APPENDIX D

WELL LOGS

VIDEO LOG

LAYNE CHRISTENSEN CO.
11001 ETIWANDA AVE. FONTANA, CA.
909 390-2833

CLIENT: CITY OF SAN BERNARDINO
ADDRESS: 300 N. "D" ST SAN BERNARDINO, CA
PHONE: (909)384-5391
LOCATION: 13TH AND "G" ST. SAN BERNARDINO, CA.

WELL NUMBER: 108 JOB NUMBER: 27-5567

SURVEYED BY: DON LEWISON: DATE: 09-JULY-01

STATIC WATER LEVEL: 189 FT. TOTAL DEPTH: 990 FT.

WATER CONDITION: TURBID/CLEAR

CASING DIAMETER: 19.75 INCH INSIDE DIAMETER

TYPE OF PERFORATIONS: SUPER/FLO MOSS LOUVER

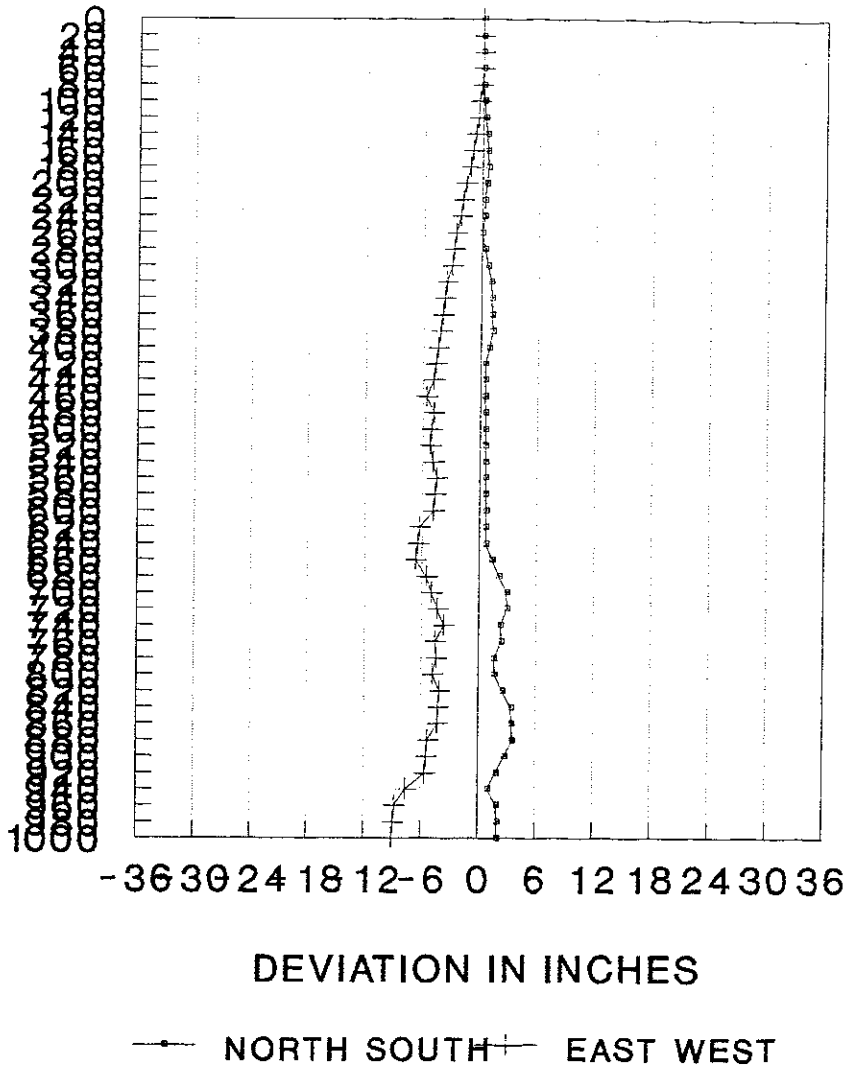
LOCATION OF PERFORATIONS: 510 TO 590 FT. AND 670 TO 990 FT.

NOTES: THIS SURVEY WAS DONE USING THE R-2000 CAMERA. ALL DEPTHS SHOWN ON THE SURVEY ARE RELATIVE FROM THE CENTER OF THE SIDE CAMERA TO THE TOP OF THE WELL CASING. THE DOWN HOLE PERSPECTIVE IS 1' 2" BELOW THE SIDE CAMERA DEPTH.

THERE IS A FILM OF OIL AT THE STATIC WATER LEVEL. THE PERFORATIONS FROM 510 TO 590 FT., APPEAR OPEN WITH GRAVEL PACK VISIBLE IN THE LOUVER. THE SECOND ZONE OF PERFORATIONS, FROM 670 TO 990 FT. APPEAR TO BE OPEN WITH SOME SETTLED FINES ALONG THE LOUVER. THERE IS FILL IN THE WELL AT 990 FT. THE CASING SCHEDULE CALLS FOR LOUVER PERFORATIONS TO 1000 FT.

WELL #108
ALIGNMENT SURVEY

DEPTH IN FEET



SURVEYED 09-JULY-01

LAYNE CHRISTENSEN CO.

11001 ETIWANDA AVE. FONTANA,

pg. 1

OWNER City of San Bernardino DATE 09-JUL-01
ADDRESS 13th + G St San Bernardino PLUMBED BY D. Lewison
WELL DIA. 19.75 WATER LEVEL 189 Ft. DATUM 10 Ft.
WELL NUMBER #108 JOB NUMBER 27-5567

DEPTH. FT.	DRIFT READING .00 INCHES				DEPTH FT.	DEVIATION READING INCHES			
	N.	S.	E.	W.		N.	S.	E.	W.
10	0		.0		10	.0		.0	
20	0		0		* 20	.0		.0	
30	.0		.0		30	.0		.0	
40	.0		.0		* 40	0		.0	
50	.0		.0		50	.0		.0	
60	.0		.0		* 60	.0		.0	
70	.0			.01	70	.0			.08
80	.0			.02	* 80	.0			.18
90	.0			.03	90	.0			.30
100		.01		.04	* 100	.11			.44
10		.02		.04	10	.24			.48
20		.02		.04	* 20	.26			.52
30		.03		.04	30	.42			.56
40		.03		.05	* 40	.45			.75
50		.03		.05	50	.48			.80
60		.03		.06	* 60	.51			1.02
70		.04		.06	70	.72			1.08
80		.03		.07	* 80	.57			1.33
90		.02		.08	90	.40			1.60
200		.02		.08	* 200	.42			1.68
10		.02		.09	10	.44			1.98
20		.01		.09	* 20	.23			2.07
30		.01		.09	30	.24			2.16
40		.01		.09	* 40	.25			2.25
50		.01		.10	250	.26			2.60

2

LAYNE CHRISTENSEN CO.

11001 ETIWANDA AVE. FONTANA,

Pg 2

OWNER City of San Bernardino DATE 09-24-01
ADDRESS 13th + G St. San Bernardino, Ca PLUMBED BY D. Lemson
WELL DIA. 19.75 WATER LEVEL 189 Ft. DATUM 10 Ft.
WELL NUMBER #108 JOB NUMBER 27-5567

DEPTH. FT.	DRIFT READING INCHES N.	S.	E.	W.	DEPTH FT.	DEVIATION READING INCHES N.	S.	E.	W.
260	.00			.10	* 260	.00			2.7
70	.01			.10	70	.28			2.80
2 80	.01			.10	* 80	.29			2.90
90	.01			.10	90	.30			3.00
300	.02			.10	* 300	.62			3.10
10	.03			.10	10	.96			3.20
20	.03			.11	* 20	.99			3.63
30	.03			.11	30	1.02			3.74
40	.03			.11	* 40	1.05			3.85
3 50	.03			.11	50	1.08			3.96
60	.03			.11	* 60	1.11			4.07
70	.03			.11	70	1.14			4.18
80	.03			.11	* 80	1.17			4.29
90	.02			.11	90	.80			4.40
400	.02			.11	* 400	.82			4.51
10	.01			.11	10	.42			4.62
20	.01			.11	* 20	.43			4.73
30	.01			.11	30	.44			4.84
4 40	.01			.11	* 40	.45			4.95
50	.01			.12	50	.46			5.52
60	.01			.12	* 60	.47			5.64
70	.01			.11	70	.48			5.28
80	.01			.10	* 80	.49			4.90
90	.01			.10	90	.50			5.00
500	.01			.10	* 500	.51			5.10

LAYNE CHRISTENSEN CO.

11001 ETIWANDA AVE. FONTANA,

P93

OWNER City of San Bernardino DATE 09-Jul-01
ADDRESS PLUMBED BY D. Lewison
WELL DIA. 19.75 WATER LEVEL 189 ft DATUM 10 ft
WELL NUMBER #108 JOB NUMBER 27-5567

DEPTH. FT.	DRIFT READING INCHES N.	S.	E.	W.	DEPTH FT.	DEVIATION READING INCHES N.	S.	E.	W.
510	.01			.10	510	.52			5.20
20	.01			.10	* 20	.53			5.30
30	.01			.10	30	.54			5.40
40	.01			.09	* 40	.55			4.95
50	.01			.09	50	.56			5.04
60	.01			.08	* 60	.57			4.56
70	.01			.08	70	.58			4.64
80	.01			.08	* 80	.59			4.72
90	.01			.08	90	.60			4.80
600	.01			.08	* 600	.61			4.88
10	.01			.09	10	.62			5.58
20	.01			.10	* 20	.63			6.30
30	.01			.10	30	.64			6.40
40	.01			.10	* 40	.65			6.50
50	.02			.10	50	1.32			6.60
60	.02			.10	* 60	1.34			6.70
70	.02			.09	70	1.36			6.12
80	.03			.08	* 80	2.07			5.52
90	.04			.08	90	2.80			5.60
700	.04			.07	* 700	2.84			4.97
10	.04			.07	10	2.88			5.04
20	.04			.06	* 20	2.92			4.38
30	.04			.05	30	2.96			3.70
40	.04			.05	* 40	2.25			3.75
50	.03			.06	50	2.28			4.56

LAYNE CHRISTENSEN CO.

11001 ETIWANDA AVE. FONTANA,

Pg. 4

OWNER C IM of San Bernardino DATE 09-July-01
ADDRESS 13TH & G St. San Bernardino, CA. PLUMBED BY D Lawson
WELL DIA. 19.75 WATER LEVEL 189 ft DATUM G.L.
WELL NUMBER 103 JOB NUMBER 27-5587

DEPTH. FT.	DRIFT READING INCHES N.	S.	E.	W.	DEPTH FT.	DEVIATION READING INCHES N.	S.	E.	W.
760	.03			.06	* 760	2.31			4.62
70	.02			.06	70	1.56			4.68
80	.02			.06	* 80	1.58			4.74
90	.02			.06	90	1.60			4.80
800	.02			.06	* 800	1.62			4.86
10	.03			.06	10	2.46			4.92
20	.03			.05	* 20	2.49			4.15
30	.03			.05	30	2.52			4.20
40	.04			.05	* 40	3.40			4.25
50	.04			.05	50	3.44			4.30
60	.04			.05	* 60	3.48			435
70	.04			.06	70	3.52			5.28
80	.04			.06	* 80	3.56			5.34
90	.03			.06	90	2.70			5.40
900	.03			.06	* 900	2.73			5.46
10	.02			.06	10	1.84			5.52
20	.02			.06	* 20	1.86			5.58
30	.01			.07	30	.94			6.58
40	.01			.08	* 40	.95			7.60
50	.01			.08	50	.96			7.68
60	.02			.09	* 60	1.94			8.73
70	.02			.09	70	1.96			8.82
80	.02			.09	* 80	1.98			8.91
990	.02			.09	990	2.00			9.00
T.D.					T.D.				

PACIFIC SURVEYS

ELECTRIC LOG
LATEROLOG 3
GAMMA-RAY

Job No.		
00753	Company	LAYNE CHRISTENSEN
	Well	CITY OF SAN BERNARDINO #108
	Field	SAN BERNARDINO
	County	SAN BERNARDINO State CA

Location:	Other Services:
13th ST. AND G	TEMP
Sec. Twp. Rge.	

Permanent Datum	G.L.		Elevation	Elevation
Log Measured From	G.L.	0	above perm. datum	K.B.
Drilling Measured From	G.L.			D.F.
				G.L.

Date	4-22-01		
Run Number	ONE		
Depth Driller	915'		
Depth Logger	914'		
Bottom Logged Interval	913'		
Top Log Interval	55'		
Casing Driller	42" @ 60'		
Casing Logger	60'		
Bit Size	20" 0-835'	17.5" 835'-915'	
Type Fluid in Hole	WATER		
Density / Viscosity	N/A		
pH / Fluid Loss	N/A		
Source of Sample	PIT		
Rm @ Meas. Temp	17.7 @ 77F		
Rmf @ Meas. Temp	17.7 @ 77F		
Rmc @ Meas. Temp	N/A		
Source of Rmf / Rmc	MEAS		
Rm @ BHT	N/A		
Time Circulation Stopped	2 HRS.		
Time Logger on Bottom	10:00 AM		
Max. Recorded Temperature	69.3 F		
Equipment Number	PS-2		
Location	L.A.		
Recorded By	LAPORTE		
Witnessed By	J. DYE		

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

ELOG Calibration Report

Serial:	DTQELOG
Model:	DTQ
Shop Calibration Performed:	Wed Mar 21 15:46:58 2001
Before Survey Verification Performed:	Tue Apr 03 10:33:49 2001
After Survey Verification Performed:	Tue Apr 03 10:46:03 2001

Shop Calibration

	Readings Zero	Readings Cal		References Zero	References Cal		Results Gain	Results Offset
Short	7.713	99.400		10.200	102.200	Ohm-m	1.003	2.461
Long	4.744	94.871		10.200	102.200	Ohm-m	1.021	-20.357
IEE	0.000	6356.361	counts	0.000	6.956	A		
VSN	64.850	7221.121	counts	1.237	137.734	V		
VLN	122.486	1814.352	counts	2.336	34.607	V		

Before Survey Verification

	Readings Zero	Readings Cal		References Zero	References Cal		Results Gain	Results Offset
Short	0.000	101.146		0.000	101.116	Ohm-m	1.000	0.000
Long	0.000	101.628		101.624	101.624	Ohm-m	1.000	0.000
IEE	0.000	6393.309	counts	0.000	6.997	A		
VSN	57.374	7265.224	counts	1.094	138.575	V		
VLN	92.701	1824.972	counts	1.768	34.809	V		

After Survey Verification

	Readings Zero	Readings Cal		References Zero	References Cal		Results Gain	Results Offset
Short	0.000	101.198		0.000	101.146	Ohm-m	0.999	0.000
Long	0.000	101.922		101.628	101.628	Ohm-m	0.997	0.000
IEE	0.000	6333.389	counts	0.000	6.931	A		
VSN	0.000	7200.889	counts	0.000	137.348	V		
VLN	178.907	1813.102	counts	3.412	34.583	V		

After Survey Verification compared to Before Survey Calibration

Zero Before	Zero After	Cal Before	Cal After

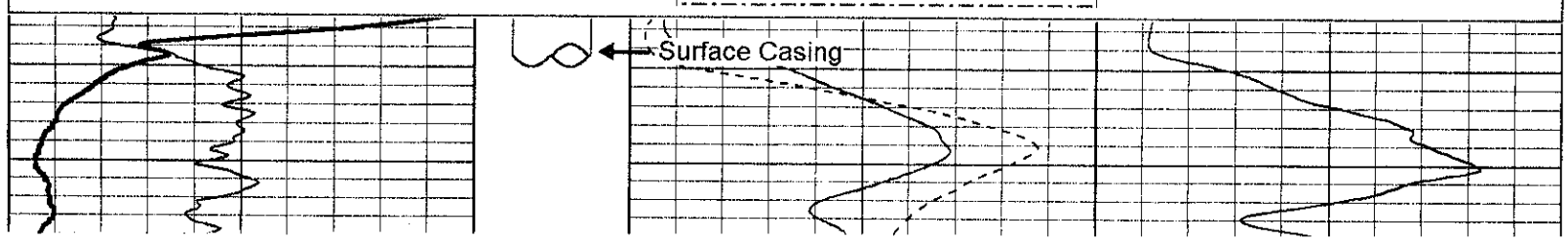
Short	0.000	0.000	Ohm-m	101.116	101.146	Ohm-m
Long	0.000	0.000	Ohm-m	101.624	101.628	Ohm-m

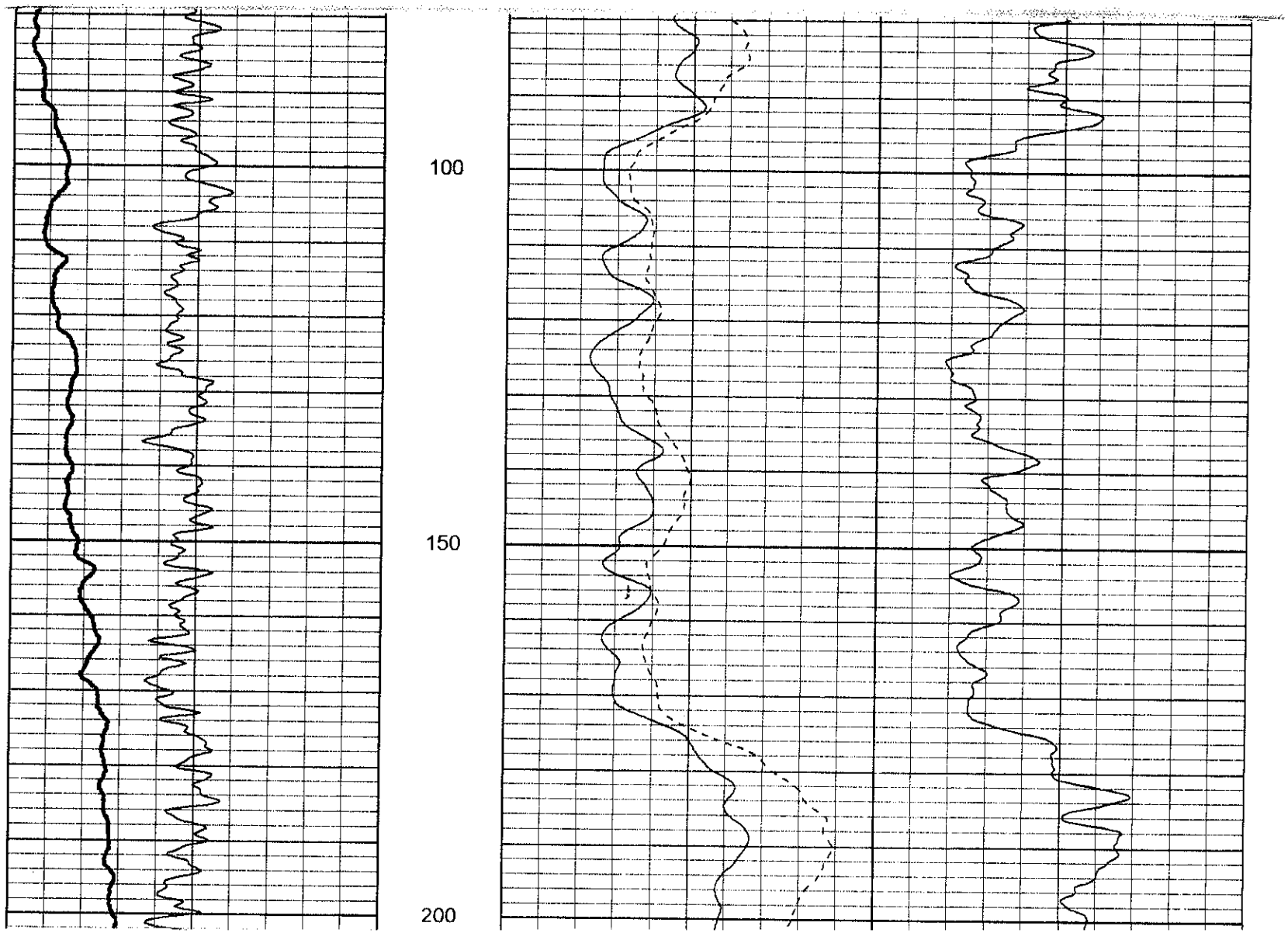
Gamma Ray Calibration Report

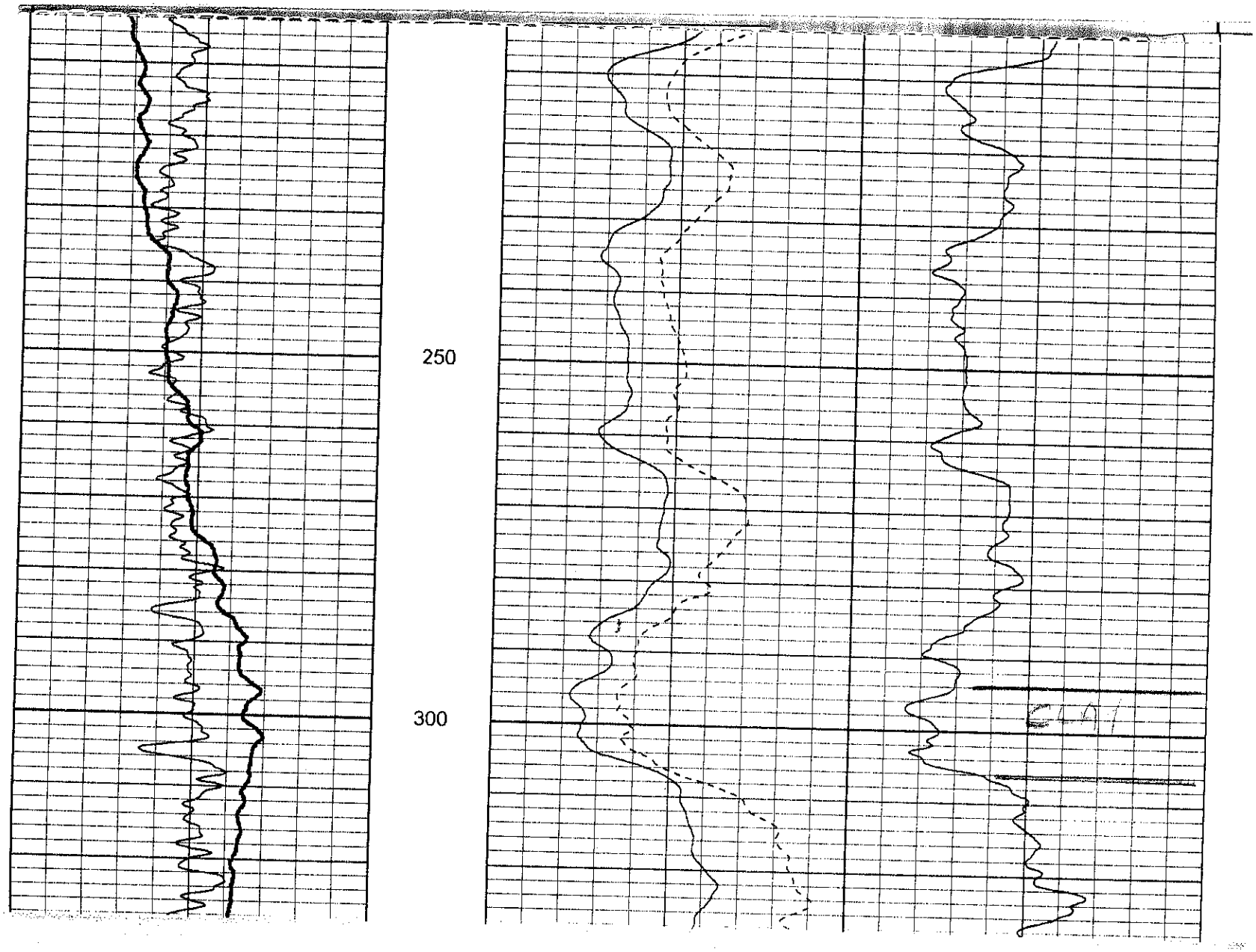
Serial Number:	ELOG1	
Tool Model:	ELOG	
Performed:	Sun Feb 18 13:45:29 2001	
Calibrator Value:	162	GAPI
Background Reading:	165.089	cps
Calibrator Reading:	727.35	cps
Sensitivity:	0.288122	GAPI/cps

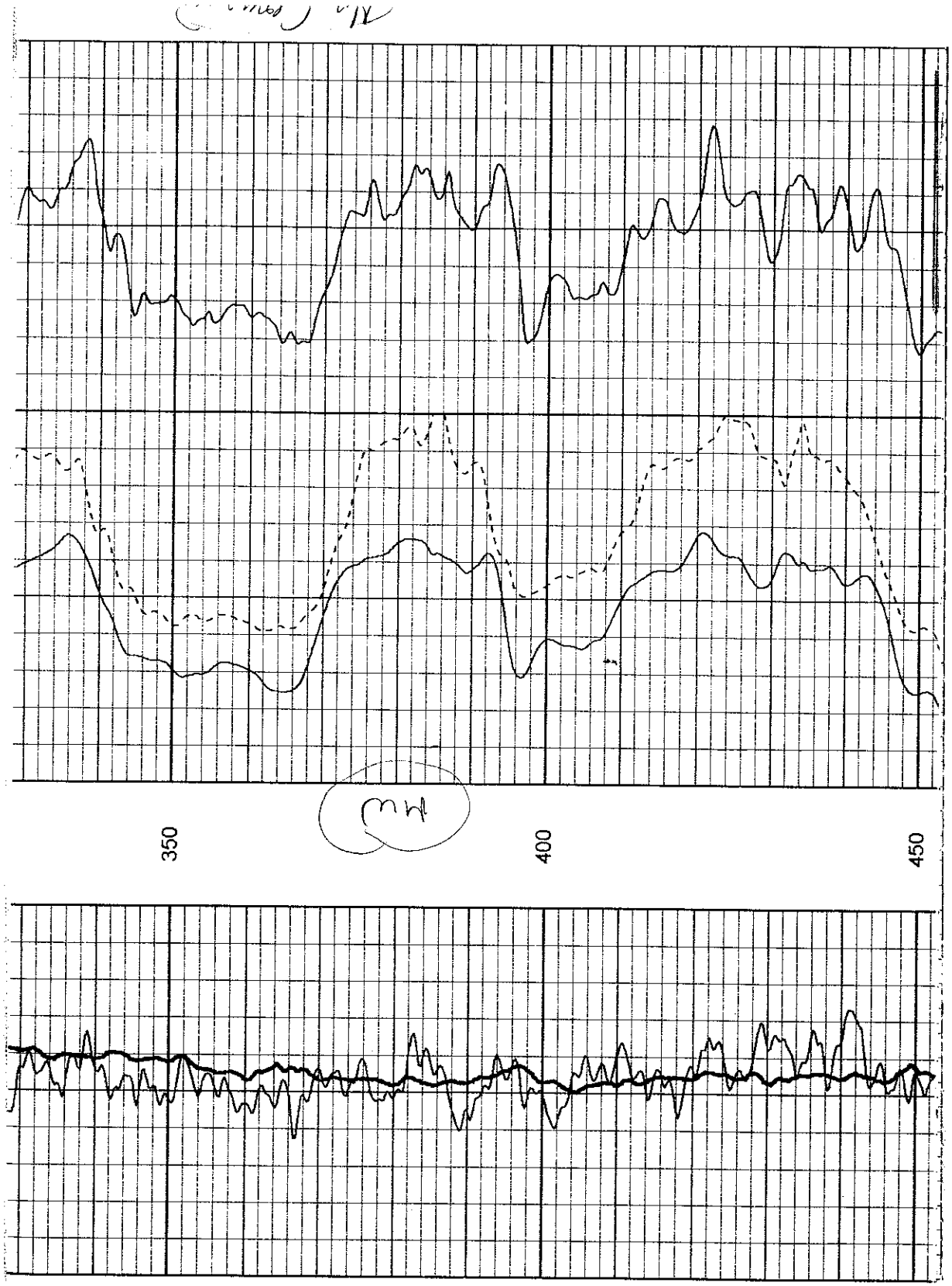
Database File:	00753.db
Dataset Pathname:	Layne/SB/LL3/merge1
Presentation Format:	elog
Dataset Creation:	Sun Apr 22 11:16:05 2001
Charted by:	Depth in Feet scaled 1:240

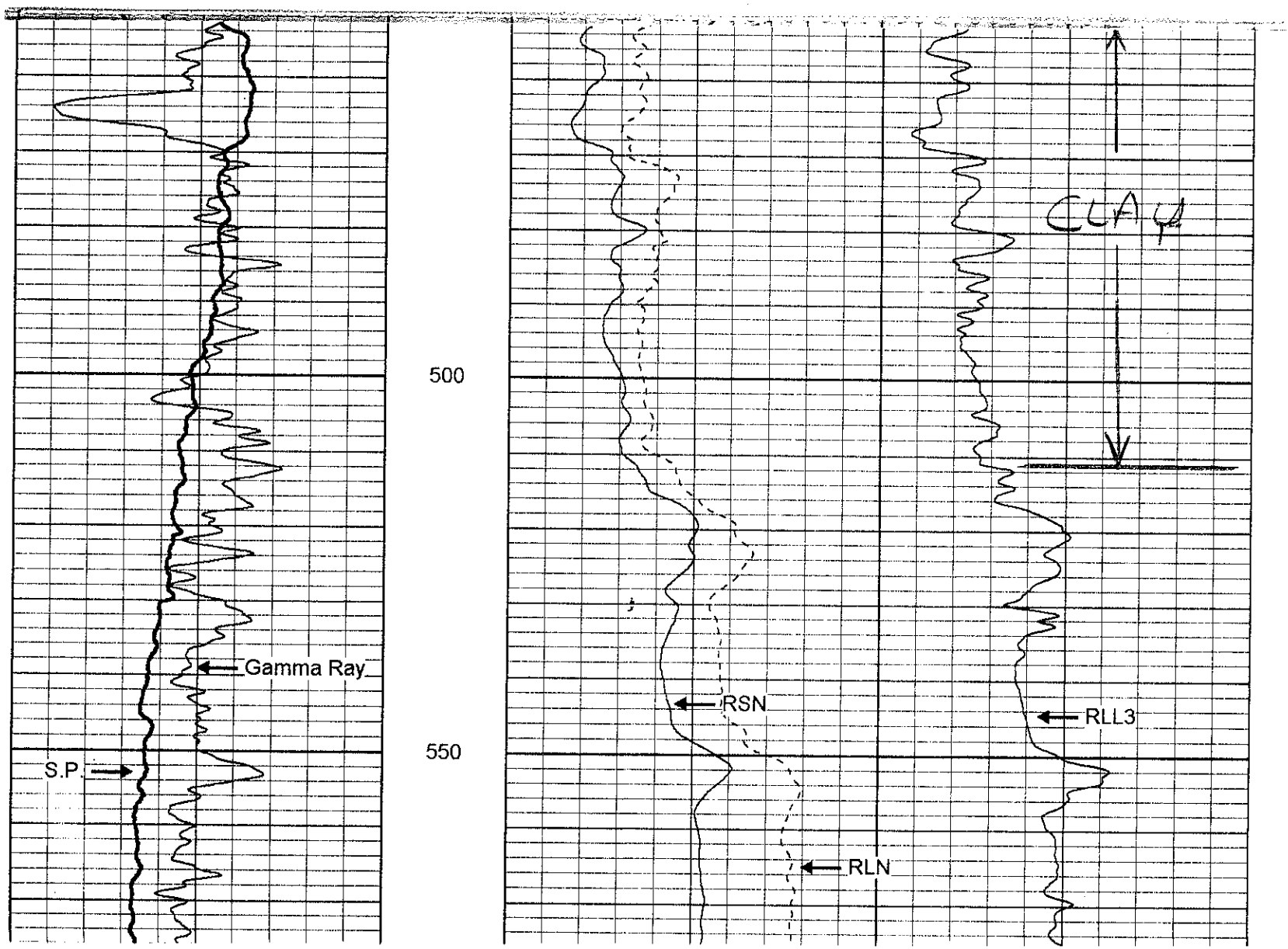
-100	S.P. (mV)	0	0	RSN (Ohm-m)	200	0	RLL3 (Ohm-m)	200
0	Gamma Ray (GAPI)	100	0	RLN (Ohm-m)	200	200	RLL3 back-up (Ohm-m)	2000
			200	RSNx10 (Ohm-m)	2000			
			200	RLNx10 (Ohm-m)	2000			

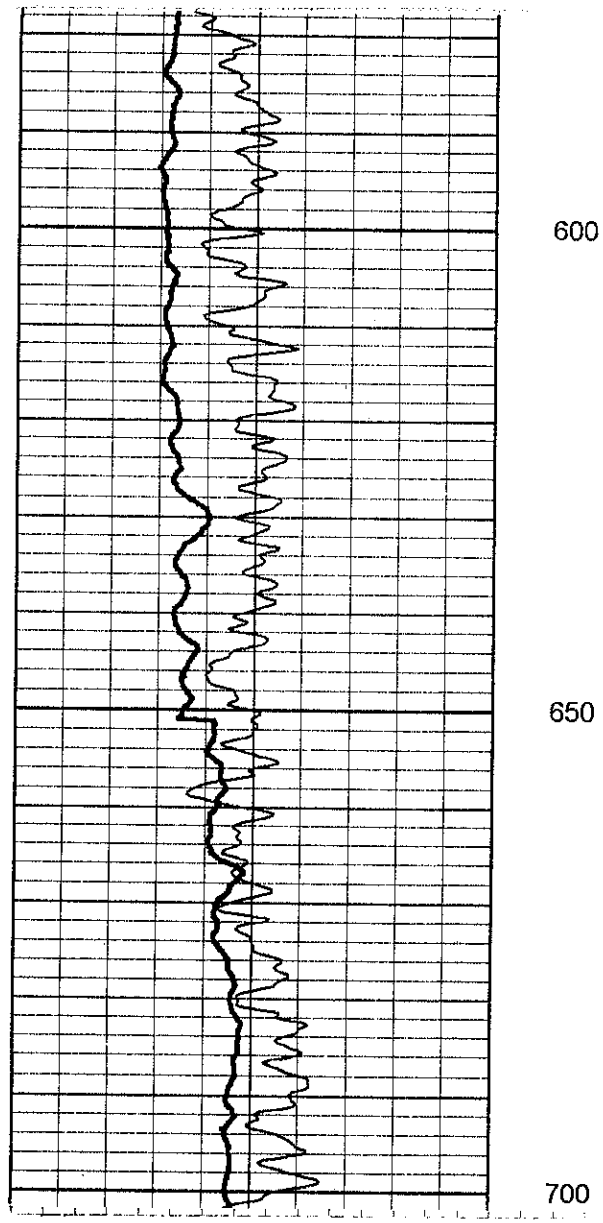


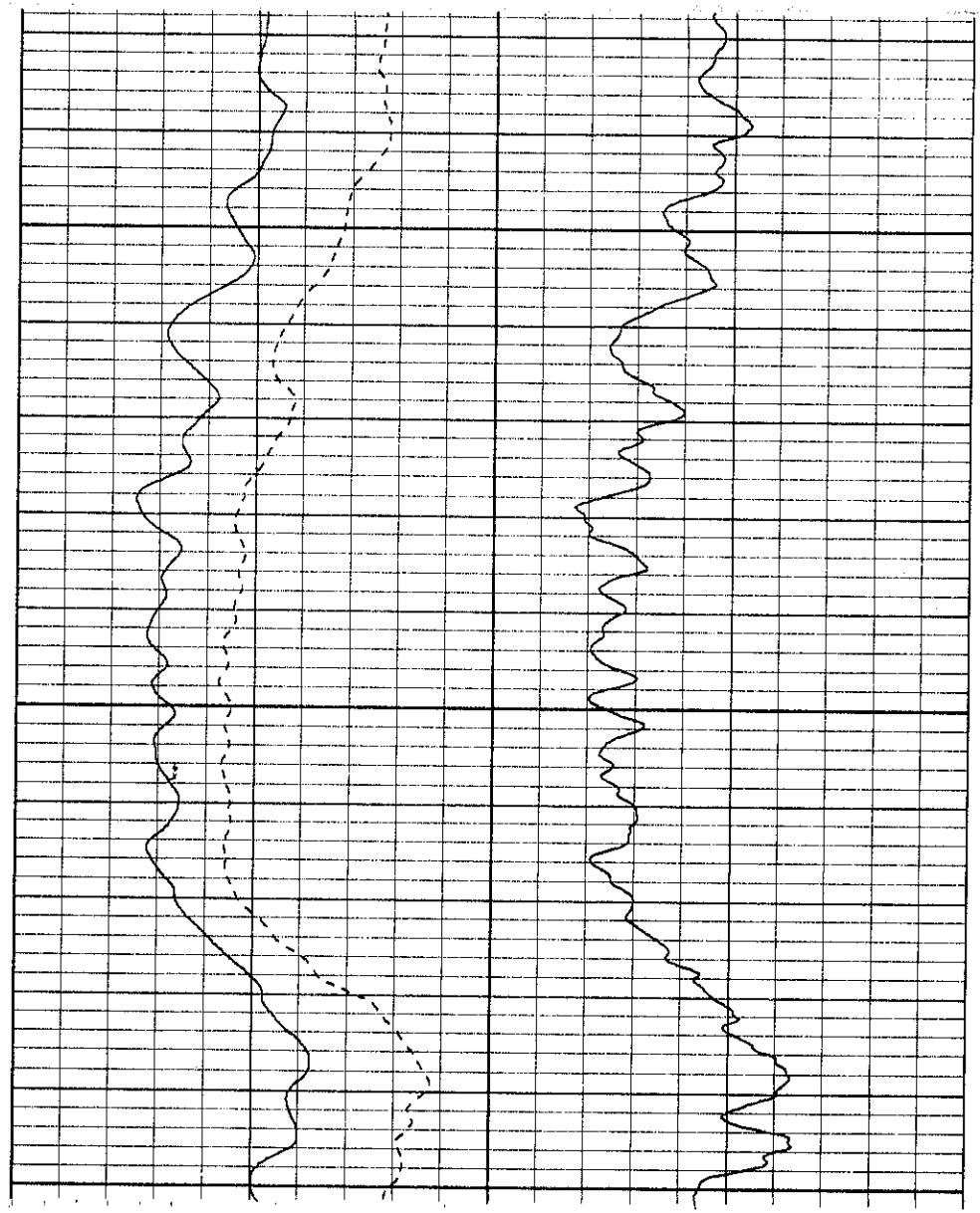

100
150
200

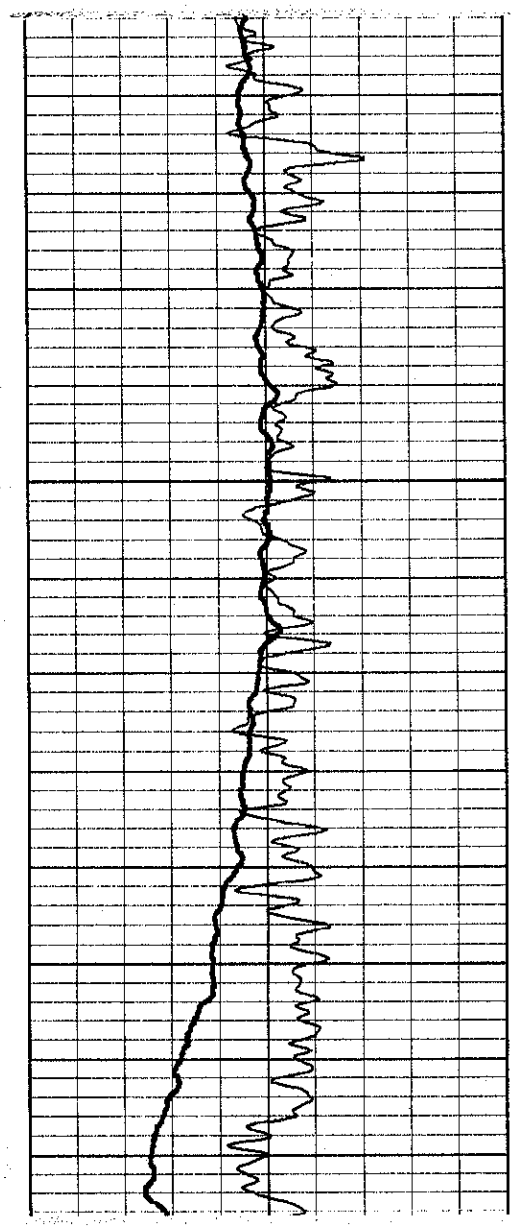

250
300
CAL


350
400
450


500
550
Gamma Ray
S.P.
RSN
RLN
RLL3
CLAY

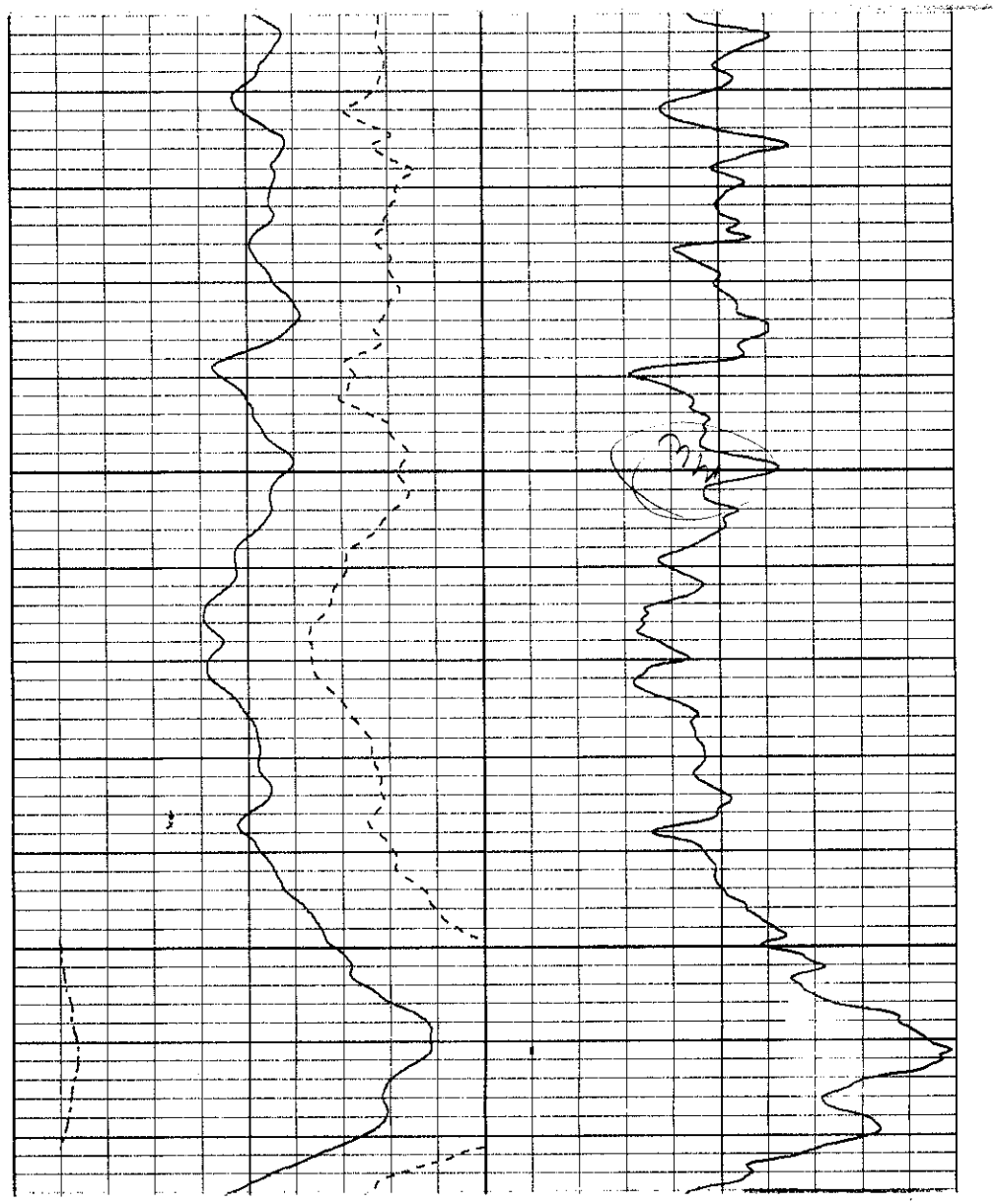

600
650
700

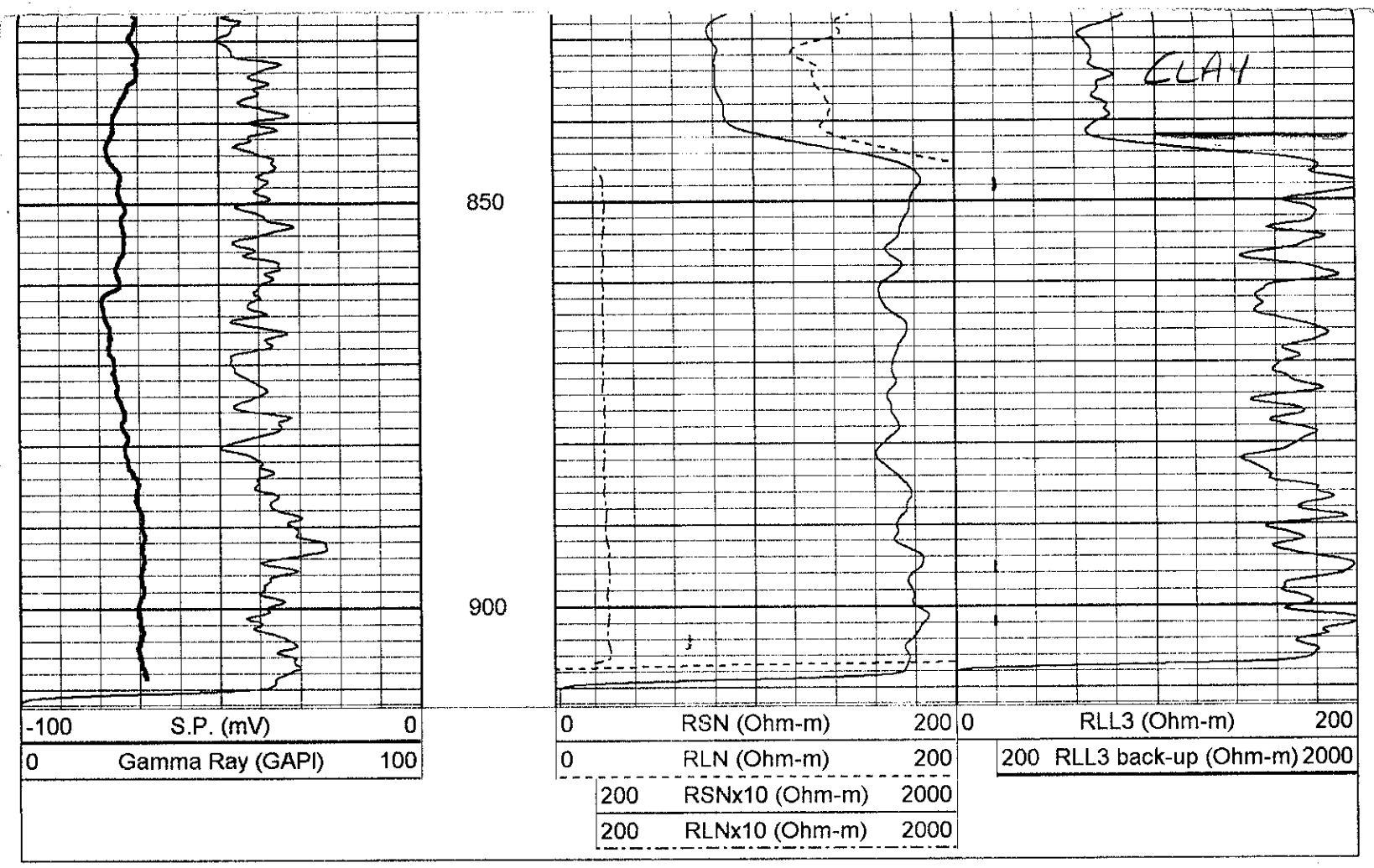




750

800




CLAY
850
900
-100 S.P. (mV) 0
0 Gamma Ray (GAPI) 100
0 RSN (Ohm-m) 200
0 RLN (Ohm-m) 200
200 RSNx10 (Ohm-m) 2000
200 RLNx10 (Ohm-m) 2000
0 RLL3 (Ohm-m) 200
200 RLL3 back-up (Ohm-m) 2000

PACIFIC SURVEYS

TEMPERATURE
DIFFERENTIAL TEMP.
GAMMA-RAY

Job No.				
00753	Company	LAYNE CHRISTENSEN		
	Well	CITY OF SAN BERNARDINO #108		
	Field	SAN BERNARDINO		
	County	SAN BERNARDINO	State	CA

Location:	Other Services:
13th ST. AND G	E-LOG LL3
Sec. Twp. Rge.	

Permanent Datum	G.L.		Elevation	Elevation
Log Measured From	G.L.	0	above perm. datum	K.B. D.F. G.L.
Drilling Measured From	G.L.			

Date	4-22-01	
Run Number	ONE	
Depth Driller	915'	
Depth Logger	915'	
Bottom Logged Interval	915'	
Top Log Interval	0	
Casing Driller	42" @ 60'	
Casing Logger	60'	
[illegible]	20" 0-835'	17.5" 835'-915'
Type Fluid in Hole	WATER	
Density / Viscosity	N/A	
pH / Fluid Loss	N/A	
Source of Sample	PIT	
Rm @ Meas. Temp	17.7 @ 77F	
Rmf @ Meas. Temp	17.7 @ 77F	
Rmc @ Meas. Temp	N/A	
Source of Rmf / Rmc	MEAS	
Rm @ BHT	N/A	
Time Circulation Stopped	2 HRS.	
Time Logger on Bottom	9:30 AM	
Max. Recorded Temperature	69.3 F	
Equipment Number	PS-2	
Location	L.A.	
Recorded By	LAPORTE	
Witnessed By	J. DYE	

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Comments

Database File: 00753.db
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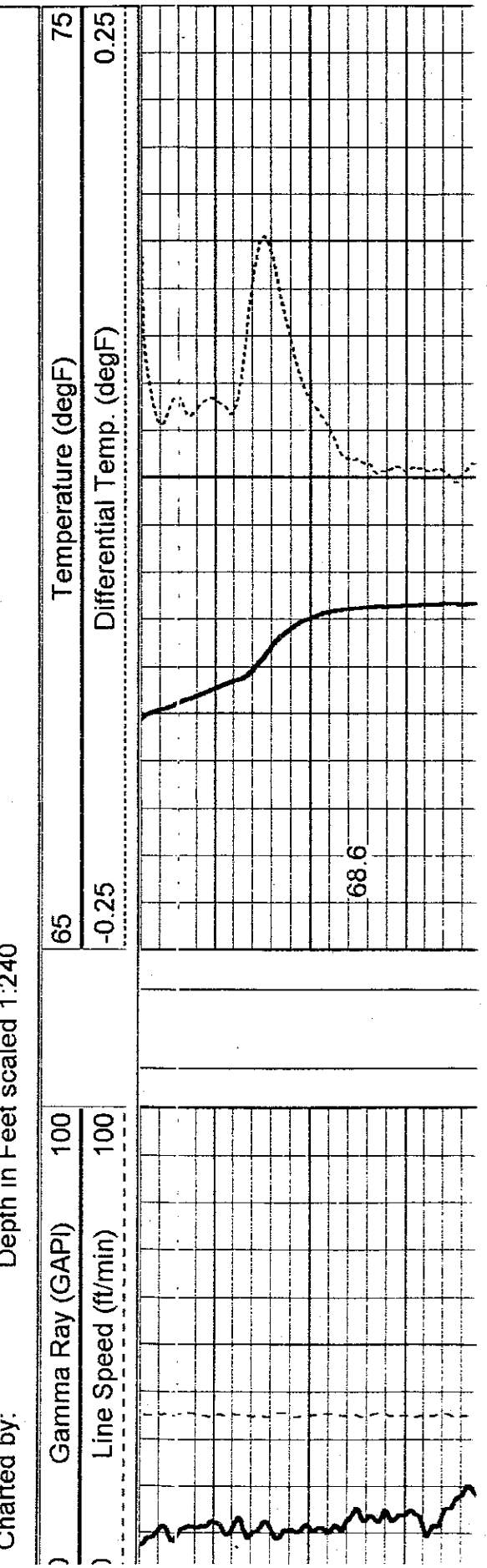
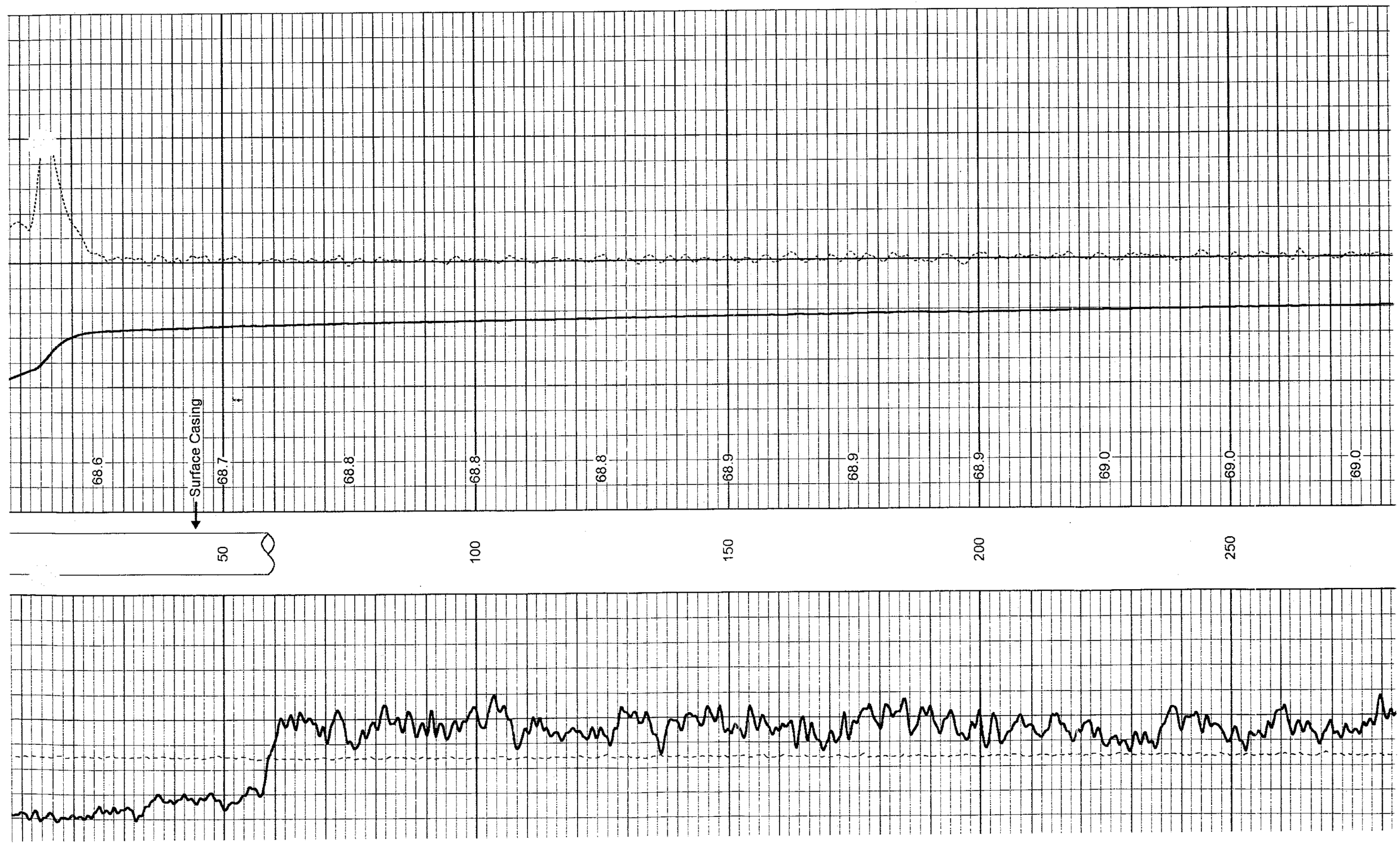
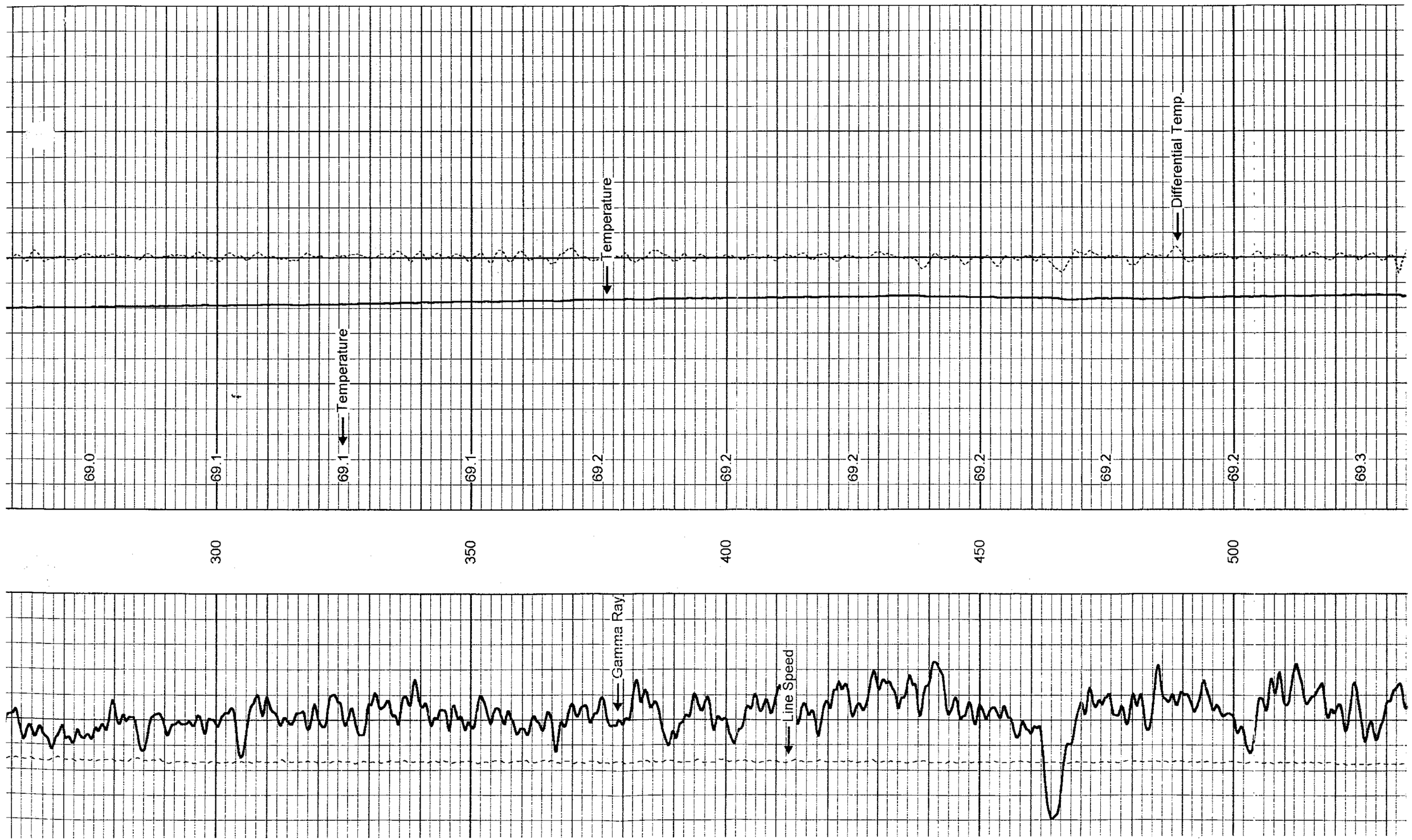
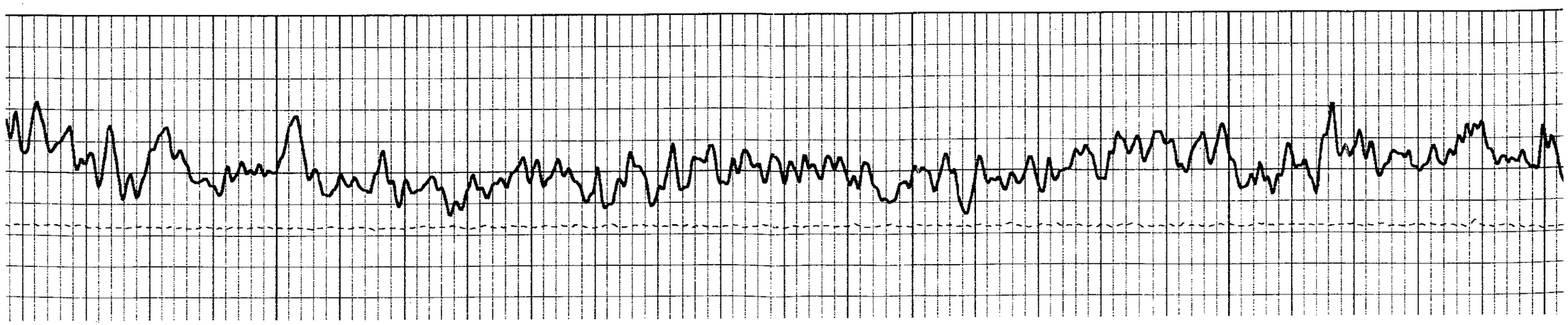
Presentation Format: temp
Dataset Creation: Sun Apr 22 11:22:25 2001
Charted by: Depth in Feet scaled 1:240

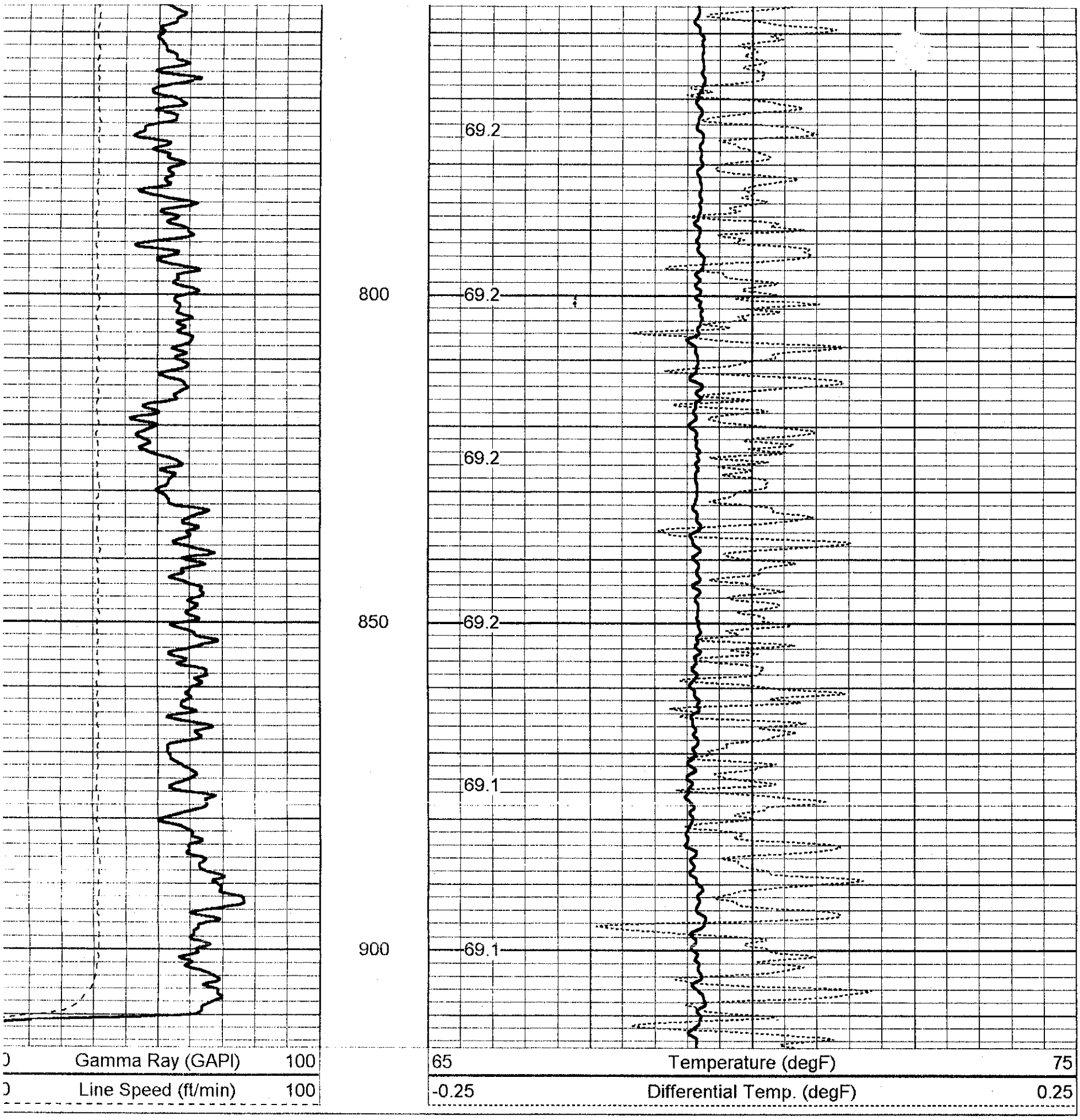



68.6
Surface Casing
68.7
68.8
68.8
68.8
68.9
68.9
68.9
69.0
69.0
69.0
50
100
150
200
250


Temperature
Temperature
Differential Temp.
69.0
69.1
69.1
69.1
69.2
69.2
69.2
69.2
69.2
69.2
69.3
300
350
400
450
500
Gamma Ray
Line Speed

69.3
69.3
69.2
69.2
69.2
69.2
69.2
69.2
69.2
69.2
550
600
650
700
750




800
850
900
69.2
69.2
69.2
69.2
69.1
69.1
0
Gamma Ray (GAPI)
100
0
Line Speed (ft/min)
100
65
Temperature (degF)
75
-0.25
Differential Temp. (degF)
0.25