6. Average Inj. Rate			N/A gpm	Yes	No	NA
7. Total Injection Vol. *TAC 331.67(a)(1)(D)*	3.8837	3.8838	33.48 million gal	Yes	No	NA
8. Minimum pH *TAC 331.63(f)*	6.25	6.25	5.0 SU * See Comments	Yes	No	NA
9. Max. Fluid Density *TAC 331.63(f)*	1.0075	1.0075	1.100	Yes	No	NA
10. Inj. Fluid Temp. *TAC 331.64(c)*	N/A	N/A		Yes	No	NA
11. Other Permit Param.	N/A	N/A	N/A	Yes	No	NA

Pen Colors and Conversion Factors (optional)

Comments

* pH is no longer a parameter for WDW-32 that needs to be reported.

The facility is required by permit provision VIII E to measure fluid density every 8 hours. It was noted in the inspection that the facility was only measuring fluid density every 12 hours. This is a violation of the above permit provision.

(Use additional comment sheet if necessary)

Lead Inspector May 10, 93 (Date) N. Hamed (Sign) NADIA HAMEED (Print)

Note: All noncompliances must include comments.

(Revised 10/1/91)

PERMIT NO. WDW-32

This permit supersedes and replaces TWC Permit No. WDW-32 issued July 3, 1967 and amended on December 6, 1969 and September 15, 1972..

TEXAS WATER COMMISSION
Stephen F. Austin State Office Building
Austin, Texas

PERMIT to conduct underground injection under provisions of Chapter 26 & 27, Texas Water Code (for hazardous waste disposal wells) and Article 4477-7, Texas Solid Waste Disposal Act

I. Name of Permittee:

A. Name Celanese Chemical Company, Inc.

B. Address P. O. Box 509
Bay City, Texas 77414

II. Type of Permit: Regular _____ Amended ___X___

III. Nature of Business: Petro-chemical Plant

IV. General Description and Location of Injection Activity

The injection well will be used to dispose of industrial waste from the Bay City Plant. The well is located 4292 feet south and 2029 feet west of the most northly northwest corner of the company property which is located on the James Moore League, Abstract No. 62, Matagorda County, Texas,

CONTINUED on Pages 2 through 8.

The permittee is authorized to conduct injection activity in accordance with limitations, requirements, and other conditions set forth herein. This permit is granted subject to the rules and orders of the Commission, and the laws of the State of Texas. This permit is valid for a period of 10 years or until amended or revoked by the Commission.

APPROVED, ISSUED AND EFFECTIVE this 13th day of January, 1987.

ATTEST: Marylene Hefner

Paul Hopkins
For the Commission

1963013 0019

approximately 10 miles southwest of Bay City, Texas, 28°51'59" North latitude, 96°01'13" West longitude. Injection will be into the Miocene sands in the approximate subsurface interval between 3300 and 3700 feet.

V. Construction Requirements

A permit for the drilling and operation of this disposal well was issued on July 3, 1967. The permittee set and cemented surface casing to a subsurface depth of 1302 feet, and long-string casing from the surface into the injection zone to 3245 feet to properly protect usable quality ground water. Cementing was by the pump and plug method. Cement was circulated outside both casings back to the surface. Except as specifically required in terms of the original permit, construction of the well and the associated facilities was done in accordance with the plans and specifications contained in the permit application. Any proposed changes to the plans and specifications must be certified in writing by the Executive Director that said changes provide equivalent or greater protection than the original design criteria and standards. Any change in well operational parameters will require a permit amendment as specified in 31 TAC Section 305.62.

VI. Character of the Waste Streams

A. Industrial waste permitted to be injected shall consist of the following waste streams; however, wastes not authorized to be stored, processed or handled in associated solid waste surface facilities are expressly not authorized.

1. Wastes generated during closure of the well and associated facilities that are compatible with permitted wastes and the reservoir.

2. Wastes associated with the production of Acetaldehyde, Vinyl Acetate, n-Butyl Alcohol, n-Propyl Alcohol, Iso-Butyl Alcohol, Heptanoic Acid, Nonanoic Acid, Hydrogen Synthesis Gas, C_7 and C_9 Aldehydes, Propionic Acid, and Fatty Alcohols.

3. Contaminated rainfall runoff, slab wash water, contaminated products, contaminated raw materials, tank car heels, and spillage, and wash water from tank car-tank truck cleaning and loading areas.

1 9 6 3 0 1 3 0 0 2 0

4. Wastes normally injected into WDW-110, when it is out of service for workover, provided that the pH is adjusted to be no less than 5.0.

B. The pH of injected waste streams shall not be less than 5.0.

C. Except as authorized by the Executive Director for purposes of performing a workover or shutting in the well, the density of injected fluids shall not exceed a specific gravity of 1.10.

VII. Injection Rates and Volumes

A. The combined maximum instantaneous rate of injection into this well, WDW-14 and WDW-49 shall not exceed 750 gallons per minute.

B. The cumulative volume of wastewater injected into this well, WDW-14 and WDW-49 shall not exceed 33,480,000 gallons per month. (Based on 750 gals/min. and a 31 day month)

C. The cumulative volume of wastewater injected into this well, WDW-14 and WDW-49 shall not exceed 394,200,000 gallons per year. (Based on 750 gals/min. and 365 days)

VIII. Operating Parameters

A. The operating surface injection pressure shall not exceed 900 psig.

B. The tubing-long string casing annulus shall be filled with a corrosion inhibiting fluid. A positive pressure with a differential from injection pressure of at least 100 psi shall be maintained on the annulus to detect well malfunctions. Instrumentation shall be installed to detect well malfunctions by both annulus pressure changes and annulus volume changes.

C. Pressure gauges shall be installed and maintained in proper operating conditions at all times on the injection tubing and tubing-long string casing annulus at the wellhead.

D. Continuous recording devices shall be installed and maintained in proper operating conditions at all times to record injection tubing pressure, injection flow rate, injection volumes and tubing-long string casing annulus pressure. The instruments shall be housed in weatherproof enclosures.

1963013002

1 9 6 3 0 1 3 0 0 2 2

E. The pH and density of the injected waste shall be monitored continuously or on a batch basis or by grab sample once every 8 hours. Annulus volumes shall be monitored a minimum once each work shift.

F. Mechanical integrity was demonstrated on December 1, 1983 and shall be demonstrated thereafter once every five years for the life of the well.

IX. Reporting Requirements

A. The permittee shall submit to the Commission within twenty (20) days after the last day of March, June, September and December of each year a Report of Injection Operation on forms supplied by the Commission.

B. The permittee shall submit to the Commission annually, with the December operating report, an acceptable report of the pressure effects of the well upon its injection zone, including a direct measurement of bottom-hole pressure, or a calculation of bottom-hole pressure using the specific gravity of fluid in the wellbore and the static fluid level. To the extent such information is reasonably available, the report shall also include:

1. Locations of newly constructed and discovered wells within the Area of Review if such wells were not included in the Technical Report accompanying the permit application or in later reports.

2. A tabulation of data for all newly constructed and discovered wells within 1/2 mile of the injection well and for all such wells within the Area of Review that penetrate to within 300 feet of the top of the injection zone as required by 31 TAC Section 331.65(b) (2) (B).

3. Annual injection fluid analysis.

C. The permittee shall notify the Austin Office of the Commission within twenty-four (24) hours of any change in monitoring parameters or of any other observations which could reasonably be attributed to a leak or other failure in well equipment.

D. The permittee shall submit to the Commission within forty-five (45) days after completion of the following tests a report including both data and interpretation of the results of:

1 9 6 3 0 1 3 0 0 2 5

1. Periodic tests of mechanical integrity; and

2. Any other test of the injection well or injection zone if required by the Executive Director.

X. Well Workovers

A. The permittee shall notify the Austin Office of the Commission of any workover or corrective maintenance operation:

1. For major workovers or corrective maintenance operations which involve removal of injection tubing the permittee shall obtain approval of the Executive Director prior to beginning work. Notification shall be in writing and shall include plans for the proposed work. The Executive Director may grant an exception to prior written notification when immediate action is required.

2. For other workovers or corrective maintenance operations the permittee shall notify the Austin Office of the Commission and obtain approval before beginning work.

B. Within sixty (60) days after completion of any workover, a completion report shall be submitted to the Commission including the reason for the well workover and details of the work performed.

C. During major workovers, the bottom-hole pressure shall be determined either by direct measurement using conventional techniques or by calculation using specific gravity of fluid in the wellbore and the static fluid level.

D. All phases of any workover shall be supervised by a person knowledgeable and experienced in practical well engineering, who is familiar with the special conditions and requirements of injection well construction and operation.

E. Mechanical integrity shall be demonstrated following major workovers or corrective maintenance operations which involve removal of injection tubing or perforating.

XI. Plugging

A. Upon final abandonment the well shall be plugged in accordance with plans and specifications contained in the

1 9 6 3 0 1 3 0 0 2 4

application after mechanical integrity of the well is verified by a program approved by the Executive Director. Any proposed changes to plans and specifications must be certified in writing by the Executive Director that said changes provide protection equivalent to or greater than the original design criteria and standards.

B. The permittee shall notify the Austin Office of the Commission in writing thirty (30) days prior to commencing plugging operations. Within thirty (30) days of completion of plugging operations the permittee shall submit to the Austin Office of the Commission a plugging report on forms provided by the Commission.

C. The permittee shall secure and maintain in full force and effect at all times a performance bond or other form of financial security, in accordance with 31 TAC Section 305.153 (relating to Financial Responsibility), to provide for proper plugging and abandonment of the permitted waste disposal well. The bond or other form of financial security shall be in the amount of $82,000.00. The amount of financial security may, at the discretion of the Texas Water Commission, be altered at a future date to provide for adequate plugging subject to prevailing general economic conditions, as provided by 31 TAC Section 305.62 (pertaining to the amendment of permits). The injection of fluids is not authorized until the permittee secures the performance bond or other form of financial security as described above.

1963013002 5

XII. Monitoring and Record-Keeping

A. The permittee shall keep complete and accurate records of:

1. All monitoring required in the permit, including:

   a. Continuous records of surface injection pressures,
   b. Continuous records of the tubing-long string annulus pressures,
   c. Continuous records of injection flow rates,
   d. Monthly total volume of injected fluids,
   e. Annulus volume,
   f. Injection fluid pH,
   g. Injection fluid density,

2. All periodic well tests, including but not limited to:

a. Injection fluid analysis,
b. Bottom-hole pressure readings,
c. Mechanical integrity.

3. All shut-in periods and times that emergency measures were used for handling waste; and

4. Any additional information on conditions that might reasonably affect the operation of the injection well.

B. All records shall be made available for review upon request from a representative of the Commission.

C. The permittee shall retain, for a period of five (5) years following abandonment, records of all information resulting from any monitoring activities or records required by this permit.

XIV. Other Requirements

A. A sign shall be posted at the well site which shall show the name of the company, company well number and permit number. The sign and identification shall be in the English language, clearly legible and shall be in numbers and letters at least one (1) inch high.

B. An all-weather road shall be installed and maintained to allow access to the disposal well and related facilities.

C. The wellhead and associated facilities shall be painted, where appropriate, and maintained in good working order without leaks.

D. The following rules are incorporated in this permit by reference:

Permit Characteristics and Conditions,
31 TAC Subchapter F, Sections 305.121-128
Additional Conditions for Injection Well Permits,
31 TAC Subchapter H, Sections 305.151-160

E. No discharge of wastes, other than those waste streams specified in Paragraph VI of this permit injected into Miocene sands in the subsurface between approximately 3300 and 3700 feet is authorized by this permit from this facility into water in the State.

F. Within thirty (30) days after permit approval, the permittee shall provide written notice to the Executive

1963013002

Director that a copy of the permit has been filed with the health and pollution control authorities of the county, city or town where the well is located.

G. All solid waste managed at the facility shall be managed in accordance with 31 TAC Chapter 335, Rules for Industrial Solid Waste and Municipal Hazardous Waste.

H. The permittee is subject to the provisions of 31 TAC 305.125.

1963013002 7

49

TEXAS WATER COMMISSION

UIC

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 49 Inspection Date(s) March 31, April 15, 93

TWC Inspector(s) Nadia Hameed (Print) District 07

Permittee Name Hoechst Celanese Company Well # 4

Inspection Type: (Regular) Follow up
Facility Type: Commercial (Non-commercial)

Company Reps/Guides	Title	Phone
Kaynartha Williams	Environmental Engineer	409-241-4123

Section 1 PRE-INJECTION FACILITIES

1. Are facilities managing hazardous wastes? Interim Status tanks waiting for an exemption on totally enclosed treatment system. Yes (No) NA
2. Facilities covered under RCRA Permit? Yes (No) NA
3. Are facilities exempted from permitting requirements? Yes (No) NA
4. Description of preinjection facilities Preinjection facilities consist of: Storage vessel V-680, two neutralization vessels 1216 and 1217, Primary Filters V-1061 V-1062 V-1059 and V-1060, Polishing Filters V-162, V-163, V-656, V-657, V-758 and V-757 and surge vessel 159
5. Evidence of leaks or spills? (If yes, note in comments) Yes (No) NA
6. In the permit for this facility, are the 31 TAC Chapter 331 rules incorporated by reference? (Yes) No

Note to the inspector: If the answer to the above question is "No", then only the provisions specifically stated in the permit are required to be met. In these cases any reference for a potential violation must cite the permit provision, not the rules.

Section 2 UIC FACILITIES

	COMPLIANT?
1. Is a legible sign with company name, company well number and TWC permit number posted at the well site? *TAC 331.66(a)(1)*	(Yes) No NA
2. Is an all weather road to the well installed and maintained? *TAC 331.66(a)(2)*	(Yes) No NA
3. Is wellhead painted (if appropriate), maintained in good working order, without leaks? *TAC 331.66(a)(3)*	(Yes) No NA
4. Whenever the well is operating, are trained staff on location and able to operate the well and respond to alarms? *TAC 331.64(c)(2)*	(Yes) No NA

Note: All noncompliances must include comments.

(Revised 10/1/91)

ADDENDUM I

TEXAS WATER COMMISSION

Paul Hopkins, Chairman
Ralph Roming, Commissioner
John O. Houchins, Commissioner

Larry R. Soward, Executive Director
Mary Ann Hefner, Chief Clerk
James K. Rourke, Jr., General Counsel

January 20, 1987

Celanese Chemical Company
P.O. Box 509
Bay City, Texas 77414

RE: Amendment to Permit No. WDW-49

Dear Sirs:

Enclosed is a copy of the referenced permit issued pursuant to your application and Chapter 26 of the Texas Water Code. The permit constitutes an official document which should be kept in your permanent records.

Please continue using the self-reporting forms you have on hand until new forms are forwarded by the Water Quality Division.

Should you have any questions, please contact us.

Very truly yours,

TEXAS WATER COMMISSION

By Mary Ann Hefner
Mary Ann Hefner
Chief Clerk

MAH:lm
Enclosures
cc w/enclosure:
TWC District No. 12
Plant Manager, Celanese Chemical Company

1 9 6 3 0 2 0 0 0 0 5

PERMIT NO. WDW-49

This permit supersedes and replaces TWC Permit No. WDW-49 issued April 8, 1969 and amended September 15, 1972.

TEXAS WATER COMMISSION
Stephen F. Austin State Office Building
Austin, Texas

PERMIT to conduct underground injection under provisions of Chapter 26 & 27, Texas Water Code (for hazardous waste disposal wells) and Article 4477-7, Texas Solid Waste Disposal Act

I. Name of Permittee:

A. Name Celanese Chemical Company

B. Address P. O. Box 509
Bay City, Texas 77414

II. Type of Permit: Regular _____ Amended ___X___

III. Nature of Business: Petro-chemical Plant

IV. General Description and Location of Injection Activity

The injection well will be used to dispose of industrial waste from the Bay City Plant. The well is located 3489 feet north and 2442 feet east of the southwest corner of the company property which is located on the James Moore League,

CONTINUED on Pages 2 through 8.

The permittee is authorized to conduct injection activity in accordance with limitations, requirements, and other conditions set forth herein. This permit is granted subject to the rules and orders of the Commission, and the laws of the State of Texas. This permit is valid for a period of 10 years or until amended or revoked by the Commission.

APPROVED, ISSUED AND EFFECTIVE this 13th day of January, 19 87.

ATTEST: Mary Ann Hefner

Paul Hopkins
For the Commission

TDWR-0076C

Abstract No. 62, Matagorda County, Texas, approximately 10 miles southwest of Bay City, Texas; 28°21'24" North latitude, 96°00'59" West longitude. Injection will be into the Miocene sands in the approximate subsurface interval between 3300 and 3700 feet.

V. Construction Requirements

A permit for the drilling and operation of this disposal well was issued on April 8, 1969. The permittee set and cemented surface casing to a subsurface depth of 1389 feet, and long-string casing from the surface into the injection zone to 3162 feet to properly protect usable quality ground water. Cementing was by the pump and plug method. Cement was circulated outside both casings back to the surface. Except as specifically required in terms of the original permit, construction of the well and the associated facilities was done in accordance with the plans and specifications contained in the permit application. Any proposed changes to the plans and specifications must be certified in writing by the Executive Director that said changes provide equivalent or greater protection than the original design criteria and standards. Any change in well operational parameters will require a permit amendment as specified in 31 TAC Section 305.62.

VI. Character of the Waste Streams

A. Industrial waste permitted to be injected shall consist of the following waste streams; however, wastes not authorized to be stored, processed or handled in associated solid waste surface facilities are expressly not authorized.

1. Wastes generated during closure of the well and associated facilities that are compatible with permitted wastes and the reservoir.

2. Wastes associated with the production of Acetaldehyde, Vinyl Acetate, n-Butyl Alcohol, n-Propyl Alcohol, Iso-Butyl Alcohol, Heptanoic Acid, Nonanoic Acid, Hydrogen Synthesis Gas, C_7 and C_9 Aldehydes, Propionic Acid, and Fatty Alcohols.

3. Contaminated rainfall runoff, slab wash water, contaminated products, contaminated raw materials, tank car heels, and spillage and wash water from tank car-tank truck cleaning and loading areas.

1 9 4 3 0 2 0 0 0 0 7

E. The pH and density of the injected waste shall be monitored continuously or on a batch basis or by grab sample once every 8 hours. Annulus volumes shall be monitored a minimum once each work shift.

F. Mechanical integrity was demonstrated on November 30, 1983 and shall be demonstrated thereafter once every five years for the life of the well.

IX. Reporting Requirements

A. The permittee shall submit to the Commission within twenty (20) days after the last day of March, June, September and December of each year a Report of Injection Operation on forms supplied by the Commission.

B. The permittee shall submit to the Commission annually, with the December operating report, an acceptable report of the pressure effects of the well upon its injection zone, including a direct measurement of bottom-hole pressure, or a calculation of bottom-hole pressure using the specific gravity of fluid in the wellbore and the static fluid level. To the extent such information is reasonably available, the report shall also include:

1. Locations of newly constructed and discovered wells within the Area of Review if such wells were not included in the Technical Report accompanying the permit application or in later reports.

2. A tabulation of data for all newly constructed and discovered wells within 1/2 mile of the injection well and for all such wells within the Area of Review that penetrate to within 300 feet of the top of the injection zone as required by 31 TAC Section 331.65(b) (2) (B).

3. Annual injection fluid analysis.

C. The permittee shall notify the Austin Office of the Commission within twenty-four (24) hours of any change in monitoring parameters or of any other observations which could reasonably be attributed to a leak or other failure in well equipment.

D. The permittee shall submit to the Commission within forty-five (45) days after completion of the following tests a report including both data and interpretation of the results of:

1. Periodic tests of mechanical integrity; and

2. Any other test of the injection well or injection zone if required by the Executive Director.

X. Well Workovers

A. The permittee shall notify the Austin Office of the Commission of any workover or corrective maintenance operation:

1. For major workovers or corrective maintenance operations which involve removal of injection tubing the permittee shall obtain approval of the Executive Director prior to beginning work. Notification shall be in writing and shall include plans for the proposed work. The Executive Director may grant an exception to prior written notification when immediate action is required.

2. For other workovers or corrective maintenance operations the permittee shall notify the Austin Office of the Commission and obtain approval before beginning work.

B. Within sixty (60) days after completion of any workover, a completion report shall be submitted to the Commission including the reason for the well workover and details of the work performed.

C. During major workovers, the bottom-hole pressure shall be determined either by direct measurement using conventional techniques or by calculation using specific gravity of fluid in the wellbore and the static fluid level.

D. All phases of any workover shall be supervised by a person knowledgeable and experienced in practical well engineering, who is familiar with the special conditions and requirements of injection well construction and operation.

E. Mechanical integrity shall be demonstrated following major workovers or corrective maintenance operations which involve removal of injection tubing or perforating.

XI. Plugging

A. Upon final abandonment the well shall be plugged in accordance with plans and specifications contained in the

1 9 5 3 0 0 0 0 0 9

application after mechanical integrity of the well is verified by a program approved by the Executive Director. Any proposed changes to plans and specifications must be certified in writing by the Executive Director that said changes provide protection equivalent to or greater than the original design criteria and standards.

B. The permittee shall notify the Austin Office of the Commission in writing thirty (30) days prior to commencing plugging operations. Within thirty (30) days of completion of plugging operations the permittee shall submit to the Austin Office of the Commission a plugging report on forms provided by the Commission.

C. The permittee shall secure and maintain in full force and effect at all times a performance bond or other form of financial security, in accordance with 31 TAC Section 305.153 (relating to Financial Responsibility), to provide for proper plugging and abandonment of the permitted waste disposal well. The bond or other form of financial security shall be in the amount of $79.000.00. The amount of financial security may, at the discretion of the Texas Water Commission, be altered at a future date to provide for adequate plugging subject to prevailing general economic conditions, as provided by 31 TAC Section 305.62 (pertaining to the amendment of permits). The injection of fluids is not authorized until the permittee secures the performance bond or other form of financial security as described above.

XII. Monitoring and Record Keeping

A. The permittee shall keep complete and accurate records of:

1. All monitoring required in the permit, including:

a. Continuous records of surface injection pressures,
b. Continuous records of the tubing-long string annulus pressures,
c. Continuous records of injection flow rates,
d. Monthly total volume of injected fluids,
e. Annulus volume,
f. Injection fluid pH,
g. Injection fluid density,

2. All periodic well tests, including but not limited to:

1 9 6 3 0 2 0 0 0 1 0

a. Injection fluid analysis,
b. Bottom-hole pressure readings,
c. Mechanical integrity.

3. All shut-in periods and times that emergency measures were used for handling waste; and

4. Any additional information on conditions that might reasonably affect the operation of the injection well.

B. All records shall be made available for review upon request from a representative of the Commission.

C. The permittee shall retain, for a period of five (5) years following abandonment, records of all information resulting from any monitoring activities or records required by this permit.

XIV. Other Requirements

A. A sign shall be posted at the well site which shall show the name of the company, company well number and permit number. The sign and identification shall be in the English language, clearly legible and shall be in numbers and letters at least one (1) inch high.

B. An all-weather road shall be installed and maintained to allow access to the disposal well and related facilities.

C. The wellhead and associated facilities shall be painted, where appropriate, and maintained in good working order without leaks.

D. The following rules are incorporated in this permit by reference:

Permit Characteristics and Conditions,
31 TAC Subchapter F, Sections 305.121-128
Additional Conditions for Injection Well Permits,
31 TAC Subchapter H, Sections 305.151-160

E. No discharge of wastes, other than those waste streams specified in Paragraph VI of this permit injected into Miocene Sands in the subsurface between approximately 3300 and 3700 feet is authorized by this permit from this facility into water in the State.

1 9 6 3 0 2 0 0 0 1 1

F. Within thirty (30) days after permit approval, the permittee shall provide written notice to the Executive Director that a copy of the permit has been filed with the health and pollution control authorities of the county, city or town where the well is located.

G. All solid waste managed at the facility shall be managed in accordance with 31 TAC Chapter 335, Rules for Industrial Solid Waste and Municipal Hazardous Waste.

H. The permittee is subject to the provisions of 31 TAC 305.125.

1 9 6 3 0 2 0 0 0 1 2

Compliance Summary
WDW-14, 32, 49, and 110

Celanese Chemical Co., Inc. has operated waste disposal wells at their Bay City facility since 1964. Their present wells were issued permits on September 28, 1964 for WDW-14, July 3, 1967 for WDW-32, April 8, 1969 for WDW-49 and March 27, 1973 for WDW-110. Annual inspections and self reporting through the years have generally revealed a compliant operation with only an occasional problem with instrument calibration, chart inking, or inadequate annulus pressure. One serious mechanical integrity problem which developed with WDW-110 in 1984 resulted in a compliance agreement with Celanese so that the problem could be resolved as expeditiously as possible. The terms of the agreement were achieved in a timely manner. Celanese is viewed overall to have a compliant, conscientious operation.

Joseph L. Peters 8/20/86

Joseph L. Peters, Hydrologist
Ground Water Conservation Section

1 9 5 3 0 2 0 0 3

TEXAS WATER COMMISSION Page 1 of 1

DISPOSAL WELL INSPECTION CHECKLIST

Permit # WDW 32, 49, + 110 Inspection Date(s) March 31, April 15,

Section 6 EPA NO-MIGRATION PETITION APPROVAL CONDITIONS

1. Is the operator disposing of more waste volume than is allowed in the petition conditions ? **YES** (NO)

   Petition Value 26,784,000 gal

   Observed Value 7,231,700 gal Time Period August

2. Is the operator's waste stream complying with the specific gravity or density conditions of the petition ? (YES) **NO**

   Petition Value or Range 1.00 to 1.10

   Observed Value or Range 1.0045 Date(s) April 15, 93

3. Is the operator disposing of any hazardous waste that has a waste code that is not included in the petition condition list of approved waste codes ? **YES** (NO)

   List wastes being disposed that aren't on the approved list:

Comments:

Note: If the answer to any of the above questions is the **bolded** answer, this means that the operator may be out of compliance with the EPA approved no-migration petition and the EPA needs to be notified of this situation as soon as possible.

1 9 6 3 0 2 0 0 0 1 4

John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

May 14, 1993

Ms. Kaymartha Williams
Environmental Engineer
Hoechst Celanese Chemical Group
P.O. Box 509
Bay City, TX 77404

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: Hoechst Celanese, S. W. Registration No. 30134
WDW-14, WDW-32, WDW-49, WDW-110
EPA ID No. TXD026040709
Underground Injection Control Violations

Dear Ms. Williams:

On March 31 and April 15, 1993, a representative of the Texas Water Commission (TWC) District 7 office conducted an inspection of the above referenced facility. The inspection was conducted to determine the facility's compliance with the commission's rules pertaining to Underground Injection Control (UIC). During the inspection, conditions were observed and documented that we believe constitute a violation of the UIC rules. The following area of alleged violation was observed.

Permit Provision VIII.E. - Operating Parameters

The pH and density of the injected waste shall be monitored continuously or on a batch basis or by grab sample once every 8 hours. Annulus volumes shall be monitored a minimum once each work shift.

- It was noted in the inspection that the facility was measuring the fluid density once every 12 hours (i.e once per shift) for the wells above.

Concerning this alleged violation, we request your response in writing with a schedule for corrective action by June 14, 1993. We also request that you advise us of any corrective action which you have already taken.

An on-site inspection or review of records will be conducted at the appropriate time to verify compliance. Failure to respond within the requested time frame and to adequately remedy UIC violations may result in the initiation of formal enforcement action which could lead

to administrative penalties of up to $10,000 per day assessed against the company by the Texas Water Commission.

A copy of the 31 TAC Chapter 331 regulations can be obtained for a fee from Agency Information Consultants, Inc., P. O. Box 2181, Austin, Texas 78768, telephone number 512/478-8991 or from Research and Planning Consultants, 3200 Red River St., Suite 302, Austin, TX 78705, telephone number 512/327-0009. The Code of Federal Regulations (40 CFR Parts 260-299) is available from the U. S. Government Printing Office, Texas Crude Building, 801 Travis Street, Houston, TX 77002, telephone number 713/228-1187 or from the U.S. Government Printing Office, Room 1C-50, Federal Building, 1100 Commerce Street, Dallas, TX 75242, telephone number 214/767-0076.

If you have any questions regarding these matters, please contact Ms. Nadia Hameed of the District 7 Office at telephone number 713/457-5191.

Sincerely,

for Billie Zapata

Susan D. Bredehoeft
Program Manager
Industrial & Hazardous Waste Program
District 7 - Houston

SDB/NH/tl

1 9 5 3 0 0 0 1 5

John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

May 14, 1993

Ms. Kaymartha Williams
Environmental Engineer
Hoechst Celanese Chemical Group
P.O. Box 509
Bay City, TX 77404

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: Hoechst Celanese, S. W. Registration No. 30134
WDW-14, WDW-32, WDW-49, WDW-110
EPA ID No. TXD026040709
Underground Injection Control Violations

Dear Ms. Williams:

On March 31 and April 15, 1993, a representative of the Texas Water Commission (TWC) District 7 office conducted an inspection of the above referenced facility. The inspection was conducted to determine the facility's compliance with the commission's rules pertaining to Underground Injection Control (UIC). During the inspection, conditions were observed and documented that we believe constitute a violation of the UIC rules. The following area of alleged violation was observed.

Permit Provision VIII.E. - Operating Parameters

The pH and density of the injected waste shall be monitored continuously or on a batch basis or by grab sample once every 8 hours. Annulus volumes shall be monitored a minimum once each work shift.

- It was noted in the inspection that the facility was measuring the fluid density once every 12 hours (i.e once per shift) for the wells above.

Concerning this alleged violation, we request your response in writing with a schedule for corrective action by June 14, 1993. We also request that you advise us of any corrective action which you have already taken.

An on-site inspection or review of records will be conducted at the appropriate time to verify compliance. Failure to respond within the requested time frame and to adequately remedy UIC violations may result in the initiation of formal enforcement action which could lead

REPLY TO: DISTRICT 7 / 5144 E. SAM HOUSTON PARKWAY N. / HOUSTON, TEXAS 77015 / AREA CODE 713/457-5191

P.O. Box 13087 • 1700 North Congress Avenue • Austin, Texas 78711-3087 • 512/463-7830

to administrative penalties of up to $10,000 per day assessed against the company by the Texas Water Commission.

A copy of the 31 TAC Chapter 331 regulations can be obtained for a fee from Agency Information Consultants, Inc., P. O. Box 2181, Austin, Texas 78768, telephone number 512/478-8991 or from Research and Planning Consultants, 3200 Red River St., Suite 302, Austin, TX 78705, telephone number 512/327-0009. The Code of Federal Regulations (40 CFR Parts 260-299) is available from the U. S. Government Printing Office, Texas Crude Building, 801 Travis Street, Houston, TX 77002, telephone number 713/228-1187 or from the U.S. Government Printing Office, Room 1C-50, Federal Building, 1100 Commerce Street, Dallas, TX 75242, telephone number 214/767-0076.

If you have any questions regarding these matters, please contact Ms. Nadia Hameed of the District 7 Office at telephone number 713/457-5191.

Sincerely,

for Billie Zaporteza
Susan D. Bredehoeft
Program Manager
Industrial & Hazardous Waste Program
District 7 - Houston

SDB/NH/tl

19530001

Texas Water Commission

INTEROFFICE MEMORANDUM

To: FILE

Date: May 14, 1993

Thru: Ben Wesley, UIC Coordinator, Program Services Unit
Field Operations Division

From: Nadia Hameed, Field Investigator
District 7 - Houston

Subject: Hoechst Celanese - Permit No. WDW-32, WDW-49 and WDW-110
TWC Registration No. 30134
Underground Injection Control Inspection
Conducted March 31 and April 15, 1993

1 9 6 3 0 2 0 0 0 1 7

I. INTRODUCTION

On March 31 and April 15, 1992, Nadia Hameed of the Texas Water Commission (TWC) District 7 office conducted an Underground Injection Control (UIC) inspection at the above referenced facility. Participating in the inspection on behalf of Hoechst Celanese was Kaymartha Williams.

II. WASTES GENERATED

The facility has three injection wells (WDW-110, WDW-32, WDW-49) for the disposal of non-hazardous wastewaters. The waste being deep well injected in these wells consists mainly of non-hazardous wastewaters including tank car wash effluent. The wastewaters and other non-hazardous waste is routed through the oil/water separators to a non-hazardous storage tank #680. From tank #680 the waste is sent to two neutralization vessels 1216 and 1217 to be pH adjusted.

III. WASTE MANAGEMENT FACILITIES

Once the pH has been adjusted the waste is put through primary filters V-1061, V-1062, V-1059 and V-1060 and then through polishing filters V-162, V-163, V-656, V-657, V-758 and V-757. It is then sent into surge vessel V-159 prior to being sent to one of the three non-hazardous deep wells for injection.

The pH is continuously monitored by pH meters and the permit requires that the fluid density be checked at least once every 8 hours.

Workover has just been completed on WDW-110 where the Lower Miocene injection interval that was used to receive hazardous waste has just been closed. As a result WDW-110 will no longer be used for hazardous waste injection.

IV. VIOLATION

- The facility is required by the Permit Provision VIII. E. to measure the fluid density every 8 hours. It was noted in the inspection that the facility was measuring the fluid density once every 12 hours (i.e once per shift) for all of the wells above.

This information is submitted as file data.

Signed: _____
Nadia Hameed
Field Investigator

Approved: for _____
Susan D. Bredehoeft
Program Manager
Industrial and Hazardous Waste Program
District 7 - Houston

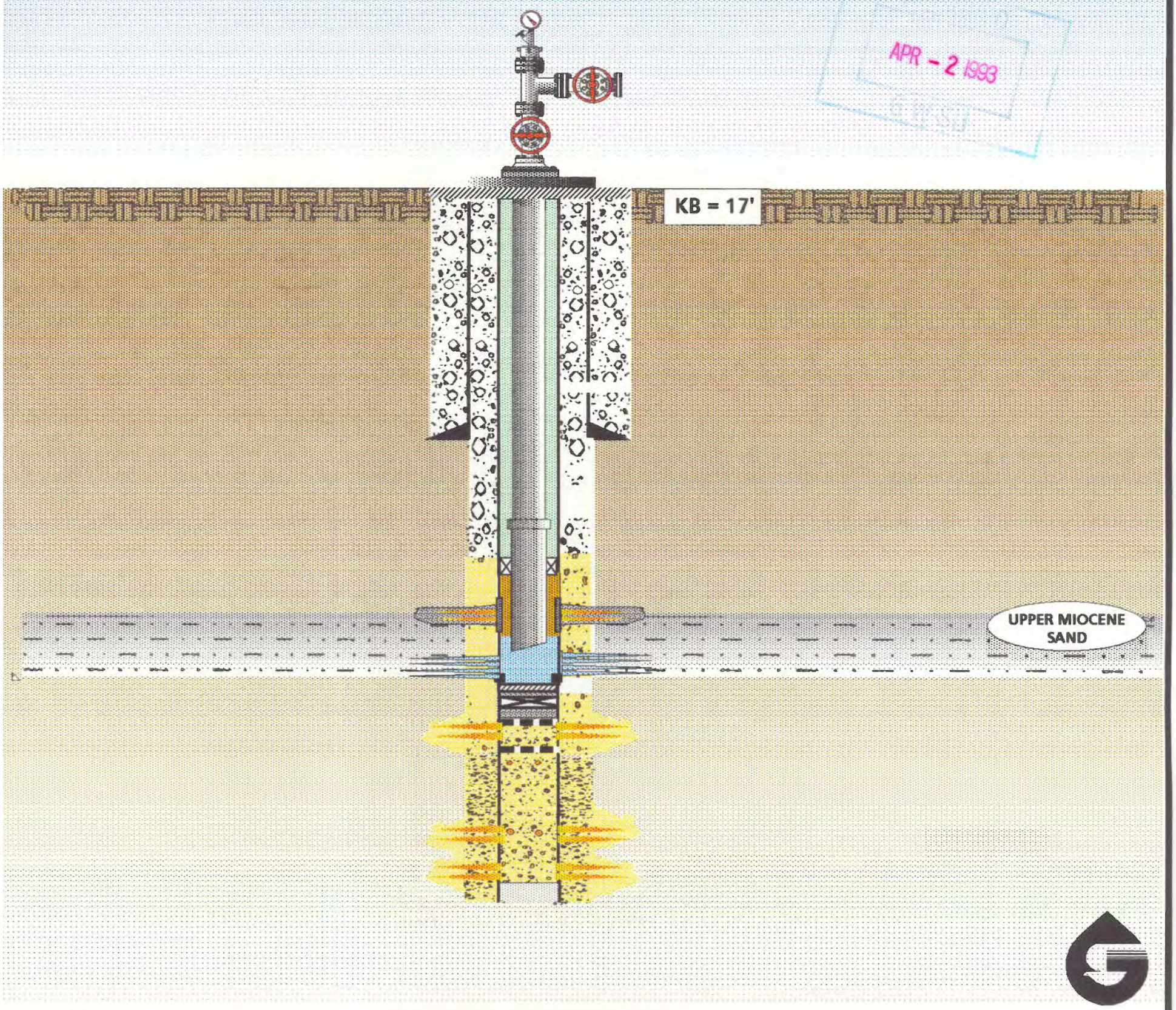
SDB/NH/tl

1963020018

HOECHST CELANESE CHEMICAL GROUP, INC.

Recomplete WDW - 110 (Well No. 1-A) in the Upper Miocene

APR - 2 1993



HOECHST CELANESE CHEMICAL GROUP

BAY CITY PLANT, MATAGORDA COUNTY, TEXAS

RECOMPLETE WDW-110 (WELL #1-A) IN THE UPPER MIOCENE

Prepared by:

Bob Hall
Dawn Bilbrey

Golden Environmental Services, Inc.
711 Louisiana, Suite 1600
Houston, Texas 77001
(713)228-7000

RECEIVED
APR - 2 1993

March 30, 1993

File: B:\03301392.110

TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND 1

1.1 INTRODUCTION 1
1.2 BACKGROUND 1

2.0 SUMMARY OF KEY TASKS PERFORMED 5

3.0 WEEKLY OPERATIONS SUMMARY 8

4.0 MECHANICAL INTEGRITY TESTING 12

4.1 ANNULUS PRESSURE TEST 12
4.2 DIFFERENTIAL TEMPERATURE LOG 12
4.3 RADIOACTIVE TRACER SURVEY 13
4.4 CONCLUSIONS 13

5.0 BOTTOM HOLE PRESSURE FALL-OFF TEST 14

Table 5.1 Analysis of Pressure Fall-off Data 15
Table 5.2 Injection Rates Prior to Shut-in 15

6.0 COMPARISON OF UPPER MIOCENE INJECTION INTERVAL WELL TEST DATA WITH PETITION DATA 16

Table 6.1 Formation Pressures 16
Table 6.2 Static Formation Pressures From Well Tests 17
Table 6.3 Permeability and Transmissivity 18

APR - 2

APPENDICES

APPENDIX A ANNULUS PRESSURE DATA

APPENDIX B TEMPERATURE/GAMMA-RAY NEUTRON LOG AND WESTERN ATLAS' LOG INTERPRETATION

APPENDIX C RADIOACTIVE TRACER SURVEY FOR MIT AND WESTERN ATLAS' LOG INTERPRETATION

APPENDIX D	EXPANDED WELLBORE SCHEMATICS
APPENDIX E	BOTTOM HOLE PRESSURE DATA
APPENDIX F	DAILY OPERATIONS REPORTS
APPENDIX G	TIW PACKER INFORMATION
APPENDIX H	INJECTION TUBING TALLY AND WEATHERFORD TORQUE TURN DATA
APPENDIX I	HOMCO CASING PATCH DATA
APPENDIX J	WESTERN ATLAS PERFORATING CHARGE PERFORMANCE
APPENDIX K	DIAGNOSTIC RADIOACTIVE TRACER SURVEY AND WESTERN ATLAS' LOG INTERPRETATION
APPENDIX L	SPINNER SURVEY AND WESTERN ATLAS' LOG INTERPRETATION
APPENDIX M	WELLHEAD SCHEMATIC
APPENDIX N	HALLIBURTON CORROSION INHIBITOR DATA
APPENDIX O	REGULATORY NOTIFICATION

APR - 2

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This document details the recompletion operations performed on Hoechst Celanese Chemical Group Inc., (HCCG) Bay City Plant Class I waste disposal well (WDW-110). This report is developed and submitted to meet the reporting requirements of the Texas Water Commission (TWC) as set forth in the Underground Injection Control Permit granted to HCCG.

1.2 BACKGROUND

In October, 1992 HCCG contracted Golden Environmental Services, Inc. (GES) to re-complete WDW-110 in the upper Miocene sands. WDW-110 is permitted in two separate injection intervals-

* The lower Miocene sand with the permitted injection interval extending 5,700' - 5,950'.

* The upper Miocene sand with the permitted injection interval extending from 3,350' - 3,600'.

Previously, WDW-110 had been completed in the lower Miocene sands. The lower Miocene completion ceased to take flow and was subsequently abandoned. The abandonment operations were completed in May, 1992 and approved by the TWC shortly thereafter. The abandonment left the lower Miocene permanently sealed off and a 799' column of acid resistant epoxy cement extending 5,517'- 4,718' inside the protection casing (see Schematic I). The TWC allowed the wellbore to remain temporarily plug and abandoned, monitored with a positive pressure at the surface, to allow HCCG time to decide the ultimate disposition of the well. Figure 1.1 and 1.2 are schematics of the upper section of the wellbore prior to and after the recompletion

Operations to recomplete WDW-110 in the upper Miocene injection zone commenced on November 22, 1992 and continued until December 11, 1992, at which point the work was suspended until January 18, 1993. Field operations to continue recompletion operations were resumed on January 18, 1993. All work was completed on February 16, 1993. A weekly summary of field operations is located in Section 3.0, the detailed daily reports are located in Appendix F.

After re-completing the well, Mechanical Integrity Testing (MIT) was performed. These tests included an annular pressure test, Radioactive Tracer Survey (RAT). Mechanical Integrity Test results and associated logs are discussed in Section 4.0.

Additionally, a bottom hole pressure fall-off test was conducted, the analysis is discussed in Section 5.0. During the bottom hole pressure falloff test a spinner survey was conducted to determine flow distribution over the perforated interval. The spinner survey and analysis may be found in Appendix L.

APR - 2 1993

2.0 SUMMARY OF KEY TASKS PERFORMED

Field procedures for the proposed upper Miocene completion were transmitted to the TWC and formally approved prior to initiating field operations. As the recompletion activities progressed, the TWC was notified as revisions to the original plan were required.

The following is a list of the key tasks that were performed and a brief discussion of same.

TASK I: *Conduct differential temperature survey for mechanical integrity.*

A differential temperature survey was run from surface to 4,719'. Maximum recorded bottom hole temperature was 135 degrees Fahrenheit.

Additionally, a gamma ray/neutron log was run for depth correlation purposes for future well operations i.e. perforating, setting the injection packer etc...

TASK II: *Install a standard cement plug from the existing plugged back total depth to approximately 3,800'.*

A cast iron bridge plug was set in good casing at 4,615'. The bridge plug was installed as a barrier to insure that the epoxy column cannot be accidently drilled, should deepening the well become and option in the future.

The well was plugged back from 4,615' back to 3,802' with 70 barrels of 16.4 ppg cement slurry.

TASK III: *Perforate the protection casing and perform isolation squeeze at approximately 3,358' - 3,360'.*

The protection casing was perforated from 3,358' - 3,360'. The well was initially squeezed through a test packer with 21 barrels of 15.6 pound per gallon Class H. Maximum pressure achieved during the squeeze was 1,350 psig. The cement squeeze was drilled out and

pressure test to 1,000 psig. The pressure decreased to 50 psig in one (1) hours.

The squeeze perforations were re-squeezed using the balanced plug method. Halliburton spotted a "micro-matrix" cement plug from 3,194'-3,392'. Pressure was applied to the cement column and the cement allowed to cure. The squeeze was drilled out and successfully pressure tested to 1,000 psig.

TASK IV: *Perforate the upper Miocene sand for injection, obtain native bottom hole pressure and conduct diagnostic Radioactive Tracer Survey.*

The upper Miocene injection zone was perforated from 3376' - 3426', 3460'- 3,471', 3494'- 3524' and from 3543'- 3572'. All intervals were perforated with a 5" hollow carrier casing gun phased at 135/45 degrees.

A native bottom hole was obtained immediately after perforating. The measured pressure at 3,440' was 1,593 psia.

A diagnostic radioactive tracer survey was performed prior to the installation of a casing patch. All injected fluids were entering the permitted interval (see Appendix K).

TASK V: *Installation of a 20' Homo casing patch over the squeeze perforations at 3358'- 3360'.*

A 20' Homco casing patch was recommended to HCCG to provide a "belt and suspenders" pressure seal across the squeeze perforations. A 20' casing patch was oriented by gamma-ray and successfully installed at 3350'- 3370'.

TASK VI: *Installation of a new stainless steel injection packer, new 5+1/2" carbon steel injection string and wellhead.*

A new 9-5/8" x 7" 316 stainless steel TIW "LH" packer with "JGS" hold down slips and 6+5/8" 316 stainless tailpipe was installed. The assembly was oriented by gamma ray and set with the base of the packer set at 3330' and the base of the tailpipe at 3380' (see Appendix

G). A diesel blanket was placed behind the tailpipe prior to setting the packer.

A new 5-1/2" 20 pound/foot, N-80 grade, LT&C injection string was installed. A total of 77 joints plus four (4) pup joints comprise the injection string.

The annulus was displaced with 150 barrels of brine. containing oxygen scavengers, biocides and corrosion inhibitor (Halliburton Annhib).

TASK VII: *Conduct annulus pressure test and Radioactive Tracer Survey for mechanical integrity.*

A successful annulus pressure test and radioactive tracer survey were conducted on January 28, 1993. Both tests were witnessed and approved by Mr. Richard Merritt of the Texas Water Commission (see Section 4.0).

TASK VIII: *Perform acid stimulation and clay stabilization treatment.*

WDW-110 was successfully acidized with 13700 gallons of 15% FE acid, clay stabilizers and "clay fix".

TASK IX: *Conduct a bottom hole pressure fall-off test.*

A bottom hole pressure fall-off test was conducted. Western Atlas provided a tandem set of tools, combining a spinner survey with a surface readout bottom hole pressure gauge for the test. The spinner survey indicated the majority of the well flow going into upper set of perforations (see Appendix L). The bottom hole pressure fall-off test is analyzed in Section 5.0.

3.0 WEEKLY OPERATIONS SUMMARY

The following operations summary is a condensed version of the daily field reports. The daily field reports may be found in Appendix F for additional details.

November 24, 1992 through November 29, 1992

Field operations began on Monday, November 23, 1992 with a safety orientation for all contractors. All equipment was moved in and rigged up. The protection casing monitoring equipment was taken out of service on Tuesday, November 24, 1993. Western Atlas was rigged up and the following logs were run: Absolute/Differential Temperature, Collar Locator, and a Compensated Neutron Gamma-ray depth correlation (see Appendix B).

A casing scraper was run in the hole and pulled out. A Halliburton EZ-SV cement retainer/bridge plug was run in the hole and set at approximately 4,615'. Halliburton then set a cement plug from 4,615' back to 3,600' with 70 bbls of 16.4 ppg cement slurry. The well was then closed in for 4 (four) days over the Thanksgiving weekend.

November 30, 1992 through December 6, 1992

When operations resumed, the casing was tested at 900 psig for 75 minutes. The cement was tagged at 3,756' and drilled out to 3,802'.

A correlation log was run and the protection casing perforated for squeeze cementing purposes from 3,358' to 3,360'. A Halliburton RTTS squeeze packer was set at 3,232'. Halliburton squeezed with 21 barrels (100 sacks) of 15.6 ppg Class "H" cement down the workstring. Maximum squeeze pressure indicated on workstring was 1,200 psig.

The RTTS packer was removed and a milled tooth bit was run in the hole to the top of the cement column at 3,397'. The cement was drilled out to 3,367' (base of cement). The bit was lowered and bottom confirmed at 3,802'.

The cement squeeze was tested to 500 psig, with pressure decreasing at a rate of 1 to 1.5 psi per minute. The pressure was then increased to 1,000 psig. The leak rate increased, the test pressure decreased by 950 psim to 50 psig in one hour. The 2 7/8" workstring was in the hole open-end to 3,375'. Halliburton was rigged up to set a balanced cement plug. Eighty (80) sacks of "micro-matrix" cement, 12.8 ppg was

spotted as a balance plug across the perforations from 3,392' to 3,194'. The workstring was then pulled above the cement column to 3,424'. Pressure was then applied to the cement column to force cement through the perforations. Pumped two barrels of fresh water, pressured increased to 1,000 psig. Pressure bled down to 860 psig in 15 minutes. Repressured to 1,000 psig, pressure bled back to 995 psig in 30 minutes. The well was then closed in over the weekend to allow the cement to cure.

December 7, 1992 through December 11, 1992

Pressure tested casing after two day shut-in to 945 psig, pressure decreased to 900 psig in 60 minutes. Bled off pressure and pulled out of the hole.

An 8 1/2" milled tooth drill bit was run in the hole to the top of cement at 3,230'. Drilled cement from 3,230' to 3,378'. The casing was tested to 470 psig, pressure decreased to 462 psig in 30 minutes. The well was closed in to thermally stabilize. The casing pressure was then increased to 1,033 psig to simulate TWC test requirement, pressure decreased to 1,015 psig in one (1) hour. The pressure was released and the 8 1/2" bit was lowered and the remaining cement plug was drilled from 3,380' to 3,395'.

A 9 5/8" casing scraper and 8 1/2" bit was run in the hole to 3,100'. The bit and scraper were rotated and reciprocated from 3,100' to 3,400' and again from 3,600' to 3,802'.

After the casing scraper run, the casing was pressured to 1,012 psig and monitored for one (1) hour, pressure decreased 1 psi over the test duration. Operations were suspended through the holidays until January 18, 1993. All equipment was rigged down and removed from the location.

January 18, 1993 through January 24, 1993

On Monday, January 18, 1993 operations were resumed with all equipment brought in and rigged up. Atlas Wireline was rigged up and an 8.679" O.D. gauge ring and junk basket were run in the hole. A restriction in the protection casing was tagged at 3,318' and the crew was unable to work past the restriction. Tandem casing scrapers to remove the obstruction. The scrapers were rotated and reciprocated from 3,280' to 3,408' to scour the area.

Western Atlas was utilized to run a wireline junk basket and gauge ring to confirm the successful removal of the obstruction. The gauge ring was lowered in the hole to 3,595' WLM without problem. The casing was pressured up to 1,000 psig for ten (10) minutes with no pressure loss during the test period. Western Atlas then made provision to begin perforating the upper Miocene injection zone. The upper Miocene was perforated with 5" hollow carrier perforating guns five (5) shots foot, 135/45 degree phasing as follows:

Interval Depths	
From (ft)	To (ft)
3,376	3,426
3,460	3,471
3,494	3,524
3,543	3,572

A Panex bottom hole pressure (BHP) gauge was run in the hole and a native BHP was measured at 1,593 psia and temperature at 124° F at 3,440'. The BHP gauge was then pulled out of the hole.

Western Atlas then conducted a diagnostic radioactive tracer log (see Appendix K) to confirm confinement of injected fluids to the permitted injection interval.

A 20' Homo carbon steel casing patch (Appendix I) was then installed to insure the future integrity of the squeeze perforations. The casing patch was successfully set from 3,350' to 3,370'.

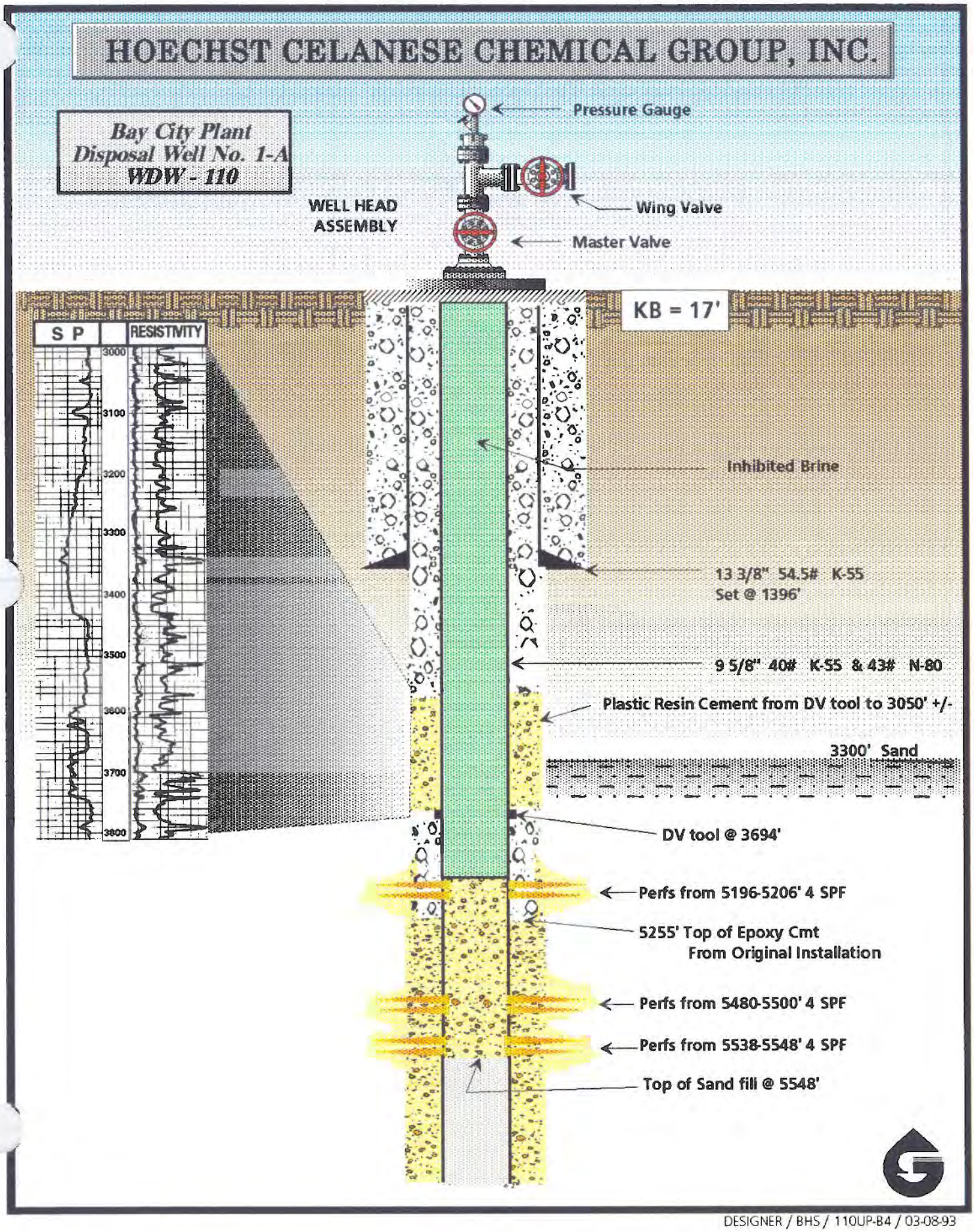
January 25, 1993 through January 28, 1993

The TIW "LH" injection packer with JGS hold downs, 35' of 6 5/8" schedule 40, 316 stainless steel tailpipe, and a 12' seal bore extension was run in the hole. The packer was set with the its base at 3,330' and the bottom of the 6+5/8" tailpipe at 3,380' (see Appendix G). The packer and casing were successfully tested to 1,060 psig for 30 minutes.

A TIW stainless steel seal assembly and 5 1/2", 20 ppf, N-80 carbon steel injection string were installed. The seal assembly was spaced out with the locator sub 3' above the packer. A total of 76 joints plus a 13', 9', and 8' pup joint were installed. The annulus was displaced with 150 bbls of inhibited brine (see Appendix N) prior to installing the wellhead.

WELL CONFIGURATION PRIOR TO COMPLETION

Detailed Upper Hole Section



DESIGNER / BHS / 110UP-B4 / 03-08-93

Mechanical Integrity Testing was begun on Thursday, January 28, 1993 with an annulus pressure test. The pressure increased 7 psi and the test was considered successful (see Appendix A). The Radioactive Tracer Survey was run with no indication of upward fluid movement (see Appendix C). Mr. Richard Merritt was onsite to witness the MIT and verbal permission was given to HCCG personnel to resume non-hazardous injection operations.

February 4, 1993 and February 16, 1993

On Friday, February 5, 1993 the well was acidized with 15% FE acid. The well was placed in service injecting 150 gpm effluent.

On Tuesday, February 16, 1993 a spinner survey (see Appendix L) and bottom hole fall-off surveys (see Appendix E) were conducted on the well. The BHP was monitored for 18 hours, at which time the decision was made that enough data had been collected to make an accurate assessment.

All field operations were complete on Wednesday, February 17, 1993.

4.0 MECHANICAL INTEGRITY TESTING

In accordance with the Texas Water Commission Underground Injection control Division requirements included in the Class I UIC permit number WDW-110 granted to Hoechst Celanese, an annulus pressure test was performed on Well No. 1-A to demonstrate mechanical integrity of the casing.

The mechanical integrity testing (MIT) is designed to demonstrate that 1) "There is no significant leak in the casing, tubing, or packer", and 2) "There is no significant fluid movement through channels adjacent to the injection bore."

The test procedures to perform MIT were reviewed and acknowledged by the TWC. A Differential Temperature log was run on November 24, 1992, and a Radioactive Tracer Survey and annulus pressure test were performed successfully on January 28, 1993.

4.1 ANNULUS PRESSURE TEST

An annulus pressure test was performed on January 28, 1993. The annulus pressure test was performed to demonstrate that there is no significant leak in the tubing, casing, or packer. The annulus was filled with brine for the test. The well was pressured up to 1,002 psig, and pressure was held for approximately one hour. Final pressure at the end of the test was 1,009 psig. Mr Richard Merritt of the Texas Water Commission gave verbal approval of a successful test. Data for the annulus pressure test is included as Appendix A.

4.2 DIFFERENTIAL TEMPERATURE LOG

A Differential Temperature log was run on November 24, 1992 after the well had been shut-in for three days. The Temperature log was performed to demonstrate that there was no significant interformational movement of fluids through channels adjacent to the wellbore. The Temperature log also serves as a base log for the comparison of future temperature logs. The temperature log provides a static, geothermal temperature profile of the well for comparison with a temperature gradient after injection operations resumed. The logging intervals was from surface to 3,815'. Atlas Wireline's interpretation and a copy of the log is included as Appendix C.

The temperature log showed no anomalies beyond what is considered normal, accounting for differences in lithology and vertical heat conduction in the surrounding formation. The log showed a fairly straight temperature gradient from 750' to 3,200'. The interval below 3,200' showed a warming trend and the highest temperature was found to be adjacent to the disposal zone.

4.3 RADIOACTIVE TRACER SURVEY

A Radioactive Tracer Survey (RAT) was run on January 28, 1993. The RAT was run to demonstrate that there is no significant fluid movement into an USDW through vertical channels adjacent to the injection wellbore.

The RAT survey revealed the leak free condition of the casing strings within the test interval as well as depicting graphically that all injected fluids exited at the protection casing seat and moved out into the injection zone. the recordings of the radioactive slugs further indicated that there was no upward migration of injected fluids above the injection zone through vertical channels adjacent to the injection wellbore. The log showed an increase in radiation from 3,460' to TD. This area is still "hot" from the diagnostic Radioactive Tracer Survey run on January 22, 1993.

4.4 CONCLUSIONS

In conclusion, Hoechst Celanese Well No. 1-A has mechanical integrity in accordance with 40 CFR 146.08 a(1) and a(2) and in accordance with TWC permit number WDW-110 by demonstrating that:

* there is no significant leak in the casing, tubing, or packer as evidenced by an annulus pressure test conducted on January 28, 1993.

* There is no significant fluid movement into an USDW through vertical channels adjacent to the injection wellbore as demonstrated by the RAT log dated January 28, 1993, and Temperature log dated November 24, 1992.

5.0 BOTTOM HOLE PRESSURE FALL-OFF TEST

Pressure fall-off data from a test conducted on WDW-110 (Well #1-A) on February 16 - 17, 1993 have been analyzed using the FAST™ software system developed by Fekete Associates, Inc. Data used in this analysis are included in Appendix B, and the results of this analysis are summarized in Table 5.1. E

One can approximate the shut-in time at which the straight-line portion or middle-time region begins as follows:

$$\Delta t = \frac{170{,}000 C e^{.14S}}{T}$$

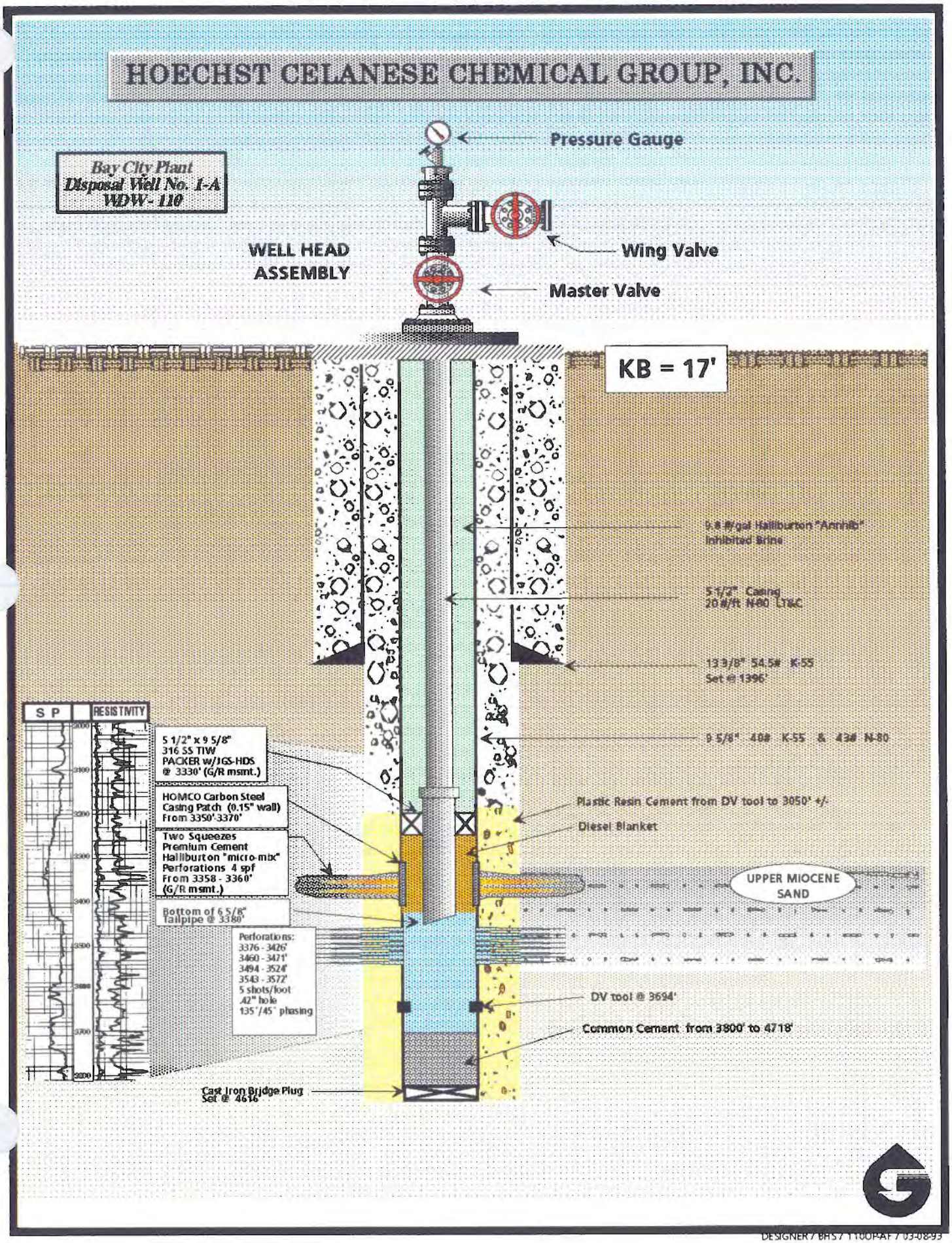
where:
- t = shut-in time at start of straight line (hrs)
- C = wellbore storage constant (bbls/psi)
- S = skin effect
- T = transmissivity (md-ft/cp)

using:
- C = .06 md-ft/psi
- S = 30
- T = 350,000 md-ft/cp, then
- t = 1.95 hours; hence, the proper straight-line portion has been selected for analysis.

Table 5.2 lists the flow rates and times prior to shutting-in the well. Injection rates in WDW-49 and WDW-32 were held constant at 74 gpm each prior to and during the fall-off test. The injection rate for WDW-14 was held constant at 200 gpm prior to and during the test.

FINAL COMPLETION

Detailed Upper Hole Section



DESIGNER / BHS / T100P.AF / 03-08-93

Table 5.1
Analysis of Pressure Fall-off Data

	Horner Analysis	Type Curve
Transmissivity (md-ft/cp)	348,600	351,900
Flow capacity (md-ft)	~~193,800~~ 247,506	195,700
Permeability (md)	~~1,175~~ 1500	1,186
Skin effect	29.1	30.7
Pressure Drop Caused by skin (psi)	81	85
Dimensionless Storage Constant	--	1942.5
Wellbore storage constant (bbls/psi)	--	0.06
Start of infinite acting period (hrs)	1	1
p* (psia)	1537.6	--

Table 5.2
Injection Rates Prior to Shut-in
Total Shut-in Time = 265.5 hours

Dates	Elapsed Time (hours)	Injection Rate (gpm)
2/5-6/93	34	200
2/7-8/93	48	116.6
2/9-16/93	183.5	200
Total Shut-in Time	265.5	

6.0 COMPARISON OF UPPER MIOCENE INJECTION INTERVAL WELL TEST DATA WITH PETITION DATA[1]

The reservoir properties (pressure, permeability, etc.) Of the upper miocene injection interval were determined through fall-off tests in WDW-14, and WDW-49 in 1992, and in WDW-110 (recompletion) in 1993. The flowing or operational formation pressures from the tests can be compared with the modeled operational pressures by converting the measured pressures to a depth of 3440 feet below ground level and removing the pressure increase due to skin effects. The formation pressures predicted by the model assume no formation damage effects or other near-bore well conditions. The measured flowing pressures corrected for skin effects and maximum predicted operational pressures are presented below:

Table 6.1
Formation Pressures

Well	Flowing Formation Pressure (psi)	Skin Pressure Loss (psi)	Revised Formation Pressure (psi)	Maximum Modeled Pressure (psi)
WDW-14	1756	127	1629	1641
WDW-49	1870	269	1601	1640
WDW-110	1672	81	1591	---

The measured flowing pressure is below the maximum modeled operational pressure by more than ten (10) psi for both WDW-14 (12 psi) and WDW-49 (39 psi). The modeled operational pressure for WDW-110 was not reported because WDW-110 was modeled as a completion in the lower Miocene injection interval. The modeled operational pressure for the other wells should be applicable to WDW-110. In order to assist future comparisons of measured flowing pressures and modeled operational pressures in the upper Miocene injection interval, graphs of the modeled operational pressures versus time for WDW-14, WDW-32, and WDW-49 have been prepared (Figures 6.1 - 6.3). These graphs show the yearly predicted operational formation pressure (1991 through end of 2000) for each well using maximum modeled injection rates (250 gallons per minute in each well). All predicted operational pressures correspond to a depth of 3440 feet below ground level and an original estimated formation pressure for the upper Miocene injection interval of 1555 psi.

[1] DuPont Environmental Remediation Services, Comparison of Upper Miocene Injection Interval Well Test Data with Petition Data, 1993.

The measured static formation pressures from the well tests, corrected to a depth of 3440 feet below ground level, Table 6.2, show a formation pressure increase range from 7 psi (WDW-110) to a maximum of 25 psi (WDW-32). This illustrates that injection operations at the plant have had limited impact on formation pressures and should continue to have limited impact on formation pressures in the future.

Table 6.2
Static Formation Pressures From Well Tests

Well	Static Formation Pressure (psi)	Formation Pressure Increase (psi)
WDW-14	1577	22
WDW-32	1580	25
WDW-49	1574	19
WDW-110	1562	7

The fall-off tests in each of the wells were analyzed to derive a transmissivity and permeability values for the upper Miocene injection interval. A comparison of the test permeability and transmissivity values with the modeled values of permeability and transmissivity is presented below. The test permeabilities range from 413 millidarcies (md) to 1,175 md with an average of 730 md. The test transmissivities range from 122,100 millidarcy-feet per centipoise (md-ft/cp) to 348,600 md-ft/cp with an average of 216,200 md-ft/cp. The test permeability and transmissivity derived from the recompletion of WDW-110 compare very favorably with the modeled values with the test transmissivity being slightly greater that the modeled value. The increased permeability and transmissivity derived in the WDW-110 test in comparison to the other well tests may indicate an area of reduced permeability around the other wells due to previous injection. In contrast, the area around WDW-110 is relatively unaffected by previous injection and therefore the derived properties from the well test may be more representative of the true reservoir properties.

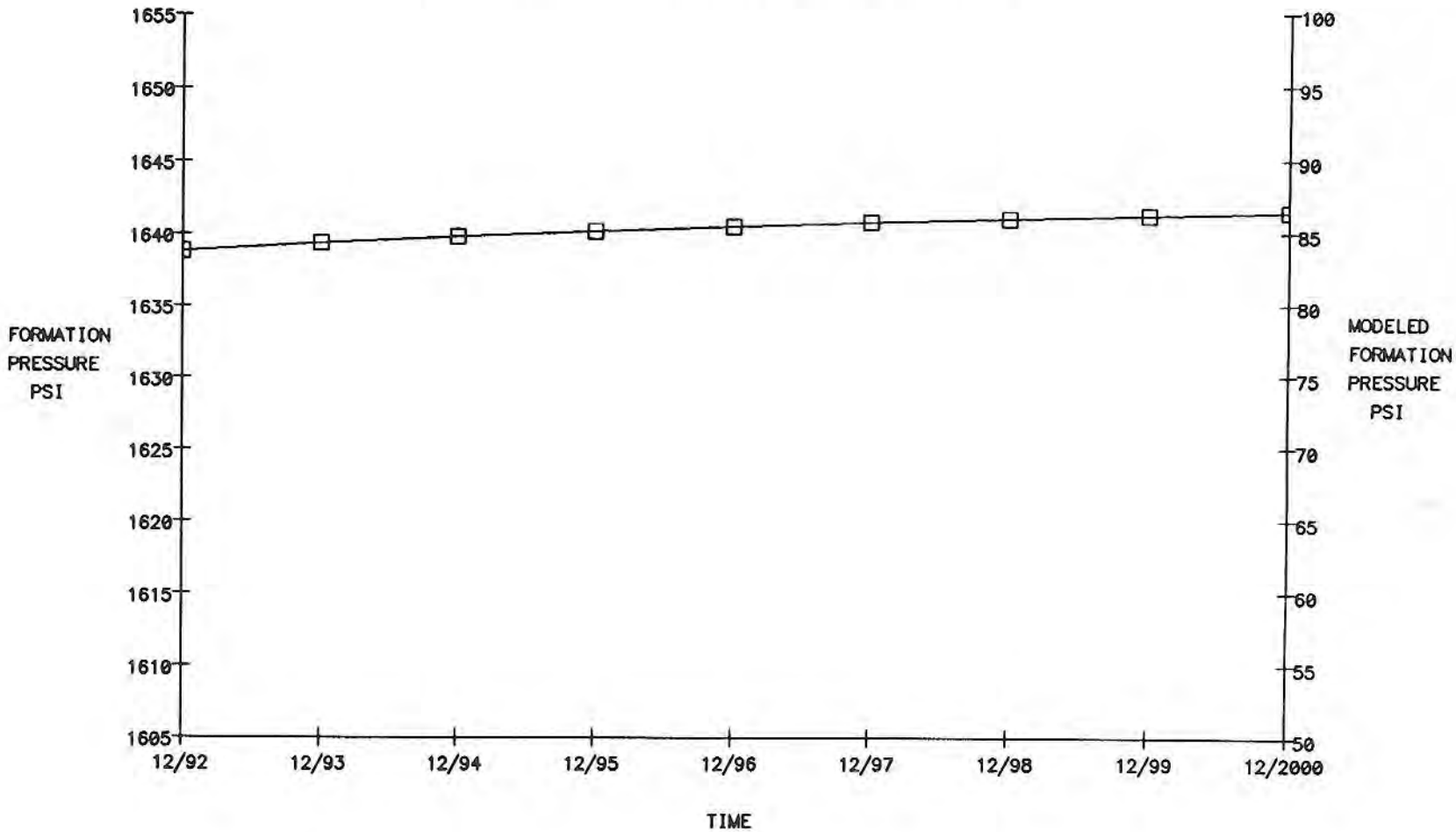
Table 6.3
Permeability and Transmissivity

Well	Test Permeability (mds)	Petition Permeability (mds)	Test Transmissivity (md-ft/cp)	Petition Transmissivity md-ft/cp)
WDW-14	602	1350	177,900	313,700
WDW-49	413	1350	122,100	313,700
WDW-110	1175	1350	348,600	313,700

Even though the modeled values for permeability and transmissivity for the upper Miocene injection interval are greater than the average values derived from recent well tests, the maximum predicted operational pressure has not been exceeded in any of the wells and the static formation pressure measurements indicate that injection operations have not greatly impacted formation pressures.

FIGURE 6.1

UPPER MIOCENE INJECTION SAND - WDW-14

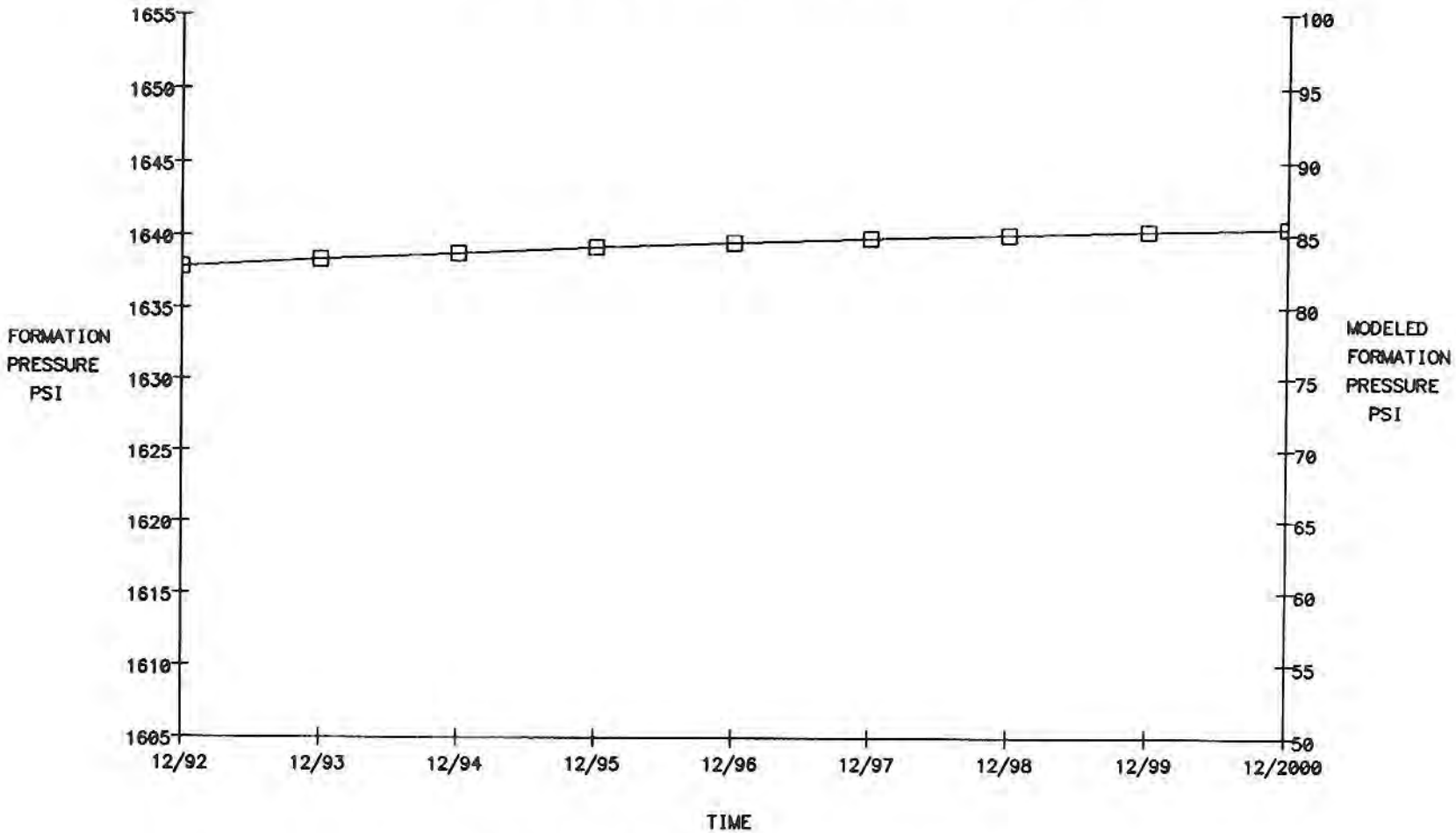


—□— MODELED FORMATION PRESSURES

MODELED OPERATIONAL FORMATION PRESSURES IN WDW-14 (1992 - 2000)

FIGURE 6.2

UPPER MIOCENE INJECTION SAND - WDW-49

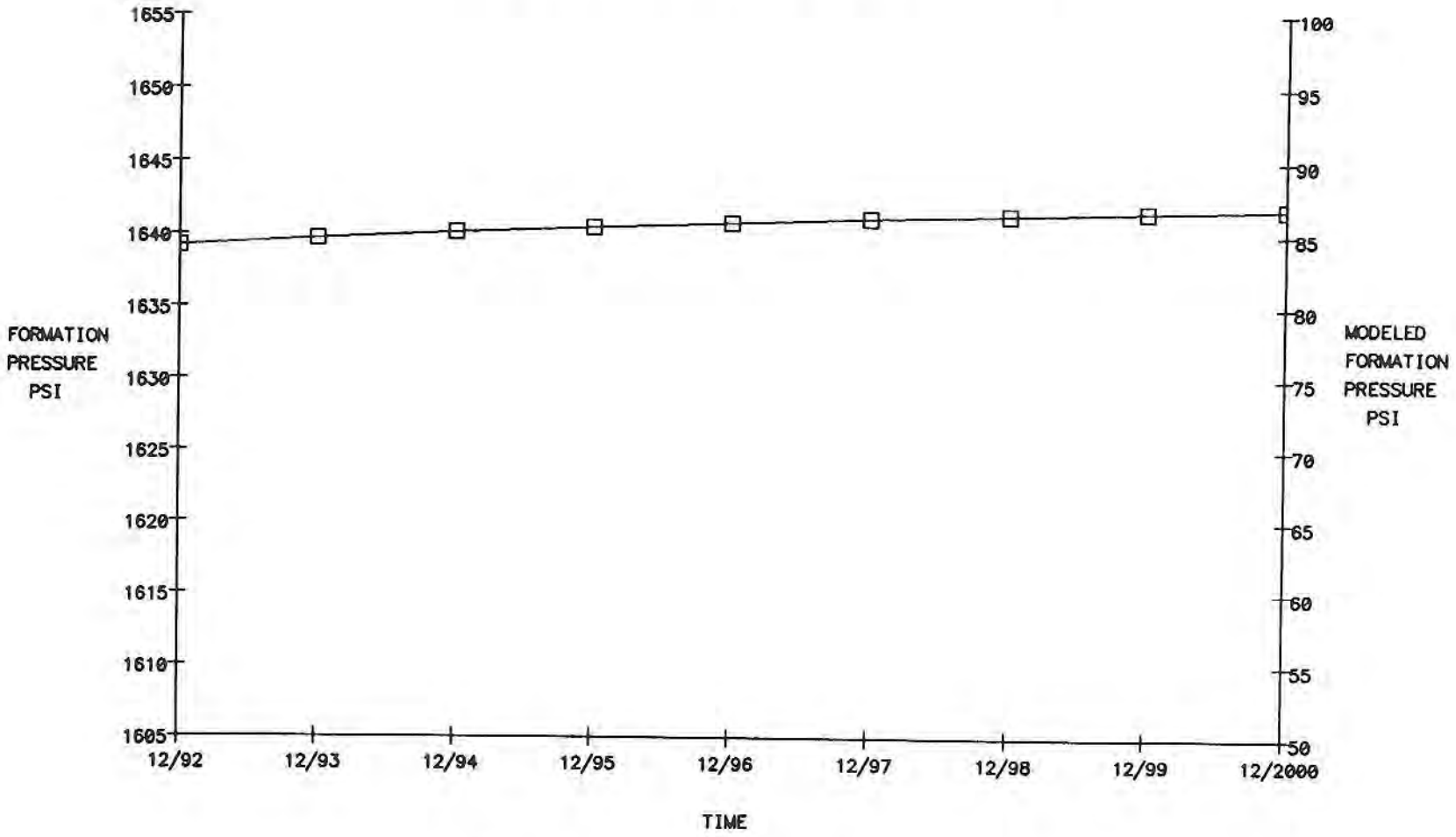


—□— MODELED FORMATION PRESSURES

MODELED OPERATIONAL FORMATION PRESSURES IN WDW-49 (1992 - 2000)

FIGURE 6.3

UPPER MIOCENE INJECTION SAND - WDW-32

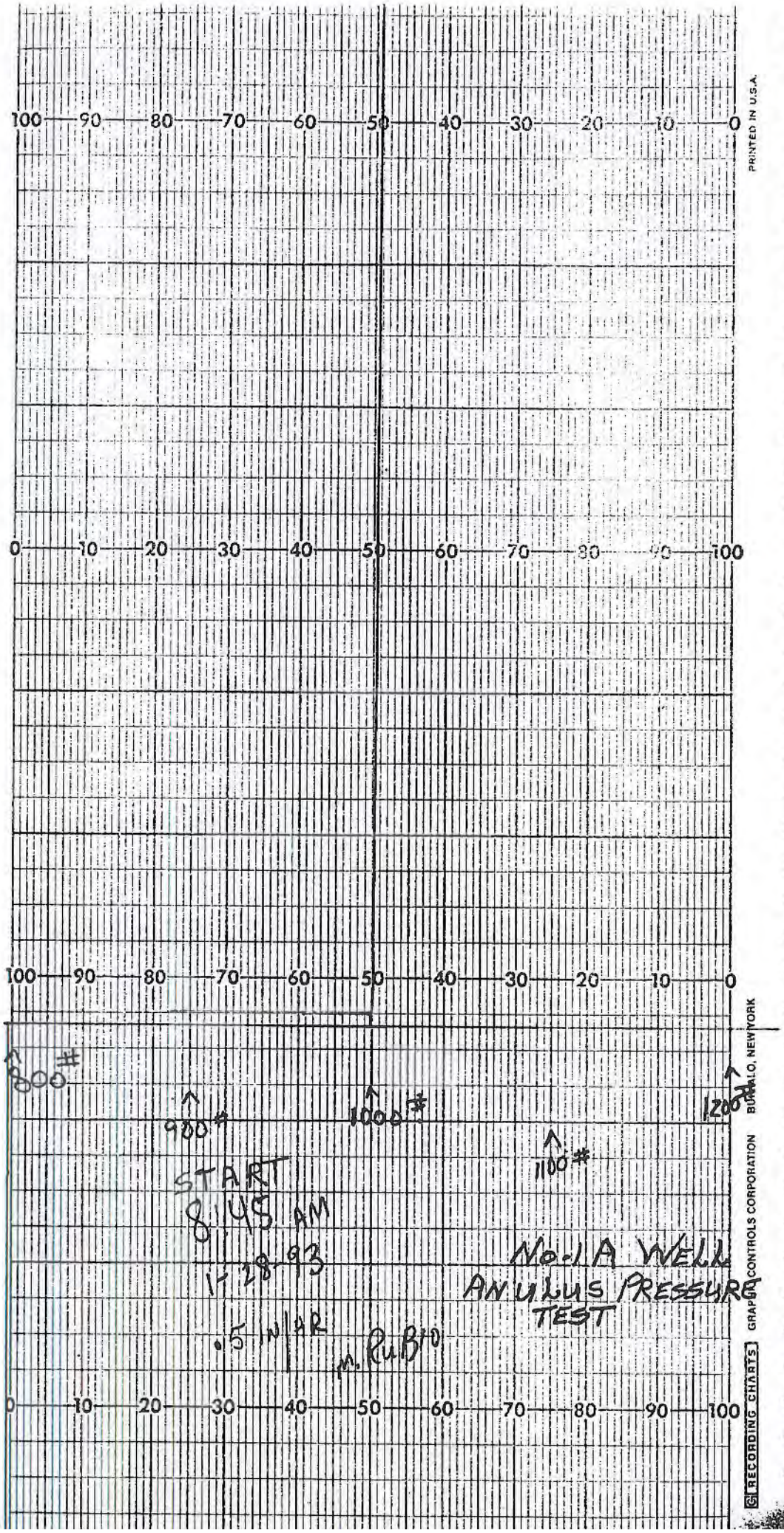


—□— MODELED FORMATION PRESSURES

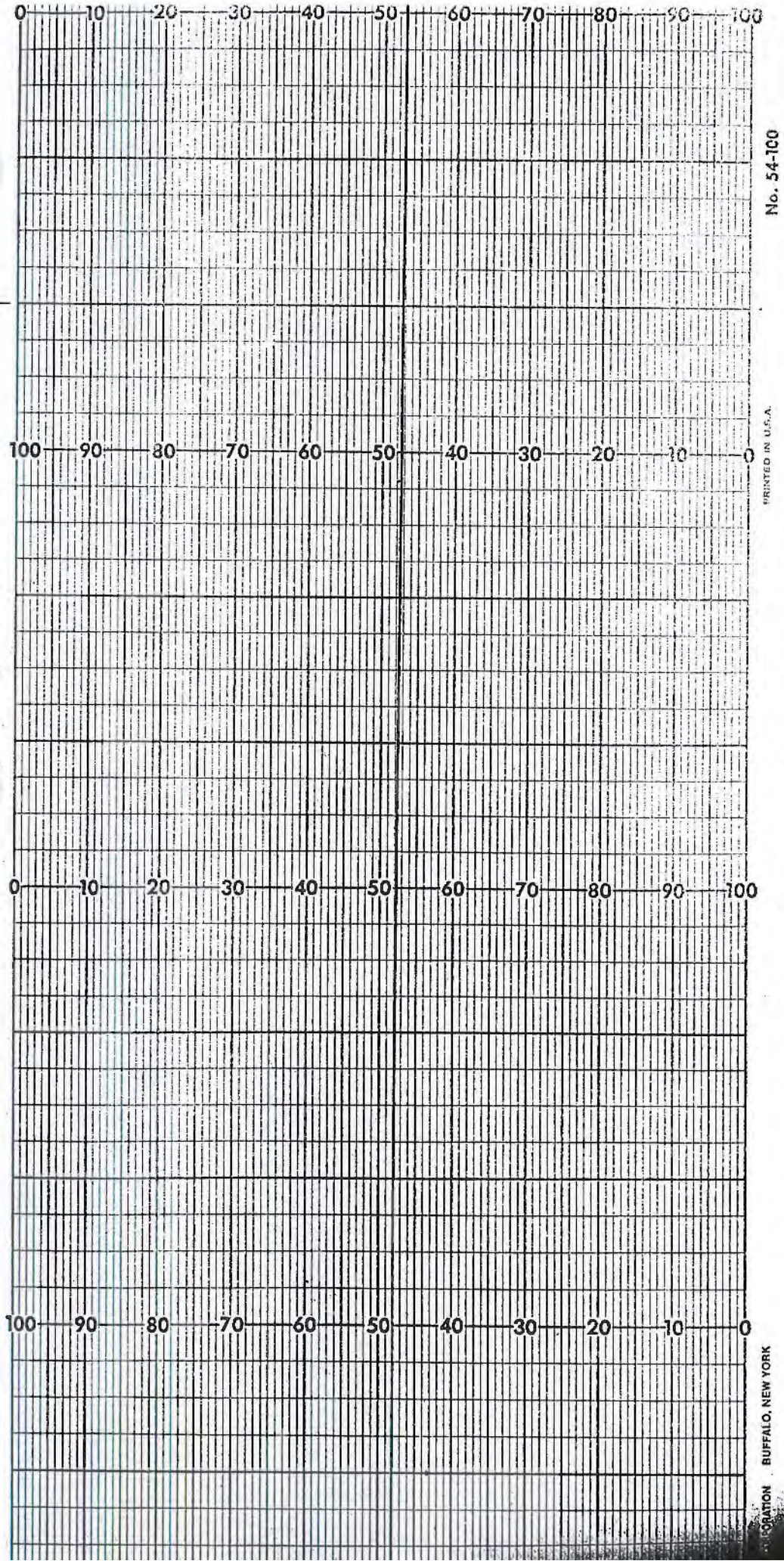
MODELED OPERATIONAL FORMATION PRESSURES IN WDW-32 (1992 - 2000)

APPENDIX A

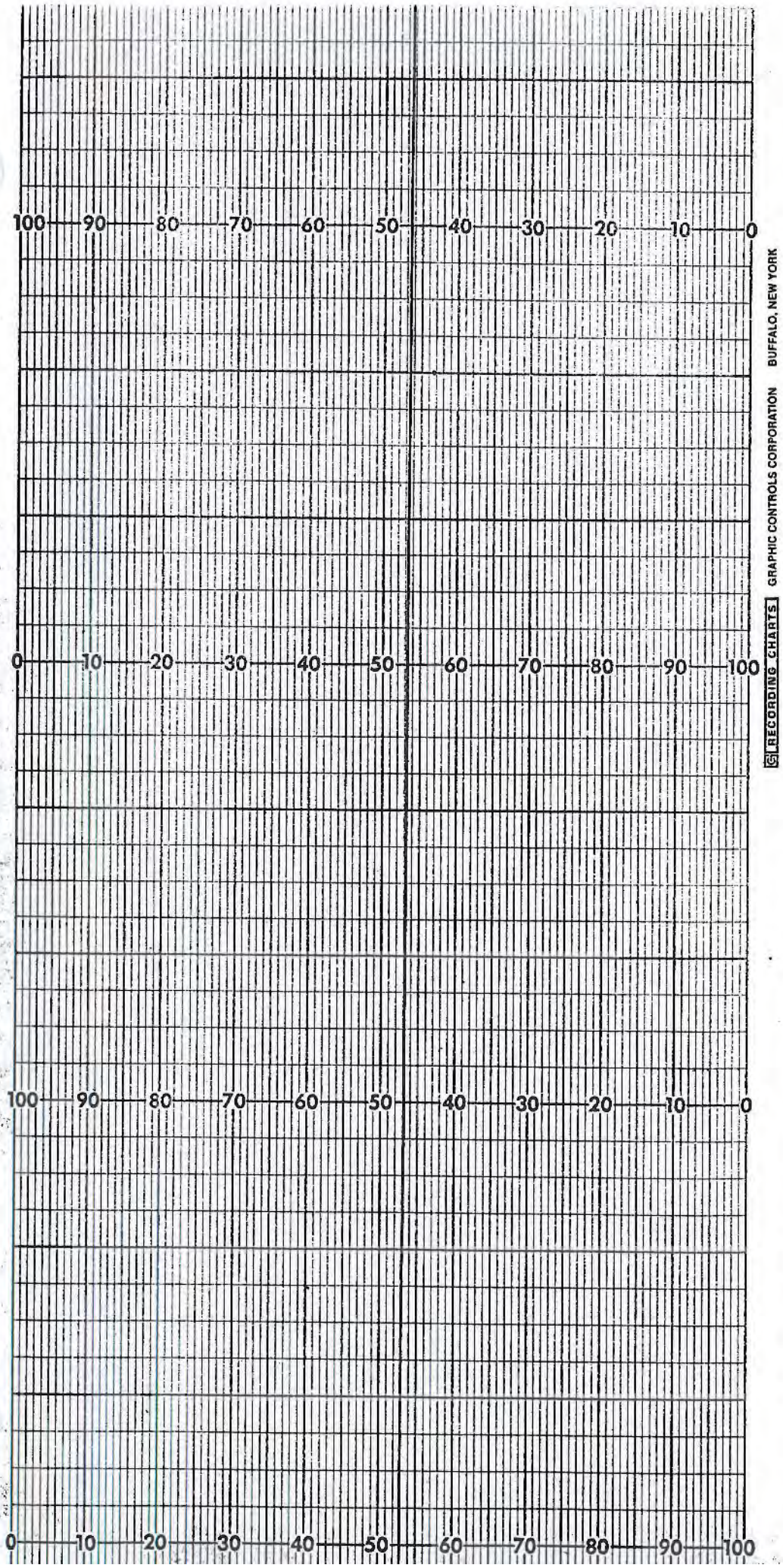
ANNULUS PRESSURE DATA


100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
800#
900#
1000#
1100#
1200#
START
8:45 AM
1-28-93
.5 IN/HR
M. RuBio
No-1 A WELL
ANULUS PRESSURE
TEST
0 10 20 30 40 50 60 70 80 90 100
PRINTED IN U.S.A.
GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK
RECORDING CHARTS

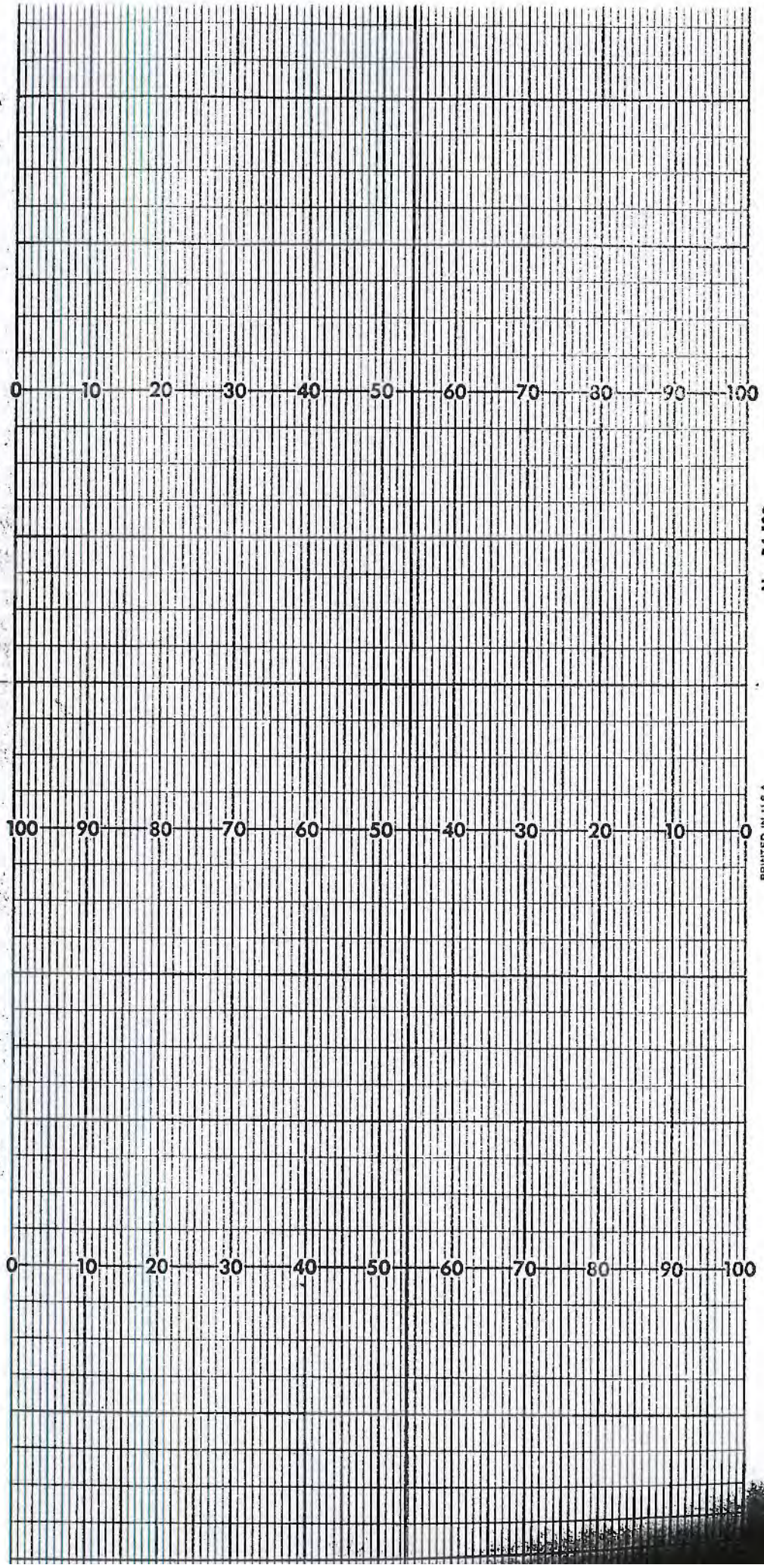
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
RECORDING CHARTS
GRAPHIC CONTROLS CORPORA
No. 54-100



No. 54-100
PRINTED IN U.S.A.
BUFFALO, NEW YORK

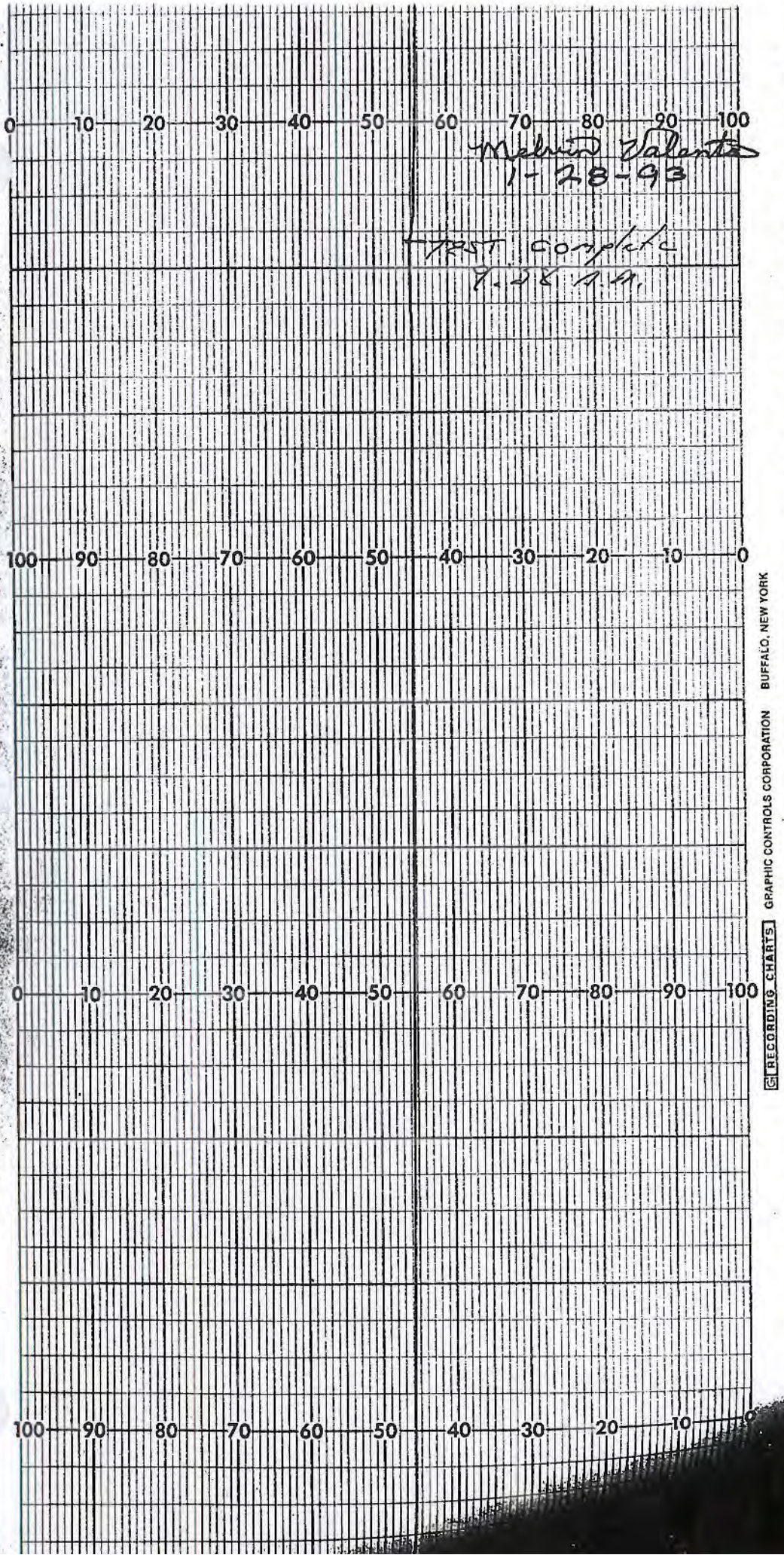


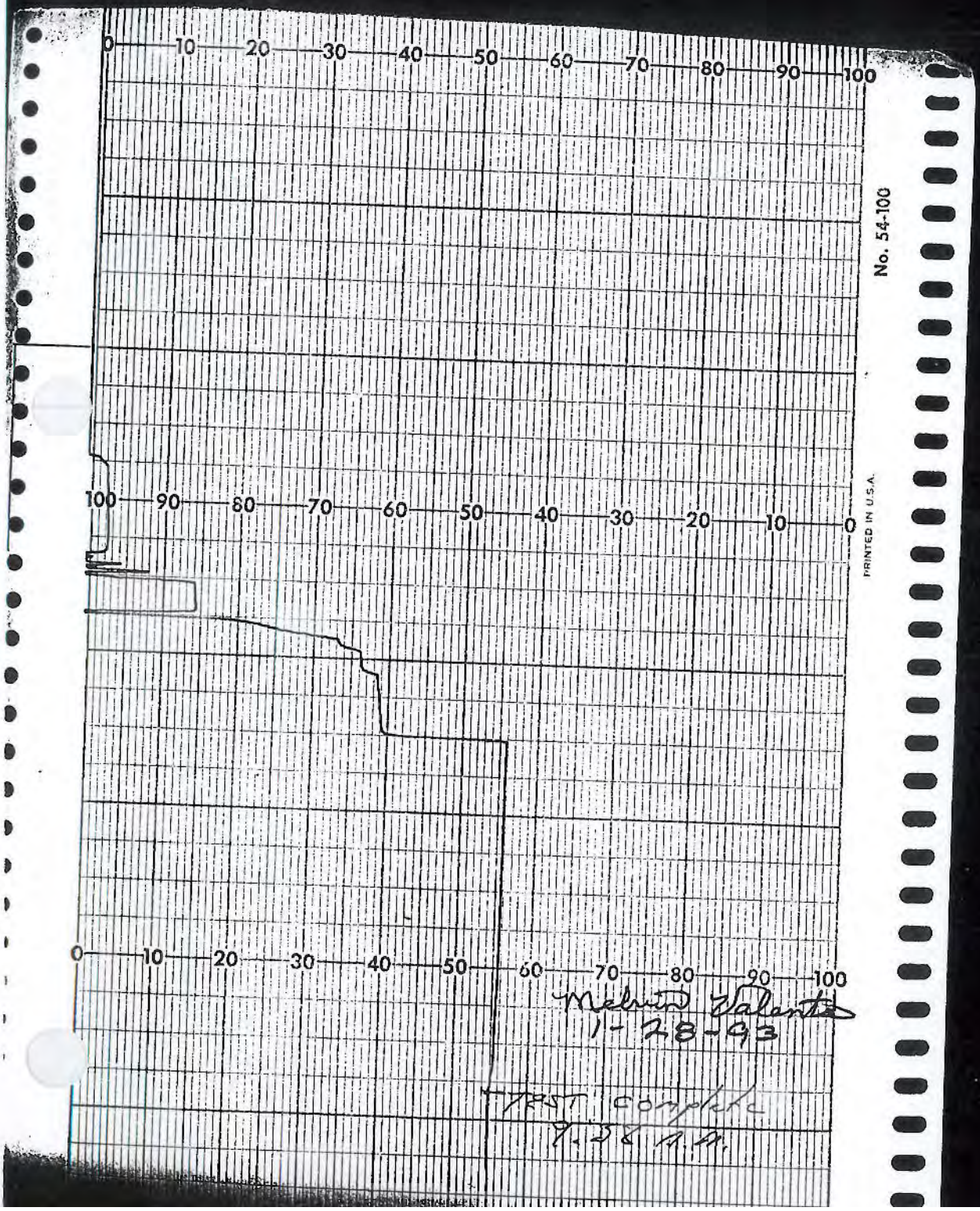
GC RECORDING CHARTS GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK



No. 54-100

PRINTED IN U.S.A.


0 10 20 30 40 50 60 70 80 90 100
Melvin Valente
1-28-93
Test complete
7:25 A.M.
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK
RECORDING CHARTS


0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100
No. 54-100
PRINTED IN U.S.A.
Melvin Valente
1-28-93
TEST complete
9:28 A.M.

APPENDIX B

TEMPERATURE/GAMMA-RAY NEUTRON LOG AND WESTERN ATLAS' LOG INTERPRETATION

ATLAS WIRELINE SERVICES
Western Atlas International

COMPENSATED NEUTRON GAMMA RAY

FILE NO.	
API NO.	
COMPANY	HOECHST CELANESE
WELL	DISPOSAL WWELL NO,1-A
FIELD	CELANESE PLANT
COUNTY	MATAGORDA
STATE	TEXAS

LOCATION:
N/A

SEC ____ TWP ____ RGE ____

OTHER SERVICES
TEMP. SURVEY

PERMANENT DATUM	GL	ELEV.	N/A
LOGGING MEASURED FROM	KB	17	FT. ABOVE P.D.
DRILLING MEASURED FROM	KB		

ELEVATIONS

KB	N/A
DF	N/A
GL	N/A

DATE	11/24/92
RUN	1
SERVICE ORDER	110318
DEPTH-DRILLER	4719
DEPTH-LOGGER	4716'
BOTTOM LOGGED INTERVAL	4715
TOP LOGGED INTERVAL	
TYPE FLUID IN HOLE	SALT WATER
SALINITY PPM CL.	N/A
DENSITY LB/GAL.	10 PPG
LEVEL	200
MAX. REC. TEMP. DEG. F	135 F
OPR. RIG TIME	3 HRS
EQUIP. NO. / LOC.	HL 6301 HOUSTON
RECORDED BY	HERRERA
WITNESSED BY	HALL

BOREHOLE RECORD

NO.	BIT	FROM	TO

CASING RECORD

SIZE	WGT	FROM	TO
13 5/8	N/A	1398	0
9 5/8	40&44	5938	0

FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS RUN (1)

CORRELATED TO GR/SBT DATED 4/27/92

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
1	1	CN	71531	2420	FREE
1	1	GR	46737	1309	FREE
1	1	CCL		2318	FREE

1	1	CCL		2318	FREE

****

FILE: 5

PARAMETERS

NAME	DEPTH INTERVAL	VALUE	UNITS
A	4717 TO 1182	0.000	
CAL COR	4717 TO 1182	7.875	INCH
CASING CNC	4717 TO 1182	NOT ACTIVE	
CHISM CN	4717 TO 1182	ACTIVE	
M	4717 TO 1182	0.000	
MATRIX	4717 TO 1182	LIMESTONE	
SALINITY	4717 TO 1182	0.000	PPK

DISPLAY SCALE CHANGES

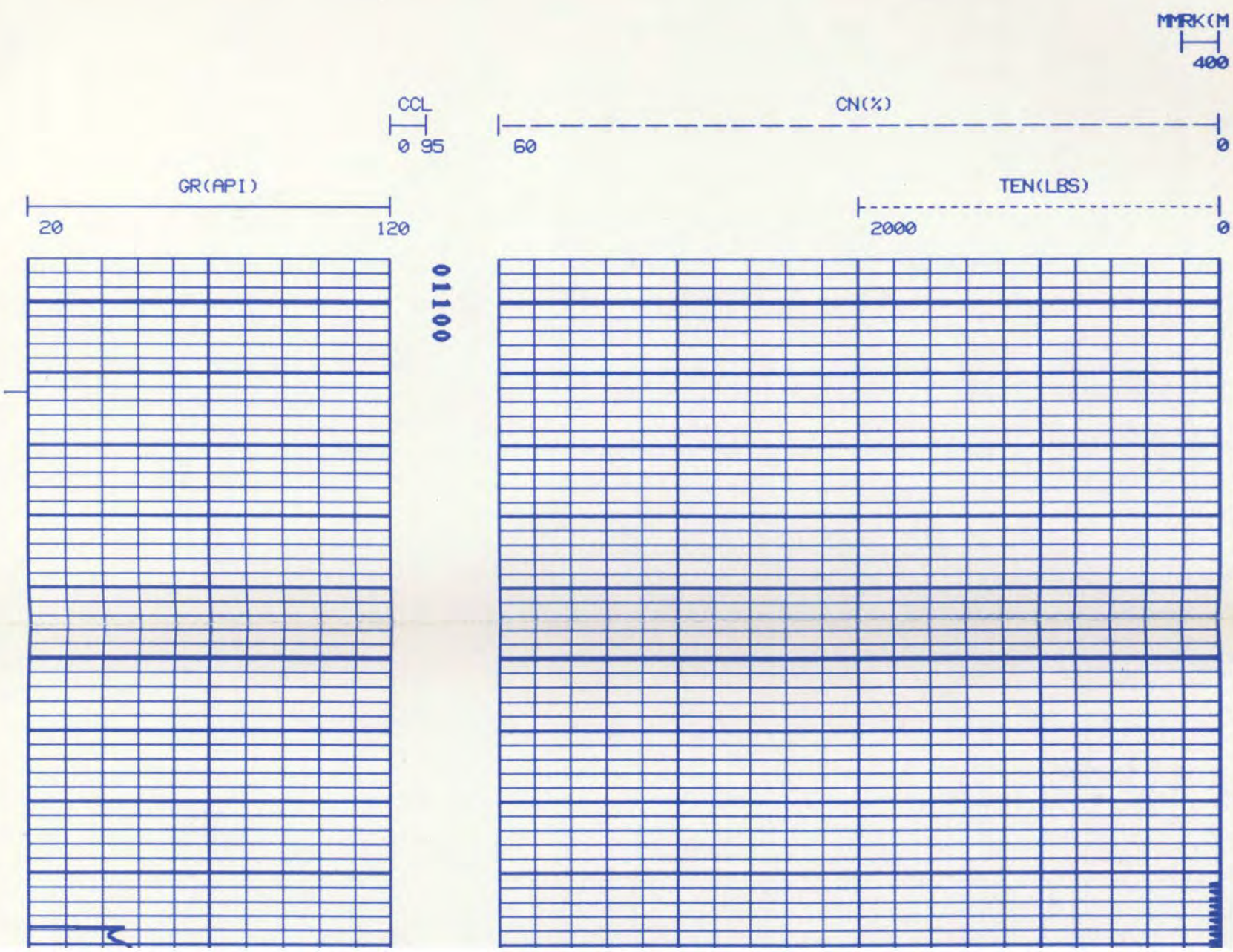
*** NONE ***

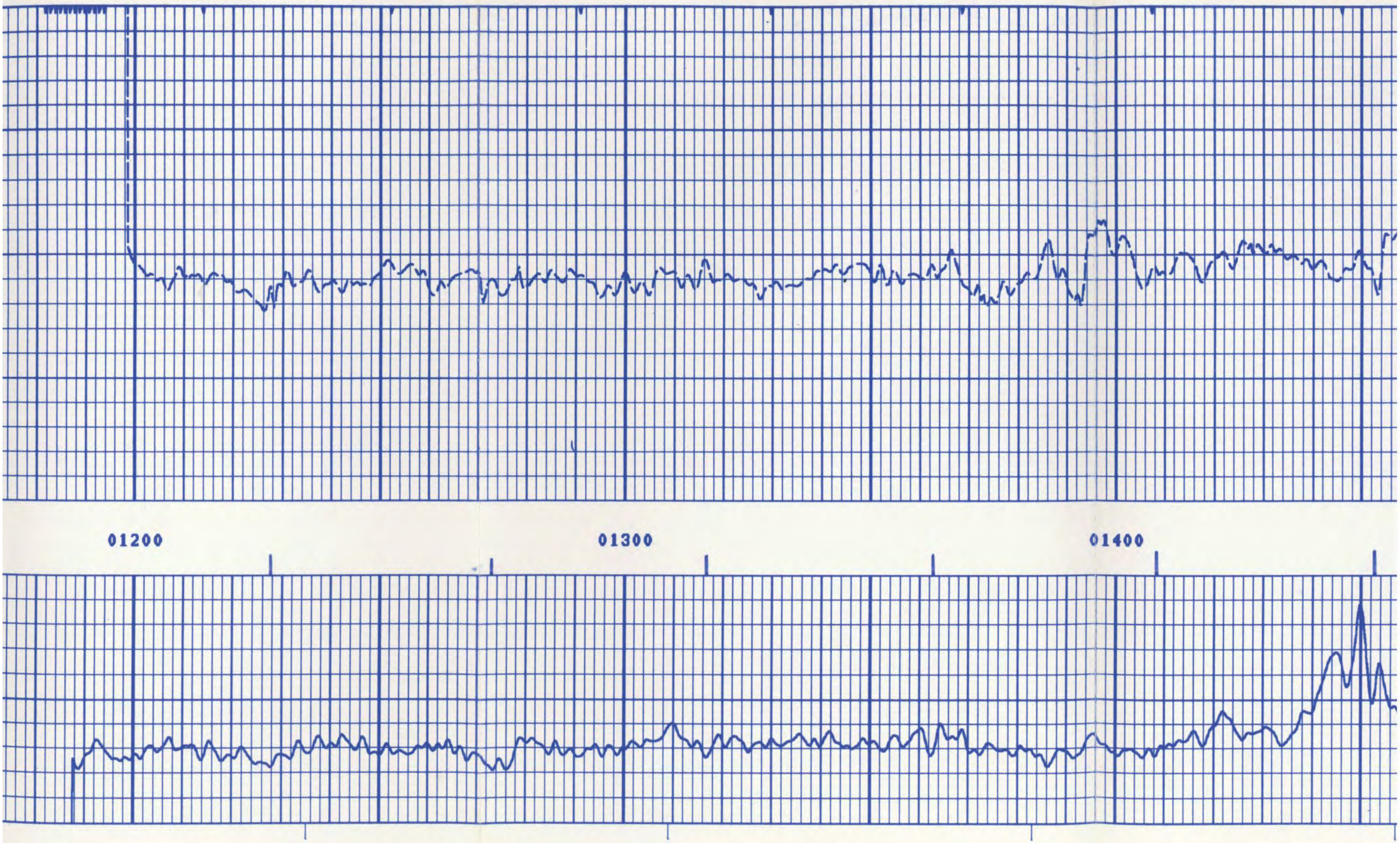
COMPANY: HOECHST CELANESE RUN: 1

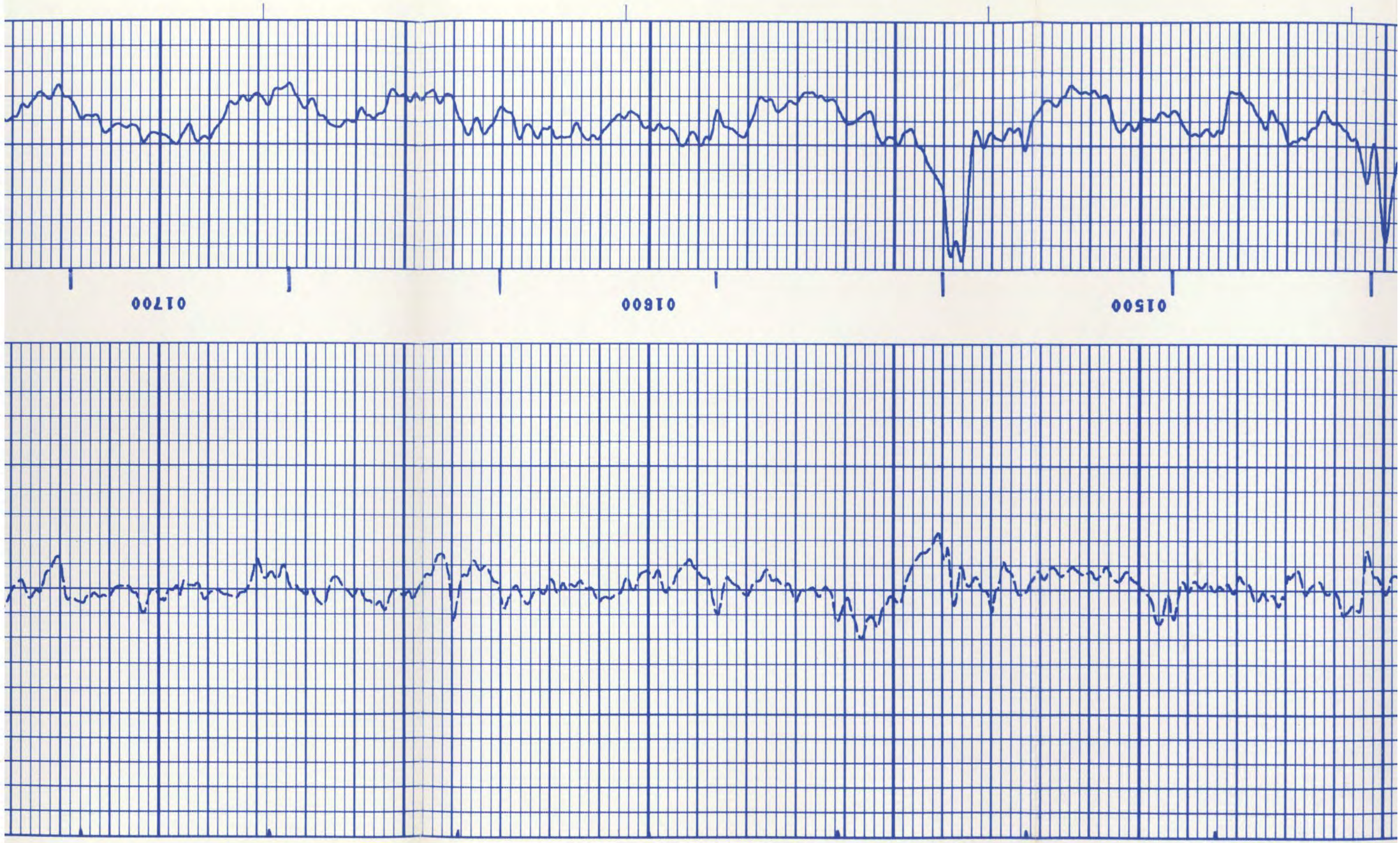
WELL NAME: DISPOSAL WELL NO.1-A TRIP: 1

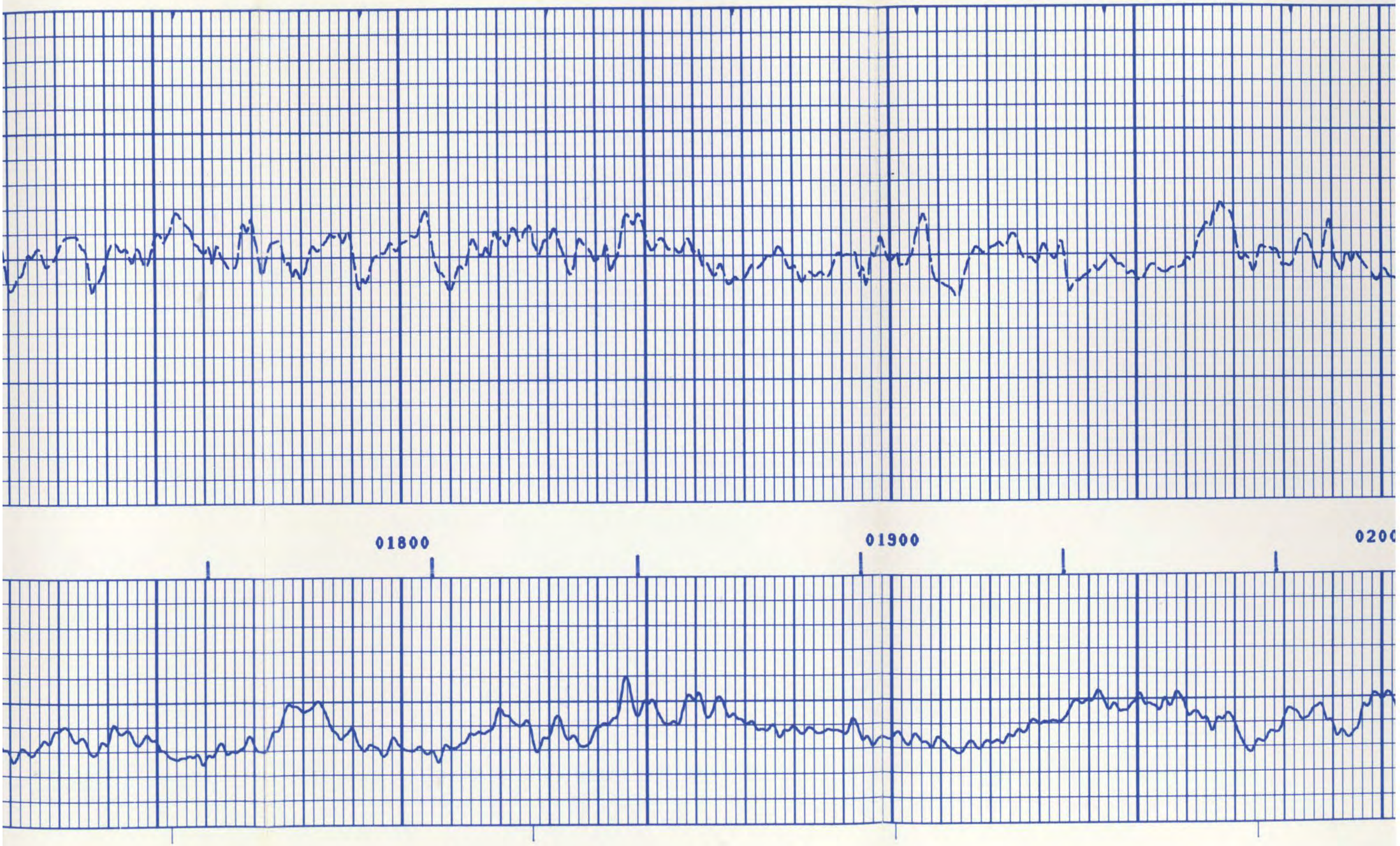
SERVICE: F 228A FILE: 5 DATE: 00/02/20 TIME: 13:20:39

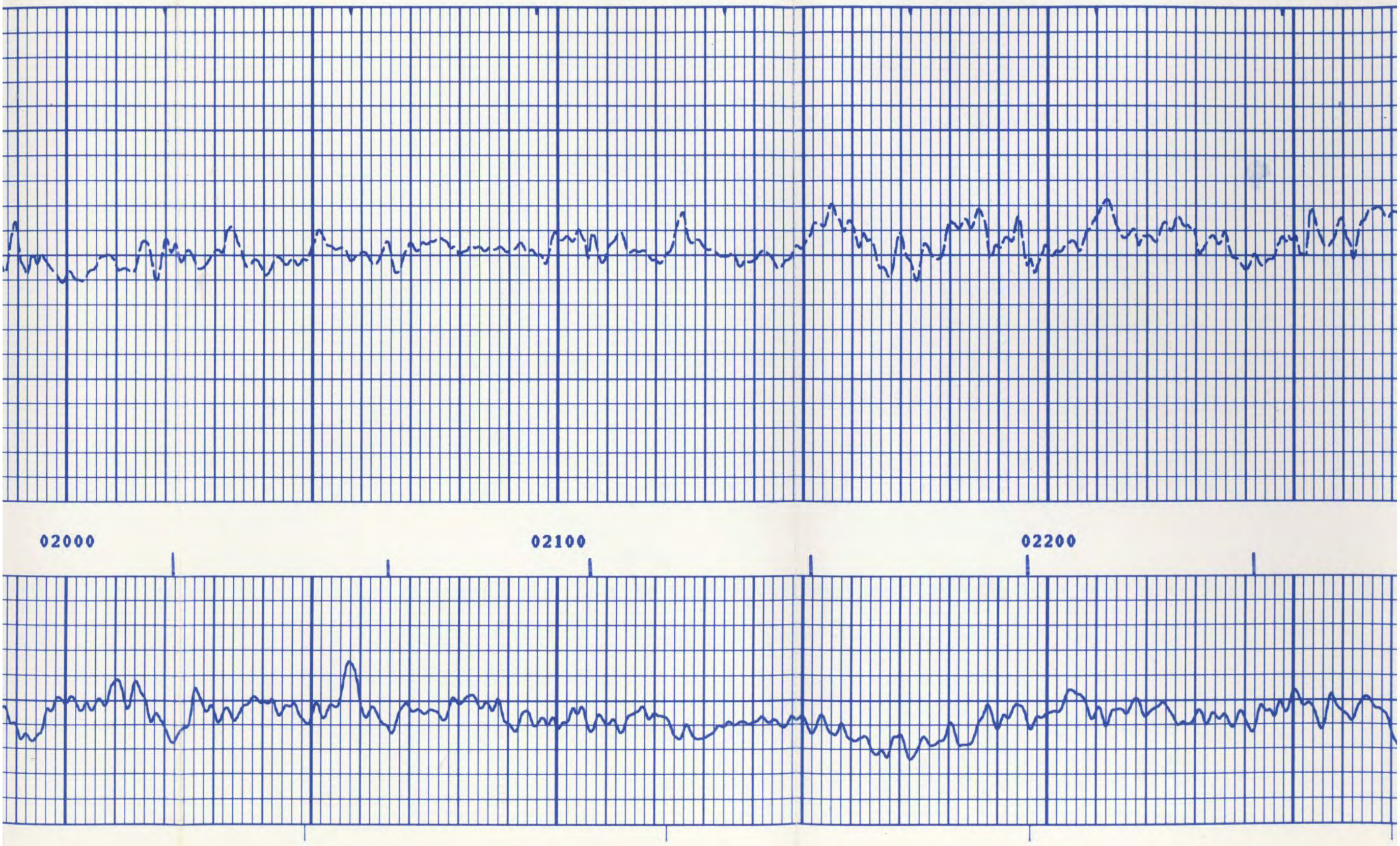
REVISION: FSYS256 REV:G002 VER:2.0 MODE: PLAYBACK

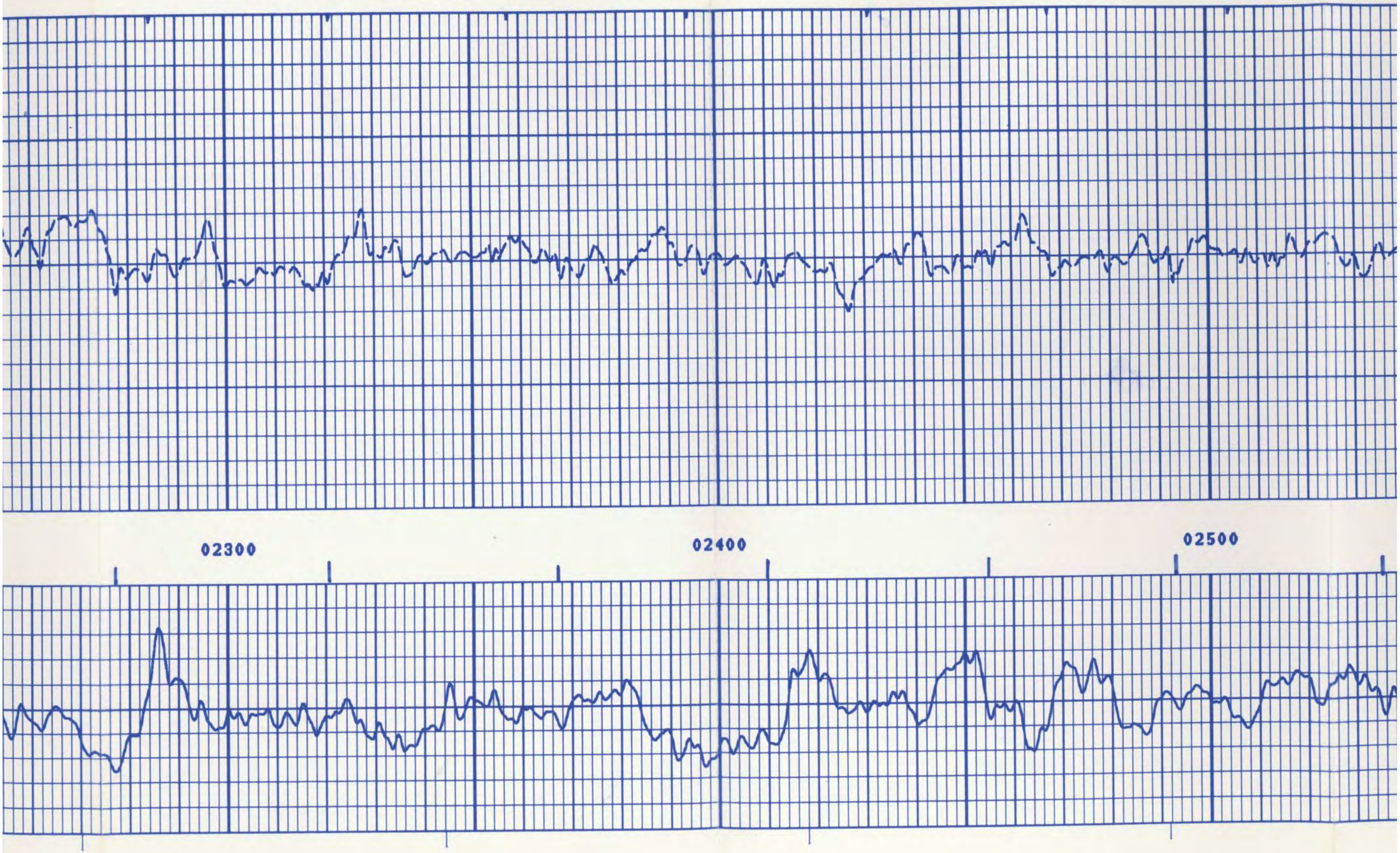


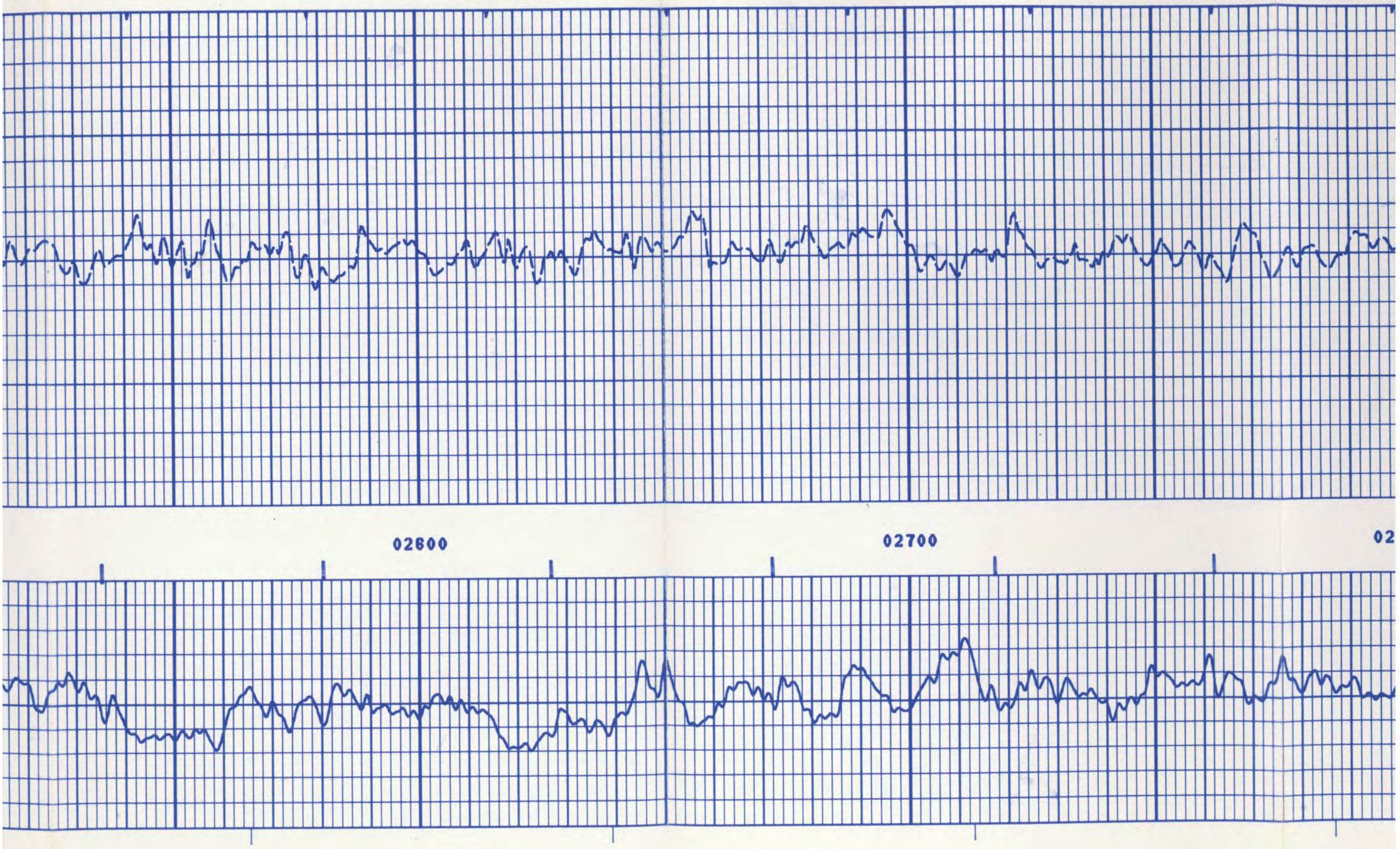

01200
01300
01400

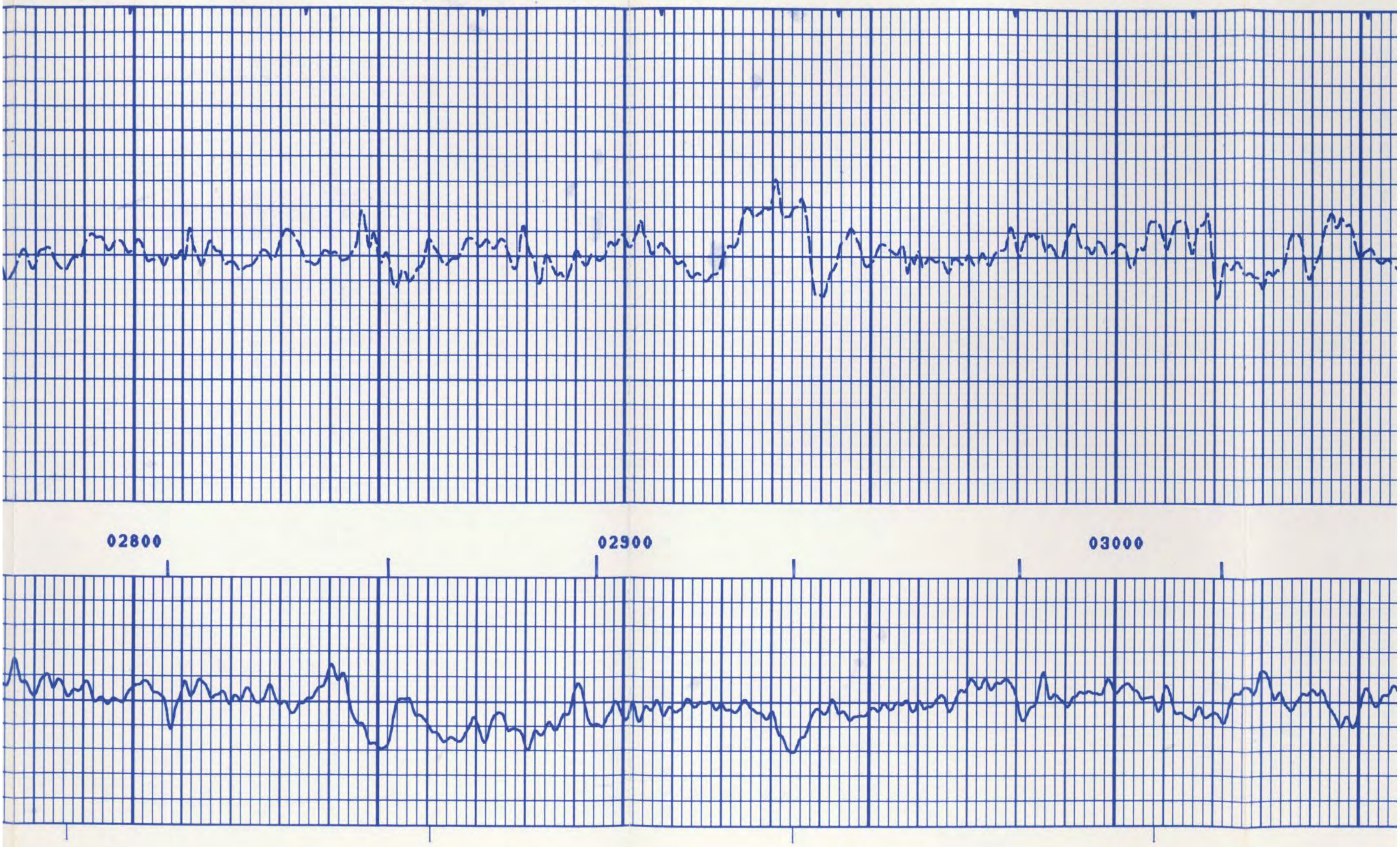

01700
01600
01500

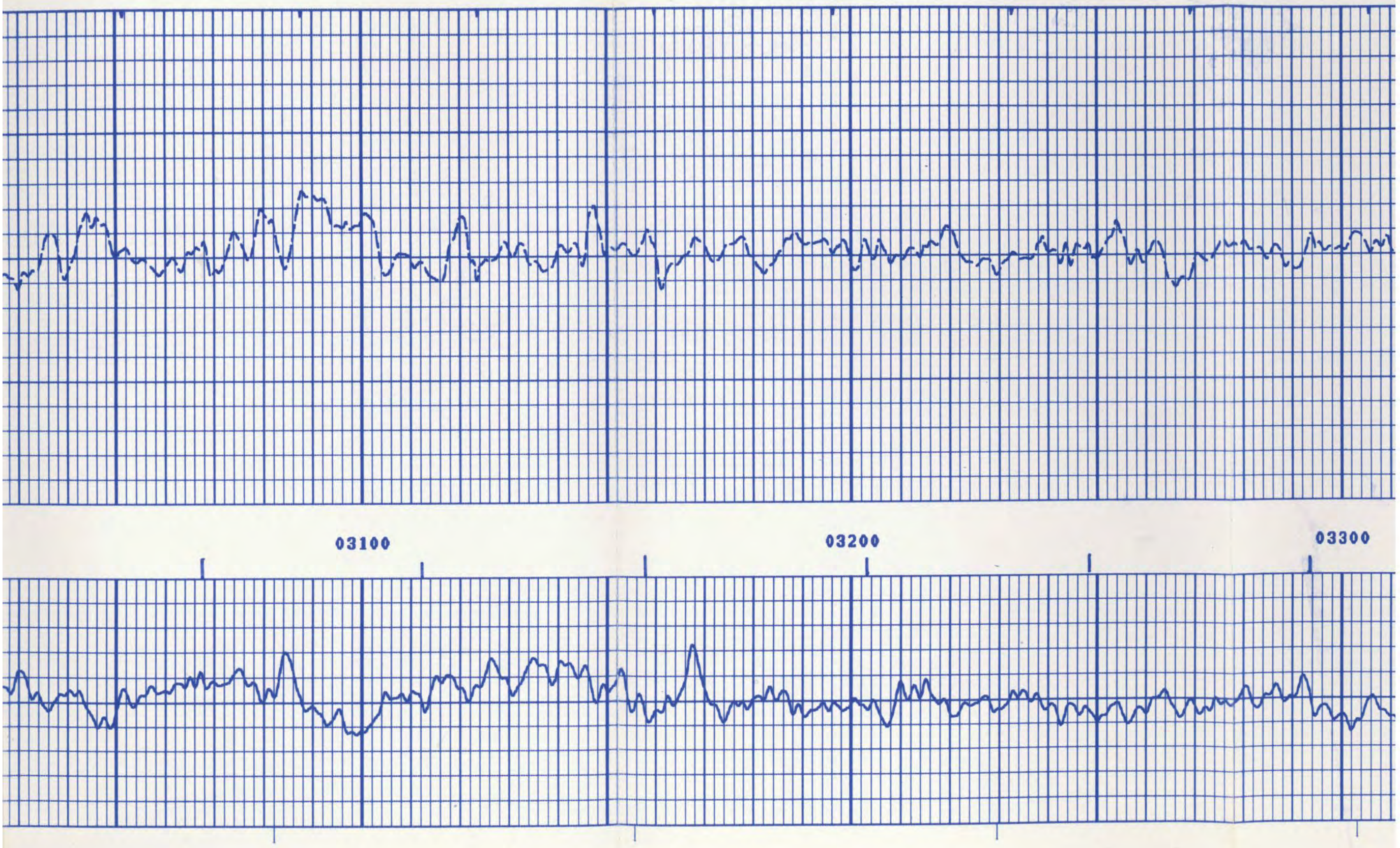

01800
01900
0200

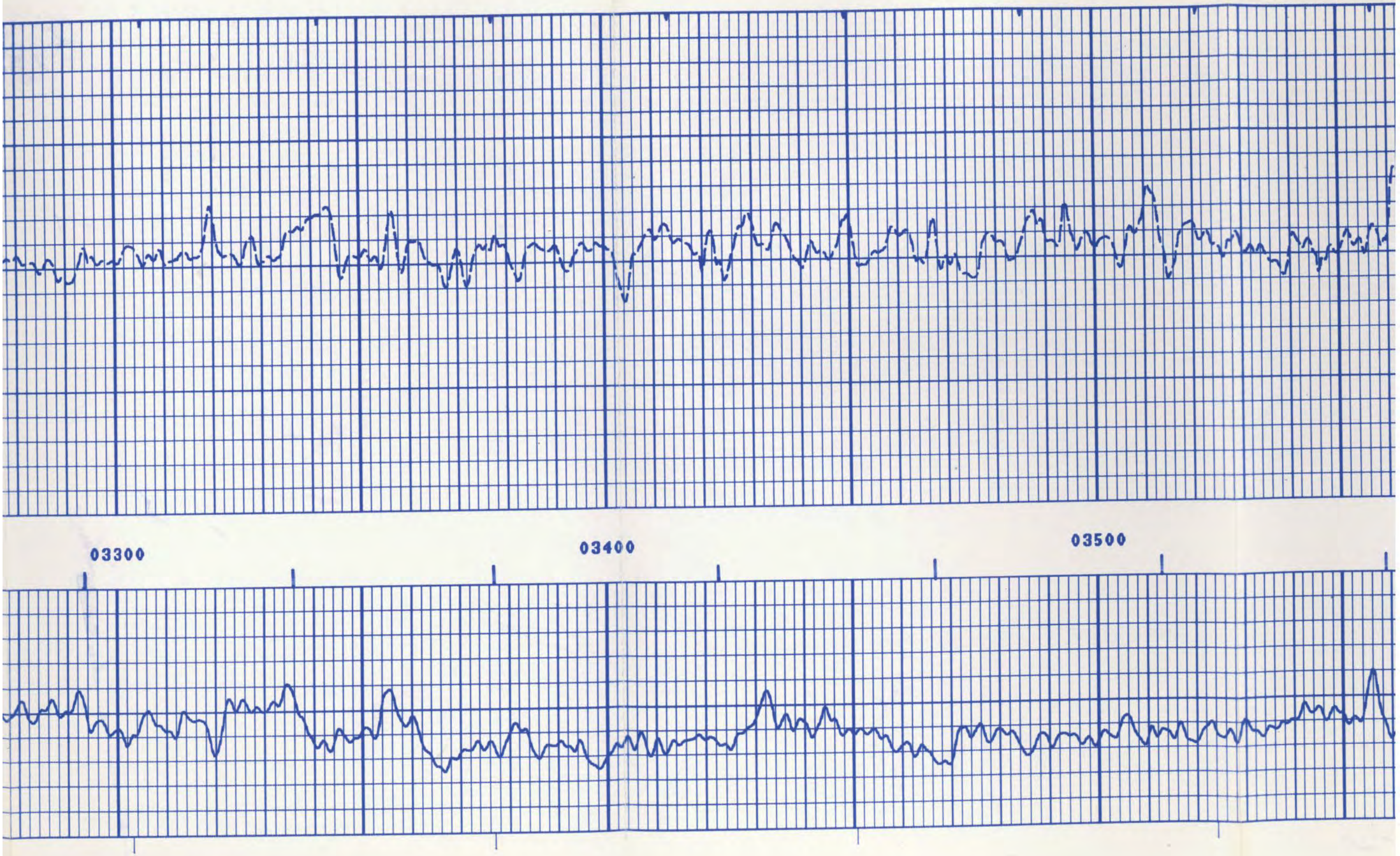

02000
02100
02200


02300
02400
02500

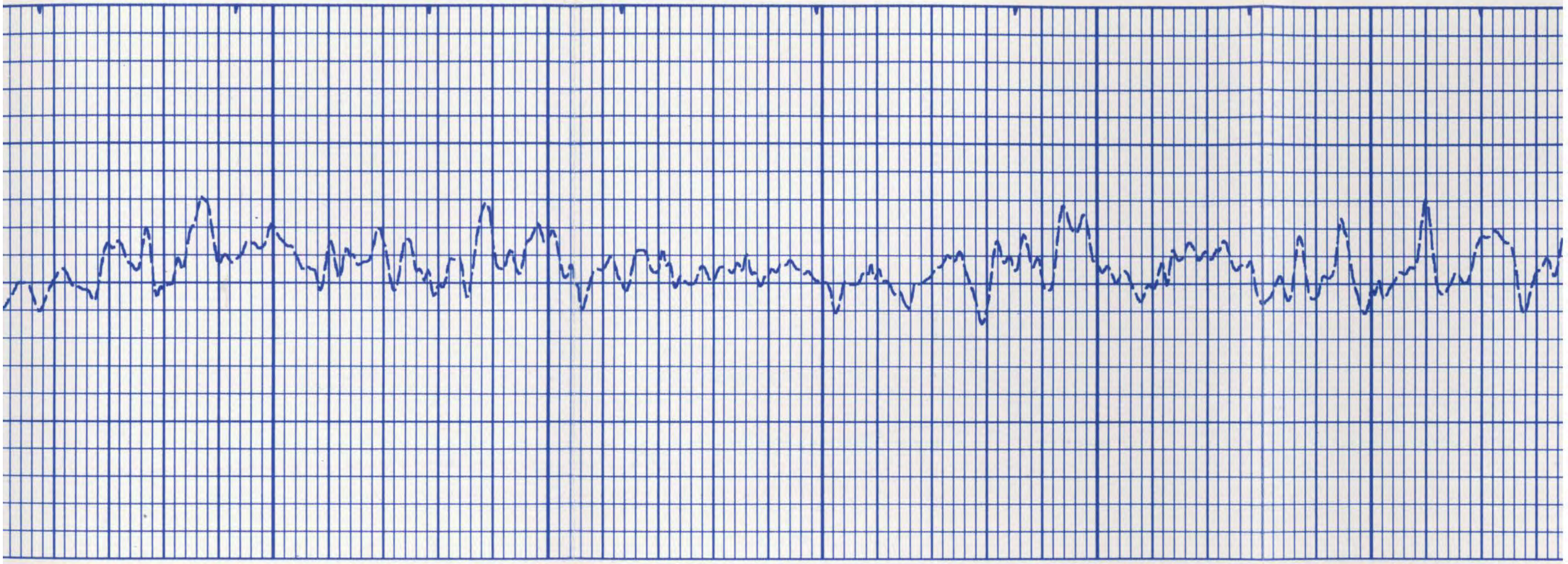

02600
02700
02

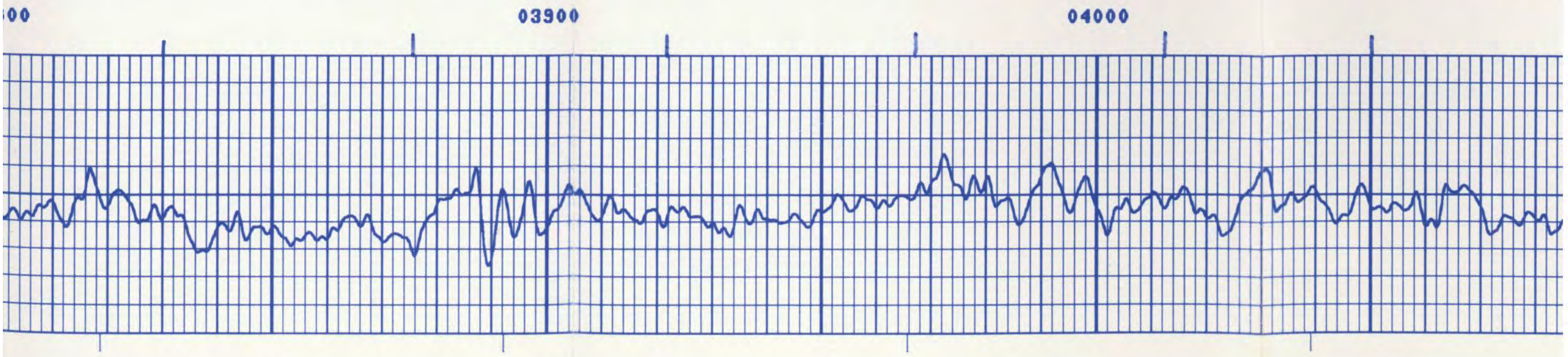

02800
02900
03000

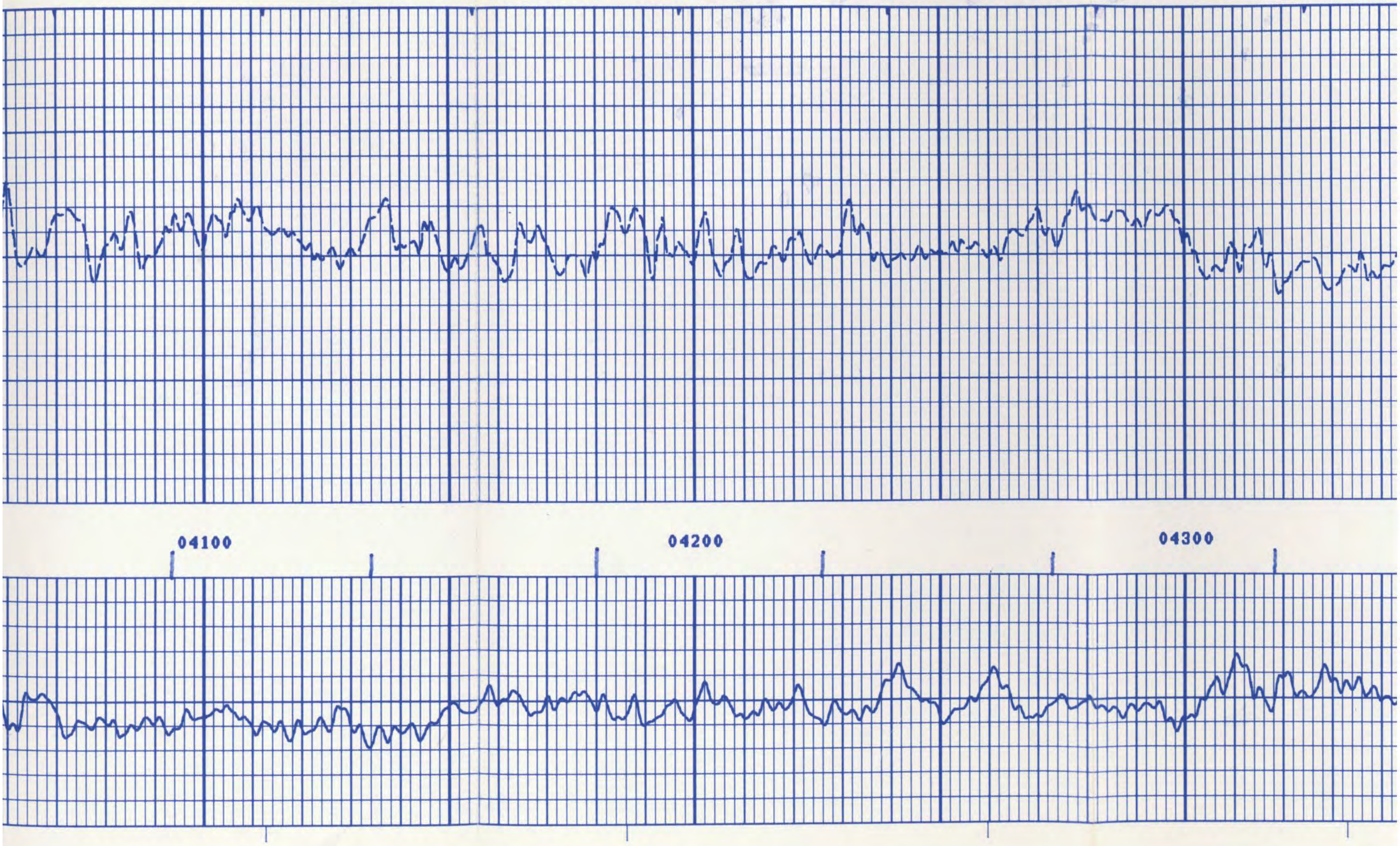

03100
03200
03300

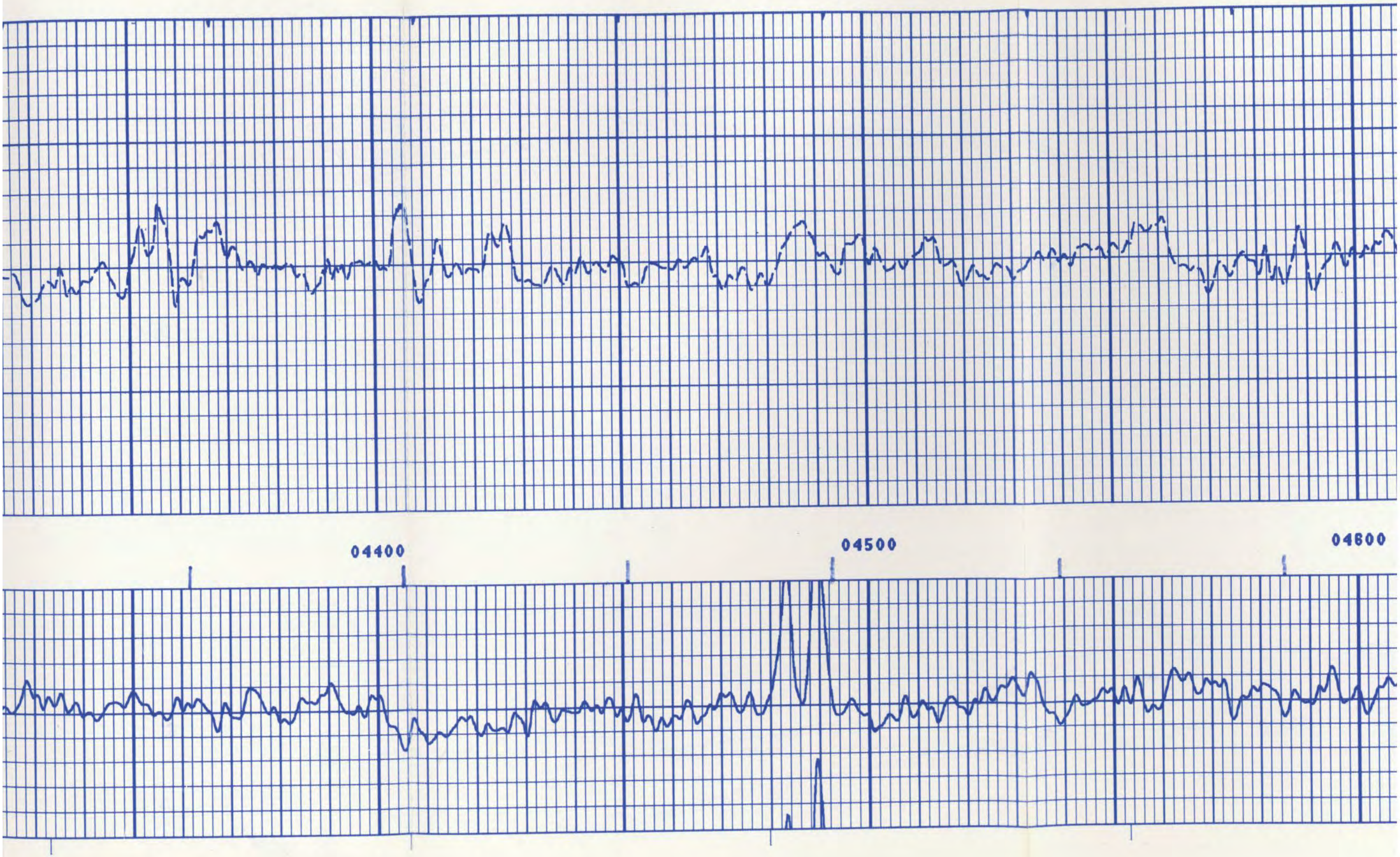

03300
03400
03500

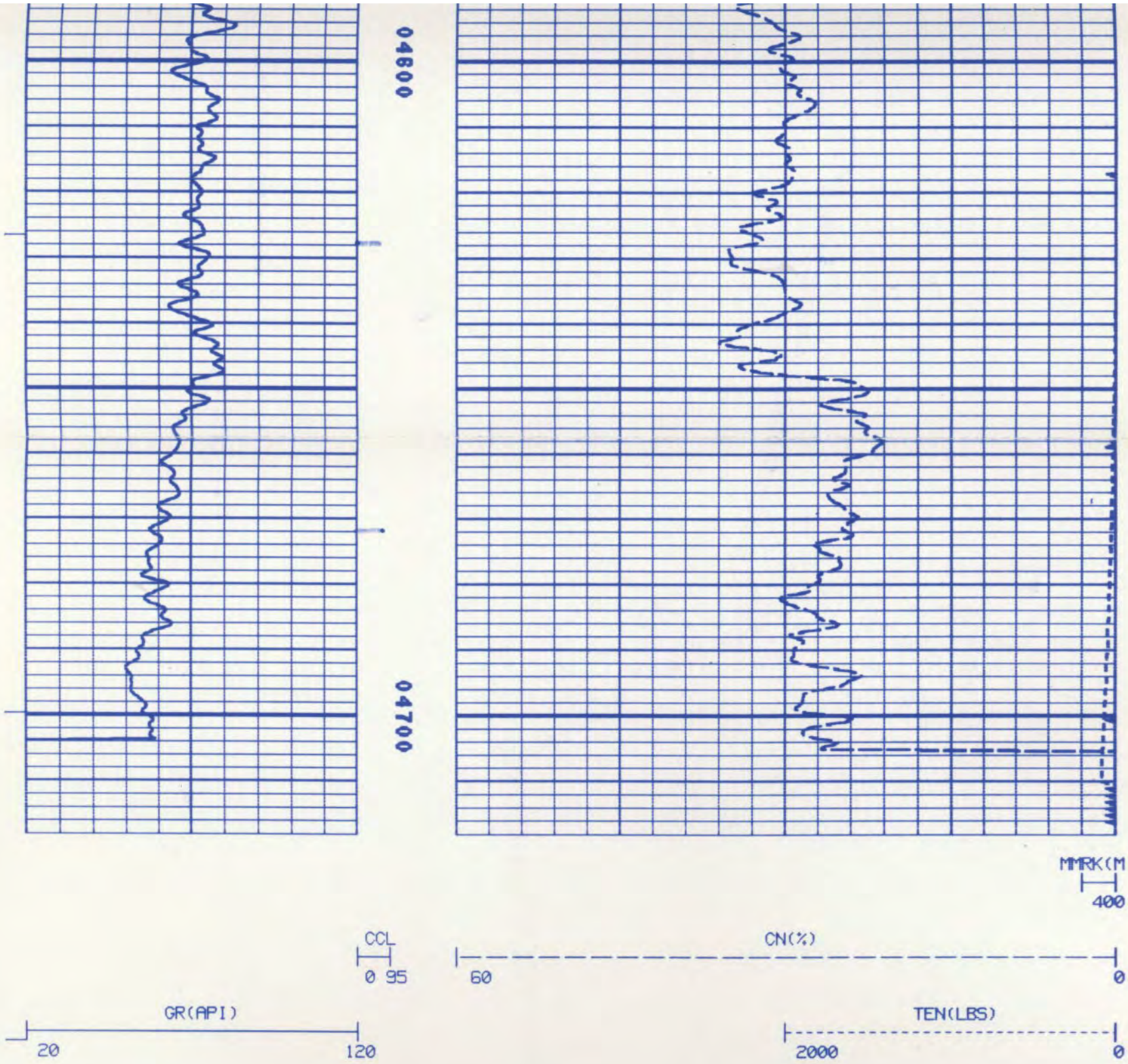
03800
03700
03600




03900
04000


04100
04200
04300


04400
04500
04600



FILE: 5

****
****

FILE: 4

PARAMETERS

NAME	DEPTH INTERVAL	VALUE	UNITS
A	4718 TO 4535	0.000	
CAL COR	4718 TO 4535	7.875	INCH
CASING CNC	4718 TO 4535	NOT ACTIVE	
CHISM CN	4718 TO 4535	ACTIVE	
M	4718 TO 4535	0.000	
MATRIX	4718 TO 4535	LIMESTONE	
SALINITY	4718 TO 4535	0.000	PPK

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE RUN: 1

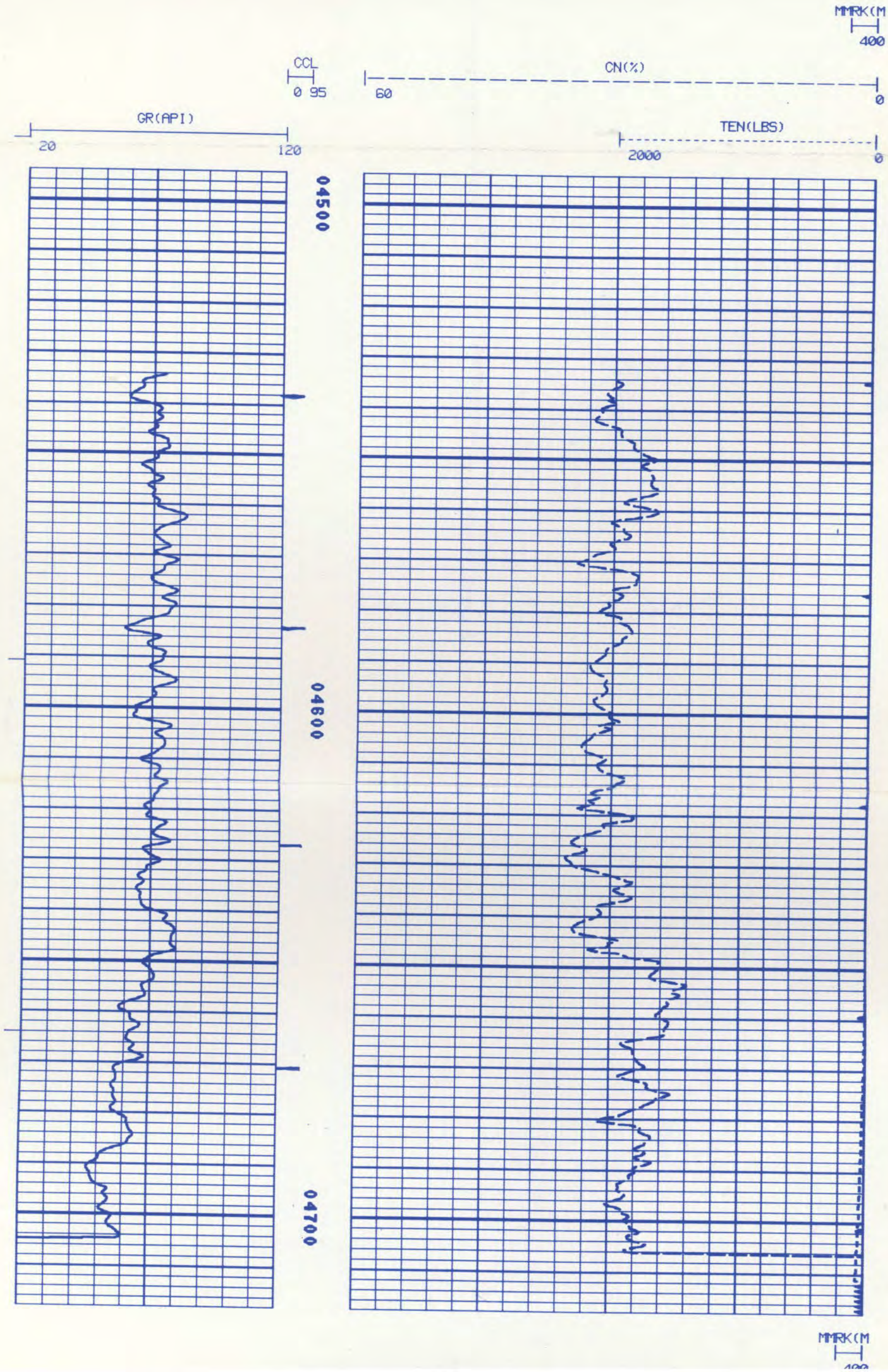
WELL NAME: DISPOSAL WELL NO.1-A TRIP: 1

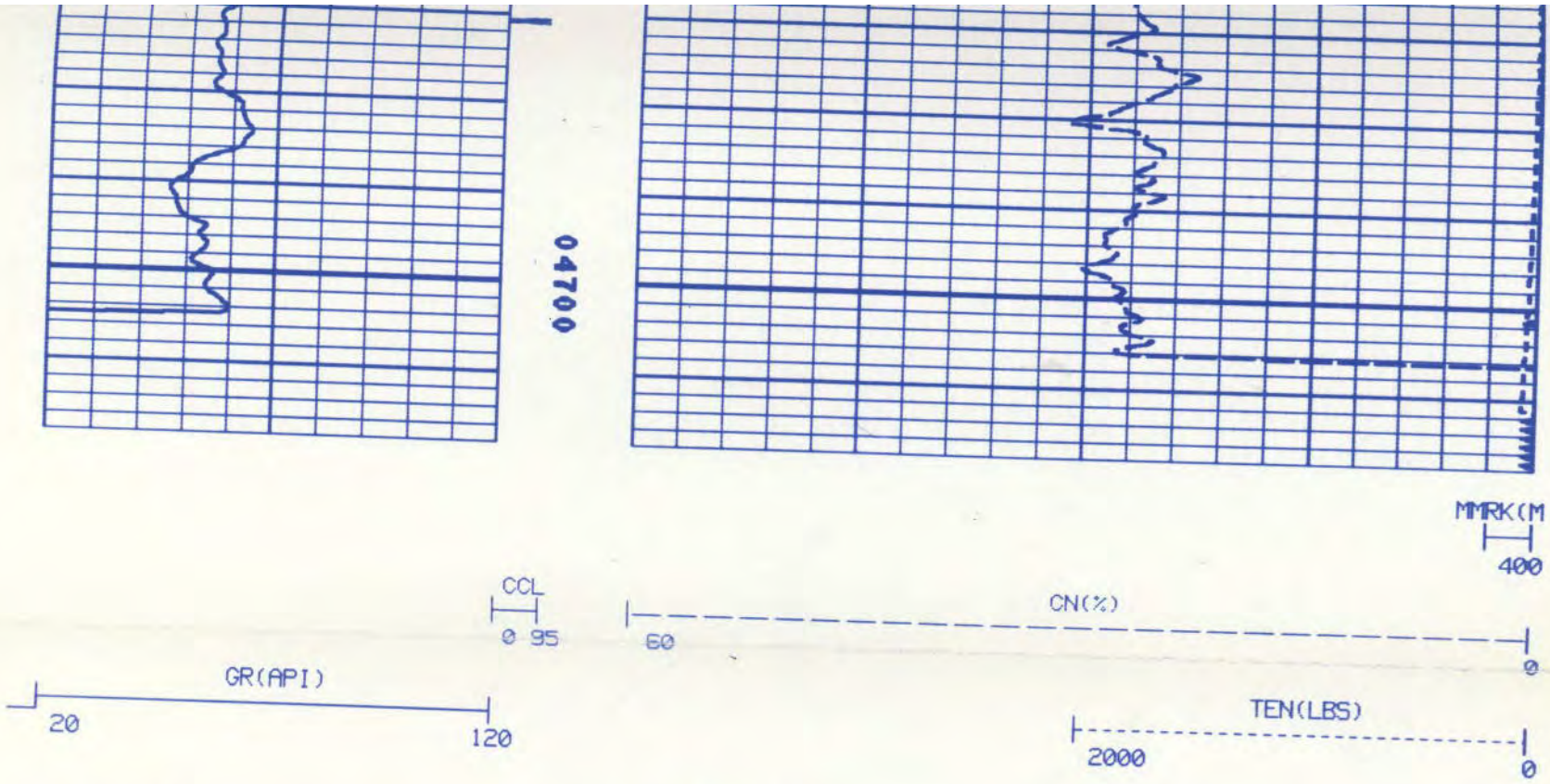
SERVICE: F 228A FILE: 4 DATE: 00/02/20 TIME: 13:11:47

REVISION: FSYS256 REV:G002 VER:2.0 MODE: PLAYBACK

REVISION: FSYS256 REV:G002 VER:2.0

MODE: PLAYBACK





FILE: 4

ATLAS WIRELINE SERVICES

Western Atlas International

COMPENSATED NEUTRON GAMMA RAY

FILE NO. 92193

API NO.

FINAL PRINT

COMPANY	HOECHST CELANESE
WELL	DISPOSAL WELL NO.1-A
FIELD	CELANESE PLANT
COUNTY	MATAGORDA STATE TEXAS

LOCATION: N/A

SEC TWP RGE

OTHER SERVICES: TEMP. SURVEY

PERMANENT DATUM GL ELEV. N/A

LOGGING MEASURED FROM KB 17 FT. ABOVE P.D.

DRILLING MEASURED FROM KB

ELEVATIONS

KB	N/A
DF	N/A
GL	N/A

DATE	11/24/92	
RUN	1	
SERVICE ORDER	110318	
DEPTH-DRILLER	4719	
DEPTH-LOGGER	4716'	
BOTTOM LOGGED INTERVAL	4715	
TOP LOGGED INTERVAL	1200	
TYPE FLUID IN HOLE	SALT WATER	
SALINITY PPM CL.	N/A	
DENSITY LB/GAL.	10 PPG	
LEVEL	200	
MAX. REC. TEMP. DEG. F	135 F	
OPR. RIG TIME	3 HRS	
EQUIP. NO. / LOC.	HL 6301 HOUSTON	
RECORDED BY	HERRERA	
WITNESSED BY	HALL	

BOREHOLE RECORD

NO.	BIT	FROM	TO

FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

CASING RECORD

SIZE	WGT	FROM	TO
13 5/8	N/A	1398	0
9 5/8	40&44	5938	0

REMARKS RUN (1)

CORRELATED TO GR/SBT DATED 4/27/92

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
1	1	CN	71531	2420	FREE
1	1	GR	46737	1309	FREE
1	1	CCL		2318	FREE

****

FILE: 5

PARAMETERS

NAME	DEPTH INTERVAL	VALUE	UNITS
A	4717 TO 1182	0.000	
CAL COR	4717 TO 1182	7.875	INCH
CASING CNC	4717 TO 1182	NOT ACTIVE	
CHISM CN	4717 TO 1182	ACTIVE	
M	4717 TO 1182	0.000	
MATRIX	4717 TO 1182	LIMESTONE	
SALINITY	4717 TO 1182	0.000	PPK

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE

WELL NAME: DISPOSAL WELL NO.1-A

SERVICE: F 228A FILE: 5

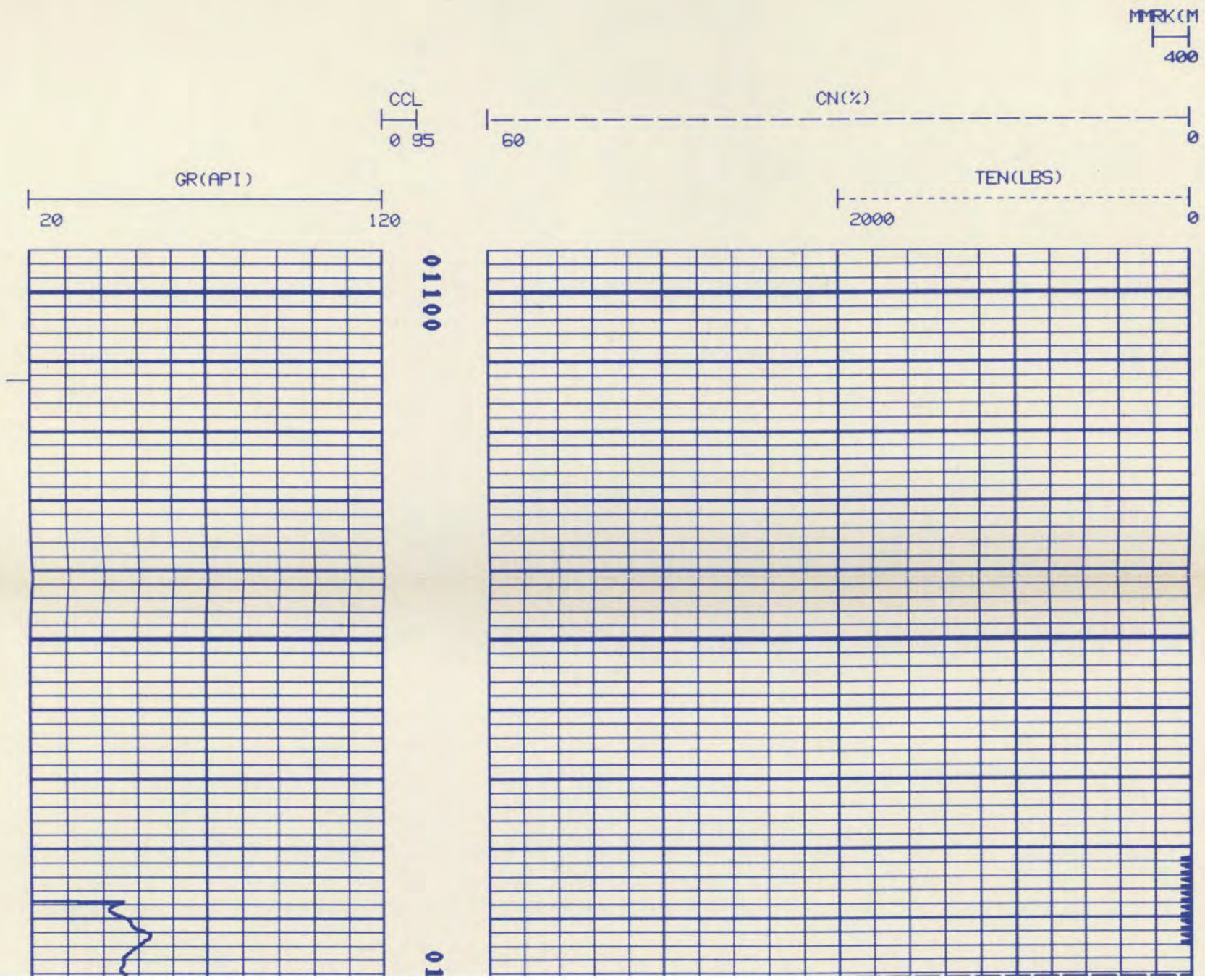
REVISION: FSYS256 REV:G002 VER:2.0

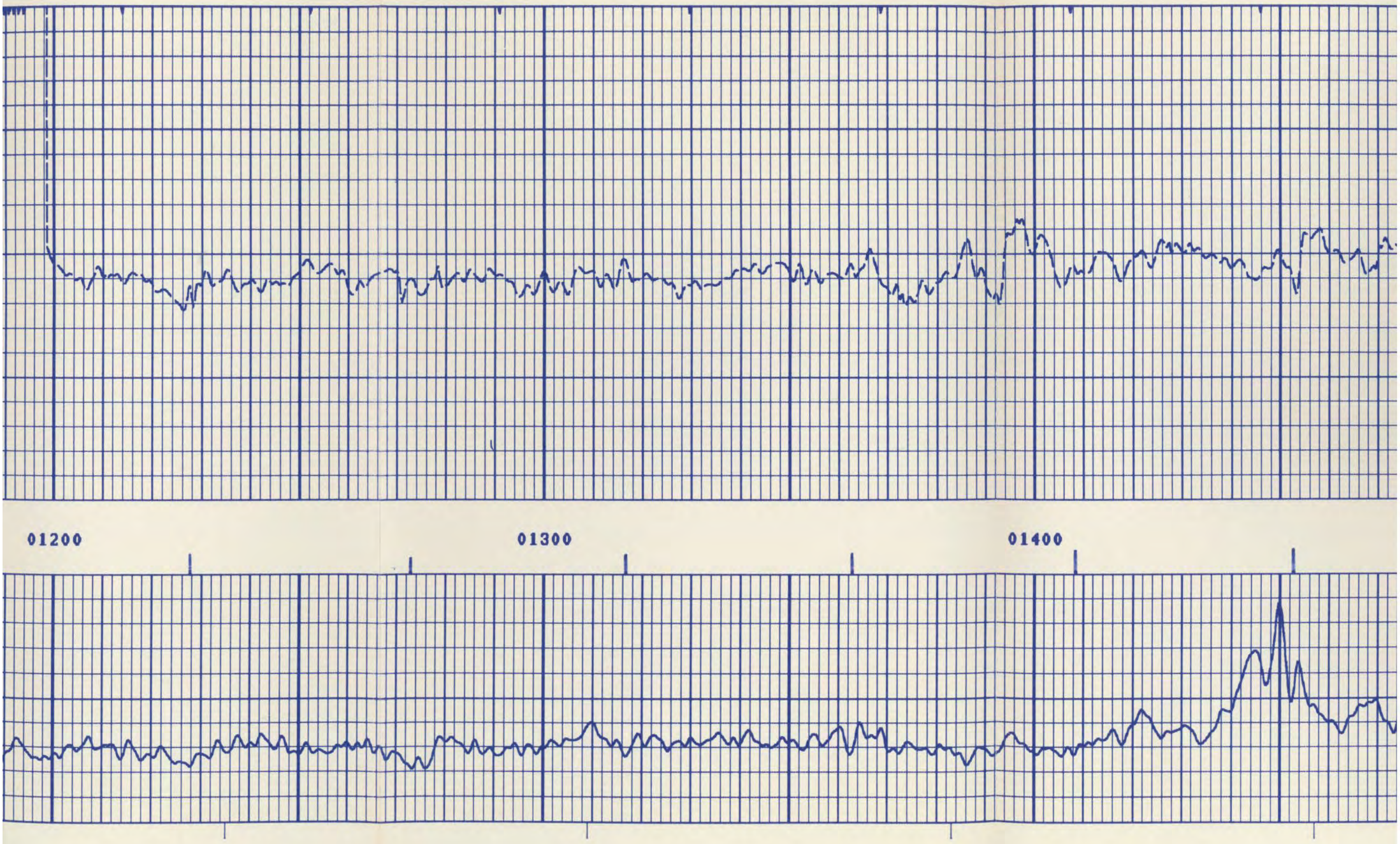
RUN: 1

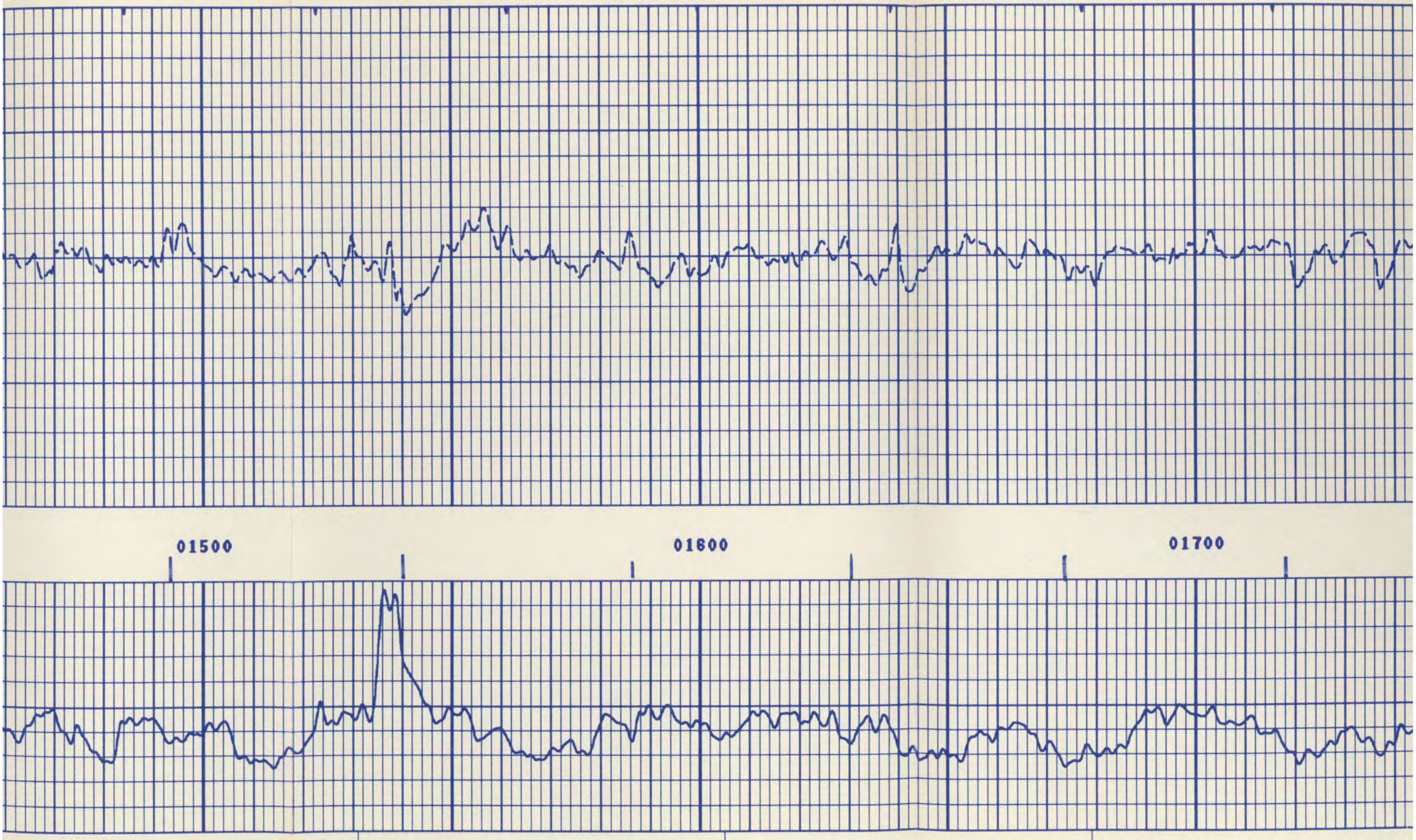
TRIP: 1

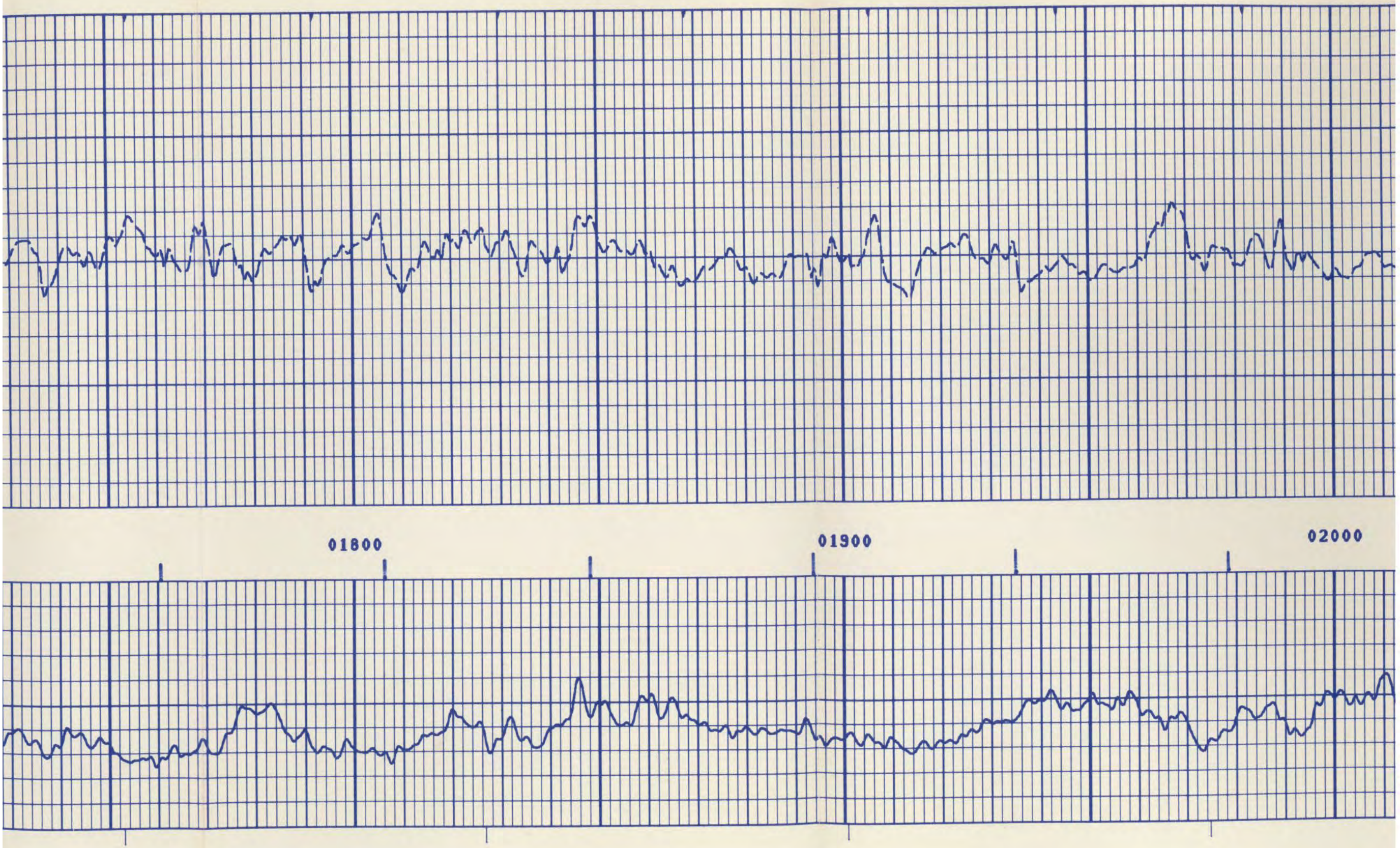
TIME: 13:20:39

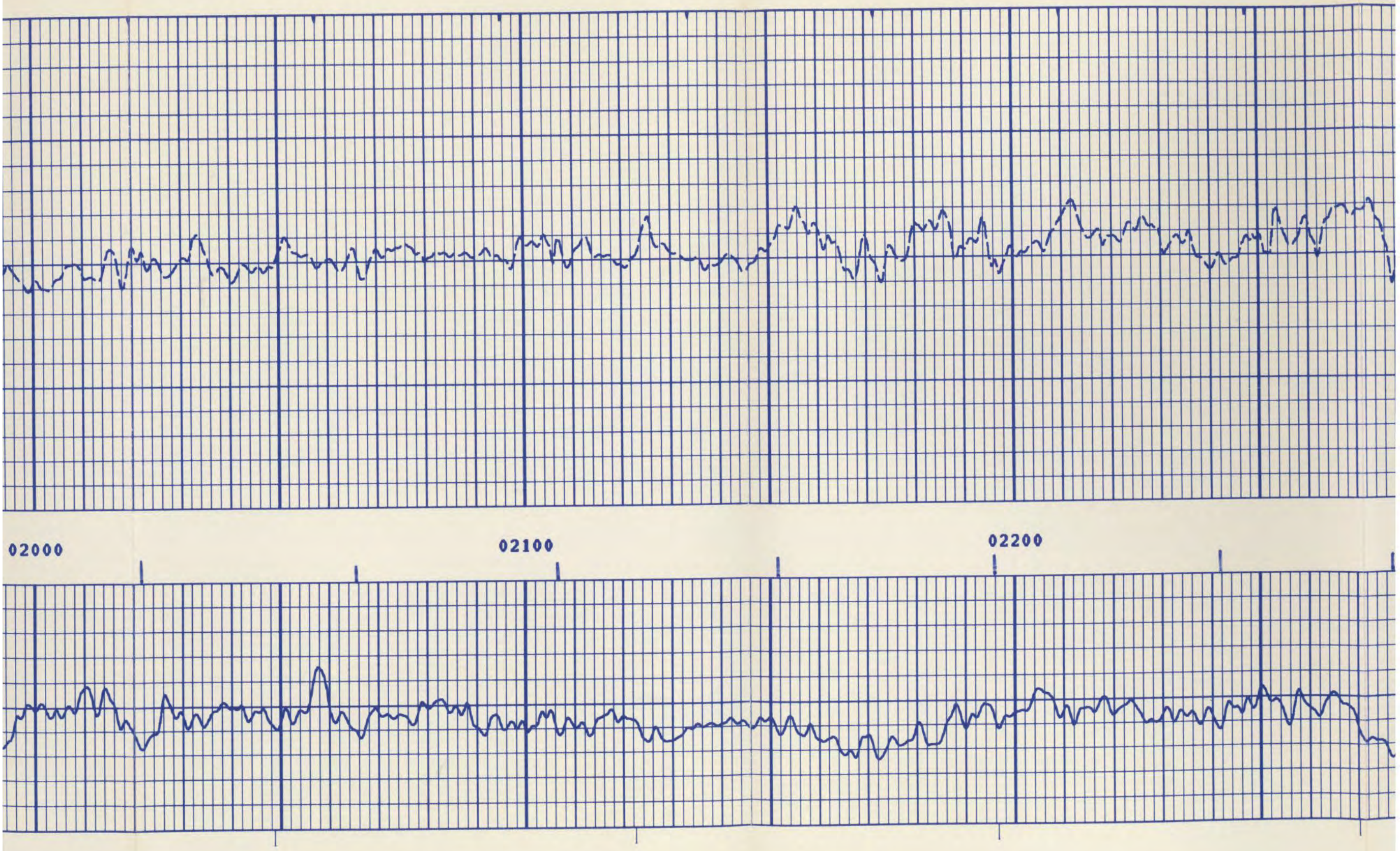
MODE: PLAYBACK

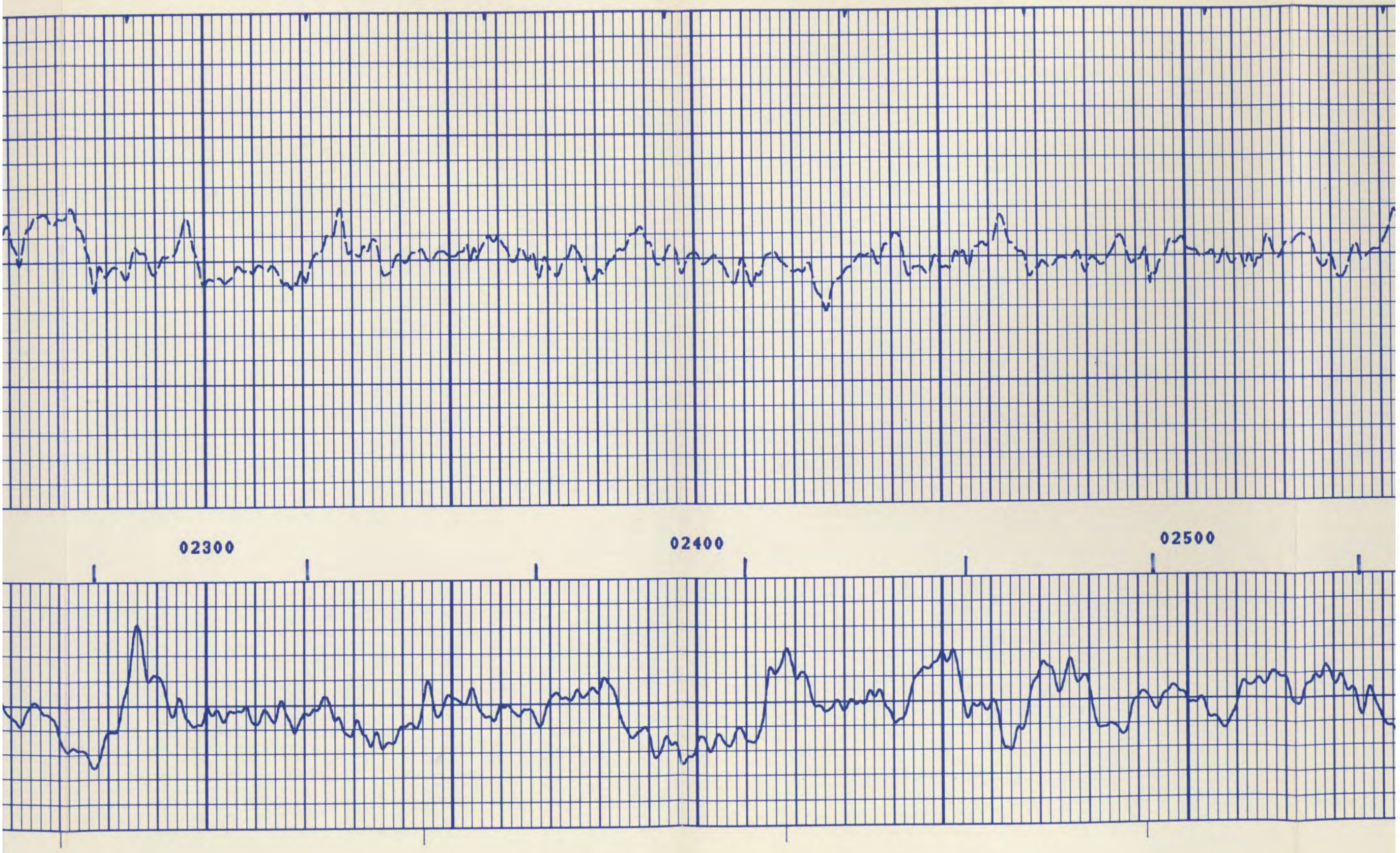


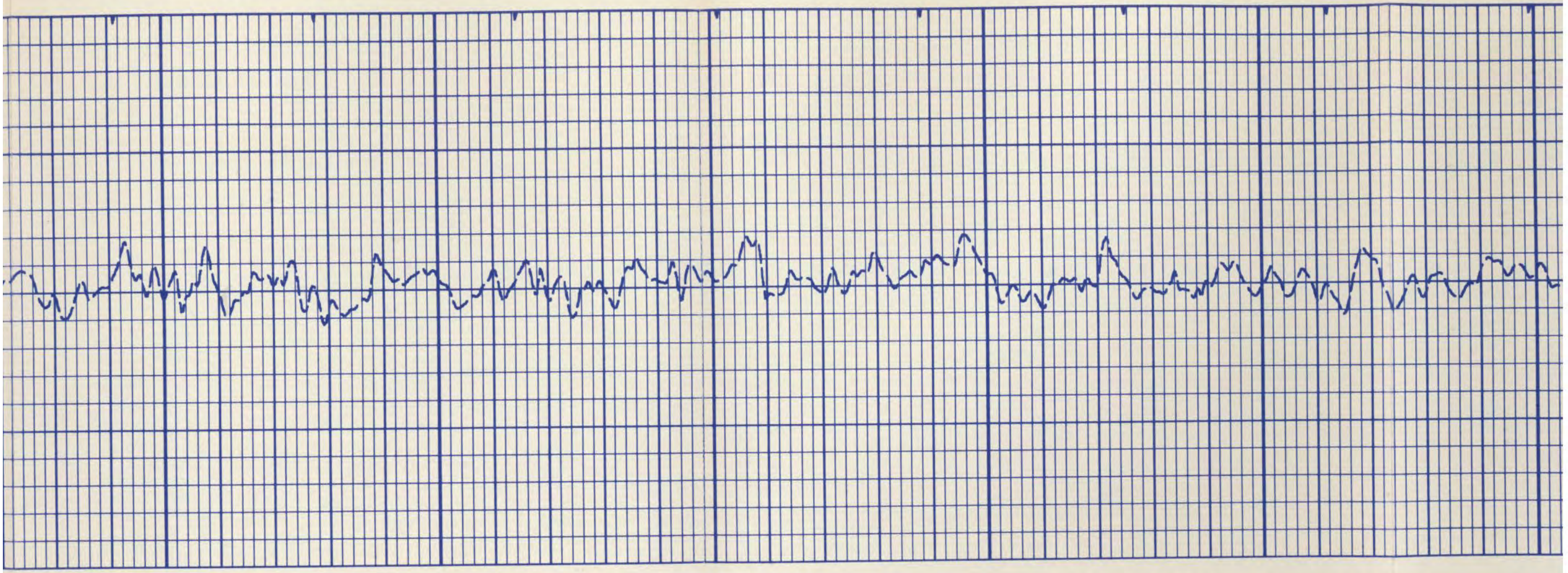

01200
01300
01400

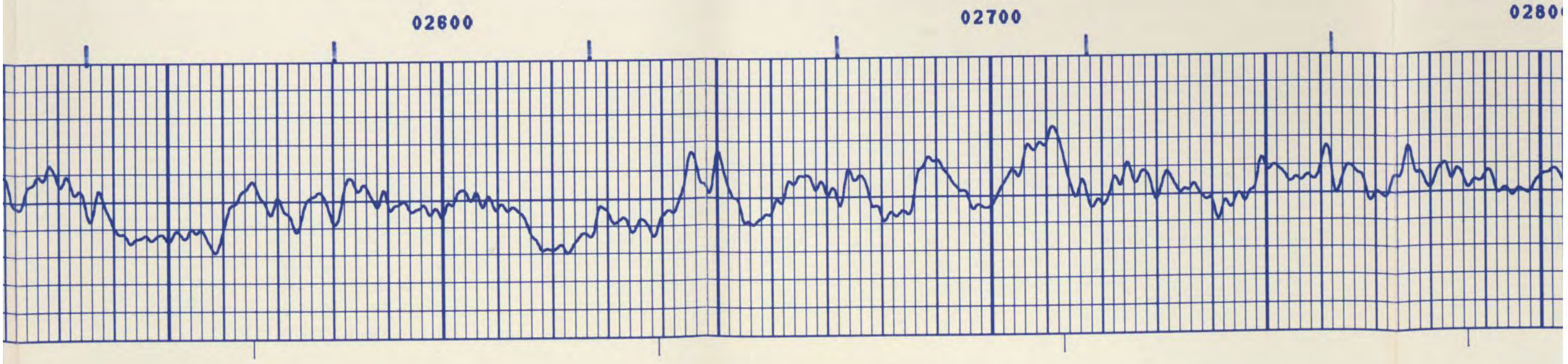

01500
01600
01700

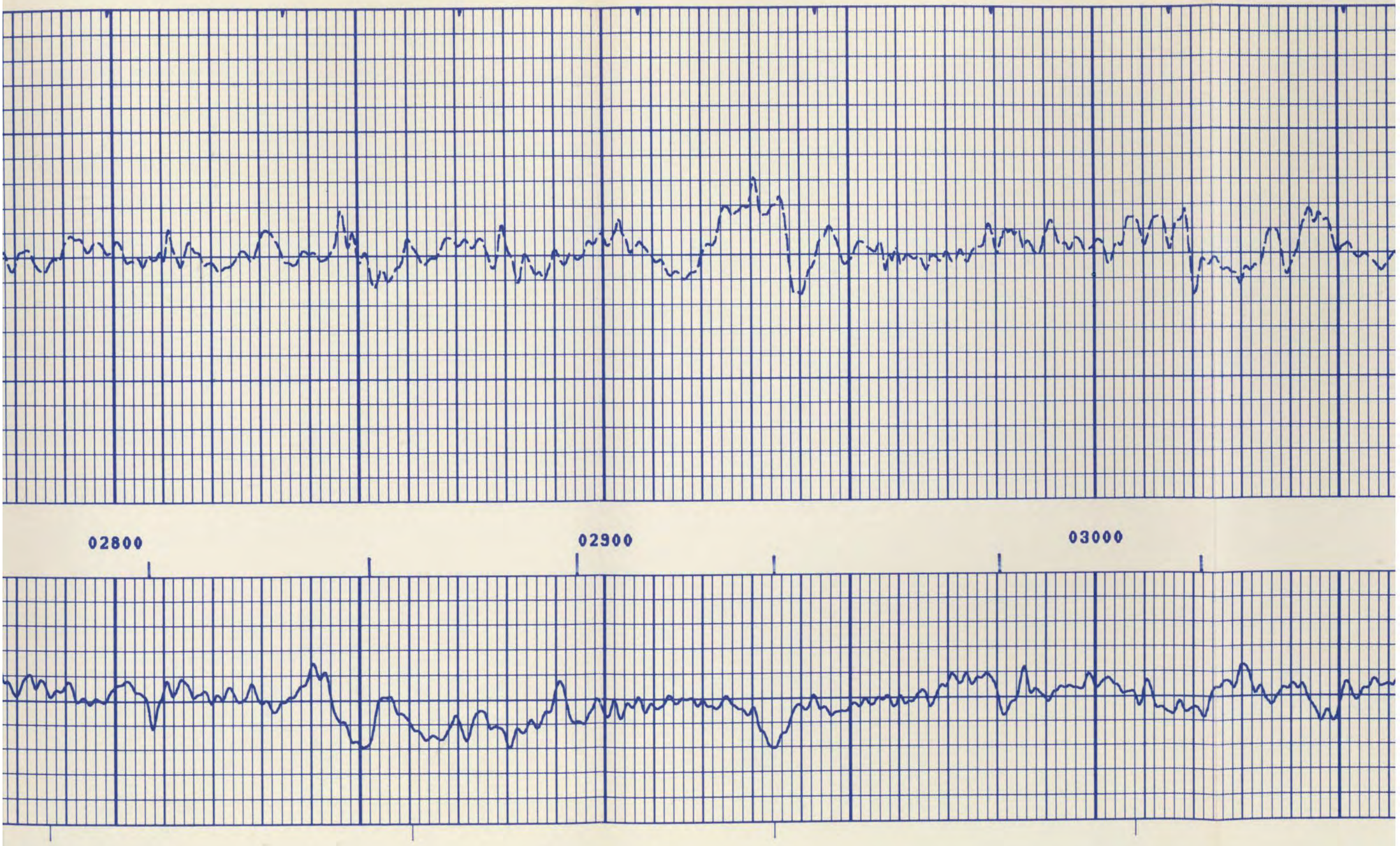

01800
01900
02000

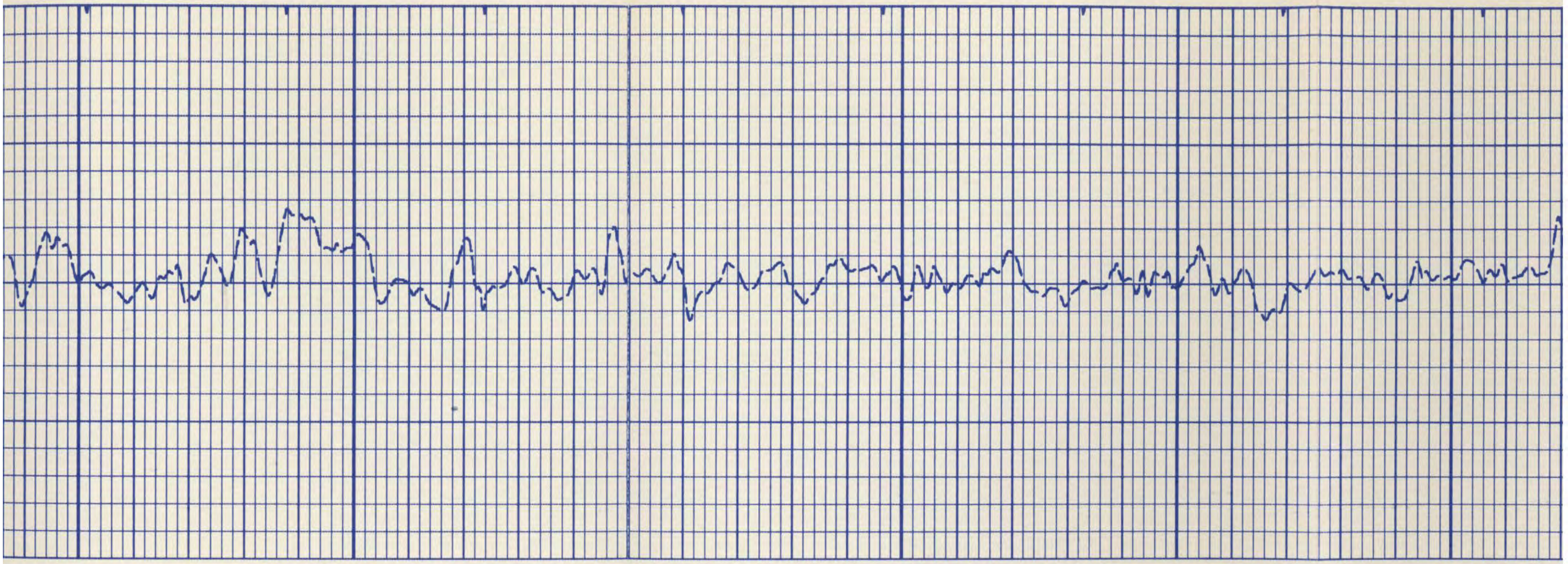

02000
02100
02200

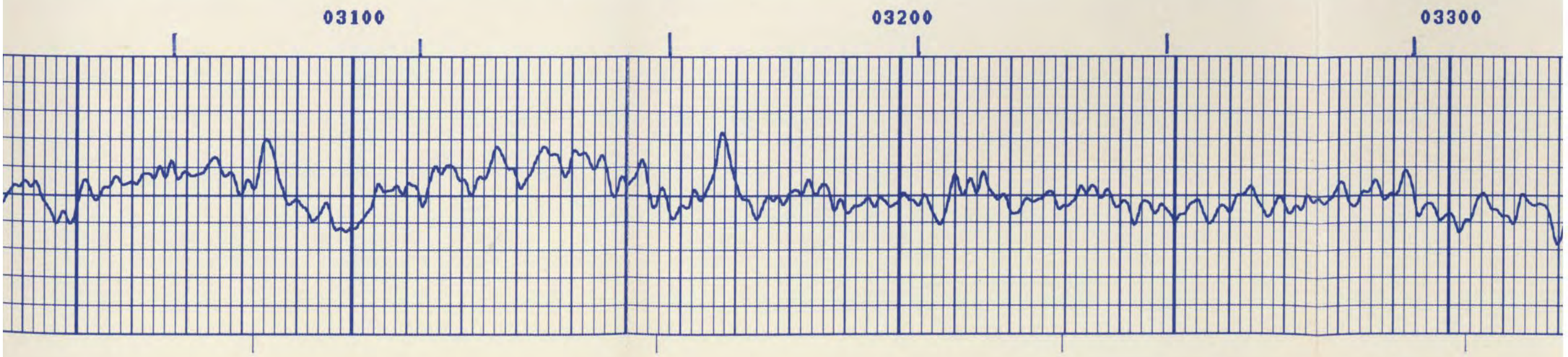

02300
02400
02500

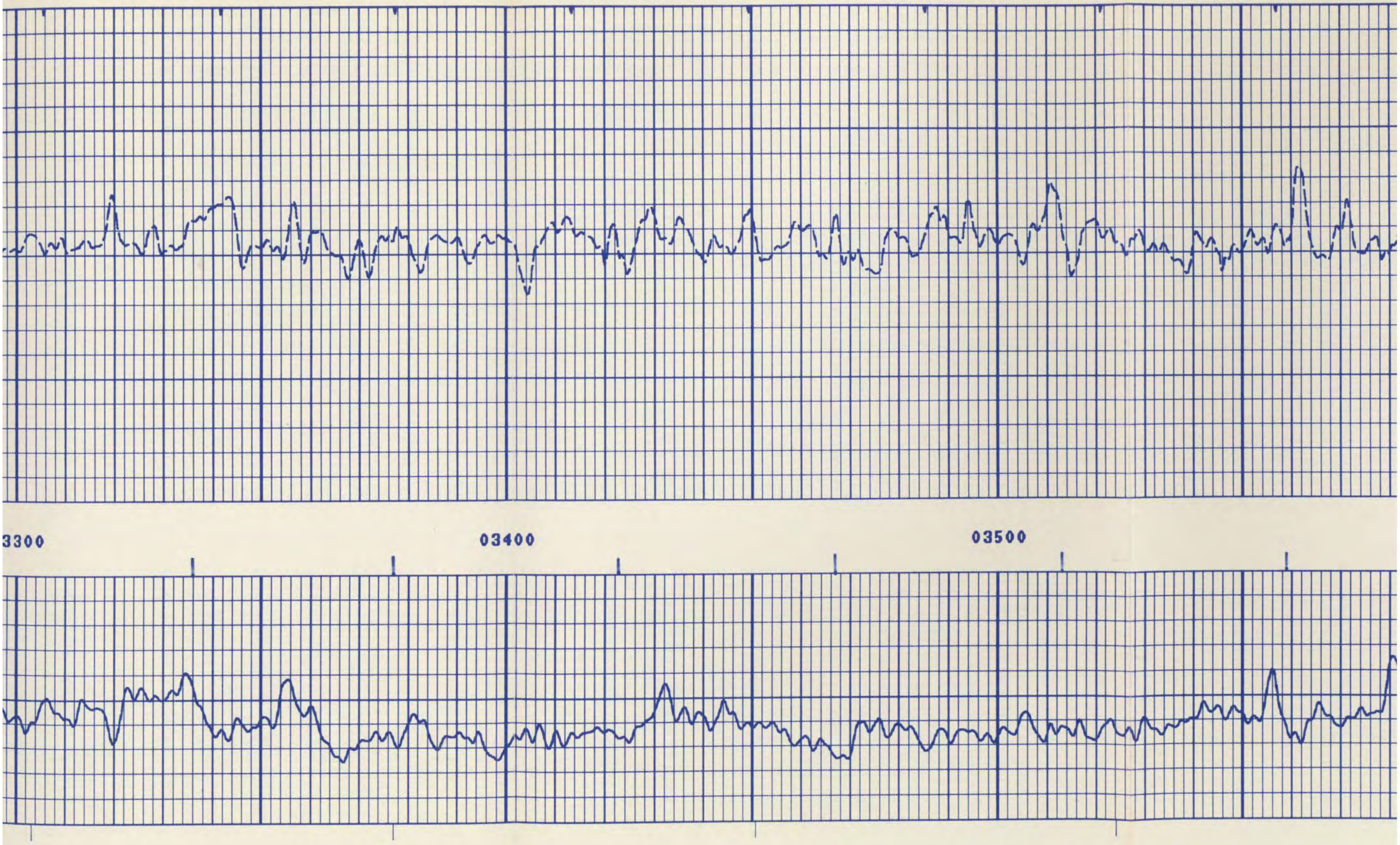


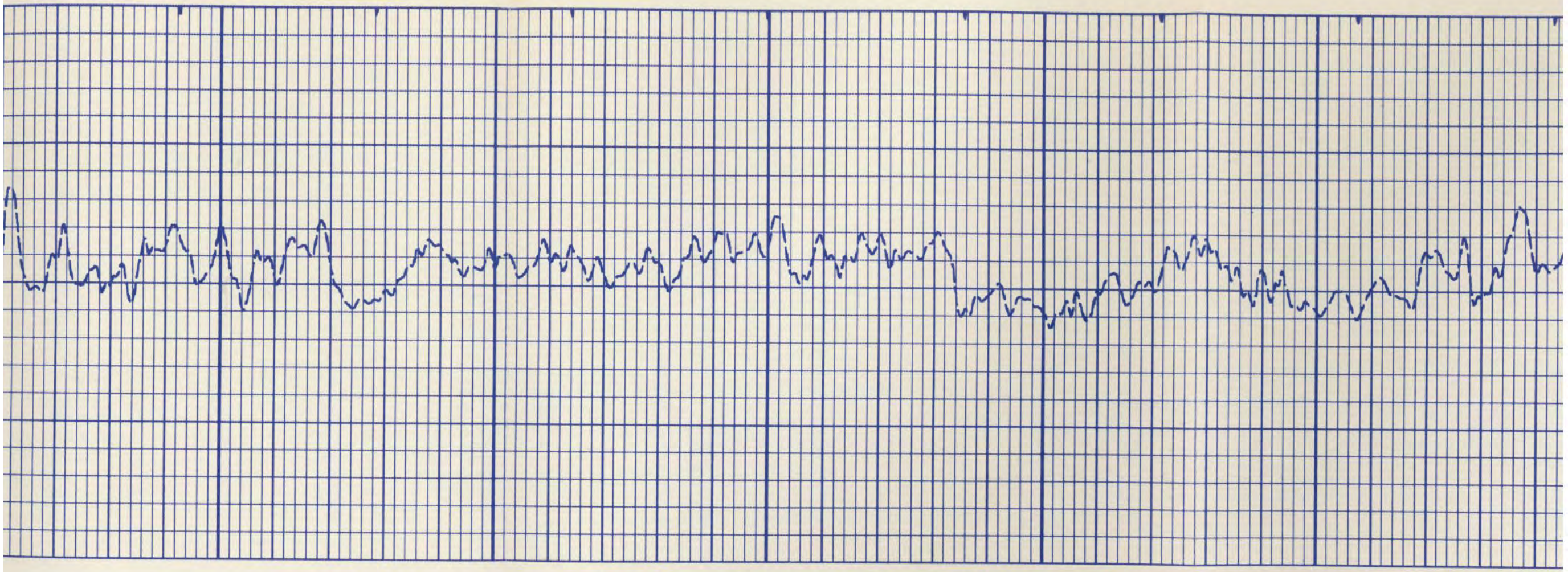

02600
02700
0280

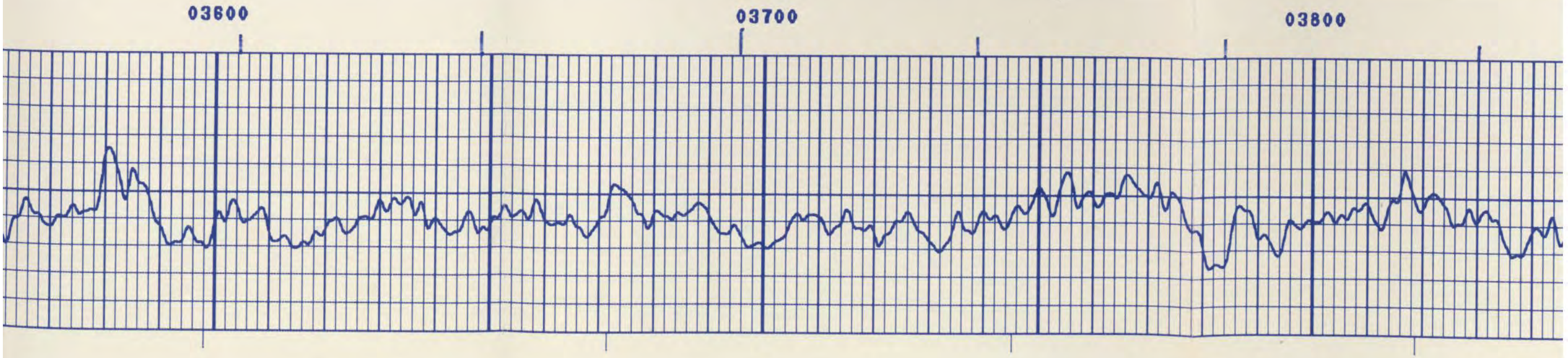

02800
02900
03000

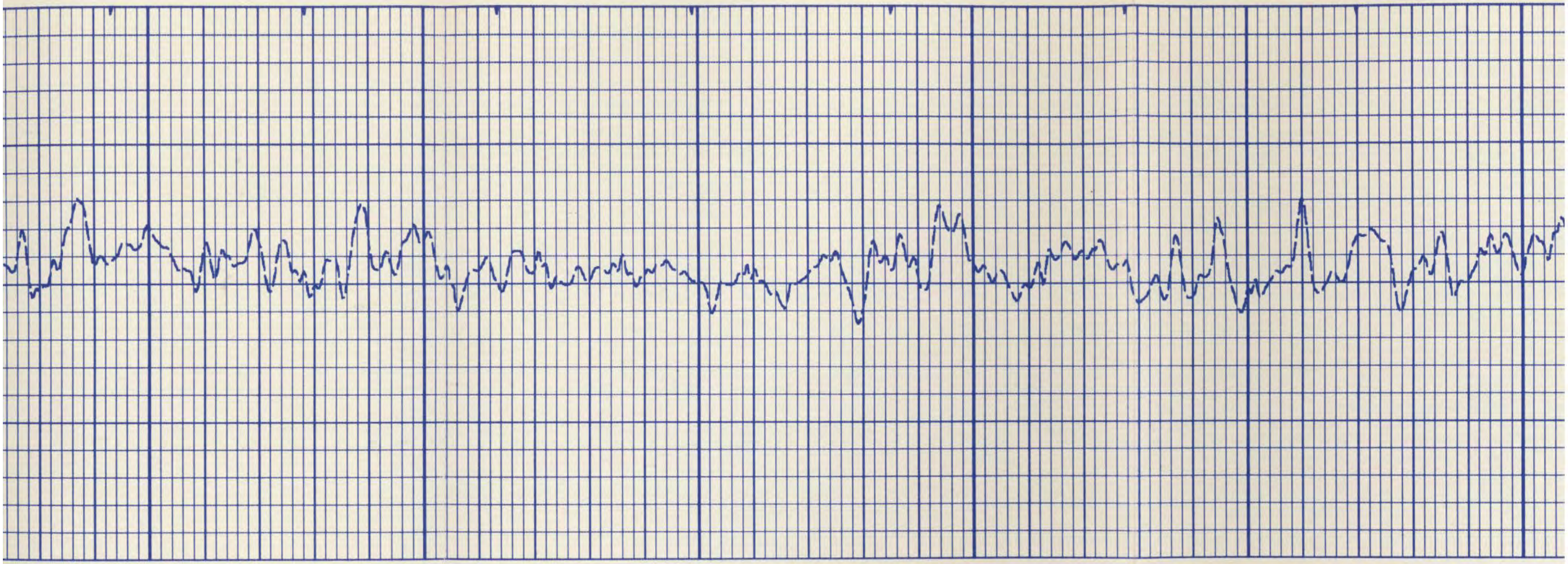


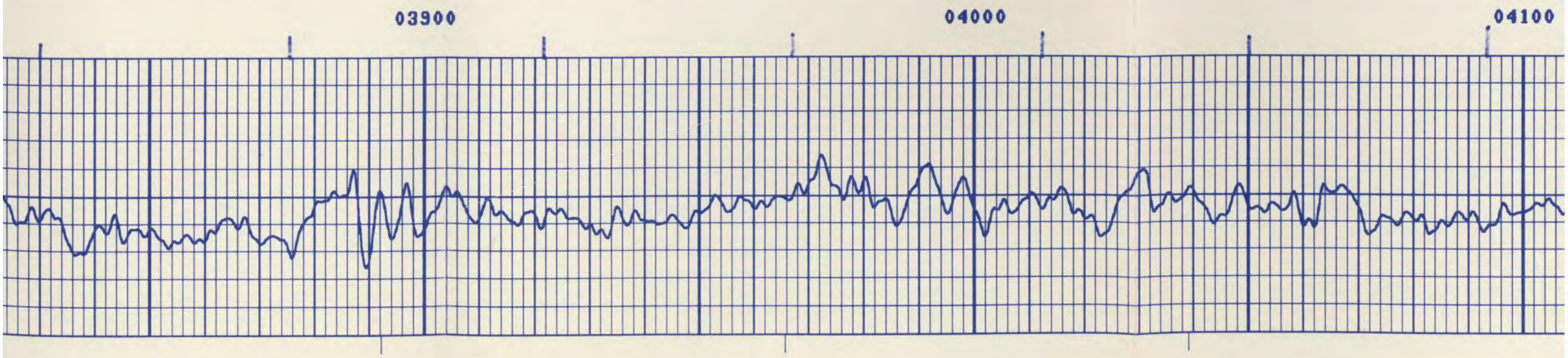

03100
03200
03300

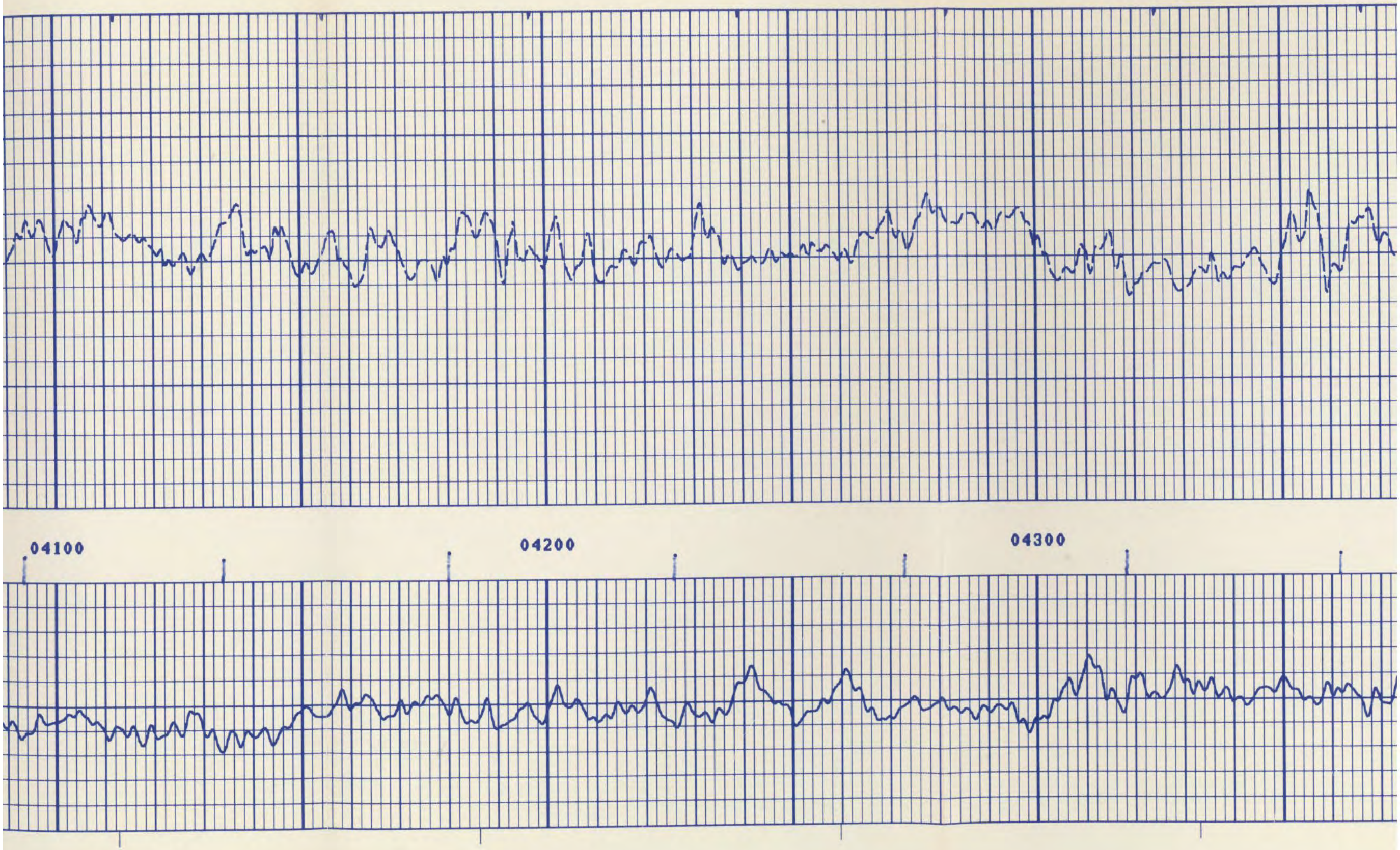

3300
03400
03500

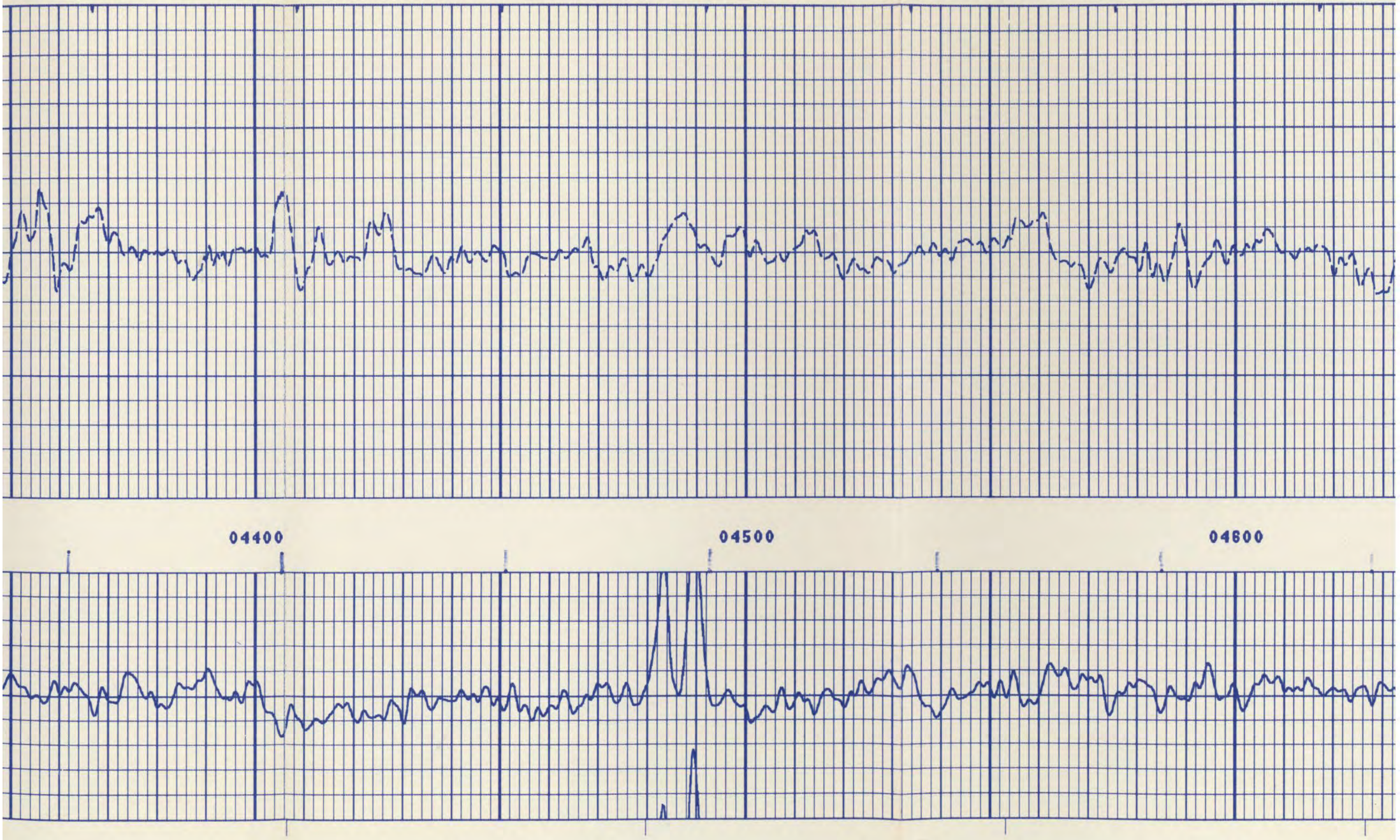


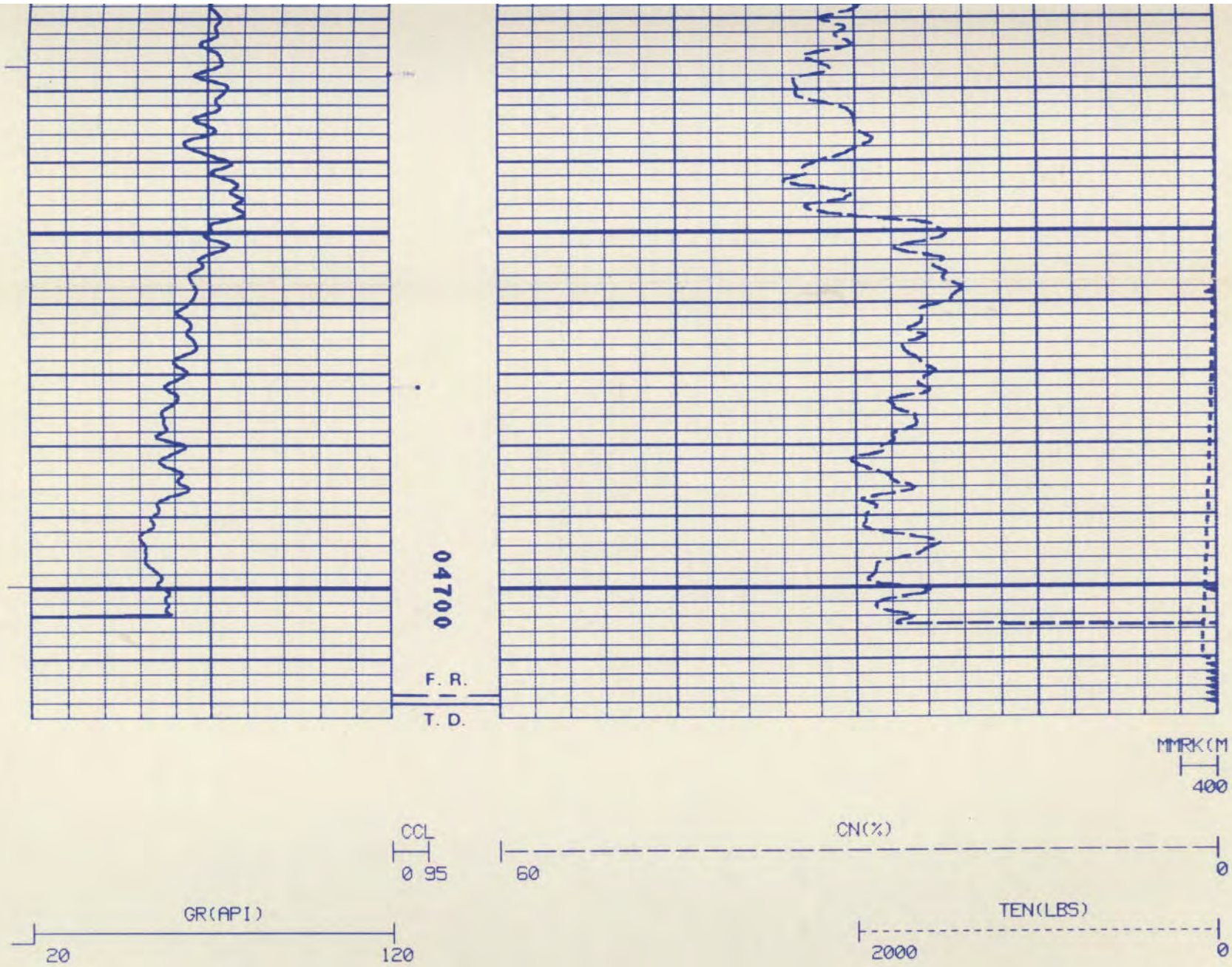

03600
03700
03800




03900
04000
04100


04100
04200
04300


04400
04500
04600



FILE: 5

****
****

FILE: 4

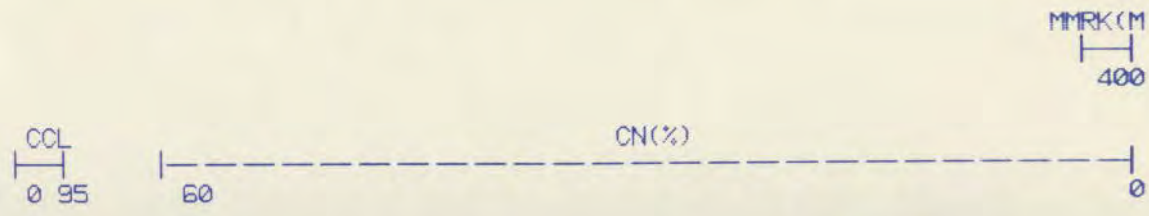
PARAMETERS

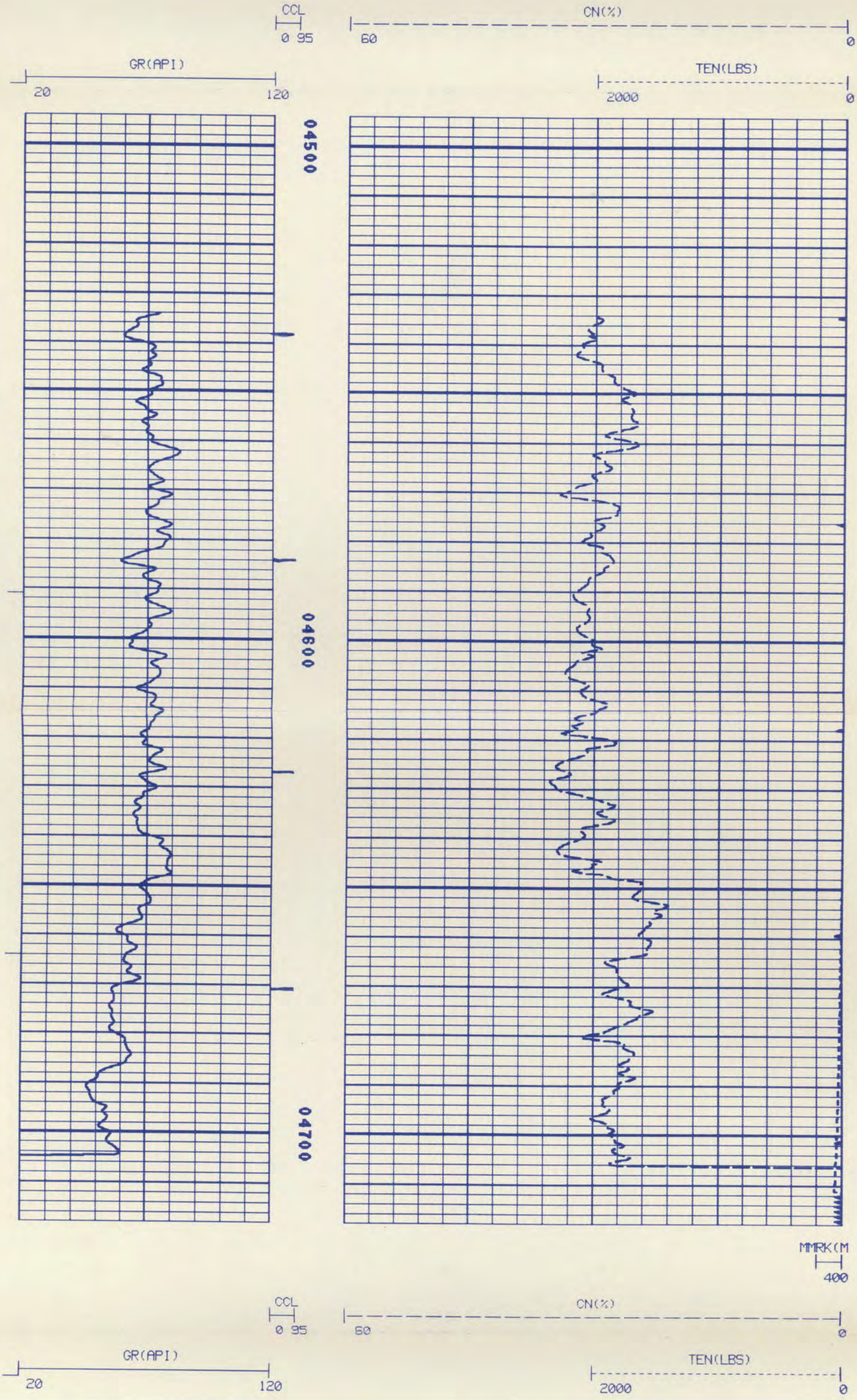
NAME	DEPTH INTERVAL	VALUE	UNITS
A	4718 TO 4535	0.000	
CAL COR	4718 TO 4535	7.875	INCH
CASING CNC	4718 TO 4535	NOT ACTIVE	
CHISM CN	4718 TO 4535	ACTIVE	
M	4718 TO 4535	0.000	
MATRIX	4718 TO 4535	LIMESTONE	
SALINITY	4718 TO 4535	0.000	PPK

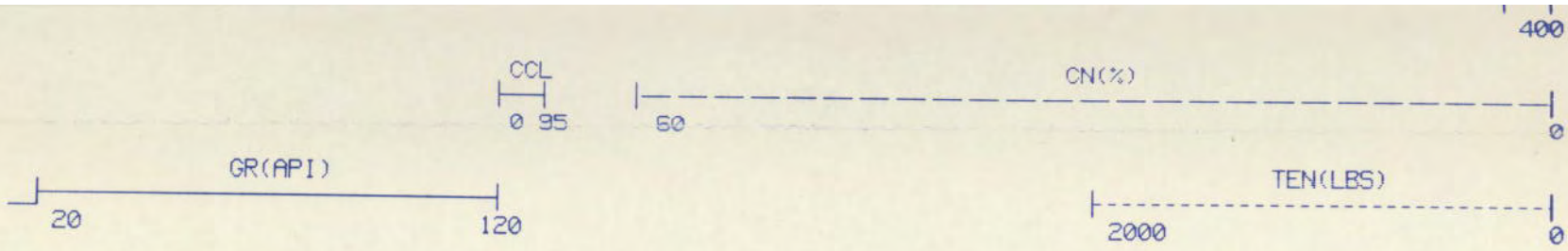
DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: HOECHST CELANESE
RUN: 1
WELL NAME: DISPOSAL WELL NO.1-A
TRIP: 1
SERVICE: F 228A FILE: 4 DATE: 00/02/20
TIME: 13:11:47
REVISION: FSYS256 REV:G002 VER:2.0
MODE: PLAYBACK




CCL
0 95
CN(%)
60
0
GR(API)
20
120
TEN(LBS)
2000
0
04500
04600
04700
MMRK(M
400
CCL
0 95
CN(%)
60
0
GR(API)
20
120
TEN(LBS)
2000
0



FILE: 4

****

DIAGNOSTIC PRODUCTION LOG ANALYSIS

Hoechst Celanese Corporation
Waste Disposal Well No. 1-A
Bay City Plant
Matagorda County, Texas

Prepared for
Bob Hall

Golden StrataServices, Inc.
Houston, Texas

ATLAS WIRELINE SERVICES
WESTERN ATLAS INTERNATIONAL

February 1993

Prepared by Freeman Hill, III

DISCLAIMER

In making interpretations of logs, our employees will give Customer the benefit of their best judgement, but since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or the correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the Customer resulting from any interpretation made/by any of our employees.

APPENDIX C

RADIOACTIVE TRACER SURVEY FOR MIT AND WESTERN ATLAS' LOG INTERPRETATION

Disposal Well Mechanics

The well consists of 13 5/8 inch casing from 0 feet to 1,398 feet. Within this pipe is 9 5/8 inch casing from 0 feet to 5,938 feet. This well has previously been used to dispose fluids but disposal was at a deeper depth.

A logging program, over a period of time, consisted of a radioactive tracer ejector and detector instrument, a temperature sonde, and a continuous spinner which was used to ensure the integrity of the well's casing and cement and to finally ascertain that the correct interval was to accept the disposed fluids.

The well was shut-in for a minimum of three days prior to initiating the logging program to provide a static, geothermal temperature profile for comparison with an altered temperature gradient after injection. The following will list each step of the logging program, its purpose and a discussion of the log's analysis.

Logging Program and Analysis

Date: 11/24/92 - Temperature / Gamma Ray / Neutron Log

1. Logged temperature instrument and Gamma Ray/Neutron from surface to 4,715 feet and 1,200 feet to 4,705 feet, respectively.

   Purpose: Base-line static temperature gradient and correlation.

   Analysis: Since uniform gradients are uncommon near surface due to fluctuating surface temperatures and changing lithologies with varying thermal diffusivities and conductivities, the irregularities found above 700 feet should be ignored. A fluid level is interpreted at 286 feet.

   Below this depth, (750 feet) a fairly straight temperature gradient of approximately .012°F/ft is observed to 3,200 feet. Some minor anomalies are noted; however, they can be attributed to varying lithologies. It is important to remember that due to the nature of shale (e.g., no permeability, compacted, little water content), the temperature recovery is retarded. Conversely, porous, permeable sands will reveal a faster thermal recovery from an altered temperature state. Below 3,200 feet, a warming trend is found with the warmest point (3,500 feet) adjacent to the targeted offset disposal zone and the new target zone to be initiated in this well.

   Since the offset interval accepting the largest volume of injected fluid over the longest period of time would result in the highest observed temperature anomaly, it is evident that the target zone has accepted the vast majority of the disposed fluids. If any other formations had accepted fluid over the disposal periods, it is very probable that they would also reveal some temperature anomalies which are not present.

   Finally, the temperature trend beginning below 3,200 feet and below the target zone can be attributed mostly to vertical heat conduction through the surrounding formation.

Western Atlas International

ATLAS WIRELINE SERVICES

PRODUCTION LOGGING SERVICES

FILE NO. 93015

API NO.

FINAL PRINT

COMPANY CELANESE BAY CITY PLANT

WELL NO. 1-A

FIELD BAY CIY PLANT

COUNTY MATAGORDA STATE TEXAS

LOCATION: N/A

SEC TWP N/A RGE N/A

OTHER SERVICES

PERMANENT DATUM GL ELEV. N/A

LOGGING MEASURED FROM KB 17 FT. ABOVE P.D.

DRILLING MEASURED FROM RKB

ELEVATIONS

KB N/A

DF N/A

GL N/A

DATE	1-28-93	
RUN	1	
SERVICE ORDER	60894	
DEPTH-DRILLER	N/A	
DEPTH-LOGGER	3802	
BOTTOM LOGGED INTERVAL	3800	
TOP LOGGED INTERVAL	3000	
TYPE FLUID IN HOLE		
SALINITY PPM CL.	N/A	
DENSITY LB/GAL.		
LEVEL	FULL	
MAX. REC. TEMP. DEG. F	N/A	
OPR. RIG TIME	3.8	
EQUIP. NO. / LOC.	6428 HOUSTON	
RECORDED BY	JOHNSTON/HERRERA	
WITNESSED BY	MR. BOB HALL	

BOREHOLE RECORD

NO.	BIT	FROM	TO

FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

CASING RECORD

SIZE	WGT	FROM	TO

REMARKS RUN (1)

TRACER WITH TWO DETECTORS RUN FOR MECHANICAL INTEGRITY TEST...WITH STATE OFFICIAL ON LOCATION

NO PROBLEMS ENCOUNTERED, OTHER THAN AN OVER-SENSITIVE CCL. THE COLLAR LOCATOR WORKED ON THE FIRST BASE PASS, WHICH WAS USED FOR THE TIE-IN. SEE FIRST SECTION (BOTTOM).

NO SIGN OF CHANNEL SEEN.

** COMMENTS ON R.A.T. **

ALL FILES ARE IN ORDER OF

** COMMENTS ON R.A.T. **

ALL FILES ARE IN ORDER OF OPERATION, WITH TIMES NOTED.

BDET IS BOTTOM DETECTOR
TDET IS TOP DETECTOR
EJECTOR IS 3.5 FT. ABOVE BDET, AND 3.5 FT. BELOW TDET.
CCL IS 2 FT. ABOBE TDET.

FILE BELOW IS LAST BASE PASS

TIME IS 12:45:P.M.

****

FILE: 24

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: CELANESE BAY CITY PLANT
WELL NAME: A-1
SERVICE: F 150C FILE: 24 DATE: 01/28/93
REVISION: FSYS256 REV:G002 VER:2.0

RUN: 1
TRIP: 1
TIME: 09:14:48
MODE: RECORD

SPD (FT/MIN)
0 200

TEN (LBS)
5000 0

UDC (V)

BDET (CPS)

SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

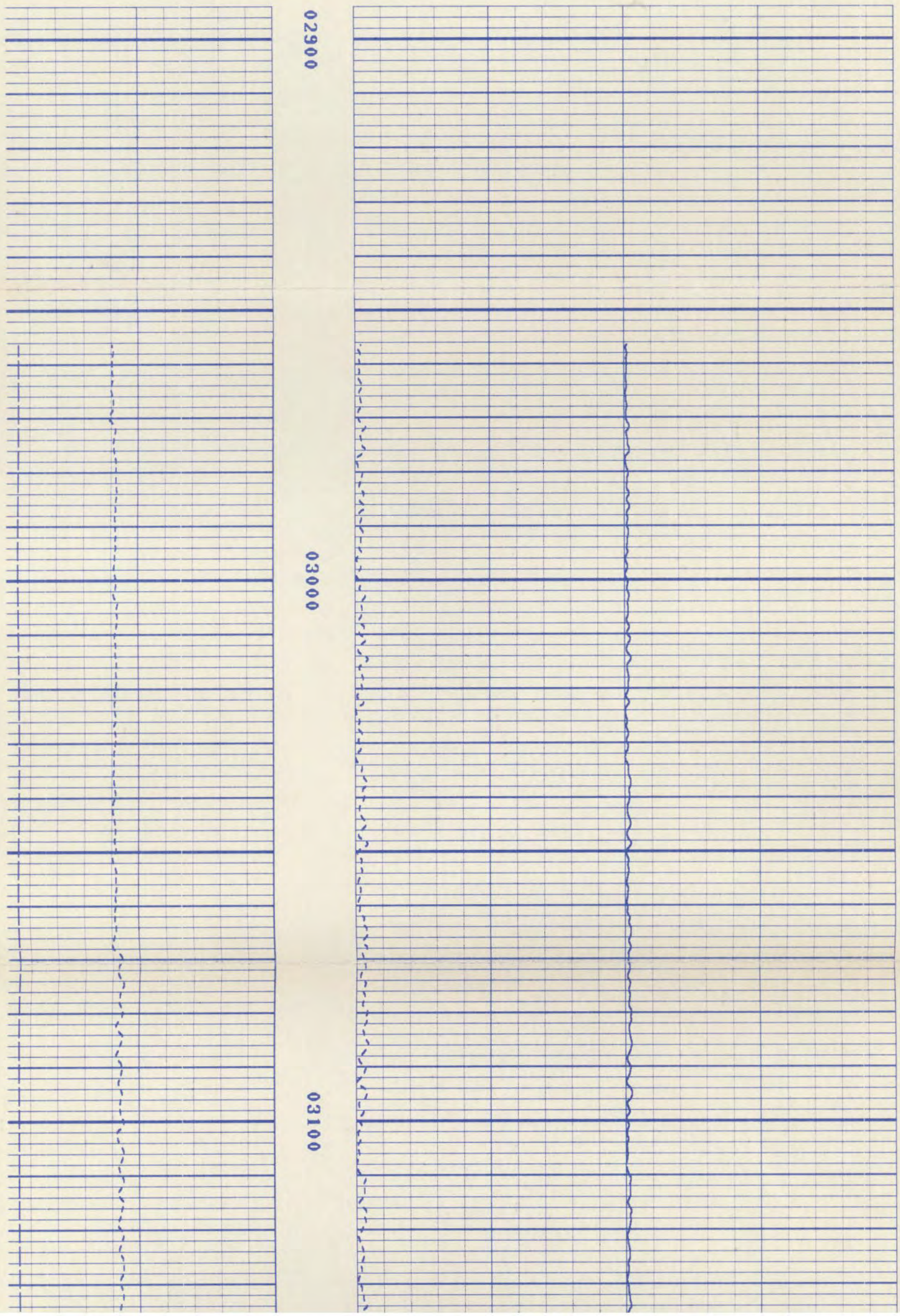
0 800

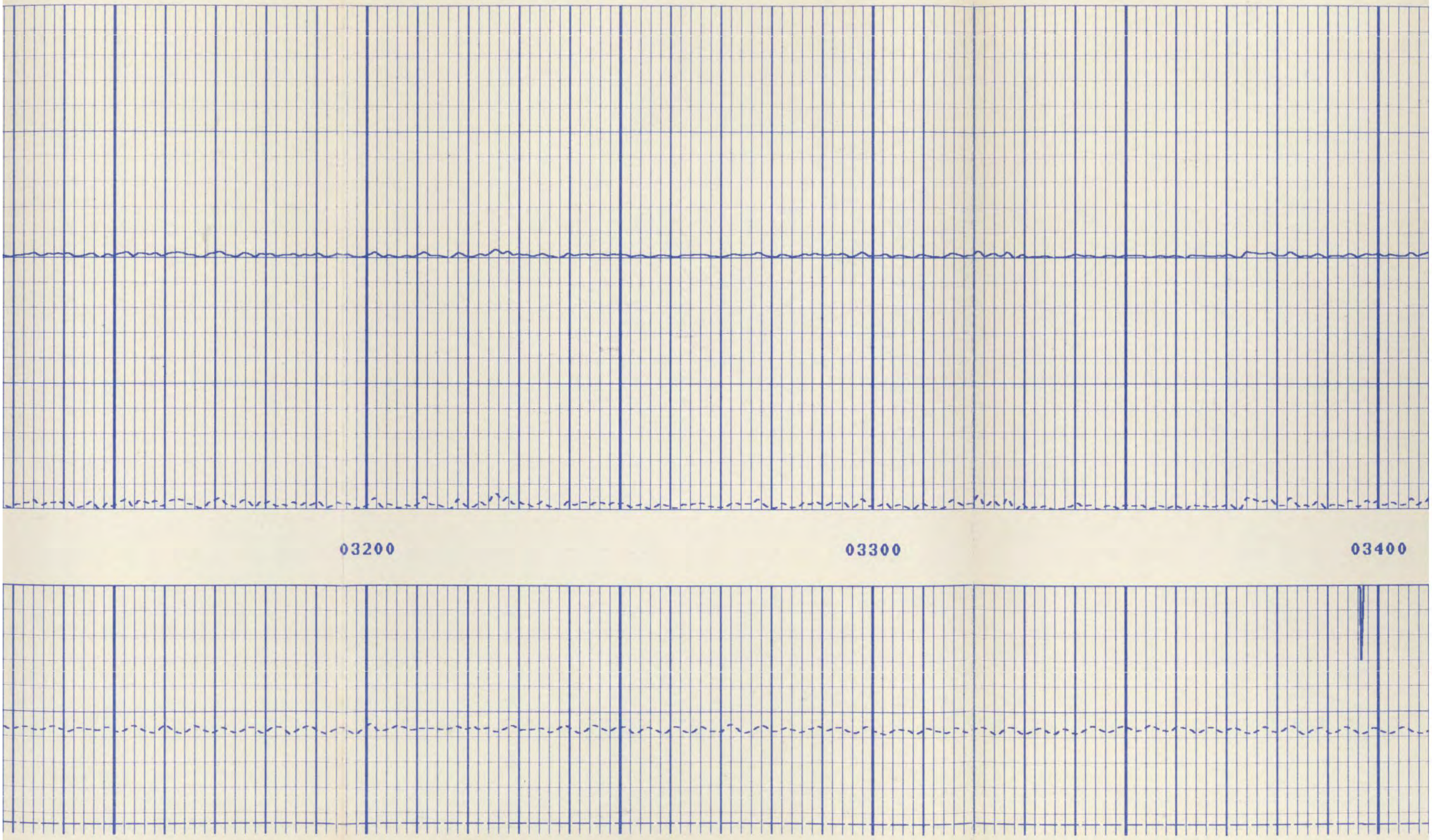
CCL

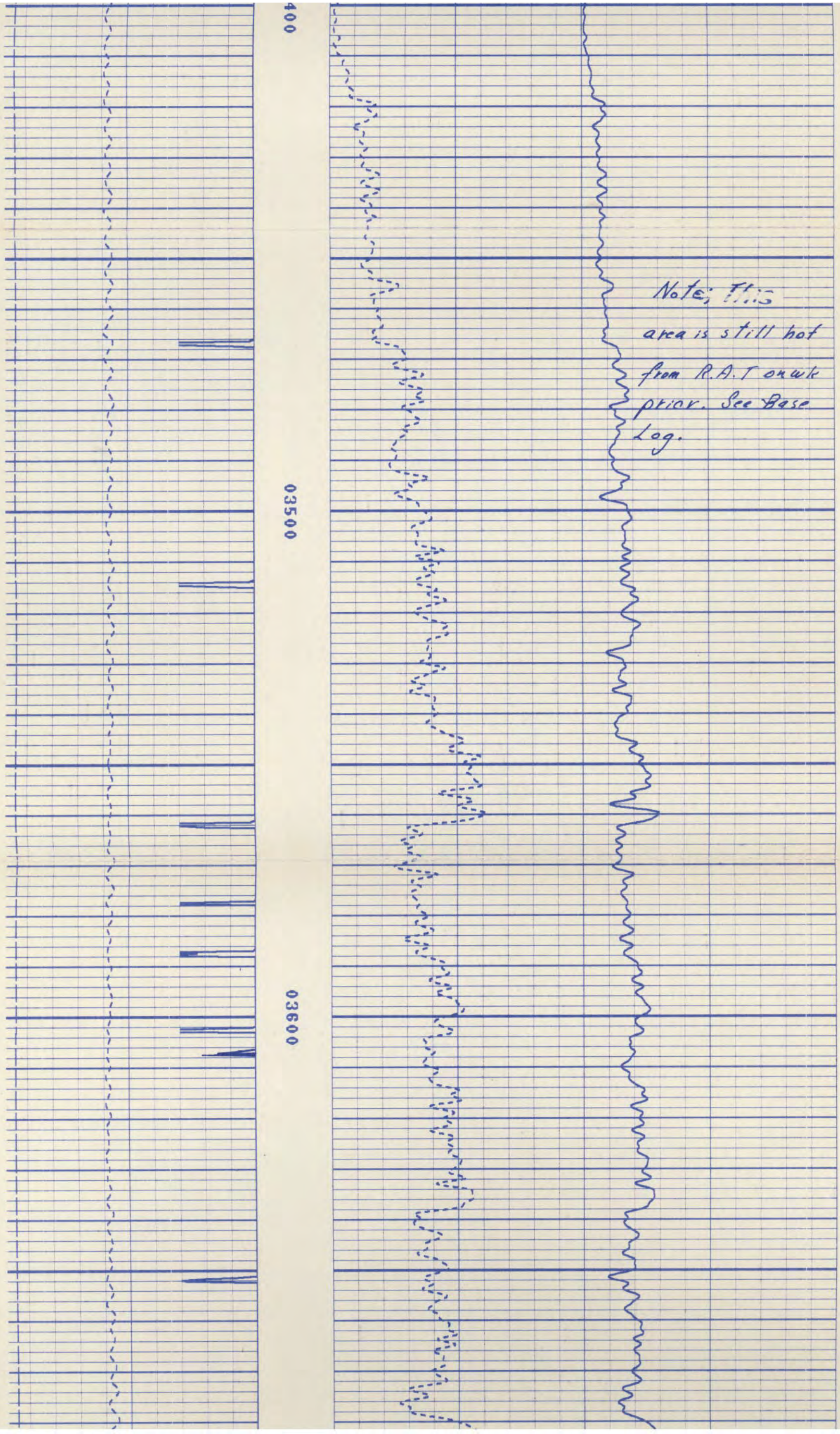
50 0

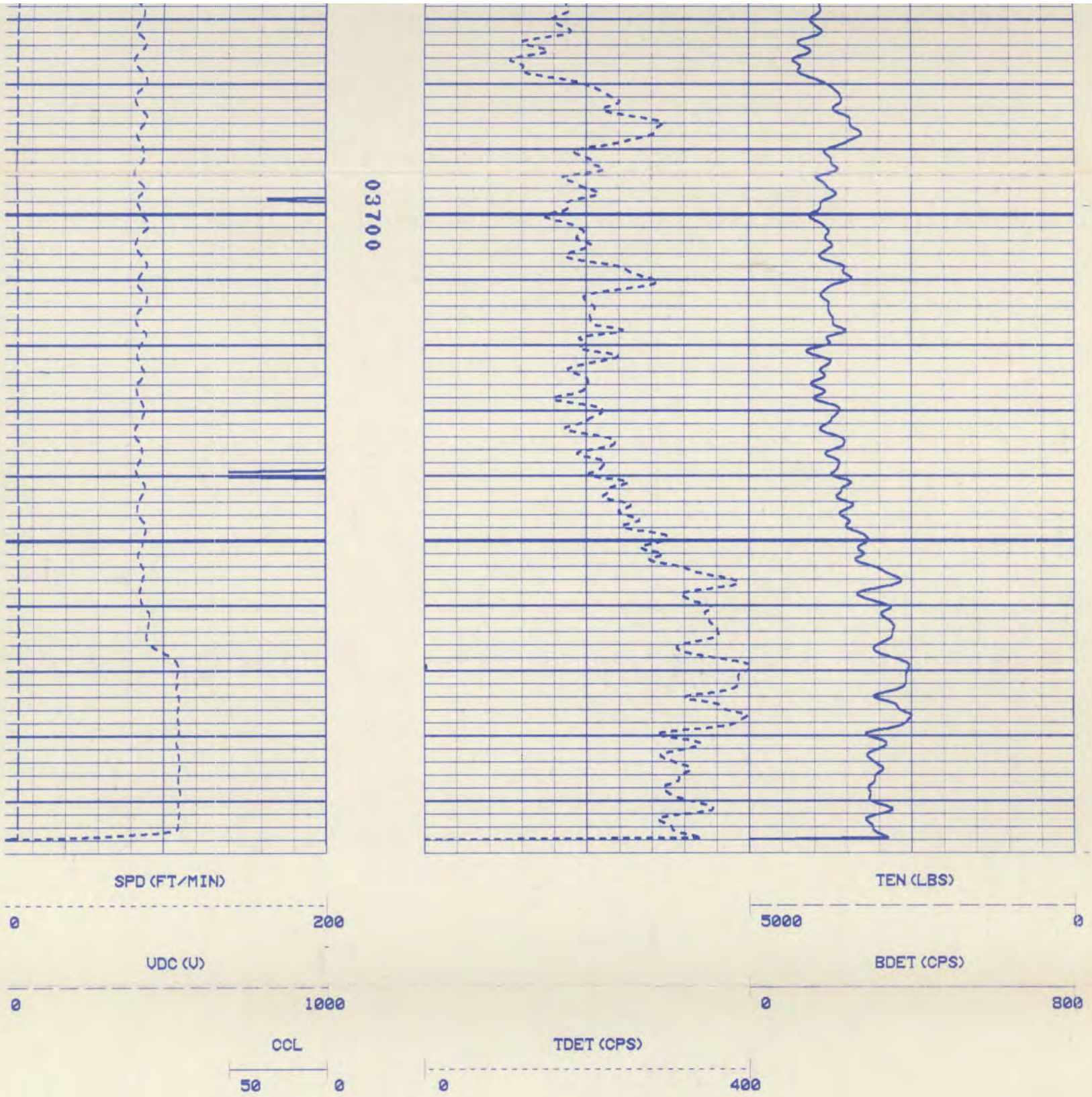
TDET (CPS)

0 400




03200
03300
03400


03400
03500
03600
Note; This
area is still hot
from R.A.T on wk
prior. See Base
Log.



FILE: 24

FILE ABOVE IS THE LAST BASE LOG PRIOR TO END-ING SURVEY. TIME IS 12:25.

FILE BELOW HAS TWO SLUGS IN TIME MODE. SLUGS ARE RELEASED AT 3356, AND LOGGED ATE THE RATE ON 2 SEC/FT.

RATE WAS A CONSTANT 1.5 BPM

RATE WAS A CONSTANT 1.5 BPM

NO SIGN OF CHANNEL.

****

FILE: 22

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: CELANESE BAY CITY PLANT

WELL NAME: A-1

SERVICE: F 150C FILE: 22 DATE: 01/28/93

REVISION: FSYS256 REV:G002 VER:2.0

RUN: 1

TRIP: 1

TIME: 08:40:18

MODE: RECORD

SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

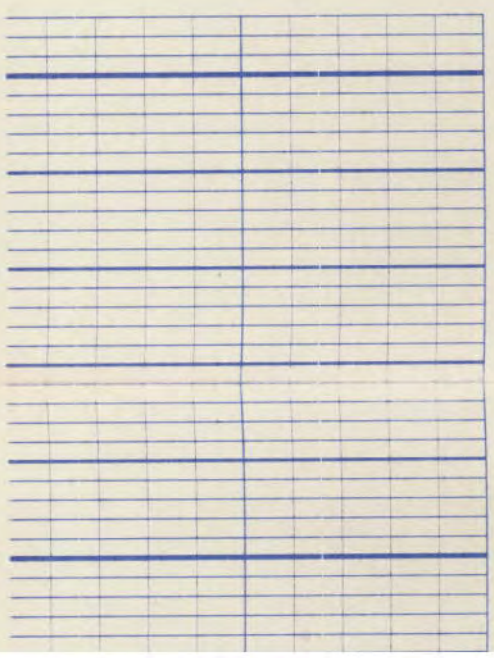
0 800

CCL

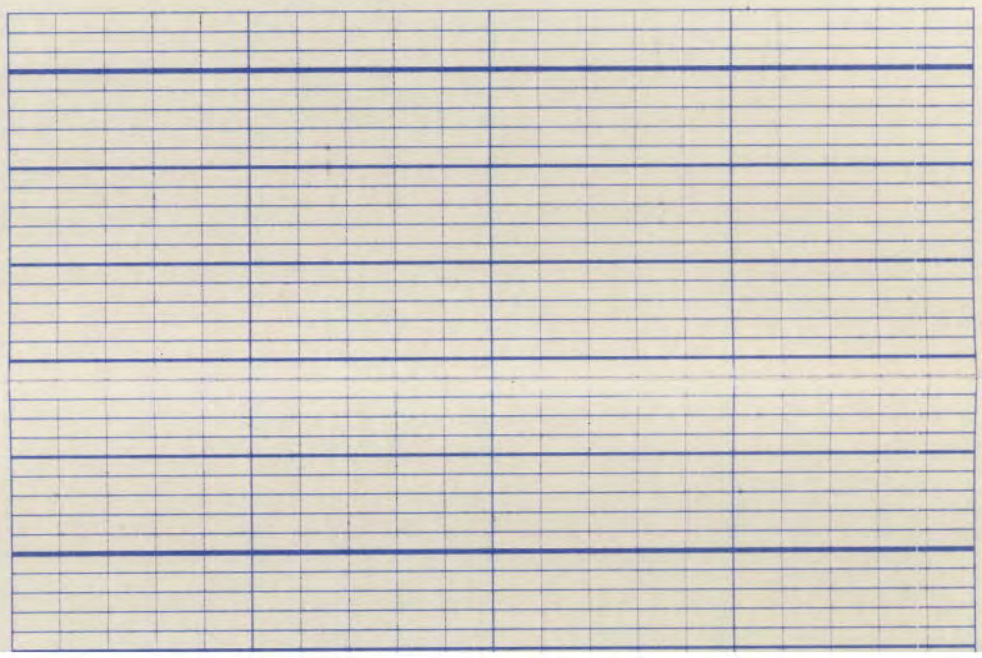
50 0

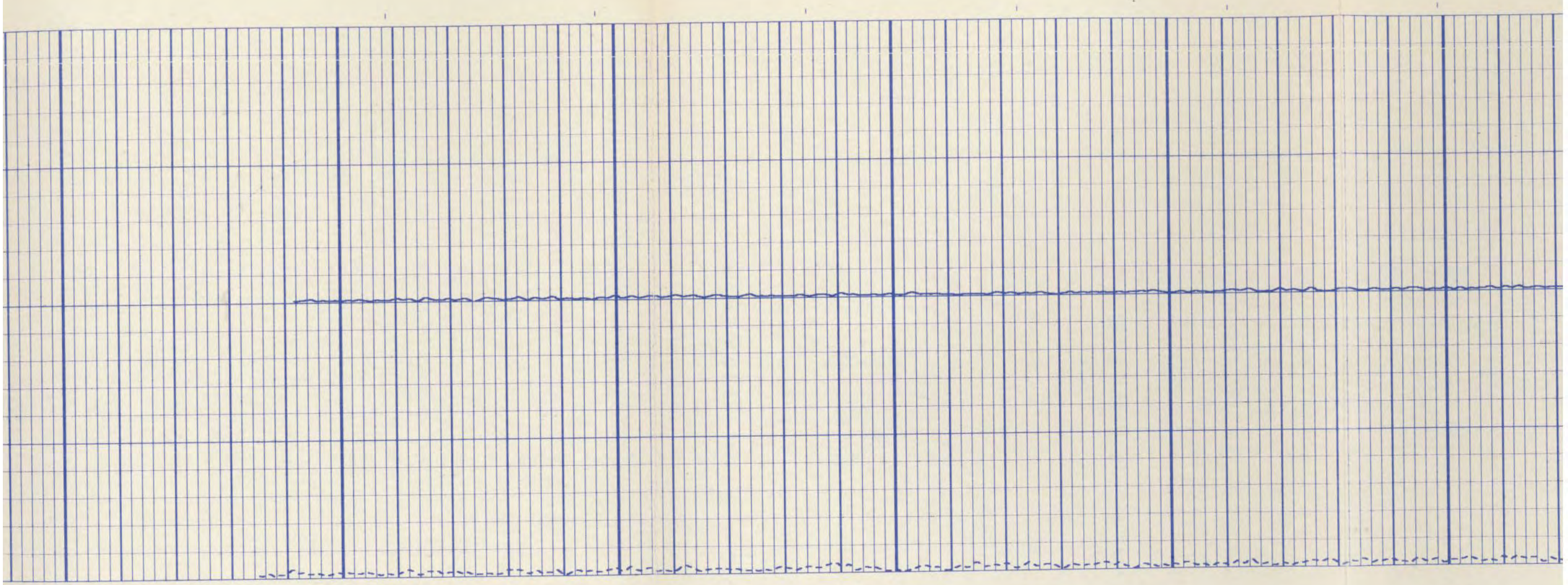
TDET (CPS)

0 400

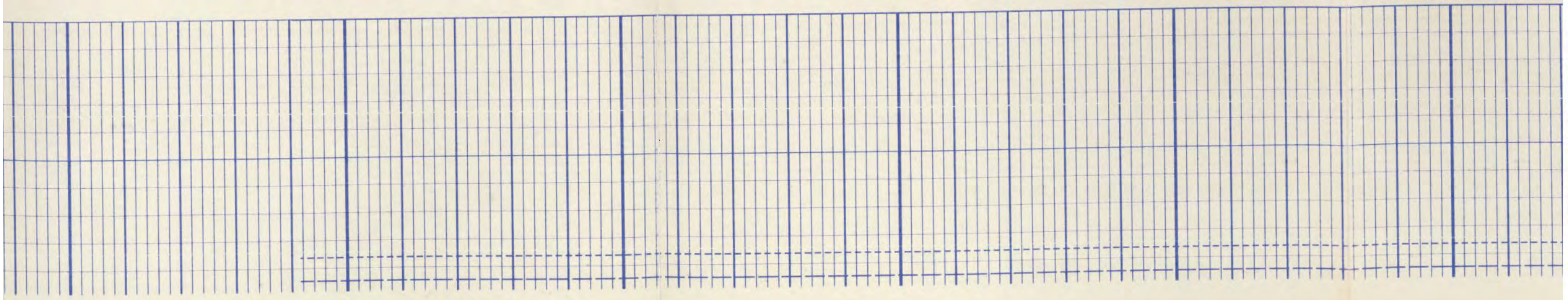


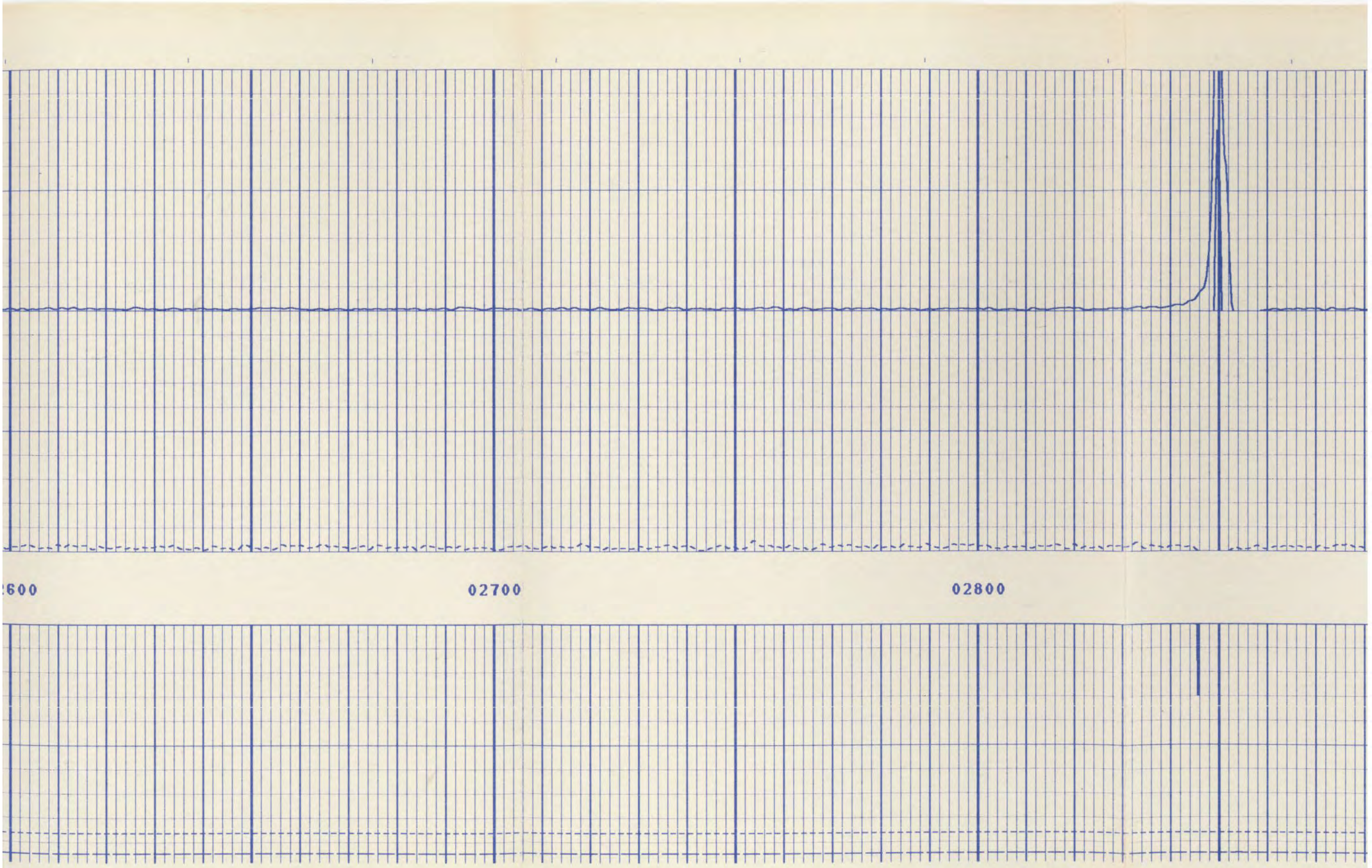
02300

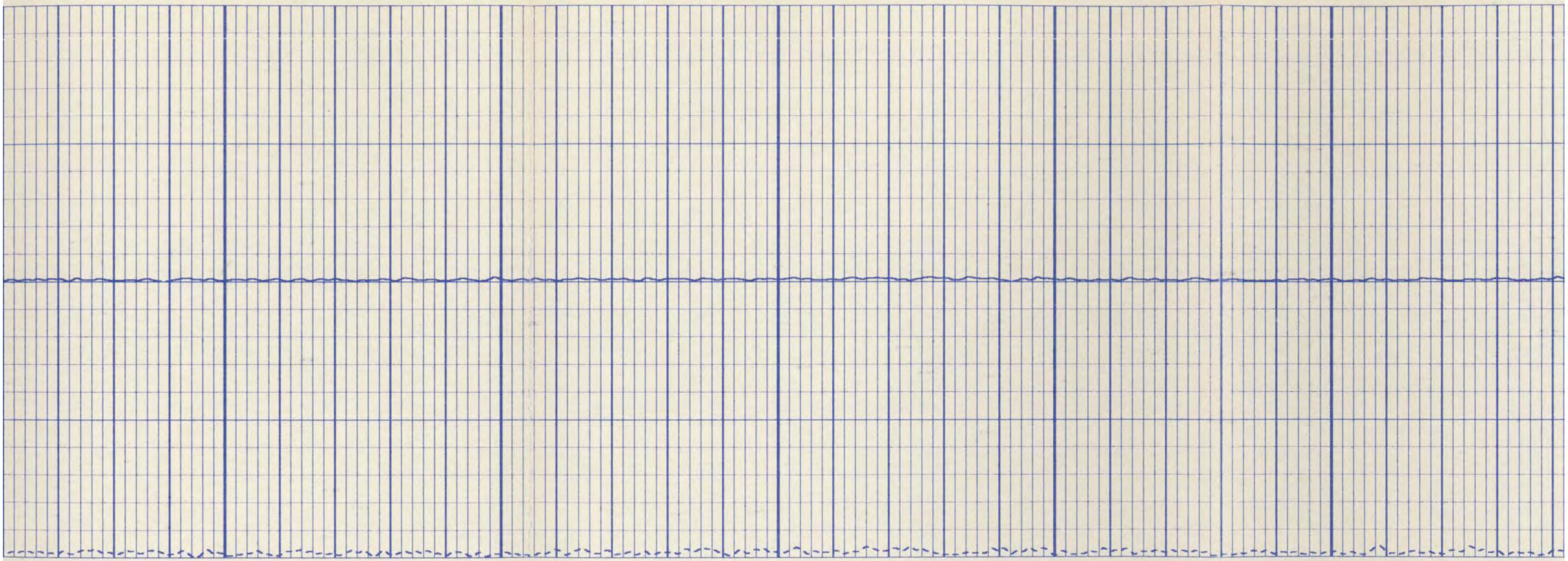




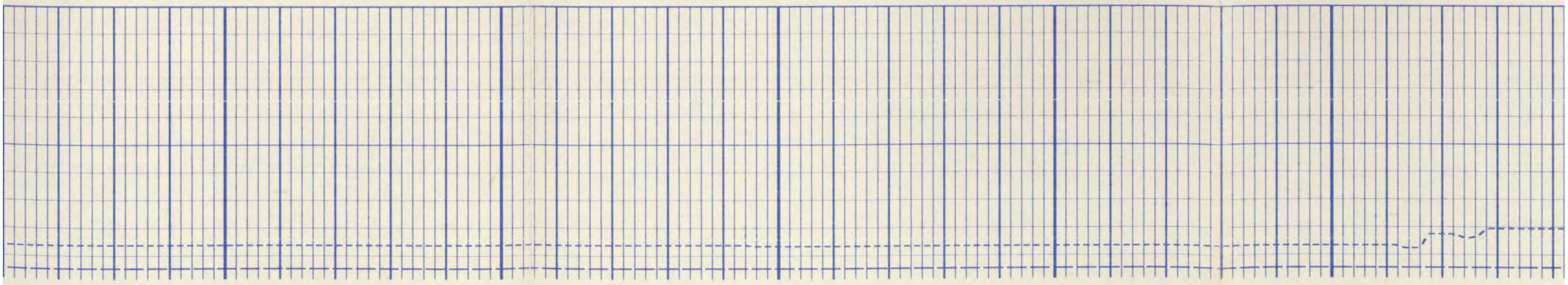
02400 02500 02600

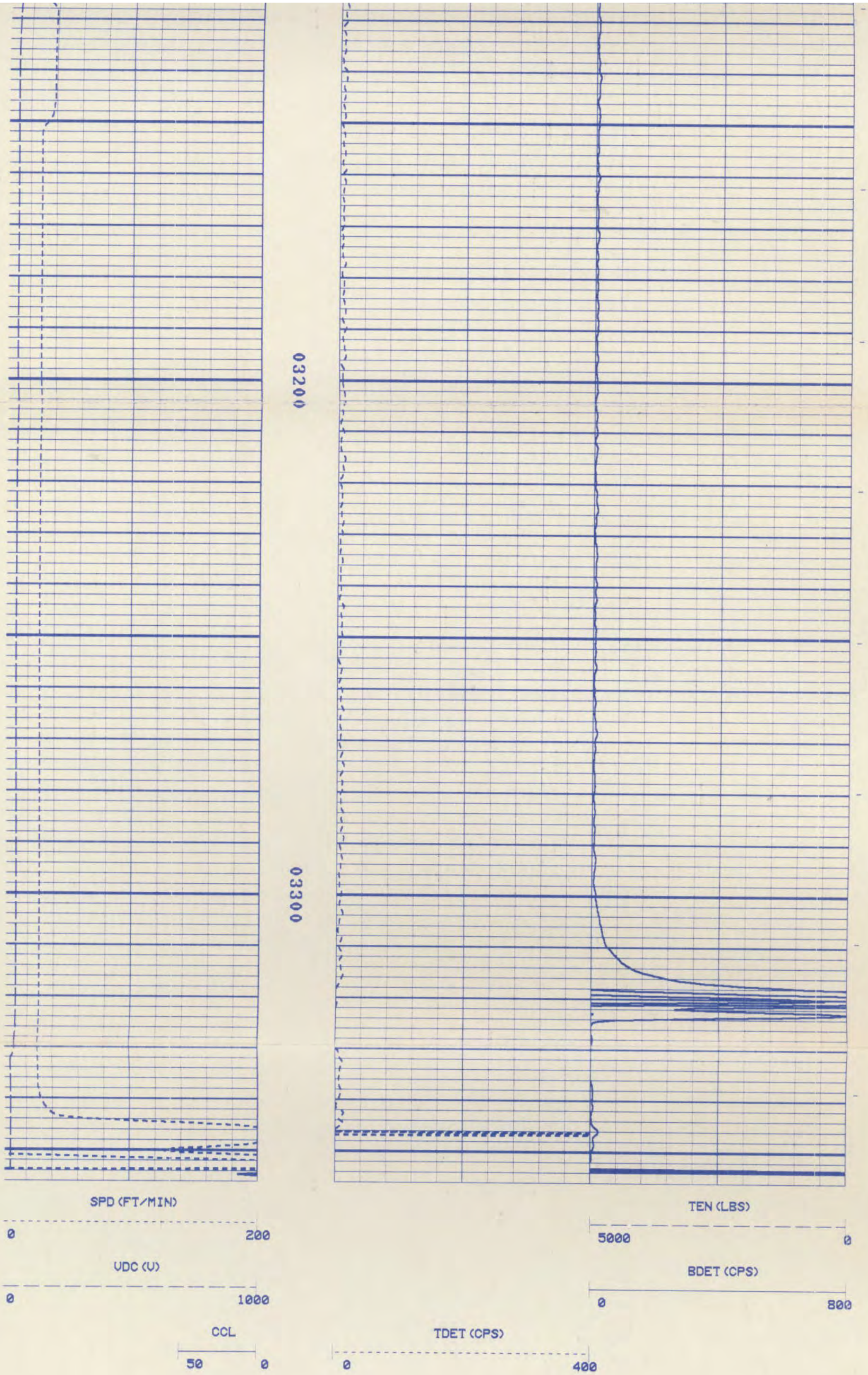



600
02700
02800



02900 03000 03100




03200
03300
SPD (FT/MIN)
0
200
VDC (V)
0
1000
CCL
50
0
TDET (CPS)
0
400
TEN (LBS)
5000
0
BDET (CPS)
0
800

FILE: 22

****

FILE: 22

****

ALL TIME DRIVE FILES ARE AT THE 2 SEC/FT. SCALE.

ABOVE, THE TIME MODE WITH TOOL STATIONARY AT 3356. RATE = 1.5 BPM. BEGUN AT 11:45

SPD (FT/MIN)
0 200

TEN (LBS)
5000 0

VDC (V)
0 1000

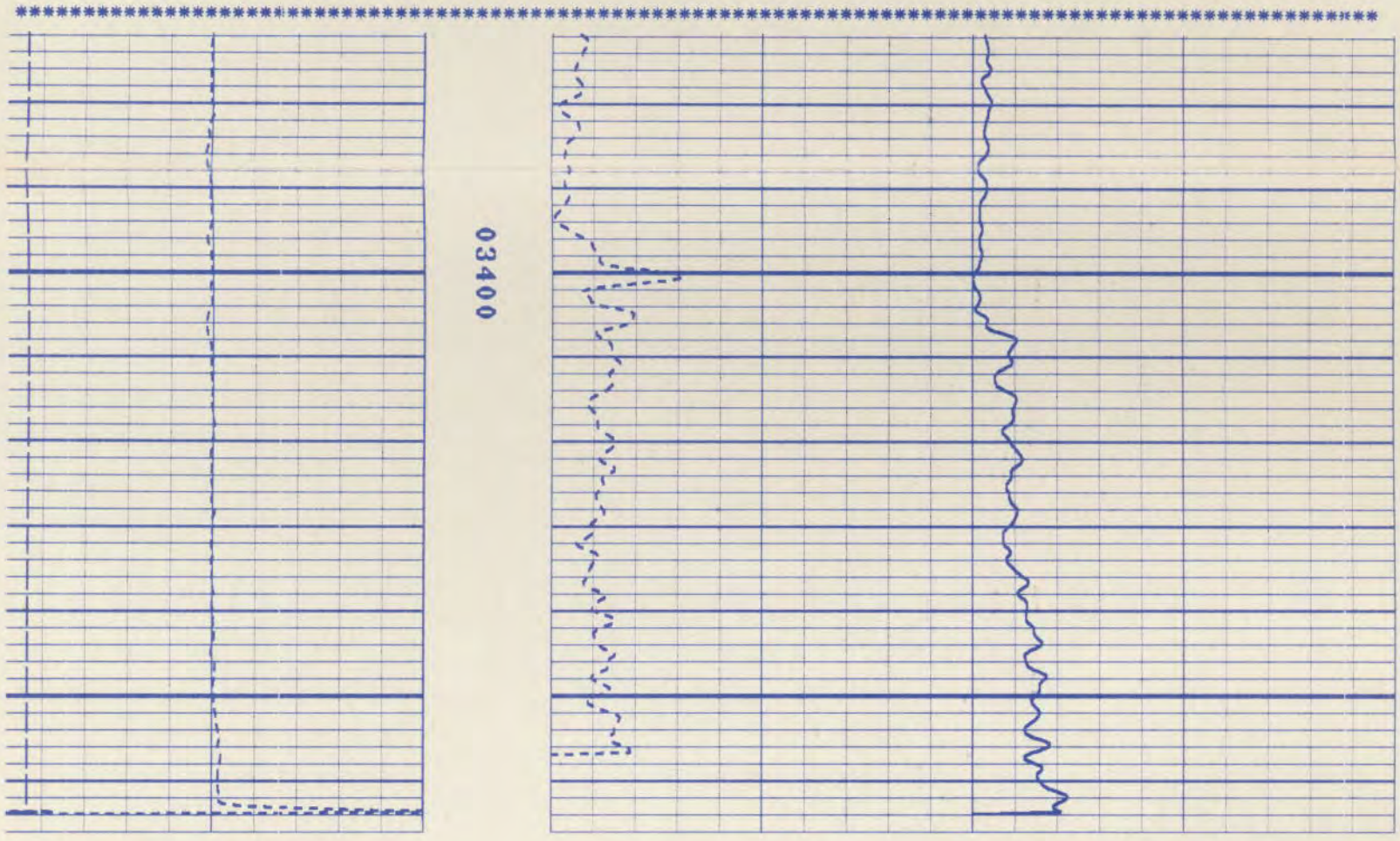
BDET (CPS)
0 800

CCL
50 0

TDET (CPS)
0 400

FILE: 21

****



SPD (FT/MIN)
0 200

TEN (LBS)
5000 0

VDC (V)

BDET (CPS)

SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

0 800

CCL

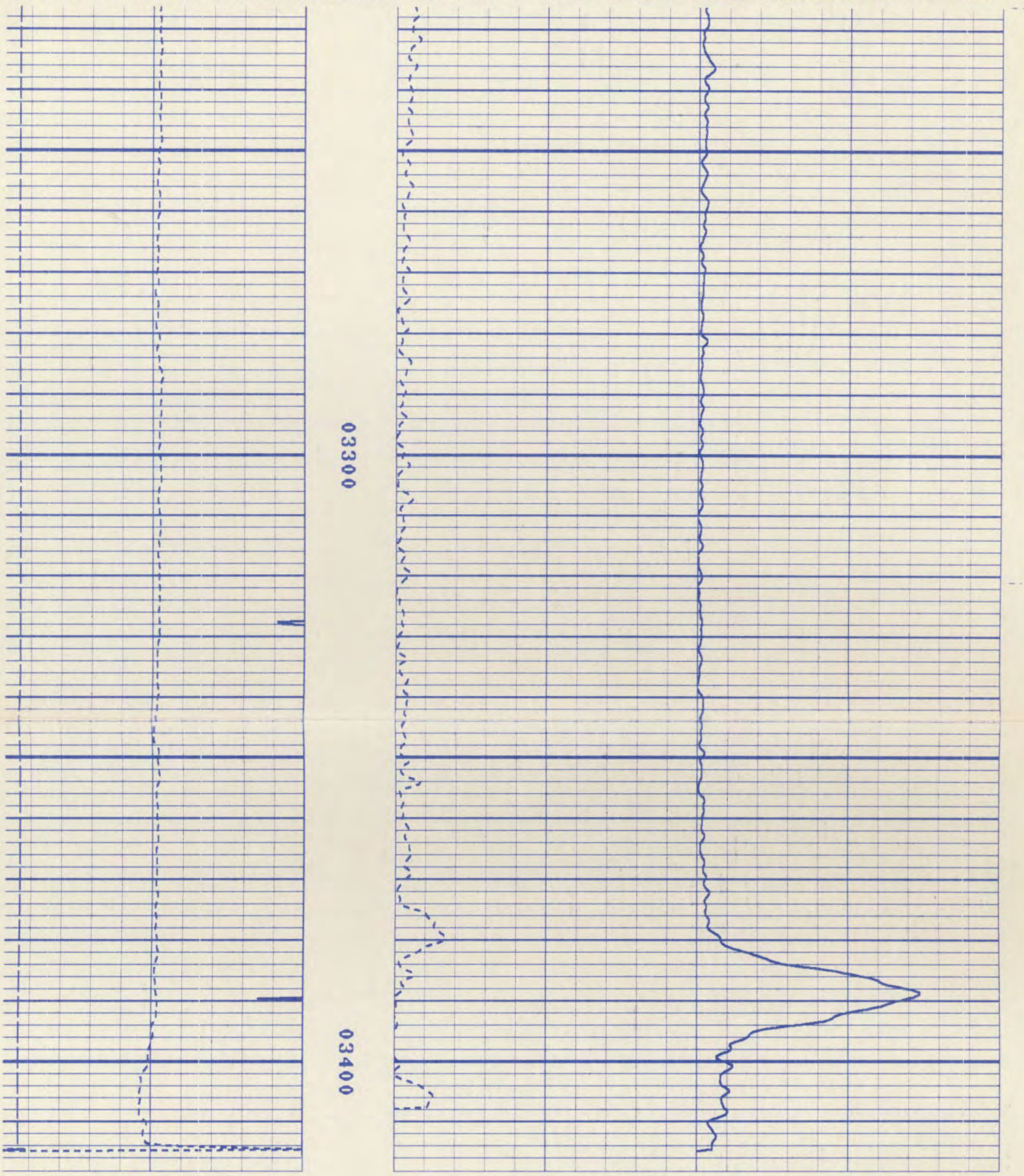
50 0

TDET (CPS)

0 400

FILE: 20

****



SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

0 800

CCL

50 0

TDET (CPS)

0 400

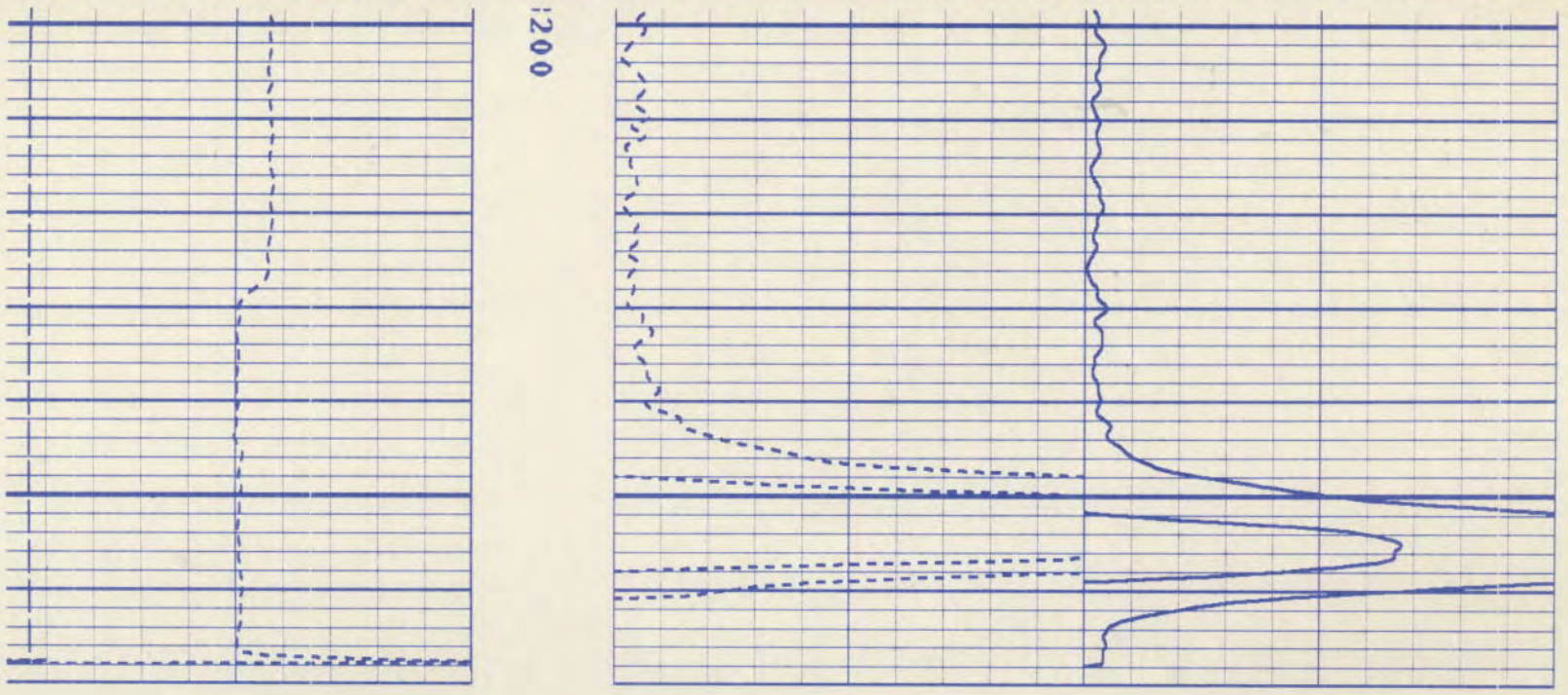
CCL

50 0

TDET (CPS)

0 400

FILE: 19



SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

0 800

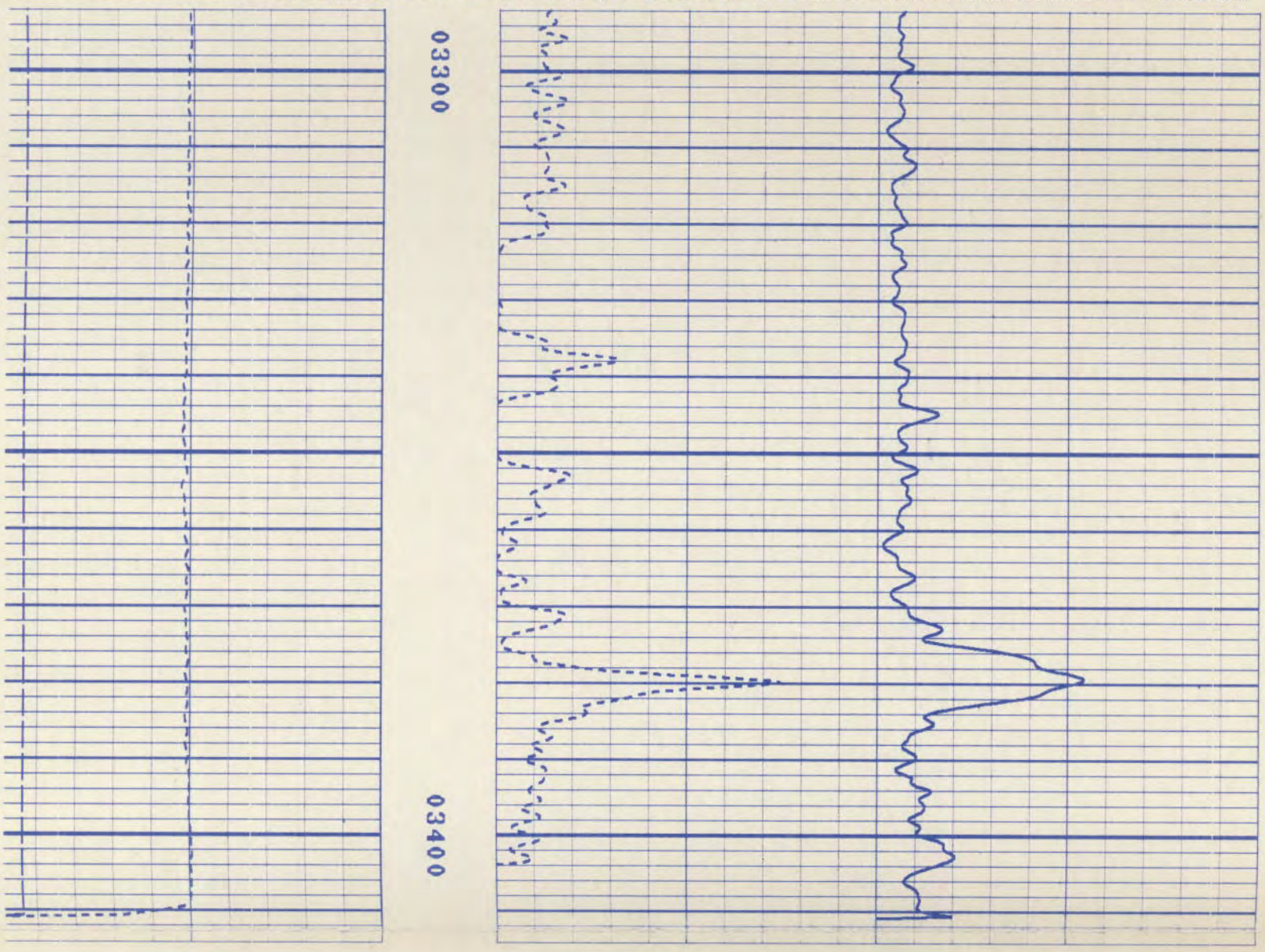
CCL

50 0

TDET (CPS)

0 400

FILE: 18

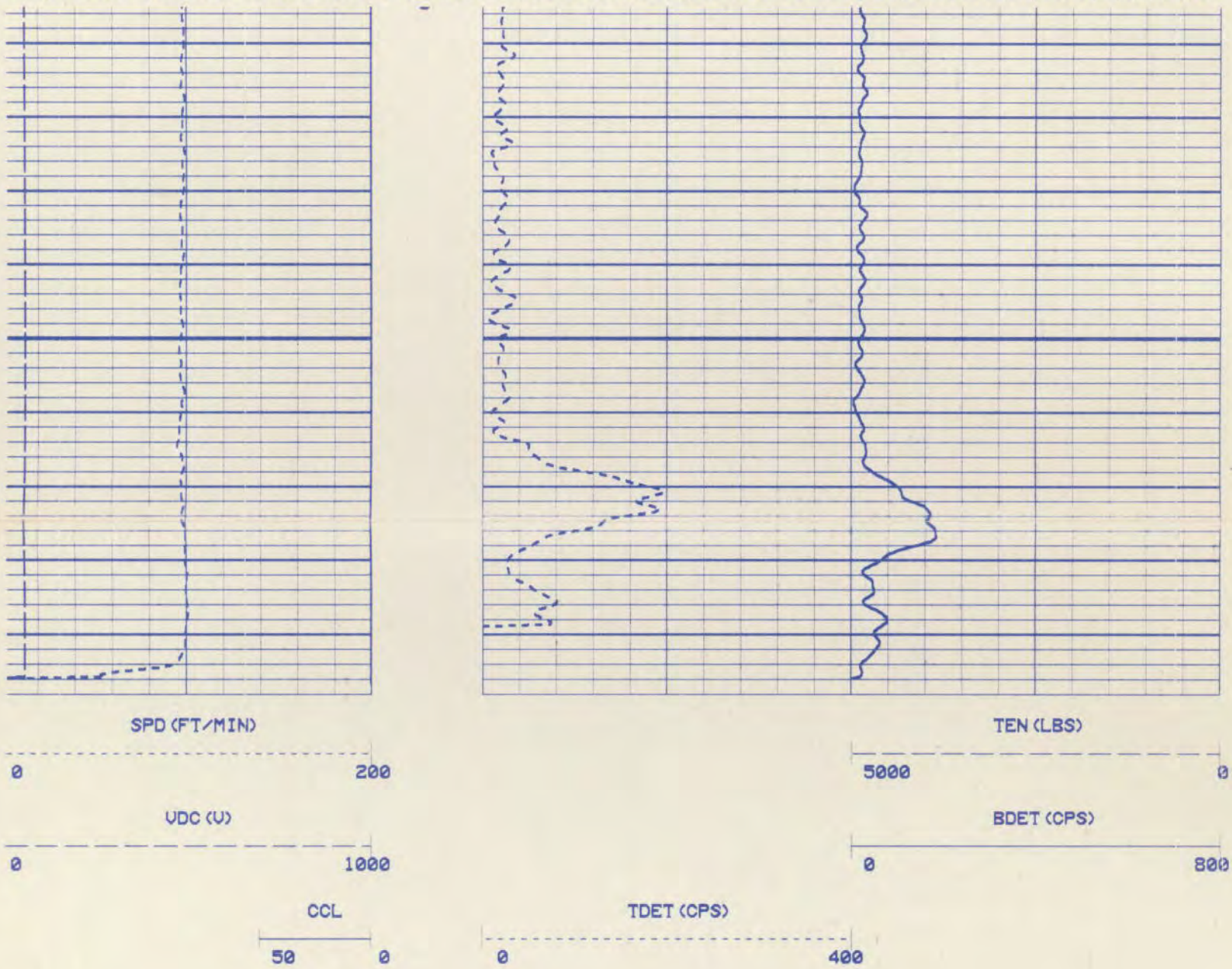


SPD (FT/MIN)

TEN (LBS)

FILE: 17

****



FILE: 16

****

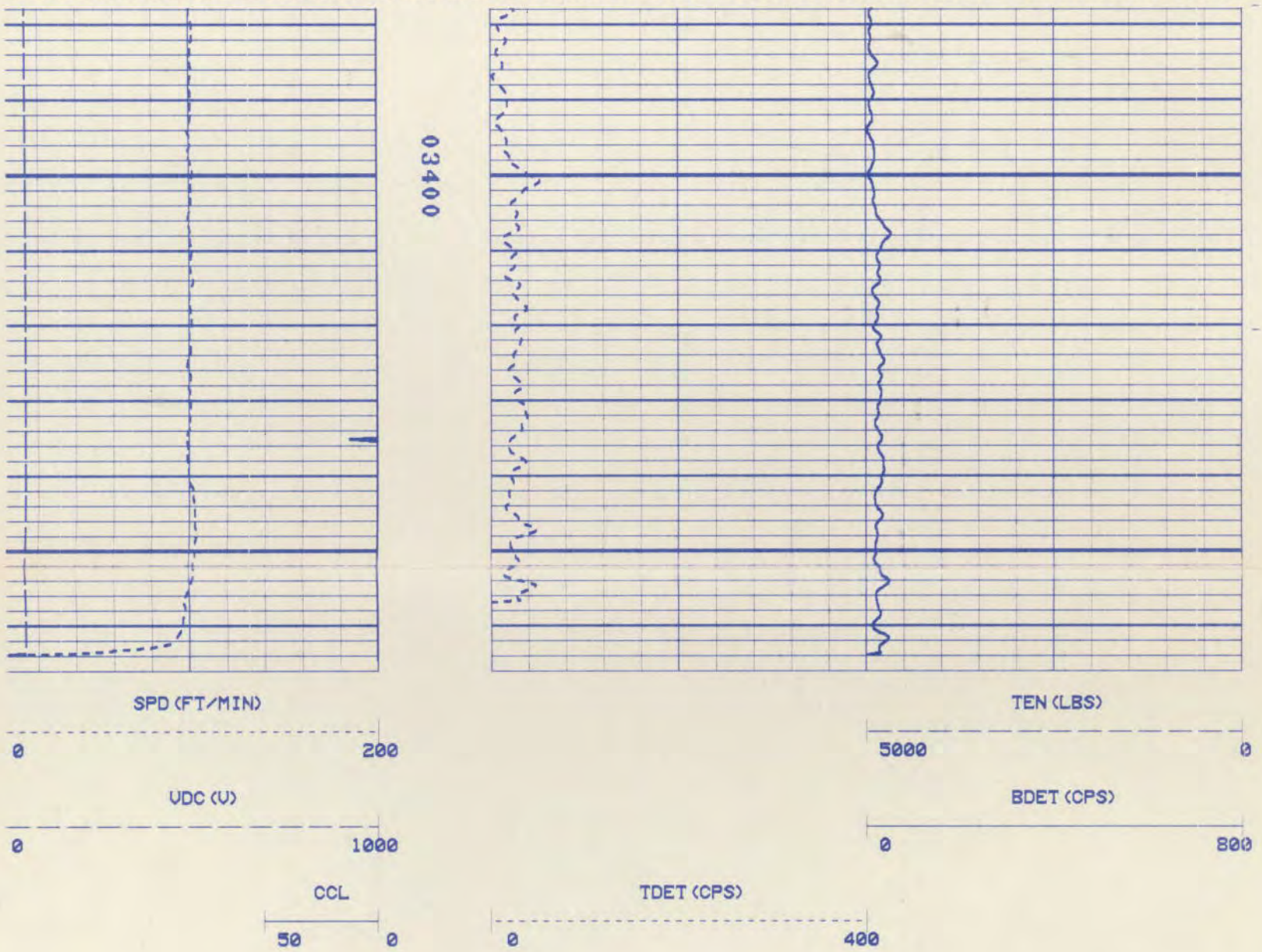
SLUG RELEASED AT 3200 FT.

SECOND SLUG RELEASED ABOVE

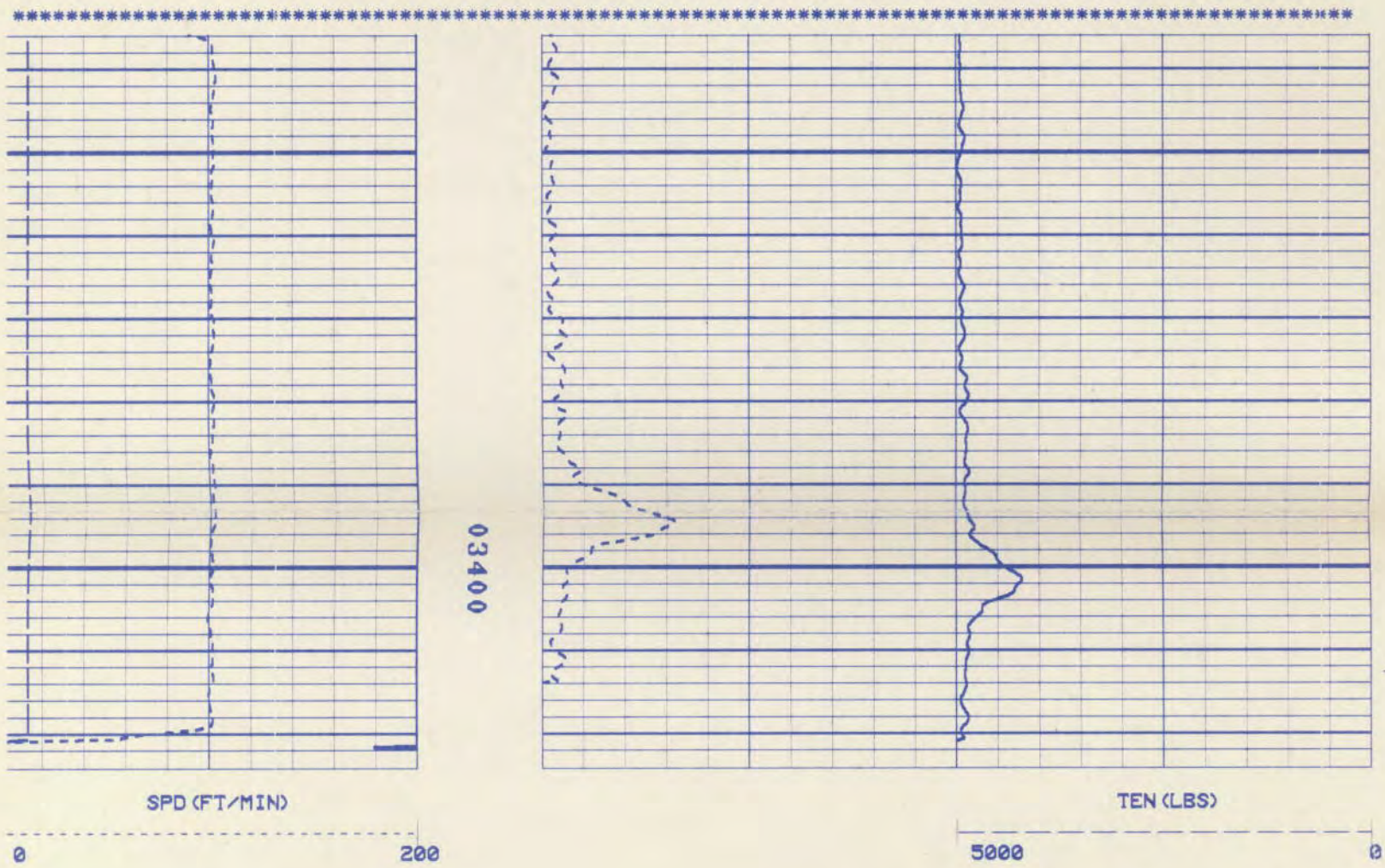
TIME 11 :30, RATE 1 BPM.

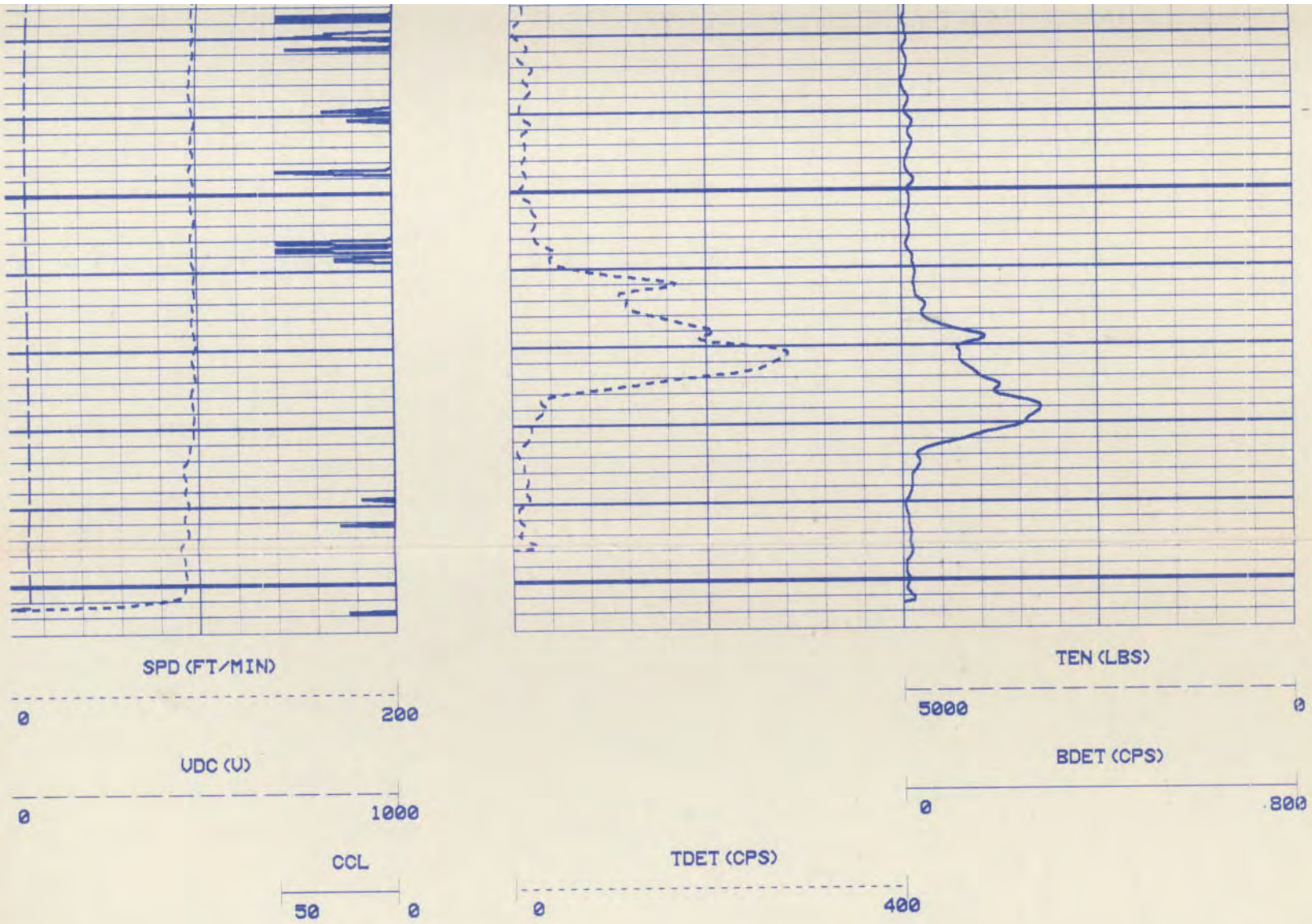
TIME 11 :30, RATE 1 BPM.

FILE: 14



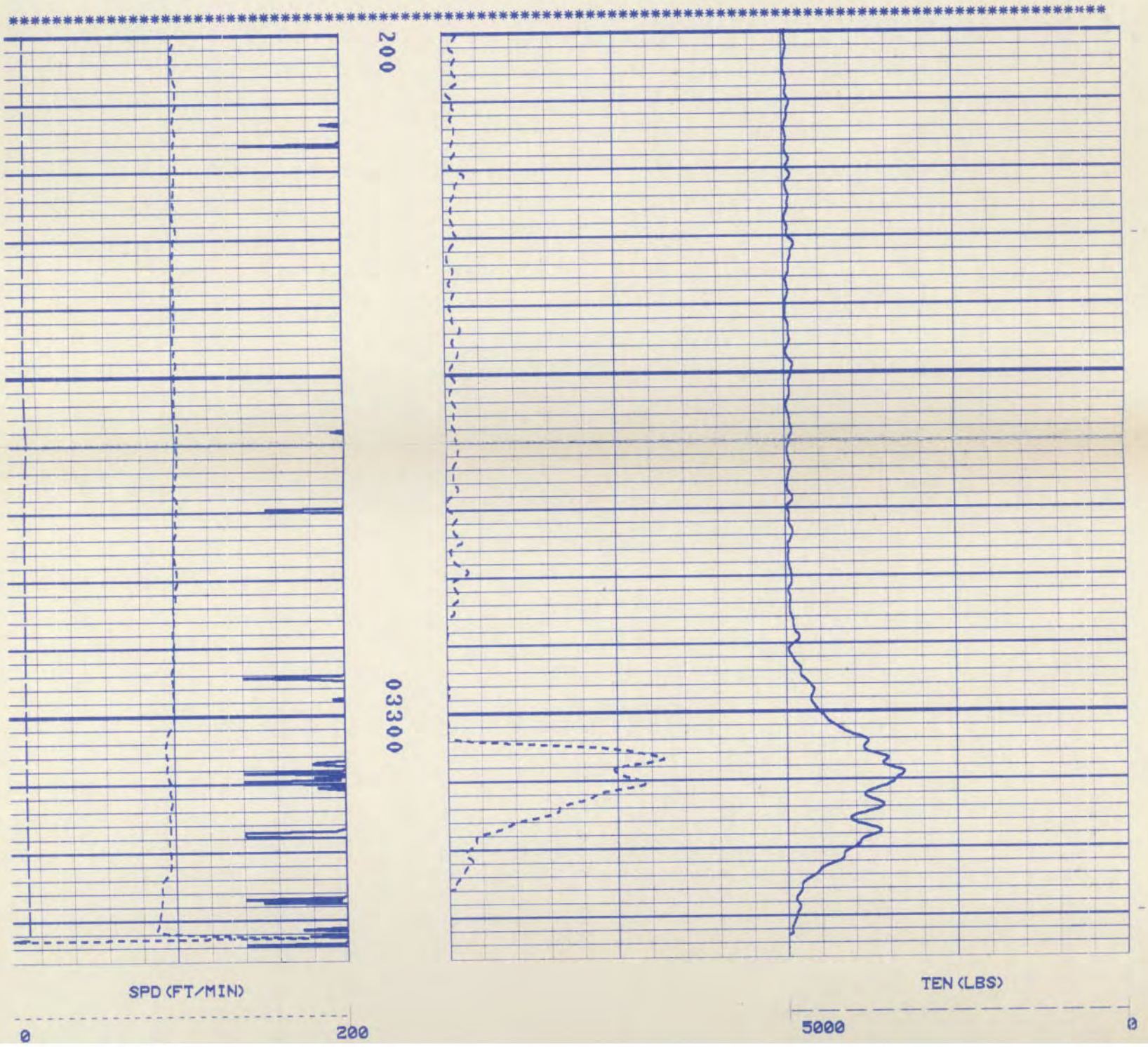
FILE: 13




SPD (FT/MIN)
0
200
TEN (LBS)
5000
0
VDC (V)
0
1000
BDET (CPS)
0
800
CCL
50
0
TDET (CPS)
0
400

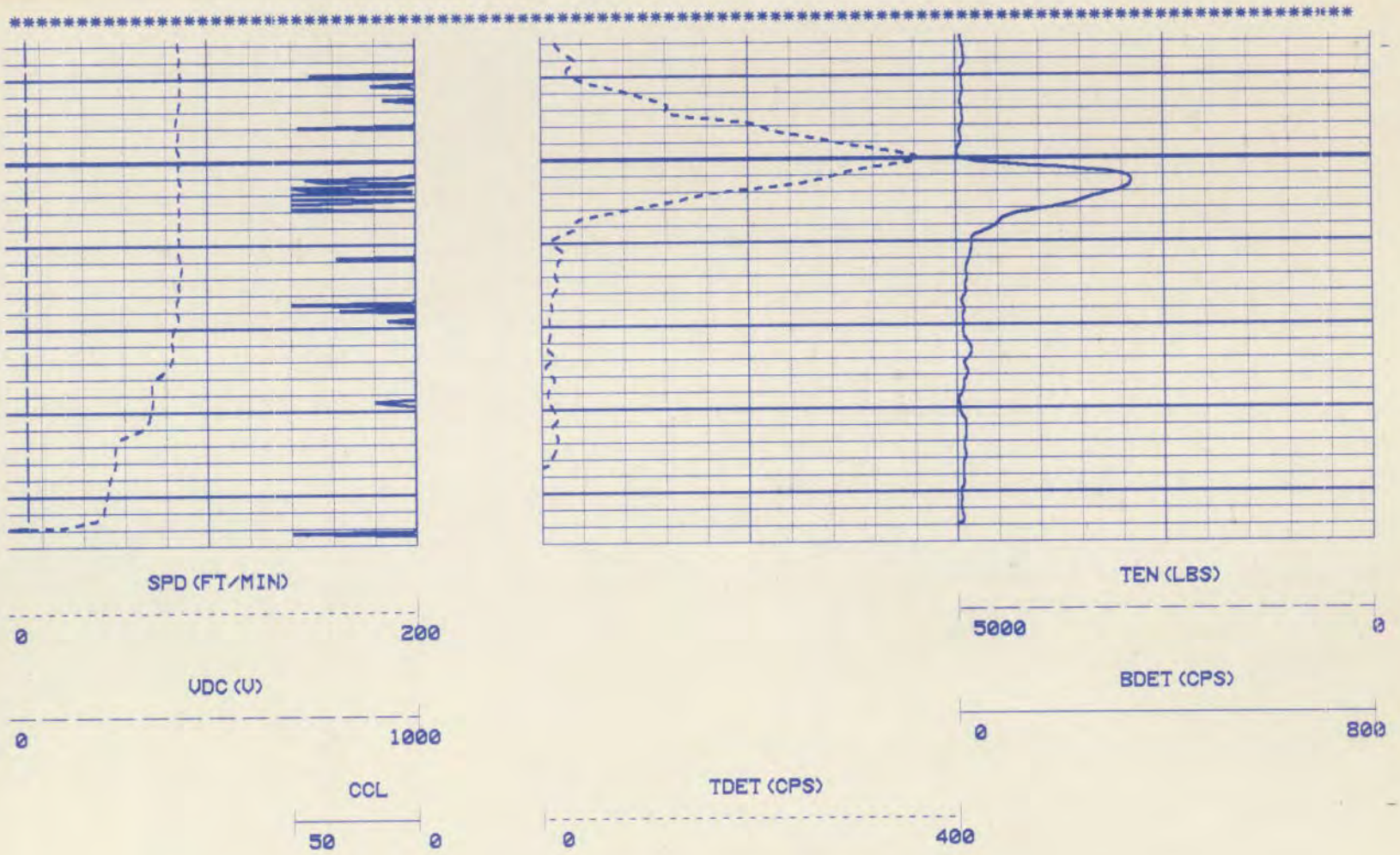
FILE: 10

****


200
03300
SPD (FT/MIN)
0
200
TEN (LBS)
5000
0

FILE: 9

****



FILE: 8

****

ABOVE, FIRST SLUG AND
LOGGING SEQUENCE...
SLUG RELEASED AT 11:A.M.,
AT 3200 FT., RATE = 25 GPM

BASE PASS BELOW, ON
DEPTH...10:A.M.

****

FILE: 7

****

FILE: 7

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: CELANESE BAY CITY PLANT RUN: 1

WELL NAME: A-1 TRIP: 1

SERVICE: F 150C FILE: 7 DATE: 01/28/93 TIME: 07:21:25

REVISION: FSYS256 REV:G002 VER:2.0 MODE: RECORD

SPD (FT/MIN)

0 200

TEN (LBS)

5000 0

VDC (V)

0 1000

BDET (CPS)

0 800

CCL

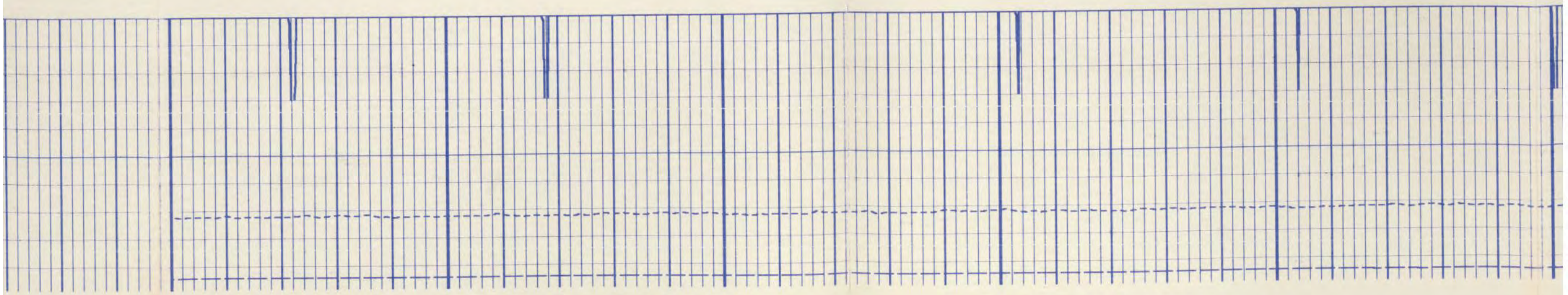
50 0

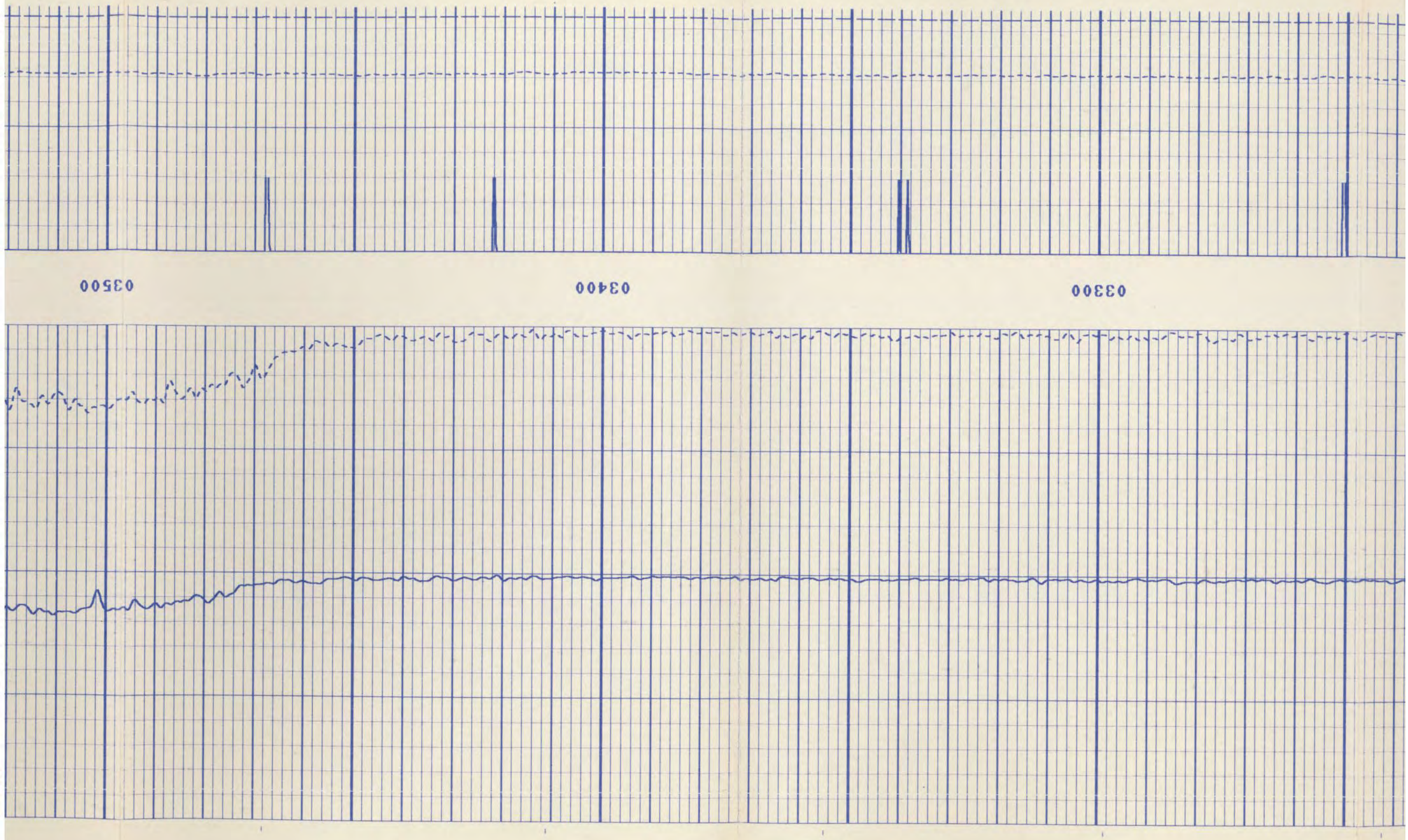
TDET (CPS)

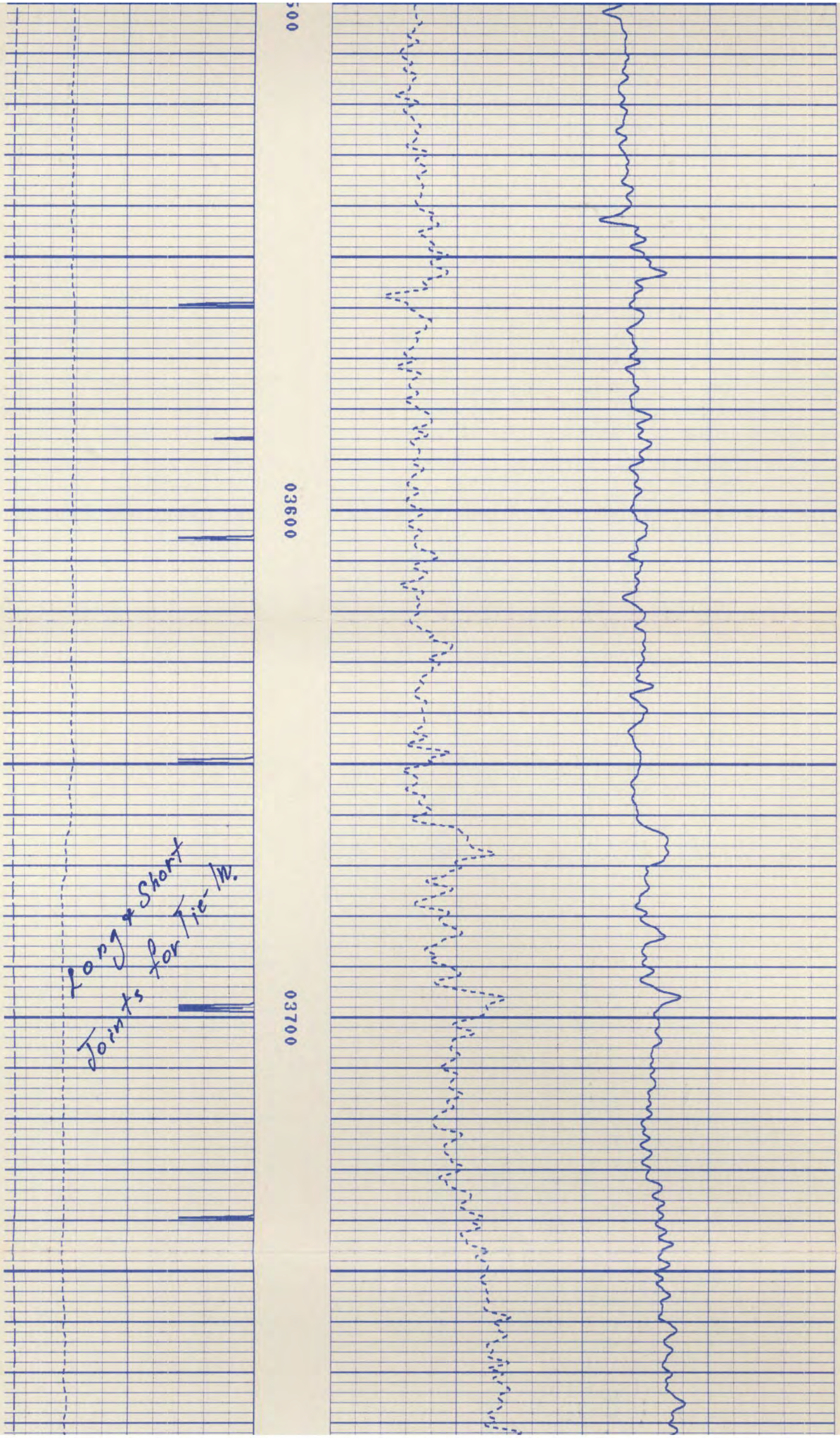
0 400

02900

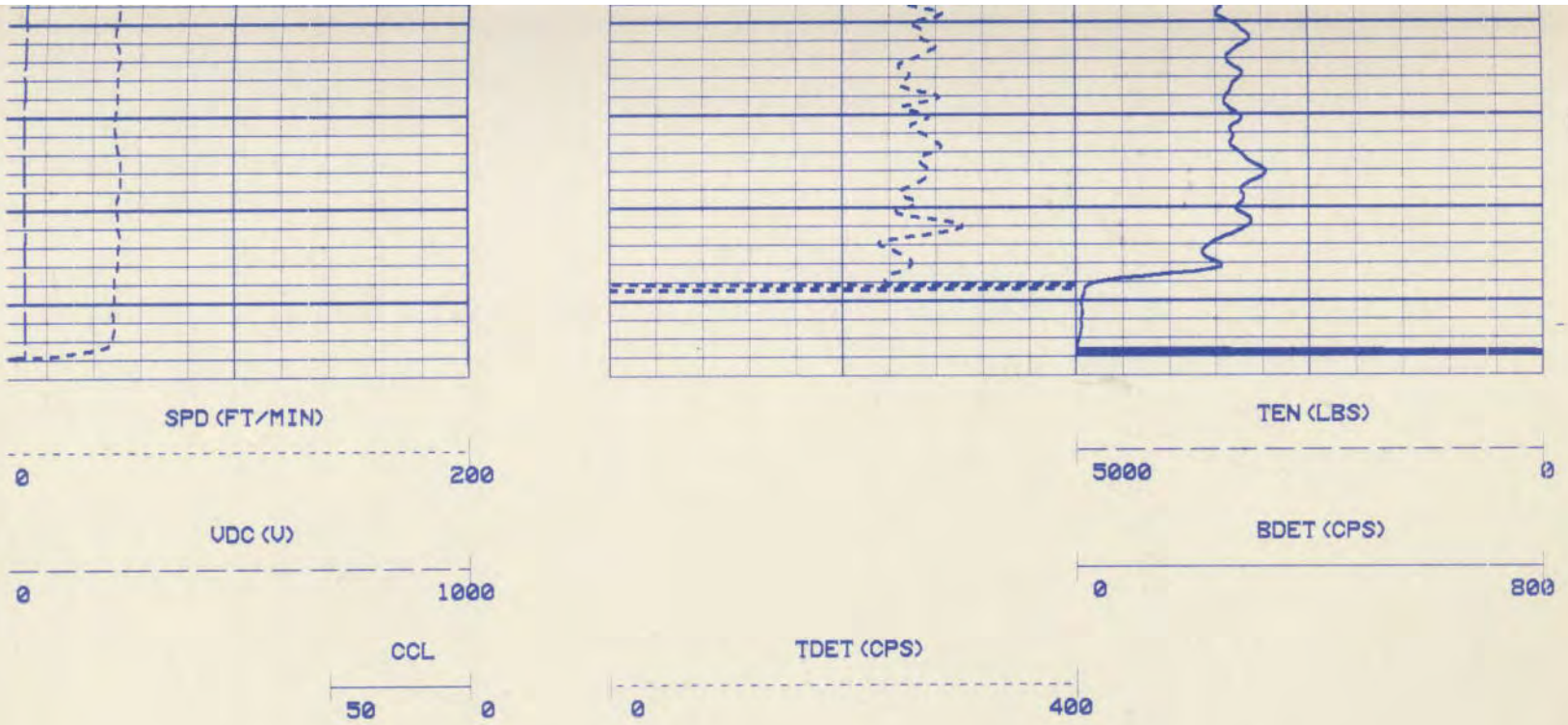
03000
03100
03200




03300
03400
03500



Long & Short
Joints for Tie-In.
03600
03700



****

REPEAT OF FIRST BASE PASS
BELOW. TIME IS 10:20.

****

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
TDET	7,0	FT,IN
BDET	0	FT,IN
CCL	9,0	FT,IN

PARAMETERS

*** NONE ***

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: CELANESE BAY CITY PLANT

RUN: 1

WELL NAME: A-1

TRIP: 1

SERVICE: F 150C FILE: 6 DATE: 01/28/93

TIME: 06:58:04

REVISION: FSYS256 REV:G002 VER:2.0

MODE: RECORD

SPD (FT/MIN)

TEN (LBS)

REVISION: FSYS256 REV:G002 VER:2.0 MODE: RECORD

SPD (FT/MIN)
0 200

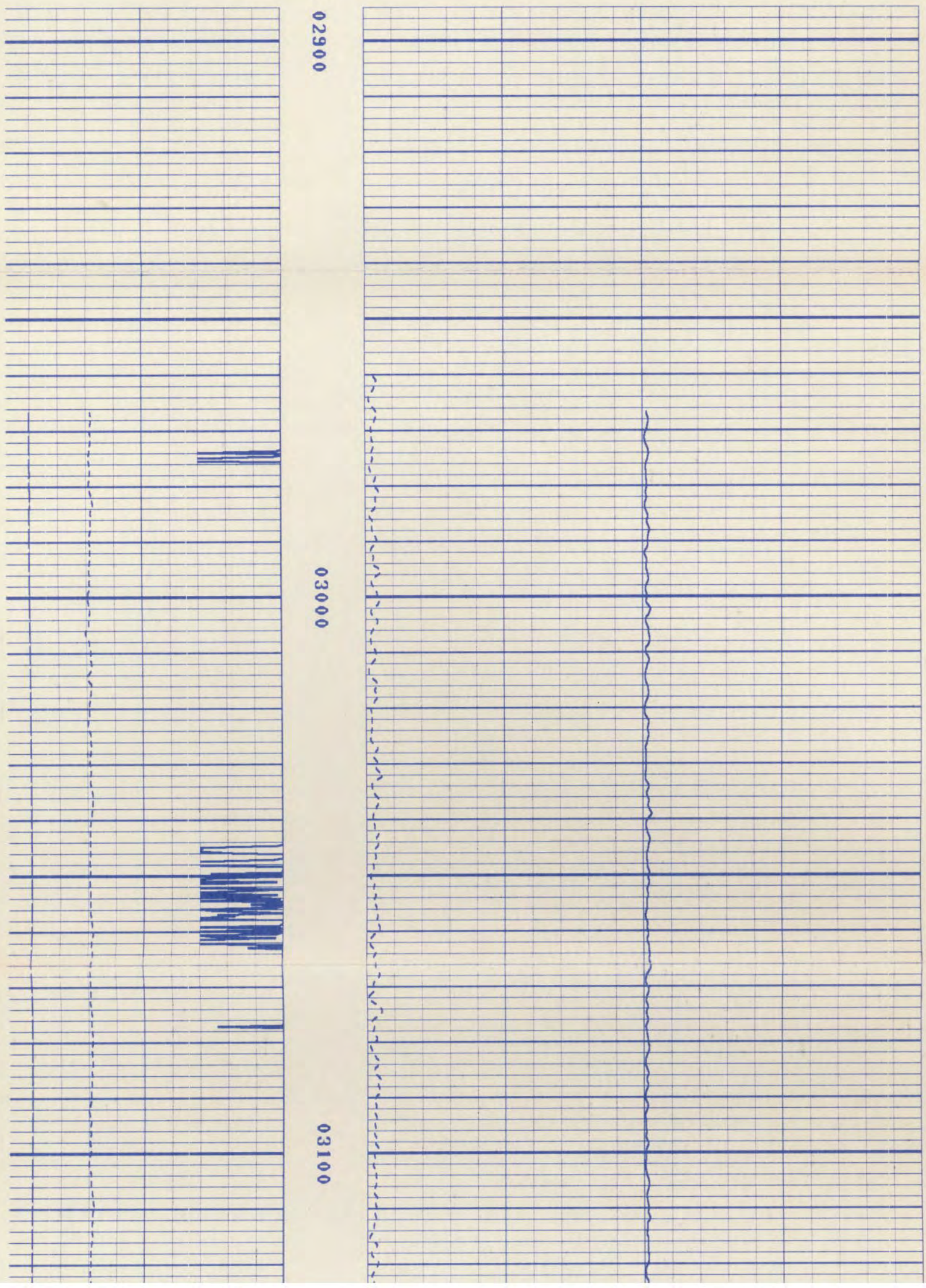
TEN (LBS)
5000 0

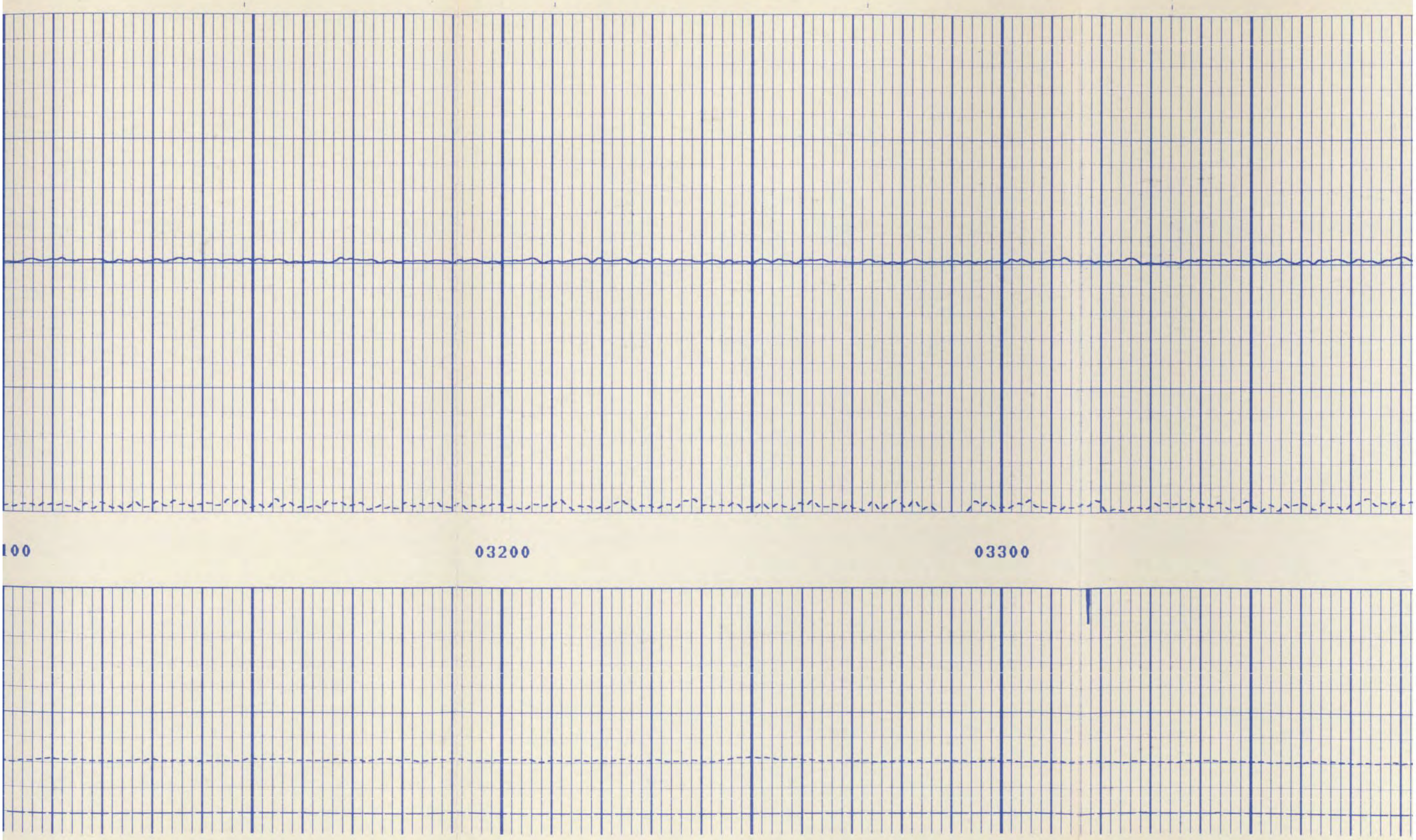
VDC (V)
0 1000

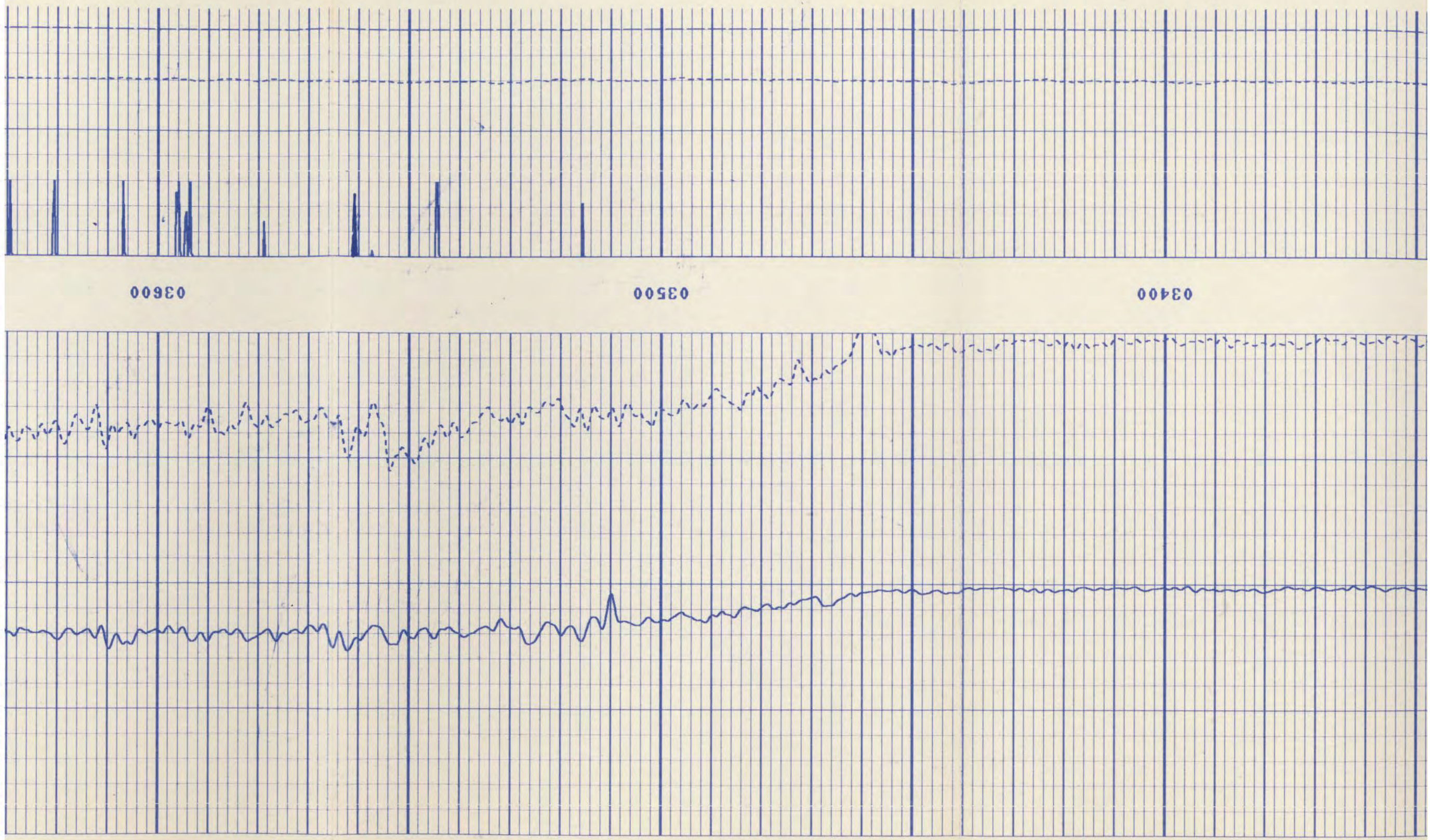
BDET (CPS)
0 800

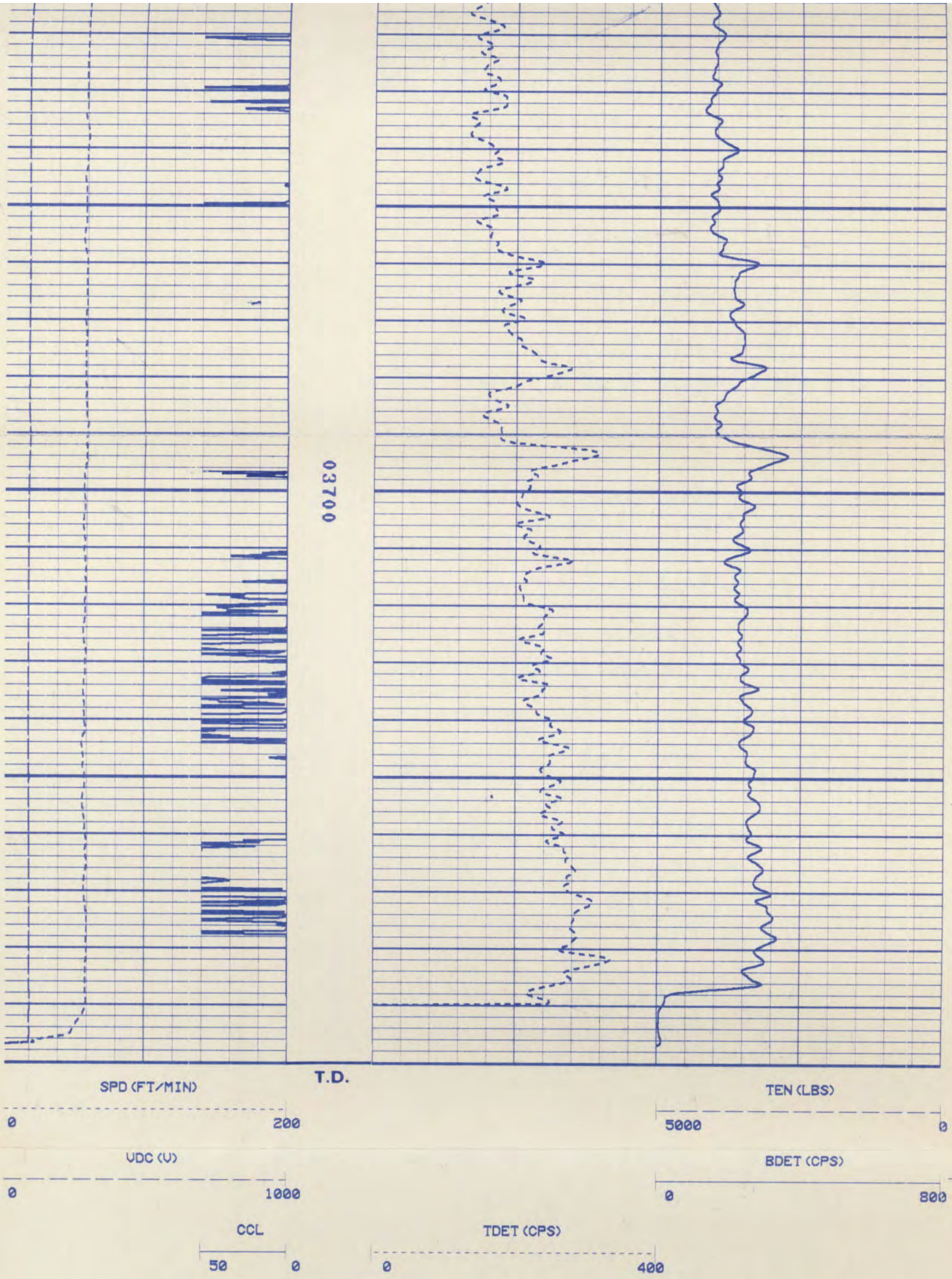
CCL
50 0

TDET (CPS)
0 400




100
03200
03300


03600
03500
03400


03700
T.D.
SPD (FT/MIN)
0
200
TEN (LBS)
5000
0
VDC (V)
0
1000
BDET (CPS)
0
800
CCL
50
0
TDET (CPS)
0
400

FILE: 6

****

DIAGNOSTIC PRODUCTION LOG ANALYSIS

Hoechst Celanese Corporation
Waste Disposal Well No. 1-A
Bay City Plant
Matagorda County, Texas

Prepared for
Bob Hall

Golden StrataServices, Inc.
Houston, Texas

ATLAS WIRELINE SERVICES
WESTERN ATLAS INTERNATIONAL

February 1993

Prepared by Freeman Hill, III

DISCLAIMER

In making interpretations of logs, our employees will give Customer the benefit of their best judgement, but since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or the correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the Customer resulting from any interpretation made/by any of our employees.

Logging Program and Analysis (Cont.)

Date: 1/21/93 - Perforating

Perforating Targeted Area for Disposal
Gun Type: 5" Omnikone (Expendable Hollow Carrier)
Shots Per Foot: 5

Depths Perforated: 3376 feet to 3426 feet
3460 feet to 3471 feet
3494 feet to 3524 feet
3543 feet to 3572 feet

Date: 1/22/93 - Pressure, Temperature Logs and Radioactive Tracerlog

1. Logged stationary pressure and temperature.

   Purpose: Base-line static pressure and temperature.

   Analysis: Pressure instrument at 3,440 feet. Pressure measured for somewhat over fifteen (15) minutes. Temperature varied by seven (7) degrees. Maximum P.S.I.A. recorded = 1592.94. Pressure gradient (.463).

2. Logged gamma ray detectors and collar locator.

   Purpose: Establish Base-line for detectors and to obtain correlation.

   Analysis: Readings within tolerances and detectors seem very stable.

3. Logged Stationary Radioactive Tracerlog. Tracerlog stationed at 3,366 feet. This would put the bottom detector at 3,370 feet; 6 feet above the upper perforation interval.

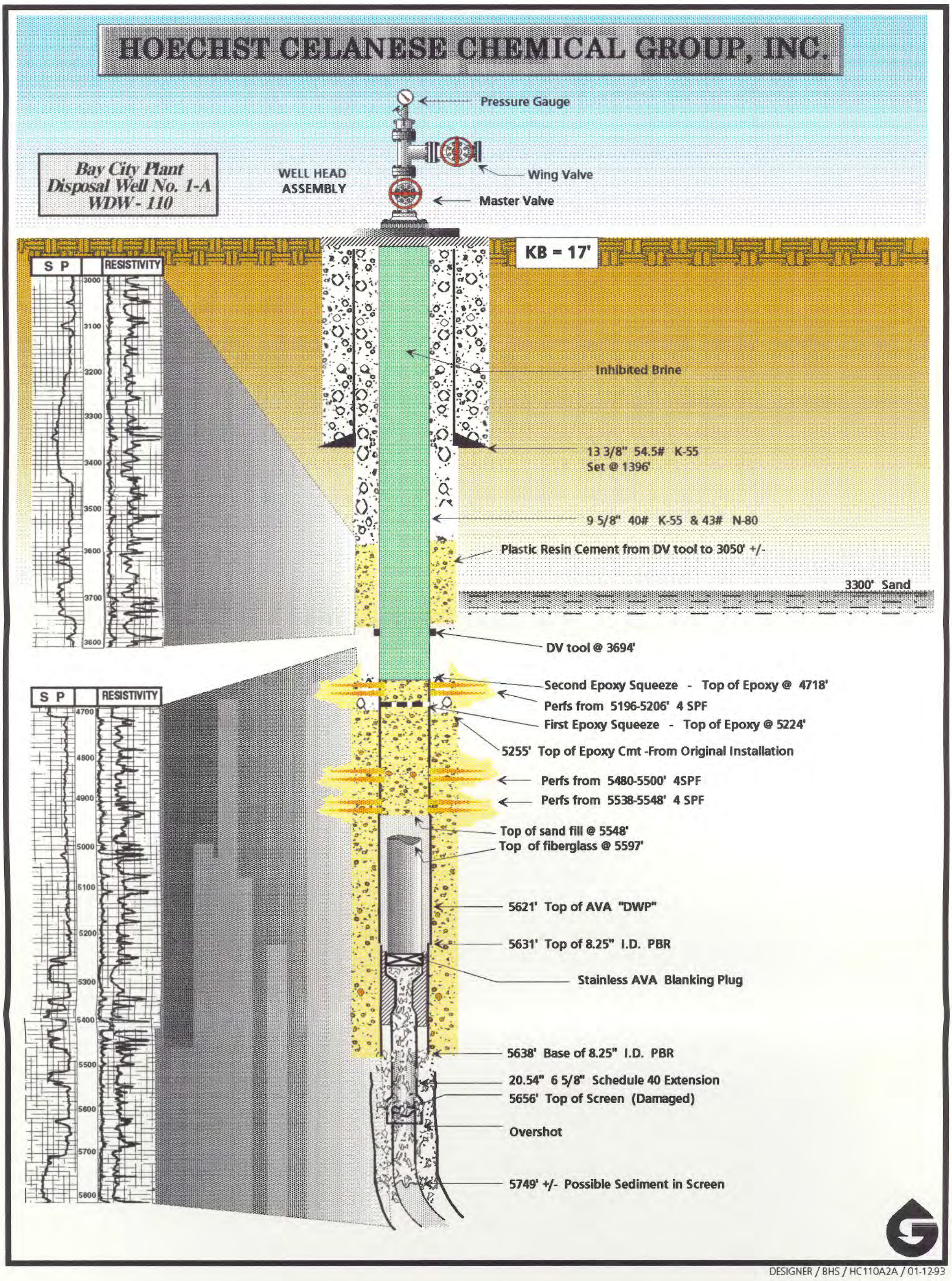
   Purpose: Establish that a channel or communication is not present above the perforated intervals.

   Analysis: One note, of no consequence, is that every time the pumps are shut down to change the tanks, a small amount of isotope is seen leaving the ejector. This can be seen on the bottom detectors (BDET) and is noted on the log. This is due to a sudden decrease in pressure around the tool which causes a slight leak before the tool can respond to the pressure drop. Four slugs were released by the tool. The first two were done with a surface injection rate of 42 GPM. The last two slugs were emitted with a surface injection rate of 210 GPM. The top detector (TDET) never indicated any radiation material moving into its area. The bottom detector (BDET) only indicated initial slug releases and did not indicate the return of radioactive material. There is no indication of upward movement.

APPENDIX D

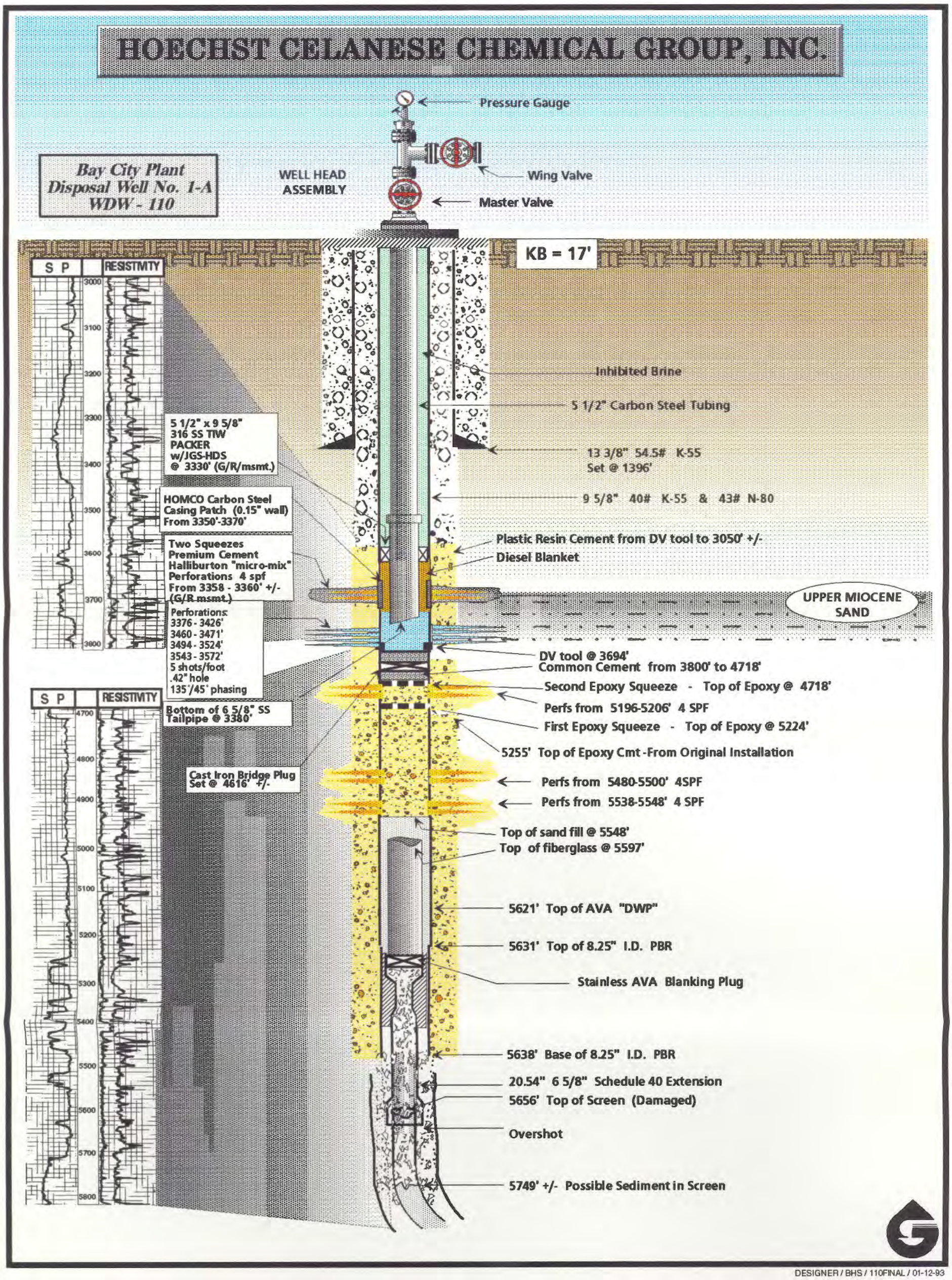
EXPANDED WELLBORE SCHEMATICS

WELL CONFIGURATION PRIOR TO COMPLETION



DESIGNER / BHS / HC110A2A / 01-12-93

FINAL COMPLETION



DESIGNER / BHS / 110FINAL / 01-12-93

APPENDIX E

BOTTOM HOLE PRESSURE DATA

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Production And Times

Cumulative Production (water)	=	-	bbl	<DEF>
Corrected Flow Time	tc =	265.500	hr TABLE 5.2	<DEF>
Final Water Rate	qw =	-6857.00	bbl/d	

Fluid Properties

Reference Pressure	pRef =	1535.0	psi	<DEF>
Water Formation Vol Factor	Bw =	1.00		<DEF>
Water Compressibility	cw =	3.000×10^{-06}	psi^{-1}	<DEF>
Water Viscosity	muw =	~~0.556~~	cp .71 AS PER RESPONSE TO NOD RECEIVED 5/21/93	
Oil Formation Vol Factor	Bo =	1.16		<DEF>
Oil Compressibility	co =	1.921×10^{-04}	psi^{-1}	<DEF>
Oil Viscosity	muo =	2.640	cp	<DEF>
Solution Gas Oil Ratio	Rso =	274.2	scf/bbl	<DEF>
Gas Formation Vol Factor	Bg =	1.56×10^{-03}		<DEF>
Gas Compressibility	cg =	7.429×10^{-04}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Reservoir Parameters

Net Pay	h =	165.00	ft	
Total Porosity	phit =	33.00	%	
Water Saturation	Sw =	100.00	%	
Oil Saturation	So =	0.00	%	
Gas Saturation	Sg =	0.00	%	
Wellbore Radius	rw =	0.30	ft	<DEF>
Formation Temperature	T =	116.00	deg F	
Formation Compressibility	cf =	3.000×10^{-06}	psi^{-1}	
Total Compressibility	ct =	6.000×10^{-06}	psi^{-1}	<DEF>

Water Well Test - FALLOFF

Radial Flow Analysis

(Horner Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Zone 1

Extended Rates

3 - Month Constant Rate	=	-	bbl/d	
6 - Month Constant Rate	=	-	bbl/d	

Stabilized Rate

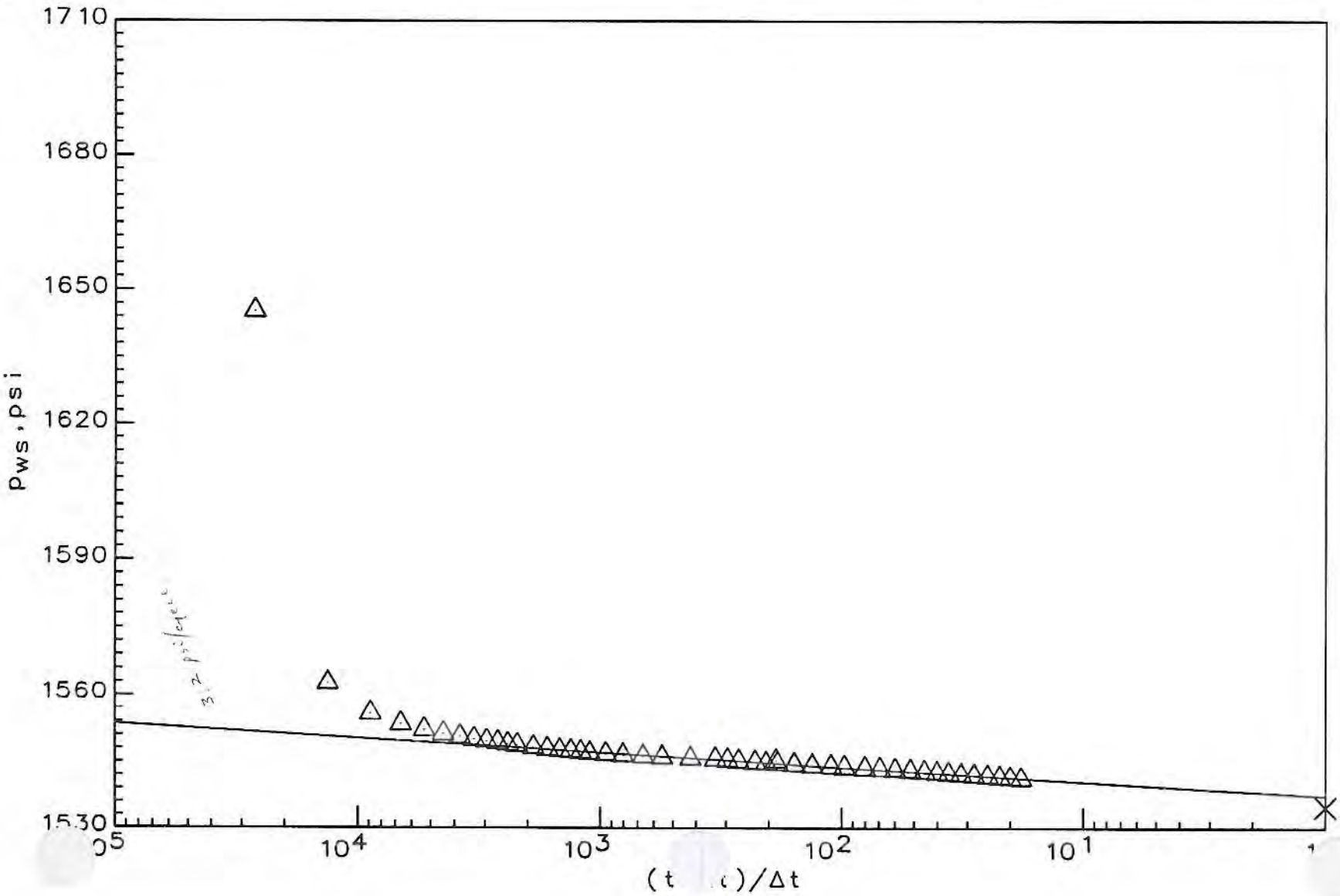
Shape Code	=	R1A		<DEF>
Drainage Area	A =	160.0	acres	<DEF>
Time To Stabilize	ts =	2.477	hr	
Stabilized Rate @ Current Skin	qs =	-19048.82	bbl/d	
Stabilized Rate @ Skin Of 0	qs =	-85244.43	bbl/d	
Stabilized Rate @ Skin Of -4	qs =	-162953.20	bbl/d	

HORNER
PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17, 1993

$[k_1/u]_t$=2112.86 k_1=1174.75 md s=29.1 p*=1537.6



Water Well Test - FALLOFF

Bourdet Et Al Type Curve Analysis

(Equivalent Time)

HOECHST CELANESE BAY CITY
WDW #1-A

PRESSURE FALL-OFF TEST
FEBRUARY 16-17,1993

Inner Zone

Match Curve	CDe2s =	1.00×10^{30}	
Match Point (pressure Ratio)	=	2.8	psi
Match Point (time Ratio)	=	6.154×10^{-04}	hr
Dimensionless Storage Constant	CD =	1942.52	
Wellbore Storage Constant	C =	0.06	bbl/psi
Transmissivity (Total)	kh/mu =	351944.29	md.ft/cp
Mobility (Total)	k/mu =	2132.996	md/cp
Flow Capacity	kh =	195681.03	md.ft
Permeability	k =	1185.95	md
Skin Effect (Total)	s =	30.753	
Pressure Drop Due To Skin	delps =	84.6	psi
Radius Of Investigation	r(inv) =	-	ft
@ Time Of Investigation	t(inv) =	-	hr
Number Of Points In Derivative	=	7	

Dual Porosity

Inter Porosity Coeff	Lambda =	-
Storativity Ratio	Omega =	-

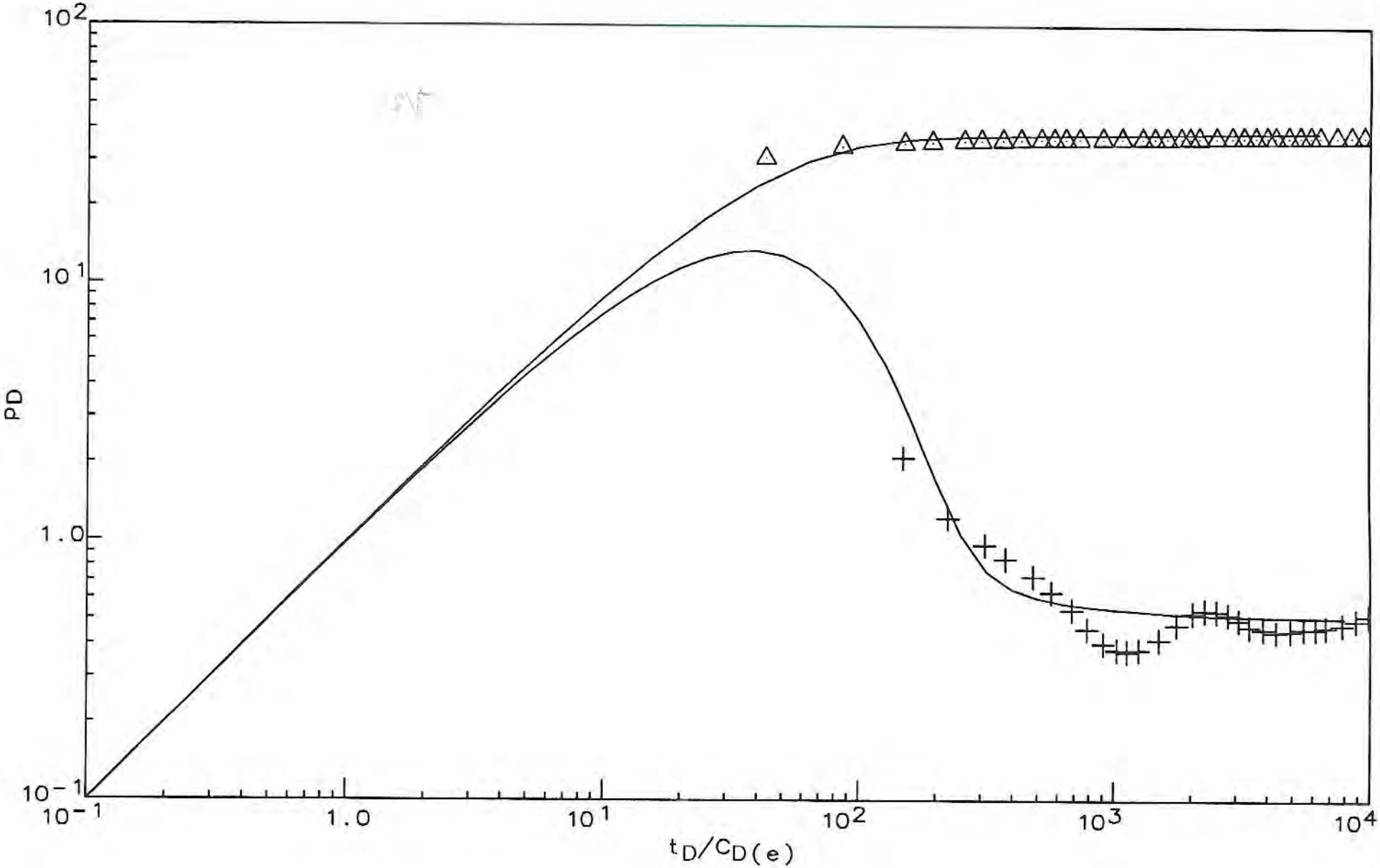
STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE FALLOFF PLOT

HOECHST CELANESE BAY CITY
WDW-1A

PRESSURE FALL-OFF
FEBRUARY 16-17, 1993

$[k_1/u]_t$=2133.00 k_1=1185.95 C_D=1471 s=30.9



E REALITY ASCII FILE SURVEY BY DRESSER ATLAS
GOLDEN STRATA
INJ. WELL , GL DEPTH 3334
CURVES ARE TEMP,SPINNER,TIME,HP,HR

0 0
16 FEB 1993 12 7 7 3360
5

TEMP	SPDN	TIME	HP	CPHOUR
93.51	4.98	60.00	1653.00	0.02
93.51	5.04	120.00	1652.08	0.03
93.52	5.17	180.00	1651.18	0.05
93.52	5.38	210.00	1650.92	0.06
90.74	196.93	240.00	1650.62	0.07
93.53	5.11	270.00	1650.32	0.08
93.54	5.18	300.00	1650.00	0.08
93.53	5.46	360.00	1649.57	0.10
93.51	5.39	420.00	1649.38	0.12
93.51	5.30	480.00	1649.11	0.13
93.48	5.25	540.00	1648.98	0.15
93.48	5.44	600.00	1648.76	0.17
93.46	5.41	660.00	1648.71	0.18
93.45	5.46	720.00	1648.55	0.20
93.45	5.30	780.00	1648.50	0.22
93.45	5.29	840.00	1648.33	0.23
93.47	5.29	900.00	1648.22	0.25
93.46	5.32	960.00	1648.07	0.27
93.47	5.22	1020.00	1647.89	0.28
93.48	5.19	1080.00	1647.82	0.30
93.48	5.24	1140.00	1647.77	0.32
93.48	5.11	1200.00	1647.88	0.33
93.48	5.13	1260.00	1647.77	0.35
93.50	5.47	1320.00	1647.79	0.37
85.54	5.61	1380.00	1647.99	0.38
93.51	5.56	1440.00	1647.72	0.40
93.52	5.54	1500.00	1647.61	0.42
93.53	5.57	1560.00	1647.53	0.43
93.53	5.60	1620.00	1647.64	0.45
93.54	5.49	1680.00	1647.64	0.47
93.55	5.33	1740.00	1647.65	0.48
93.56	5.59	1800.00	1647.61	0.50
93.55	5.51	1860.00	1647.59	0.52
93.54	5.55	1920.00	1647.56	0.53
115.32	5.43	1980.00	1646.82	0.55
93.52	5.51	2040.00	1647.66	0.57
93.52	5.29	2100.00	1647.73	0.58
93.53	5.49	2160.00	1647.73	0.60
93.55	5.40	2220.00	1647.63	0.62
93.56	5.33	2280.00	1647.58	0.63
93.57	5.40	2340.00	1647.58	0.65
93.57	5.43	2400.00	1647.60	0.67
93.56	5.37	2460.00	1647.56	0.68
93.57	5.32	2520.00	1647.67	0.70
93.54	5.42	2580.00	1647.67	0.72
93.52	5.42	2640.00	1647.69	0.73
93.49	5.49	2700.00	1647.83	0.75
93.48	5.63	2760.00	1647.74	0.77

93.47	5.55	2820.00	1647.89	0.78
93.47	5.61	2880.00	1647.84	0.80
93.47	5.64	2940.00	1647.85	0.82
93.47	5.54	3000.00	1647.86	0.83
93.48	5.65	3060.00	1647.75	0.85
93.49	5.66	3120.00	1647.76	0.87
93.52	5.50	3180.00	1647.63	0.88
0.00	6452.96	3240.00	1649.74	0.90
93.57	5.63	3300.00	1647.42	0.92
93.57	5.51	3360.00	1647.41	0.93
93.56	5.64	3420.00	1647.44	0.95
93.55	5.62	3480.00	1647.45	0.97
93.55	5.64	3540.00	1647.60	0.98
93.53	5.60	3600.00	1647.59	1.00
93.50	5.55	3660.00	1647.72	1.02
93.49	5.63	3720.00	1647.75	1.03
93.49	5.70	3780.00	1647.60	1.05
93.50	5.59	3840.00	1647.59	1.07
93.52	5.67	3900.00	1647.60	1.08
93.54	5.71	3960.00	1647.53	1.10
93.53	5.58	4020.00	1647.47	1.12
93.54	5.64	4080.00	1647.41	1.13
93.55	5.64	4140.00	1647.41	1.15
93.56	5.60	4200.00	1647.45	1.17
93.55	5.62	4260.00	1647.48	1.18
93.55	5.63	4320.00	1647.46	1.20
93.53	5.60	4380.00	1647.50	1.22
93.53	5.66	4440.00	1647.47	1.23
93.52	5.60	4500.00	1647.56	1.25
93.51	5.58	4560.00	1647.63	1.27
93.50	5.59	4620.00	1647.71	1.28
93.49	5.55	4680.00	1647.68	1.30
93.47	5.60	4740.00	1647.77	1.32
93.46	5.70	4800.00	1647.58	1.33
93.49	5.57	4860.00	1647.66	1.35
93.50	5.73	4920.00	1647.55	1.37
93.51	5.52	4980.00	1647.48	1.38
93.52	5.56	5040.00	1647.46	1.40
93.53	5.74	5100.00	1647.27	1.42
93.53	5.62	5160.00	1647.29	1.43
93.55	5.66	5220.00	1647.31	1.45
93.55	5.72	5280.00	1647.34	1.47
93.55	5.66	5340.00	1647.34	1.48
652.92	5.53	5400.00	1898.86	1.50
93.54	5.72	5460.00	1647.45	1.52
74.82	1490.99	5520.00	1648.08	1.53
93.54	5.66	5580.00	1647.45	1.55
93.53	5.60	5640.00	1647.49	1.57
93.54	5.61	5700.00	1647.46	1.58
93.55	5.60	5760.00	1647.47	1.60
93.56	5.64	5820.00	1647.38	1.62
93.58	5.51	5880.00	1647.38	1.63
93.59	5.68	5940.00	1647.30	1.65
93.60	5.51	6000.00	1647.21	1.67
93.60	5.64	6060.00	1647.30	1.68
93.59	5.56	6120.00	1647.38	1.70
93.58	5.65	6180.00	1647.42	1.72
93.58	5.68	6240.00	1647.44	1.73
93.58	5.71	6300.00	1646.85	1.75
93.57	5.70	6360.00	1647.05	1.77

93.59	5.72	6420.00	1647.14	1.78
93.61	5.74	6480.00	1647.12	1.80
93.61	5.58	6540.00	1647.13	1.82
93.63	5.70	6600.00	1647.13	1.83
93.64	5.69	6660.00	1647.13	1.85
93.63	5.59	6720.00	1647.23	1.87
93.62	5.60	6780.00	1647.28	1.88
93.61	5.54	6840.00	1647.37	1.90
93.59	5.66	6900.00	1647.47	1.92
93.58	5.64	6960.00	1647.53	1.93
93.59	5.66	7020.00	1647.35	1.95
93.59	5.74	7080.00	1647.40	1.97
93.59	5.63	7140.00	1647.35	1.98
93.59	5.73	7200.00	1647.36	2.00
93.59	5.65	7260.00	1647.39	2.02
93.59	5.72	7320.00	1647.43	2.03
93.59	5.71	7380.00	1647.43	2.05
93.58	5.63	7440.00	1647.40	2.07
93.57	5.69	7500.00	1647.51	2.08
93.56	5.77	7560.00	1647.52	2.10
93.57	5.76	7620.00	1647.48	2.12
93.58	5.74	7680.00	1647.51	2.13
93.58	5.65	7740.00	1647.41	2.15
93.57	5.72	7800.00	1647.48	2.17
93.56	5.80	7860.00	1647.56	2.18
93.55	5.84	7920.00	1647.54	2.20
93.55	5.77	7980.00	1647.53	2.22
93.54	5.74	8040.00	1647.59	2.23
93.56	5.70	8100.00	1647.58	2.25
93.57	5.90	8160.00	1647.44	2.27
93.56	5.80	8220.00	1647.41	2.28
93.55	5.74	8280.00	1647.48	2.30
93.55	5.78	8316.00	1647.47	2.31
93.55	5.82	8317.00	1647.48	2.31
93.55	5.83	8318.00	1647.49	2.31
93.55	5.82	8319.00	1647.49	2.31
93.55	5.78	8320.00	1647.50	2.31
93.55	5.74	8321.00	1647.49	2.31
93.54	5.70	8322.00	1647.50	2.31
93.54	5.68	8323.00	1647.49	2.31
93.54	5.67	8324.00	1647.49	2.31
93.54	5.68	8325.00	1647.49	2.31
93.54	5.70	8326.00	1647.49	2.31
93.54	5.70	8327.00	1647.48	2.31
93.54	5.69	8328.00	1647.47	2.31
93.54	5.68	8329.00	1647.46	2.31
93.54	5.67	8330.00	1647.46	2.31
93.54	5.68	8331.00	1647.47	2.31
93.54	5.70	8332.00	1647.47	2.31
93.54	5.71	8333.00	1647.49	2.31
93.54	5.73	8334.00	1647.50	2.32
93.54	5.73	8335.00	1647.50	2.32
93.54	5.73	8336.00	1647.50	2.32
93.54	5.73	8337.00	1647.50	2.32
93.54	5.73	8338.00	1647.50	2.32
93.55	5.73	8339.00	1647.49	2.32
93.55	5.73	8340.00	1647.50	2.32
93.55	5.71	8341.00	1647.50	2.32
93.55	5.68	8342.00	1647.51	2.32
93.55	5.65	8343.00	1647.51	2.32

93.56	5.65	8344.00	1647.52	2.32
93.56	5.66	8345.00	1647.53	2.32
93.56	5.69	8346.00	1647.54	2.32
93.56	5.71	8347.00	1647.54	2.32
93.56	5.72	8348.00	1647.54	2.32
93.56	5.70	8349.00	1647.54	2.32
93.56	5.69	8350.00	1647.53	2.32
93.56	5.68	8351.00	1647.53	2.32
93.56	5.71	8352.00	1647.54	2.32
93.56	5.75	8353.00	1647.55	2.32
93.56	5.79	8354.00	1647.56	2.32
93.56	5.82	8355.00	1647.57	2.32
93.56	5.82	8356.00	1647.57	2.32
93.56	5.80	8357.00	1647.57	2.32
93.56	5.77	8358.00	1647.56	2.32
93.56	5.75	8359.00	1647.55	2.32
93.56	5.74	8360.00	1647.54	2.32
93.56	5.74	8361.00	1647.53	2.32
93.56	5.76	8362.00	1647.51	2.32
93.56	5.78	8363.00	1647.49	2.32
93.56	5.79	8364.00	1647.48	2.32
93.56	5.78	8365.00	1647.47	2.32
93.56	5.77	8366.00	1647.47	2.32
93.56	5.75	8367.00	1647.48	2.32
93.56	5.74	8368.00	1647.49	2.32
93.56	5.73	8369.00	1647.49	2.32
93.56	5.72	8370.00	1647.49	2.33
93.56	5.70	8371.00	1647.49	2.33
93.56	5.67	8372.00	1647.48	2.33
93.56	5.64	8373.00	1647.47	2.33
93.56	5.63	8374.00	1647.46	2.33
93.56	5.63	8375.00	1647.46	2.33
93.56	5.66	8376.00	1647.47	2.33
93.56	5.69	8377.00	1647.48	2.33
93.56	5.73	8378.00	1647.50	2.33
93.56	5.75	8379.00	1647.51	2.33
93.56	5.77	8380.00	1647.52	2.33
93.56	5.77	8381.00	1647.53	2.33
93.56	5.76	8382.00	1647.54	2.33
93.56	5.75	8383.00	1647.54	2.33
93.56	5.75	8384.00	1647.54	2.33
93.56	5.76	8385.00	1647.53	2.33
93.56	5.78	8386.00	1647.52	2.33
93.56	5.80	8387.00	1647.52	2.33
93.56	5.82	8388.00	1647.53	2.33
93.56	5.84	8389.00	1647.53	2.33
93.56	5.84	8390.00	1647.54	2.33
93.56	5.85	8391.00	1647.54	2.33
93.55	5.85	8392.00	1647.54	2.33
93.55	5.85	8393.00	1647.54	2.33
93.55	5.85	8394.00	1647.54	2.33
93.55	5.86	8395.00	1647.53	2.33
93.55	5.87	8396.00	1647.53	2.33
93.55	5.87	8397.00	1647.53	2.33
93.55	5.85	8398.00	1647.52	2.33
93.55	5.82	8399.00	1647.51	2.33
93.55	5.78	8400.00	1647.50	2.33
93.55	5.74	8401.00	1647.49	2.33
93.55	5.72	8402.00	1647.47	2.33
93.55	5.71	8403.00	1647.46	2.33

93.55	5.71	8404.00	1647.45	2.33
93.55	5.72	8405.00	1647.45	2.33
93.55	5.74	8406.00	1647.47	2.34
93.55	5.76	8407.00	1647.48	2.34
93.55	5.78	8408.00	1647.49	2.34
93.55	5.79	8409.00	1647.49	2.34
93.55	5.80	8410.00	1647.49	2.34
93.55	5.78	8411.00	1647.48	2.34
93.55	5.76	8412.00	1647.47	2.34
93.55	5.74	8413.00	1647.45	2.34
93.55	5.72	8414.00	1647.45	2.34
93.55	5.72	8415.00	1647.45	2.34
93.55	5.73	8416.00	1647.45	2.34
93.55	5.75	8417.00	1647.45	2.34
93.55	5.77	8418.00	1647.43	2.34
93.55	5.78	8419.00	1647.41	2.34
93.55	5.78	8420.00	1647.40	2.34
93.55	5.78	8421.00	1647.39	2.34
93.55	5.76	8422.00	1647.38	2.34
93.55	5.74	8423.00	1647.39	2.34
93.55	5.71	8424.00	1647.40	2.34
93.55	5.69	8425.00	1647.40	2.34
93.55	5.69	8426.00	1647.39	2.34
93.55	5.71	8427.00	1647.38	2.34
93.55	5.73	8428.00	1647.38	2.34
93.55	5.75	8429.00	1647.38	2.34
93.56	5.76	8430.00	1647.38	2.34
93.56	5.75	8431.00	1647.40	2.34
93.56	5.74	8432.00	1647.41	2.34
93.56	5.72	8433.00	1647.42	2.34
93.57	5.71	8434.00	1647.43	2.34
93.57	5.69	8435.00	1647.43	2.34
93.57	5.67	8436.00	1647.43	2.34
93.57	5.65	8437.00	1647.43	2.34
93.57	5.62	8438.00	1647.43	2.34
93.57	5.61	8439.00	1647.45	2.34
93.57	5.60	8440.00	1647.46	2.34
93.57	5.61	8441.00	1647.47	2.34
93.57	5.63	8442.00	1647.47	2.35
93.57	5.66	8443.00	1647.48	2.35
93.57	5.68	8444.00	1647.47	2.35
93.57	5.69	8445.00	1647.46	2.35
93.57	5.68	8446.00	1647.44	2.35
93.57	5.65	8447.00	1647.42	2.35
93.57	5.62	8448.00	1647.41	2.35
93.57	5.60	8449.00	1647.40	2.35
93.57	5.62	8450.00	1647.41	2.35
93.57	5.67	8451.00	1647.41	2.35
93.57	5.75	8452.00	1647.43	2.35
93.57	5.82	8453.00	1647.45	2.35
93.57	5.87	8454.00	1647.46	2.35
93.57	5.87	8455.00	1647.46	2.35
93.57	5.83	8456.00	1647.45	2.35
93.57	5.76	8457.00	1647.44	2.35
93.57	5.69	8458.00	1647.44	2.35
93.57	5.64	8459.00	1647.43	2.35
93.57	5.62	8460.00	1647.43	2.35
93.57	5.63	8461.00	1647.42	2.35
93.57	5.66	8462.00	1647.41	2.35
93.57	5.70	8463.00	1647.40	2.35

93.57	5.73	8464.00	1647.40	2.35
93.57	5.74	8465.00	1647.41	2.35
93.57	5.76	8466.00	1647.42	2.35
93.57	5.76	8467.00	1647.42	2.35
93.57	5.77	8468.00	1647.42	2.35
93.57	5.78	8469.00	1647.43	2.35
93.57	5.78	8470.00	1647.42	2.35
93.57	5.77	8471.00	1647.42	2.35
93.57	5.75	8472.00	1647.42	2.35
93.57	5.72	8473.00	1647.43	2.35
93.57	5.70	8474.00	1647.45	2.35
93.57	5.69	8475.00	1647.46	2.35
93.57	5.70	8476.00	1647.48	2.35
93.57	5.72	8477.00	1647.49	2.35
93.57	5.75	8478.00	1647.48	2.36
93.57	5.77	8479.00	1647.47	2.36
93.57	5.79	8480.00	1647.46	2.36
93.57	5.78	8481.00	1647.45	2.36
93.57	5.77	8482.00	1647.43	2.36
93.57	5.76	8483.00	1647.42	2.36
93.57	5.74	8484.00	1647.42	2.36
93.57	5.73	8485.00	1647.43	2.36
93.57	5.73	8486.00	1647.43	2.36
93.57	5.73	8487.00	1647.44	2.36
93.57	5.74	8488.00	1647.44	2.36
93.57	5.74	8489.00	1647.45	2.36
93.57	5.74	8490.00	1647.45	2.36
93.57	5.73	8491.00	1647.44	2.36
93.57	5.72	8492.00	1647.45	2.36
93.57	5.71	8493.00	1647.45	2.36
93.57	5.71	8494.00	1647.46	2.36
93.57	5.71	8495.00	1647.46	2.36
93.57	5.72	8496.00	1647.47	2.36
93.57	5.73	8497.00	1647.46	2.36
93.57	5.74	8498.00	1647.45	2.36
93.57	5.75	8499.00	1647.43	2.36
93.57	5.76	8500.00	1647.41	2.36
93.57	5.77	8501.00	1647.39	2.36
93.57	5.78	8502.00	1647.36	2.36
93.57	5.79	8503.00	1647.35	2.36
93.57	5.80	8504.00	1647.33	2.36
93.57	5.80	8505.00	1647.32	2.36
93.57	5.78	8506.00	1647.31	2.36
93.57	5.76	8507.00	1647.31	2.36
93.57	5.75	8508.00	1647.30	2.36
93.57	5.74	8509.00	1647.30	2.36
93.57	5.75	8510.00	1647.30	2.36
93.57	5.77	8511.00	1647.30	2.36
93.57	5.79	8512.00	1647.31	2.36
93.57	5.80	8513.00	1647.32	2.36
93.57	5.79	8514.00	1647.33	2.37
93.57	5.76	8515.00	1647.34	2.37
93.58	5.72	8516.00	1647.35	2.37
93.58	5.70	8517.00	1647.36	2.37
93.58	5.70	8518.00	1647.36	2.37
93.58	5.72	8519.00	1647.37	2.37
93.58	5.75	8520.00	1647.38	2.37
93.58	5.76	8521.00	1647.39	2.37
93.57	5.73	8522.00	1647.39	2.37
93.57	5.68	8523.00	1647.38	2.37

93.57	5.62	8524.00	1647.37	2.37
93.57	5.58	8525.00	1647.36	2.37
93.57	5.57	8526.00	1647.35	2.37
93.57	5.59	8527.00	1647.36	2.37
93.57	5.64	8528.00	1647.37	2.37
93.58	5.70	8530.00	1647.38	2.37
93.58	5.86	8540.00	1647.44	2.37
93.57	5.80	8550.00	1647.42	2.38
93.57	5.64	8560.00	1647.38	2.38
93.57	5.84	8570.00	1647.37	2.38
93.57	5.78	8580.00	1647.33	2.38
93.57	5.93	8590.00	1647.39	2.39
93.57	5.76	8600.00	1647.36	2.39
93.57	5.75	8601.00	1647.37	2.39
93.57	5.72	8602.00	1647.37	2.39
93.57	5.70	8603.00	1647.37	2.39
93.56	5.70	8604.00	1647.37	2.39
93.56	5.71	8605.00	1647.37	2.39
93.56	5.74	8606.00	1647.38	2.39
93.56	5.78	8607.00	1647.38	2.39
93.56	5.80	8608.00	1647.39	2.39
93.56	5.81	8609.00	1647.39	2.39
93.56	5.79	8610.00	1647.39	2.39
93.56	5.77	8611.00	1647.39	2.39
93.56	5.75	8612.00	1647.39	2.39
93.56	5.75	8613.00	1647.39	2.39
93.56	5.77	8614.00	1647.39	2.39
93.56	5.81	8615.00	1647.39	2.39
93.56	5.86	8616.00	1647.41	2.39
93.56	5.89	8617.00	1647.41	2.39
93.56	5.89	8618.00	1647.42	2.39
93.56	5.88	8619.00	1647.42	2.39
93.56	5.85	8620.00	1647.41	2.39
93.56	5.81	8621.00	1647.40	2.39
93.56	5.78	8622.00	1647.39	2.40
93.56	5.75	8623.00	1647.38	2.40
93.56	5.73	8624.00	1647.37	2.40
93.56	5.73	8625.00	1647.37	2.40
93.56	5.74	8626.00	1647.37	2.40
93.56	5.76	8627.00	1647.38	2.40
93.56	5.77	8628.00	1647.39	2.40
93.56	5.79	8629.00	1647.39	2.40
93.56	5.79	8630.00	1647.40	2.40
93.56	5.80	8631.00	1647.40	2.40
93.56	5.80	8632.00	1647.40	2.40
93.56	5.79	8633.00	1647.40	2.40
93.56	5.78	8634.00	1647.40	2.40
93.56	5.76	8635.00	1647.40	2.40
93.56	5.73	8636.00	1647.41	2.40
93.56	5.71	8637.00	1647.42	2.40
93.56	5.71	8638.00	1647.42	2.40
93.56	5.74	8639.00	1647.43	2.40
93.56	5.78	8640.00	1647.44	2.40
93.56	5.83	8641.00	1647.45	2.40
93.56	5.85	8642.00	1647.46	2.40
93.56	5.85	8643.00	1647.46	2.40
93.56	5.83	8644.00	1647.45	2.40
93.56	5.81	8645.00	1647.45	2.40
93.56	5.80	8646.00	1647.45	2.40
93.56	5.81	8647.00	1647.45	2.40

93.56	5.84	8648.00	1647.46	2.40
93.56	5.85	8649.00	1647.46	2.40
93.56	5.85	8650.00	1647.46	2.40
93.56	5.83	8651.00	1647.44	2.40
93.56	5.80	8652.00	1647.42	2.40
93.56	5.77	8653.00	1647.39	2.40
93.56	5.75	8654.00	1647.38	2.40
93.56	5.75	8655.00	1647.37	2.40
93.56	5.76	8656.00	1647.37	2.40
93.56	5.78	8657.00	1647.38	2.40
93.56	5.80	8658.00	1647.38	2.41
93.56	5.81	8659.00	1647.39	2.41
93.56	5.80	8660.00	1647.39	2.41
93.56	5.77	8661.00	1647.39	2.41
93.56	5.72	8662.00	1647.40	2.41
93.56	5.67	8663.00	1647.40	2.41
93.56	5.65	8664.00	1647.40	2.41
93.56	5.65	8665.00	1647.40	2.41
93.56	5.68	8666.00	1647.41	2.41
93.56	5.72	8667.00	1647.42	2.41
93.56	5.76	8668.00	1647.43	2.41
93.56	5.80	8669.00	1647.45	2.41
93.56	5.83	8670.00	1647.48	2.41
93.56	5.83	8671.00	1647.49	2.41
93.56	5.83	8672.00	1647.50	2.41
93.56	5.81	8673.00	1647.50	2.41
93.56	5.80	8674.00	1647.50	2.41
93.56	5.80	8675.00	1647.50	2.41
93.56	5.80	8676.00	1647.50	2.41
93.56	5.82	8677.00	1647.50	2.41
93.56	5.83	8678.00	1647.50	2.41
93.56	5.84	8679.00	1647.50	2.41
93.56	5.83	8680.00	1647.49	2.41
93.56	5.81	8681.00	1647.48	2.41
93.56	5.79	8682.00	1647.47	2.41
93.56	5.77	8683.00	1647.46	2.41
93.56	5.77	8684.00	1647.46	2.41
93.56	5.77	8685.00	1647.46	2.41
93.56	5.78	8686.00	1647.45	2.41
93.56	5.78	8687.00	1647.46	2.41
93.56	5.78	8688.00	1647.46	2.41
93.56	5.78	8689.00	1647.48	2.41
93.56	5.78	8690.00	1647.49	2.41
93.56	5.79	8691.00	1647.50	2.41
93.56	5.81	8692.00	1647.52	2.41
93.56	5.83	8693.00	1647.52	2.41
93.55	5.84	8694.00	1647.52	2.42
93.55	5.83	8695.00	1647.51	2.42
93.55	5.80	8696.00	1647.49	2.42
93.55	5.78	8697.00	1647.48	2.42
93.55	5.76	8698.00	1647.46	2.42
93.55	5.76	8699.00	1647.45	2.42
93.56	5.77	8700.00	1647.44	2.42
93.56	5.79	8701.00	1647.43	2.42
93.56	5.82	8702.00	1647.43	2.42
93.55	5.84	8703.00	1647.43	2.42
93.55	5.85	8704.00	1647.44	2.42
93.55	5.84	8705.00	1647.46	2.42
93.55	5.82	8706.00	1647.48	2.42
93.55	5.78	8707.00	1647.50	2.42

93.55	5.76	8708.00	1647.51	2.42
93.55	5.75	8709.00	1647.52	2.42
93.56	5.75	8710.00	1647.52	2.42
93.56	5.76	8711.00	1647.51	2.42
93.56	5.76	8712.00	1647.51	2.42
93.56	5.75	8713.00	1647.49	2.42
93.57	5.73	8714.00	1647.48	2.42
93.57	5.72	8715.00	1647.46	2.42
93.57	5.71	8716.00	1647.43	2.42
93.57	5.71	8717.00	1647.42	2.42
93.57	5.70	8718.00	1647.41	2.42
93.57	5.68	8719.00	1647.40	2.42
93.57	5.66	8720.00	1647.40	2.42
93.57	5.64	8721.00	1647.40	2.42
93.57	5.61	8722.00	1647.41	2.42
93.57	5.60	8723.00	1647.41	2.42
93.57	5.61	8724.00	1647.41	2.42
93.57	5.64	8725.00	1647.41	2.42
93.57	5.68	8726.00	1647.40	2.42
93.57	5.73	8727.00	1647.39	2.42
93.57	5.76	8728.00	1647.38	2.42
93.57	5.75	8729.00	1647.38	2.42
93.56	5.73	8730.00	1647.38	2.43
93.56	5.70	8731.00	1647.38	2.43
93.56	5.68	8732.00	1647.38	2.43
93.56	5.69	8733.00	1647.39	2.43
93.56	5.73	8734.00	1647.39	2.43
93.56	5.79	8735.00	1647.40	2.43
93.56	5.84	8736.00	1647.42	2.43
93.56	5.86	8737.00	1647.44	2.43
93.56	5.87	8738.00	1647.45	2.43
93.56	5.85	8739.00	1647.47	2.43
93.56	5.81	8740.00	1647.47	2.43
93.56	5.78	8741.00	1647.46	2.43
93.56	5.76	8742.00	1647.45	2.43
93.56	5.76	8743.00	1647.44	2.43
93.56	5.77	8744.00	1647.43	2.43
93.56	5.76	8745.00	1647.42	2.43
93.56	5.73	8746.00	1647.42	2.43
93.56	5.70	8747.00	1647.43	2.43
93.56	5.68	8748.00	1647.42	2.43
93.56	5.68	8749.00	1647.43	2.43
93.56	5.70	8750.00	1647.43	2.43
93.56	5.72	8751.00	1647.43	2.43
93.56	5.76	8752.00	1647.44	2.43
93.55	5.78	8753.00	1647.45	2.43
93.55	5.79	8754.00	1647.46	2.43
93.55	5.79	8755.00	1647.47	2.43
93.55	5.78	8756.00	1647.47	2.43
93.55	5.77	8757.00	1647.46	2.43
93.55	5.76	8758.00	1647.45	2.43
93.55	5.75	8759.00	1647.44	2.43
93.55	5.77	8760.00	1647.42	2.43
93.55	5.79	8761.00	1647.40	2.43
93.55	5.83	8762.00	1647.40	2.43
93.55	5.85	8763.00	1647.39	2.43
93.55	5.87	8764.00	1647.39	2.43
93.55	5.86	8765.00	1647.39	2.43
93.55	5.84	8766.00	1647.39	2.43
93.55	5.81	8767.00	1647.39	2.44

93.55	5.78	8768.00	1647.41	2.44
93.55	5.77	8769.00	1647.41	2.44
93.55	5.76	8770.00	1647.41	2.44
93.55	5.76	8771.00	1647.41	2.44
93.55	5.75	8772.00	1647.41	2.44
93.55	5.67	8780.00	1647.42	2.44
93.55	5.86	8790.00	1647.36	2.44
93.55	5.86	8800.00	1647.37	2.44
93.55	5.75	8810.00	1647.35	2.45
93.54	5.80	8820.00	1647.39	2.45
93.55	5.79	8830.00	1647.31	2.45
93.54	5.77	8840.00	1647.29	2.46
93.54	5.76	8850.00	1647.25	2.46
93.54	5.64	8858.00	1647.16	2.46
93.54	5.63	8859.00	1647.14	2.46
93.54	5.62	8860.00	1647.12	2.46
93.54	5.61	8861.00	1647.08	2.46
93.54	5.60	8862.00	1647.03	2.46
93.55	5.60	8863.00	1646.97	2.46
93.55	5.60	8864.00	1646.89	2.46
93.55	5.61	8865.00	1646.78	2.46
93.55	5.62	8866.00	1646.65	2.46
93.54	5.62	8867.00	1646.49	2.46
93.54	5.61	8868.00	1646.31	2.46
93.54	5.57	8869.00	1646.10	2.46
93.54	5.52	8870.00	1645.86	2.46
93.54	5.46	8871.00	1645.57	2.46
93.54	5.39	8872.00	1645.25	2.46
93.54	5.33	8873.00	1644.88	2.46
93.54	5.28	8874.00	1644.45	2.46
93.54	5.23	8875.00	1643.94	2.47
93.54	5.15	8876.00	1643.29	2.47
93.54	5.00	8877.00	1642.42	2.47
93.54	4.73	8878.00	1641.19	2.47
93.54	4.27	8879.00	1639.37	2.47
93.54	3.63	8880.00	1636.65	2.47
93.54	2.85	8881.00	1632.74	2.47
93.54	2.02	8882.00	1627.54	2.47
93.54	1.27	8883.00	1621.24	2.47
93.53	0.70	8884.00	1614.31	2.47
93.53	0.33	8885.00	1607.34	2.47
93.53	0.15	8886.00	1600.91	2.47
93.53	0.07	8887.00	1595.37	2.47
93.53	0.05	8888.00	1590.79	2.47
93.53	0.04	8889.00	1587.06	2.47
93.53	0.04	8890.00	1583.99	2.47
93.53	0.04	8891.00	1581.38	2.47
93.53	0.04	8892.00	1579.13	2.47
93.53	0.03	8893.00	1577.15	2.47
93.53	0.02	8894.00	1575.40	2.47
93.53	0.02	8895.00	1573.82	2.47
93.53	0.01	8896.00	1572.42	2.47
93.53	0.00	8897.00	1571.16	2.47
93.53	0.00	8898.00	1570.02	2.47
93.53	0.00	8899.00	1568.99	2.47
93.53	0.00	8900.00	1568.05	2.47
93.53	0.00	8901.00	1567.19	2.47
93.53	0.00	8902.00	1566.41	2.47
93.53	0.00	8903.00	1565.69	2.47
93.53	0.00	8904.00	1565.02	2.47

93.53	0.00	8905.00	1564.42	2.47
93.53	0.00	8906.00	1563.85	2.47
93.53	0.00	8907.00	1563.33	2.47
93.53	0.00	8908.00	1562.85	2.47
93.53	0.00	8909.00	1562.39	2.47
93.53	0.00	8910.00	1561.97	2.47
93.53	0.00	8911.00	1561.58	2.48
93.53	0.00	8912.00	1561.21	2.48
93.53	0.00	8913.00	1560.86	2.48
93.53	0.00	8914.00	1560.52	2.48
93.53	0.00	8915.00	1560.21	2.48
93.53	0.00	8916.00	1559.92	2.48
93.53	0.00	8917.00	1559.63	2.48
93.53	0.00	8918.00	1559.37	2.48
93.53	0.00	8919.00	1559.10	2.48
93.53	0.00	8920.00	1558.86	2.48
93.53	0.00	8921.00	1558.63	2.48
93.53	0.00	8922.00	1558.40	2.48
93.53	0.00	8923.00	1558.19	2.48
93.53	0.00	8924.00	1557.98	2.48
93.53	0.00	8925.00	1557.78	2.48
93.53	0.00	8926.00	1557.59	2.48
93.53	0.00	8927.00	1557.41	2.48
93.53	0.00	8928.00	1557.24	2.48
93.53	0.00	8929.00	1557.08	2.48
93.53	0.00	8930.00	1556.93	2.48
93.53	0.00	8931.00	1556.78	2.48
93.53	0.00	8932.00	1556.64	2.48
93.53	0.00	8933.00	1556.51	2.48
93.54	0.00	8934.00	1556.38	2.48
93.54	0.00	8935.00	1556.25	2.48
93.54	0.00	8936.00	1556.13	2.48
93.54	0.00	8937.00	1556.00	2.48
93.54	0.00	8938.00	1555.89	2.48
93.54	0.00	8939.00	1555.78	2.48
93.54	0.00	8940.00	1555.66	2.48
93.54	0.00	8941.00	1555.55	2.48
93.54	0.00	8942.00	1555.45	2.48
93.54	0.00	8943.00	1555.34	2.48
93.54	0.00	8944.00	1555.25	2.48
93.54	0.00	8945.00	1555.15	2.48
93.54	0.00	8946.00	1555.05	2.48
93.54	0.00	8947.00	1554.96	2.49
93.54	0.00	8948.00	1554.88	2.49
93.54	0.00	8949.00	1554.79	2.49
93.54	0.00	8950.00	1554.70	2.49
93.54	0.00	8951.00	1554.62	2.49
93.54	0.00	8952.00	1554.54	2.49
93.54	0.00	8953.00	1554.46	2.49
93.54	0.00	8954.00	1554.38	2.49
93.54	0.00	8955.00	1554.30	2.49
93.54	0.00	8956.00	1554.23	2.49
93.54	0.00	8957.00	1554.15	2.49
93.54	0.00	8958.00	1554.08	2.49
93.54	0.00	8959.00	1554.01	2.49
93.54	0.00	8960.00	1553.94	2.49
93.54	0.00	8961.00	1553.88	2.49
93.54	0.00	8962.00	1553.81	2.49
93.54	0.00	8963.00	1553.74	2.49
93.54	0.00	8964.00	1553.69	2.49

93.54	0.00	8965.00	1553.62	2.49
93.54	0.00	8966.00	1553.56	2.49
93.54	0.00	8967.00	1553.50	2.49
93.54	0.00	8968.00	1553.44	2.49
93.54	0.00	8969.00	1553.38	2.49
93.54	0.00	8970.00	1553.33	2.49
93.54	0.00	8971.00	1553.27	2.49
93.54	0.00	8972.00	1553.22	2.49
93.54	0.00	8973.00	1553.16	2.49
93.54	0.00	8974.00	1553.11	2.49
93.54	0.00	8975.00	1553.05	2.49
93.54	0.00	8976.00	1553.00	2.49
93.54	0.00	8977.00	1552.95	2.49
93.54	0.00	8978.00	1552.90	2.49
93.54	0.00	8979.00	1552.85	2.49
93.54	0.00	8980.00	1552.81	2.49
93.54	0.00	8981.00	1552.76	2.49
93.54	0.00	8982.00	1552.71	2.49
93.54	0.00	8983.00	1552.67	2.50
93.54	0.00	8984.00	1552.62	2.50
93.54	0.00	8985.00	1552.57	2.50
93.54	0.00	8986.00	1552.53	2.50
93.54	0.00	8987.00	1552.49	2.50
93.54	0.00	8988.00	1552.44	2.50
93.54	0.00	8989.00	1552.40	2.50
93.54	0.00	8990.00	1552.36	2.50
93.54	0.00	8991.00	1552.32	2.50
93.54	0.00	8992.00	1552.28	2.50
93.54	0.00	8993.00	1552.24	2.50
93.54	0.00	8994.00	1552.20	2.50
93.54	0.00	8995.00	1552.16	2.50
93.54	0.00	8996.00	1552.12	2.50
93.54	0.00	8997.00	1552.08	2.50
93.54	0.00	8998.00	1552.05	2.50
93.54	0.00	8999.00	1552.01	2.50
93.54	0.00	9000.00	1551.97	2.50
93.54	0.00	9001.00	1551.93	2.50
93.54	0.00	9002.00	1551.89	2.50
93.54	0.00	9003.00	1551.86	2.50
93.54	0.00	9004.00	1551.83	2.50
93.54	0.00	9005.00	1551.79	2.50
93.54	0.00	9006.00	1551.75	2.50
93.54	0.00	9007.00	1551.72	2.50
93.54	0.00	9008.00	1551.69	2.50
93.54	0.00	9009.00	1551.65	2.50
93.54	0.00	9010.00	1551.62	2.50
93.54	0.00	9011.00	1551.59	2.50
93.54	0.00	9012.00	1551.56	2.50
93.54	0.00	9013.00	1551.52	2.50
93.54	0.00	9014.00	1551.49	2.50
93.54	0.00	9015.00	1551.46	2.50
93.54	0.00	9016.00	1551.42	2.50
93.54	0.00	9017.00	1551.40	2.50
93.54	0.00	9018.00	1551.37	2.51
93.54	0.00	9019.00	1551.34	2.51
93.54	0.00	9020.00	1551.31	2.51
93.54	0.00	9021.00	1551.28	2.51
93.54	0.00	9022.00	1551.25	2.51
93.54	0.00	9023.00	1551.23	2.51
93.54	0.00	9024.00	1551.20	2.51

93.54	0.00	9025.00	1551.17	2.51
93.54	0.00	9026.00	1551.14	2.51
93.54	0.00	9027.00	1551.12	2.51
93.54	0.00	9028.00	1551.09	2.51
93.54	0.00	9029.00	1551.06	2.51
93.54	0.00	9030.00	1551.03	2.51
93.54	0.00	9031.00	1551.01	2.51
93.54	0.00	9032.00	1550.99	2.51
93.54	0.00	9033.00	1550.96	2.51
93.54	0.00	9034.00	1550.93	2.51
93.54	0.00	9035.00	1550.91	2.51
93.54	0.00	9036.00	1550.88	2.51
93.54	0.00	9037.00	1550.86	2.51
93.54	0.00	9038.00	1550.83	2.51
93.54	0.00	9039.00	1550.81	2.51
93.54	0.00	9040.00	1550.78	2.51
93.54	0.00	9041.00	1550.76	2.51
93.54	0.00	9042.00	1550.74	2.51
93.55	0.00	9043.00	1550.71	2.51
93.55	0.00	9044.00	1550.69	2.51
93.55	0.00	9045.00	1550.67	2.51
93.55	0.00	9046.00	1550.64	2.51
93.55	0.00	9047.00	1550.62	2.51
93.55	0.00	9048.00	1550.60	2.51
93.55	0.00	9049.00	1550.57	2.51
93.55	0.00	9050.00	1550.56	2.51
93.55	0.00	9051.00	1550.53	2.51
93.55	0.00	9052.00	1550.51	2.51
93.55	0.00	9053.00	1550.49	2.51
93.55	0.00	9054.00	1550.47	2.52
93.55	0.00	9055.00	1550.45	2.52
93.55	0.00	9056.00	1550.43	2.52
93.55	0.00	9057.00	1550.40	2.52
93.55	0.00	9058.00	1550.38	2.52
93.55	0.00	9059.00	1550.36	2.52
93.55	0.00	9060.00	1550.34	2.52
93.56	0.00	9061.00	1550.32	2.52
93.56	0.00	9062.00	1550.30	2.52
93.56	0.00	9063.00	1550.28	2.52
93.56	0.00	9064.00	1550.26	2.52
93.56	0.00	9065.00	1550.24	2.52
93.56	0.00	9066.00	1550.22	2.52
93.56	0.00	9067.00	1550.20	2.52
93.56	0.00	9068.00	1550.18	2.52
93.56	0.00	9069.00	1550.16	2.52
93.56	0.00	9070.00	1550.14	2.52
93.56	0.00	9071.00	1550.13	2.52
93.56	0.00	9072.00	1550.10	2.52
93.56	0.00	9073.00	1550.09	2.52
93.56	0.00	9074.00	1550.07	2.52
93.56	0.00	9075.00	1550.05	2.52
93.56	0.00	9076.00	1550.03	2.52
93.56	0.00	9077.00	1550.02	2.52
93.55	0.00	9078.00	1549.99	2.52
93.55	0.00	9079.00	1549.98	2.52
93.55	0.00	9080.00	1549.96	2.52
93.55	0.00	9081.00	1549.94	2.52
93.55	0.00	9082.00	1549.93	2.52
93.56	0.00	9083.00	1549.91	2.52
93.56	0.00	9084.00	1549.89	2.52

93.57	0.00	9085.00	1549.87	2.52
93.58	0.00	9086.00	1549.85	2.52
93.58	0.00	9087.00	1549.84	2.52
93.59	0.00	9088.00	1549.82	2.52
93.59	0.00	9089.00	1549.81	2.52
93.59	0.00	9090.00	1549.79	2.53
93.59	0.00	9091.00	1549.78	2.53
93.59	0.00	9092.00	1549.75	2.53
93.59	0.00	9093.00	1549.74	2.53
93.59	0.00	9094.00	1549.72	2.53
93.59	0.00	9095.00	1549.71	2.53
93.60	0.00	9096.00	1549.69	2.53
93.60	0.00	9097.00	1549.67	2.53
93.60	0.00	9098.00	1549.66	2.53
93.60	0.00	9099.00	1549.64	2.53
93.60	0.00	9100.00	1549.63	2.53
93.60	0.00	9101.00	1549.61	2.53
93.60	0.00	9102.00	1549.60	2.53
93.59	0.00	9103.00	1549.58	2.53
93.59	0.00	9104.00	1549.57	2.53
93.59	0.00	9105.00	1549.55	2.53
93.59	0.00	9106.00	1549.54	2.53
93.59	0.00	9107.00	1549.53	2.53
93.59	0.00	9108.00	1549.51	2.53
93.59	0.00	9109.00	1549.50	2.53
93.59	0.00	9110.00	1549.48	2.53
93.60	0.00	9111.00	1549.46	2.53
93.60	0.00	9112.00	1549.45	2.53
93.60	0.00	9113.00	1549.44	2.53
93.60	0.00	9114.00	1549.42	2.53
93.60	0.00	9115.00	1549.41	2.53
93.60	0.00	9116.00	1549.39	2.53
93.60	0.00	9117.00	1549.38	2.53
93.60	0.00	9118.00	1549.37	2.53
93.60	0.00	9119.00	1549.35	2.53
93.60	0.00	9120.00	1549.34	2.53
93.60	0.00	9121.00	1549.33	2.53
93.60	0.00	9122.00	1549.31	2.53
93.59	0.00	9123.00	1549.30	2.53
93.59	0.00	9124.00	1549.29	2.53
93.59	0.00	9125.00	1549.27	2.53
93.59	0.00	9126.00	1549.26	2.54
93.59	0.00	9127.00	1549.24	2.54
93.59	0.00	9128.00	1549.23	2.54
93.58	0.00	9129.00	1549.22	2.54
93.58	0.00	9130.00	1549.21	2.54
93.58	0.00	9131.00	1549.19	2.54
93.58	0.00	9132.00	1549.18	2.54
93.58	0.00	9133.00	1549.16	2.54
93.58	0.00	9134.00	1549.15	2.54
93.58	0.00	9135.00	1549.15	2.54
93.58	0.00	9136.00	1549.13	2.54
93.58	0.00	9137.00	1549.12	2.54
93.58	0.00	9138.00	1549.11	2.54
93.58	0.00	9139.00	1549.09	2.54
93.58	0.00	9140.00	1549.08	2.54
93.58	0.00	9141.00	1549.07	2.54
93.58	0.00	9142.00	1549.06	2.54
93.58	0.00	9143.00	1549.05	2.54
93.58	0.00	9144.00	1549.03	2.54

93.58	0.00	9145.00	1549.02	2.54
93.58	0.00	9146.00	1549.01	2.54
93.58	0.00	9147.00	1549.00	2.54
93.58	0.00	9148.00	1548.99	2.54
93.58	0.00	9149.00	1548.97	2.54
93.58	0.00	9150.00	1548.97	2.54
93.58	0.00	9151.00	1548.95	2.54
93.59	0.00	9152.00	1548.94	2.54
93.59	0.00	9153.00	1548.93	2.54
93.59	0.00	9154.00	1548.92	2.54
93.60	0.00	9155.00	1548.91	2.54
93.60	0.00	9156.00	1548.90	2.54
93.60	0.00	9157.00	1548.89	2.54
93.60	0.00	9158.00	1548.87	2.54
93.60	0.00	9159.00	1548.86	2.54
93.60	0.00	9160.00	1548.85	2.54
93.60	0.00	9161.00	1548.84	2.54
93.59	0.00	9170.00	1548.74	2.55
93.61	0.00	9180.00	1548.64	2.55
93.65	0.00	9190.00	1548.53	2.55
93.66	0.00	9200.00	1548.44	2.56
93.65	0.00	9210.00	1548.34	2.56
93.64	0.00	9220.00	1548.26	2.56
93.67	0.00	9230.00	1548.18	2.56
93.70	0.00	9240.00	1548.09	2.57
93.67	0.00	9250.00	1548.02	2.57
93.66	0.00	9260.00	1547.95	2.57
93.68	0.00	9270.00	1547.88	2.58
93.67	0.00	9280.00	1547.82	2.58
93.67	0.00	9290.00	1547.76	2.58
90.88	192.32	9300.00	1547.79	2.58
93.68	0.00	9310.00	1547.63	2.59
93.69	0.00	9320.00	1547.58	2.59
93.69	0.00	9330.00	1547.52	2.59
93.70	0.00	9340.00	1547.47	2.59
93.69	0.00	9350.00	1547.42	2.60
93.75	0.00	9360.00	1547.38	2.60
93.74	0.00	9370.00	1547.32	2.60
93.75	0.00	9380.00	1547.27	2.61
93.74	0.00	9390.00	1547.23	2.61
93.73	0.00	9400.00	1547.18	2.61
93.72	0.00	9410.00	1547.14	2.61
93.75	0.00	9420.00	1547.09	2.62
93.74	0.00	9450.00	1546.98	2.63
93.74	0.00	9460.00	1546.93	2.63
93.76	0.00	9480.00	1546.86	2.63
93.77	0.00	9500.00	1546.80	2.64
93.79	0.00	9520.00	1546.73	2.64
93.84	0.00	9540.00	1546.66	2.65
93.82	0.00	9560.00	1546.60	2.66
93.81	0.00	9580.00	1546.55	2.66
93.83	0.00	9600.00	1546.50	2.67
93.86	0.00	9620.00	1546.45	2.67
93.84	0.00	9640.00	1546.39	2.68
93.84	0.00	9660.00	1546.35	2.68
93.84	0.00	9680.00	1546.29	2.69
93.87	0.00	9700.00	1546.24	2.69
93.87	0.00	9720.00	1546.18	2.70
93.88	0.00	9740.00	1546.15	2.71
93.90	0.00	9760.00	1546.12	2.71

93.89	0.00	9780.00	1546.08	2.72
93.96	0.00	9800.00	1546.06	2.72
93.95	0.00	9820.00	1546.04	2.73
93.92	0.00	9840.00	1545.99	2.73
93.91	0.00	9860.00	1545.97	2.74
93.93	0.00	9880.00	1545.94	2.74
93.95	0.00	9900.00	1545.92	2.75
93.95	0.00	9920.00	1545.90	2.76
93.96	0.00	9940.00	1545.86	2.76
93.99	0.00	9960.00	1545.83	2.77
93.97	0.00	9980.00	1545.82	2.77
94.00	0.00	10020.00	1545.77	2.78
94.01	0.00	10050.00	1545.72	2.79
94.01	0.00	10080.00	1545.68	2.80
94.05	0.00	10110.00	1545.65	2.81
94.05	0.00	10140.00	1545.64	2.82
94.13	0.00	10170.00	1545.62	2.83
94.08	0.00	10200.00	1545.61	2.83
94.06	0.00	10230.00	1545.60	2.84
94.09	0.00	10260.00	1545.56	2.85
94.09	0.00	10290.00	1545.52	2.86
94.14	0.00	10320.00	1545.49	2.87
94.11	0.00	10350.00	1545.47	2.88
94.16	0.00	10380.00	1545.44	2.88
94.17	0.00	10410.00	1545.42	2.89
94.18	0.00	10440.00	1545.41	2.90
94.19	0.00	10470.00	1545.40	2.91
94.21	0.00	10500.00	1545.39	2.92
94.18	0.00	10530.00	1545.36	2.93
94.18	0.00	10560.00	1545.33	2.93
94.19	0.00	10590.00	1545.30	2.94
94.19	0.00	10620.00	1545.29	2.95
94.25	0.00	10650.00	1545.28	2.96
94.24	0.00	10680.00	1545.26	2.97
94.25	0.00	10710.00	1545.24	2.97
94.26	0.00	10740.00	1545.23	2.98
94.26	0.00	10770.00	1545.22	2.99
94.29	0.00	10800.00	1545.20	3.00
94.31	0.00	10830.00	1545.19	3.01
94.29	0.00	10860.00	1545.19	3.02
94.28	0.00	10890.00	1545.18	3.03
94.36	0.00	10920.00	1545.16	3.03
94.39	0.00	10980.00	1545.15	3.05
94.38	0.00	11040.00	1545.15	3.07
94.42	0.00	11100.00	1545.13	3.08
94.41	0.00	11160.00	1545.11	3.10
94.40	0.00	11220.00	1545.08	3.12
94.45	0.00	11280.00	1545.07	3.13
94.44	0.00	11340.00	1545.06	3.15
94.46	0.00	11400.00	1545.03	3.17
94.52	0.00	11460.00	1544.99	3.18
94.49	0.00	11520.00	1544.96	3.20
94.58	0.00	11580.00	1544.98	3.22
94.58	0.00	11640.00	1544.96	3.23
94.59	0.00	11700.00	1544.91	3.25
94.62	0.00	11760.00	1544.87	3.27
94.65	0.00	11820.00	1544.86	3.28
94.71	0.00	11880.00	1544.82	3.30
94.74	0.00	11940.00	1544.78	3.32
94.76	0.00	12000.00	1544.75	3.33

94.82	0.00	12060.00	1544.71	3.35
94.81	0.00	12120.00	1544.68	3.37
94.86	0.00	12180.00	1544.65	3.38
94.87	0.00	12240.00	1544.62	3.40
94.91	0.00	12300.00	1544.58	3.42
94.94	0.00	12360.00	1544.53	3.43
94.98	0.00	12420.00	1544.50	3.45
95.01	0.00	12480.00	1544.48	3.47
95.02	0.00	12540.00	1544.45	3.48
95.07	0.00	12600.00	1544.42	3.50
95.10	0.00	12660.00	1544.40	3.52
95.10	0.00	12720.00	1544.39	3.53
95.13	0.00	12780.00	1544.38	3.55
95.17	0.00	12840.00	1544.39	3.57
95.21	0.00	12900.00	1544.34	3.58
95.23	0.00	12960.00	1544.32	3.60
95.26	0.00	13020.00	1544.28	3.62
95.28	0.00	13080.00	1544.26	3.63
95.29	0.00	13140.00	1544.23	3.65
95.34	0.00	13200.00	1544.21	3.67
95.36	0.00	13260.00	1544.19	3.68
95.40	0.00	13320.00	1544.16	3.70
95.42	0.00	13380.00	1544.14	3.72
95.45	0.00	13440.00	1544.09	3.73
95.48	0.00	13500.00	1544.06	3.75
95.50	0.00	13560.00	1544.05	3.77
95.51	0.00	13620.00	1544.02	3.78
95.56	0.00	13680.00	1544.02	3.80
95.59	0.00	13740.00	1544.01	3.82
95.62	0.00	13800.00	1544.01	3.83
95.65	0.00	13860.00	1544.01	3.85
95.66	0.00	13920.00	1544.00	3.87
77.56	3831.50	13980.00	1544.60	3.88
95.72	0.00	14040.00	1543.98	3.90
95.76	0.00	14100.00	1543.95	3.92
95.78	0.00	14160.00	1543.93	3.93
95.80	0.00	14220.00	1543.91	3.95
95.82	0.00	14280.00	1543.90	3.97
95.86	0.00	14340.00	1543.90	3.98
95.88	817.03	14400.00	1543.89	4.00
95.91	0.00	14460.00	1543.88	4.02
95.95	0.00	14520.00	1543.87	4.03
95.95	0.00	14580.00	1543.85	4.05
95.98	0.00	14640.00	1543.85	4.07
96.00	0.00	14700.00	1543.83	4.08
96.04	0.00	14760.00	1543.83	4.10
96.06	0.00	14820.00	1543.82	4.12
96.09	0.00	14880.00	1543.80	4.13
96.11	0.00	14940.00	1543.78	4.15
96.14	0.00	15000.00	1543.76	4.17
96.17	0.00	15060.00	1543.76	4.18
96.19	0.00	15120.00	1543.76	4.20
96.21	0.00	15180.00	1543.75	4.22
96.23	0.00	15240.00	1543.73	4.23
96.25	0.00	15300.00	1543.71	4.25
96.28	0.00	15360.00	1543.69	4.27
96.31	0.00	15420.00	1543.68	4.28
96.33	0.00	15480.00	1543.68	4.30
96.35	0.00	15540.00	1543.65	4.32
96.38	0.00	15600.00	1543.64	4.33

96.41	0.00	15660.00	1543.63	4.35
96.43	0.00	15720.00	1543.62	4.37
96.46	0.00	15780.00	1543.61	4.38
96.48	0.00	15840.00	1543.61	4.40
96.51	0.00	15900.00	1543.59	4.42
96.51	0.00	15960.00	1543.59	4.43
96.54	0.00	16020.00	1543.59	4.45
96.57	0.00	16080.00	1543.56	4.47
96.59	0.00	16140.00	1543.55	4.48
96.62	0.00	16200.00	1543.54	4.50
96.65	0.00	16260.00	1543.53	4.52
96.66	0.00	16320.00	1543.52	4.53
96.67	0.00	16380.00	1543.51	4.55
96.72	0.00	16440.00	1543.51	4.57
96.73	0.00	16500.00	1543.50	4.58
96.76	0.00	16560.00	1543.49	4.60
96.77	0.00	16620.00	1543.48	4.62
96.80	0.00	16680.00	1543.48	4.63
96.81	0.00	16740.00	1543.46	4.65
96.84	0.00	16800.00	1543.45	4.67
96.87	0.00	16860.00	1543.45	4.68
96.89	0.00	16920.00	1543.43	4.70
96.91	0.00	16980.00	1543.43	4.72
96.94	0.00	17040.00	1543.42	4.73
96.95	0.00	17100.00	1543.42	4.75
96.97	0.00	17160.00	1543.41	4.77
97.01	0.00	17220.00	1543.40	4.78
97.02	0.00	17280.00	1543.40	4.80
97.06	0.00	17340.00	1543.38	4.82
97.07	0.00	17400.00	1543.37	4.83
97.10	0.00	17460.00	1543.37	4.85
97.11	0.00	17520.00	1543.36	4.87
97.14	0.00	17580.00	1543.35	4.88
97.16	0.00	17640.00	1543.34	4.90
97.18	0.00	17700.00	1543.33	4.92
97.21	0.00	17760.00	1543.31	4.93
97.23	0.00	17820.00	1543.31	4.95
97.25	0.00	17880.00	1543.30	4.97
97.27	0.00	17940.00	1543.29	4.98
97.29	0.00	18000.00	1543.29	5.00
97.30	0.00	18060.00	1543.28	5.02
97.34	0.00	18120.00	1543.28	5.03
97.37	0.00	18180.00	1543.26	5.05
97.38	0.00	18240.00	1543.26	5.07
97.42	0.00	18300.00	1543.25	5.08
97.43	0.00	18360.00	1543.23	5.10
97.45	0.00	18420.00	1543.23	5.12
97.47	0.00	18480.00	1543.22	5.13
97.49	0.00	18540.00	1543.18	5.15
97.51	0.00	18600.00	1543.20	5.17
97.54	0.00	18660.00	1543.17	5.18
97.55	0.00	18720.00	1543.16	5.20
97.60	0.00	18780.00	1543.15	5.22
97.61	0.00	18840.00	1543.14	5.23
97.62	0.00	18900.00	1543.14	5.25
97.65	0.00	18960.00	1543.13	5.27
97.66	0.00	19020.00	1543.12	5.28
97.67	0.00	19080.00	1543.12	5.30
97.70	0.00	19140.00	1543.12	5.32
97.72	0.00	19200.00	1543.11	5.33

97.74	0.00	19260.00	1543.11	5.35
97.76	0.00	19320.00	1543.11	5.37
97.78	0.00	19380.00	1543.10	5.38
97.81	0.00	19440.00	1543.10	5.40
97.82	0.00	19500.00	1543.09	5.42
97.85	0.00	19560.00	1543.07	5.43
97.86	0.00	19620.00	1543.07	5.45
97.89	0.00	19680.00	1543.07	5.47
97.91	0.00	19740.00	1543.07	5.48
97.93	0.00	19800.00	1543.05	5.50
97.95	0.00	19860.00	1543.05	5.52
97.96	0.00	19920.00	1543.04	5.53
97.99	0.00	19980.00	1543.03	5.55
98.01	0.00	20040.00	1543.03	5.57
98.03	0.00	20100.00	1543.02	5.58
98.04	0.00	20160.00	1543.02	5.60
98.07	0.00	20220.00	1543.01	5.62
98.08	0.00	20280.00	1543.01	5.63
98.11	0.00	20340.00	1543.01	5.65
98.13	0.00	20400.00	1543.00	5.67
98.16	0.00	20460.00	1542.99	5.68
98.17	0.00	20520.00	1542.99	5.70
98.18	0.00	20580.00	1542.99	5.72
98.21	0.00	20640.00	1542.99	5.73
98.21	0.00	20700.00	1542.98	5.75
98.23	0.00	20760.00	1542.97	5.77
98.25	0.00	20820.00	1542.97	5.78
98.27	0.00	20880.00	1542.96	5.80
98.30	0.00	20940.00	1542.95	5.82
98.30	0.00	21000.00	1542.95	5.83
98.34	0.00	21060.00	1542.95	5.85
98.36	0.00	21120.00	1542.93	5.87
98.38	0.00	21180.00	1542.93	5.88
98.39	0.00	21240.00	1542.92	5.90
98.40	0.00	21300.00	1542.91	5.92
98.42	0.00	21360.00	1542.90	5.93
98.44	0.00	21420.00	1542.91	5.95
98.46	0.00	21480.00	1542.89	5.97
98.48	0.00	21540.00	1542.88	5.98
98.49	0.00	21600.00	1542.88	6.00
98.51	0.00	21660.00	1542.88	6.02
98.53	0.00	21720.00	1542.87	6.03
98.55	0.00	21780.00	1542.86	6.05
98.57	0.00	21840.00	1542.85	6.07
98.59	0.00	21900.00	1542.85	6.08
98.61	0.00	21960.00	1542.84	6.10
98.64	0.00	22020.00	1542.84	6.12
98.67	0.00	22080.00	1542.84	6.13
98.68	0.00	22140.00	1542.83	6.15
98.70	0.00	22200.00	1542.82	6.17
98.71	0.00	22260.00	1542.82	6.18
98.73	0.00	22320.00	1542.82	6.20
98.76	0.00	22380.00	1542.81	6.22
98.77	0.00	22440.00	1542.80	6.23
98.78	0.00	22500.00	1542.79	6.25
98.81	0.00	22560.00	1542.78	6.27
98.83	0.00	22620.00	1542.78	6.28
98.85	0.00	22680.00	1542.78	6.30
98.86	0.00	22740.00	1542.77	6.32
98.87	0.00	22800.00	1542.76	6.33

98.89	0.00	22860.00	1542.76	6.35
98.91	0.00	22920.00	1542.75	6.37
98.93	0.00	22980.00	1542.75	6.38
98.94	0.00	23040.00	1542.74	6.40
98.96	0.00	23100.00	1542.74	6.42
99.00	0.00	23160.00	1542.73	6.43
99.02	0.00	23220.00	1542.72	6.45
99.03	0.00	23280.00	1542.72	6.47
99.05	0.00	23340.00	1542.71	6.48
99.06	0.00	23400.00	1542.71	6.50
99.08	0.00	23460.00	1542.70	6.52
99.10	0.00	23520.00	1542.69	6.53
99.12	0.00	23580.00	1542.69	6.55
99.13	0.00	23640.00	1542.69	6.57
99.16	0.00	23700.00	1542.67	6.58
99.17	0.00	23760.00	1542.67	6.60
99.18	0.00	23820.00	1542.65	6.62
99.20	0.00	23880.00	1542.66	6.63
99.21	0.00	23940.00	1542.66	6.65
99.24	0.00	24000.00	1542.65	6.67
99.24	0.00	24060.00	1542.65	6.68
99.26	0.00	24120.00	1542.64	6.70
99.27	0.00	24180.00	1542.63	6.72
99.29	0.00	24240.00	1542.63	6.73
99.32	0.00	24300.00	1542.62	6.75
99.33	0.00	24360.00	1542.62	6.77
99.35	0.00	24420.00	1542.61	6.78
99.39	0.00	24480.00	1542.61	6.80
99.40	0.00	24540.00	1542.61	6.82
99.42	0.00	24600.00	1542.60	6.83
99.43	0.00	24660.00	1542.59	6.85
99.45	0.00	24720.00	1542.59	6.87
99.47	0.00	24780.00	1542.59	6.88
99.49	0.00	24840.00	1542.58	6.90
99.51	0.00	24900.00	1542.57	6.92
99.51	0.00	24960.00	1542.57	6.93
99.54	0.00	25020.00	1542.56	6.95
99.54	0.00	25080.00	1542.55	6.97
99.57	0.00	25140.00	1542.55	6.98
99.59	0.00	25200.00	1542.55	7.00
99.60	0.00	25260.00	1542.54	7.02
99.61	0.00	25320.00	1542.54	7.03
99.63	0.00	25380.00	1542.53	7.05
99.65	0.00	25440.00	1542.53	7.07
99.66	0.00	25500.00	1542.53	7.08
99.68	0.00	25560.00	1542.52	7.10
99.69	0.00	25620.00	1542.50	7.12
99.71	0.00	25680.00	1542.46	7.13
99.72	0.00	25740.00	1542.44	7.15
99.75	0.00	25800.00	1542.42	7.17
99.77	0.00	25860.00	1542.41	7.18
99.78	0.00	25920.00	1542.42	7.20
99.80	0.00	25980.00	1542.42	7.22
99.82	0.00	26040.00	1542.42	7.23
99.83	0.00	26100.00	1542.42	7.25
99.85	0.00	26160.00	1542.42	7.27
99.86	0.00	26220.00	1542.42	7.28
99.88	0.00	26280.00	1542.43	7.30
99.88	0.00	26340.00	1542.43	7.32
99.91	0.00	26400.00	1542.43	7.33

99.92	0.00	26460.00	1542.43	7.35
99.94	0.00	26520.00	1542.42	7.37
99.96	0.00	26580.00	1542.42	7.38
99.97	0.00	26640.00	1542.42	7.40
99.99	0.00	26700.00	1542.42	7.42
100.01	0.00	26760.00	1542.42	7.43
100.01	0.00	26820.00	1542.41	7.45
100.04	0.00	26880.00	1542.41	7.47
100.06	0.00	26940.00	1542.40	7.48
100.07	0.00	27000.00	1542.40	7.50
100.07	0.00	27060.00	1542.40	7.52
100.10	0.00	27120.00	1542.39	7.53
100.10	0.00	27180.00	1542.39	7.55
100.12	0.00	27240.00	1542.39	7.57
100.15	0.00	27300.00	1542.38	7.58
100.16	0.00	27360.00	1542.38	7.60
100.18	0.00	27420.00	1542.38	7.62
100.18	0.00	27480.00	1542.38	7.63
100.20	0.00	27540.00	1542.37	7.65
100.22	0.00	27600.00	1542.36	7.67
100.23	0.00	27660.00	1542.36	7.68
100.25	0.00	27720.00	1542.36	7.70
100.26	0.00	27780.00	1542.35	7.72
100.29	0.00	27840.00	1542.34	7.73
100.29	0.00	27900.00	1542.34	7.75
100.31	0.00	27960.00	1542.34	7.77
100.32	0.00	28020.00	1542.33	7.78
100.33	0.00	28080.00	1542.33	7.80
100.36	0.00	28140.00	1542.33	7.82
100.37	0.00	28200.00	1542.32	7.83
100.39	0.00	28260.00	1542.32	7.85
100.40	0.00	28320.00	1542.32	7.87
100.41	0.00	28380.00	1542.31	7.88
100.45	0.00	28440.00	1542.30	7.90
100.44	0.00	28500.00	1542.30	7.92
100.45	0.00	28560.00	1542.29	7.93
100.48	0.00	28620.00	1542.29	7.95
100.49	0.00	28680.00	1542.29	7.97
100.50	0.00	28740.00	1542.28	7.98
100.52	0.00	28800.00	1542.28	8.00
100.54	0.00	28860.00	1542.27	8.02
100.55	0.00	28920.00	1542.26	8.03
100.57	0.00	28980.00	1542.26	8.05
100.57	0.00	29040.00	1542.26	8.07
100.61	0.00	29100.00	1542.25	8.08
100.61	0.00	29160.00	1542.25	8.10
100.62	0.00	29220.00	1542.24	8.12
100.64	0.00	29280.00	1542.24	8.13
100.65	0.00	29340.00	1542.24	8.15
100.66	0.00	29400.00	1542.23	8.17
100.68	0.00	29460.00	1542.23	8.18
100.70	0.00	29520.00	1542.22	8.20
100.72	0.00	29580.00	1542.22	8.22
100.73	0.00	29640.00	1542.22	8.23
100.75	0.00	29700.00	1542.21	8.25
100.76	0.00	29760.00	1542.20	8.27
100.78	0.00	29820.00	1542.20	8.28
100.79	0.00	29880.00	1542.20	8.30
100.80	0.00	29940.00	1542.19	8.32
100.81	0.00	30000.00	1542.19	8.33

100.82	0.00	30060.00	1542.18	8.35
100.84	0.00	30120.00	1542.18	8.37
100.85	0.00	30180.00	1542.17	8.38
100.86	0.00	30240.00	1542.17	8.40
100.87	0.00	30300.00	1542.17	8.42
100.90	0.00	30360.00	1542.16	8.43
100.90	0.00	30420.00	1542.15	8.45
100.92	0.00	30480.00	1542.15	8.47
100.93	0.00	30540.00	1542.14	8.48
100.94	0.00	30600.00	1542.14	8.50
100.95	0.00	30660.00	1542.14	8.52
100.97	0.00	30720.00	1542.13	8.53
100.99	0.00	30780.00	1542.13	8.55
101.01	0.00	30840.00	1542.12	8.57
101.02	0.00	30900.00	1542.11	8.58
101.03	0.00	30960.00	1542.11	8.60
101.03	0.00	31020.00	1542.11	8.62
101.05	0.00	31080.00	1542.10	8.63
101.08	0.00	31140.00	1542.10	8.65
101.09	0.00	31200.00	1542.09	8.67
101.10	0.00	31260.00	1542.09	8.68
101.13	0.00	31320.00	1542.08	8.70
101.14	0.00	31380.00	1542.08	8.72
101.15	0.00	31440.00	1542.08	8.73
101.17	0.00	31500.00	1542.07	8.75
101.18	0.00	31560.00	1542.07	8.77
101.19	0.00	31620.00	1542.07	8.78
101.20	0.00	31680.00	1542.06	8.80
101.22	0.00	31740.00	1542.05	8.82
101.23	0.00	31800.00	1542.05	8.83
01.25	0.00	31860.00	1542.05	8.85
101.26	0.00	31920.00	1542.04	8.87
101.27	0.00	31980.00	1542.04	8.88
101.29	0.00	32040.00	1542.04	8.90
101.29	0.00	32100.00	1542.03	8.92
101.31	0.00	32160.00	1542.02	8.93
101.32	0.00	32220.00	1542.02	8.95
101.33	0.00	32280.00	1542.02	8.97
101.35	0.00	32340.00	1542.01	8.98
101.36	0.00	32400.00	1542.01	9.00
101.37	0.00	32460.00	1542.01	9.02
101.38	0.00	32520.00	1542.01	9.03
101.40	0.00	32580.00	1542.00	9.05
101.42	0.00	32640.00	1542.00	9.07
101.42	0.00	32700.00	1541.99	9.08
101.44	0.00	32760.00	1541.99	9.10
101.44	0.00	32820.00	1541.99	9.12
101.46	0.00	32880.00	1541.98	9.13
101.47	0.00	32940.00	1541.98	9.15
101.48	0.00	33000.00	1541.98	9.17
101.49	0.00	33060.00	1541.97	9.18
101.50	0.00	33120.00	1541.97	9.20
101.51	0.00	33180.00	1541.96	9.22
101.53	0.00	33240.00	1541.96	9.23
101.55	0.00	33300.00	1541.95	9.25
101.56	0.00	33360.00	1541.95	9.27
01.57	0.00	33420.00	1541.95	9.28
101.58	0.00	33480.00	1541.93	9.30
101.59	0.00	33540.00	1541.93	9.32
101.60	0.00	33600.00	1541.93	9.33

101.61	0.00	33660.00	1541.93	9.35
101.63	0.00	33720.00	1541.92	9.37
101.65	0.00	33780.00	1541.92	9.38
101.66	0.00	33840.00	1541.92	9.40
101.68	0.00	33900.00	1541.91	9.42
101.68	0.00	33960.00	1541.91	9.43
101.70	0.00	34020.00	1541.91	9.45
101.71	0.00	34080.00	1541.90	9.47
101.72	0.00	34140.00	1541.89	9.48
101.74	0.00	34200.00	1541.89	9.50
101.76	0.00	34260.00	1541.89	9.52
101.77	0.00	34320.00	1541.89	9.53
101.79	0.00	34380.00	1541.88	9.55
101.80	0.00	34440.00	1541.88	9.57
101.81	0.00	34500.00	1541.88	9.58
101.81	0.00	34560.00	1541.88	9.60
101.84	0.00	34620.00	1541.87	9.62
101.84	0.00	34680.00	1541.87	9.63
101.86	0.00	34740.00	1541.86	9.65
101.87	0.00	34800.00	1541.85	9.67
101.88	0.00	34860.00	1541.85	9.68
101.90	0.00	34920.00	1541.85	9.70
101.90	0.00	34980.00	1541.84	9.72
101.90	0.00	35040.00	1541.84	9.73
101.92	0.00	35100.00	1541.83	9.75
101.94	0.00	35160.00	1541.83	9.77
101.94	0.00	35220.00	1541.83	9.78
101.97	0.00	35280.00	1541.83	9.80
101.96	0.00	35340.00	1541.82	9.82
101.99	0.00	35400.00	1541.82	9.83
02.00	0.00	35460.00	1541.81	9.85
102.00	0.00	35520.00	1541.81	9.87
102.01	0.00	35580.00	1541.81	9.88
102.03	0.00	35640.00	1541.80	9.90
102.04	0.00	35700.00	1541.80	9.92
102.05	0.00	35760.00	1541.80	9.93
102.05	0.00	35820.00	1541.79	9.95
102.08	0.00	35880.00	1541.79	9.97
102.08	0.00	35940.00	1541.79	9.98
102.10	0.00	36000.00	1541.79	10.00
102.11	0.00	36060.00	1541.78	10.02
102.13	0.00	36120.00	1541.76	10.03
102.15	0.00	36180.00	1541.74	10.05
102.14	0.00	36240.00	1541.73	10.07
102.16	0.00	36300.00	1541.73	10.08
102.17	0.00	36360.00	1541.73	10.10
102.18	0.00	36420.00	1541.73	10.12
102.19	0.00	36480.00	1541.72	10.13
102.20	0.00	36540.00	1541.72	10.15
102.21	0.00	36600.00	1541.72	10.17
102.23	0.00	36660.00	1541.71	10.18
102.24	0.00	36720.00	1541.71	10.20
102.25	0.00	36780.00	1541.71	10.22
102.26	0.00	36840.00	1541.71	10.23
102.28	0.00	36900.00	1541.71	10.25
102.29	0.00	36960.00	1541.70	10.27
02.30	0.00	37020.00	1541.70	10.28
102.31	0.00	37080.00	1541.70	10.30
102.31	0.00	37140.00	1541.69	10.32
102.33	0.00	37200.00	1541.69	10.33

102.35	0.00	37260.00	1541.68	10.35
102.36	0.00	37320.00	1541.68	10.37
102.37	0.00	37380.00	1541.68	10.38
102.37	0.00	37440.00	1541.67	10.40
102.38	0.00	37500.00	1541.67	10.42
102.39	0.00	37560.00	1541.67	10.43
102.41	0.00	37620.00	1541.67	10.45
102.42	0.00	37680.00	1541.67	10.47
102.45	0.00	37740.00	1541.66	10.48
102.46	0.00	37800.00	1541.66	10.50
102.46	0.00	37860.00	1541.66	10.52
102.46	0.00	37920.00	1541.66	10.53
102.48	0.00	37980.00	1541.65	10.55
102.49	0.00	38040.00	1541.64	10.57
102.51	0.00	38100.00	1541.64	10.58
102.52	0.00	38160.00	1541.64	10.60
102.52	0.00	38220.00	1541.64	10.62
102.52	0.00	38280.00	1541.64	10.63
102.52	0.00	38340.00	1541.63	10.65
102.55	0.00	38400.00	1541.63	10.67
102.56	0.00	38460.00	1541.62	10.68
102.59	0.00	38520.00	1541.62	10.70
102.60	0.00	38580.00	1541.62	10.72
102.60	0.00	38640.00	1541.61	10.73
102.61	0.00	38700.00	1541.61	10.75
102.62	0.00	38760.00	1541.60	10.77
102.62	0.00	38820.00	1541.60	10.78
102.63	0.00	38880.00	1541.60	10.80
102.65	0.00	38940.00	1541.59	10.82
102.66	0.00	39000.00	1541.59	10.83
02.66	0.00	39060.00	1541.59	10.85
102.68	0.00	39120.00	1541.59	10.87
102.69	0.00	39180.00	1541.58	10.88
102.69	0.00	39240.00	1541.58	10.90
102.71	0.00	39300.00	1541.58	10.92
102.71	0.00	39360.00	1541.58	10.93
102.75	0.00	39420.00	1541.58	10.95
102.75	0.00	39480.00	1541.57	10.97
102.77	0.00	39540.00	1541.57	10.98
102.78	0.00	39600.00	1541.57	11.00
102.79	0.00	39660.00	1541.56	11.02
102.80	0.00	39720.00	1541.56	11.03
102.81	0.00	39780.00	1541.55	11.05
102.81	0.00	39840.00	1541.55	11.07
102.83	0.00	39900.00	1541.55	11.08
102.82	0.00	39960.00	1541.55	11.10
102.84	0.00	40020.00	1541.55	11.12
102.85	0.00	40080.00	1541.54	11.13
102.86	0.00	40140.00	1541.54	11.15
102.87	0.00	40200.00	1541.54	11.17
102.88	0.00	40260.00	1541.53	11.18
102.89	0.00	40320.00	1541.53	11.20
102.90	0.00	40380.00	1541.53	11.22
102.90	0.00	40440.00	1541.52	11.23
102.92	0.00	40500.00	1541.52	11.25
102.92	0.00	40560.00	1541.52	11.27
02.95	0.00	40620.00	1541.52	11.28
102.96	0.00	40680.00	1541.51	11.30
102.98	0.00	40740.00	1541.51	11.32
102.98	0.00	40800.00	1541.51	11.33

102.99	0.00	40860.00	1541.51	11.35
103.00	0.00	40920.00	1541.50	11.37
103.01	0.00	40980.00	1541.50	11.38
103.03	0.00	41040.00	1541.50	11.40
103.04	0.00	41100.00	1541.50	11.42
103.03	0.00	41160.00	1541.49	11.43
103.05	0.00	41220.00	1541.48	11.45
103.06	0.00	41280.00	1541.48	11.47
103.06	0.00	41340.00	1541.48	11.48
103.08	0.00	41400.00	1541.48	11.50
103.08	0.00	41460.00	1541.47	11.52
103.08	0.00	41520.00	1541.47	11.53
103.09	0.00	41580.00	1541.47	11.55
103.11	0.00	41640.00	1541.46	11.57
103.11	0.00	41700.00	1541.46	11.58
103.12	0.00	41760.00	1541.46	11.60
103.13	0.00	41820.00	1541.46	11.62
103.14	0.00	41880.00	1541.45	11.63
103.16	0.00	41940.00	1541.45	11.65
103.16	0.00	42000.00	1541.44	11.67
103.17	0.00	42060.00	1541.44	11.68
103.17	0.00	42120.00	1541.44	11.70
103.19	0.00	42180.00	1541.44	11.72
103.20	0.00	42240.00	1541.44	11.73
103.21	0.00	42300.00	1541.43	11.75
103.21	0.00	42360.00	1541.43	11.77
103.22	0.00	42420.00	1541.43	11.78
103.24	0.00	42480.00	1541.43	11.80
103.25	0.00	42540.00	1541.42	11.82
103.26	0.00	42600.00	1541.42	11.83
103.28	0.00	42660.00	1541.42	11.85
103.28	0.00	42720.00	1541.42	11.87
103.29	0.00	42780.00	1541.41	11.88
103.29	0.00	42840.00	1541.41	11.90
103.30	0.00	42900.00	1541.40	11.92
103.31	0.00	42960.00	1541.40	11.93
103.32	0.00	43020.00	1541.40	11.95
103.32	0.00	43080.00	1541.39	11.97
103.33	0.00	43140.00	1541.39	11.98
103.36	0.00	43200.00	1541.39	12.00
103.35	0.00	43260.00	1541.38	12.02
103.36	0.00	43320.00	1541.38	12.03
103.37	0.00	43380.00	1541.39	12.05
103.38	0.00	43440.00	1541.38	12.07
103.38	0.00	43500.00	1541.38	12.08
103.39	0.00	43560.00	1541.38	12.10
103.40	0.00	43620.00	1541.38	12.12
103.41	0.00	43680.00	1541.38	12.13
103.43	0.00	43740.00	1541.37	12.15
103.43	0.00	43800.00	1541.37	12.17
103.44	0.00	43860.00	1541.37	12.18
103.45	0.00	43920.00	1541.36	12.20
103.46	0.00	43980.00	1541.36	12.22
103.47	0.00	44040.00	1541.35	12.23
103.48	0.00	44100.00	1541.35	12.25
103.49	0.00	44160.00	1541.35	12.27
103.50	0.00	44220.00	1541.35	12.28
103.50	0.00	44280.00	1541.35	12.30
103.51	0.00	44340.00	1541.34	12.32
103.54	0.00	44400.00	1541.34	12.33

103.54	0.00	44460.00	1541.34	12.35
103.55	0.00	44520.00	1541.34	12.37
103.54	0.00	44580.00	1541.33	12.38
103.56	0.00	44640.00	1541.33	12.40
103.57	0.00	44700.00	1541.33	12.42
103.58	0.00	44760.00	1541.33	12.43
103.59	0.00	44820.00	1541.32	12.45
103.60	0.00	44880.00	1541.32	12.47
103.61	0.00	44940.00	1541.32	12.48
103.61	0.00	45000.00	1541.32	12.50
103.62	0.00	45060.00	1541.32	12.52
103.63	0.00	45120.00	1541.31	12.53
103.64	0.00	45180.00	1541.31	12.55
103.65	0.00	45240.00	1541.31	12.57
103.65	0.00	45300.00	1541.30	12.58
103.66	0.00	45360.00	1541.31	12.60
103.67	0.00	45420.00	1541.30	12.62
103.68	0.00	45480.00	1541.30	12.63
103.69	0.00	45540.00	1541.30	12.65
103.73	0.00	45600.00	1541.29	12.67
103.72	0.00	45660.00	1541.29	12.68
103.73	0.00	45720.00	1541.29	12.70
103.74	0.00	45780.00	1541.28	12.72
103.76	0.00	45840.00	1541.28	12.73
103.77	0.00	45900.00	1541.28	12.75
103.77	0.00	45960.00	1541.28	12.77
103.78	0.00	46020.00	1541.27	12.78
103.79	0.00	46080.00	1541.27	12.80
103.80	0.00	46140.00	1541.27	12.82
103.81	0.00	46200.00	1541.26	12.83
103.82	0.00	46260.00	1541.26	12.85
103.82	0.00	46320.00	1541.26	12.87
103.83	0.00	46380.00	1541.26	12.88
103.85	0.00	46440.00	1541.25	12.90
103.85	0.00	46500.00	1541.25	12.92
103.86	0.00	46560.00	1541.25	12.93
103.87	0.00	46620.00	1541.25	12.95
103.87	0.00	46680.00	1541.24	12.97
103.89	0.00	46740.00	1541.24	12.98
103.90	0.00	46800.00	1541.24	13.00
103.90	0.00	46860.00	1541.23	13.02
103.91	0.00	46920.00	1541.23	13.03
103.92	0.00	46980.00	1541.22	13.05
103.92	0.00	47040.00	1541.22	13.07
103.93	0.00	47100.00	1541.22	13.08
103.94	0.00	47160.00	1541.22	13.10
103.95	0.00	47220.00	1541.22	13.12
103.96	0.00	47280.00	1541.22	13.13
103.97	0.00	47340.00	1541.22	13.15
103.98	0.00	47400.00	1541.21	13.17
103.98	0.00	47460.00	1541.21	13.18
103.99	0.00	47520.00	1541.21	13.20
104.00	0.00	47580.00	1541.21	13.22
104.00	0.00	47640.00	1541.21	13.23
104.00	0.00	47700.00	1541.21	13.25
104.00	0.00	47760.00	1541.21	13.27
104.00	0.00	47820.00	1541.21	13.28
104.03	0.00	47880.00	1541.20	13.30
104.02	0.00	47940.00	1541.20	13.32
104.04	0.00	48000.00	1541.19	13.33

104.05	0.00	48060.00	1541.19	13.35
104.06	0.00	48120.00	1541.19	13.37
104.07	0.00	48180.00	1541.19	13.38
104.08	0.00	48240.00	1541.19	13.40
104.09	0.00	48300.00	1541.18	13.42
104.09	0.00	48360.00	1541.18	13.43
104.10	0.00	48420.00	1541.18	13.45
104.10	0.00	48480.00	1541.18	13.47
104.12	0.00	48540.00	1541.18	13.48
104.13	0.00	48600.00	1541.17	13.50
104.13	0.00	48660.00	1541.17	13.52
104.13	0.00	48720.00	1541.17	13.53
104.14	0.00	48780.00	1541.17	13.55
104.15	0.00	48840.00	1541.17	13.57
104.16	0.00	48900.00	1541.17	13.58
104.18	0.00	48960.00	1541.16	13.60
104.18	0.00	49020.00	1541.16	13.62
104.20	0.00	49080.00	1541.15	13.63
104.20	0.00	49140.00	1541.15	13.65
104.21	0.00	49200.00	1541.15	13.67
104.20	0.00	49260.00	1541.14	13.68
104.22	0.00	49320.00	1541.14	13.70
104.23	0.00	49380.00	1541.14	13.72
104.25	0.00	49440.00	1541.14	13.73
104.24	0.00	49500.00	1541.14	13.75
104.26	0.00	49560.00	1541.14	13.77
104.26	0.00	49620.00	1541.12	13.78
104.27	0.00	49680.00	1541.12	13.80
104.30	0.00	49740.00	1541.12	13.82
104.29	0.00	49800.00	1541.12	13.83
104.29	0.00	49860.00	1541.12	13.85
104.31	0.00	49920.00	1541.12	13.87
104.33	0.00	49980.00	1541.11	13.88
104.33	0.00	50040.00	1541.11	13.90
104.34	0.00	50100.00	1541.11	13.92
104.34	0.00	50160.00	1541.11	13.93
104.34	0.00	50220.00	1541.10	13.95
104.36	0.00	50280.00	1541.10	13.97
104.37	0.00	50340.00	1541.10	13.98
104.38	0.00	50400.00	1541.10	14.00
104.39	0.00	50460.00	1541.10	14.02
104.39	0.00	50520.00	1541.10	14.03
104.39	0.00	50580.00	1541.09	14.05
104.39	0.00	50640.00	1541.09	14.07
104.41	0.00	50700.00	1541.09	14.08
104.41	0.00	50760.00	1541.09	14.10
104.42	0.00	50820.00	1541.08	14.12
104.42	0.00	50880.00	1541.08	14.13
104.45	0.00	50940.00	1541.08	14.15
104.45	0.00	51000.00	1541.07	14.17
104.45	0.00	51060.00	1541.07	14.18
104.46	0.00	51120.00	1541.07	14.20
104.47	0.00	51180.00	1541.07	14.22
104.47	0.00	51240.00	1541.07	14.23
104.48	0.00	51300.00	1541.07	14.25
104.49	0.00	51360.00	1541.07	14.27
104.50	0.00	51420.00	1541.06	14.28
104.51	0.00	51480.00	1541.06	14.30
104.51	0.00	51540.00	1541.05	14.32
104.53	0.00	51600.00	1541.05	14.33

104.54	0.00	51660.00	1541.05	14.35
104.54	0.00	51720.00	1541.05	14.37
104.56	0.00	51780.00	1541.05	14.38
104.55	0.00	51840.00	1541.05	14.40
104.56	0.00	51900.00	1541.05	14.42
104.57	0.00	51960.00	1541.05	14.43
104.58	0.00	52020.00	1541.04	14.45
104.59	0.00	52080.00	1541.04	14.47
104.60	0.00	52140.00	1541.03	14.48
104.60	0.00	52200.00	1541.03	14.50
104.61	0.00	52260.00	1541.03	14.52
104.62	0.00	52320.00	1541.02	14.53
104.63	0.00	52380.00	1541.02	14.55
104.63	0.00	52440.00	1541.02	14.57
104.65	0.00	52500.00	1541.02	14.58
104.65	0.00	52560.00	1541.01	14.60
104.66	0.00	52620.00	1541.01	14.62
104.67	0.00	52680.00	1541.01	14.63
104.66	0.00	52740.00	1541.01	14.65
104.67	0.00	52800.00	1541.01	14.67
104.68	0.00	52860.00	1541.01	14.68
104.69	0.00	52920.00	1541.01	14.70
104.70	0.00	52980.00	1541.01	14.72
104.70	0.00	53040.00	1541.00	14.73
104.71	0.00	53100.00	1541.00	14.75
104.72	0.00	53160.00	1541.00	14.77
104.73	0.00	53220.00	1541.00	14.78
104.73	0.00	53280.00	1541.00	14.80
104.75	0.00	53340.00	1540.99	14.82
104.75	0.00	53400.00	1540.99	14.83
104.75	0.00	53460.00	1540.99	14.85
104.76	0.00	53520.00	1540.99	14.87
104.76	0.00	53580.00	1540.99	14.88
104.77	0.00	53640.00	1540.98	14.90
104.79	0.00	53700.00	1540.98	14.92
104.78	0.00	53760.00	1540.98	14.93
104.80	0.00	53820.00	1540.98	14.95
104.81	0.00	53880.00	1540.97	14.97
104.82	0.00	53940.00	1540.97	14.98
104.82	0.00	54000.00	1540.96	15.00
104.83	0.00	54060.00	1540.96	15.02
104.83	0.00	54120.00	1540.96	15.03
104.84	0.00	54180.00	1540.96	15.05
104.84	0.00	54240.00	1540.96	15.07
104.85	0.00	54300.00	1540.96	15.08
104.86	0.00	54360.00	1540.96	15.10
104.87	0.00	54420.00	1540.96	15.12
104.89	0.00	54480.00	1540.94	15.13
104.87	0.00	54540.00	1540.94	15.15
104.89	0.00	54600.00	1540.94	15.17
104.90	0.00	54660.00	1540.94	15.18
104.91	0.00	54720.00	1540.94	15.20
104.90	0.00	54780.00	1540.93	15.22
104.91	0.00	54840.00	1540.94	15.23
104.91	0.00	54900.00	1540.93	15.25
104.93	0.00	54960.00	1540.93	15.27
104.93	0.00	55020.00	1540.93	15.28
104.95	0.00	55080.00	1540.93	15.30
104.96	0.00	55140.00	1540.93	15.32
104.99	0.00	55200.00	1540.93	15.33

104.98	0.00	55260.00	1540.93	15.35
104.97	0.00	55320.00	1540.93	15.37
104.99	0.00	55380.00	1540.92	15.38
104.99	0.00	55440.00	1540.91	15.40
104.99	0.00	55500.00	1540.91	15.42
104.99	0.00	55560.00	1540.92	15.43
105.00	0.00	55620.00	1540.92	15.45
105.01	0.00	55680.00	1540.91	15.47
105.02	0.00	55740.00	1540.91	15.48
105.02	0.00	55800.00	1540.91	15.50
105.03	0.00	55860.00	1540.90	15.52
105.04	0.00	55920.00	1540.90	15.53
105.04	0.00	55980.00	1540.90	15.55
105.05	0.00	56040.00	1540.90	15.57
105.07	0.00	56100.00	1540.89	15.58
105.07	0.00	56160.00	1540.89	15.60
105.07	0.00	56220.00	1540.89	15.62
105.08	0.00	56280.00	1540.88	15.63
105.08	0.00	56340.00	1540.88	15.65
105.09	0.00	56400.00	1540.88	15.67
105.09	0.00	56460.00	1540.89	15.68
105.10	0.00	56520.00	1540.88	15.70
105.11	0.00	56580.00	1540.88	15.72
105.13	0.00	56640.00	1540.88	15.73
105.14	0.00	56700.00	1540.87	15.75
105.13	0.00	56760.00	1540.87	15.77
105.14	0.00	56820.00	1540.86	15.78
105.16	0.00	56880.00	1540.86	15.80
105.14	0.00	56940.00	1540.86	15.82
105.17	0.00	57000.00	1540.87	15.83
05.16	0.00	57060.00	1540.86	15.85
105.17	0.00	57120.00	1540.86	15.87
105.17	0.00	57180.00	1540.86	15.88
105.18	0.00	57240.00	1540.86	15.90
105.20	0.00	57300.00	1540.85	15.92
105.20	0.00	57360.00	1540.85	15.93
105.21	0.00	57420.00	1540.85	15.95
105.22	0.00	57480.00	1540.84	15.97
105.23	0.00	57540.00	1540.84	15.98
105.23	0.00	57600.00	1540.84	16.00
105.25	0.00	57660.00	1540.84	16.02
105.24	0.00	57720.00	1540.83	16.03
105.25	0.00	57780.00	1540.83	16.05
105.25	0.00	57840.00	1540.83	16.07
105.27	0.00	57900.00	1540.82	16.08
105.26	0.00	57960.00	1540.82	16.10
105.27	0.00	58020.00	1540.82	16.12
105.28	0.00	58080.00	1540.82	16.13
105.29	0.00	58140.00	1540.82	16.15
105.30	0.00	58200.00	1540.82	16.17
105.30	0.00	58260.00	1540.82	16.18
105.30	0.00	58320.00	1540.82	16.20
105.31	0.00	58380.00	1540.81	16.22
105.32	0.00	58440.00	1540.81	16.23
105.33	0.00	58500.00	1540.81	16.25
105.35	0.00	58560.00	1540.81	16.27
05.34	0.00	58620.00	1540.80	16.28
105.35	0.00	58680.00	1540.78	16.30
105.36	0.00	58740.00	1540.81	16.32
105.36	0.00	58800.00	1540.80	16.33

105.37	0.00	58860.00	1540.80	16.35
105.40	0.00	58920.00	1540.78	16.37
105.41	0.00	58980.00	1540.76	16.38
105.42	0.00	59040.00	1540.74	16.40
105.43	0.00	59100.00	1540.78	16.42
105.42	0.00	59160.00	1540.78	16.43
105.43	0.00	59220.00	1540.78	16.45
105.42	0.00	59280.00	1540.77	16.47
105.42	0.00	59340.00	1540.79	16.48
105.42	0.00	59400.00	1540.80	16.50
105.42	0.00	59460.00	1540.80	16.52
105.44	0.00	59520.00	1540.78	16.53
105.46	0.00	59580.00	1540.78	16.55
105.46	0.00	59640.00	1540.78	16.57
105.47	0.00	59700.00	1540.78	16.58
105.47	0.00	59760.00	1540.78	16.60
105.47	0.00	59820.00	1540.77	16.62
105.49	0.00	59880.00	1540.77	16.63
105.49	0.00	59940.00	1540.77	16.65
105.50	0.00	60000.00	1540.77	16.67
105.50	0.00	60060.00	1540.76	16.68
105.51	0.00	60120.00	1540.76	16.70
105.52	0.00	60180.00	1540.76	16.72
105.52	0.00	60240.00	1540.76	16.73
105.52	0.00	60300.00	1540.76	16.75
105.53	0.00	60360.00	1540.76	16.77
105.53	0.00	60420.00	1540.76	16.78
105.54	0.00	60480.00	1540.76	16.80
105.55	0.00	60540.00	1540.76	16.82
105.56	0.00	60600.00	1540.76	16.83
105.56	0.00	60660.00	1540.75	16.85
105.57	0.00	60720.00	1540.75	16.87
105.57	0.00	60780.00	1540.74	16.88
105.58	0.00	60840.00	1540.75	16.90
105.59	0.00	60900.00	1540.74	16.92
105.60	0.00	60960.00	1540.73	16.93
105.60	0.00	61020.00	1540.73	16.95
105.60	0.00	61080.00	1540.73	16.97
105.61	0.00	61140.00	1540.73	16.98
105.62	0.00	61200.00	1540.73	17.00
105.63	0.00	61260.00	1540.73	17.02
105.63	0.00	61320.00	1540.73	17.03
105.63	0.00	61380.00	1540.71	17.05
105.64	0.00	61440.00	1540.71	17.07
105.66	0.00	61500.00	1540.71	17.08
105.66	0.00	61560.00	1540.71	17.10
105.65	0.00	61620.00	1540.71	17.12
105.67	0.00	61680.00	1540.69	17.13
105.67	0.00	61740.00	1540.70	17.15
105.67	0.00	61800.00	1540.70	17.17
105.68	0.00	61860.00	1540.70	17.18
105.70	0.00	61920.00	1540.70	17.20
105.70	0.00	61980.00	1540.70	17.22
105.70	0.00	62040.00	1540.70	17.23
105.71	0.00	62100.00	1540.70	17.25
105.71	0.00	62160.00	1540.69	17.27
105.72	0.00	62220.00	1540.69	17.28
105.72	0.00	62280.00	1540.69	17.30
105.73	0.00	62340.00	1540.69	17.32
105.74	0.00	62400.00	1540.69	17.33

105.75	0.00	62460.00	1540.69	17.35
105.75	0.00	62520.00	1540.69	17.37
105.75	0.00	62580.00	1540.68	17.38
105.76	0.00	62640.00	1540.68	17.40
105.76	0.00	62700.00	1540.68	17.42
105.78	0.00	62760.00	1540.68	17.43
105.78	0.00	62820.00	1540.66	17.45
105.79	0.00	62880.00	1540.66	17.47
105.78	0.00	62940.00	1540.66	17.48
105.78	0.00	63000.00	1540.66	17.50
105.80	0.00	63060.00	1540.65	17.52
105.80	0.00	63120.00	1540.65	17.53
105.79	0.00	63180.00	1540.65	17.55
105.81	0.00	63240.00	1540.65	17.57
105.81	0.00	63300.00	1540.64	17.58
105.82	0.00	63360.00	1540.65	17.60
105.82	0.00	63420.00	1540.63	17.62
105.83	0.00	63480.00	1540.63	17.63
105.85	0.00	63540.00	1540.63	17.65
105.84	0.00	63600.00	1540.63	17.67
105.85	0.00	63660.00	1540.63	17.68
105.86	0.00	63720.00	1540.63	17.70
105.86	0.00	63780.00	1540.63	17.72
105.87	0.00	63840.00	1540.62	17.73
105.87	0.00	63900.00	1540.63	17.75
105.88	0.00	63960.00	1540.64	17.77
105.89	0.00	64020.00	1540.63	17.78
105.90	0.00	64080.00	1540.64	17.80
105.89	0.00	64140.00	1540.64	17.82
105.90	0.00	64200.00	1540.63	17.83
105.91	0.00	64260.00	1540.63	17.85
105.91	0.00	64320.00	1540.63	17.87
105.92	0.00	64380.00	1540.62	17.88
105.93	0.00	64440.00	1540.62	17.90
105.93	0.00	64500.00	1540.61	17.92
105.93	0.00	64560.00	1540.61	17.93
105.96	0.00	64620.00	1540.61	17.95
105.94	0.00	64680.00	1540.61	17.97
105.95	0.00	64740.00	1540.61	17.98
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00

105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00
105.96	0.00	64800.00	1540.61	18.00

APPENDIX F

DAILY OPERATIONS REPORTS

APPENDIX F
DAILY FIELD OPERATIONS

Report #1 - Sunday, November 22, 1992

Drove from Houston, Texas to Bay City, Texas to begin field operations on Hoechst Celanese Chemical Group's WDW-110 (Well No. 1-A) located at their Bay City Plant in Matagorda County, Texas.

Report #2 - Monday, November 23, 1992

All contractors attended HCCG safety orientation and site-specific safety training. Laid down 6 mil plastic liner across location. Spotted pump, tanks and pipe racks on liner. Moved in and rigged up WellTech Well Service workover rig. Diked around equipment and wellhead with sand.

Spotted 500 bbl. frac tank. Unloaded 130 joints of 2-7/8", PH-6 workstring and rental equipment. Unloaded sock-type fluid filter from Flo Trend and centrifugal transfer pump.

Report #3 - Tuesday, November 24, 1992

Decommissioned nitrogen pressure system and flowmaster from wellhead. Bled off 135 psig nitrogen from well. Removed wellhead. Installed annular blowout preventer. Rigged up floor.

Rigged up Western Atlas slickline unit to run cased hole logs. Went in the hole logging with 3-1/8" absolute/differential temperature + collar locator. Tagged bottom at 4,718'. Pulled out of hole. Picked up gamma-ray/neutron logging tools and went in hole with same. Logged from 4,718' back to 1,200'. Pulled out of hole. Closed well in for night.

Report #5 - Wednesday, November 25, 1992

Picked up 9-5/8" casing scraper and 2-7/8" PH-6 workstring and went in hole with same to approximately 4,718'. Pulled out of hole with casing scraper and workstring.

Rigged up Western Atlas. Ran 3-5/8" gauge ring from surface to 4,718'. Pulled out of hole with same. Picked up Halliburton EZ-SV cement retainer/bridge plug and went in hole with same. Set plug at approximately 4,615'. Pulled out of hole and rigged down Western Atlas.

Went in hole with 2-7/8" workstring to the top of the bridge plug at 4,615'. Filled well with

brine. Reverse circulated bottoms up.

Rigged up Halliburton to set cement plug. Set balanced cement plug from 4,615' back to approximately 3,600' with 70 bbls. of 16.4 ppg cement slurry. Pulled out of hole to 2,500'. Reverse circulated clean. Rigged down Halliburton.

Closed well in for Thanksgiving holiday week-end.

Report #7 - Monday, November 30, 1992

Pressure tested 9-5/8" casing to 900 psig for 75 minutes. Pressure decreased 10 psig over duration of test. Bled casing to 0 psig. Unloaded self-contained hydraulic closing unit and rigged up same on annular blowout preventer. Preventer closing OK. Pulled out of hole.

Picked up 8-1/2" milled tooth with (6) 4-1/8" drill collars. Went in hole with same. Tagged top of cement at 3,756'. Rigged up stripper head and power swivel. Drilled hard cement to 3,802'. Reverse circulated cement cuttings to surface. Pulled up off bottom. Closed well in for night.

Report #8 - Tuesday, December 1, 1992

Rigged down power swivel and stripper head. Started out of hole with workstring, pulled 10 stands. Closed hydril to pressure test casing to 1,000 psig. Hydril was leaking around sealing element. Sealed hydril and pressure tested casing to 1,000 psig for one hour. Pressure decreased by 7 psi over duration of test. Pulled out of hole with workstring.

Rigged up Western Atlas to perforate for squeeze. Ran correlation log and perforated from 3,358' to 3,360', 4 shots per foot with 4" casing gun. Pulled out of hole and rigged down Western Atlas.

Picked up Halliburton RTTS squeeze packer and tubing tester. Went in hole with same to 3,232'. Closed tubing tester. Tested tubing and Halliburton surface piping to 3,500 psig. Rigged up Halliburton pump truck. Set RTTS packer. Tested packer to 800 psig. Pumped 100-sack cement squeeze down workstring as follows:

1. Pumped 5 barrels (bbls.) of fresh water, 1 barrel per minute (bpm), at 850 psig.

2. Pumped 21 bbls. 15.6 pounds per gallon (ppg) Class H with 3% Halad 344. Injection rate varied from 1 to 2-1/4 bpm. Maximum pressure was 900 psig.

3. Pumped 3 bbls. of fresh water at 2-1/2 bpm, at a rate of 2 bpm, from 900 psig to 1,350 psig.

4. Pumped 20 bbls. of 9.8 brine at 1/4 bpm, at a rate of 2 bpm, from 800 psig to 1,350 psig.

   Instantaneous shut-in pressure 1,200 psig, 1,180 psig in one minute; 1,120 psig in 10 minutes.

5. Bled back 1 barrel of brine. Pressure dropped to 900 psig at shut in.

6. Pumped 1 barrel brine back in pipe and pressure increased to 1,025 psig.

Squeeze complete. Rigged down Halliburton. Closed well in for night.

Note: Well will be thermally unstable for "good" pressure test in #3 above. May have to wait until Thursday for pressure test.

Report #9 - Wednesday, December 3, 1993

Shut in tubing pressure 900 psig, shut in casing pressure 700 psig this a.m. Released RTTS test packer and pulled out of hole with same. Picked up 8-1/2" milled tooth with (6) 4-1/8" drill collars. Went in hole with same. Tagged top of cement at 3,397'. Rigged up stripper head and power swivel. Drilled hard cement from 3,297' to 3,337', at .67' per minute. Drilled cement from 3,338' down through the base of cement at 3,367', at 3' per minute. Reverse circulated wellbore clean.

Continued in hole and tagged bottom at 3,802'. Pulled out of hole to 3,362'. Closed well in for night.

Report #10 - Thursday, December 4, 1993

Pressure tested cement squeeze to 500 psig. Pressure decreased at a rate of 1 psi/min - 1.5 psi/min. Increased pressure test to 1000 psig to simulate TWC test requirements. Pressure decreased to 50 psig in one (1) hour.

Discussed options to repair leak with HCCG personnel. Decision made to set balanced cement plug (Halliburton "micro-matrix" cement slurry) across squeeze perforations to seal same.

Pulled out of hole laying down 8-1/2" milled tooth drill bit and racked 4-1/8" drill collars in derrick.

Went in hole open-ended with 2-7/8" workstring to 3,375'. Rigged up Halliburton to set balanced cement plug. Halliburton mixed slurry--unable to actuate pneumatic suction valves within one hour of mixing slurry. Decision was made to abort cement job. Dumped cement slurry in plastic lined/diked area of location. Rigged down

Halliburton. Pulled up above squeeze perforations with workstring. Closed well in for night.

Report #11 - Friday, December 5, 1992

Lowered workstring beneath squeeze perforations (to 3,392') this a.m. Rigged up Halliburton to set balanced cement plug. Mixed and pumped 80 sacks (15.2 barrels) of "micro-matrix" cement with 2% CFR-3 + .04 gallon/sack FDP-C475 at 12.8 ppg. Pumped 10 barrels of fresh water spacer before 1 barrel of fresh water spacer behind plug. Spotted plug from 3,392' to 3,194'.

Pulled out of hole to 2,424'. Reverse circulated bottoms up - no cement in returns. Pumped total of 2 barrels. Pressured up on 9-5/8" protection casing to 1,000 psi. Pressure bled off to 860 psig in 15 minutes. Pressured back up to 1,000 psig. Pressure bled back to 995 psig in 30 minutes.

Rigged down Halliburton. Will allow cement to cure until Monday, December 7. Closed well in for the weekend.

Report #12 - Monday, December 7, 1992

Shut-in casing pressure was 335 psig this a.m. Pressure tested casing to 945 psig. Pressure decreased to 900 psig in 60 minutes. Bled off pressure and pulled out of hole.

Picked up 8-1/2" milled tooth bit and (6) 4-1/2" drill collars. Went in hole with same. Tagged top of cement at 3,230'. Rigged up stripper head and power swivel. Drilled cement from 3,230' to 3,378' (18' beneath perforations). Reverse circulated wellbore clean.

Pressure tested casing to 470 psig. Pressure decreased 462 psig in 30 minutes. Rigged down power swivel and pulled up the hole to 3,203' to allow well to thermally stabilize. Closed well in for night.

Report #13 - Tuesday, December 8, 1992

Pressure tested 9-5/8" protection casing to 462 psig. Pressure decreased to 450 psig in 1 hour. Increased pressure to 1,033 psig (per TWC 1,000 psi test requirement). Pressure decreased to 1,015 psig in 1 hour. Test successful. Released pressure.

Continued in hole with 8-1/2" bit. Tagged top of remaining cement plug at 3,380'. Rigged up power swivel. Drilled cement. Broke out of plug at 3,395'. Reverse circulated bottoms up.

Continued in hole. Tagged bottom at 3,802'. Reverse circulated bottoms up. Pressure tested casing to 1,016 psig. Pressure decreased to 1,007 psig in 30 minutes.

Started out of hole with workstring. Closed well in for night.

Note: Well thermally unstable for final pressure test. Thirty minute test conducted to confirm previous testing performed over this interval (prior to perforating).

Report #14 - Wednesday, December 9, 1992

Finished pulling out of hole with 8-1/2" bit. Picked up 9-5/8" casing scraper and 8-1/2" drill bit and went in hole with same to 3,100'. Rigged up stripper head and power swivel. Rotated and reciprocated bit and scraper from 3,100' to 3,400' and again from 3,600' to 3,802'. Circulated cement cuttings from well.

Pressure tested 9-5/8" casing to 1,020 psig for 30 minutes. Pressure decreased to 1,010 during test. Unable to conduct 60-minute test and still remove casing scraper from well prior to sundown. Pulled out of hole with bit and scraper. Closed well in for night.

Ploss Vacuum Service was unable to clean tanks with 130-barrel vacuum truck today. Will circulate well with clean brine tomorrow.

Report #15 - Thursday, December 10, 1992

Went in hole with workstring open-ended to 3,300'. Pressure tested 9-5/8" casing to 1,012 psig. Monitored pressure for 1 hour with calibrated test gauge. Pressure decreased 1 psi (down to 1,011 psig) over test duration.

Waited on orders. Decision was made by HCCG to suspend operations until January 18, 1993. Will rig down.

Ordered and received oxygen scavenger, biocide and corrosion inhibitor to add to clean brine in frac tank. Cleaned rig tanks while waiting on chemicals.

Lowered workstring to 3,802'. Circulated well with clean inhibited brine. Pulled workstring up to 3,762'. Closed well in for night.

Report #16 - Friday, December 11, 1992

Pulled out of hole laying down workstring. Removed blow out preventer and nippled up wellhead. Rigged down workover rig and peripheral equipment. Loaded out rental tools.

Workover rig will leave on Monday morning, December 14.

FINAL REPORT UNTIL OPERATIONS RESUME ON MONDAY, JANUARY 18, 1993.

Report #17 - Monday, January 18, 1993

All contractors attended HCCG site specific safety training. Laid down 6 mil. plastic liner across location. Moved in and rigged up WellTech Well Services workover rig. Rigged up pump, tanks, pipe racks and cat walk on liner. Diked around equipment and wellhead with sand.

HCCG personnel decommissioned nitrogen pressure system and flow meter from wellhead. Bled off 135 psig nitrogen from well.

Unloaded 131 joints of 2-7/8", PH-6 workstring and rental equipment from Petco. Closed well in for the night.

Report #18 - Tuesday, January 19, 1993

Bled pressure off HCCG surface piping. Nippled down wellhead and installed annular blowout preventer. Rigged up work floor.

Rigged up Western Atlas wireline. Started in hole with 8.679" O.D. gauge ring and junk basket. Tagged restriction at 3,318' (casing patch setting depth 3,350'-3,370'). Unable to work past restriction. Pulled out of hole with junk basket and gauge ring. No definitive markings indicated on gauge ring, junk basket was empty.

Met with HCCG personnel to discuss course of action. Decision was made to run tandem casing scrapers to attempt to "clean up" casing wall in the area from 3,300' to 3,400'. Rigged down and released Western Atlas. Closed well in for night.

Report #19 - Wednesday, January 20, 1993

Picked up 8-5/8" bit, tandem casing scrapers, bumper jars and (4) 4-1/8" drill collars. Went in hole with same to 3,280', picking up 2-7/8", PH-6 workstring.

Rigged up stripper head and power swivel. Began reverse circulating well with clean brine. Rotated and reciprocated casing scraper (while circulating) down to 3,408'. Reverse circulated well clean. A "handful" of thin cement chips and a few thin pieces of corroded metal were found in fluid returns at surface.

Pulled back up to 3,280' rotating and reciprocating tandem casing scrapers. Rigged down power swivel and stripper head. Pulled out of hole with tandem casing scrapers. Closed well in for night.

Note: At this point, GES was not certain whether the corroded metal chips recovered from the well today are from the protection casing or from the heavy wall drill collars picked up today. The drill collars are a strong possibility as the source.

Report #20 - Thursday, January 21, 1993

Rigged up Western Atlas. Went in hole with junk basket and 8.679" O.D. gauge ring to 3,595' wireline measurement (WLM). Pulled out of hole to 2,000'. Pressure tested 9-5/8" protection casing to 1,000 psig for 10 minutes. No pressure loss observed over test period. Finished pulling out of hole with junk basket and gauge ring. No restrictions noted on gauge ring run.

Prepared to perforate protection casing with 5" O.D. hollow carrier casing guns at 5 shots per foot 135/45 degree phasing. Perforated for injection. Made eight (8) successful trips with 5" perforating guns. Perforated the following intervals:

Interval Depths	
From (ft.)	To (ft.)
3,376	3,426
3,460	3,471
3,494	3,524
3,543	3,572

Picked up Panex quartz crystal bottom hole pressure (BHP) gauge to obtain bottom hole pressure. Telemetry tools, both primary and back-up tools, not functioning properly. Closed well in for night.

Report #21 - Friday, January 22, 1993

Western Atlas went in hole with Panex BHP gauge. Measured bottom hole pressure at 1,593 psia and bottom hole temperature of 124° F at 3,440' (ground level). Pulled out of hole with bottom hole pressure gauge.

Western Atlas picked up radioactive tracer (RAT) survey tools and went in hole with same. Tagged bottom at 3,595'. No apparent sand influx after perforating. Positioned lower gamma-ray detector at 3,370'. Ejected a total of three (3) radioactive slugs. No indication of any upward movement of fluid behind the protection casing. Pump rate for RAT survey was 210 gallons per minute (gpm) of 9.8 ppg brine at a surface injection pressure of 100 psig. Pulled out of hole.

Picked up 20' carbon steel Homco casing patch and setting tool. Went in hole with same to 3,370' (tubing measurement). Western Atlas went in hole with gamma-ray/collar locator to run correlation log. Correlation log indicated casing patch was set 5' to deep according to the gamma-ray/neutron correlation log. Pulled out of

hole with wireline tools. Rigged down and released Western Atlas.

Made depth adjustment to wireline measurement. Pulled casing patch up the hole 5'. Rigged up Halliburton to set casing patch. Pressured up on workstring and casing patch. Bled off pressure. Picked up on workstring to pull the setting tools through the patch, rolling out patch against the casing wall. Maximum tension pulled was 35,000# above the workstring weight. Surface observations indicated casing patch was properly set from 3,350' to 3,370'. Pulled out of hole with workstring and laid down setting tools. Closed well in for the weekend to allow patch to set.

Note: Top of Homco casing patch is at 3,350' (WLM), base of casing patch is at 3,370' (WLM). Patch has 0.15" wall (i.e. will restrict I.D. of protection casing by 0.30").

Report #22 - Monday, January 25, 1993

Moved in and rigged up Western Atlas to run 8" O.D. gauge ring and gamma-ray/collar locator correlation log. Went in hole with gauge ring to 3,400'. Pulled out of hole.

Picked up 35' of 6-5/8" sch. 40, 316 stainless steel tailpipe, 12' seal bore extension, and TIW "LH" packer with "JGS" hold downs. Went in hole with same to 3,376' (base of tailpipe).

Picked up gamma-ray/collar locator to correlate packer setting depth to gamma-ray/neutron correlation log. Made 12' depth correlation to gamma/ray/neutron correlation log.

Spotted diesel blanket around tailpipe. Set packer with 25,000# weight. Filled annulus with brine. Pressurized annulus to 1,000 psig. Slight pressure decrease noted. Closed well in for night.

Note: Well thermally unstable. Will re-test tomorrow morning.

Report #23 - Tuesday, January 26, 1993

Shut-in casing pressure 600 psig. Pressured up on 9-5/8" protection casing to 1,060 psig. Pressure decreased to 1,040 psig in 30 minutes. Test successful. released pressure.

Rotated workstring 35 rounds to the right to release setting tool. Removed setting tool from packer. Lowered setting tool down on packer with 28,000 pounds to set top slips on packer. Pulled out of hole, laying down workstring, drill collars and setting tool.

Rigged up Weatherford International casing tongs to run 5-1/2" injection string. Picked up TIW stainless steel seal assembly and 5-1/2", 20 ppf, N-80 carbon steel injection string, and started in hole with same. Closed well in for night.

Report #24 - Wednesday, January 27, 1993

Finished running TIW seal assembly and 5-1/2", 20 ppf, N-80 carbon steel injection string in hole. Stung into packer with seal assembly. Spaced out with locator sub, 3' above packer. Seal assembly 9' into packer. Total of 76 joints + 13' + 9' + 8' pup joint in hole.

Displaced annulus with 150 barrels of inhibited brine (with Halliburton Annhib--corrosion inhibitor, oxygen scavenger and biocide). Landed injection tubing on mandrel-type hanger in wellhead.

Rigged down Weatherford International. Rigged down work floor. Nippled down annular-type blowout preventer. Began nippling up wellhead. Pressure tested annulus to 600 psig (wellhead configuration did not allow 1,000 psig test at this time). Annulus pressure increased to 680 psig due to thermal expansion. Finished nippling up wellhead. Closed well in for night.

Note: Annulus thermally unstable. Will re-test tomorrow morning.

Report #25 - Thursday, January 28, 1993

Prepared to perform Mechanical Integrity Test (MIT). Pressure tested annulus to 1,002 psig at 7:35 a.m. Pressure increased 7 psi in 30 minutes. Final test pressure at 8:05 a.m. 1,009 psig. Test successful.

Moved in and rigged up Western Atlas to run Radioactive Tracer (RAT) survey. Went in hole with tracer tools, tagged bottom at 3,802'. RAT conducted as follows:

* Initial gamma-ray base log #1 from 3,802' back to 3,000'.
* Initial gamma-ray base log #2 from 3,802' back to 3,000'.
* Dynamic slug #1 ejected at 3,200' - pump rate 25 gpm - 42 gpm.
* Dynamic slug #2 ejected at 3,200' - pump rate 42 gpm.
* Stationary slug #1 ejected at 3,356' - pump rate 63 gpm.
* Stationary slug #2 ejected at 3,356' - pump rate 63 gpm.

* Final gamma-ray base log run from 3,802' - 3,000'.

Pulled out of the hole and rigged down Western Atlas.

Removed upper wellhead and added 3/4" spacer ring above the mandrel hanger. Re-installed upper wellhead, tested wellhead packing and "O" rings to 2500 psig. Rigged down, released and loaded out rental equipment. Lowered derrick on workover rig and loaded out same.

Injection well re-completion operations complete - turned well over to HCCG personnel to finish installation of injection line.

NOTE: Mr. Richard Merritt of TWC on location to review annulus pressure test and witness RAT. Mr Merritt gave HCCG verbal permission to inject non-hazardous waste per the TWC UIC permit.

Report #26 - Friday, February 5, 1993

Arrived at plant gate at 6:45 a.m. Security personnel provided orientation to Harry Allison (GES), Halliburton, and Goetz personnel. Moved trucks to the location and started rigging up. Halliburton went to Bay City to get 2-3/8" x 2" swage. Received site orientation and finished rigging up. Received TWC approval after faxing procedures to Richard Merritt.

Tested lines to 500 psig and then started pumping FE acid at 10:45 a.m. Pumped 4,000 gallons of FE 15% acid with no pressure on the well. The pump rate averaged 6-3/4 bpm. The pressure rose to approximately 50 psig.

Followed with 1,000 gallons of FE 15% acid and diverter material. The pump rate was 6-3/4 bpm and the pressure rose to approximately 65 psig.

Followed with 3,000 gallons of FE 15% acid. Same pump rate and approximately the same pressure.

Followed with 1,000 gallons of FE 15% acid and diverter material. Same pump rate and approximately the same pressure.

Followed with 4,700 gallons of FE 15% acid. Same pump rate and approximately the same pressure.

Displaced with 1,000 gallons of "clay fix". Same pump rate and the pressure was approximately 70 psig.

Final displacement was with 21,000 gallons of brine and the rate came up to 9 bpm and the well pressure dropped to zero.

APPENDIX G

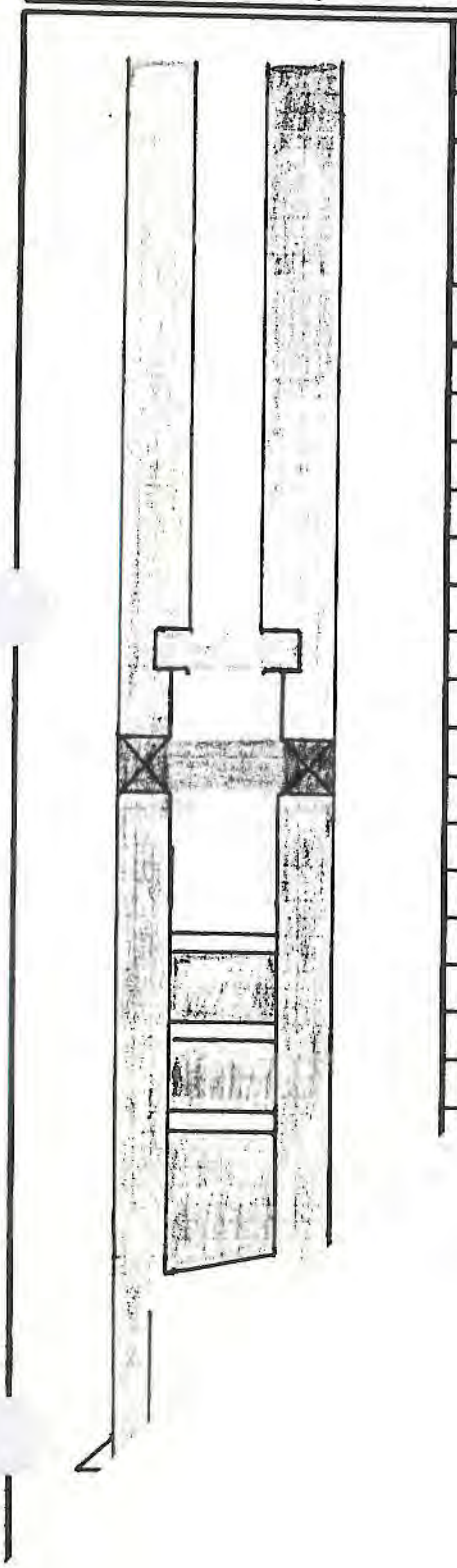
TIW PACKER INFORMATION

TEXAS IRON WORKS, INC.
A PEARCE INDUSTRIES COMPANY

P.O. BOX 35729
12300 S. MAIN
(713) 729-2110 - HOUSTON, TX 77035

COMPLETION GUIDE

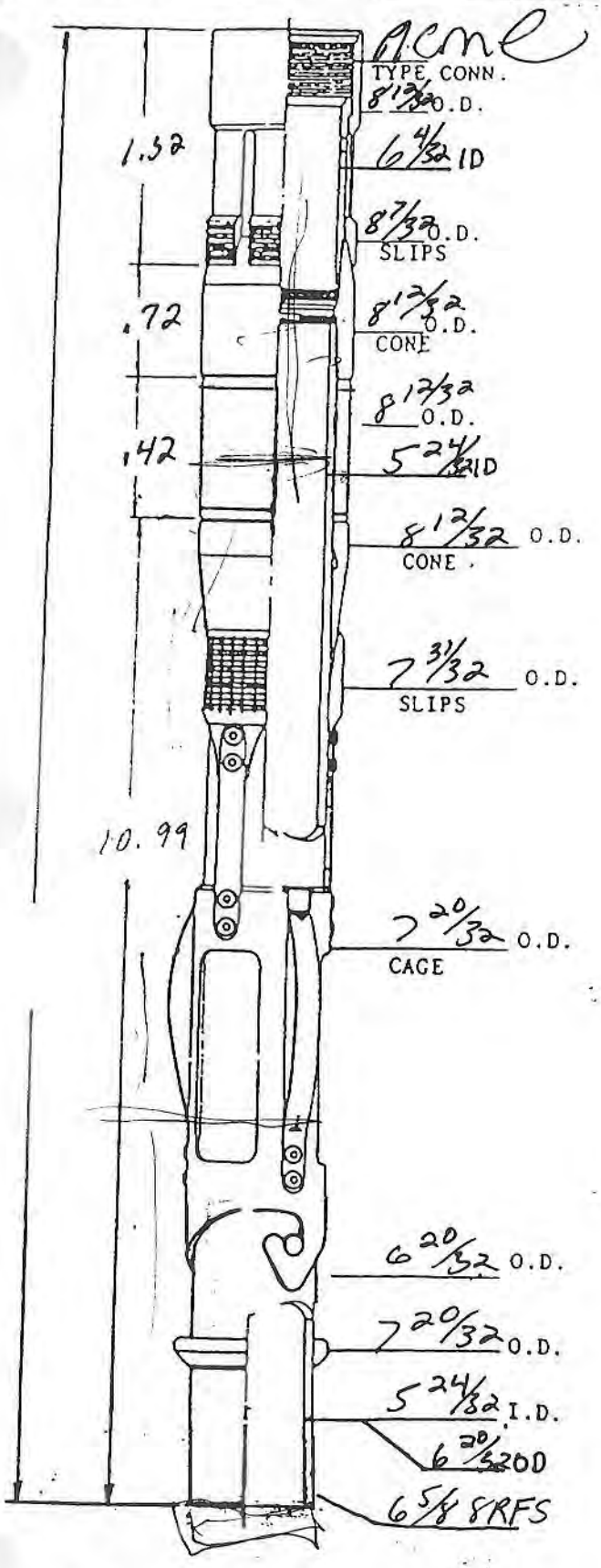
PREPARED FOR Bob Hall
COMPANY Golden Engineering
DATE 1-27-93
FIELD Bay City
LEASE Hoechst Celanese
WELL WDW #1-A
SERVICEMAN David W. (Pete) Smith
COUNTY/PARISH Matagorda
STATE Texas



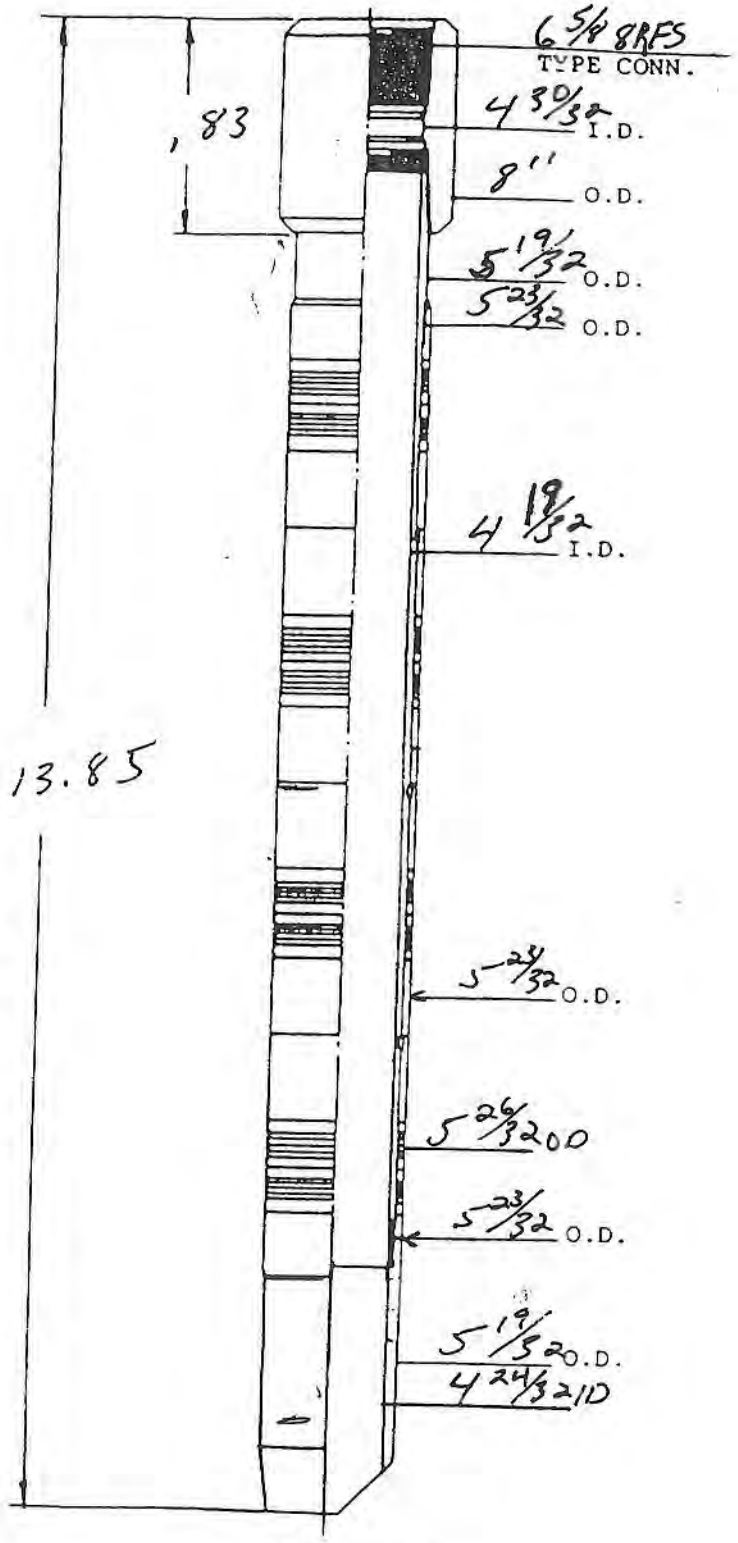
		SIZE	WEIGHT	GRADE	THREAD	TYPE COMPLETION FLUID IN CASING	
CASING		9 5/8	40#				
LINER		5 1/2"	20#	N-80	8RD LT+C	WT. ON PACKER	TYPE LATCH
TUBING	UPPER					NEUTRAL	
	MIDDLE						
	LOWER						

ITEM NO.	EQUIPMENT & SERVICE DESCRIPTION	O.D.	I.D.	LENGTH	EST. OR DEPTH
	— ELEVATION —				
	1 Jt. 5 1/2" 20# N-80 8RD LT+C	5 1/2	4.778	41.66	17.0
	Pup Jt. 5 1/2" 20# N-80 8RD LT+C	5 1/2	4.778	13.08	58.66
	Pup Jt. 5 1/2" 20# N-80 8RD LT+C	5 1/2	4.778	9.75	71.74
	Pup Jt. 5 1/2" 20# N-80 8RD LT+C	5 1/2	4.778	7.80	81.49
	76 Jts. 5 1/2" 20# Csg. N-80 8RD LT+C	5 1/2	4.778	3229.42	89.29
	TIW Seal Assy. w/4 units EPDM Packing				
	5 1/2" 23# 316 SS w/Muleshoe Bottom + 8" O.D.	8"	4 19/32	.83	3318.71
	No-Go (Overall Length 13.85)				
	TIW LH Packer w/JGS-HDS 1 Piece G.S.P.O.	8 3/8	5 3/4		
	6 5/8" 28# 316 SS X 9 5/8 40-47# w/RH-J.	8 3/8	5 3/4	13.45	3319.54
	(Packoff Rubber @ 3322'				
	Collar 316 SS 8RD Short.	7 1/4			
	6 5/8" Csg. 316 SS 8RD Short 28#	6 5/8	6 2/32	6.86	3332.99
	Collar 316 SS 8RD Short	7 1/4			

OPERATOR CELANESE	DISTRICT HOUSTON	LEASE W DW	DATE 1-22-93
SERVICEMAN	Well No.	COUNTY MATAGORDA	STATE TX



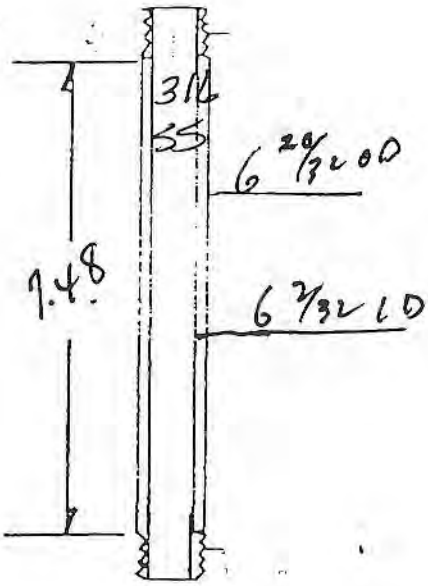
Right Hand ↻
L H PACKER W/J.G. HOLDDOWN SLIPS
S/N 92K07732

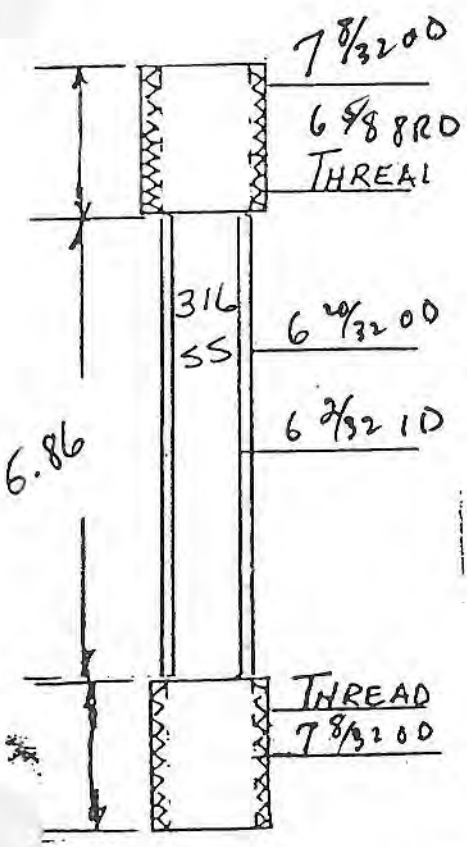


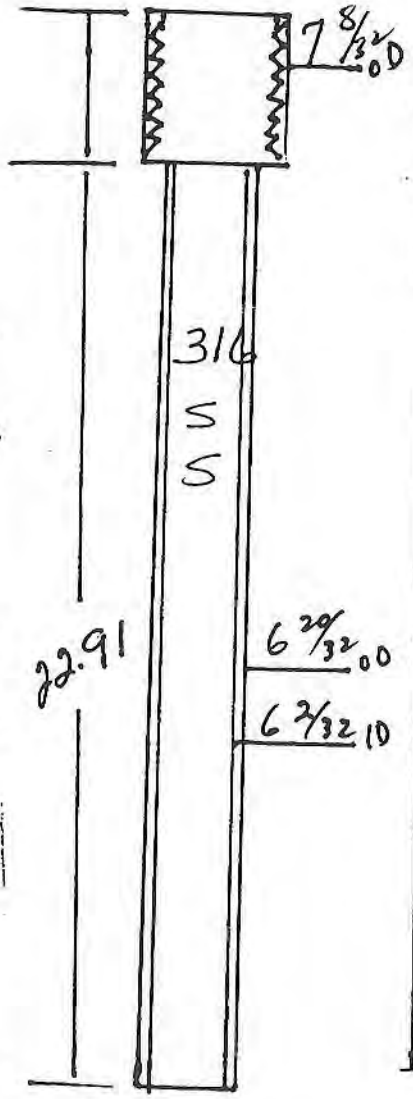
SEAL NIPPLE
S/N 92K07733

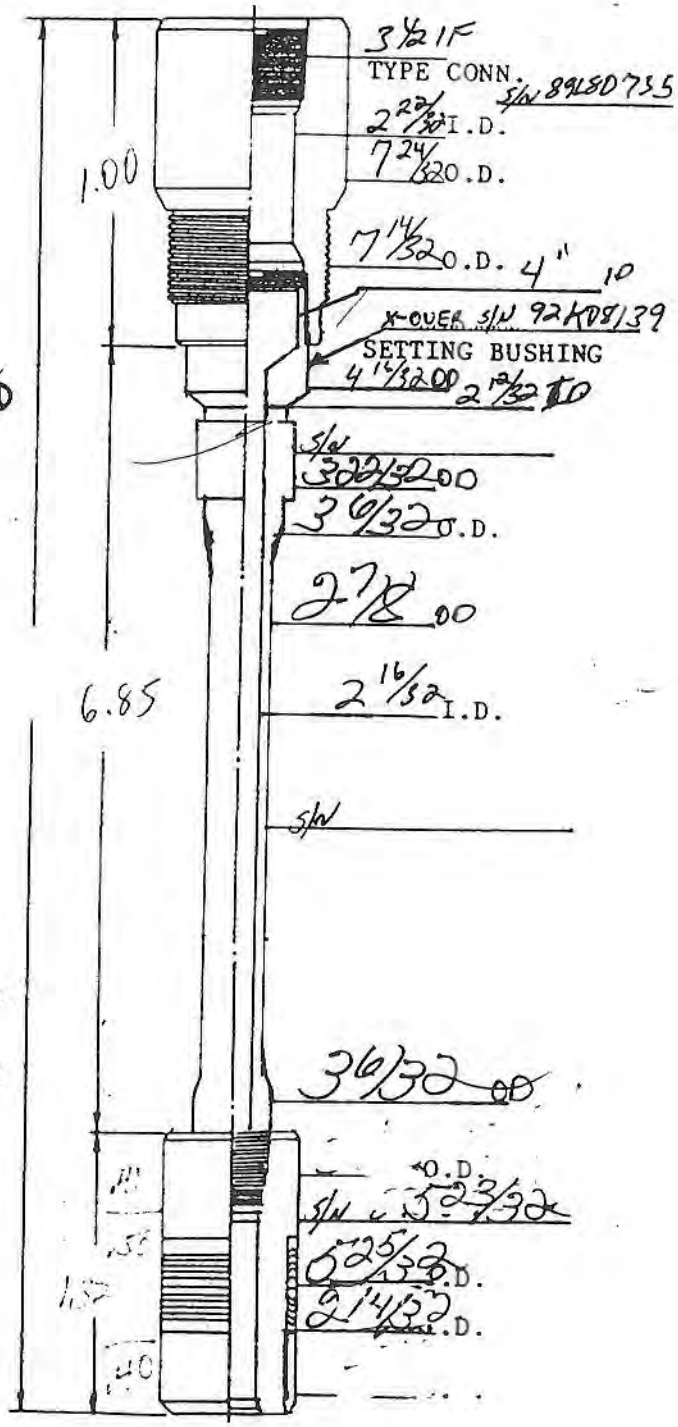
TEXAS IRON WORKS, INC.

OPERATOR GOLDEN CLANESE		DISTRICT HOUSTON	LEASE W DW	DATE 1-22-9
SERVICEMAN	Well No.	COUNTY or PARISH MATAGORDA	STATE TX	









TYPE JGS SETTING TOOL

S/N _____

OVERALL 36.24

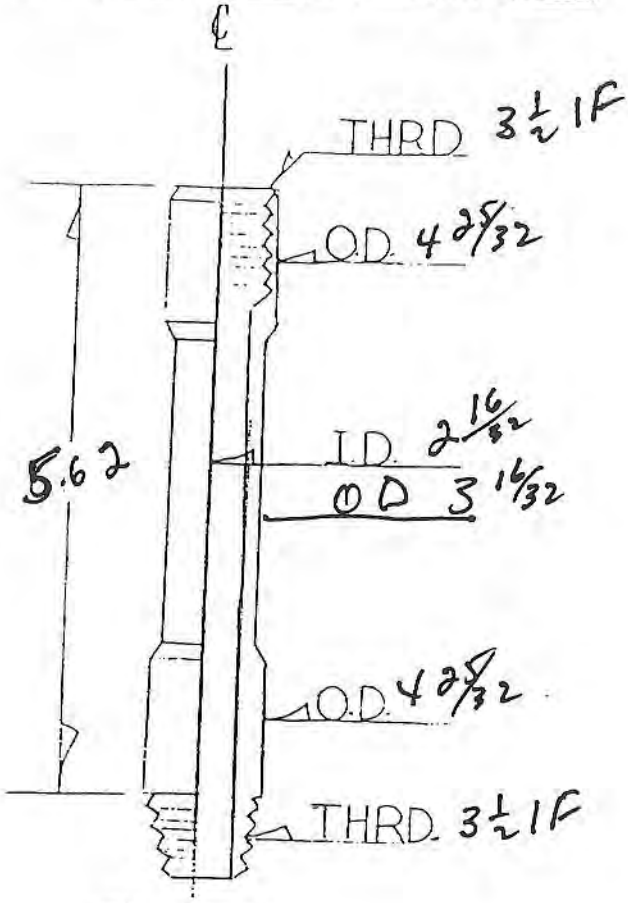
O RING 2- 000

TEXAS IRON WORKS, INC.

ERATOR CELANESE	DISTRICT HOUSTON	LEASE UNKN	DATE 1-22-93
RVICEMAN	Well No.	COUNTY or PARISH MATAGORDA	STATE TX

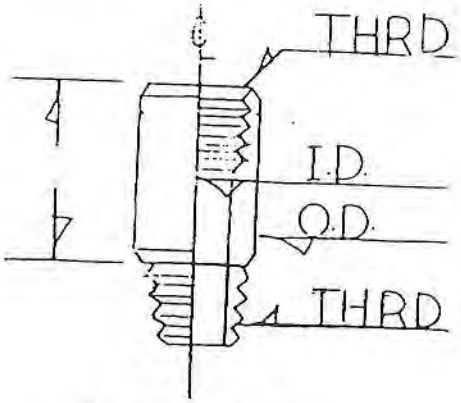
LINER OD: ____/____ GRD. ____ CONN. ____ ID. ____ DRIFT ____

CASING ____ OD. ____ ID. ____ DRIFT ____



PUPUT.

S/N 89L92126



XOVER

S/N

TIW CORPORATION

5151 GASMER
HOUSTON, TEXAS
(713) 728-9250

FAX: (713) 728-4309

FAX TRANSMISSION

DATE: November 12 - 1992
TO: Bob Hall
COMPANY: Golden Strata
FAX NUMBER: 222-9900
FROM: Lawrence Jacobs
COMPANY: TIW
TOTAL No. of Pages (Including Cover Page): 2

☞ If you do not receive all pages, please contact by phone (713) 728-9250.

MESSAGE

Letter we discussed this morning, I have turned in a sale order for this packer, & all I need is the size & kind of threads on top of the seal assemble.

Please let me know your decision as soon as you can.

Many Thanks
Lawrence

TIW CORPORATION
A Prince Industries Company

November 12, 1992

Golden Strata
711 Louisiana Suite 1600
Pennzoil Place
Houston Tx 77002

Mr. Bob Hall,

TIW has replaced our JGS packer with the LH packer. The reason was to put or make changes to improve our new line of packers like the LH packer. The following are some improvements of the L.H.

A) has an open jay instead of a closed jay on the cage.

B) The slip arms between the lower slips & cage is spring steel which is extremely tough & heat treated seperately. On the JGS packer the slips, arms & cage are all one, which is a lot weaker & more brittle and is more prone to break off.

C) The LH takes a different element.

D) The delivery time on our LH Packer with the following description:

Packer

LH Packer w/JGS HD Slips, ratchet ring in lower cone, right hand set, right hand release, 5-3/4" ID polished barrel, one unit packoff (6-5/8" 28# 316SS, RST & C X 9-5/8" 40 to 47#)

Seal Assembly

three unit seal assembly w/6-5/8" OR 5-1/2" Box up (please specify threads)

Delivery will be between Nov. 21 to Nov. 23 without any forseen problems.

Yours Truly,

Lawrence Jacobs

Lawrence Jacobs
Houston District Manager

SALES DISTRICT
P.O. BOX 35729 HOUSTON, TEXAS 77235-5729
TEL: 713/728-9250 TLX: 462-0356 TIW UI FAX: 713/728-4309

TIW CORPORATION

5151 GASMER
HOUSTON, TEXAS
(713) 728-9250

FAX: (713) 728-4309

FAX TRANSMISSION

DATE: 11-13-92
TO: Bob Hall
COMPANY: Golden Strata
FAX NUMBER: 222 9900
FROM: Lawrence Jacobs
COMPANY: TIW
TOTAL No. of Pages (Including Cover Page):

☞ If you do not receive all pages, please contact by phone (713) 728-9250.

MESSAGE

Bob, with a temp swing of 30°-120°
You'll get a -2.76 change, you then will have
6DG
2.76
3.24 of PBR left. the seals are 3' long.
So you'll have -24" above the top seal.

Please let me know.
Thanks Lawrence

TIW CORPORATION GOLDEN1.XLS1

FOR:
COMPANY: GOLDEN STRATA
BY: DAS
DISTRICT: TIW HOUSTON 2.000
WELL:
2.01[TVD]TIW:DAS(123R3) DATE: 12-Nov-92 04:29 PM

SITUATION TYPE	1	2	
Seal Bore, Polished Riser dia.(in):	4.250	4.250	
Depth of Seal Bore [Measured](ft.):	3,850	3,850	
Depth of Seal Bore [True Vt.](ft.):	3,850	3,850	
Casing inside diameter.(in.):	8.835	8.835	
Tubing outside diameter.(in.):	5.500	5.500	
Tubing nominal weight.(#/ft):	23.000	23.000	
Tubing nominal inside dia.(in.):	4.670	4.670	
Tubing minimum yield.(psi):	80,000	80,000	
Slack-off during space-out.(lbs):	15,000	15,000	= 0
Length of seals.(in.):	-------	-------	
Ambient mean temperature.(°F):	80	80	
Temp. of PBR @ space-out.(°F):	120	120	
Fluid at space-out.(#/gal):	9.20	9.20	
Surface temp. of fluid.(°F):	30	85	
Seal Bore temperature.(°F):	35	35	
Max. fluid wt. inside tub.(#/gal.):	8.34	8.34	
Weight of annulus fluid.(#/gal):	9.20	9.20	
Surface pressure in tubing.(psi):	1,000	1,000	
Surface pressure in annulus.(psi):	0	0	
Young's Modulus:	3.00E+07	3.00E+07	
Coefficient of Thermal Expansion:	6.90E-06	6.90E-06	
Piston effects.(ft) L1:	0.047	0.05	
O Buckling effects.(ft) L2:	-0.004	0.00	
u Ballooning effects.(ft) L3:	-0.182	-0.18	
t Temperature effects.(ft) L4:	-1.793	-1.06	
p Total:	-1.932	-1.20	
u Tubing slack-off.(ft):	0.296	0.30	
t Net tubing movement.(ft):	-1.635	-0.90	= 2.76
Outer Fiber Stress.(psi) So:	4,780	4,780	
Inner Fiber Stress.(psi) Si:	5,868	5,868	
LATCHED STRING			
Attempted movement of seals. (ft):	-1.635	-0.905	
Force on Latch.(lbs):	(75,686)	(43,727)	
Tubing force above Latch.(lbs):	(78,122)	(46,163)	
Maximum Fiber Stress.(psi):	12,582	8,416	
Surface tubing weight.(lbs):	166,672	134,713	

TIW CORPORATION

5151 GASMER
HOUSTON, TEXAS
(713) 728-9250

FAX: (713) 728-4309

FAX TRANSMISSION

DATE: NOVEMBER 17, 1992
TO: BOB HALL
COMPANY: GOLDEN STRATA
FAX NUMBER: 222-9900
FROM: LAWRENCE JACOBS
COMPANY: TIW CORPORATION
TOTAL No. of Pages (Including Cover Page): 1

☞ If you do not receive all pages, please contact by phone (713) 728-9250.

MESSAGE

WITH AN 8' POLISHED PACKER BARREL AND 3 SETS OF SEALS SPACED OUT IN THE CENTER OF OUR PACKER BARREL, THE TEMP WOULD HAVE TO GET TO 0° AT THE SURFACE AND 0° AT THE PACKER DEPTH BEFORE THE TUBING WOULD CONTRACT ENOUGH TO PULL OUR SEALS FROM THE POLISHED PACKER BARREL.

ON ELONGATING, THE TEMP. WOULD HAVE TO GET TO 225° AT THE SURFACE & 225° AT THE PACKER BEFORE THE TUBING WOULD ELONGATE ENOUGH FOR THE SEALS TO EXTRUDE OUT OF THE POLISHED BARREL.

OUR ELASTOMER VENDER SAYS THAT EPR SEALS IS ONLY A 3 WORKING DAY DELIVERY AND IS LESS EXPENSIVE THAN OUR REGULAR PACKING (VITON AIRMID GLASS & RYTON).

Lawrence Jacobs

LAWRENCE JACOBS
'STRICT SALES MANAGER.

TIW CORPORATION

5151 GASMER
HOUSTON, TEXAS
(713) 728-9250

FAX: (713) 728-4309

FAX TRANSMISSION

DATE: 11-18-92
TO: Bob HALL
COMPANY: Golden STRATA
FAX NUMBER: 228-7000
FROM: Lawrence Jacobs
COMPANY: TIW
TOTAL No. of Pages (Including Cover Page): 2

☞ If you do not receive all pages, please contact by phone (713) 728-9250.

MESSAGE

This is w/ 96" or 8' PBR on the cold side you would have to get the temp down to 0 at surface & 0° at the packer to pull the seals from the PBR or Packer.

On the high side it would take 225° at surface and 225° at PBR or packer to extrude the seals out the bottom

Our eng Dave Scott said for a 12' PBR his computer is not set up to go on the negative side

Still working on the EPR (Ethylene Propylene) seals. Our vender will most likely get back to me after lunch.

Lawrence

0 - 225

FOR: BOB HALL
COMPANY: GOLDEN STRATA
BY: DAS / MJM
DISTRICT: TIW HOUSTON
WELL: CELANESE
2.01[TVD]TIW:DAS(123R3) DATE: 18-Nov-92 11:04 AM

Seal Bore, Polished Riser dia.(in):	1	2
Depth of Seal Bore [Measured](ft.):	4.250	4.250
Depth of Seal Bore [True Vt.](ft.):	3,850	3,850
Casing inside diameter.(in.):	3,850	3,850
Tubing outside diameter.(in.):	8.835	8.835
Tubing nominal weight.(#/ft):	5.500	5.500
Tubing nominal inside dia.(in.):	23.000	23.000
Tubing minimum yield.(psi):	4.670	4.670
Slack-off during space-out.(lbs):	80,000	80,000
Length of seals.(in.):	0	0
Ambient mean temperature.(°F):	96.000	96.000
Temp. of PBR @ space-out.(°F):	74	74
Fluid at space-out.(#/gal):	92	92
Surface temp. of fluid.(°F):	9.20	9.20
Seal Bore temperature.(°F):	0	225
Max. fluid wt. inside tub.(#/gal.):	0	225
Weight of annulus fluid.(#/gal):	8.34	8.34
Surface pressure in tubing.(psi):	9.20	9.20
Surface pressure in annulus.(psi):	1,000	1,000
Young's Modulus:	0	0
Coefficient of Thermal Expansion:	3.00E+07	3.00E+07
	6.90E-06	6.90E-06
Piston effects.(ft) L1:		
Buckling effects.(ft) L2:	0.047	0.047
Ballooning effects.(ft) L3:	-0.004	-0.004
Temperature effects.(ft) L4:	-0.182	-0.182
Total:	-2.205	3.772
Tubing slack-off.(ft):	-2.343	3.634
Net tubing movement.(ft):	0.000	0.000
Net Between option 1 & 2 (ft):	-2.343	3.634
Outer Fiber Stress.(psi) So:		5.977
Inner Fiber Stress.(psi) Si:	4,780	4,780
	5,868	5,868
Attempted movement of seals. (ft):	-2.343	3.634
Force on Latch.(lbs):	(104,509)	154,133
Tubing force above latch.(lbs):	(106,945)	151,697
Maximum Fiber Stress.(psi):	16,645	39,689
Surface tubing weight.(lbs):	195,495	(63,147)
Pipe body load limit.(lbs):	530,370	530,370

APPENDIX H

INJECTION TUBING TALLY AND WEATHERFORD TORQUE TURN DATA

Appendix H
Injection Tubing Tally

43	44	41	80	43	07	39	06	41	71	45	51	43	25	42	45
41	62	44	95	43	10	41	21	43	05	43	15	41	43	41	88
41	76	42	02	42	31	41	51	41	50	42	28	43	67	37	55
43	--	43	38	42	--	42	02	44	63	42	51	44	62	35	70
43	06	42	68	43	10	44	--	44	06	43	52	44	15	38	76
43	02	44	80	43	65	44	12	42	95	42	97	44	68	42	12
40	92	43	62	43	65	40	02	41	10	43	05	41	87	41	66
43	85	43	10	40	25	43	65	45	10	41	70	42	90	7	80
41	30	43	07	41	61	44	21	41	75	43	97	43	10	9	75
42	70	39	67	42	51	42	90	40	86	40	71	43	50	13	08
424	67	429	09	425	25	422	70	426	71	429	37	433	17	310	75

SUMMARY: (Tally all pipe in feet & hundreths without threads, show shoe joint, lost joint, & joints left out. Use separate line in summary for each different kind pipe.)

Joint Nos. _thru_	O.D.	Wt/Ft	Grade	Threads	Condt.	Length	
1-79	5 1/2	20#	N-80	8rd LT&C		3355	00
Pup Jt.	5 1/2	20 #	N-80	8rd LT&C		7	80
Pup Jt.	5 1/2	20 #	N-80	8rd LT&C		9	75
Pup Jt.	5 1/2	20 #	N-80	8rd LT&C		13	08

Jts. Delivered: 79	Datum:
Jts. Run: 77	Datum to BHF:
Jts. Left Out: 2	Pipe Set @:
Tallied by: Pete Smith Date: 1/27/93	
Company: TIW Corp.	
Prospect: Bob Hall w/GES	
Field: Bay City	
Co & State: Matagorda, TX	
Lease & Well: WDW #1-A	

J.A.M SERVICES REPORT

JAM REPORT

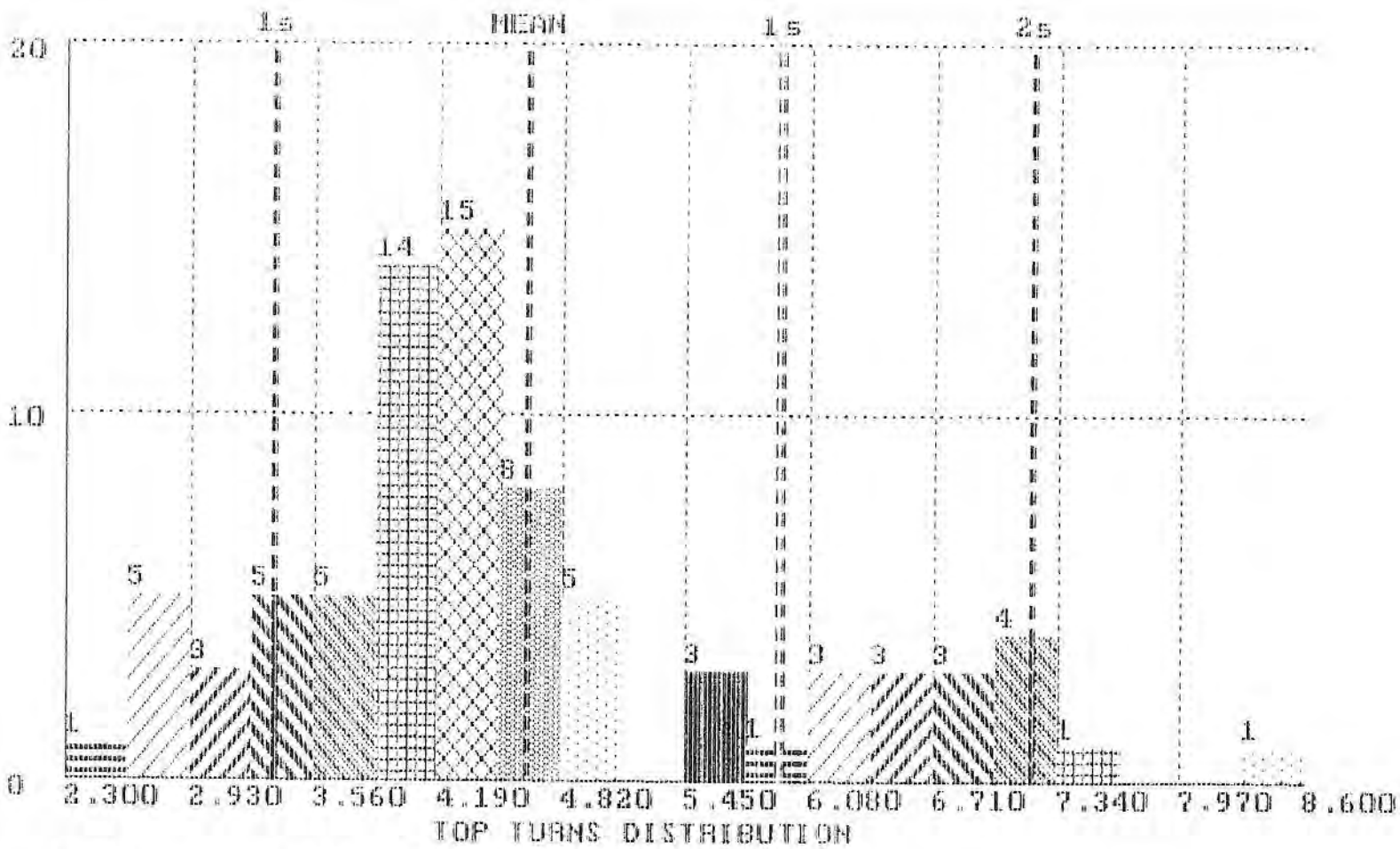
Company :	GOLDEN ENERGY
Lease :	CELENESE BAY CITY
Well # :	1
Pipe Desc. :	5 1/2 20 N-80 LT&C

J.A.M SERVICES REPORT

COLOR	RED	WHITE	BLUE
SIZE	5 1/2		
THREAD	LT&C		
WEIGHT	20		
GRADE	N-80		
MAX TQ	5350		
OPT TQ	4280		
MIN TQ	3210		
REF TQ	550		
MAX TNS	7.000		
MIN TNS	0.000		
JTS RAN	77		
FOOTAGE	3310		
BACK OUTS	0		
REJECTS	0		

J.A.M SERVICES REPORT

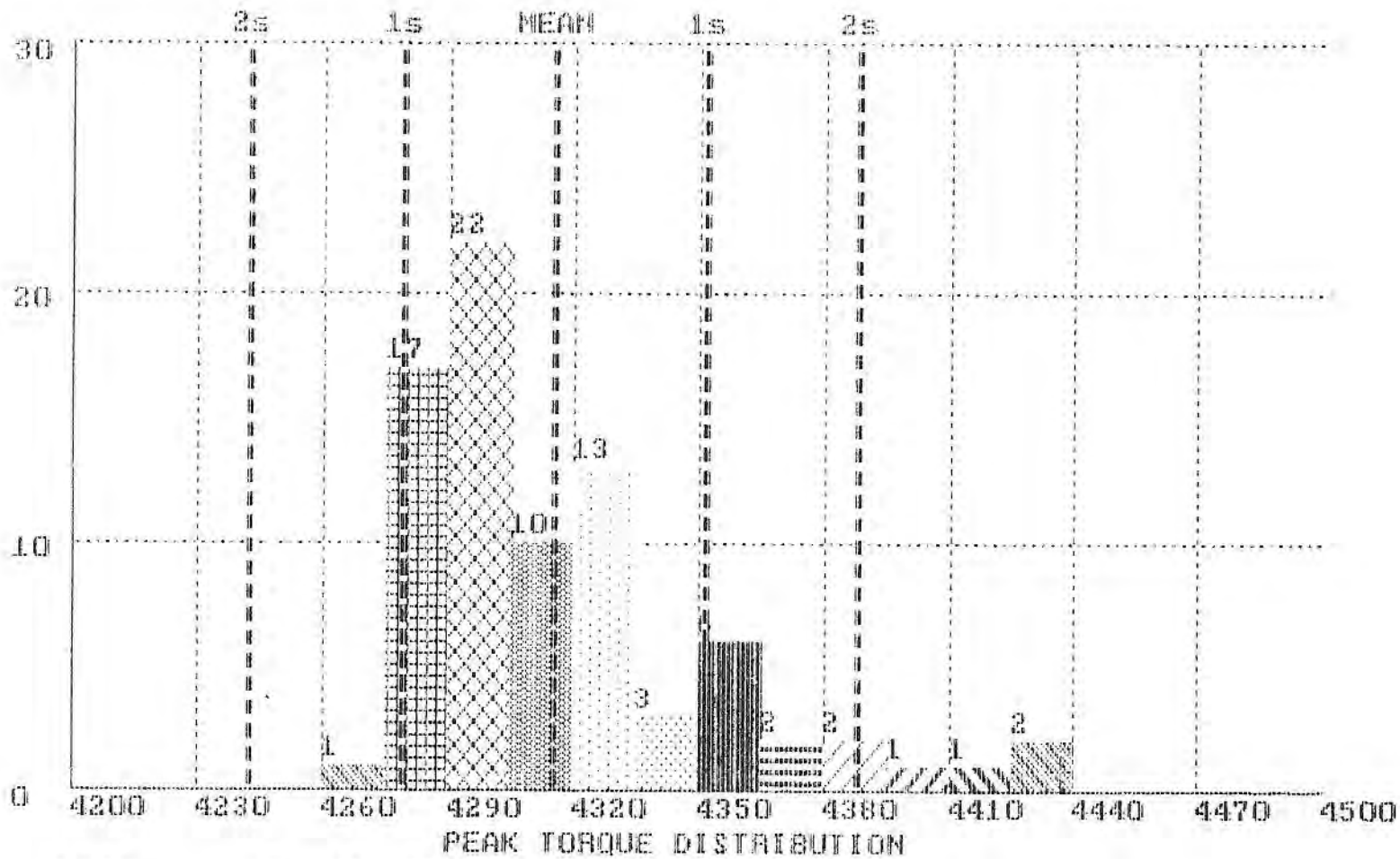
Company :	GOLDEN ENERGY
Service Ticket Number:	2203277300
Diskette I.D. Number:	LAF-277
Lease :	CELANESE BAY CITY
Well Number :	1
Rig Name :	POOL W/S
Tong Model :	5.5 GMBH
Field / Block :	BAY CITY, TX.
Customer Representative :	MR. BOB HALL
Pipe Condition :	NEW
Thread Lubricant :	WEATHERFORD LUBE SEAL
Computer #1 :	LV093
Computer #2 :	LV098
Technician #1 :	JOHN W. NEWMAN
Torque information supplied by :	LONE STAR STEEL



LT&C 5 1/2 20 N-80

MEAN = 4.643 STANDARD DEVIATION = 1.296

TOTAL CONNECTIONS = 80 IN RANGE = 80

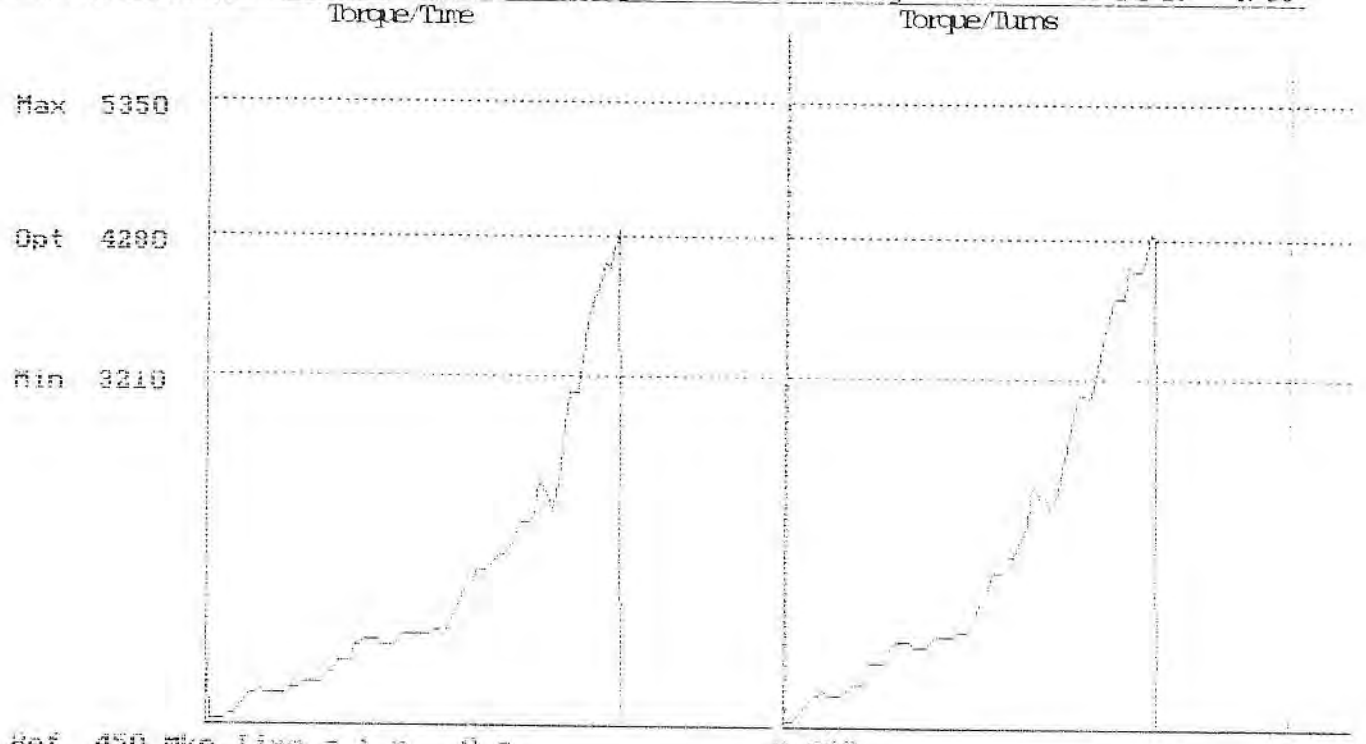


LT&C 5 1/2 20 N-80

MEAN = 4315 STANDARD DEVIATION = 36.661

TOTAL CONNECTIONS = 80 IN RANGE = 80

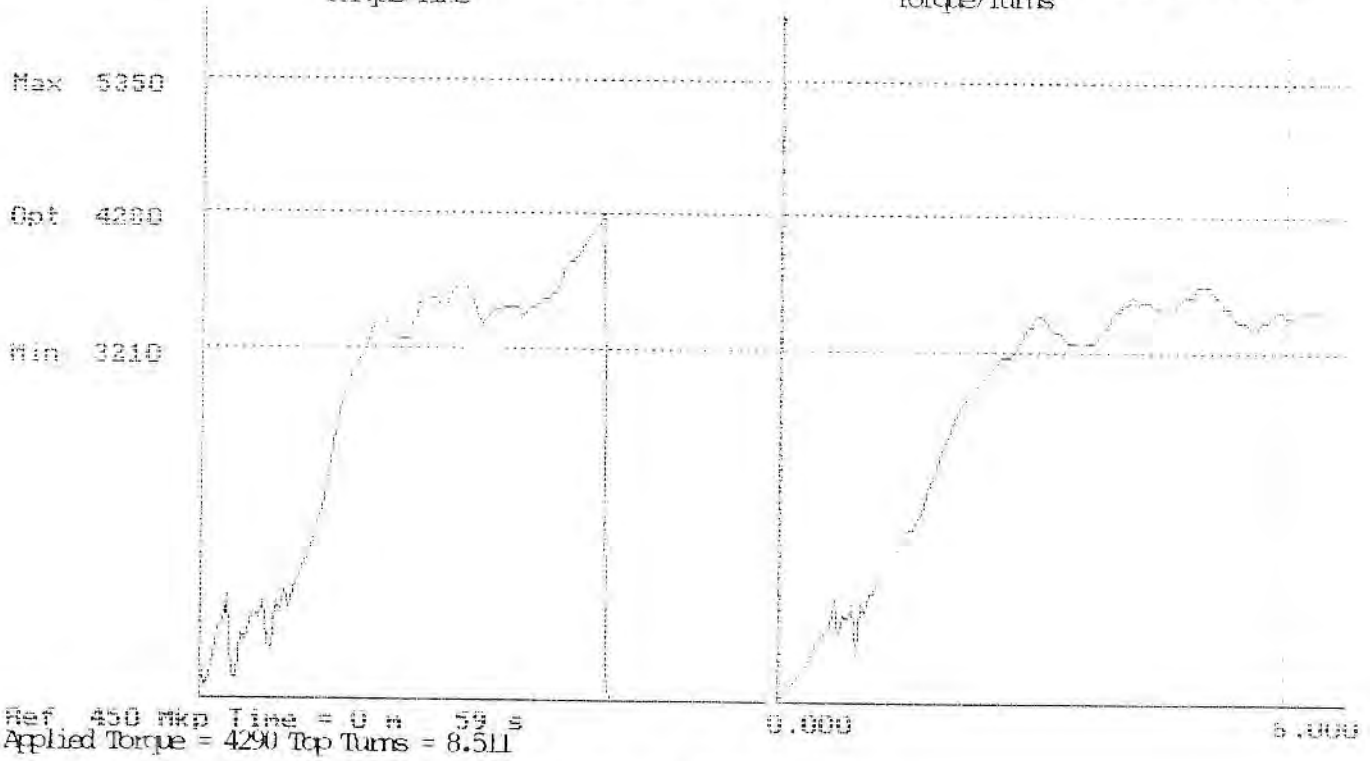
17:15 01/26/93 ACCEPT Joint # = 1 Log # = 1 Red String LT&C 5 1/2 20 N-80



Ref 450 mkp Time = 1 m 0 s
Applied Torque = 4295 Top Turns = 4.406

Comments:OK JAW...JOINT 1 TO SEALS

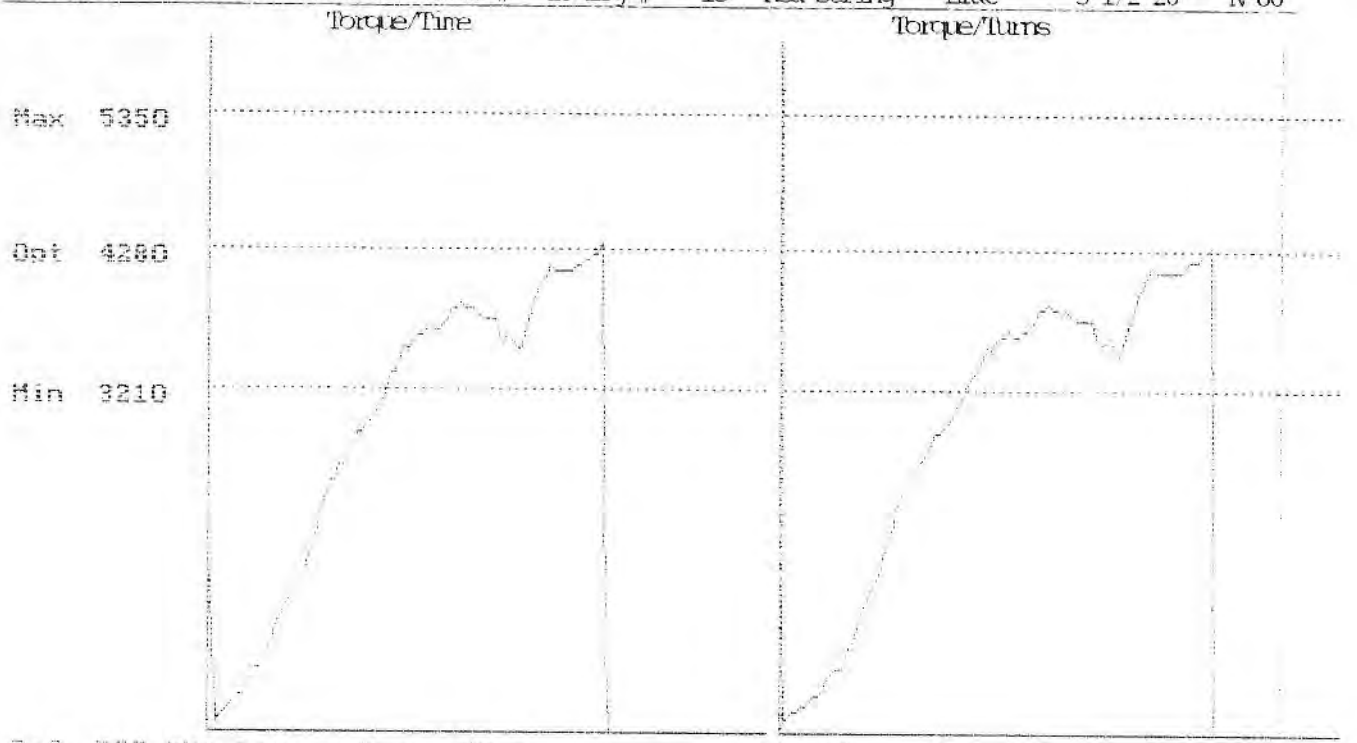
17:28 01/26/93 ACCEPT Joint # = 2 Log # = 2 Red String LT&C 5 1/2 20 N-80



Ref 450 mkp Time = 0 m 59 s
Applied Torque = 4290 Top Turns = 8.511

Comments:OK JAW...BACKUP SLIPPED...COLLAR TURNED

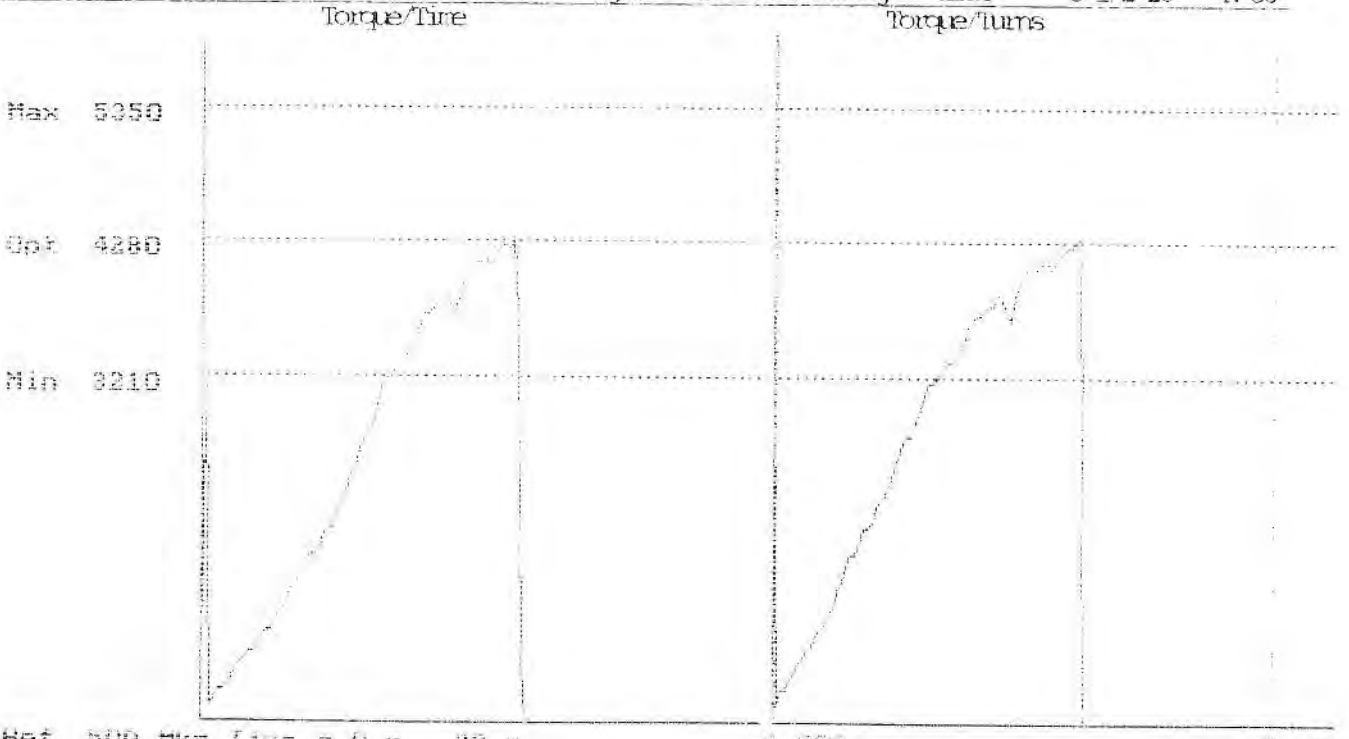
07:46 01/27/93 ACCEPT Joint # = 13 Log # = 13 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4327 Top Turns = 6.051

Comments:OK JWN

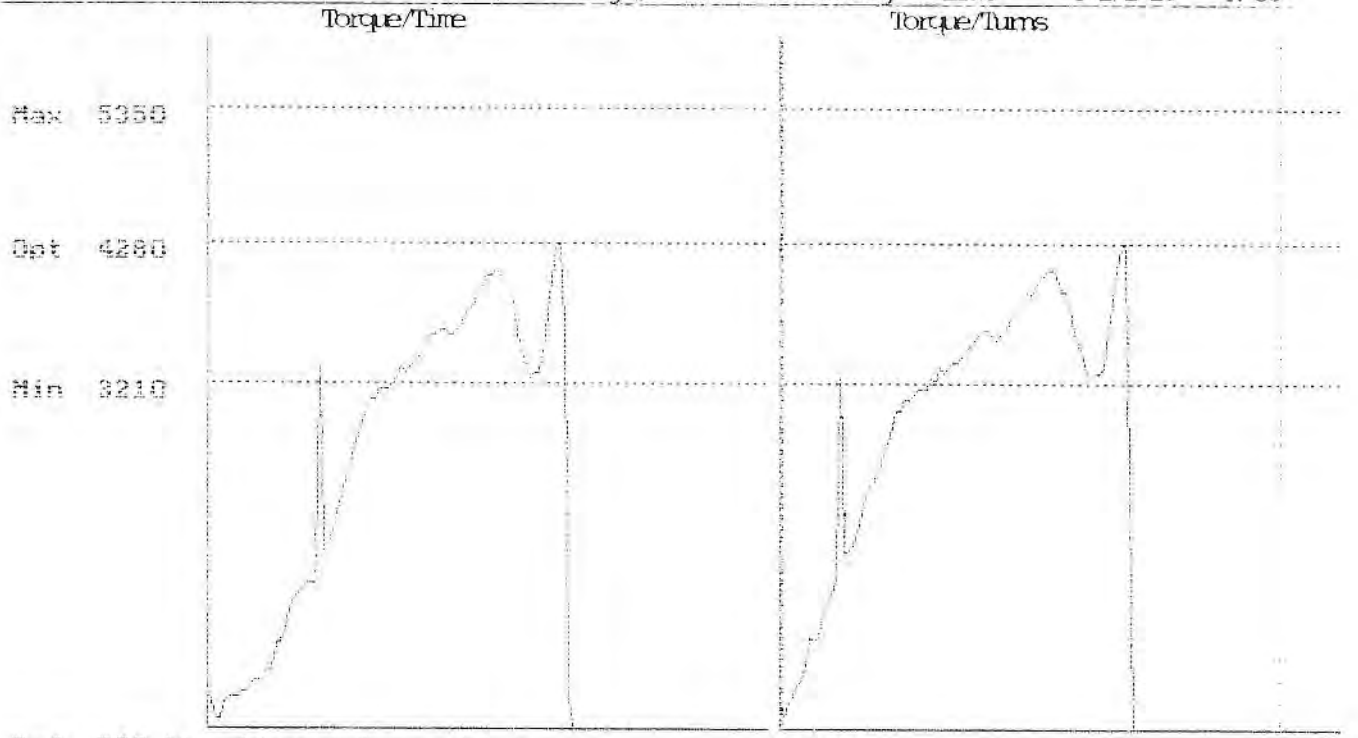
07:49 01/27/93 ACCEPT Joint # = 14 Log # = 14 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4306 Top Turns = 4.325

Comments:OK JWN

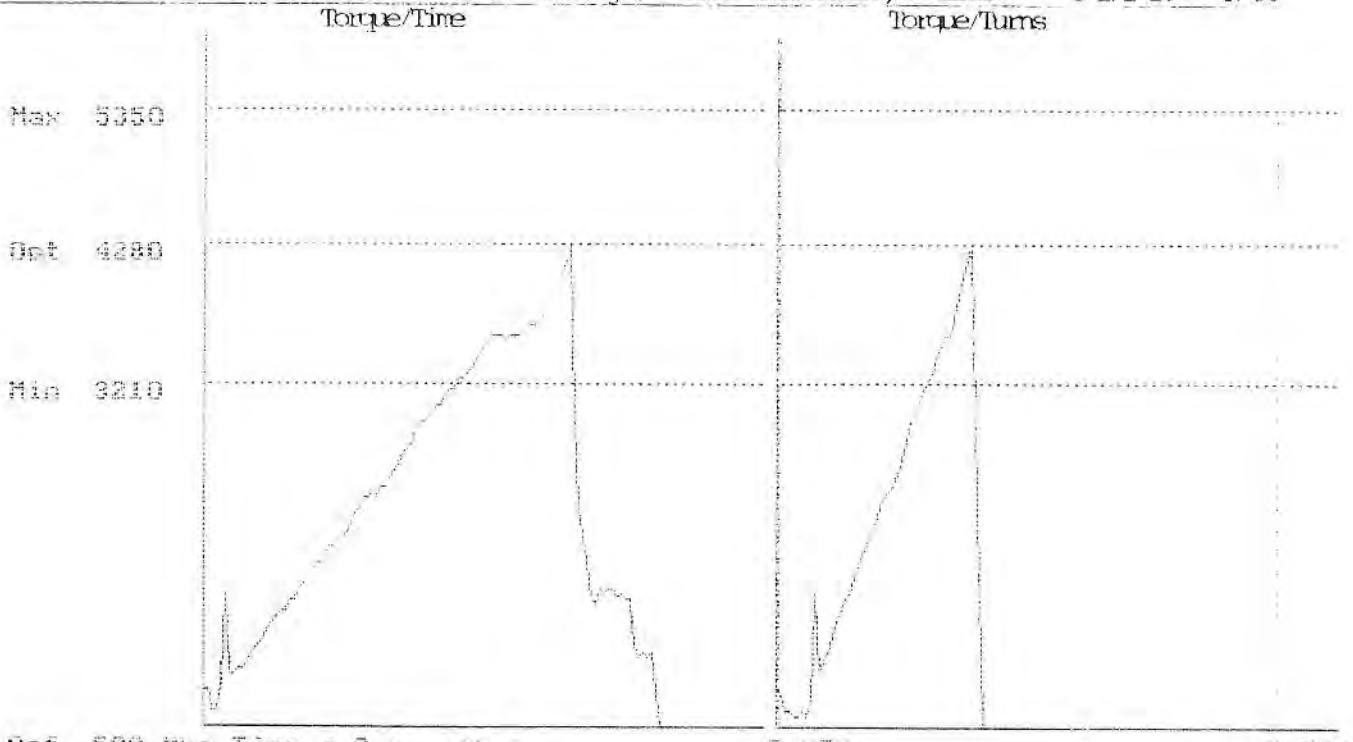
07:52 01/27/93 ACCEPT Joint # = 15 Log # = 15 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4285 Top Turns = 4.886

Comments:OK JAW

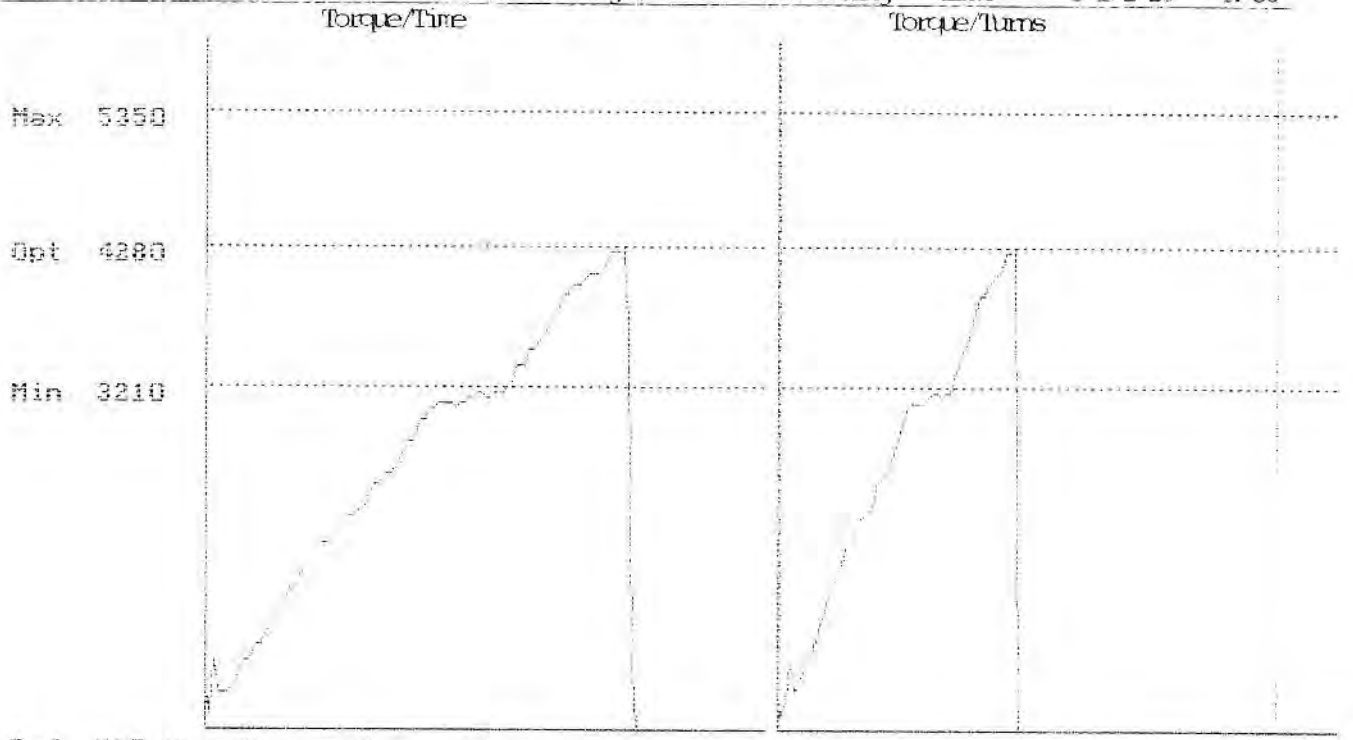
07:56 01/27/93 ACCEPT Joint # = 16 Log # = 16 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4277 Top Turns = 2.839

Comments:OK JAW...BACKUP SLIPPED

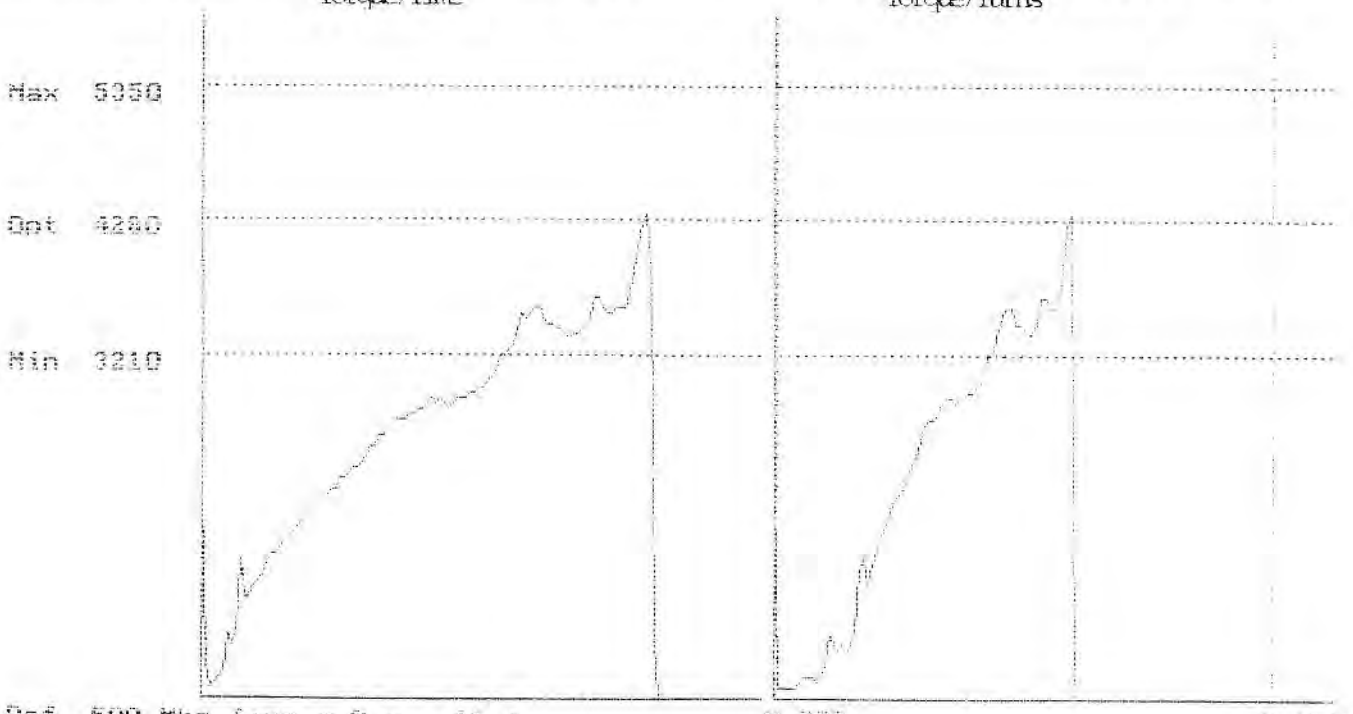
07:58 01/27/93 ACCEPT Joint # = 17 Log # = 17 Red String L&C 5 1/2 20 N-80



Ref 500 Mkp Time = 0 m 15 s 0.000 7.000
Applied Torque = 4295 Top Turns = 3.366

Comments:OK JWN

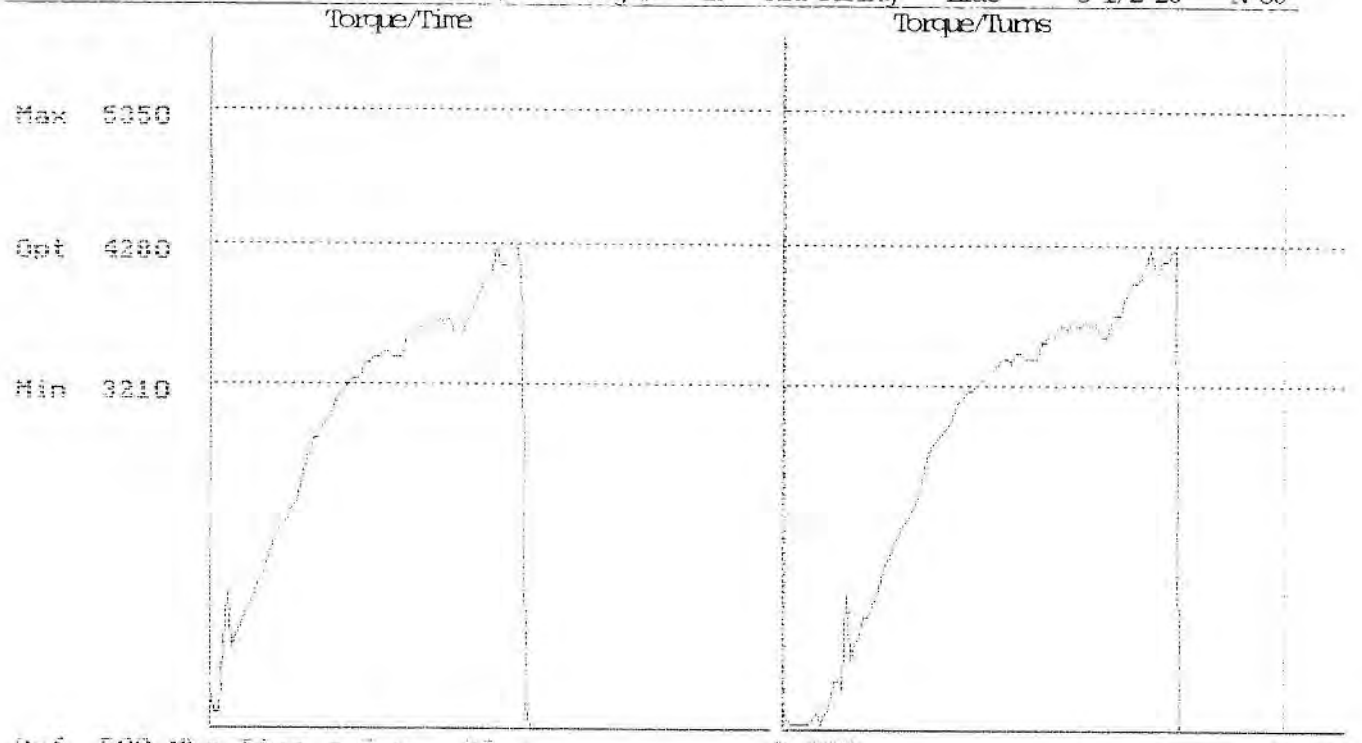
08:00 01/27/93 ACCEPT Joint # = 18 Log # = 18 Red String L&C 5 1/2 20 N-80



Ref 500 Mkp Time = 0 m 16 s 0.000 7.000
Applied Torque = 4321 Top Turns = 4.185

Comments:OK JWN

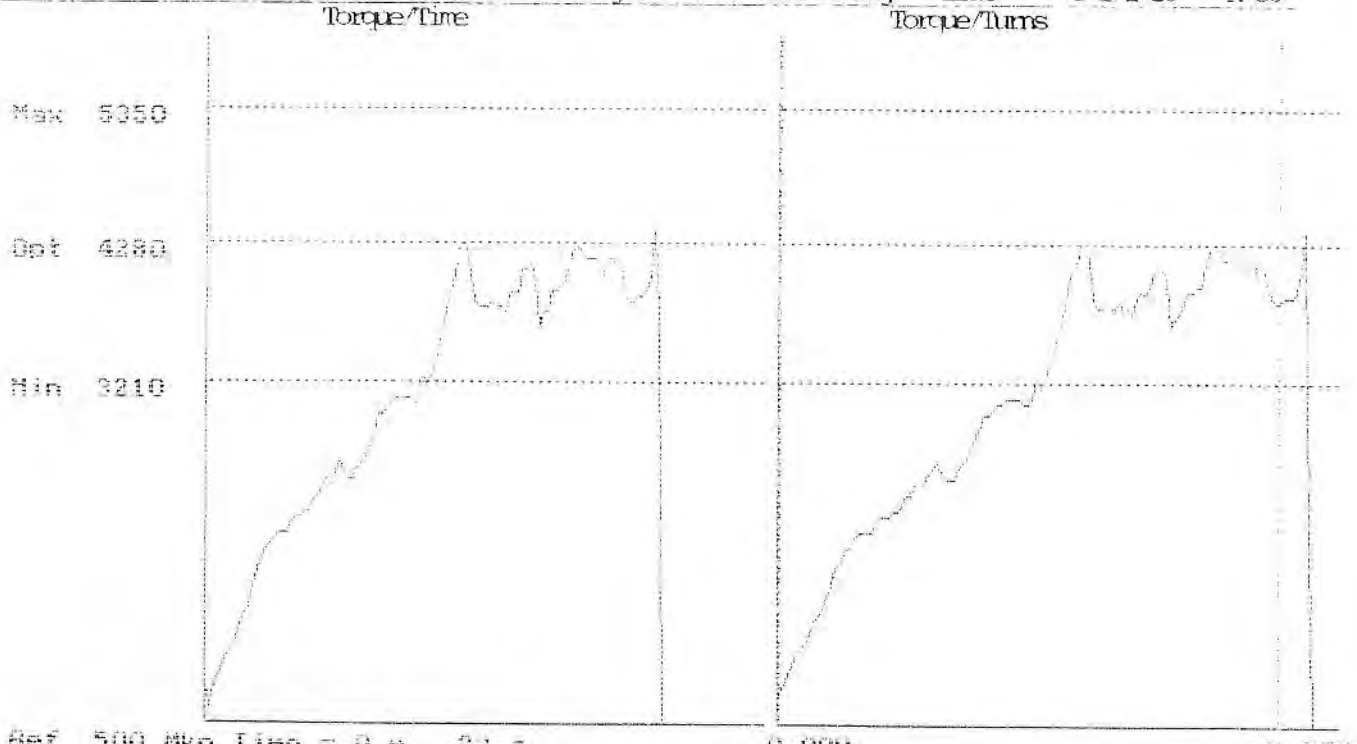
08:05 01/27/93 ACCEPT Joint # = 19 Log # = 19 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4295 Top Turns = 5.532

Comments:OK JWN

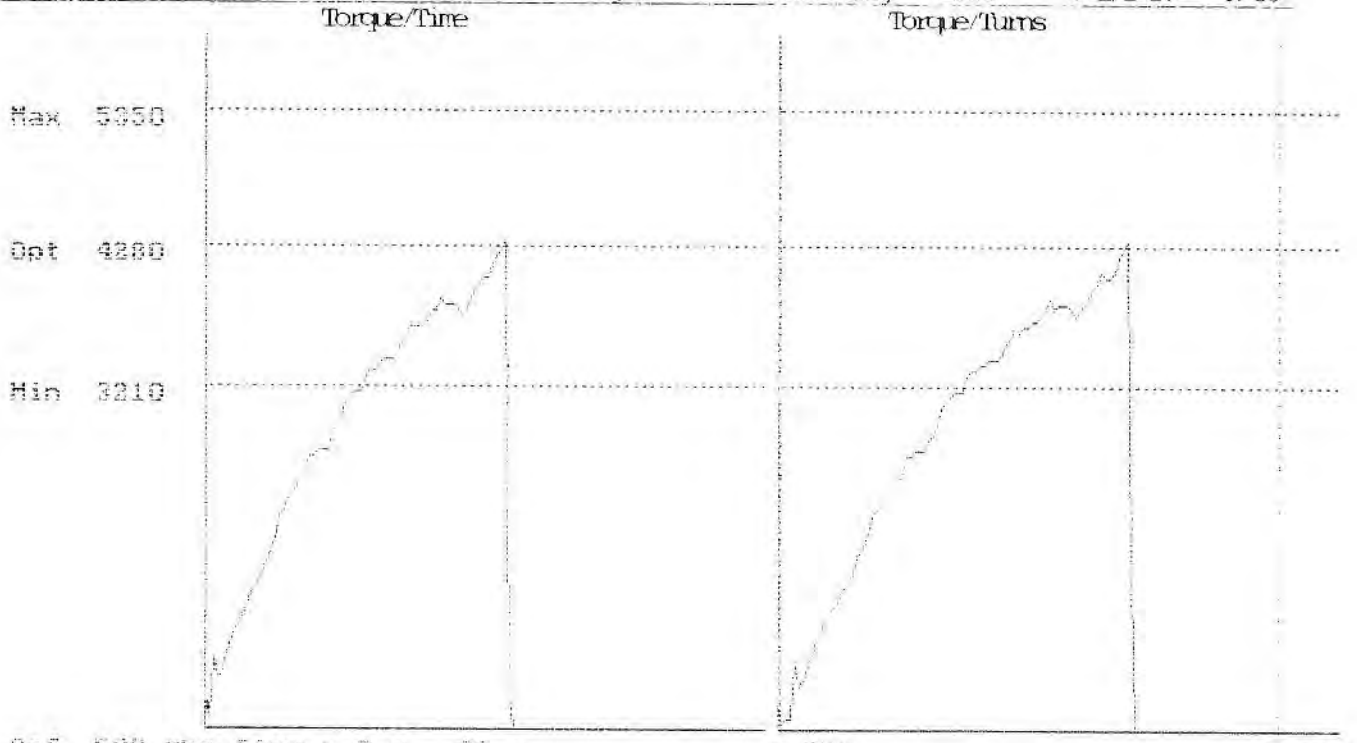
08:08 01/27/93 ACCEPT Joint # = 20 Log # = 20 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4363 Top Turns = 7.408

Comments:OK JWN...COLLAR TURNED

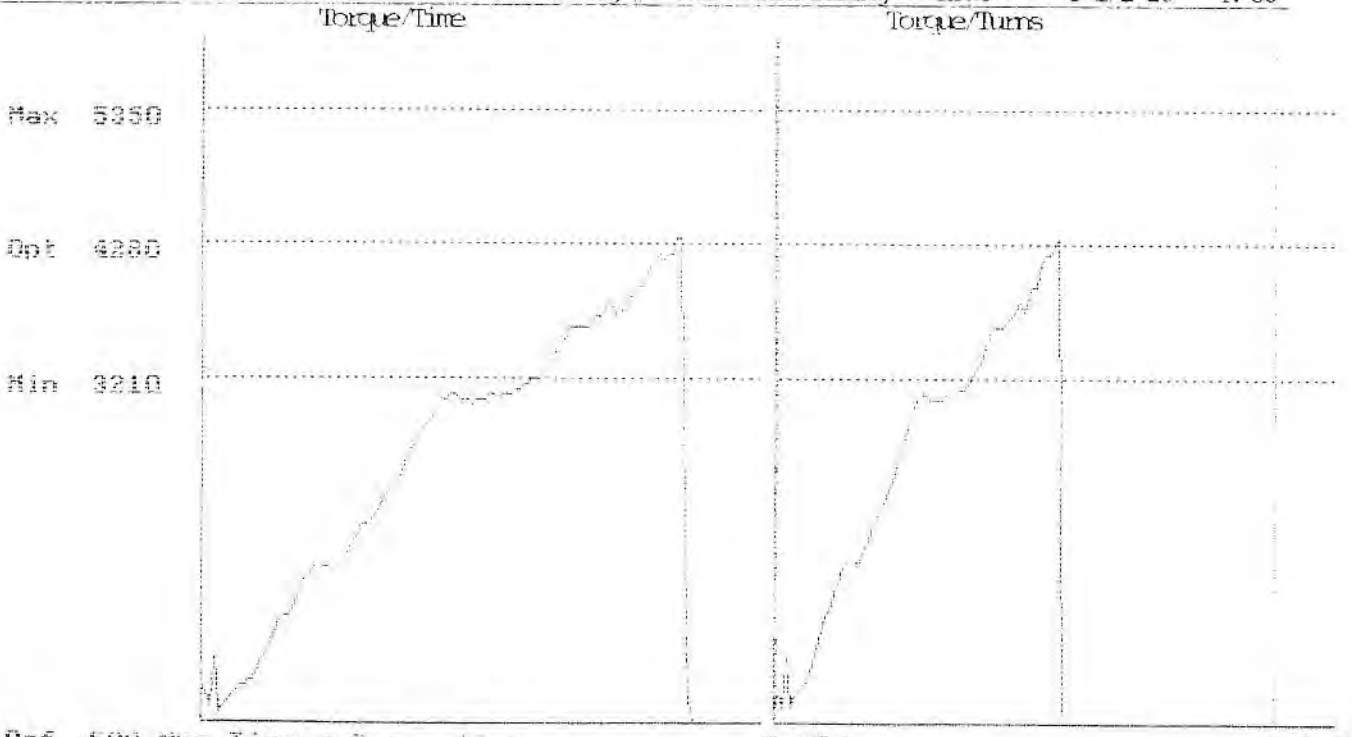
08:10 01/27/93 ACCEPT Joint # = 21 Log # = 21 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 22 s 0.000 7.000
Applied Torque = 4321 Top Turns = 4.942

Comments:OK JWN

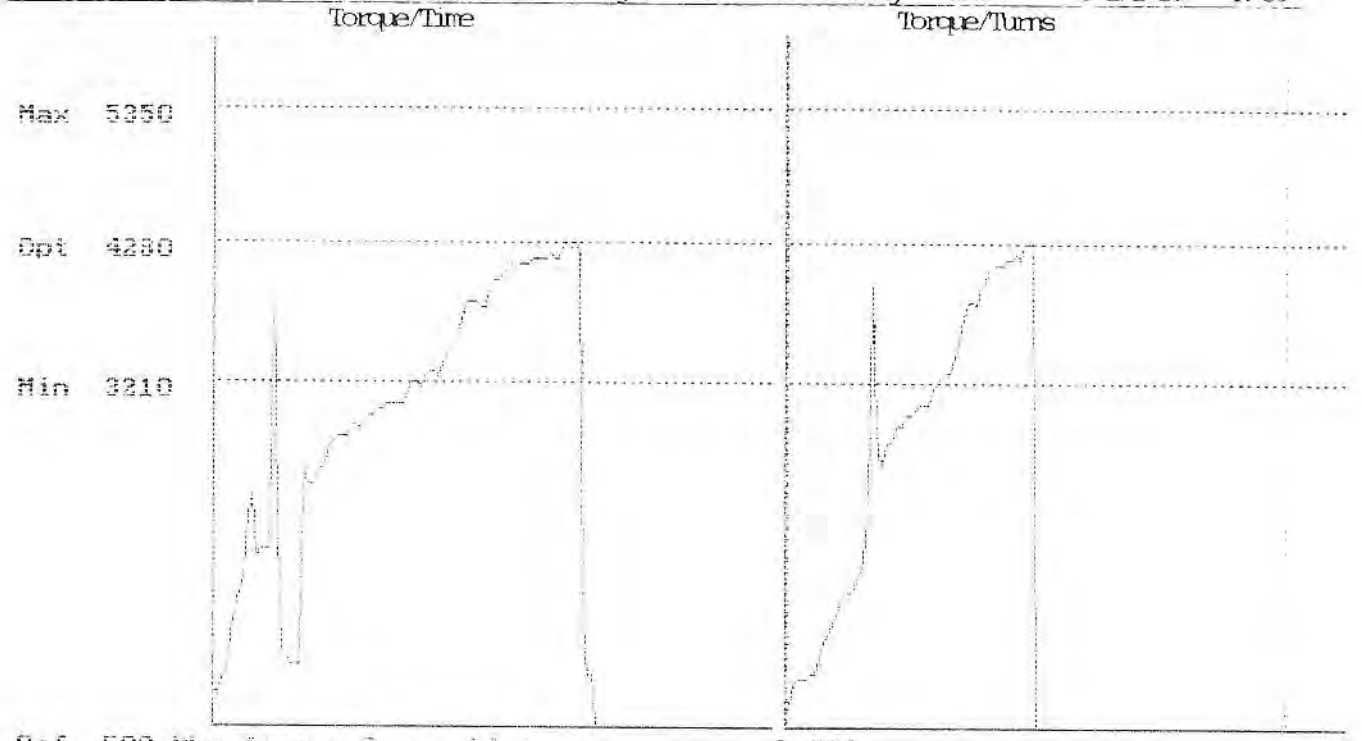
08:12 01/27/93 ACCEPT Joint # = 22 Log # = 22 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 18 s 0.000 7.000
Applied Torque = 4316 Top Turns = 4.024

Comments:OK JWN

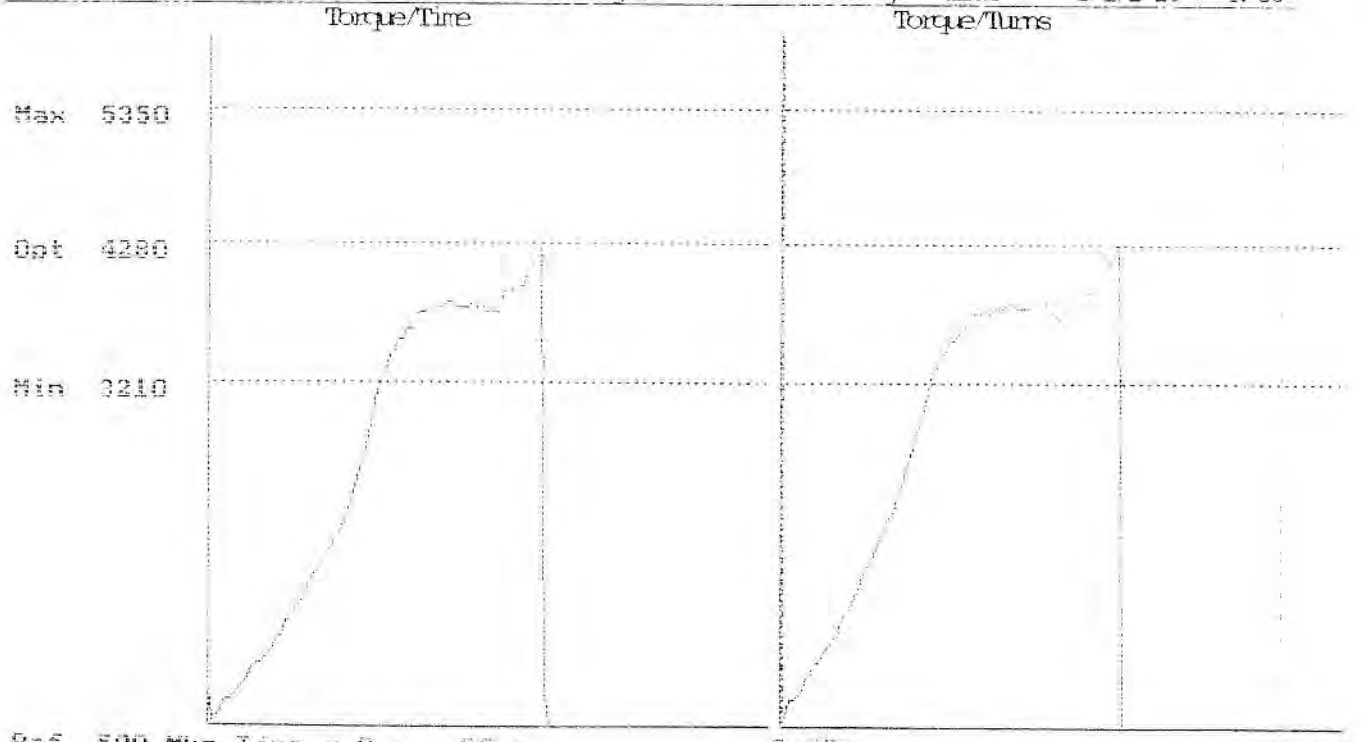
08:15 01/27/93 ACCEPT Joint # = 23 Log # = 23 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 3.470

Comments:OK JAW...OPERATOR POPPED SNUB LINE DURING SHIFT

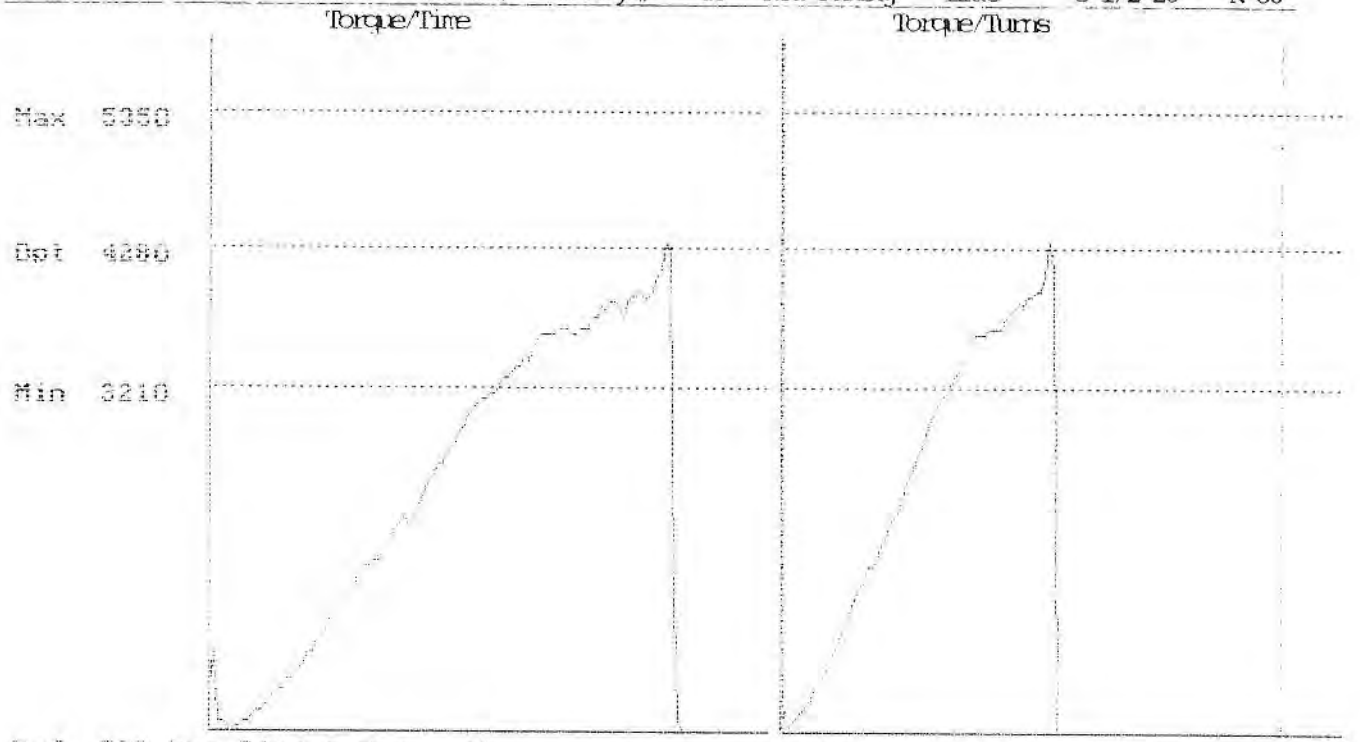
08:17 01/27/93 ACCEPT Joint # = 24 Log # = 24 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4285 Top Turns = 4.738

Comments:OK JAW

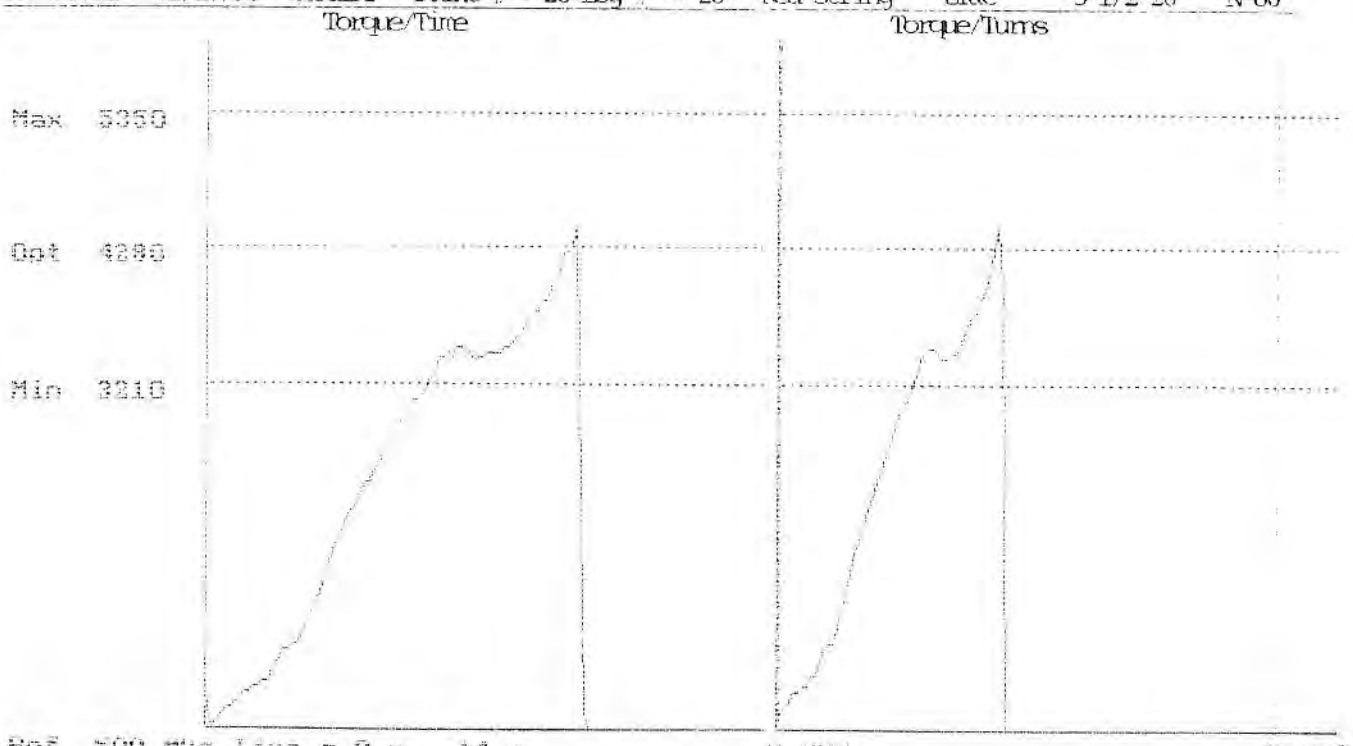
08:19 01/27/93 ACCEPT Joint # = 25 Log # = 25 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 17 s
Applied Torque = 4327 Top Turns = 3.810

Comments:OK JWN

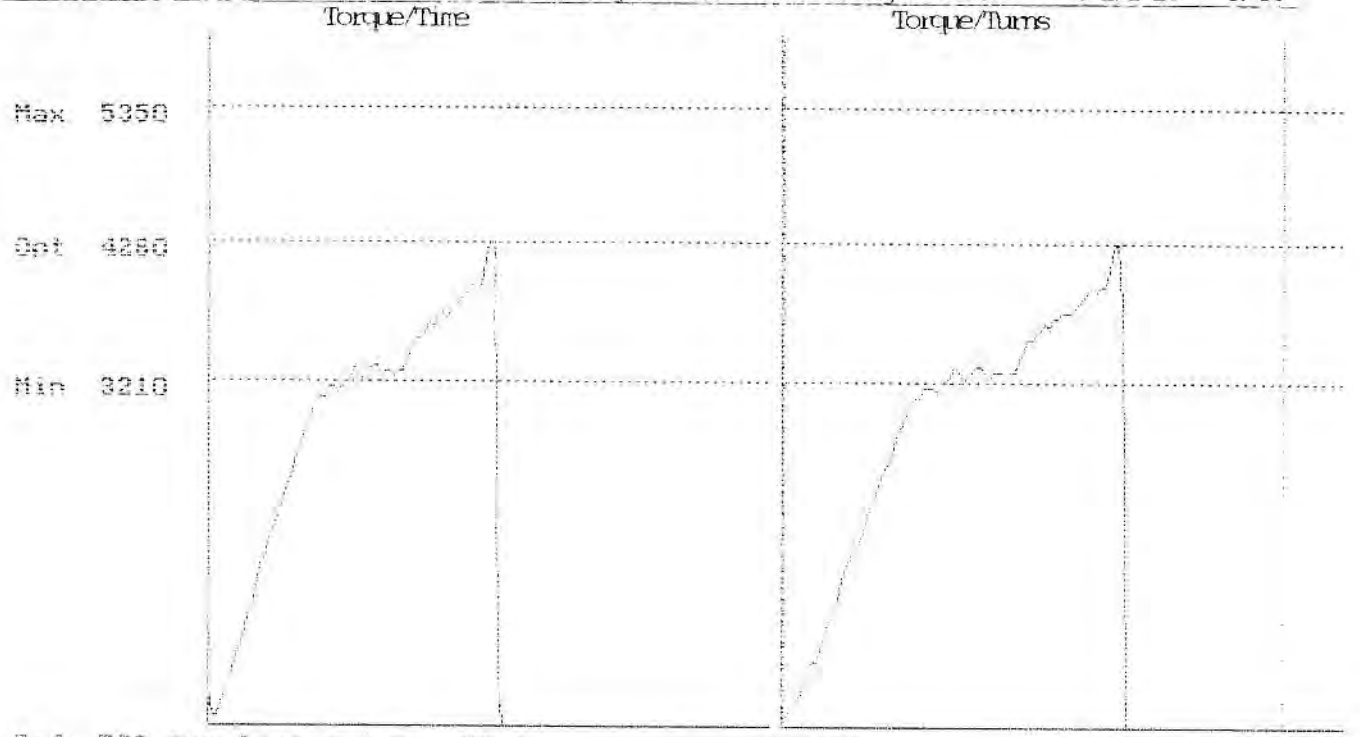
08:21 01/27/93 ACCEPT Joint # = 26 Log # = 26 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 14 s
Applied Torque = 4431 Top Turns = 3.146

Comments:OK JWN

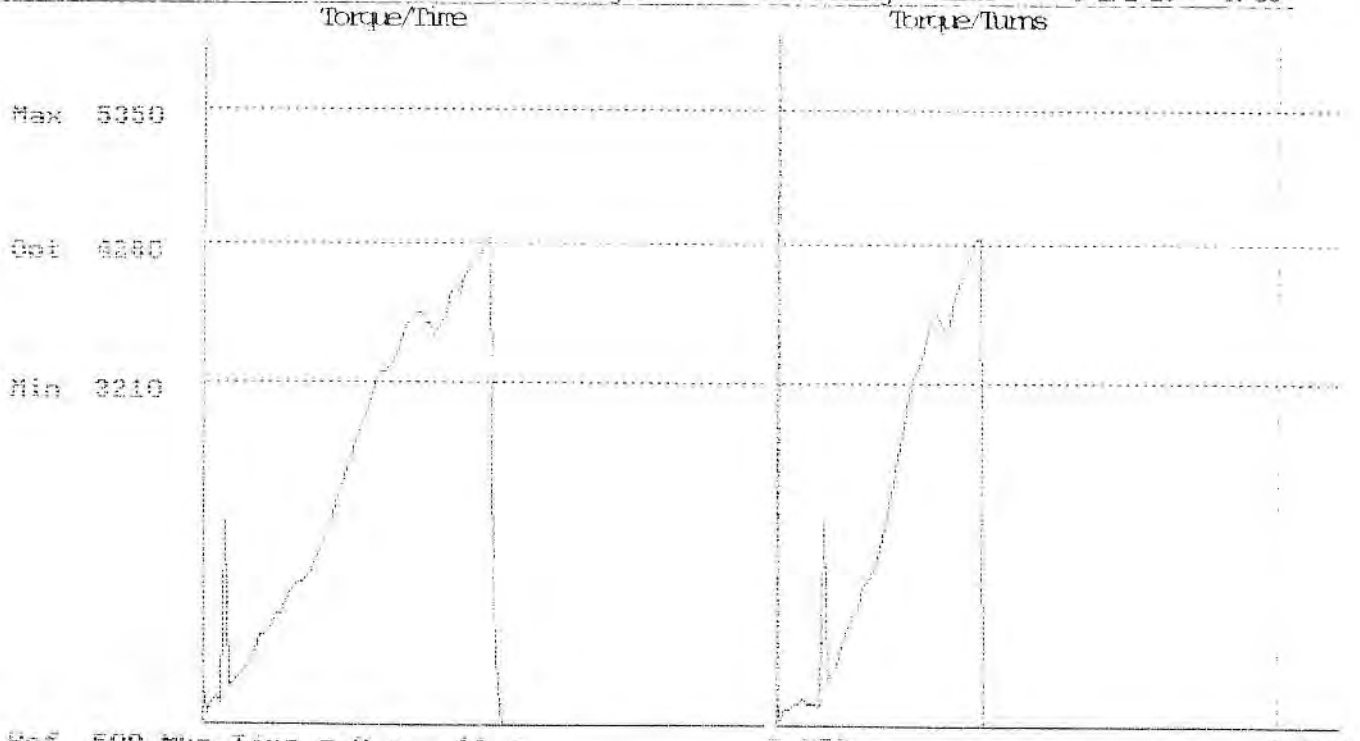
08:24 01/27/93 ACCEPT Joint # = 27 Log # = 27 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 21 s
Applied Torque = 4295 Top Turns = 4.766

Comments:OK JWN

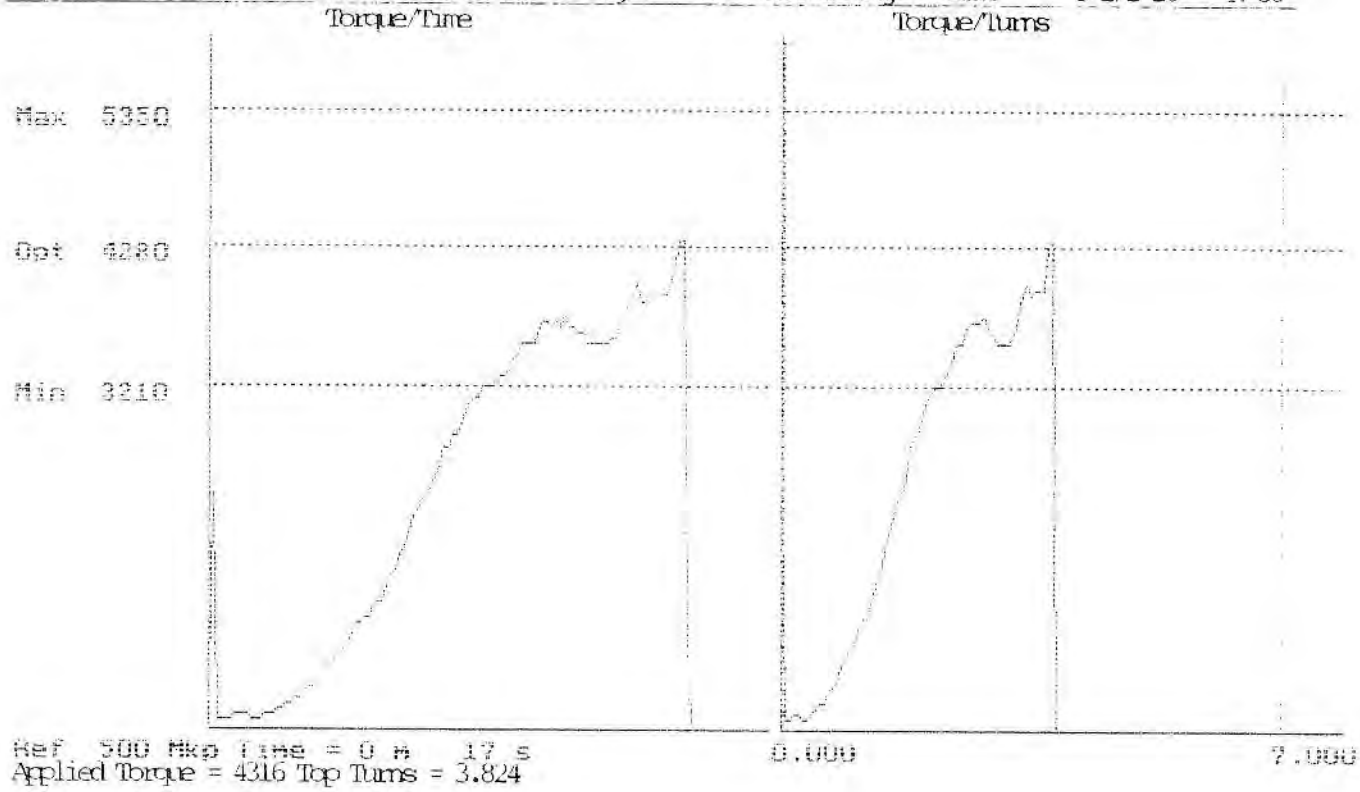
08:26 01/27/93 ACCEPT Joint # = 28 Log # = 28 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 11 s
Applied Torque = 4342 Top Turns = 2.855

Comments:OK JWN

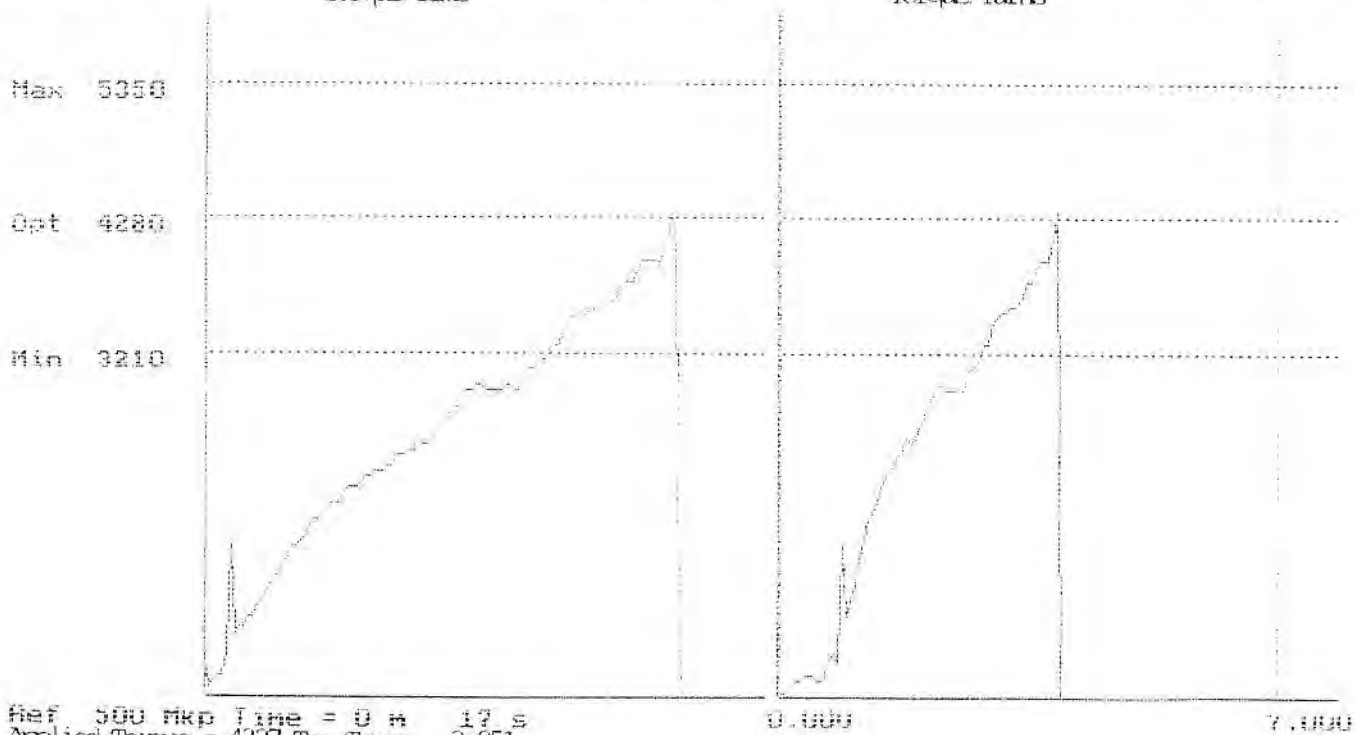
08:28 01/27/93 ACCEPT Joint # = 29 Log # = 29 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4316 Top Turns = 3.824

Comments:OK JWN

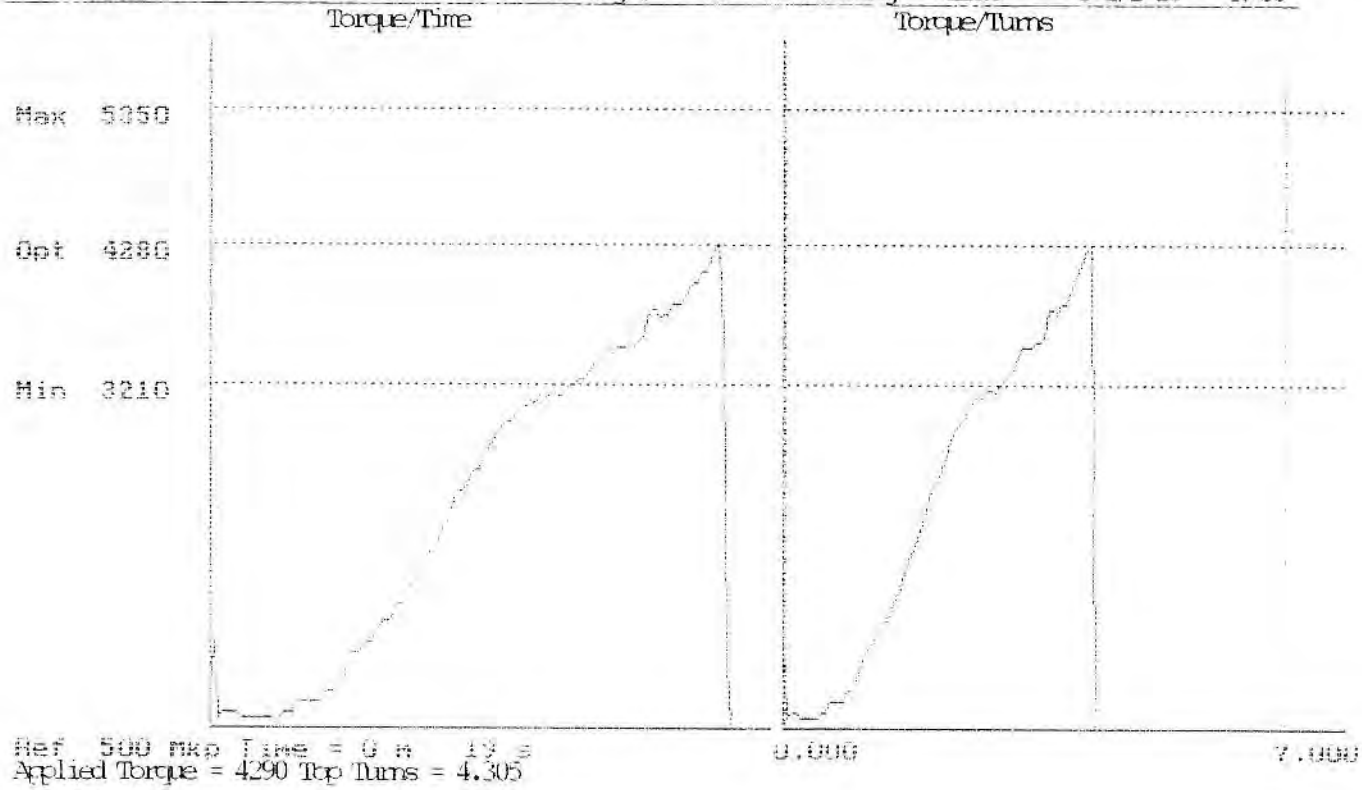
08:30 01/27/93 ACCEPT Joint # = 30 Log # = 30 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4327 Top Turns = 3.951

Comments:OK JWN

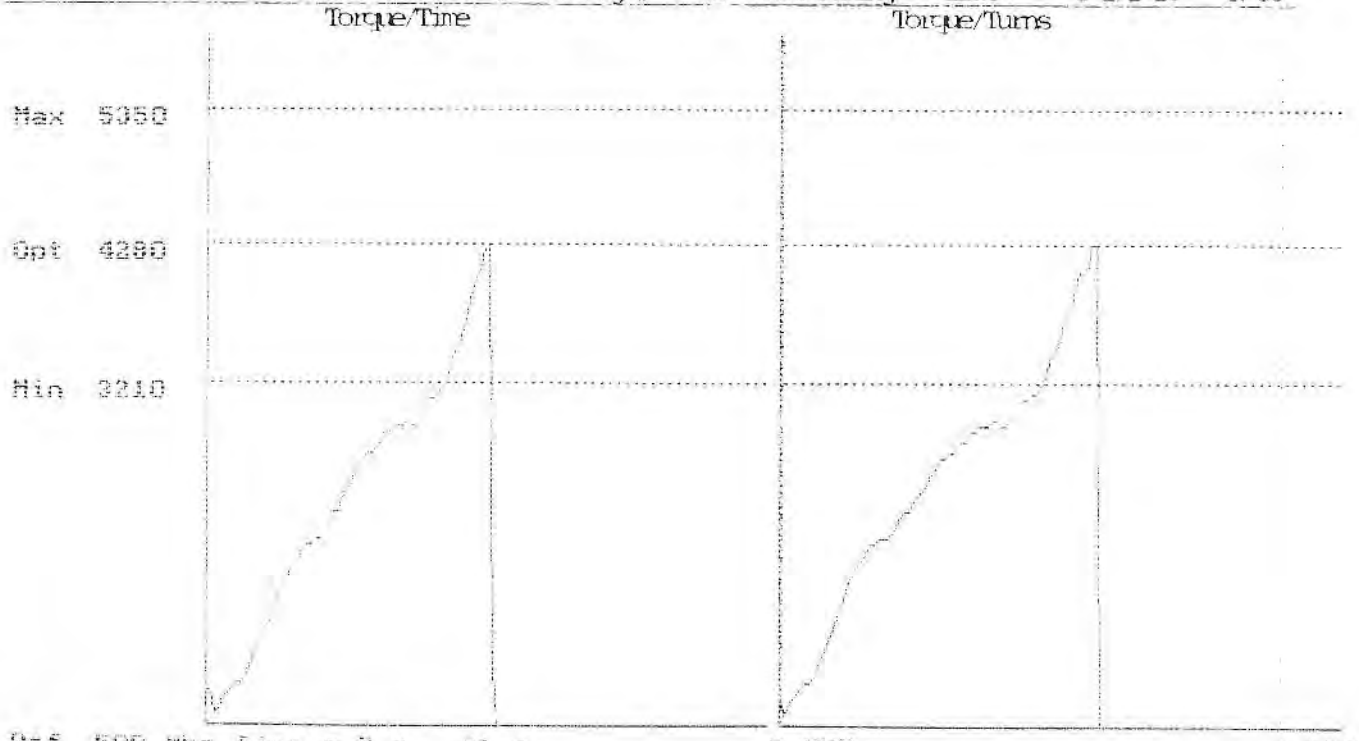
08:32 01/27/93 ACCEPT Joint # = 31 Log # = 31 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 4.305

Comments:OK JWN

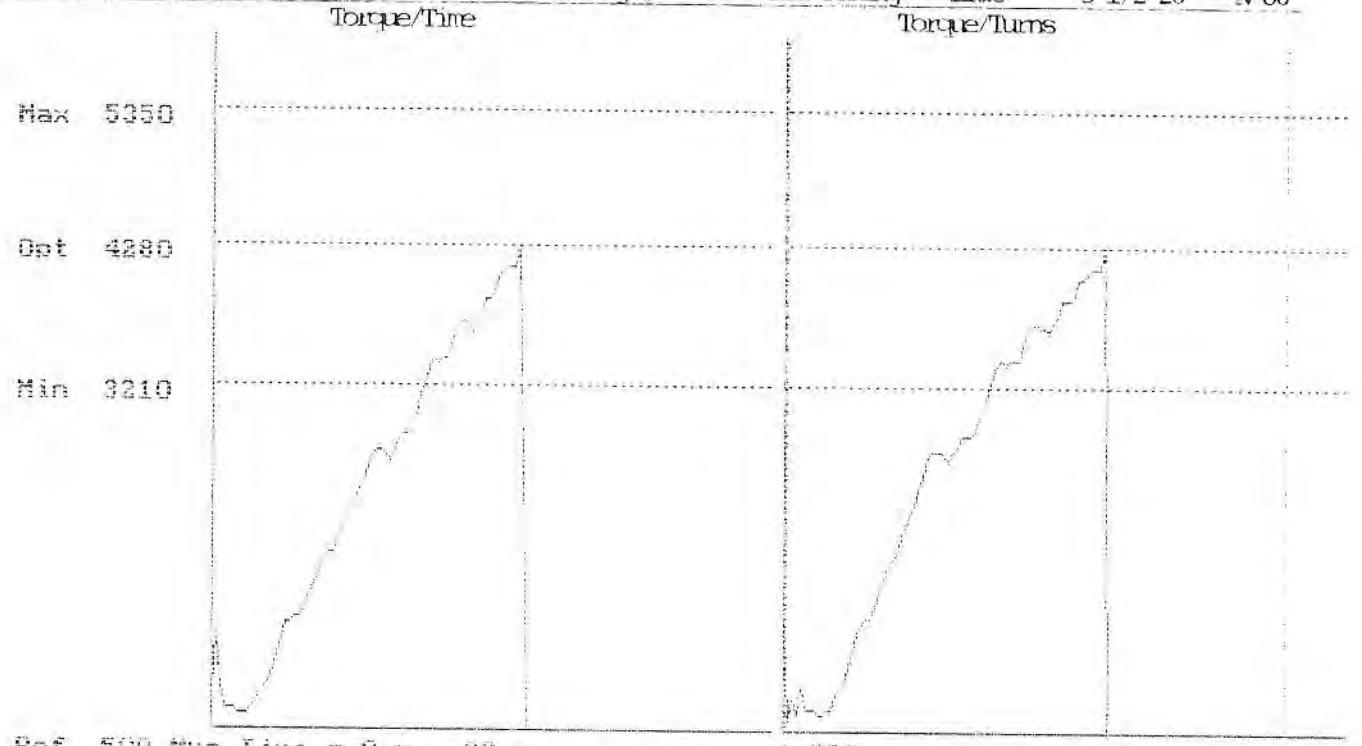
08:34 01/27/93 ACCEPT Joint # = 32 Log # = 32 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 4.413

Comments:OK JWN

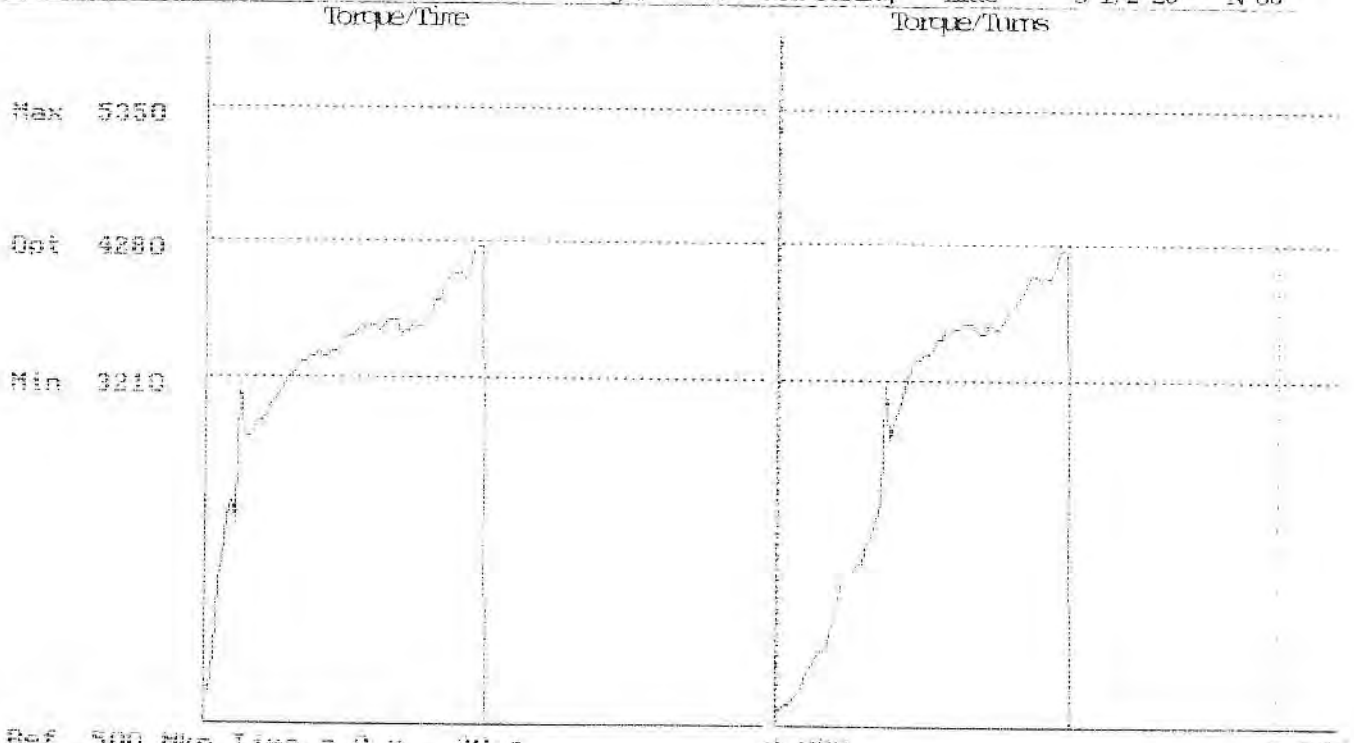
08:36 01/27/93 ACCEPT Joint # = 33 Log # = 33 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4285 Top Turns = 4.510

Comments:OK JWN

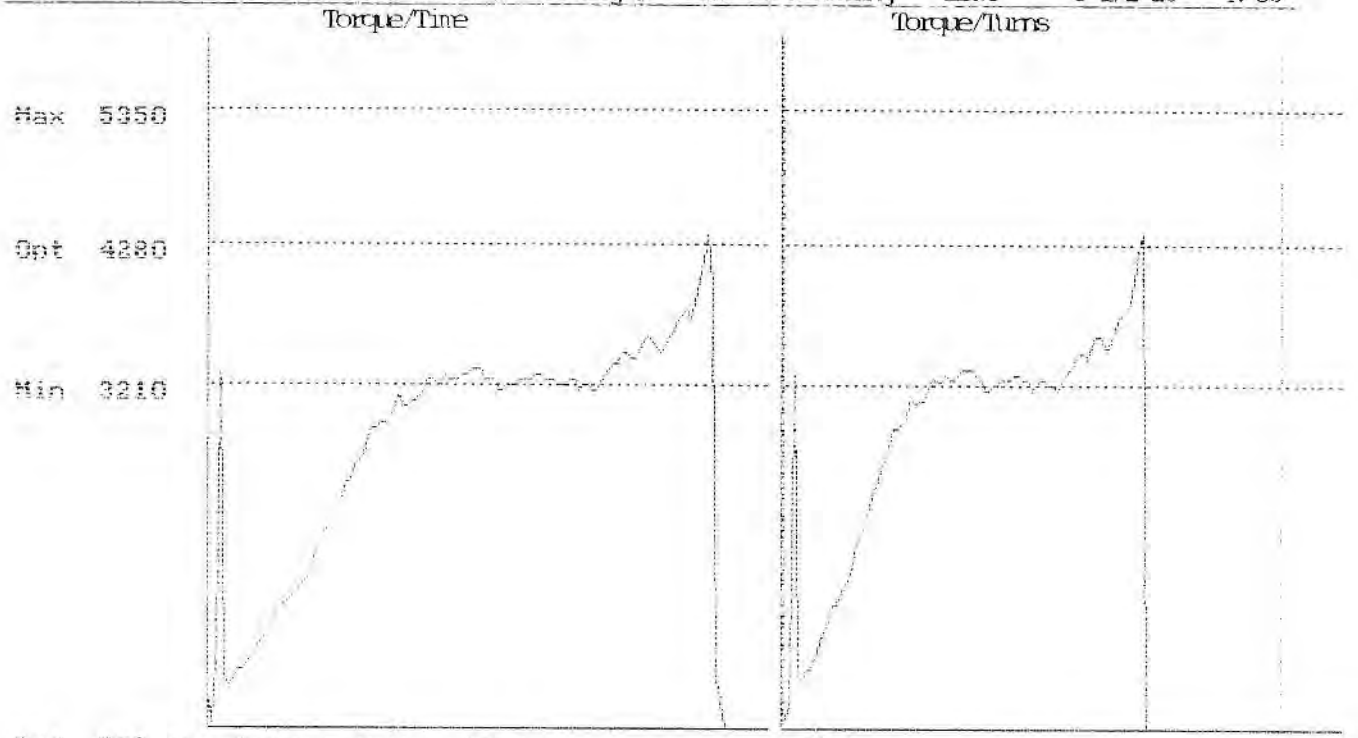
08:38 01/27/93 ACCEPT Joint # = 34 Log # = 34 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 4.085

Comments:OK JWN

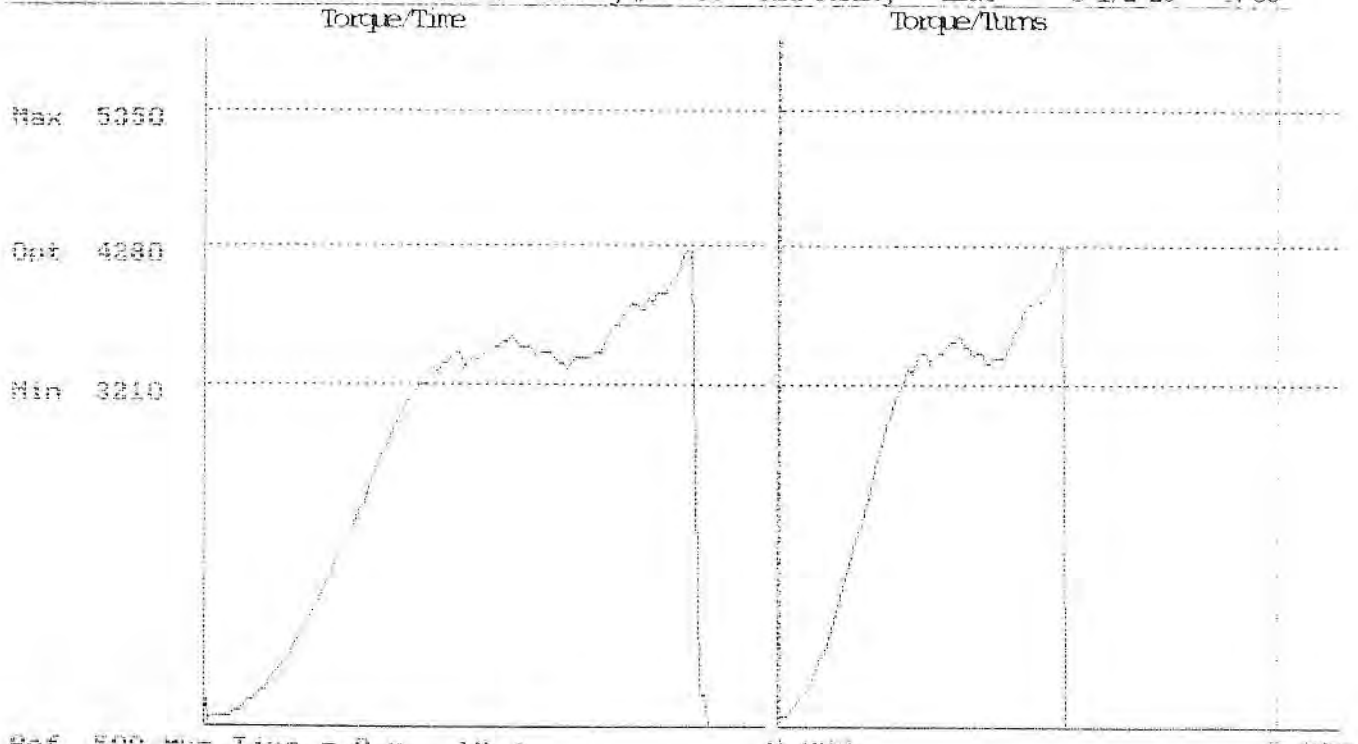
08:40 01/27/93 ACCEPT Joint # = 35 Log # = 35 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 23 s
Applied Torque = 4353 Top Turns = 5.091

Comments:OK JWN

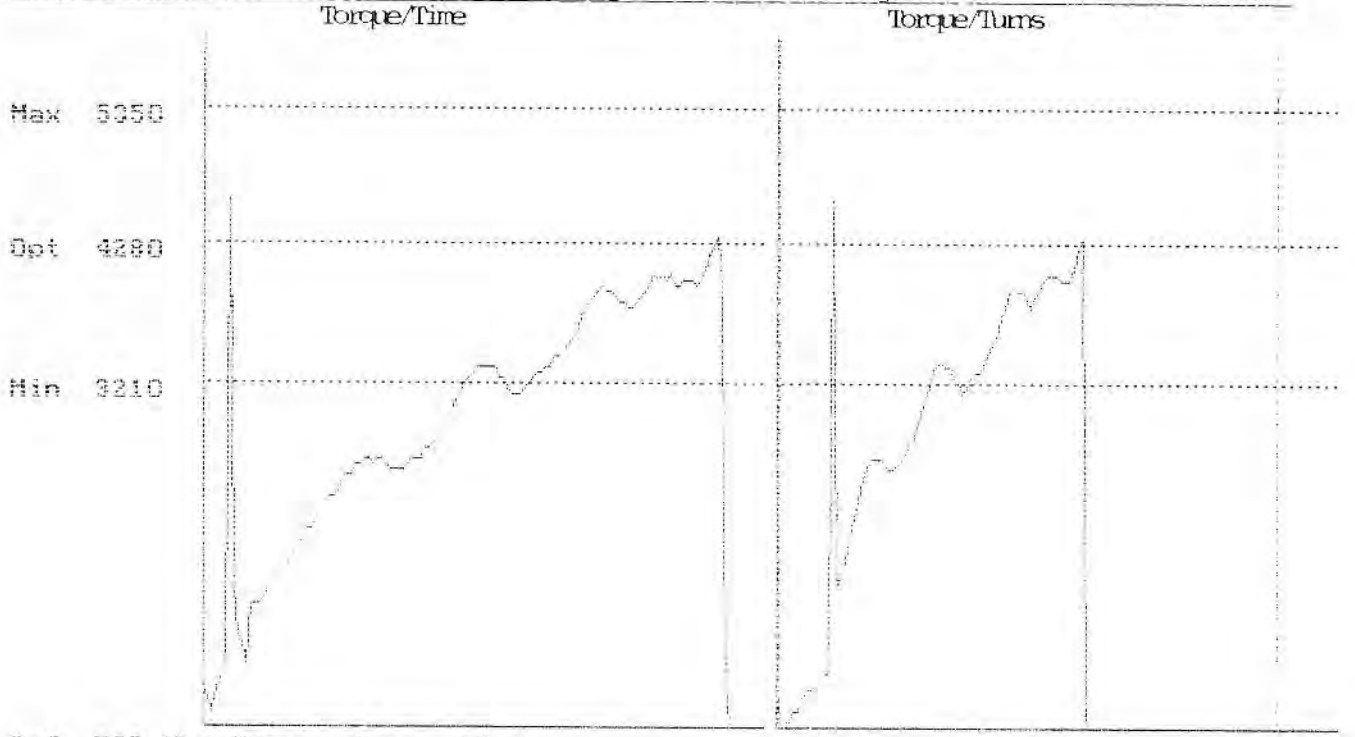
08:43 01/27/93 ACCEPT Joint # = 36 Log # = 36 Red String LT&C 5 1/2 20 N-80



Ref 500 mkp Time = 0 m 18 s
Applied Torque = 4290 Top Turns = 4.027

Comments:OK JWN

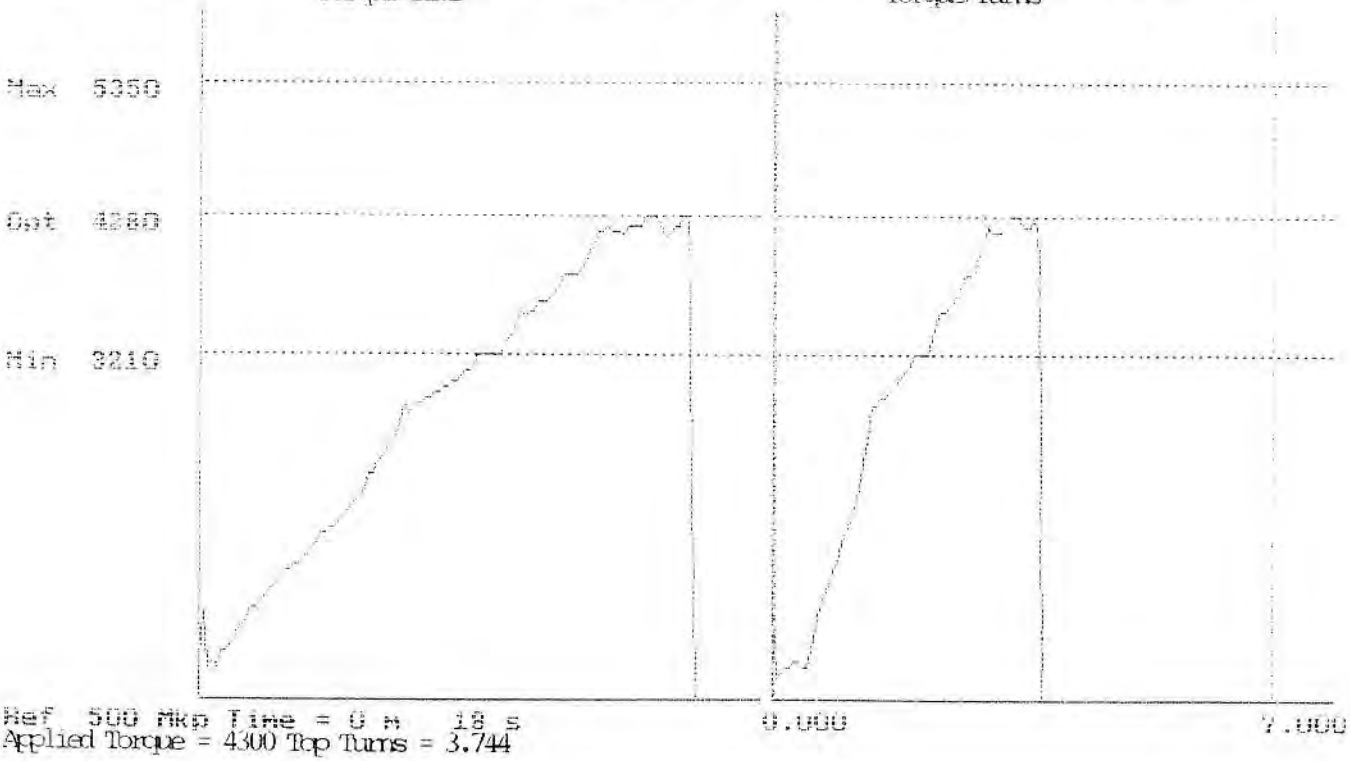
08:45 01/27/93 ACCEPT Joint # = 37 Log # = 37 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4321 Top Turns = 4.332

Comments:OK JWN...OPERATOR POPPED SNUB LINE DURING SHIFT

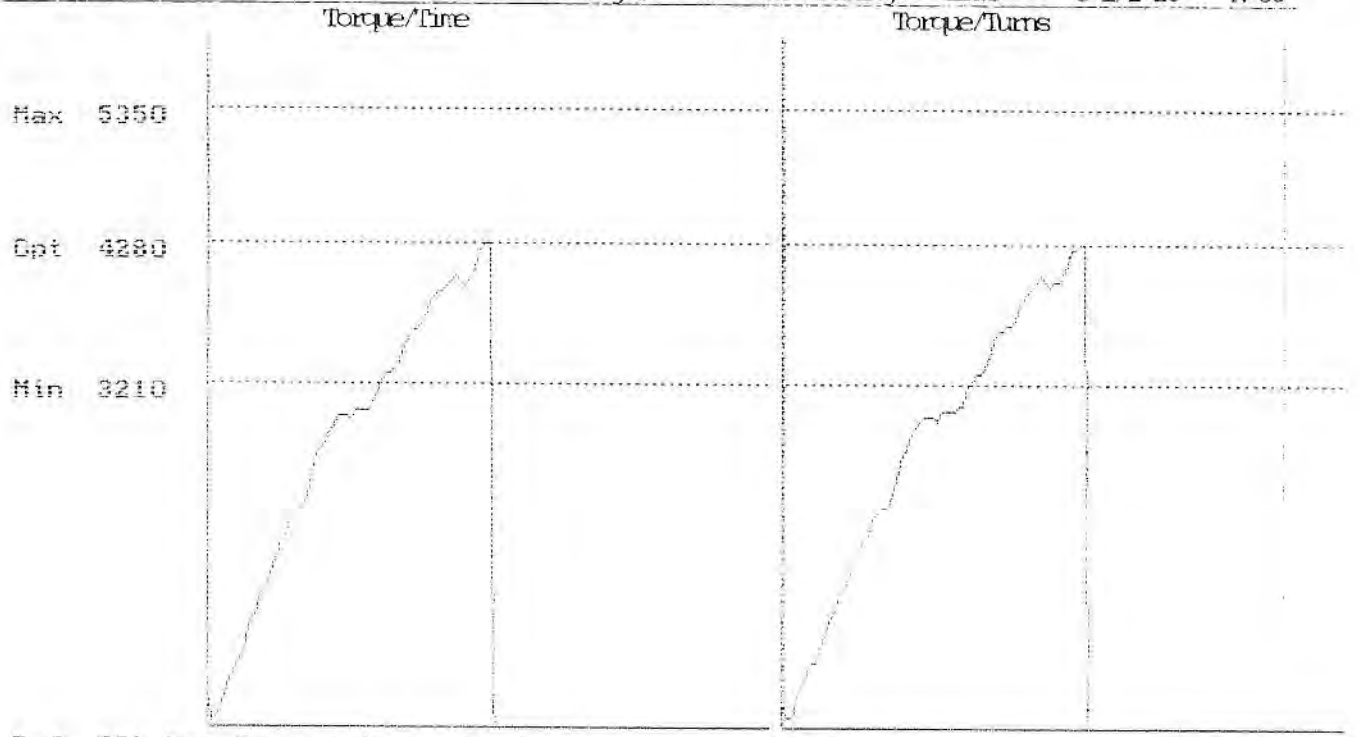
08:47 01/27/93 ACCEPT Joint # = 38 Log # = 38 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 3.744

Comments:OK JWN

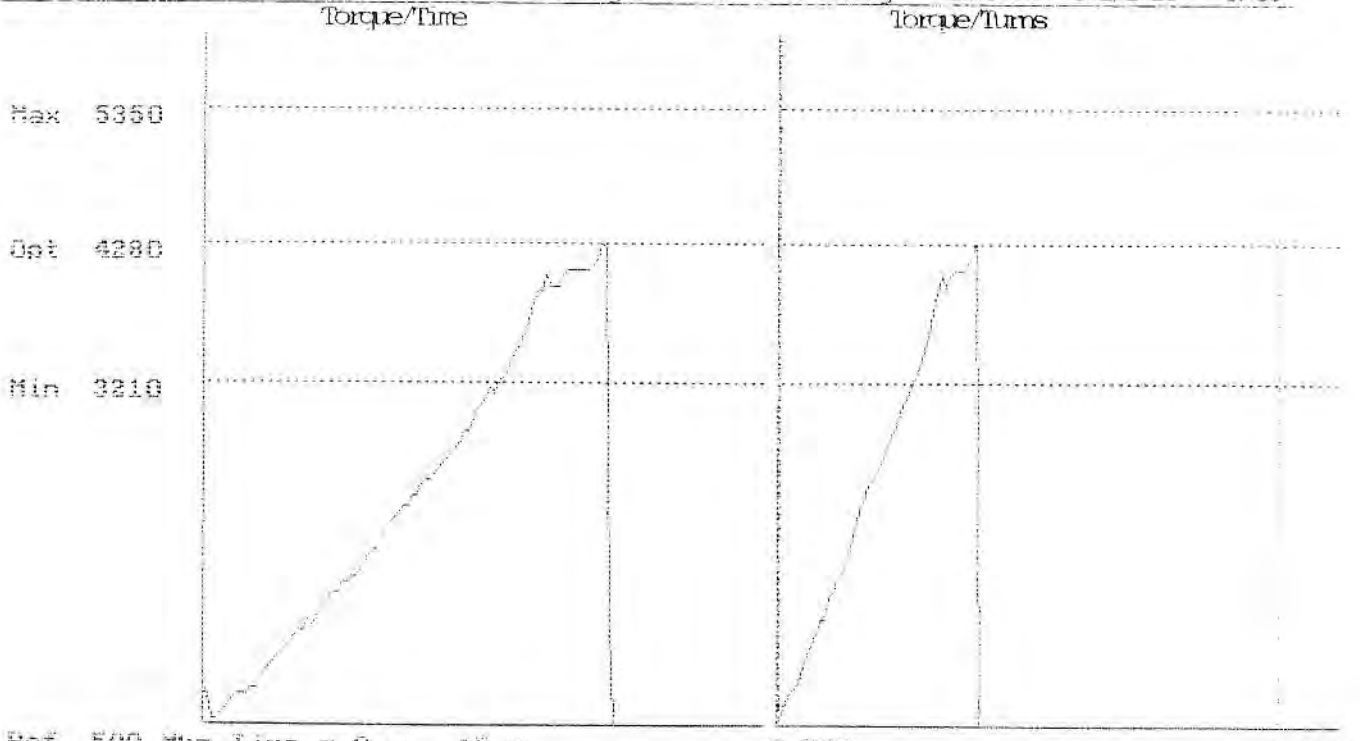
08:49 01/27/93 ACCEPT Joint # = 39 Log # = 39 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 4.249

Comments:OK JWN

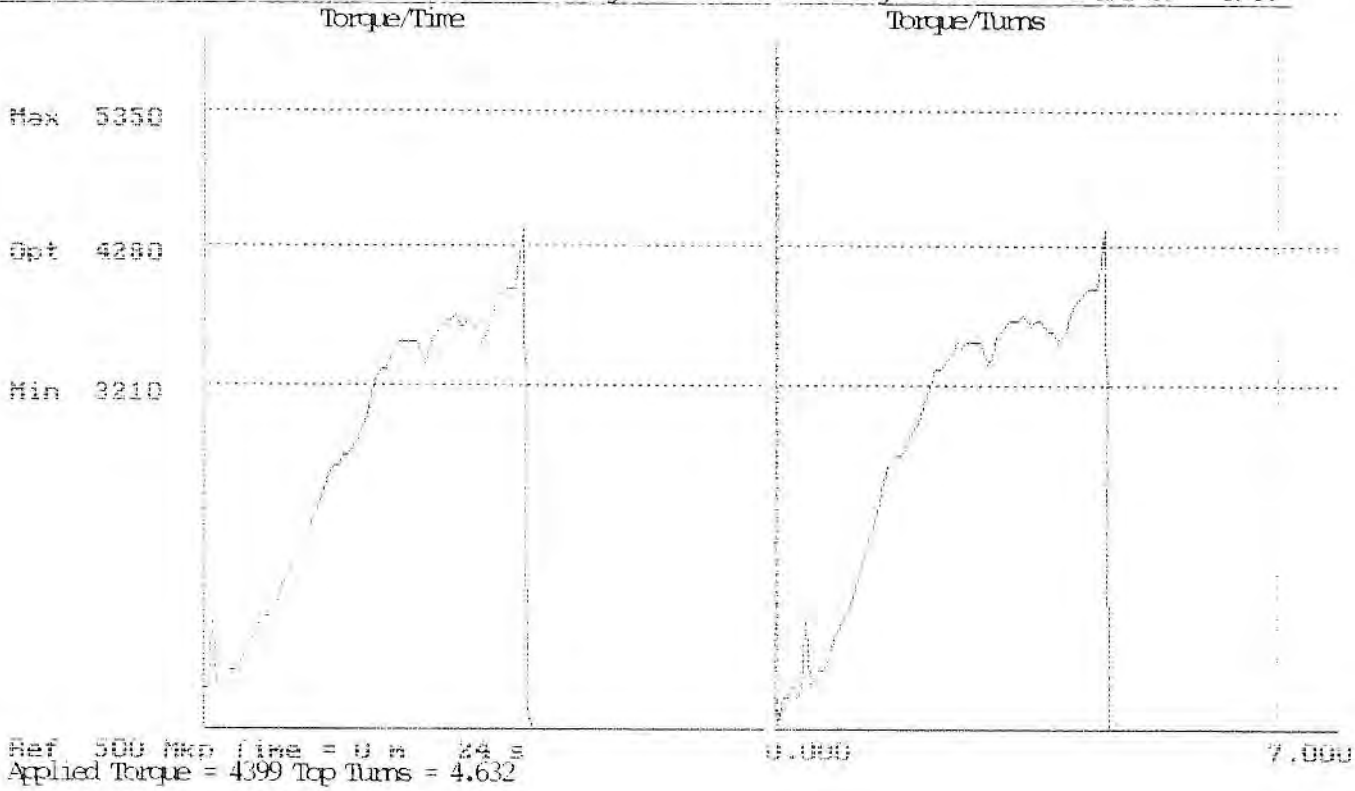
08:51 01/27/93 ACCEPT Joint # = 40 Log # = 40 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 2.806

Comments:OK JWN

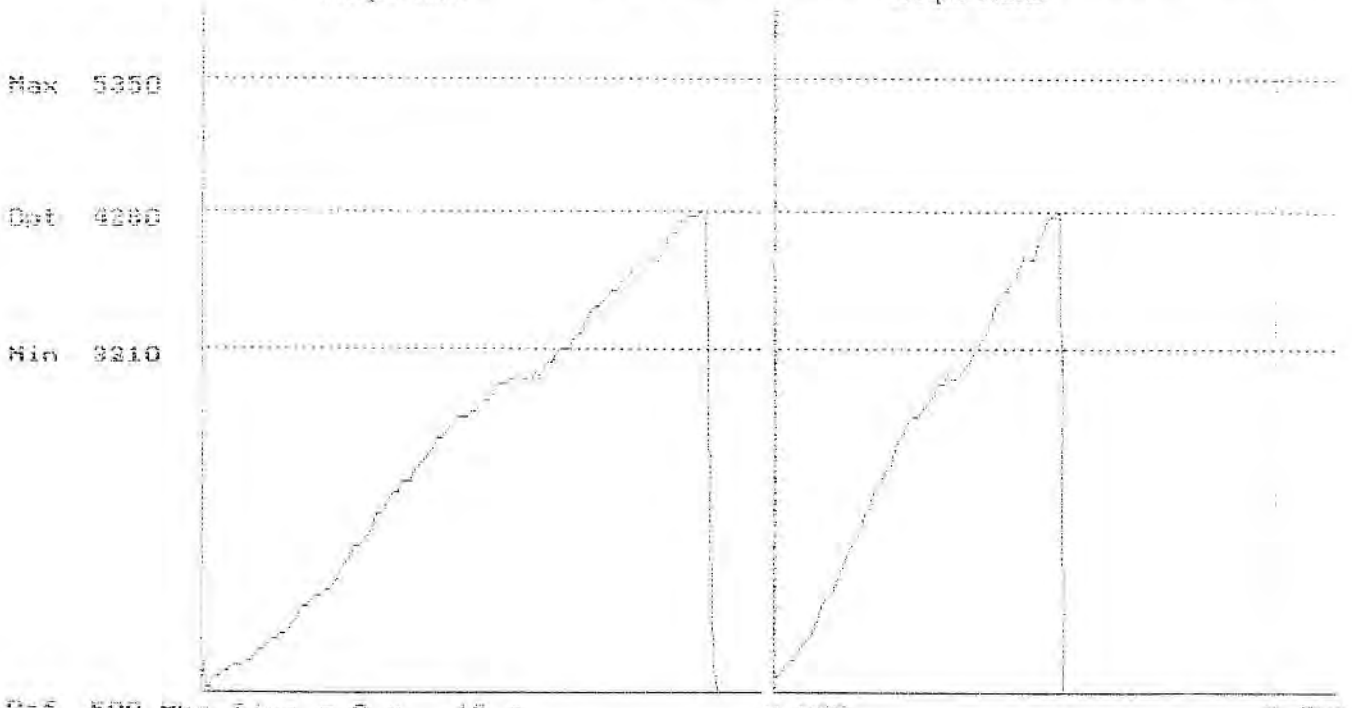
08:53 01/27/93 ACCEPT Joint # = 41 Log # = 41 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4399 Top Turns = 4.632

Comments:OK JWN

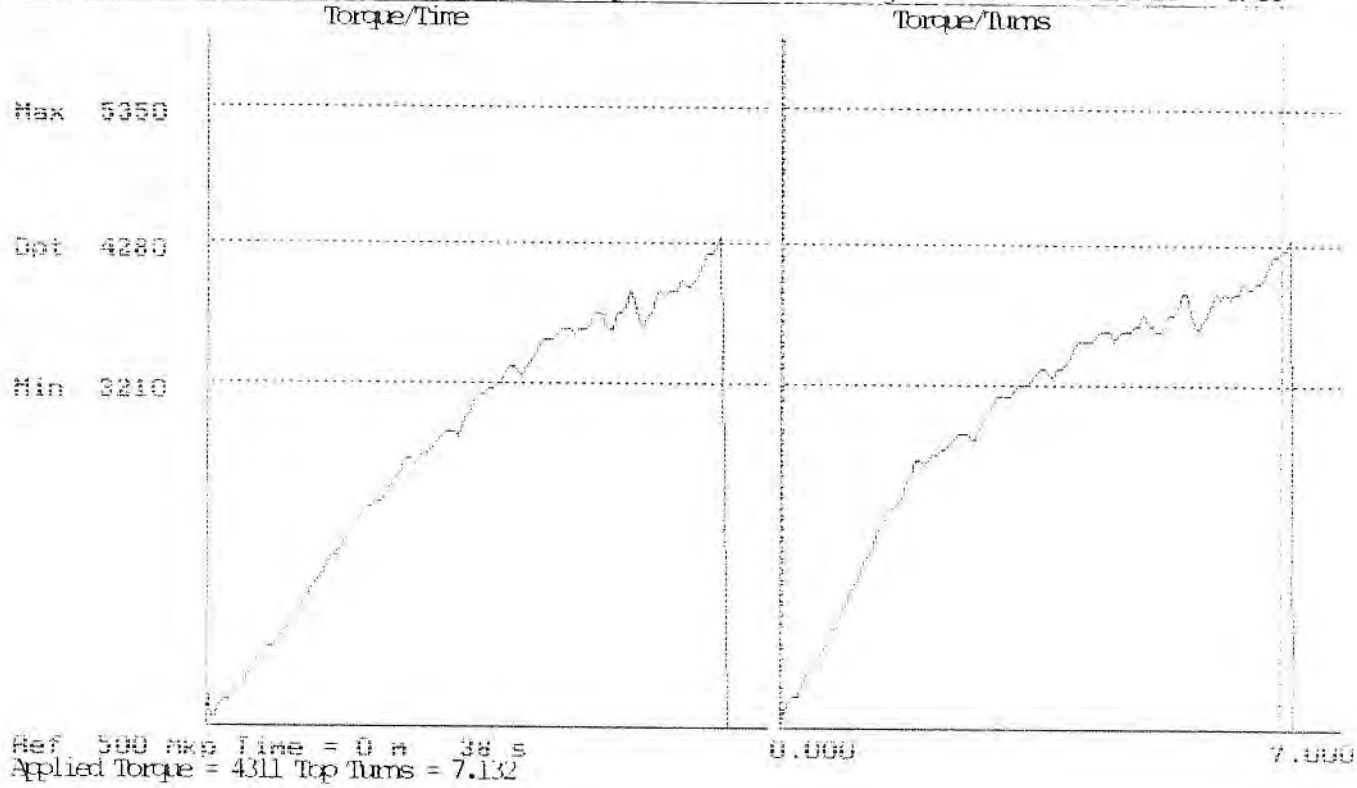
08:55 01/27/93 ACCEPT Joint # = 42 Log # = 42 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 4.029

Comments:OK JWN

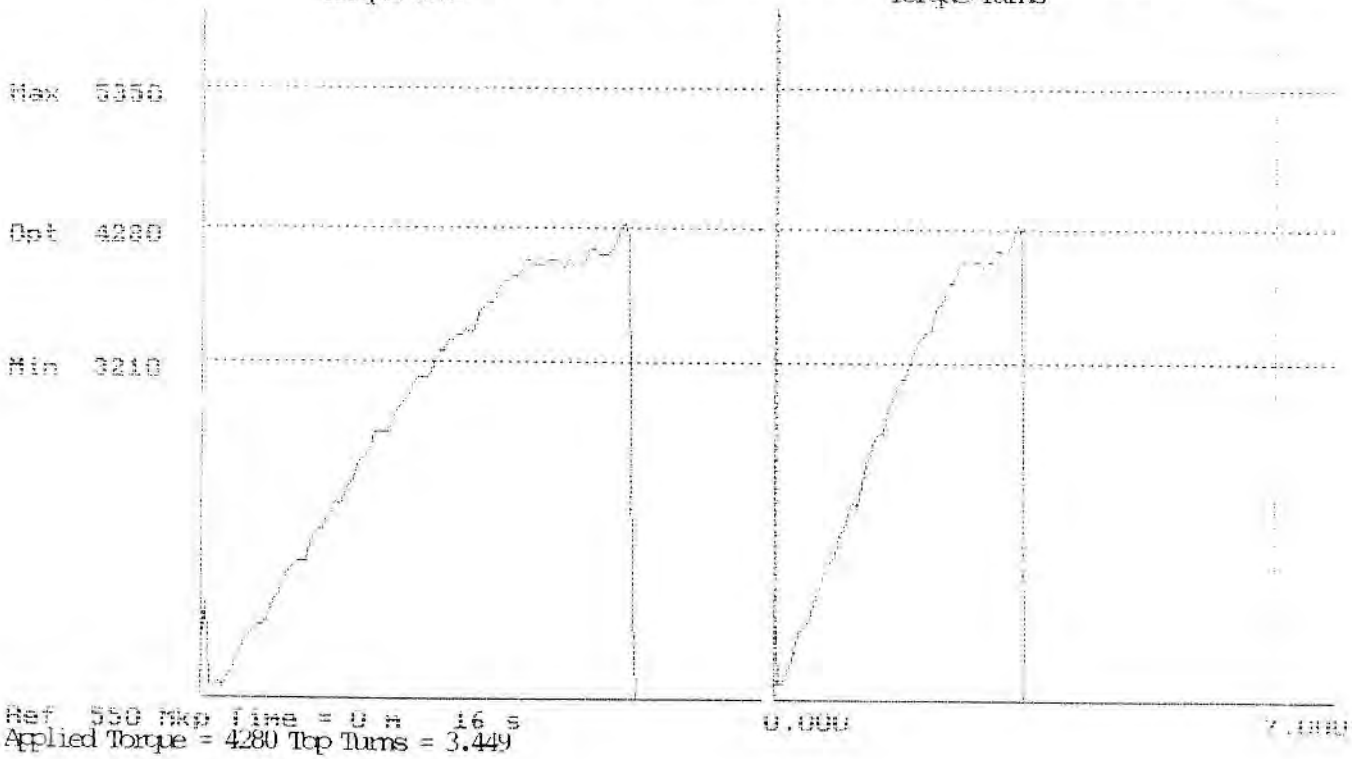
08:58 01/27/93 ACCEPT Joint # = 43 Log # = 43 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4311 Top Turns = 7.132

Comments:OK JWN

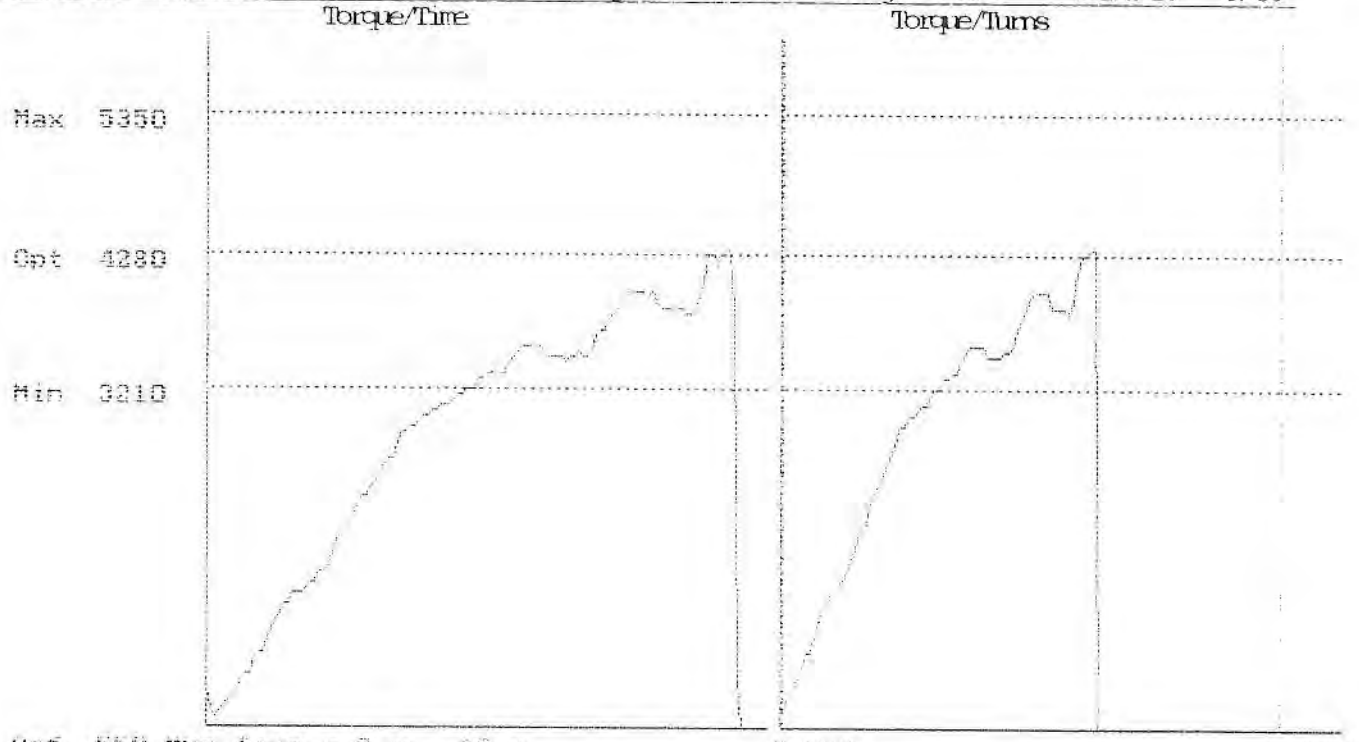
09:00 01/27/93 ACCEPT Joint # = 44 Log # = 44 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 3.449

Comments:OK JWN

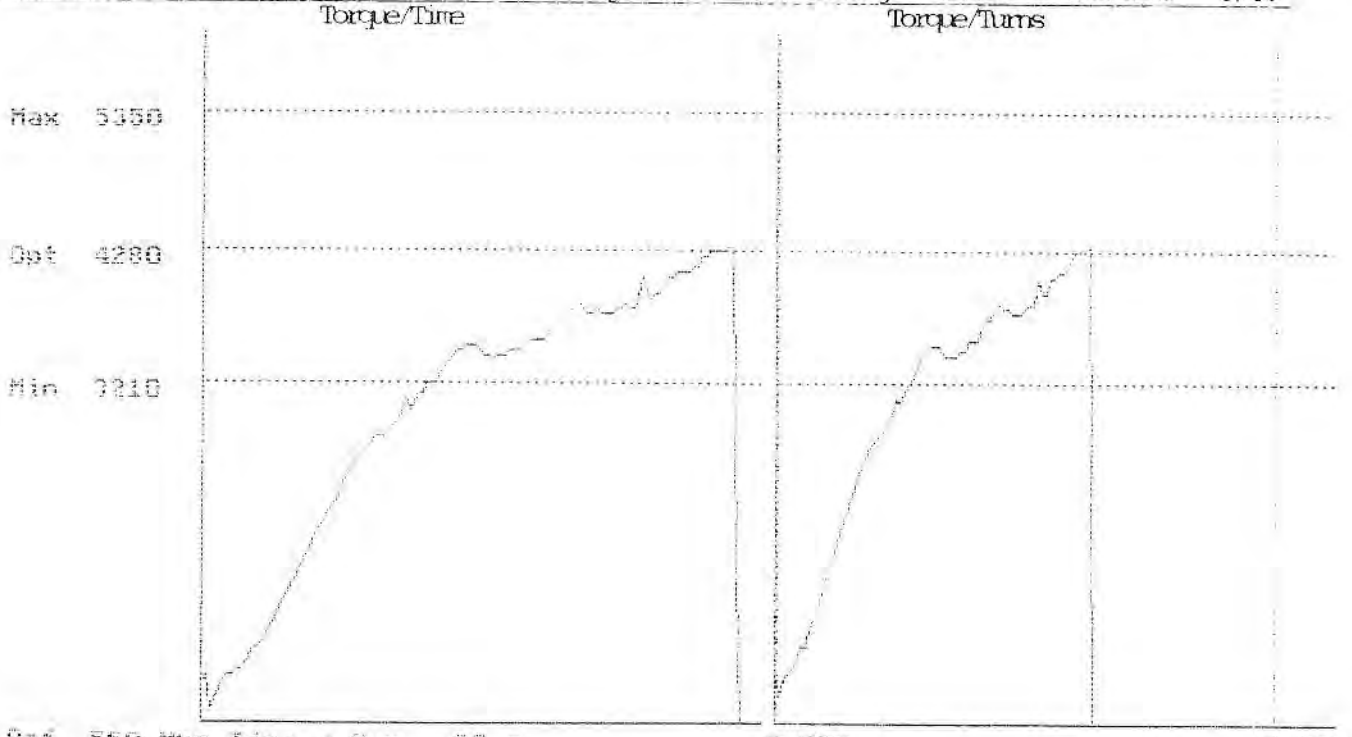
09:02 01/27/93 ACCEPT Joint # = 45 Log # = 45 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 4.415

Comments:OK JWN

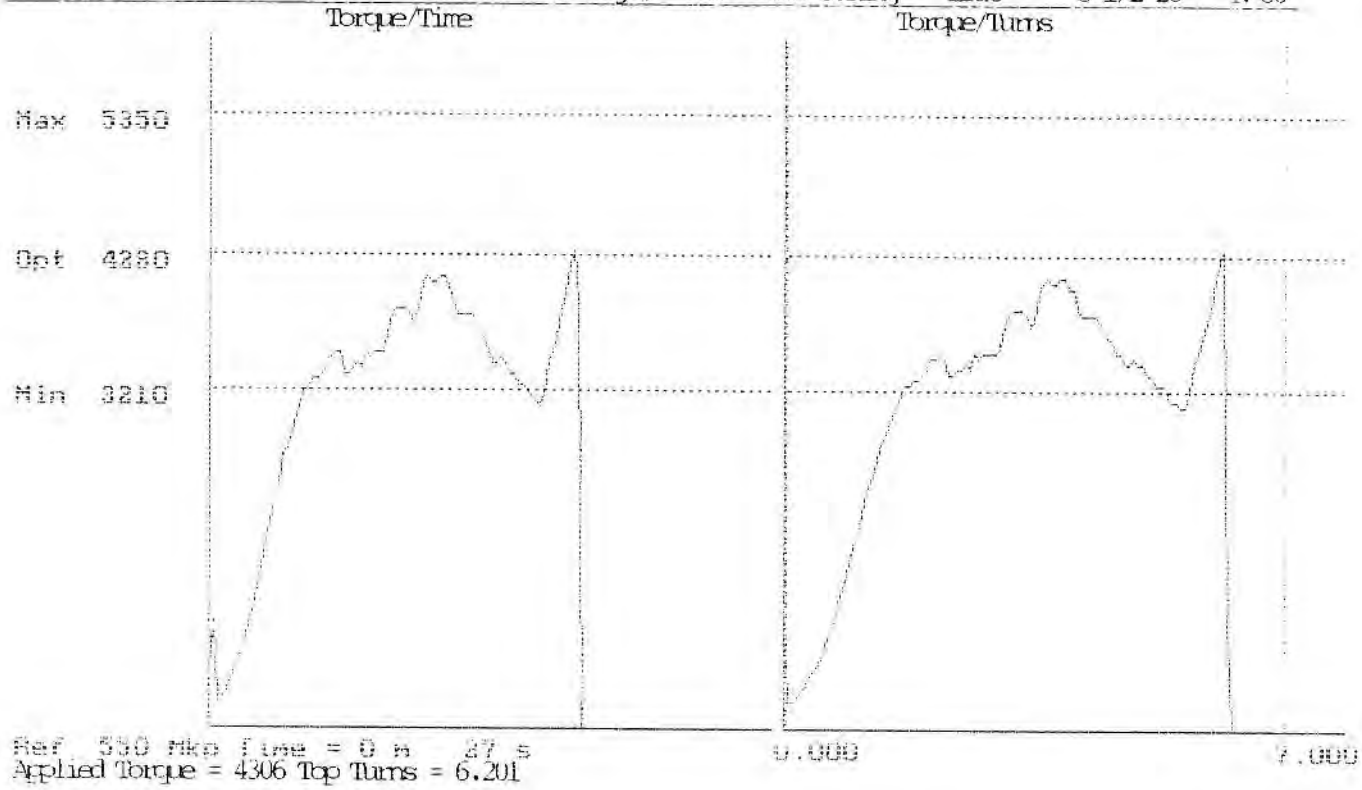
09:04 01/27/93 ACCEPT Joint # = 46 Log # = 46 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 4.428

Comments:OK JWN

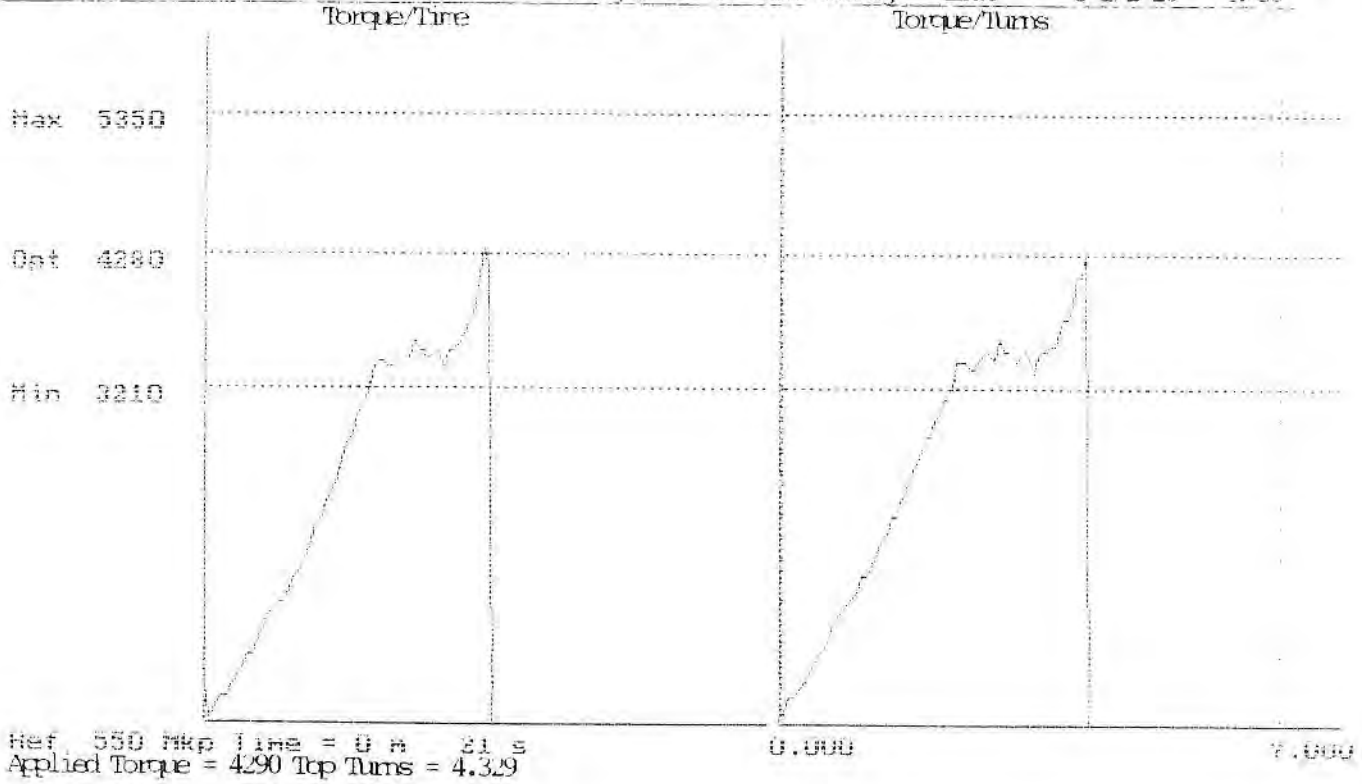
09:07 01/27/93 ACCEPT Joint # = 47 Log # = 47 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4306 Top Turns = 6.201

Comments:OK JAW...COLLAR TURNED

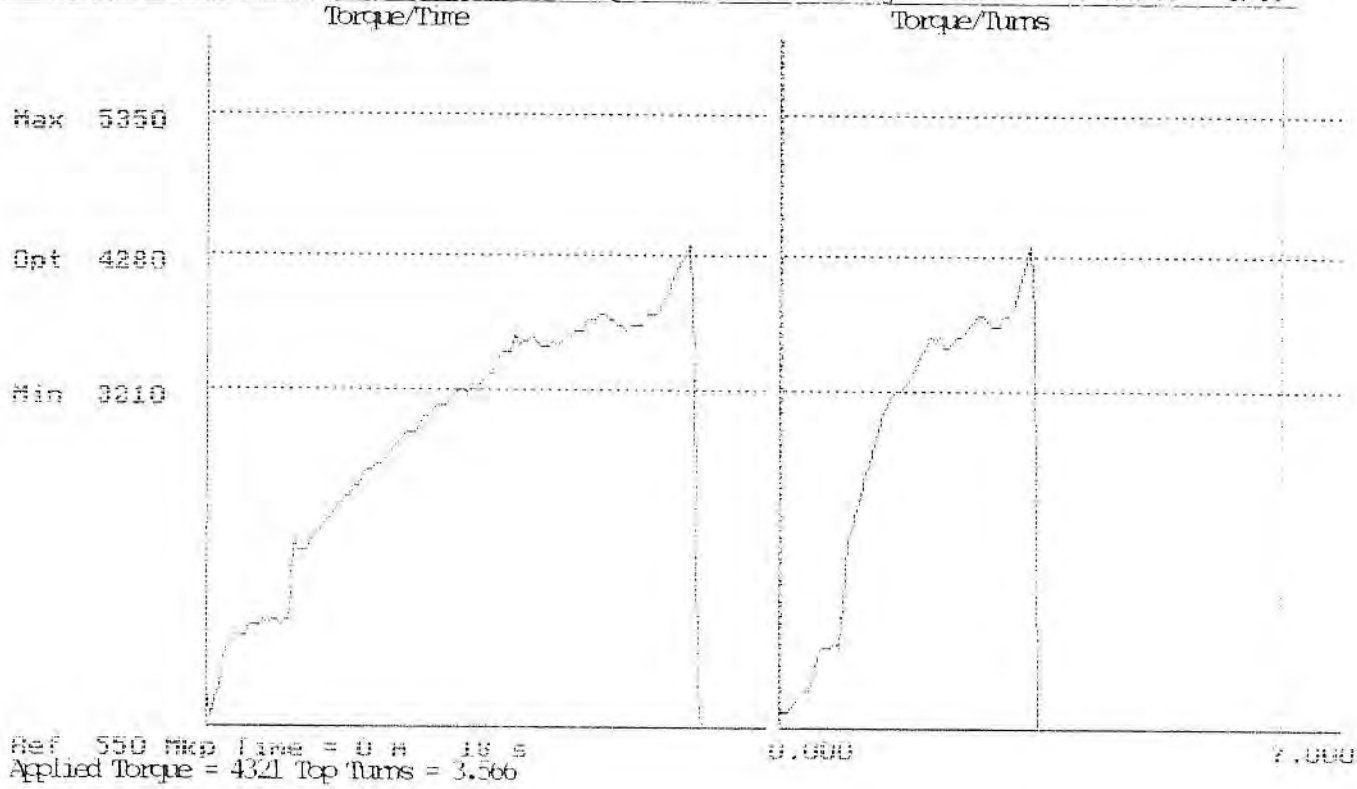
09:09 01/27/93 ACCEPT Joint # = 48 Log # = 48 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 4.329

Comments:OK JAW

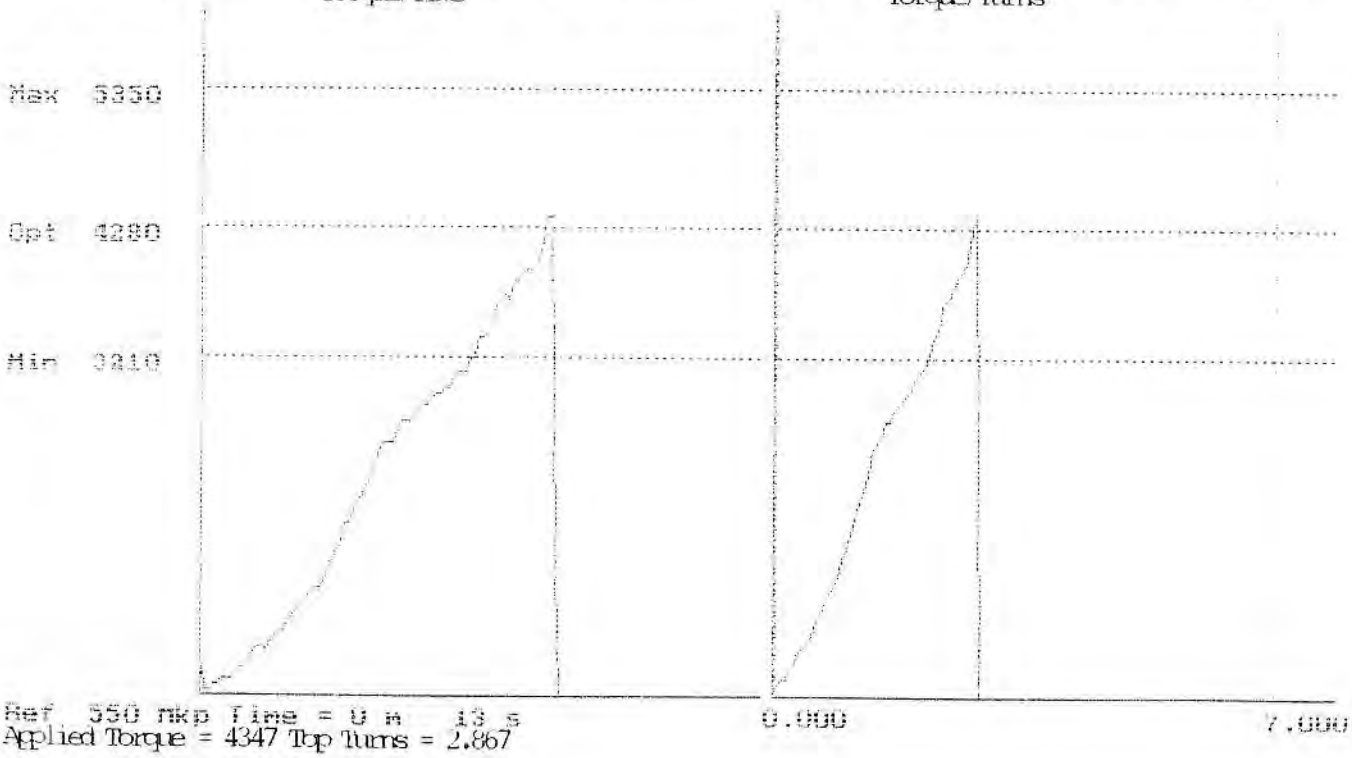
09:11 01/27/93 ACCEPT Joint # = 49 Log # = 49 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4321 Top Turns = 3.566

Comments:OK JWN

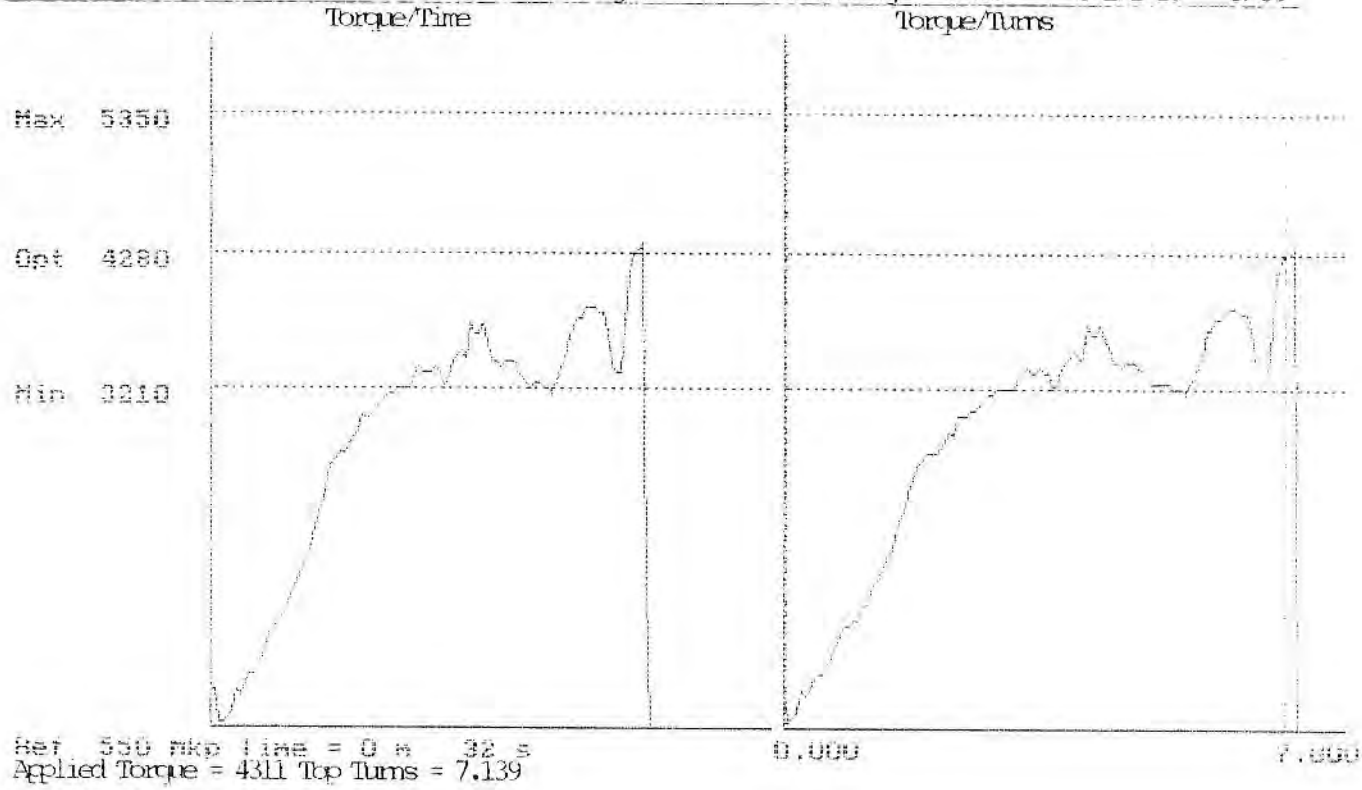
09:13 01/27/93 ACCEPT Joint # = 50 Log # = 50 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4347 Top Turns = 2.867

Comments:OK JWN

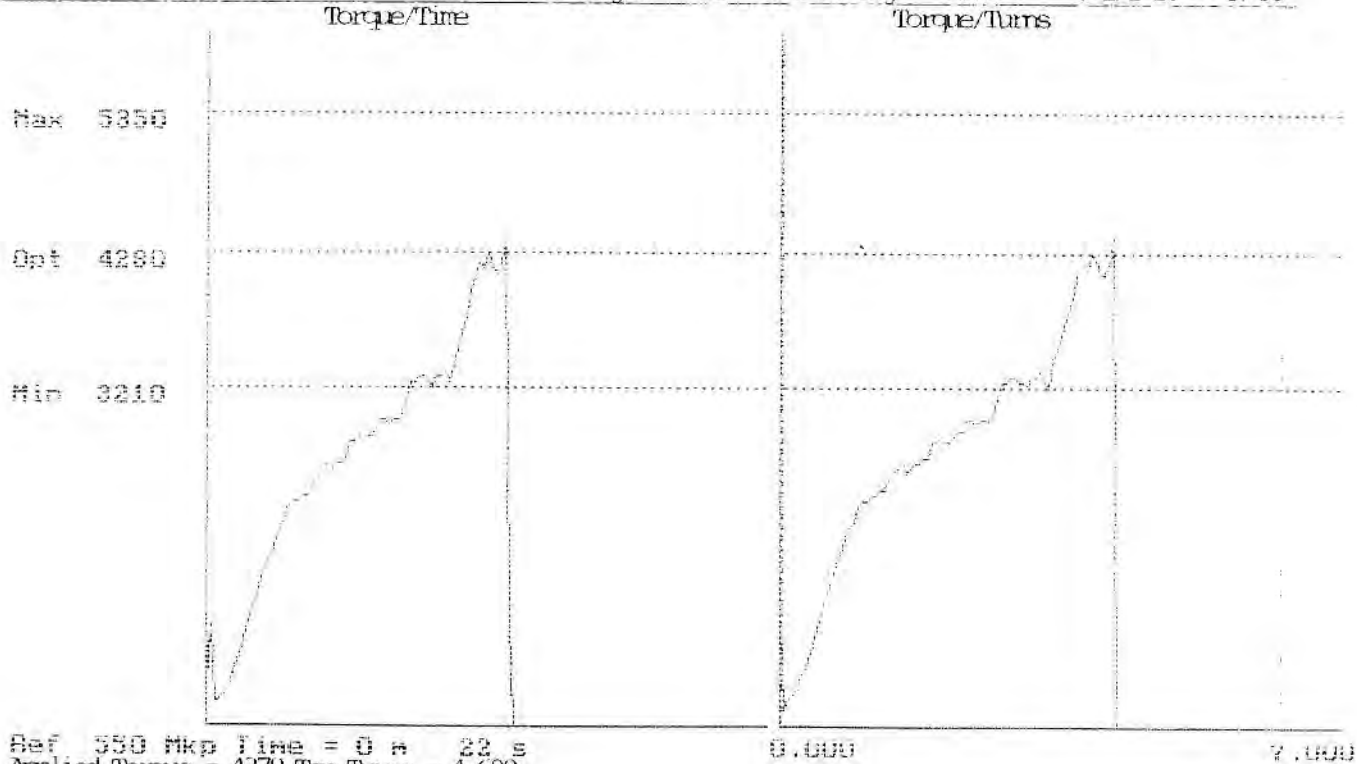
09:16 01/27/93 ACCEPT Joint # = 51 Log # = 51 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4311 Top Turns = 7.139

Comments:OK JWN...COLLAR TURNED

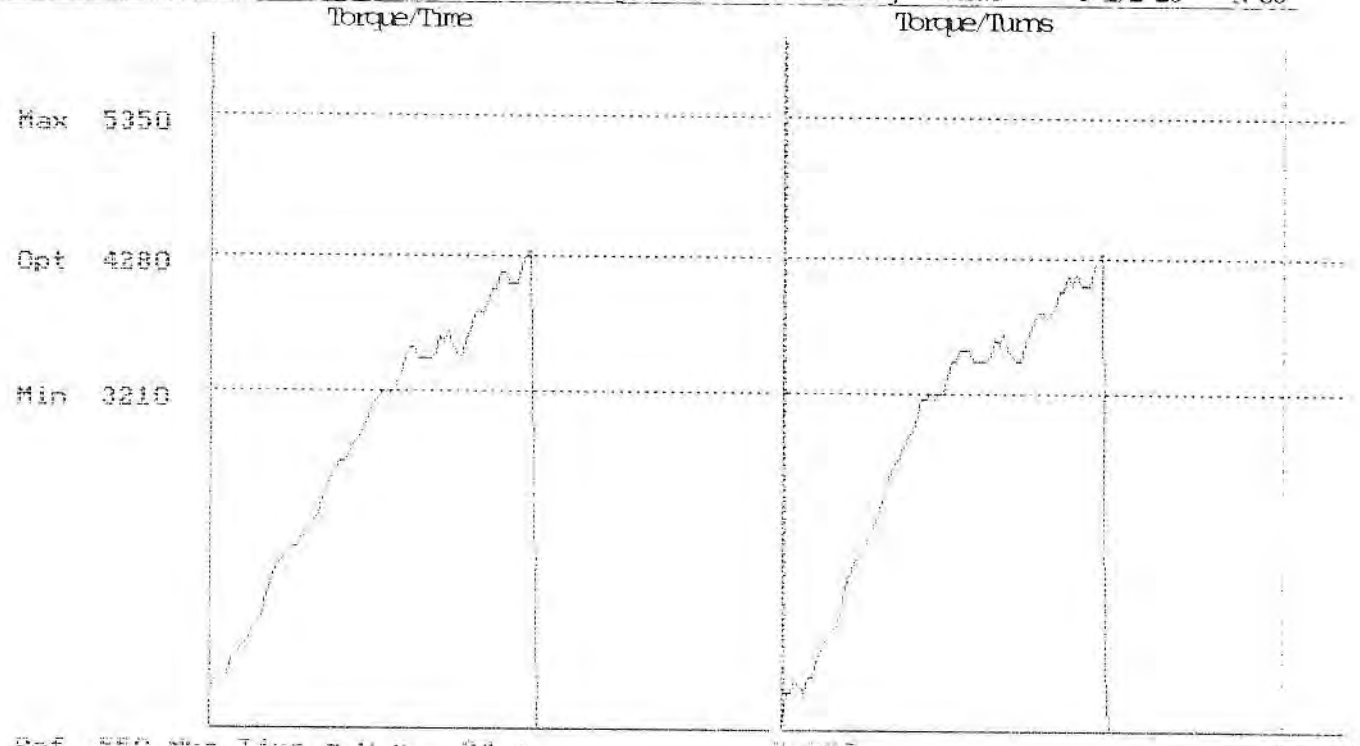
09:18 01/27/93 ACCEPT Joint # = 52 Log # = 52 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4379 Top Turns = 4.689

Comments:OK JWN

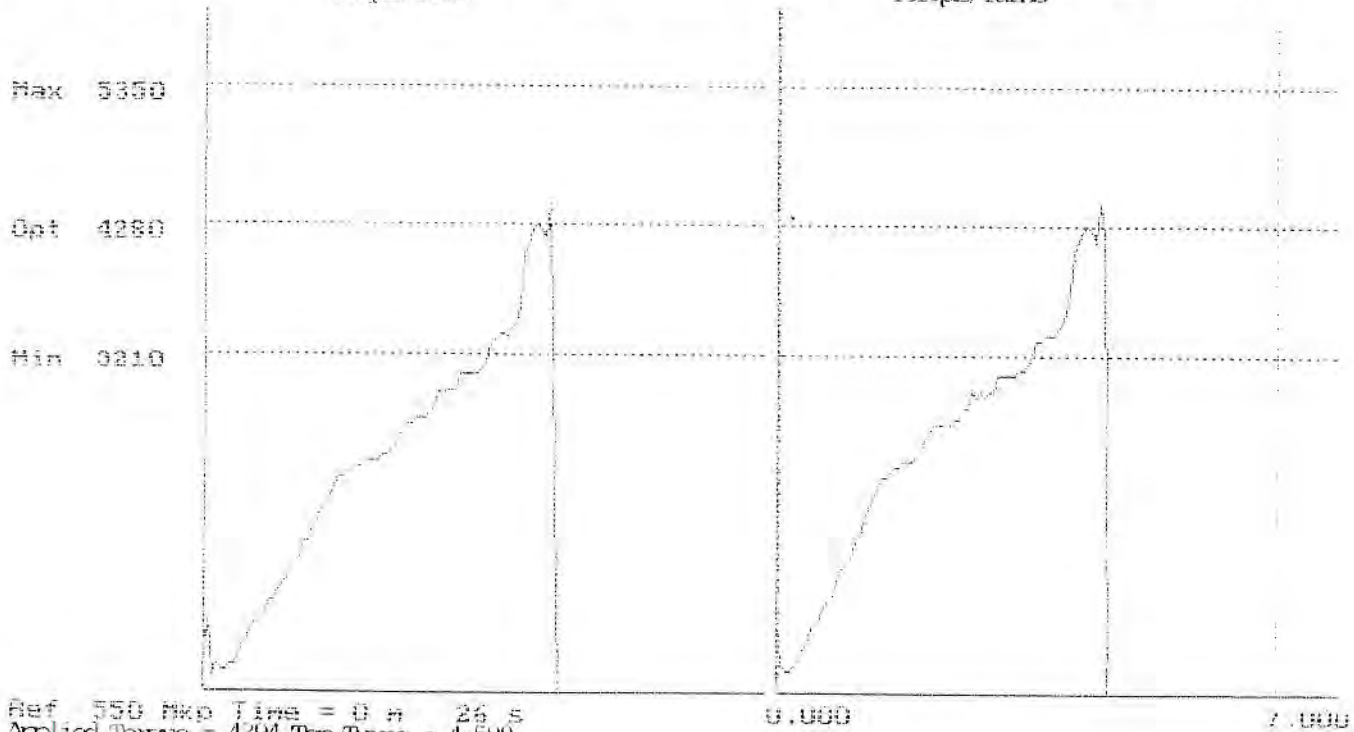
09:20 01/27/93 ACCEPT Joint # = 53 Log # = 53 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4295 Top Turns = 4.518

Comments:OK JWN

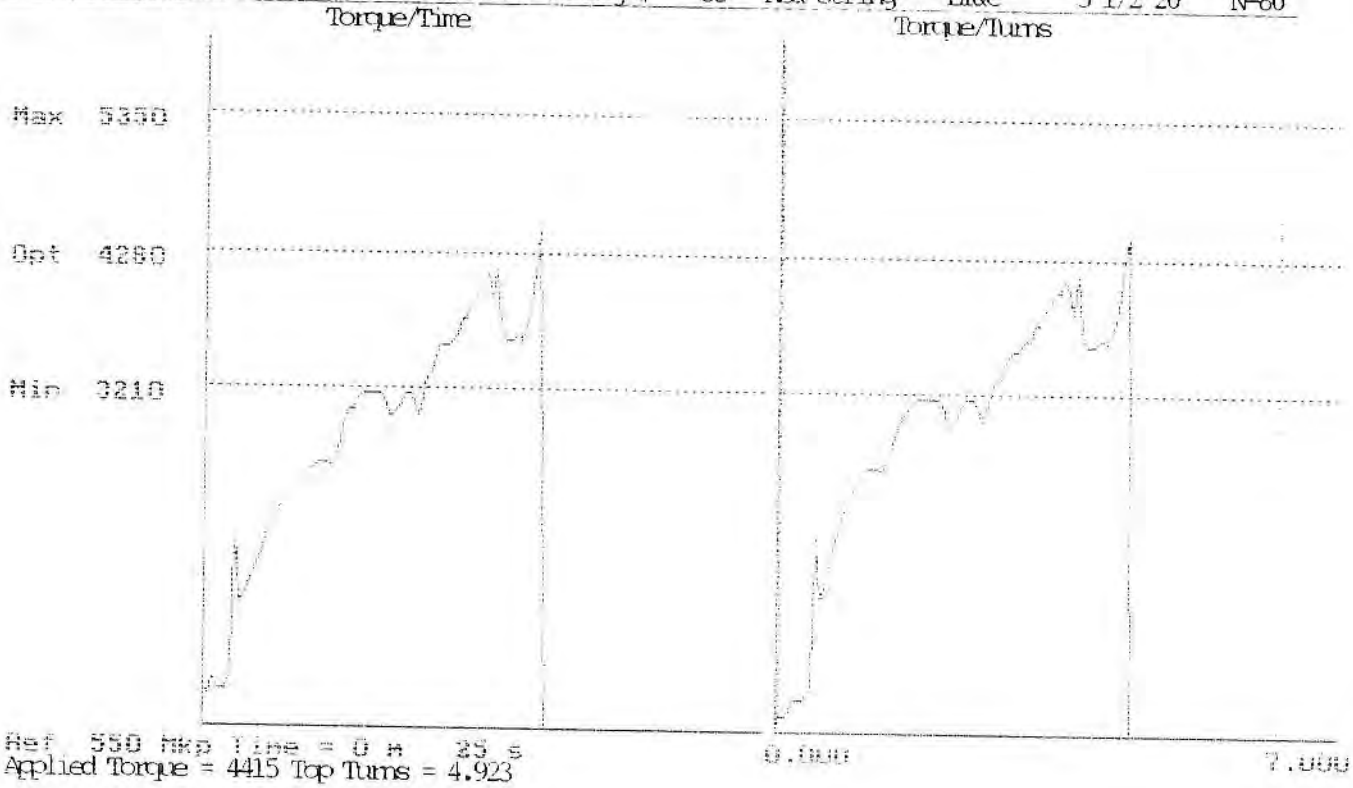
09:22 01/27/93 ACCEPT Joint # = 54 Log # = 54 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4394 Top Turns = 4.588

Comments:OK JWN

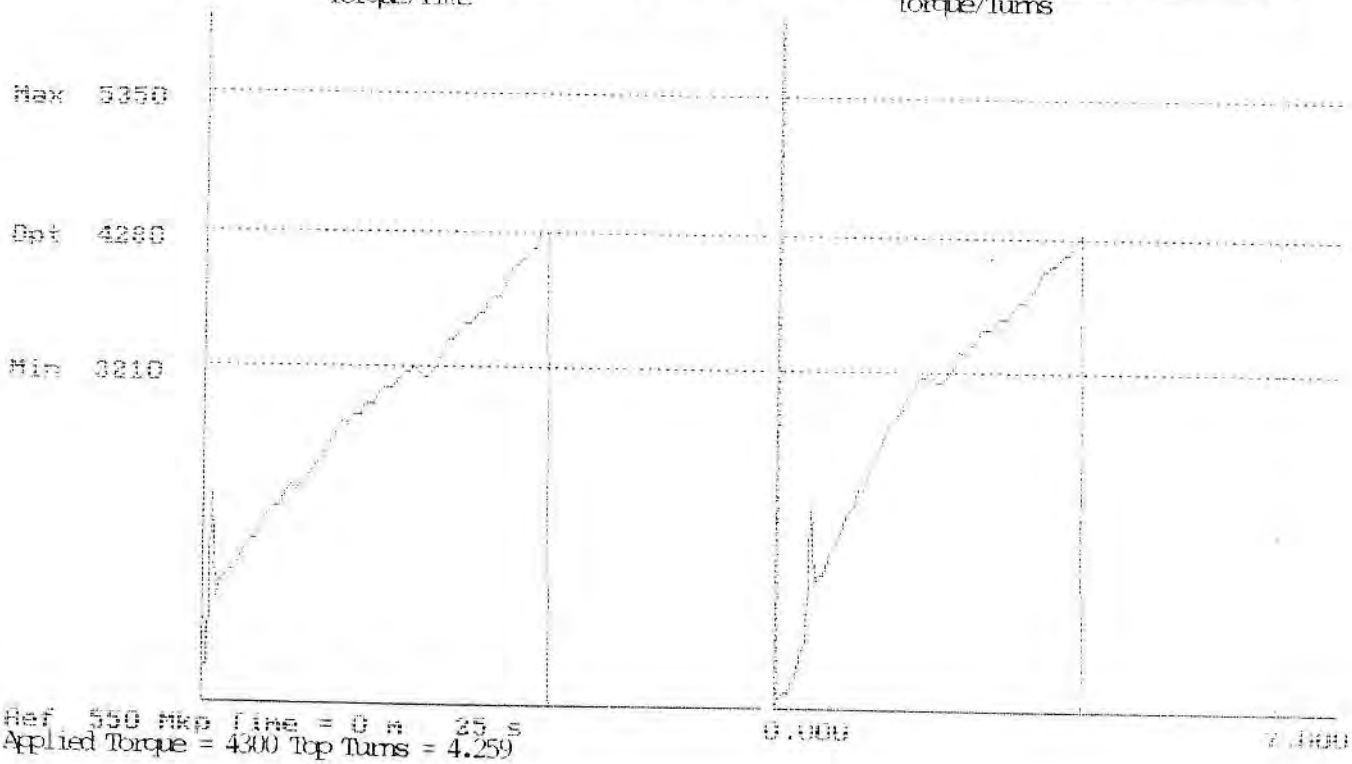
09:25 01/27/93 ACCEPT Joint # = 55 Log # = 55 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4415 Top Turns = 4.923

Comments:OK JWN

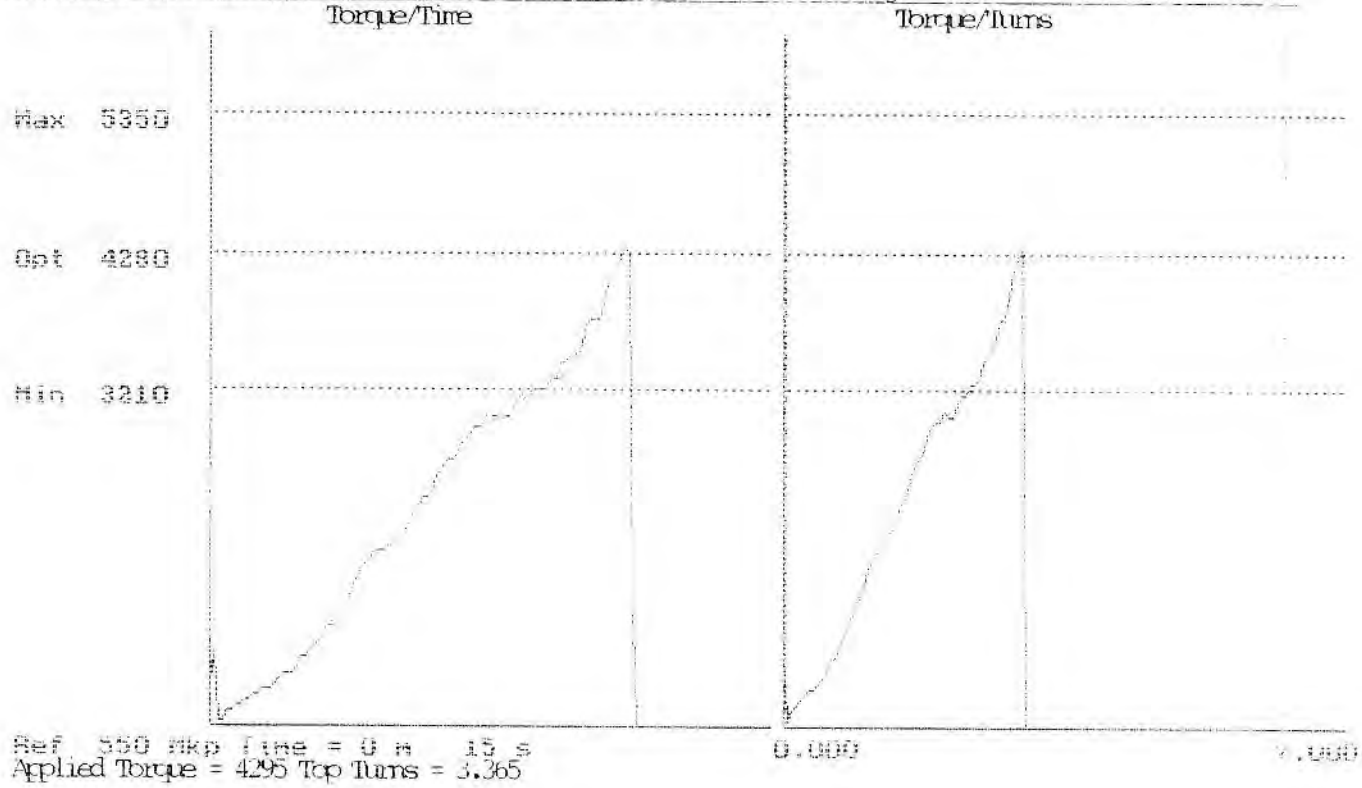
09:27 01/27/93 ACCEPT Joint # = 56 Log # = 56 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 4.259

Comments:OK JWN

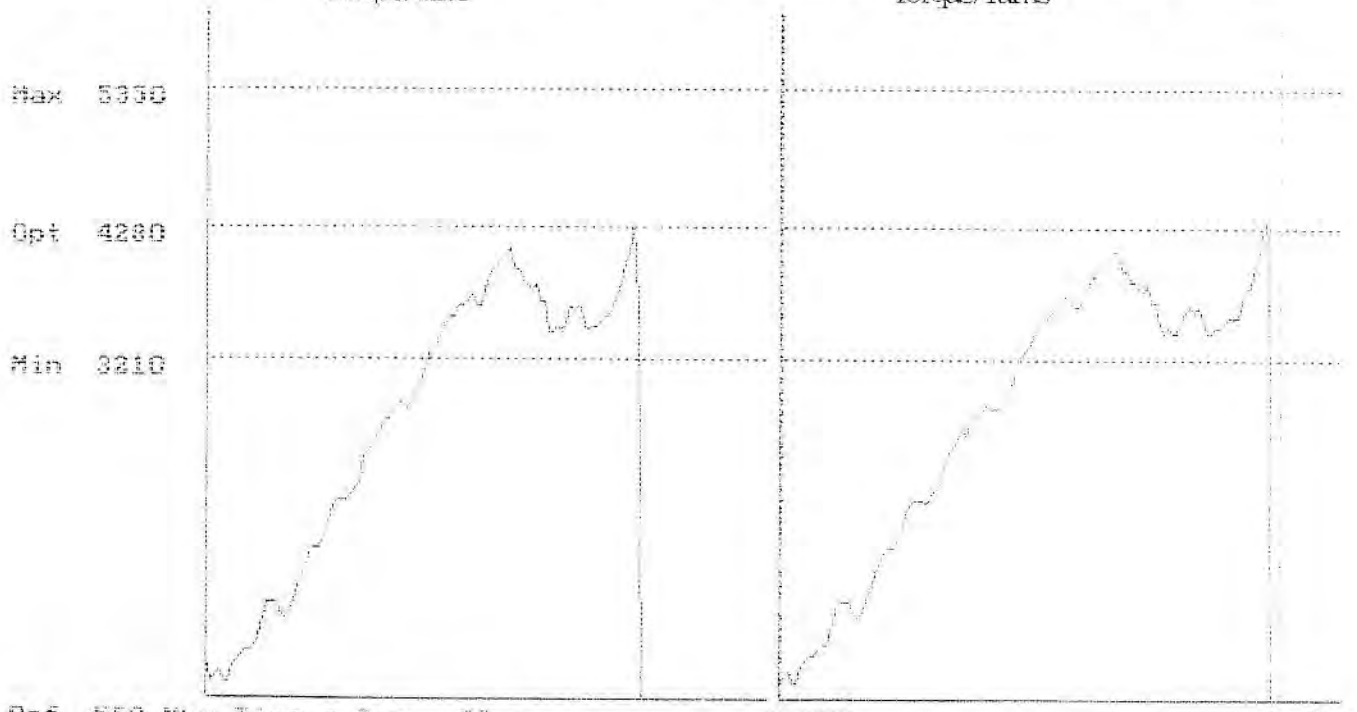
09:29 01/27/93 ACCEPT Joint # = 57 Log # = 57 Red String L&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 15 s
Applied Torque = 4295 Top Turns = 3.365

Comments:OK JAW

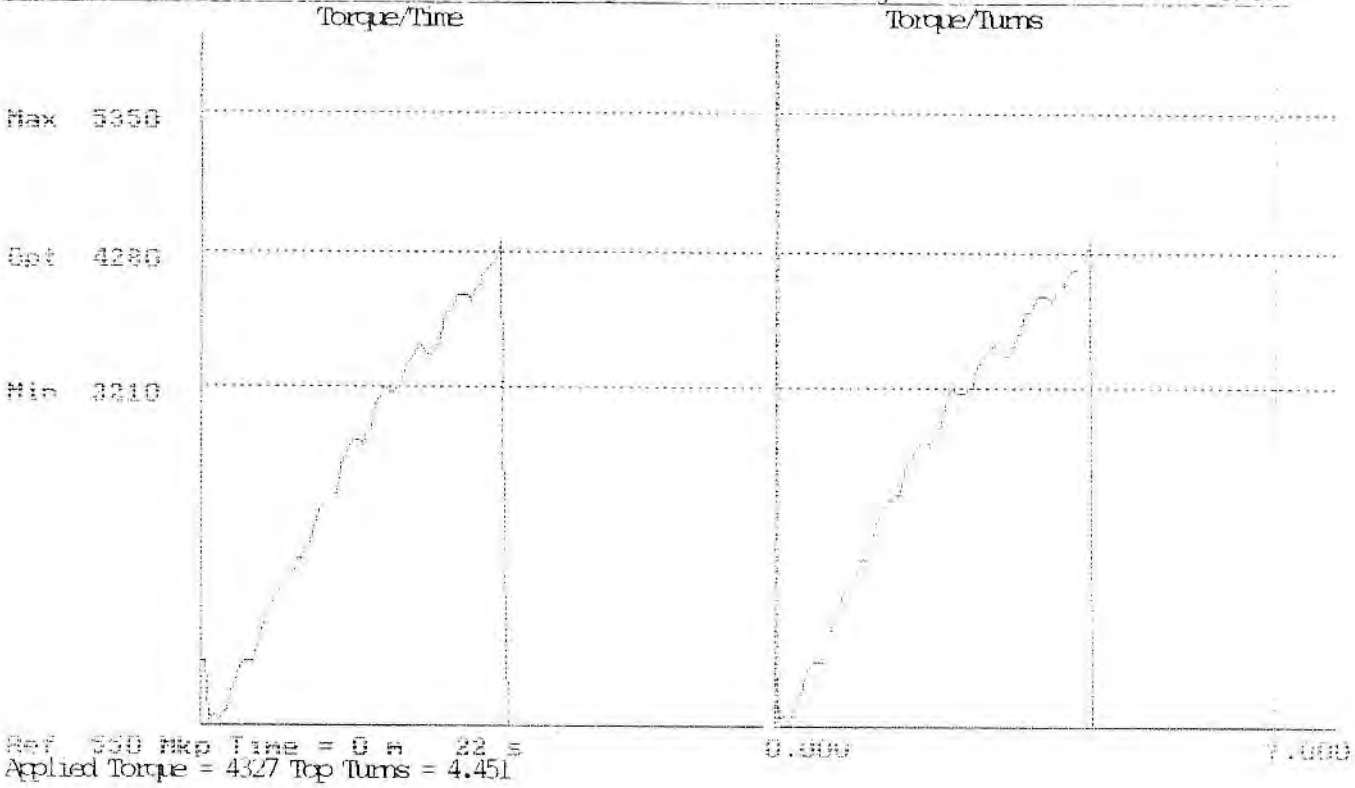
09:32 01/27/93 ACCEPT Joint # = 58 Log # = 58 Red String L&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 32 s
Applied Torque = 4316 Top Turns = 6.822

Comments:OK JAW...COLLAR TURNED

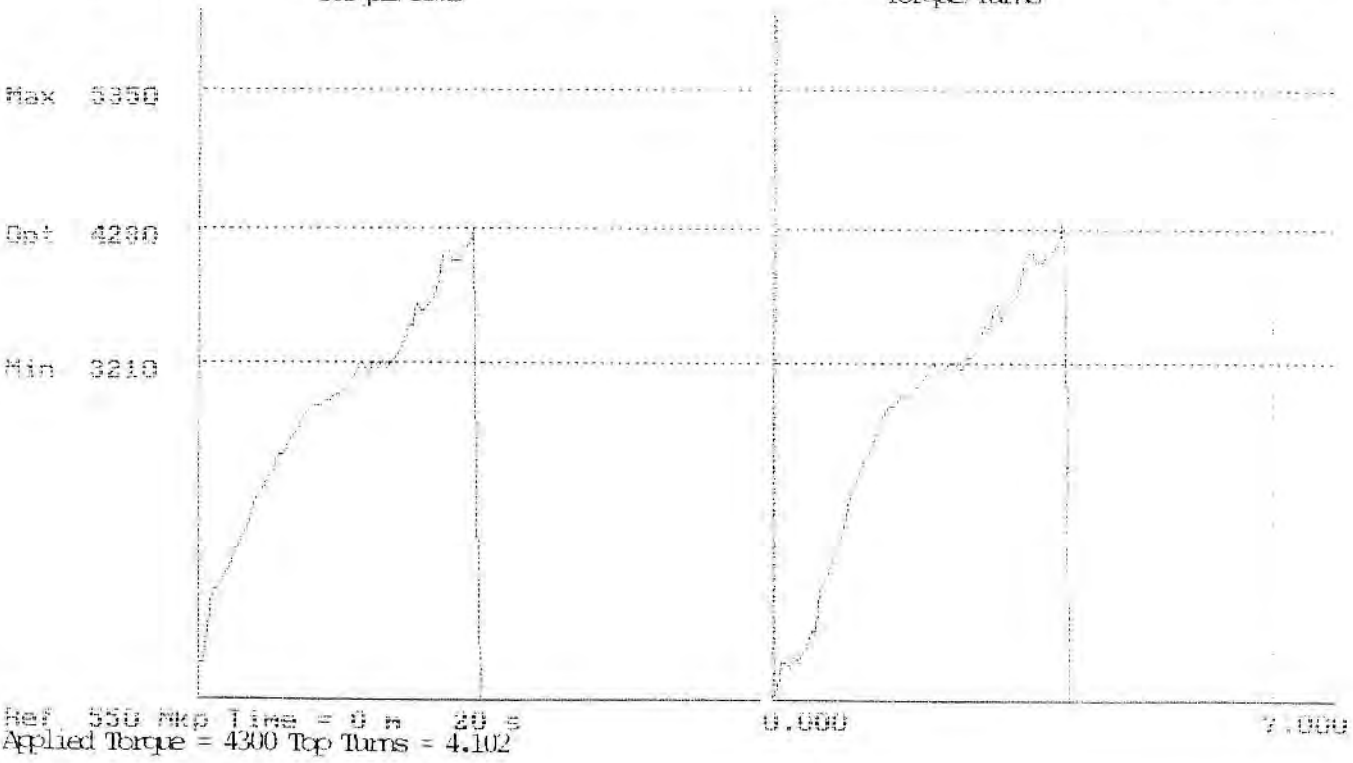
09:34 01/27/93 ACCEPT Joint # = 59 Log # = 59 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4327 Top Turns = 4.451

Comments:OK JWN

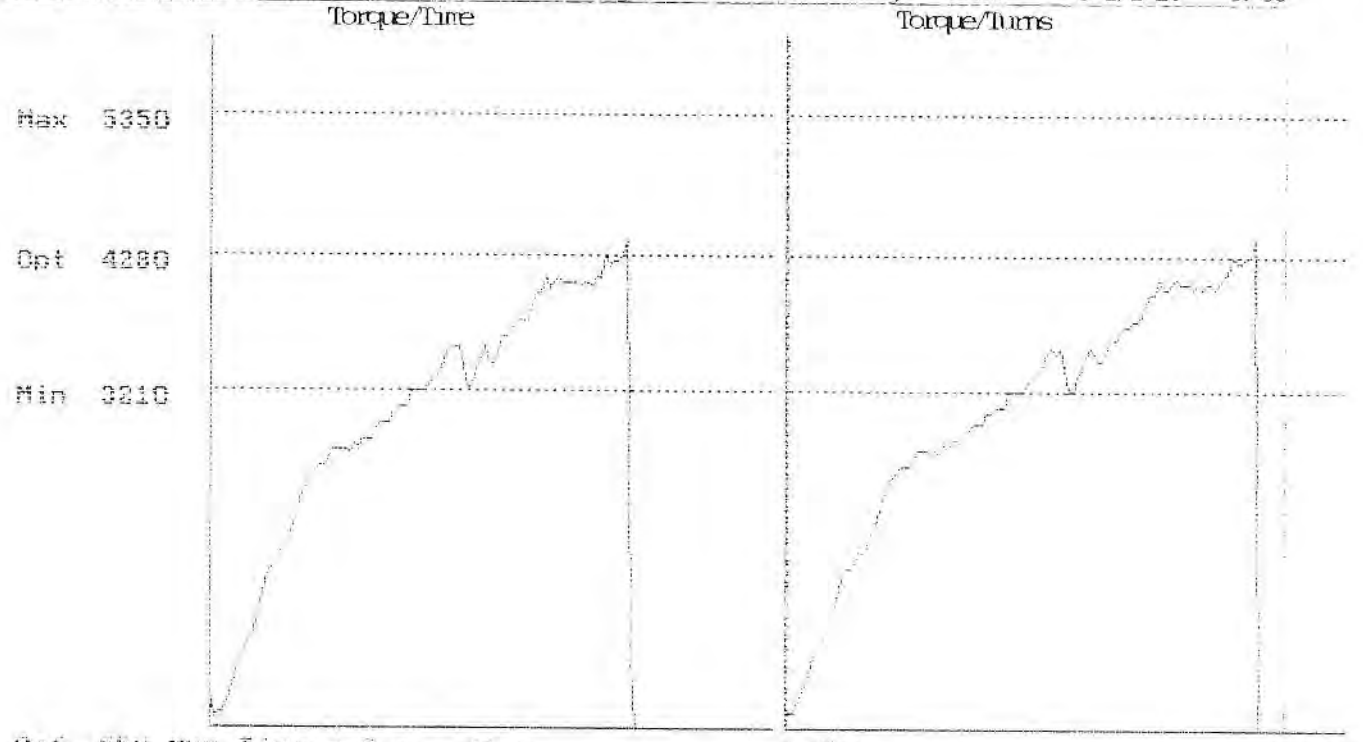
09:36 01/27/93 ACCEPT Joint # = 60 Log # = 60 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 4.102

Comments:OK JWN

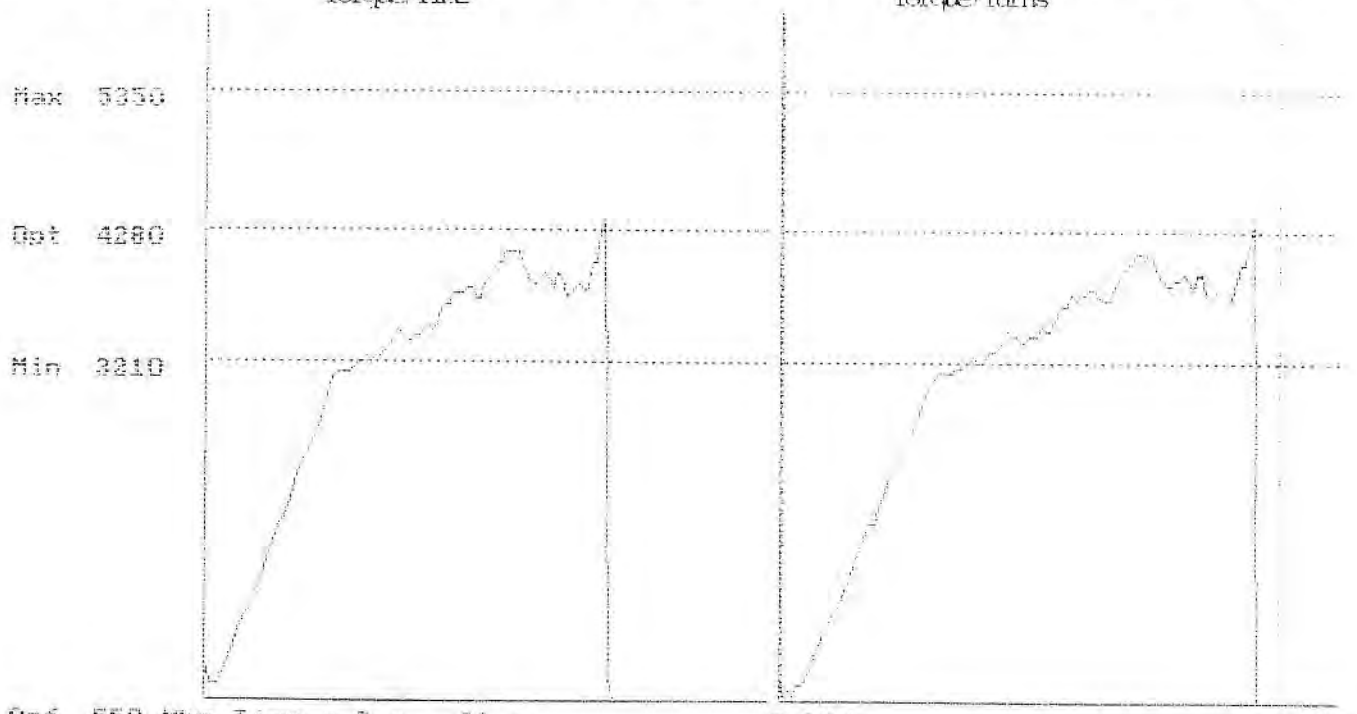
09:38 01/27/93 ACCEPT Joint # = 61 Log # = 61 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4353 Top Turns = 6.602

Comments:OK JWN

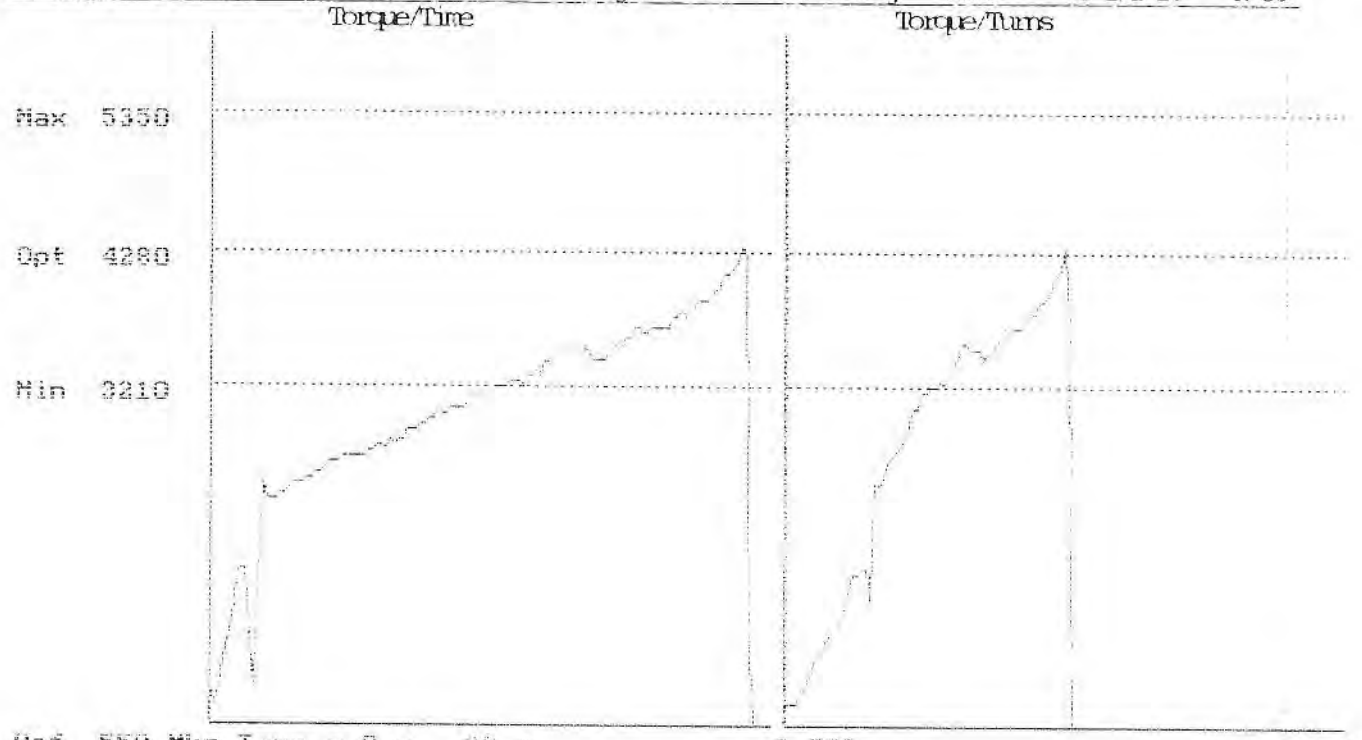
09:41 01/27/93 ACCEPT Joint # = 62 Log # = 62 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4327 Top Turns = 6.660

Comments:OK JWN

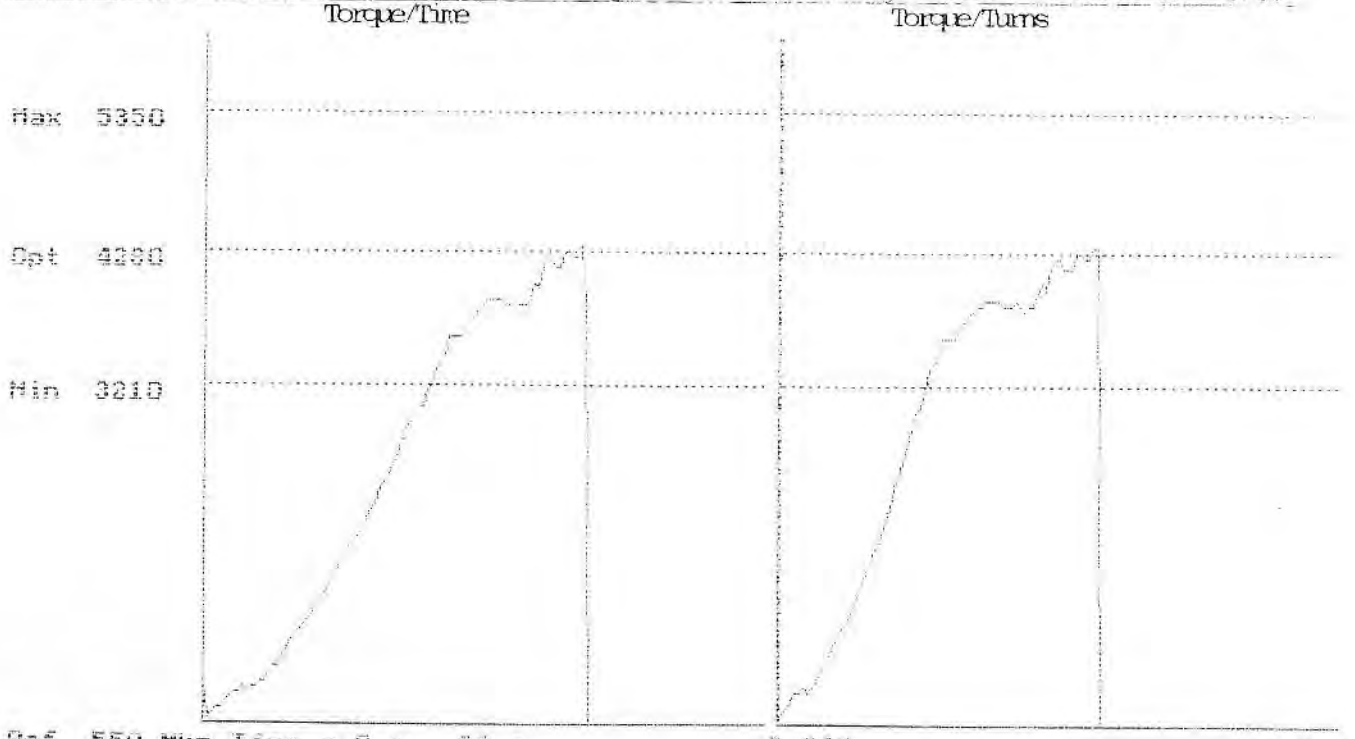
09:43 01/27/93 ACCEPT Joint # = 63 Log # = 63 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 3.985

Comments:OK JWN

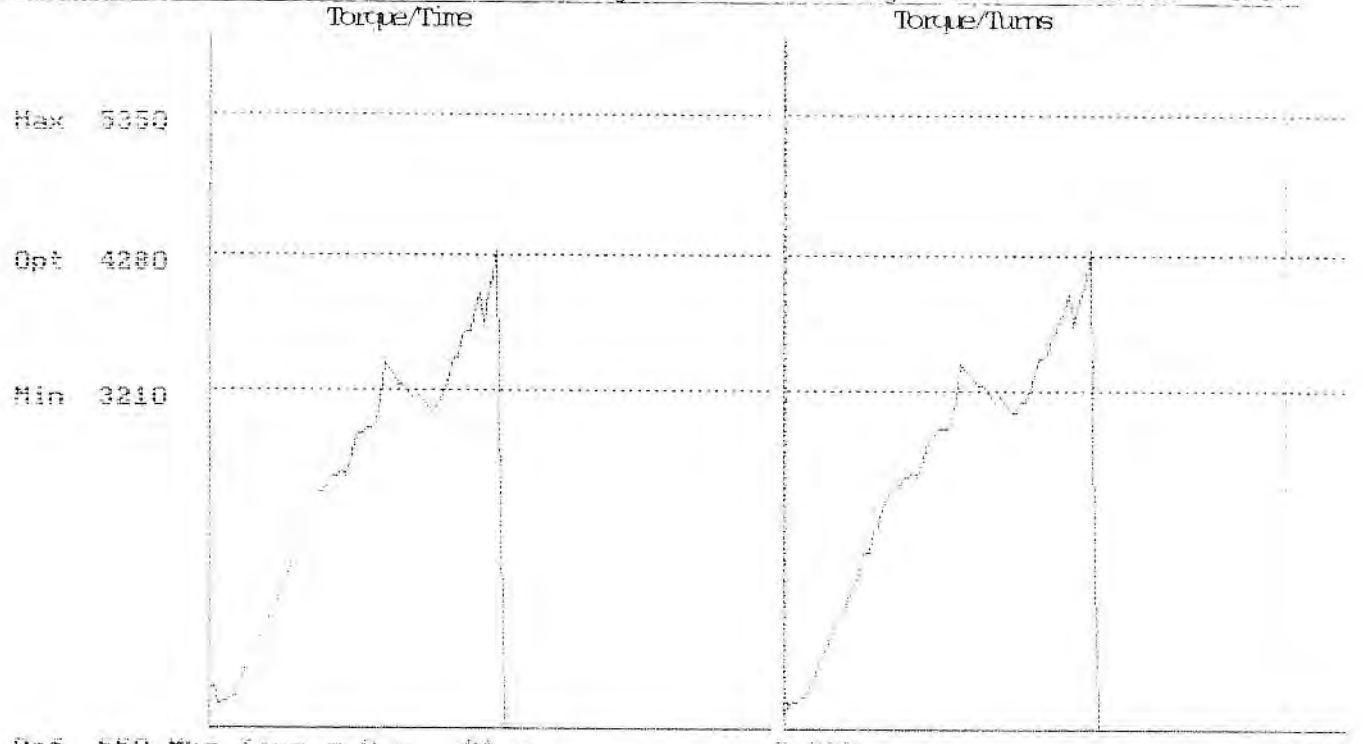
09:45 01/27/93 ACCEPT Joint # = 64 Log # = 64 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 4.486

Comments:OK JWN

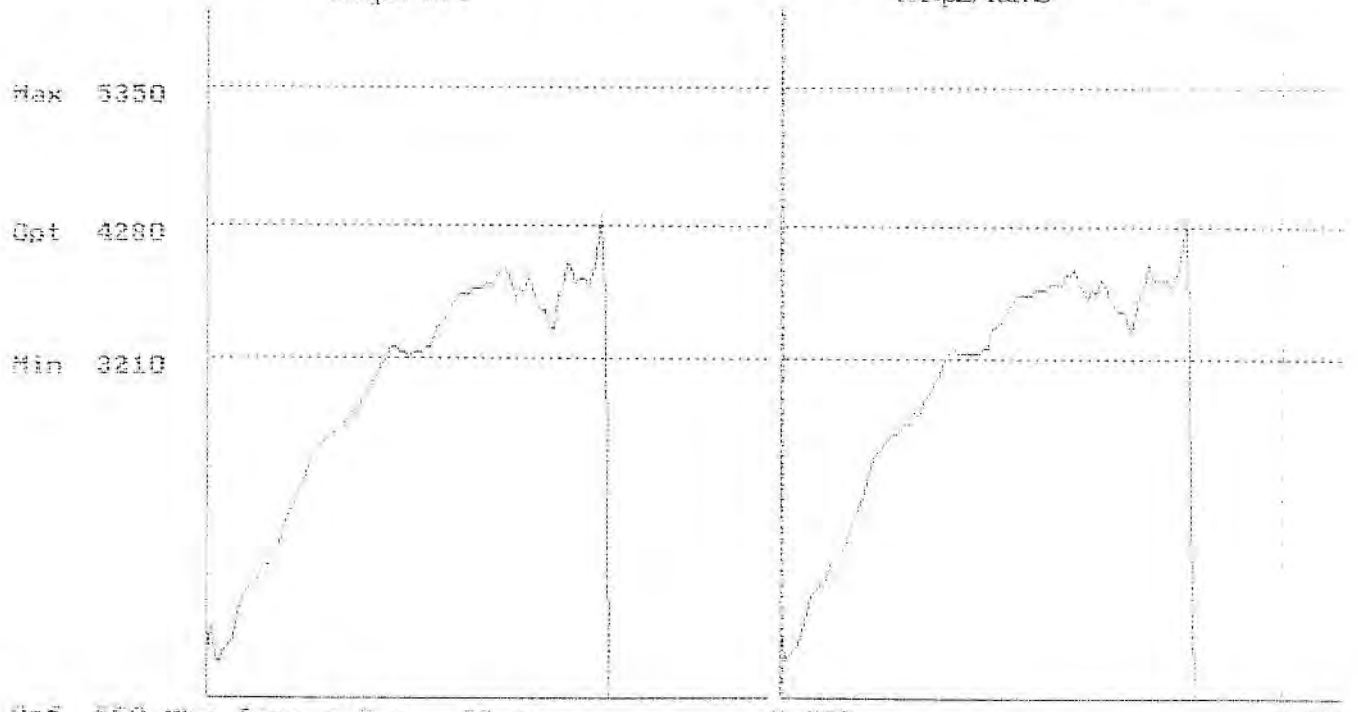
09:47 01/27/93 ACCEPT Joint # = 65 Log # = 65 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 21 s
Applied Torque = 4285 Top Turns = 4.342

Comments:OK JWN

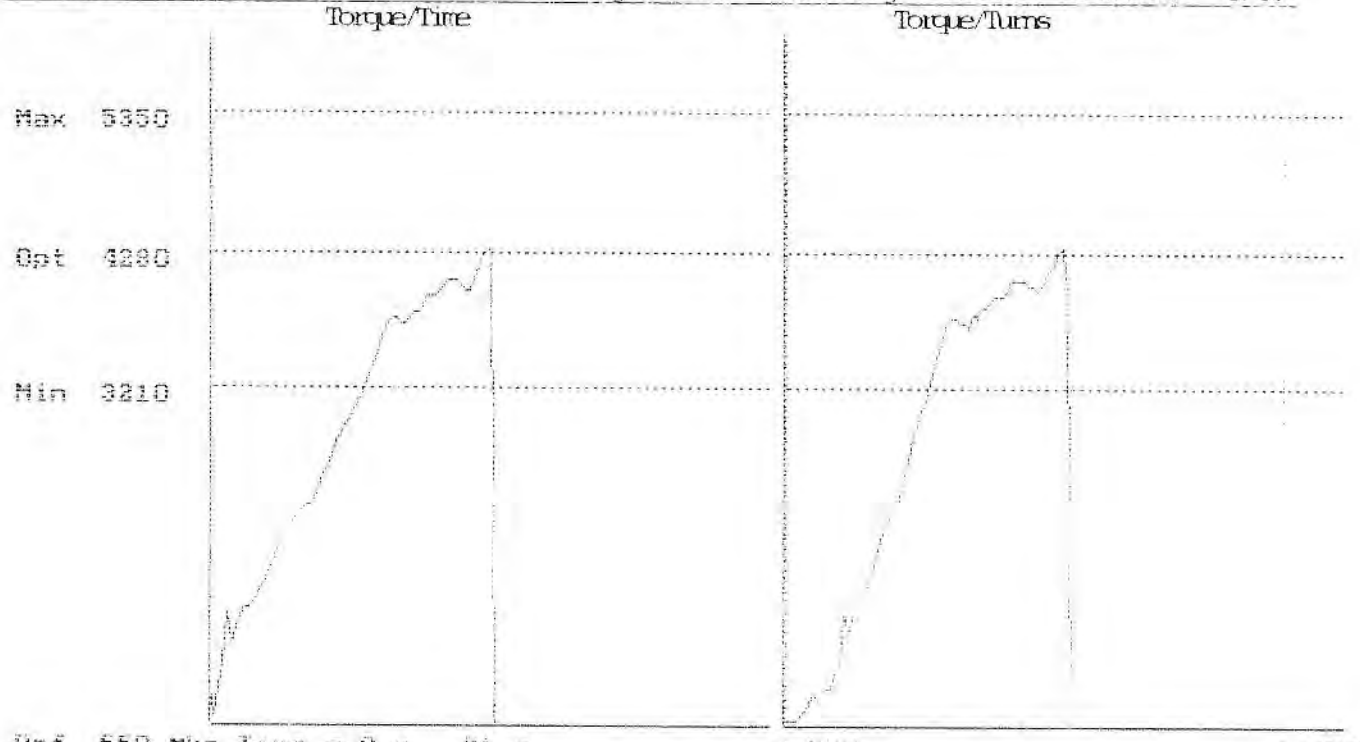
09:50 01/27/93 ACCEPT Joint # = 66 Log # = 66 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 29 s
Applied Torque = 4342 Top Turns = 5.726

Comments:OK JWN

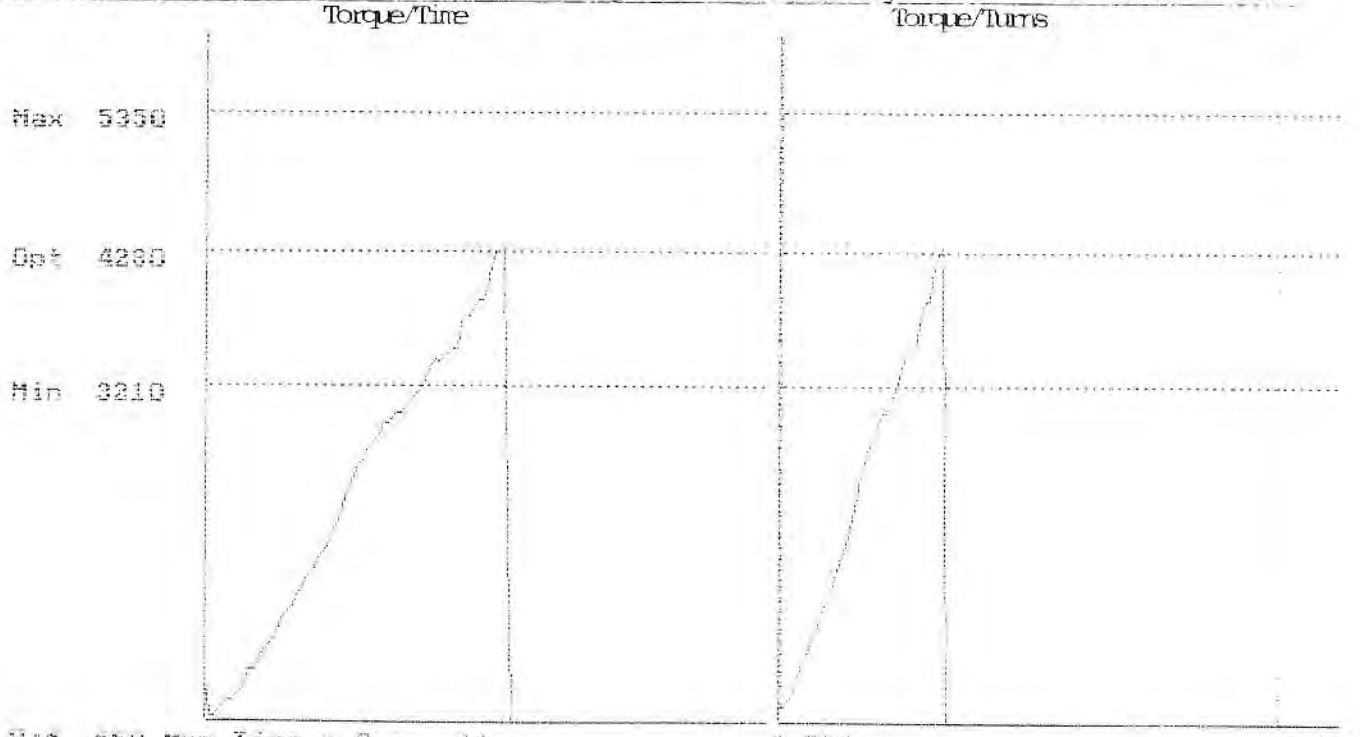
09:52 01/27/93 ACCEPT Joint # = 67 Log # = 67 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 21 s 0.000 7.000
Applied Torque = 4280 Top Turns = 3.982

Comments:OK JWN

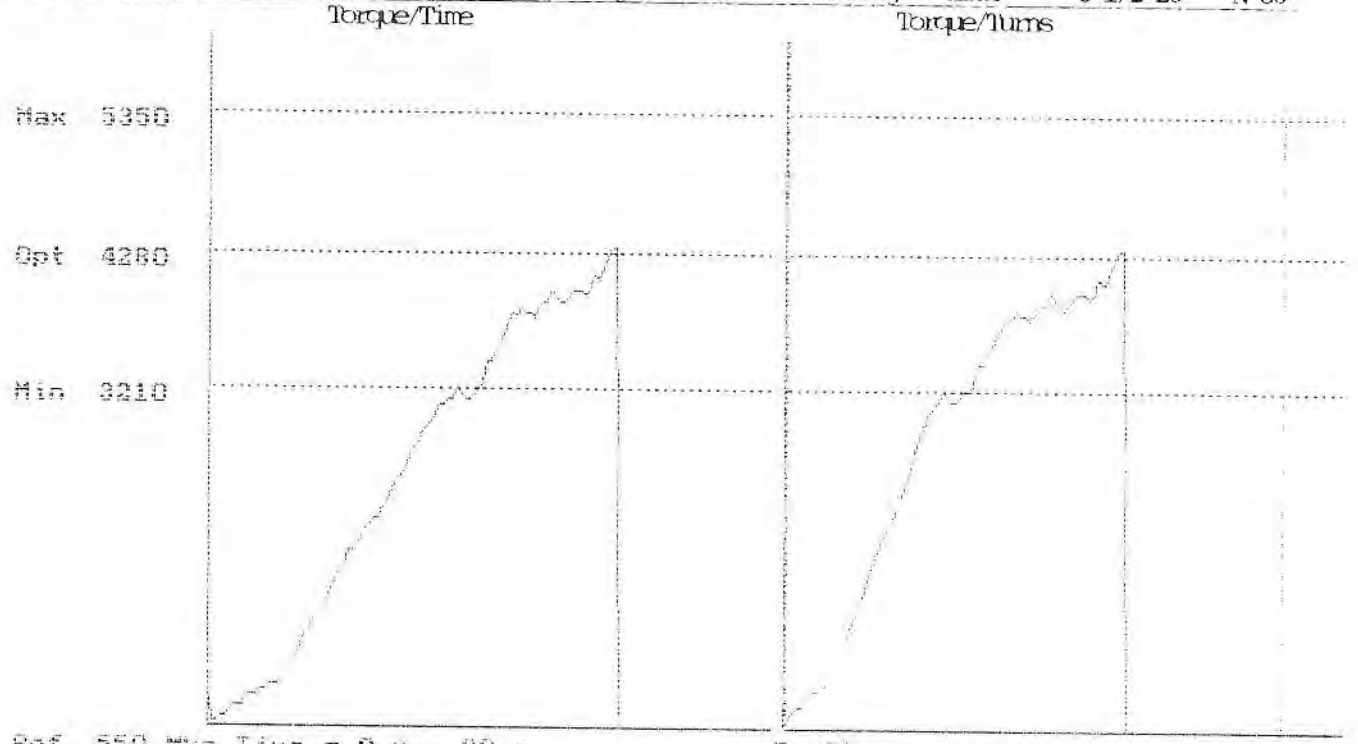
09:54 01/27/93 ACCEPT Joint # = 68 Log # = 68 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 11 s 0.000 7.000
Applied Torque = 4280 Top Turns = 2.335

Comments:OK JWN

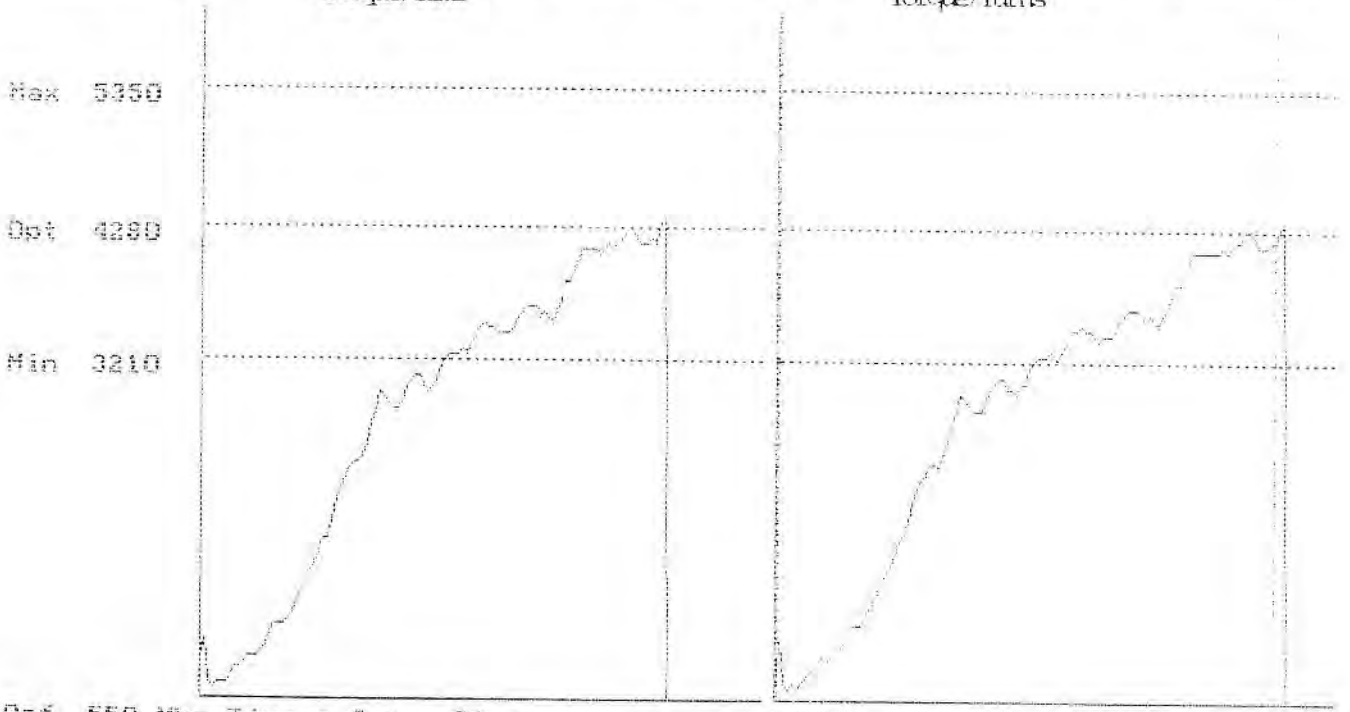
09:58 01/27/93 ACCEPT Joint # = 69 Log # = 69 Red String L&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 30 s
Applied Torque = 4295 Top Turns = 4.785

Comments:OK JWN

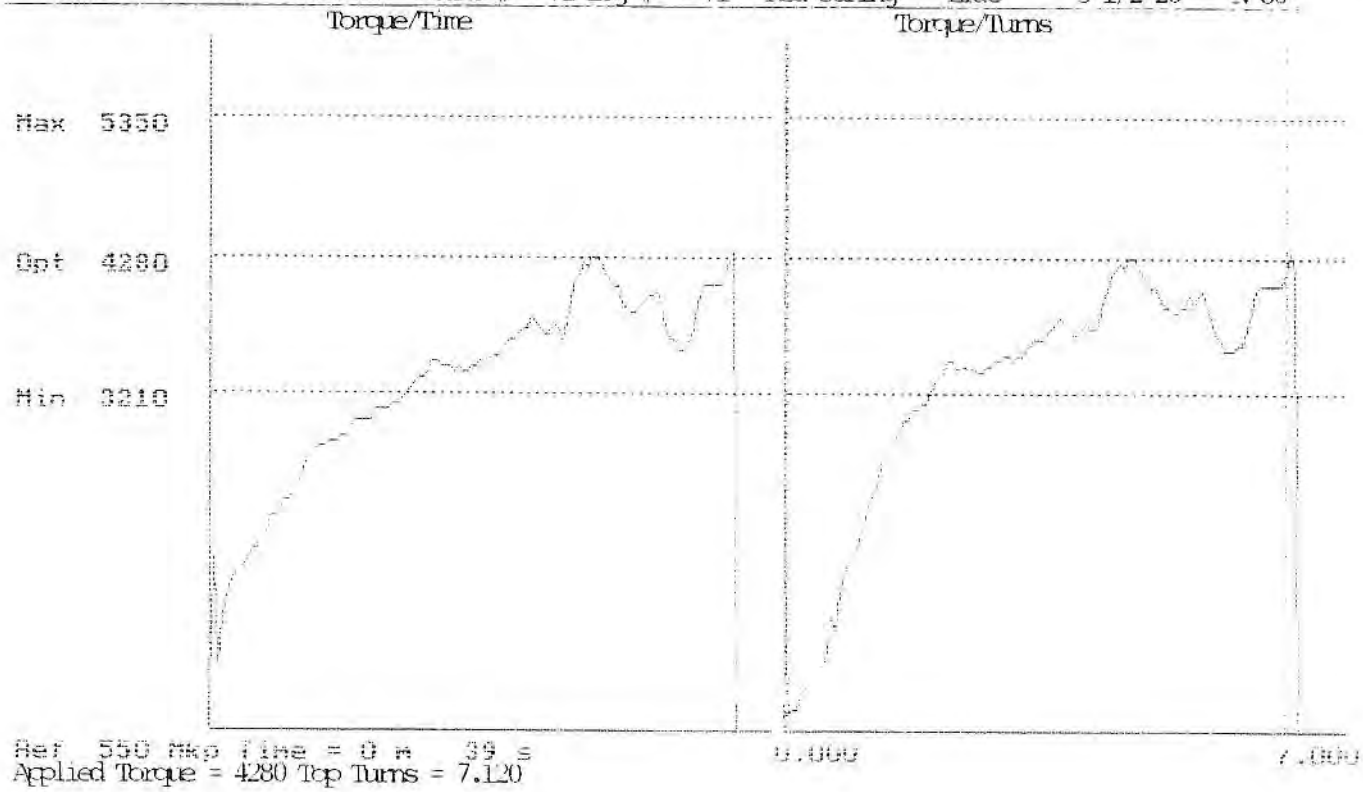
10:00 01/27/93 ACCEPT Joint # = 70 Log # = 70 Red String L&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 34 s
Applied Torque = 4321 Top Turns = 7.159

Comments:OK JWN

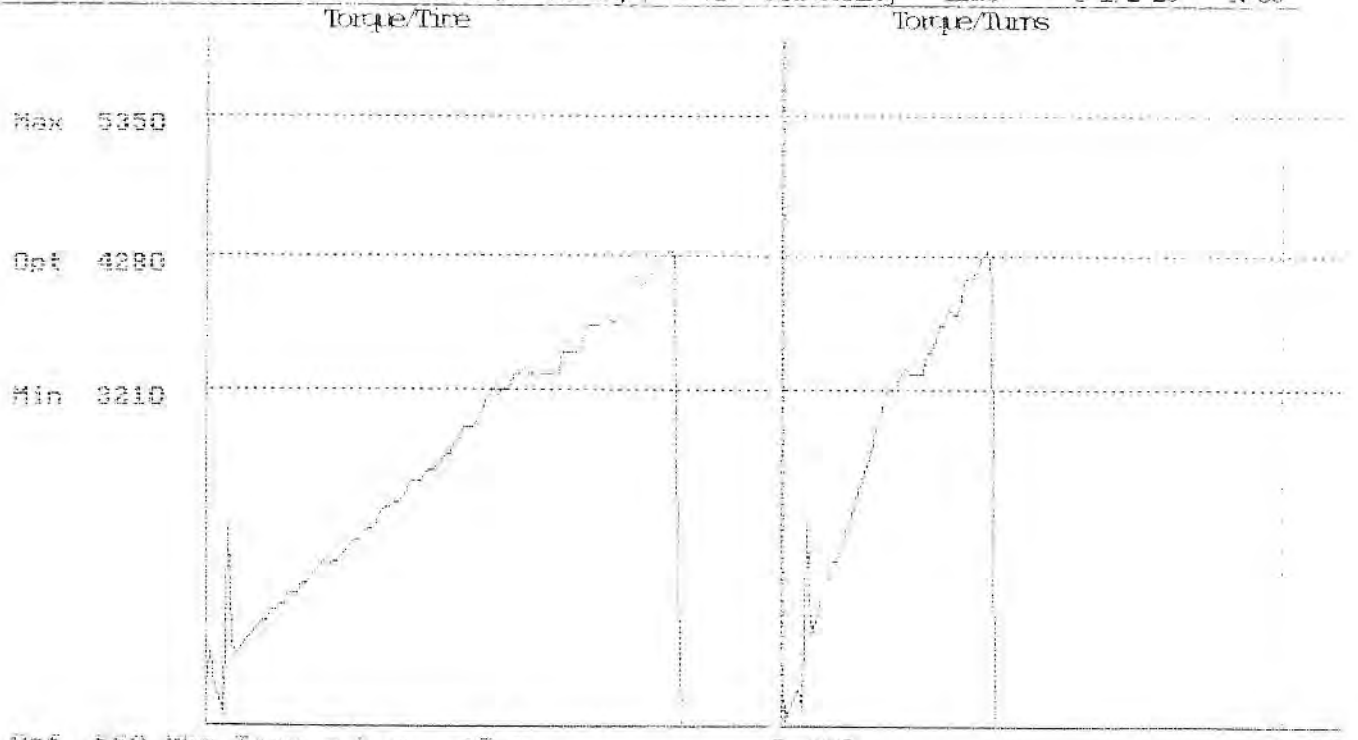
10:03 01/27/93 ACCEPT Joint # = 71 Log # = 71 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 7.120

Comments:OK JWN

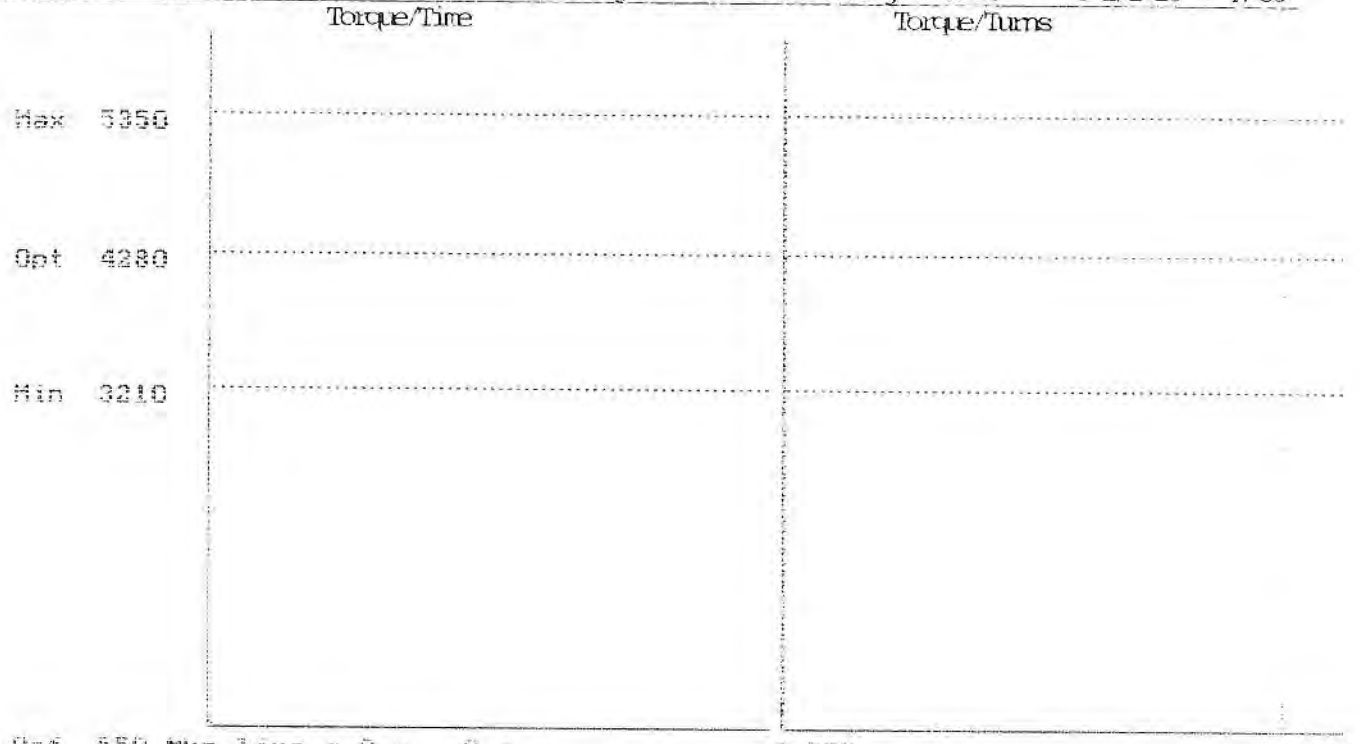
10:05 01/27/93 ACCEPT Joint # = 72 Log # = 72 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4295 Top Turns = 2.964

Comments:OK JWN

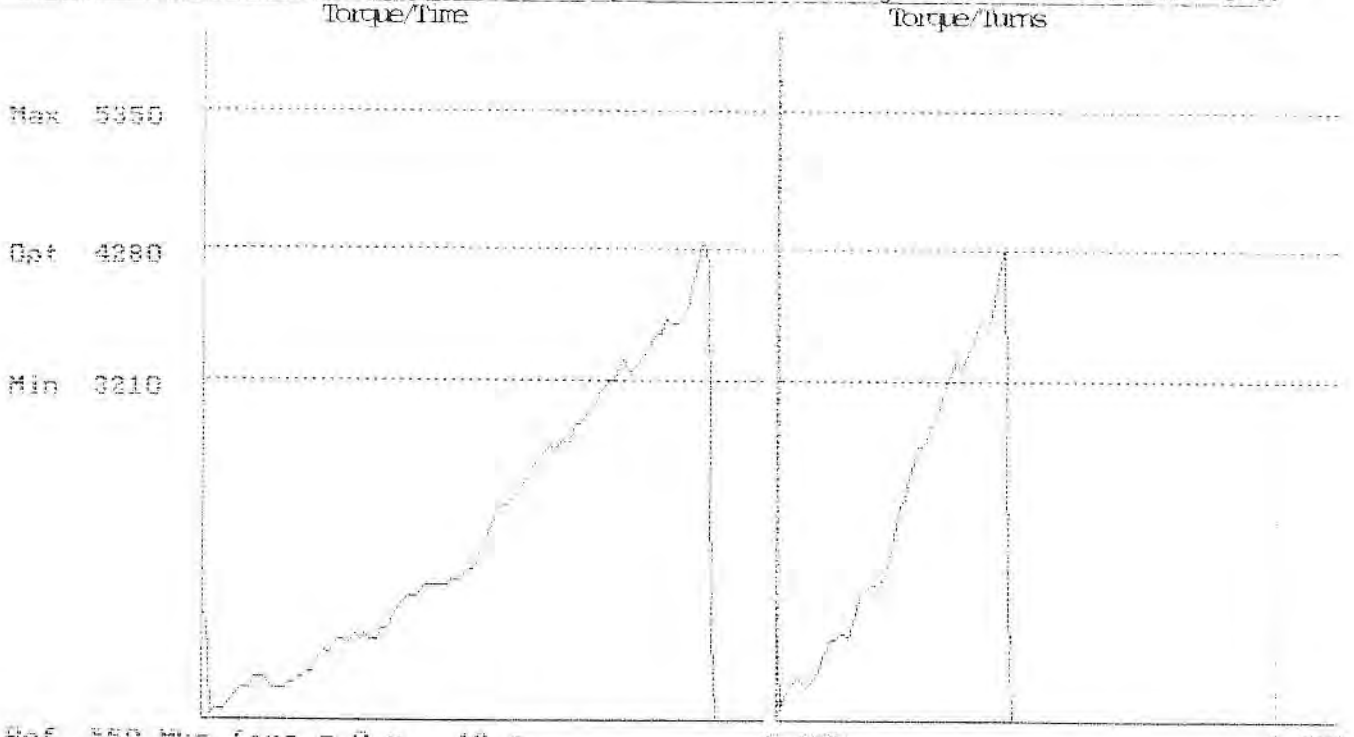
10:59 01/27/93 REJECT Joint # = 73 Log # = 73 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 0 s
Applied Torque = 619 Top Turns = 0.000

Comments:NAC

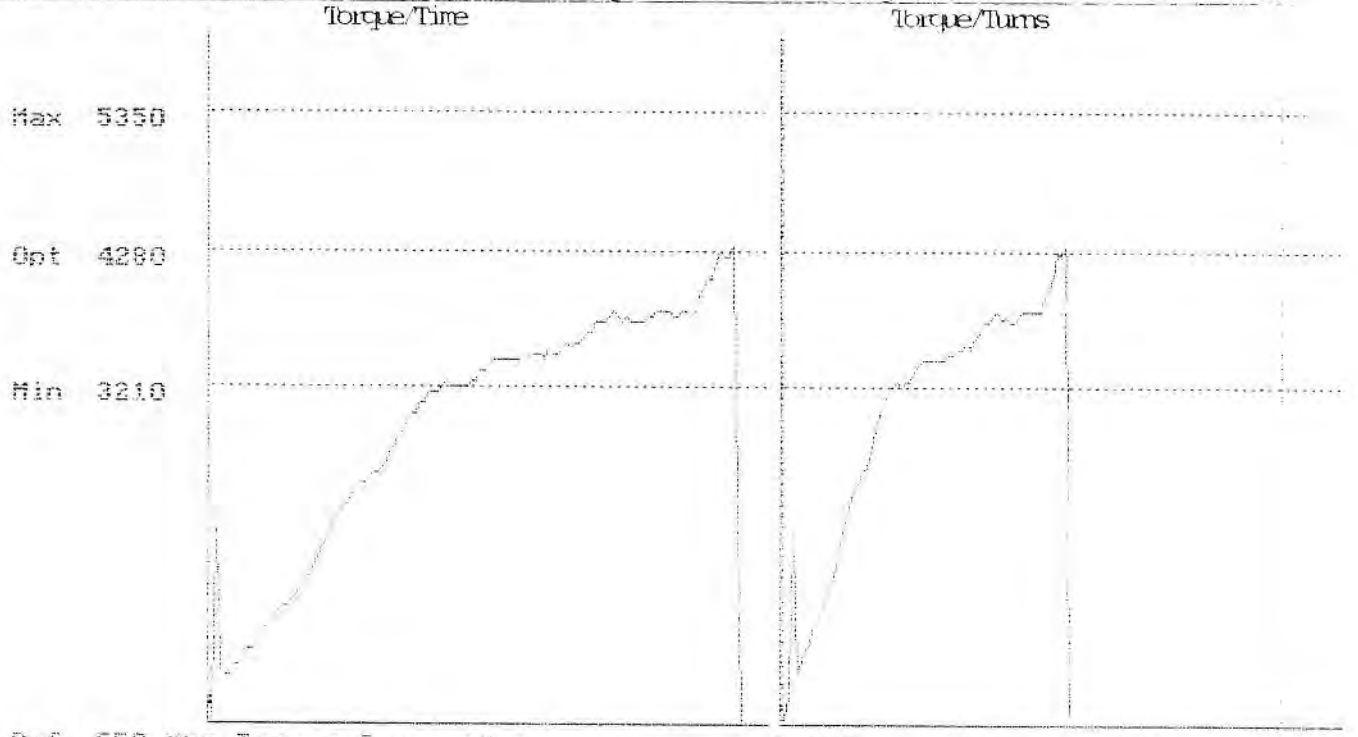
11:01 01/27/93 ACCEPT Joint # = 73 Log # = 74 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 18 s
Applied Torque = 4280 Top Turns = 3.259

Comments:OK JAN

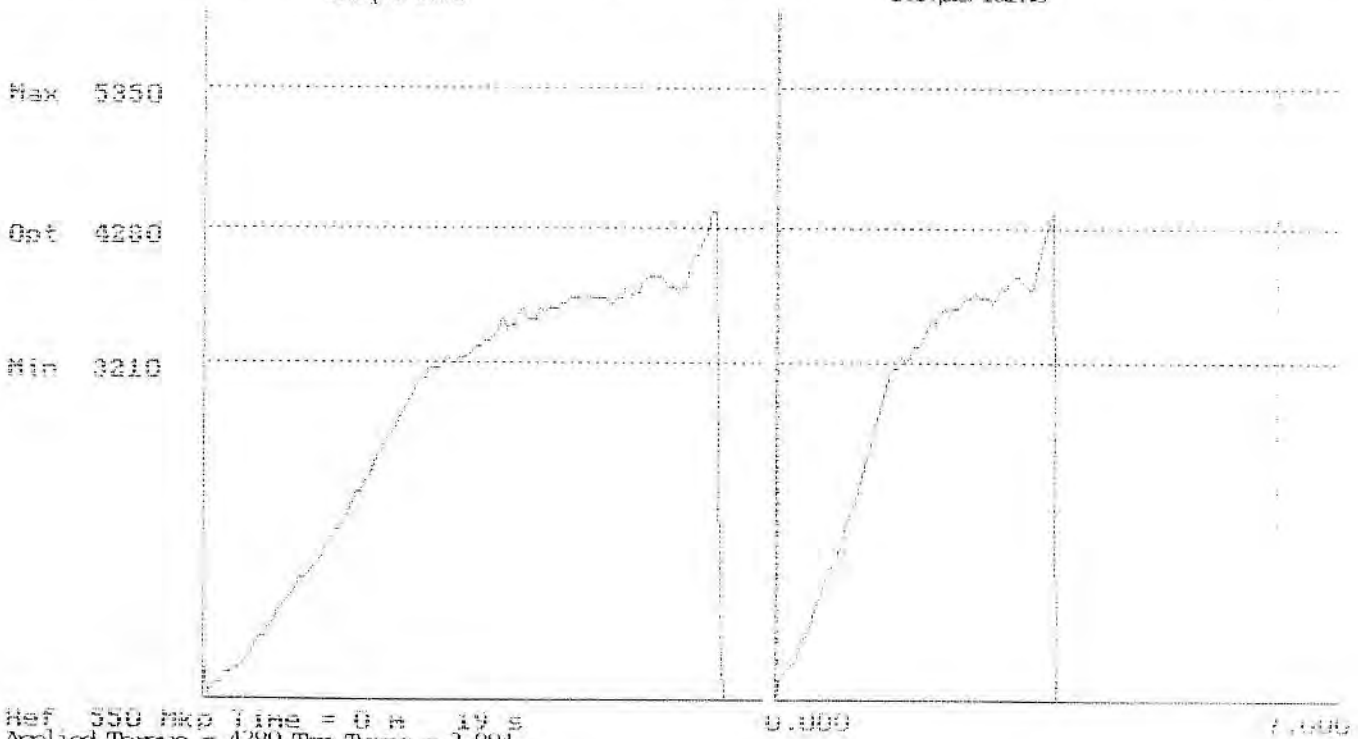
11:04 01/27/93 ACCEPT Joint # = 74 Log # = 75 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 4.030

Comments:OK JWN

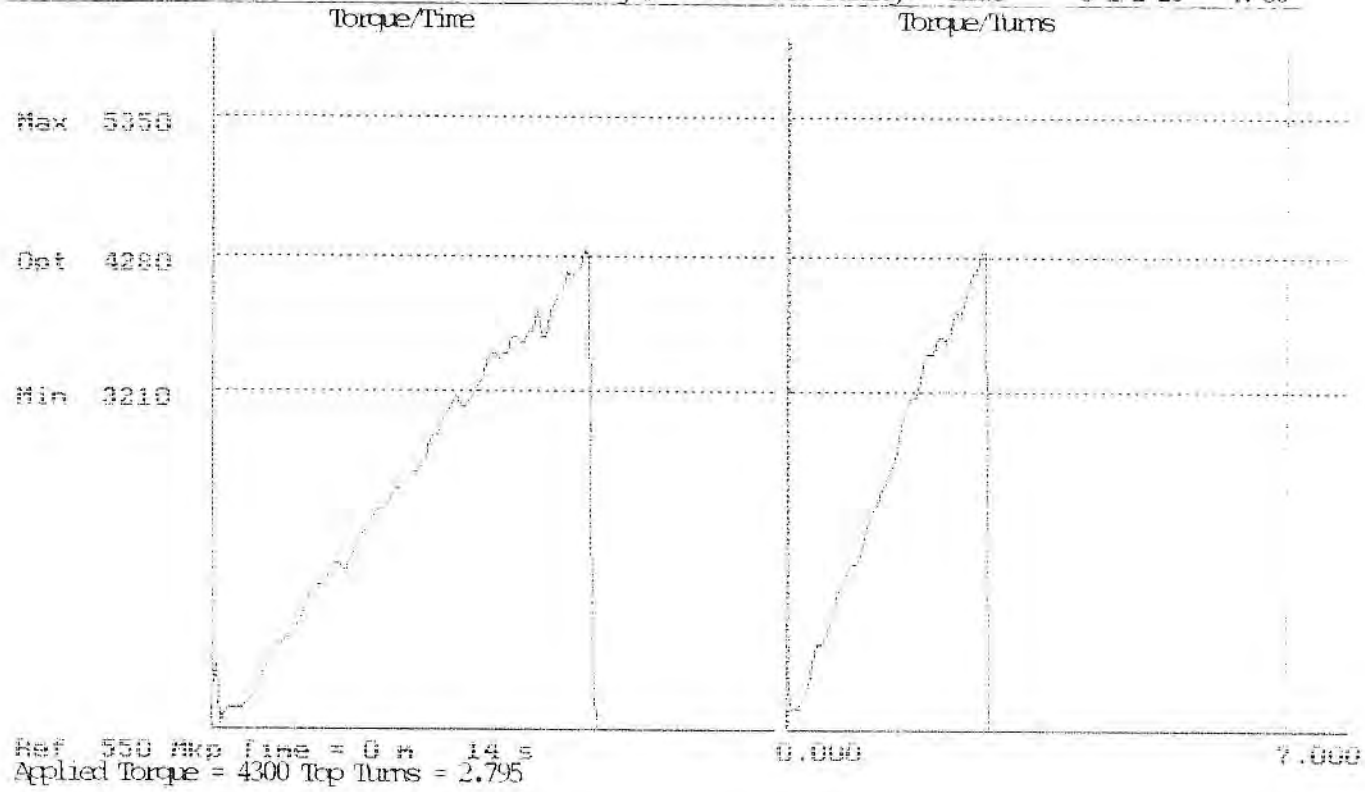
11:06 01/27/93 ACCEPT Joint # = 75 Log # = 76 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4389 Top Turns = 3.894

Comments:OK JWN

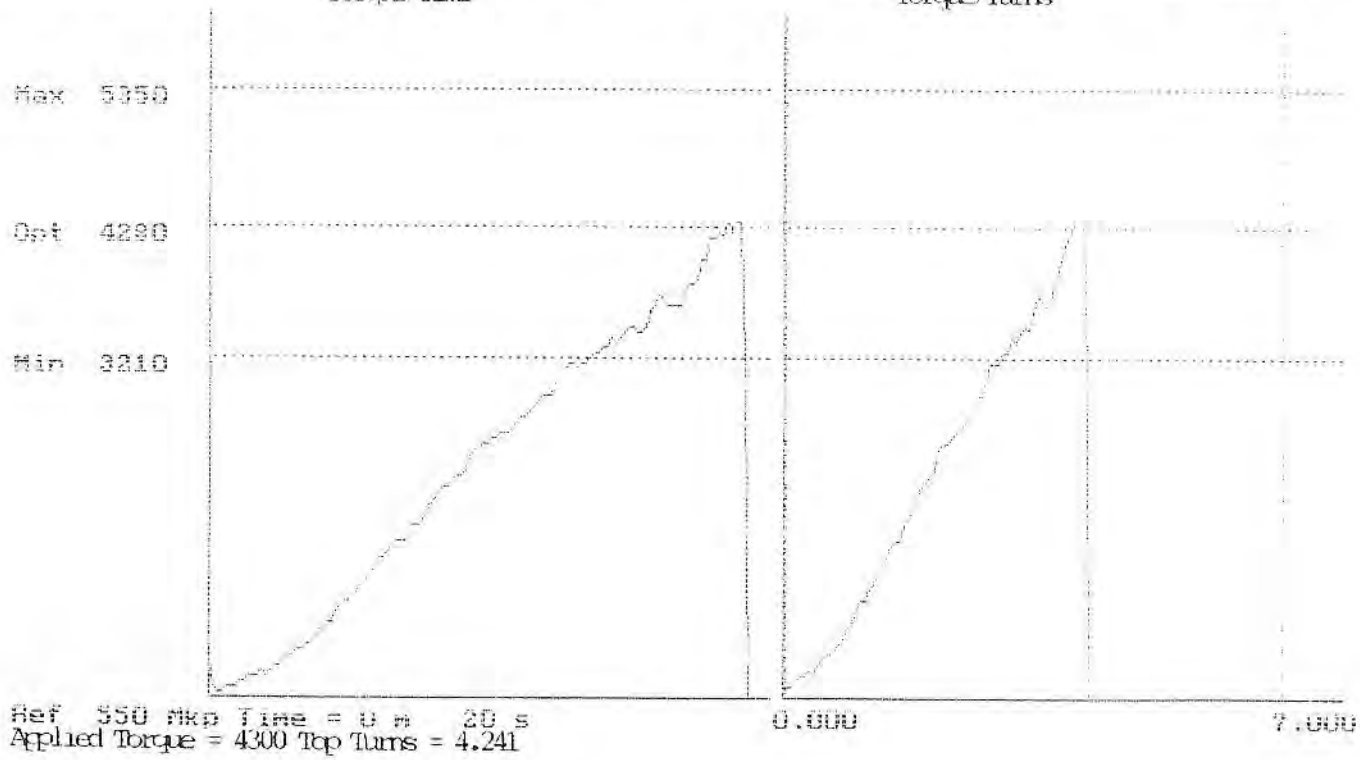
11:08 01/27/93 ACCEPT Joint # = 76 Log # = 77 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 2.795

Comments:OK JWN

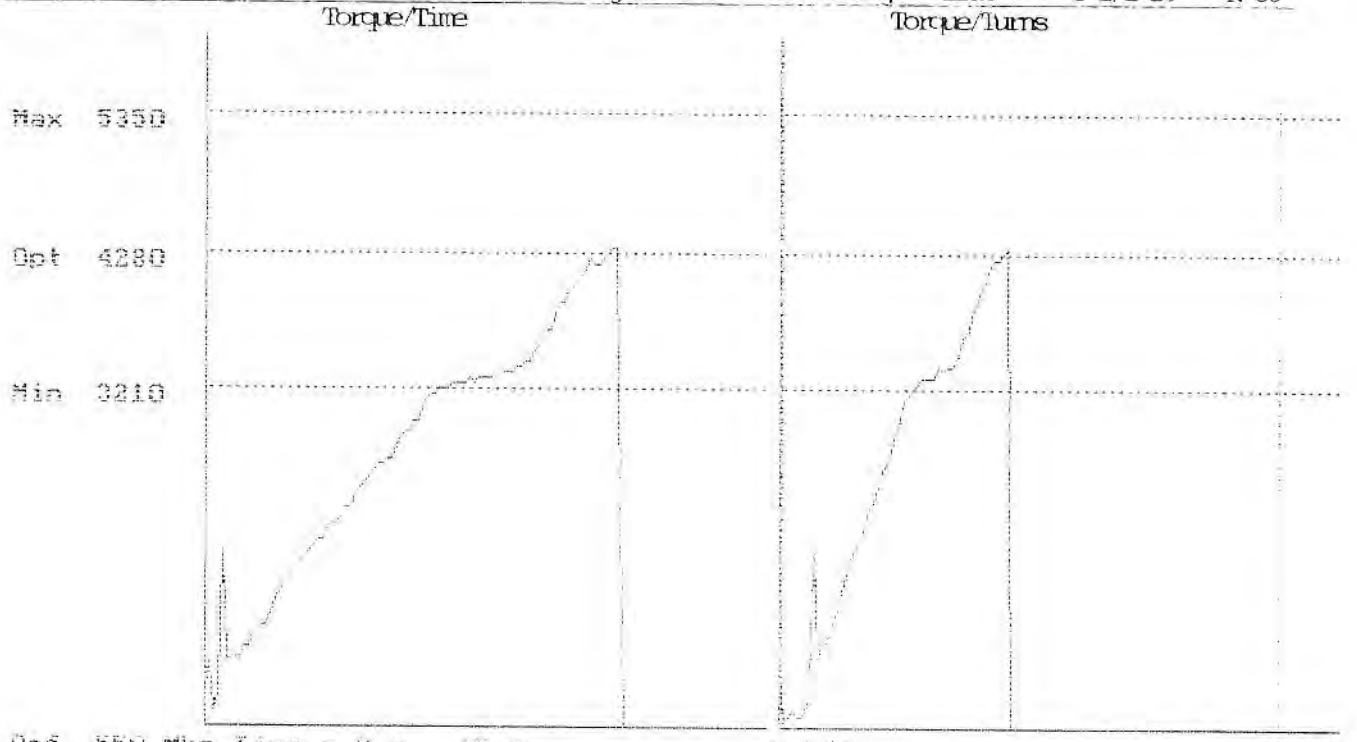
11:12 01/27/93 REJECT Joint # = 77 Log # = 78 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4300 Top Turns = 4.241

Comments:BACKED OUT FOR SPACE OUT

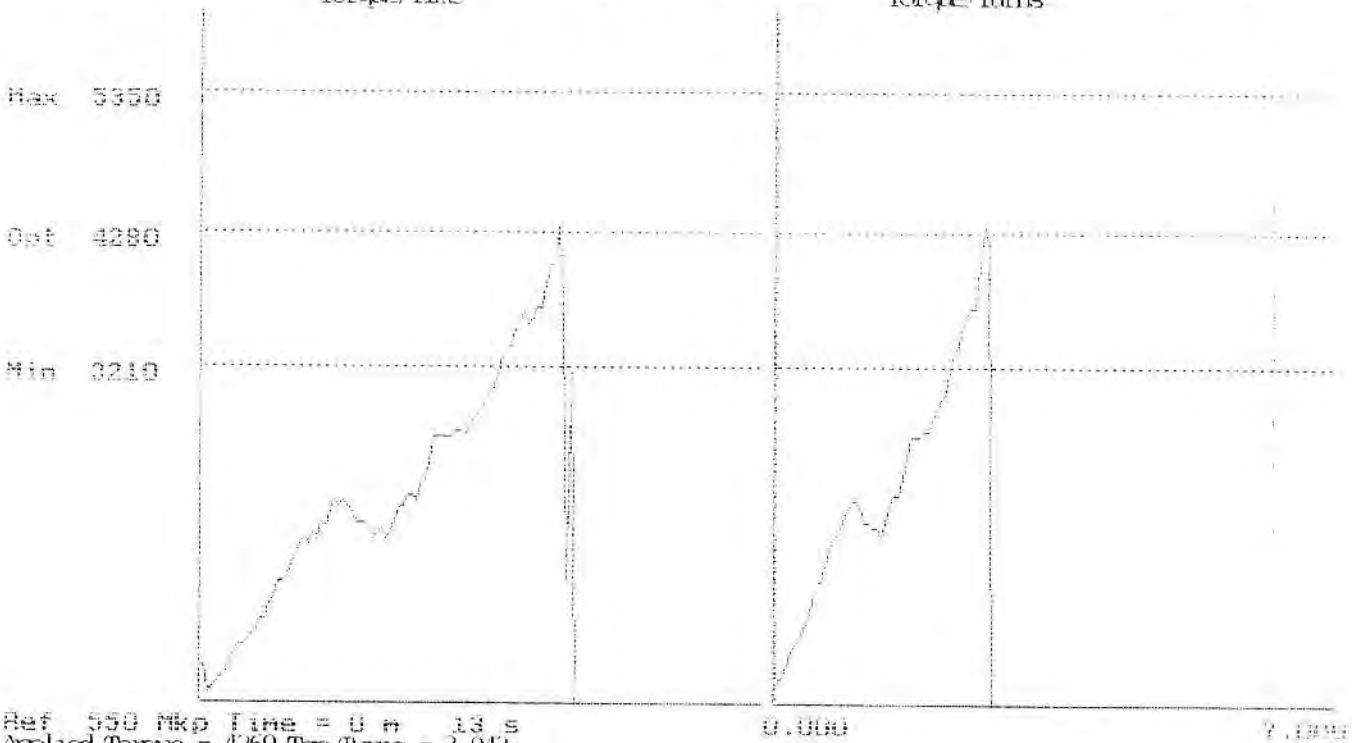
11:14 01/27/93 REJECT Joint # = 78 Log # = 79 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 13 s
Applied Torque = 4300 Top Turns = 3.241

Comments:BACKED OUT FOR SPACE OUT

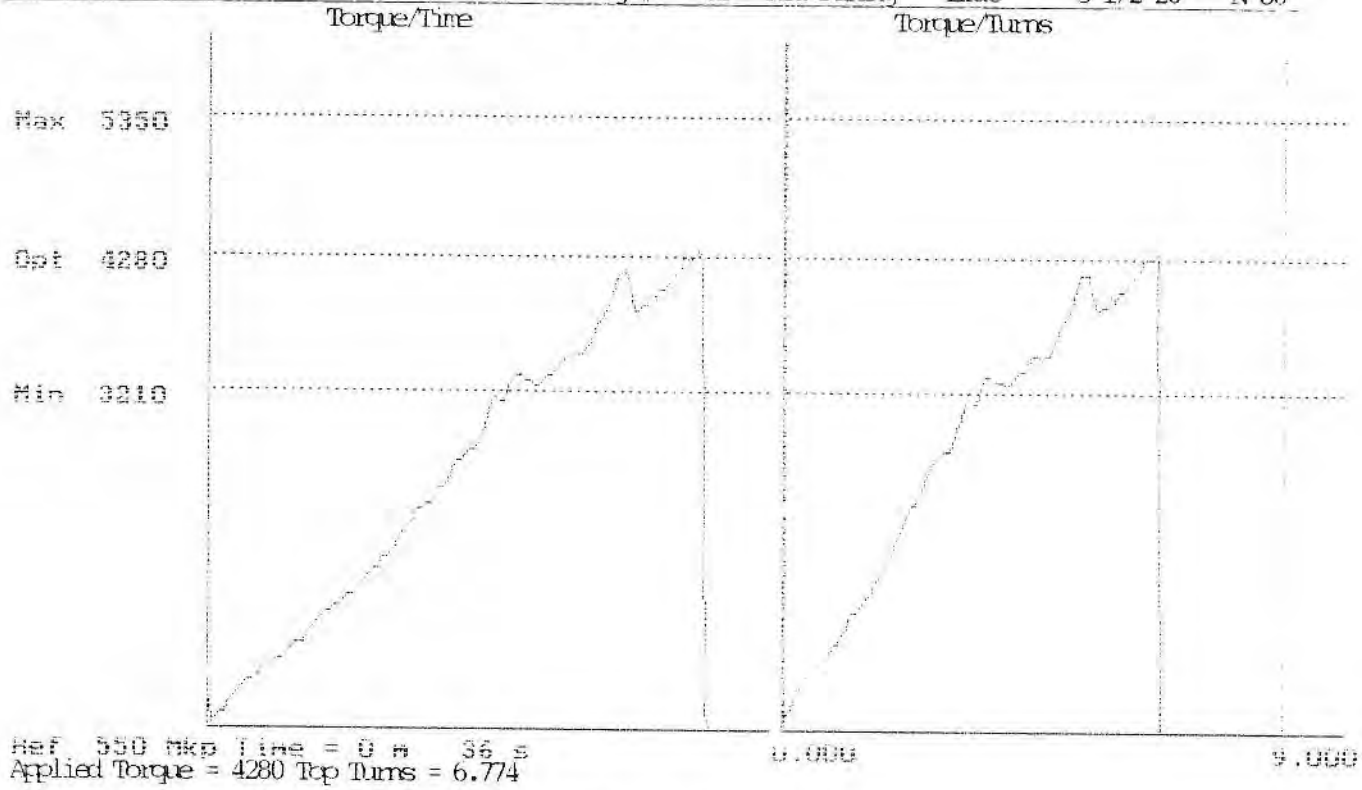
13:38 01/27/93 ACCEPT Joint # = 77 Log # = 80 Red String LT&C 5 1/2 20 N-80



Ref 550 Mkp Time = 0 m 13 s
Applied Torque = 4269 Top Turns = 3.043

Comments:OK JAN...8 FT PUP

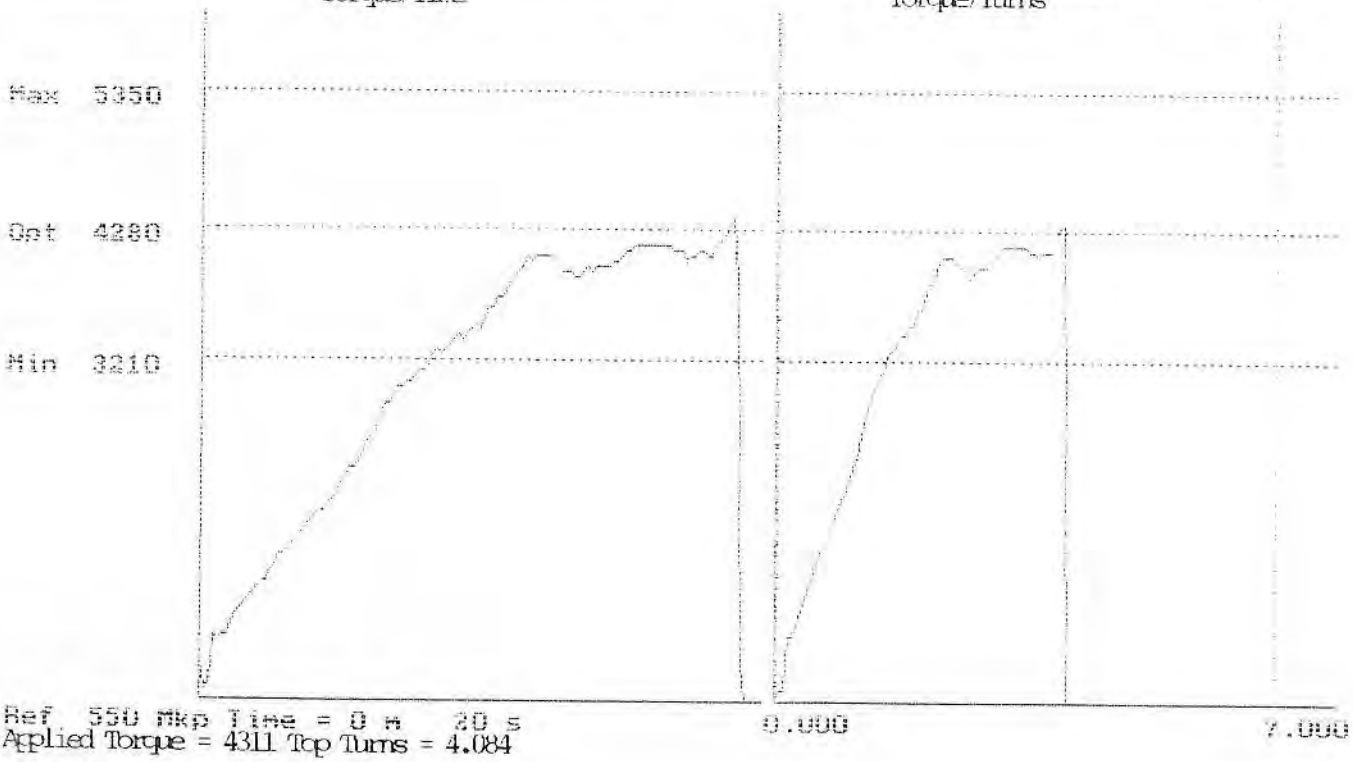
13:42 01/27/93 ACCEPT Joint # = 77 Log # = 81 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4280 Top Turns = 6.774

Comments:OK JWN...10 FT PUP...FLOATING COLLAR

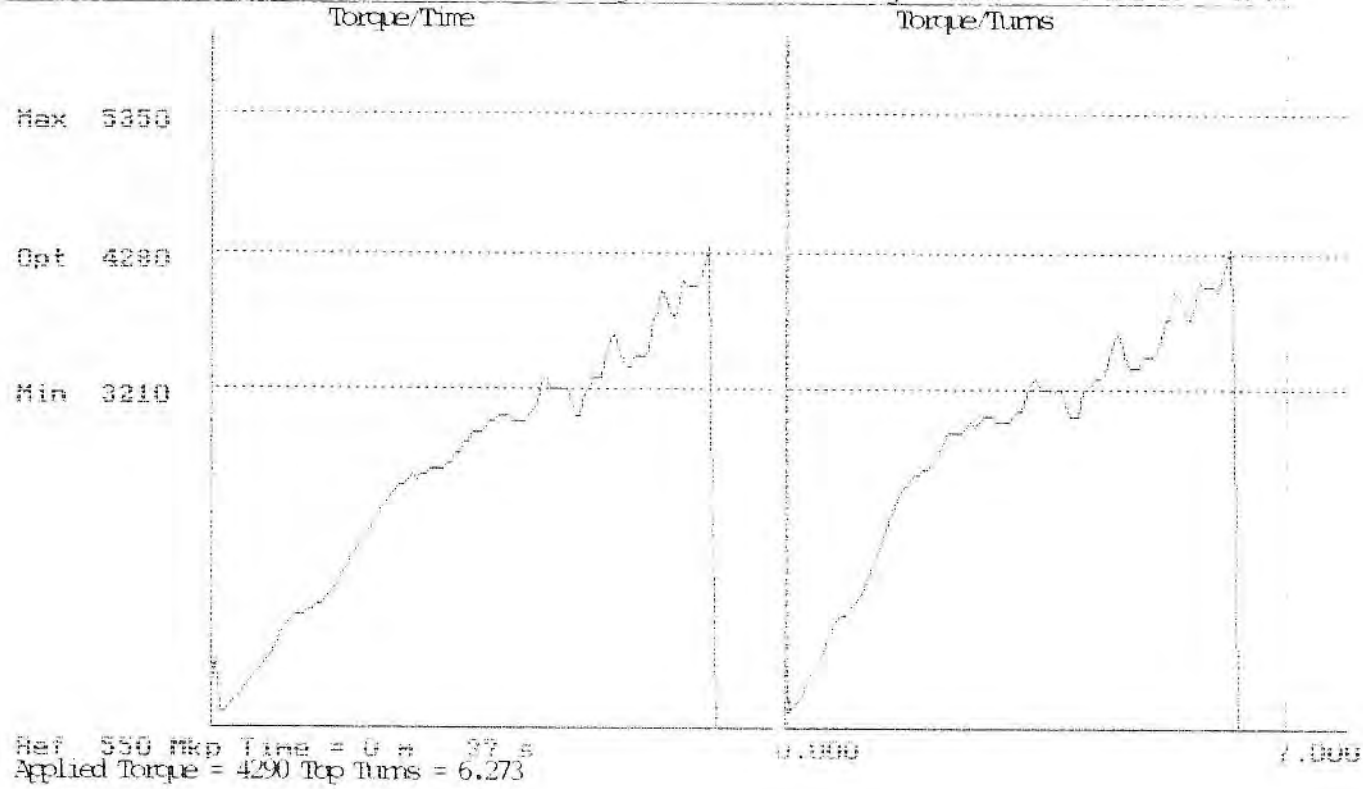
13:52 01/27/93 ACCEPT Joint # = 77 Log # = 82 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4311 Top Turns = 4.084

Comments:OK JWN...13 FT PUP

13:55 01/27/93 ACCEPT Joint # = 77 Log # = 83 Red String LT&C 5 1/2 20 N-80



Applied Torque = 4290 Top Turns = 6.273

Comments:OK JAN...LAST JOINT

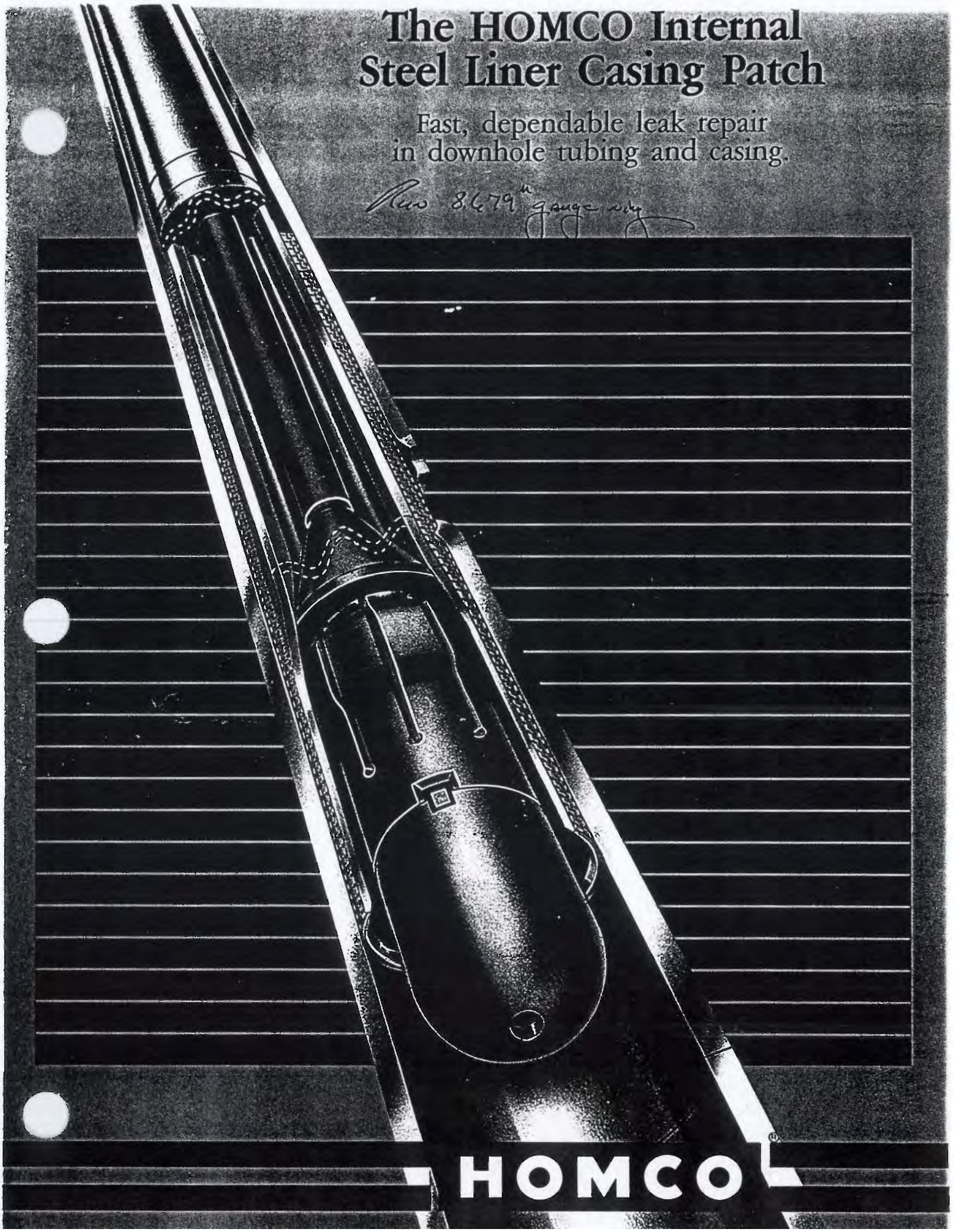
APPENDIX I

HOMCO CASING PATCH DATA

The HOMCO Internal Steel Liner Casing Patch

Fast, dependable leak repair in downhole tubing and casing.

Rev 8.679" gauge only



HOMCO®

98% Successful

Fast, permanent casing leak repairs with the HOMCO steel casing patch.

Applications

Designed to seal perforations, collar and thread leaks, splits, limited corrosive areas in tubing and casing and to provide added protection on squeeze jobs, the HOMCO Internal Steel Liner Casing Patch is as versatile as it is effective. It can be successfully placed to any depth and has repeatedly sealed leaks and perforations where cementing efforts have failed.

Patches can be used in production wells, in wells that have to be deepened after patching and in disposal and storage wells. They can be run through and set below previously installed patches and are permanent yet can be removed from the well bore by milling.

Advantages

The HOMCO Internal Steel Liner ing Patch has achieved worldwide ptance. Skilled HOMCO person-, using special setting tools and techniques have installed over 5,000 patches to date. The rate of success has been nearly perfect — 98%. And our customers tell us their patches are still holding.

The HOMCO Internal Steel Liner Casing Patch offers significant advantages over other sealing methods:

Speed

☐ Repairs are made quickly. Total setting time is limited only by round trip time.

☐ There is no waiting time. Operations can be resumed as soon as the setting tool is pulled and the patch pressure tested.

Certainty

☐ You get a seal the first time if leak information is accurate.

☐ The patch will seal against external pressure differentials as great as 3500 psi over a 1 inch diameter hole.

☐ Steel makes the seal. Steel is unlikely to crack or crumble. The fiberglass mat will never rot or corrode. The epoxy resin extrudes into leaks and cavities in the casing wall and acts as a gasket and secondary sealing agent.

☐ The HOMCO setting tool is designed for twice the normal operating pressure.

Versatility

☐ The HOMCO patch is available in 20′ lengths up to several hundred feet.

☐ HOMCO has a complete line of tools and patches for over 60 different sizes and weights of tubing and casing from 2⅞ to 16 inches.

☐ The casing patch is available worldwide through 72 HOMCO and A-1 Bit & Tool Company service locations (see back page).

⅛ inch thick liners are available for normal patching operations. A new heavier wall liner has been developed, successfully used, and is now available for higher pressure operations. Also available, upon request, is a special liner material for highly corrosive conditions, and one for high temperature wells (600°F).

Patches can be run through and set below previously installed patches of the same type.

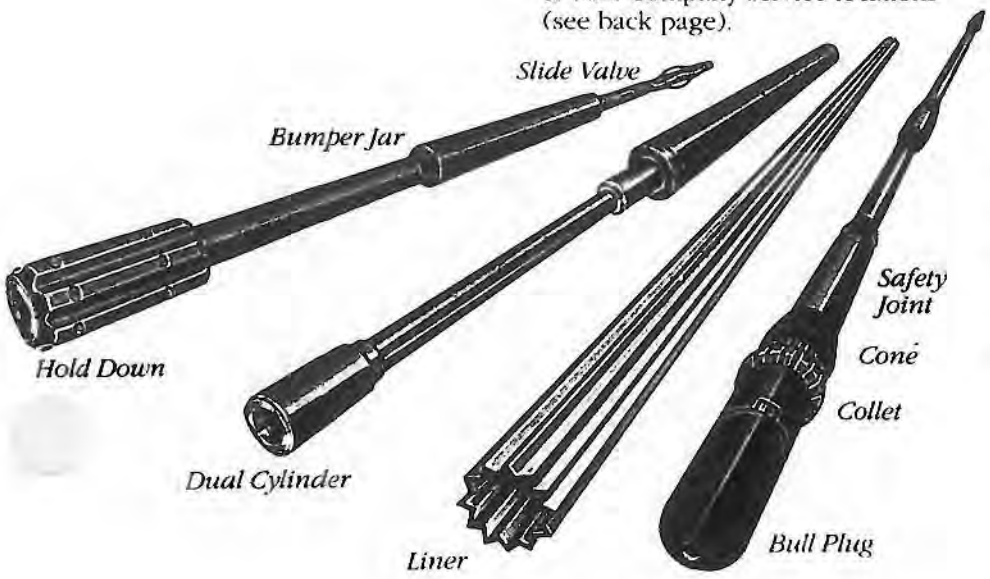
The HOMCO Internal Steel Liner Casing Patch requires special setting tools and techniques. Installation must be made by HOMCO or A-1 Bit & Tool personnel.

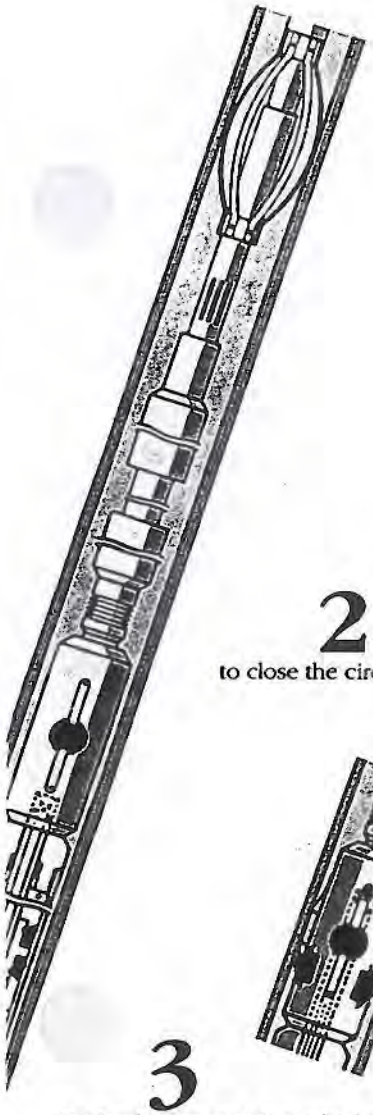
Tool Components...

The major components of the setting tool include the slide valve, bumper jar, hold down, dual cylinder and liner. The tool is essentially a dual hydraulic cylinder assembly with an expander assembly (cone and collet) to expand the steel liner. The steel liner is located over the lower piston stem and stem extensions connected to the dual cylinder assembly.

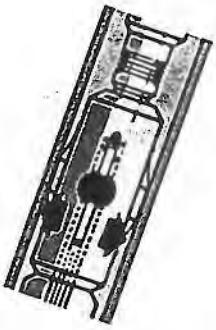
...and Operation.

1 The setting tool is assembled. The patch is sized to the casing. The expander assembly, extensions, and casing patch are placed on the lower polished rod. After the steel liner is coated with epoxy resin the tool is run into the well bore on the working string. The liner is positioned across the leak area.

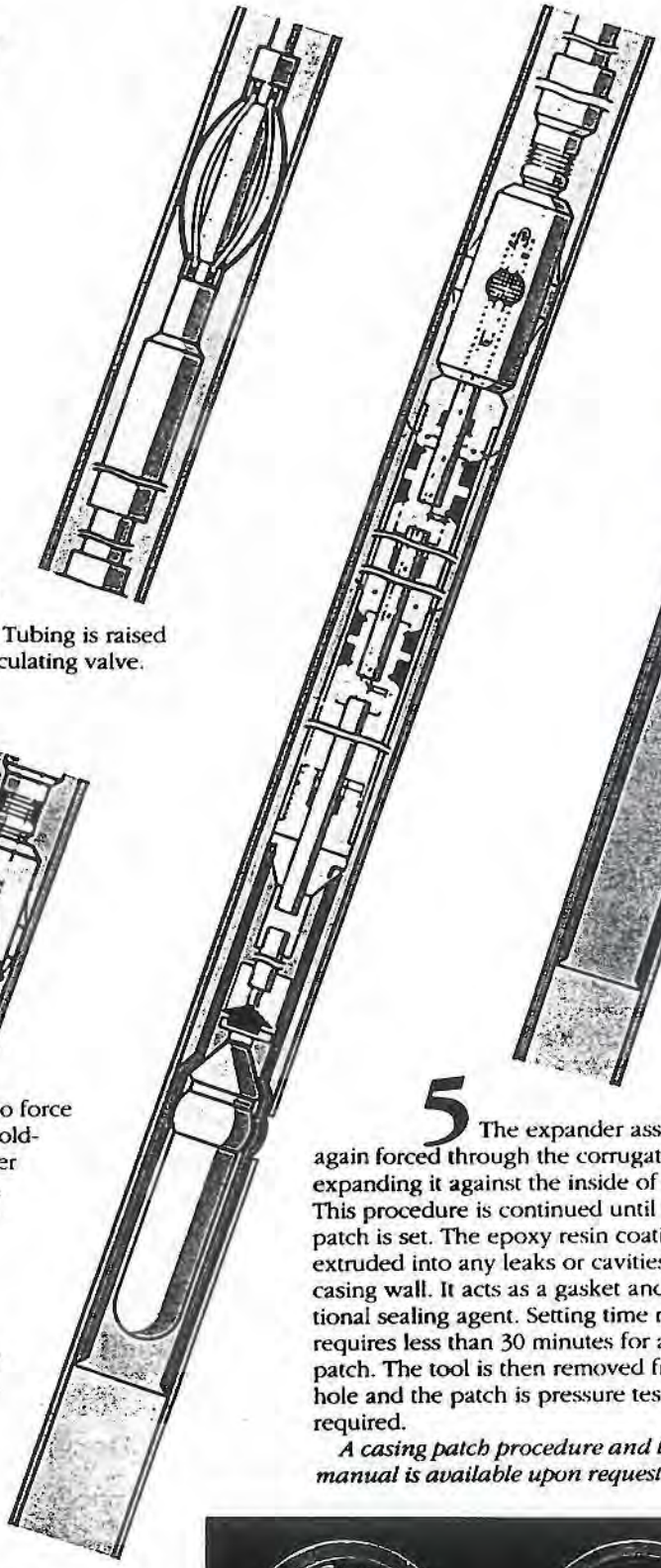




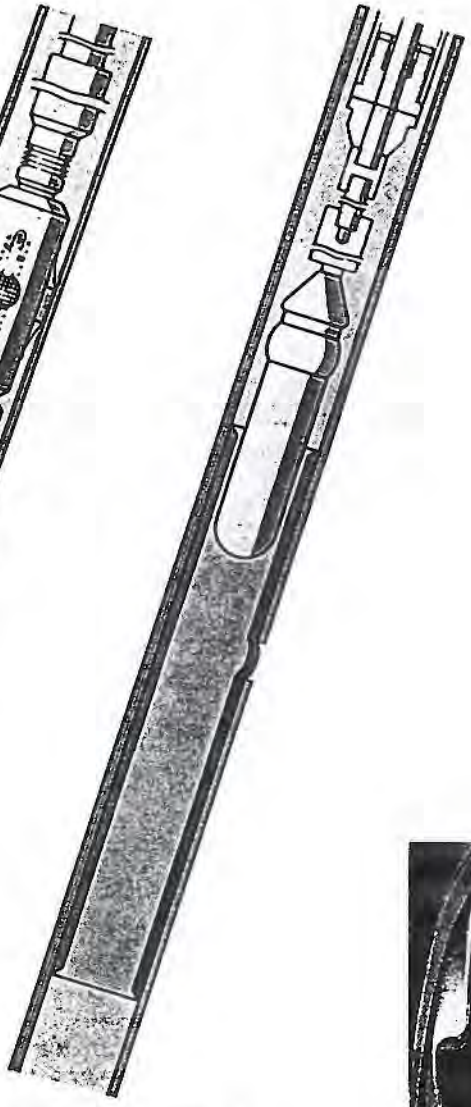
2 Tubing is raised to close the circulating valve.



3 Hydraulic pressure is applied to force out buttons on the hydraulic holddown. This anchors the cylinder firmly and isolates tubing from all tensile loads caused by the setting operation.

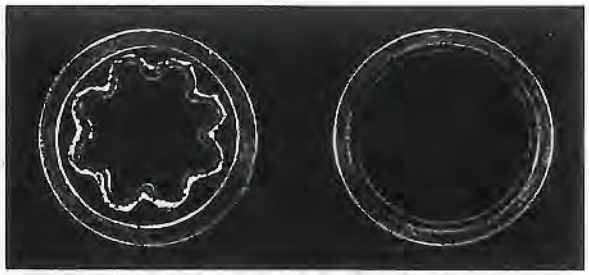


4 Pressure on underside of pistons pulls expander assembly into the botton of the corrugated patch. As pressure increases, the expander assembly is forced further into the patch. expanding it against the inside of the casing. Five feet of patch can be expanded in one stroke. The circulating valve is opened by lowering tubing and telescoping the slide valve. Tubing is raised again to pull up the cylinders in relation to pistons held down by the expander assembly. Expanded section of patch is anchored to the casing wall by friction caused by ressive hoop stress. Hydraulic pres- s again applied to tubing after closing the circulating valve. Hydraulic holddown buttons expand to anchor the cylinder in a new, higher position.



5 The expander assembly is again forced through the corrugated patch, expanding it against the inside of casing. This procedure is continued until the entire patch is set. The epoxy resin coating is extruded into any leaks or cavities in the casing wall. It acts as a gasket and additional sealing agent. Setting time normally requires less than 30 minutes for a 20′ patch. The tool is then removed from the hole and the patch is pressure tested as required.

A casing patch procedure and technical manual is available upon request.



The Homco Patch is an internal steel liner having a standard wall thickness of 1/8 inch. Available in 20′ lengths up to several hundred feet, they are corrugated longitudinally to provide clearance for running inside casing. Covered with a glass mat and coated with epoxy resin, the patch is expanded to conform symmetrically to the casing bore. Casing diameter is reduced .300 inch using the standard 1/8 inch liner and .480 inch using the heavier wall liner. Special liners are available for high pressure and temperature operations as well as H_2S, CO_2 and corrosive conditions.

FORWARD

The following manual has been written to provide information regarding the proper use of HOMCO's Internal Casing Patch in specific applications. It poses questions (and reasons for each question) required to determine the feasibility of successfully using the patch to seal leaks in casing in any situation. Each type of leak application is discussed with regard to special requirements and concerns typically associated with leaks of that type.

Common questions and concerns associated with any patch job are discussed as well as recommended hole preparation and how to prepare for setting a patch.

Certain procedures are identified to avoid potential problems which may arise during the setting of a patch. Knowledge of the potential problems and steps to avoid them prior to running a patch will assure the continued success of sealing any leak with HOMCO's Internal Casing Patch.

HOMCO INTERNATIONAL, INC.
Engineering Department

INDEX

FORWARD
INDEX

I. **WHAT IS HOMCO's INTERNAL CASING PATCH** 1

II. **HOW TO DETERMINE IF THE PATCH IS THE SOLUTION TO A SPECIFIC APPLICATION** 2

A. Questions Common to All Applications 3

B. Discussion and Concerns Associated With Specific Applications

1. Collar Leaks 4
2. Perforations 4
3. Split Casing 4
4. Milled Windows or Wear in Doglegs 5
5. Corrosion 6
6. Water Encroachment or Coning 6

C. Reasons Behind the Questions ..... 7 - 10

III. **HOLE PREPARATIONS AND RECOMMENDATIONS BEFORE RUNNING THE PATCH** 11

A. Locating Leaks and Correlating Depth 12

B. Length of Patch Required 12

IV. **PRECAUTIONS WHILE RUNNING THE PATCH** 13

V. **STUCK IN THE HOLE** 13

A. Removing a Set Patch 13

VI. **SPECIAL PATCH APPLICATIONS** 14

A. High Temperature Applications 14

B. Corrosion Resistant Patches 14

C. Extended Length Patches 14

D. Heavy Wall Patches 15

E. Multiple Patches in One Well 16

F. Possible Combinations of Special Patches 16

INDEX

VII. **TESTING OF THE PATCH** 16

VIII. **PRESSURE RATING OF THE PATCH**

A. Pressure Capacity Chart 17

B. Internal Pressure Capacity Chart 18

IX. **CASE HISTORY** 19

A. Technical Data Chart 20

X. **HOMCO SALES AND SERVICE LOCATIONS** 21

WHAT IS HOMCO's INTERNAL CASING PATCH

HOMCO's Internal Casing Patch is a thin walled steel liner which tightly conforms against the inside of casing to permanently seal any type of casing leak. The standard patch only restricts the I.D. of the casing by 0.300 inches. However, a heavier patch is available in casing sizes 7" and larger with a 0.480 I.D. restriction.

The standard patch arrives at location in corrugated form (star shaped in cross-section to allow free passage down hole) with fiberglass cloth on the outside. When starting the patch in the hole, epoxy is applied on the fiberglass cloth. Once in position the patch is expanded by pulling a specially designed expander assembly thru it with a hydraulic cylinder assembly. Once expanded or formed against the casing I.D. it is permanently held in place by radial compression.

For over 25 years, HOMCO's Internal Casing Patch has been successfully used to seal various types of casing leaks (ie. collar leaks, perforations, splits, etc.). The patch is available in virtually all sizes and weights ranging from 2 7/8" tubing to 13 3/8" casing. Other or special sizes are available by special order.

HOW TO DETERMINE IF THE PATCH IS THE SOLUTION TO A SPECIFIC APPLICATION

In determining the feasibility of using the patch to seal a specific type of leak in a given application, many questions should be carefully considered. The following pages pose many questions regarding well conditions, etc., which should be carefully answered prior to running a patch. The accuracy of the answers could mean the difference between a successful patch and or a mis-run.

Various types of applications are discussed with specific concerns that apply to each application. Also the reasons behind each question are discussed to provide the reader with information to determine the feasibility of a successful patch. Always consult with a HOMCO representative on the concerns presented in the pages that follow.

The following pages are not intended to imply that the patch will definitely, or definitely not, work. They are intended to emphasize the importance of accurate information and discussion of pertinent well conditions which could adversely affect the setting and performance of the patch.

QUESTIONS COMMON TO ALL APPLICATIONS

1. Casing Size and Weight ? _____
2. I.D. restrictions above, in, or near leak area ? If so, describe giving I.D.'s:

   _____ Inch I.D. _____
3. Hole Deviation ? _____ °
4. Depth and Severity of Doglegs ? _____
5. Fluid Level ?_____ ft., Weight ?_____ #, Corrosive ? _____
6. Pressure Rating Required ? Internal _____ psi., External _____psi
   (see page 21)
7. Depth of Leak(s) or Leaking Zone(s)? _____
8. Type of Leak ?

   _____ Collar Leak (See Page 5)

   _____ Perforations (See Page 5)

   _____ Split Casing (See Page 5)

   _____ Milled Windows or Wear in Dogleg. (See Page 6)

   _____ Corrosion (See Page 7)

   _____ Water Encroachment or Coning (See Page 7)

   _____ Other. Specify: _____
9. Describe the Leak: (Size, Diameter, Length, Width, etc.)

   _____
10. Temperature ? Downhole _____ °F; Atmospheric _____ °F.
11. Is Additional Drilling Planned ? _____
12. What equipment will have to pass thru the patch ? Describe: _____

    _____
13. Rig Size: Height ? _____ Pulling Capacity at Depth ?_____
14. Work String ? _____ Size ? _____

    Connection ? _____ Pressure Rating ? _____

    Pulling Capacity at Depth ?_____

DISCUSSION AND CONCERNS ASSOCIATED WITH SPECIFIC APPLICATIONS

COLLAR LEAKS

The Casing Patch is excellent for sealing collar leaks. A 20 foot patch can easily be placed across the leaking collars. No special preparation is required, other than a casing scraper and drift runs.

The internal pressure rating will typically be the casing limit (as shown on Page 20) unless the connection is severely washed out.

PERFORATIONS

Undesired perforations, such as test zones or low pay zones, can be sealed off quickly with an internal casing patch. Also the slight I.D. restriction (typically 0.300") has little effect on production of pay zones below.

The size of the perforations will dictate the pressure rating of the patch. Corrosion and erosion of the perforations will increase their size and reduce the internal and external pressure rating of the patch. Refer to the pressure rating chart on page 20.

Patches can be milled out or perforated to re-open a zone.

Coning or encroachment of water or gas in large production zones is discussed on page 7.

SPLIT CASING

When patching split casing, it is strongly recommended that the patch cover the full length of the joint plus 6 to 8 feet overlap on each end. The reason for this is that splits will have a tendency to grow over time, or more likely, while setting the patch.

If the split was caused by excessive pressure, it is important to closely consider future pressure requirements of the patch.

MILLED WINDOWS or WEAR IN DOGLEGS

A number of additional questions should be addressed when dealing with these applications.

Milled windows or wear holes in doglegs are often quite large and their size or shape is difficult to determine. To determine approximate pressure ratings a somewhat accurate description of the leak is required. If an accurate description is not obtained use the worst case pressure rating for that size casing. (See Pressure Rating Chart Page 20.)

A milled window may have rolled-in edge at the bottom. If this possible edge is large enough it could interfere with the setting of the patch, possibly resulting in being stuck in the hole (see page 15) with the patch partially set. With this in mind, it is extremely important to make an API drift run to assure that the patch can be set. If the drift won't pass thru, a taper mill or string mill can be run to remove the restriction. Re-run the drift to assure that the restriction is removed. If the drift passes freely, there should be no problems in setting a perfect patch.

Doglegs pose a similar situation. Severe doglegs may not allow the rigid unset patch and tools to pass. Therefore, it is strongly recommended that a trip be made with a flush joint wash pipe or drill collars longer than the patch and tools with an O.D. larger than the unset patch. This will assure that the patch and setting equipment will pass thru the dogleg and avoid a mis-run or getting stuck and setting the patch in the wrong location and further restricting the dogleg.

Rod wear of tubing or casing in doglegs can be patched, but if a rod pump is used after patching, the rods will eventually wear thru the patch.

A casing scraper run is always recommended before setting a patch to clean the casing in the patch area. However, if the window or dogleg wear is very large there may be some concern about sticking the scraper. Bear in mind that not making a scraper run has its risks as well. Foreign material on the casing wall, if large enough, can prevent setting the full length of patch resulting in a fishing job. This is another good reason for the drift run or mill run described above.