JICA

メキシコ合衆国ラ・プリマベーラ地熱開発計画調査

報告書

別添資料

平成元年２月

国際協力事業団

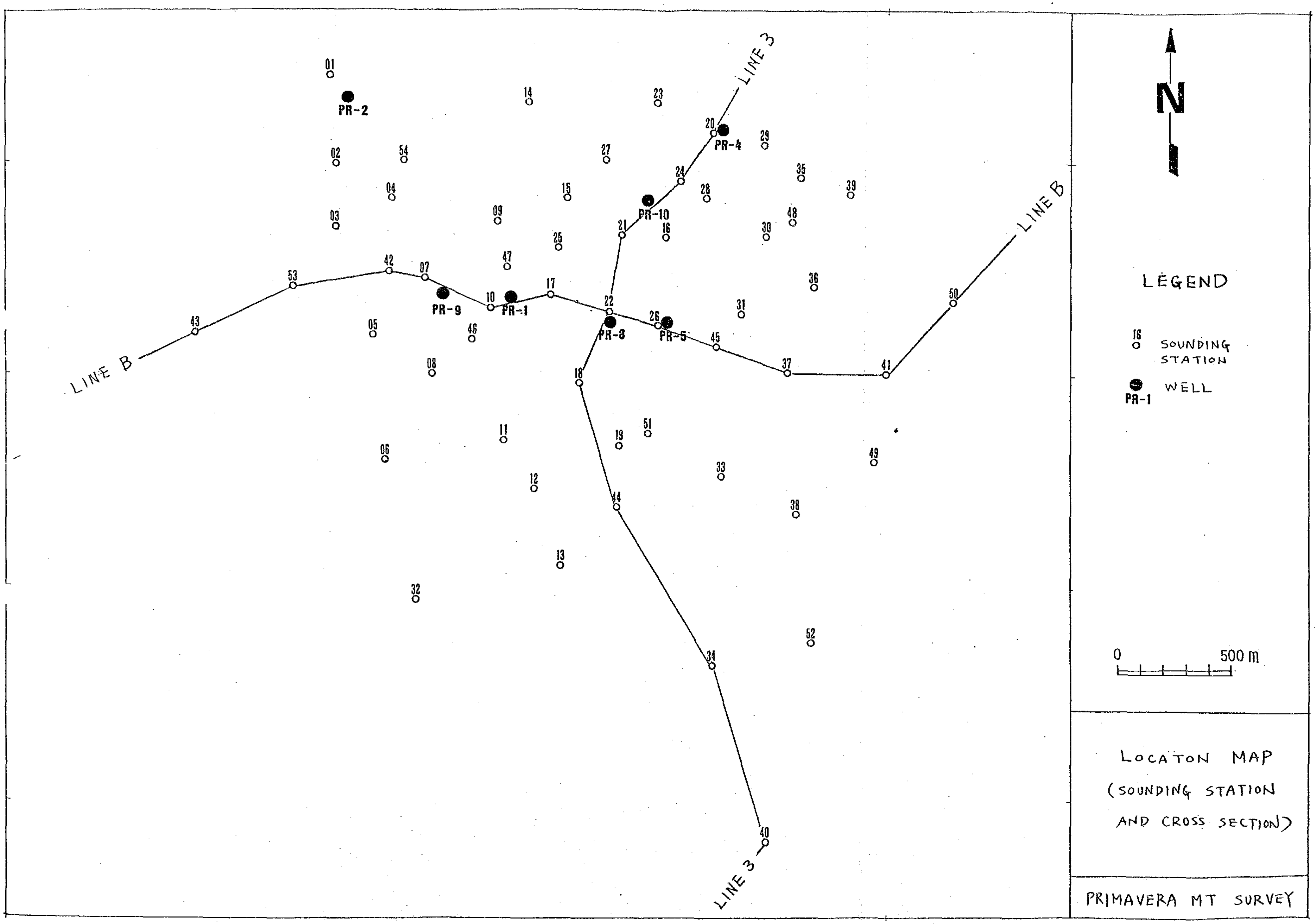
メキシコ合衆国ラ・プリマベーラ地熱開発計画調査

報　告　書

別 添 資 料

平成元年２月

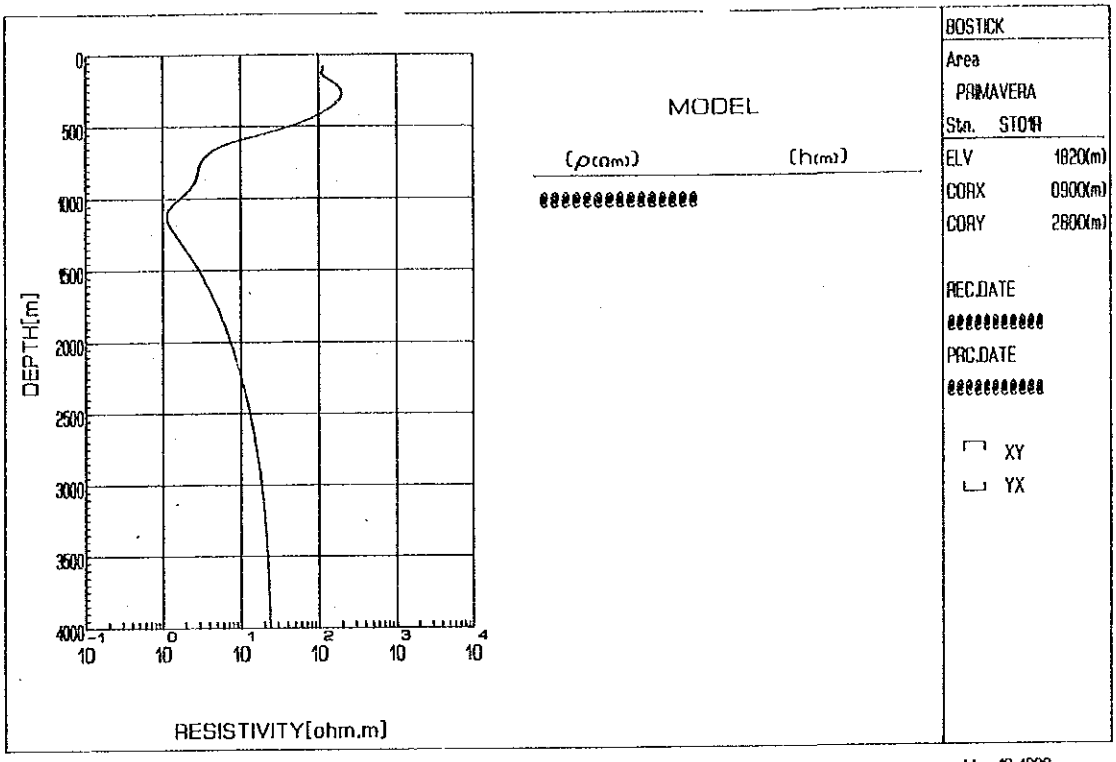
国 際 協 力 事 業 団


LINE B
LINE 3
PR-2
PR-4
PR-10
PR-9
PR-1
PR-8
PR-5
N
LEGEND
SOUNDING STATION
WELL
0 500 m
LOCATON MAP
(SOUNDING STATION AND CROSS SECTION)
PRIMAVERA MT SURVEY

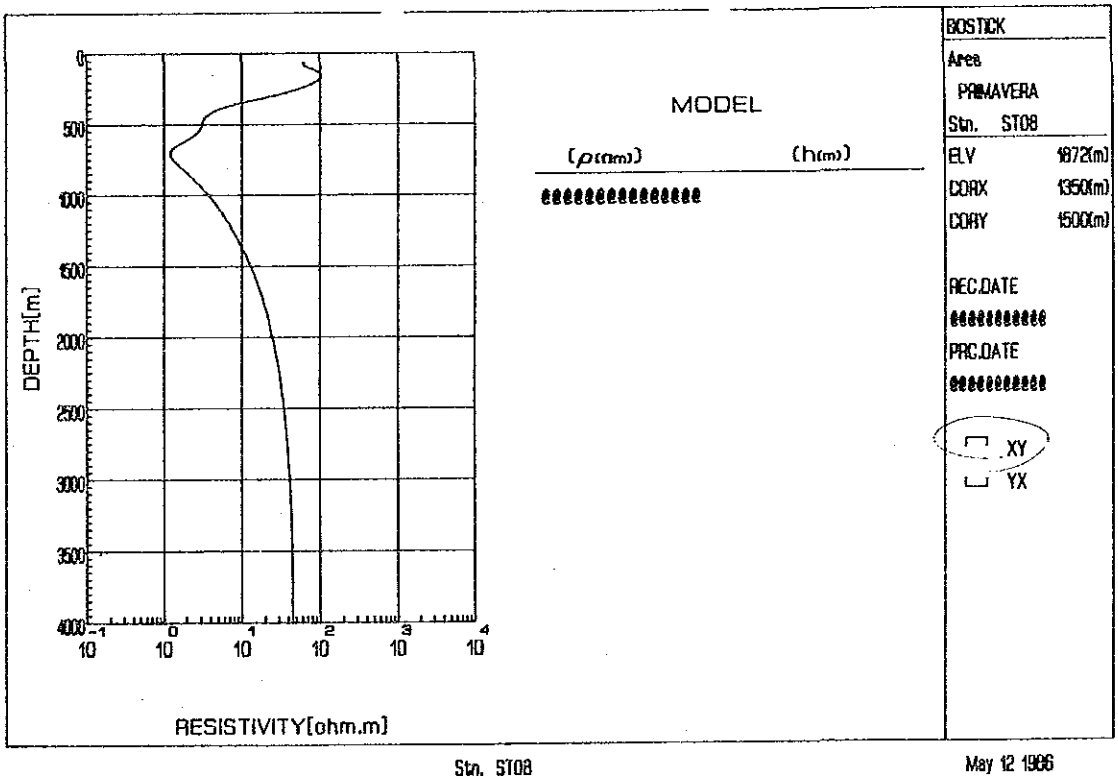
PRIMAVERA MT SURVEY

THE RESULTS OF MODE SELECTION

ST NO.	MODE		ST NO.	MODE		ST NO.	MODE		ST NO.	MODE	
	TE	TM		TE	TM		TE	TM		TE.	TM
01	XY	YX	15	YX	XY	29	XY	YX	43	XY	YX
02	XY	YX	16	XY	YX	30	YX	XY	44	YX	XY
03	YX	XY	17	XY	YX	31	YX	XY	45	XY	YX
04	YX	XY	18	XY	YX	32	YX	XY	46	XY	YX
05	YX	XY	19	XY	YX	33	YX	XY	47	YX	XY
06	XY	YX	20	XY	YX	34	XY	YX	48	YX	XY
07	XY	YX	21	XY	YX	35	XY	YX	49	YX	XY
08	XY	YX	22	XY	YX	36	XY	YX	50	YX	XY
09	XY	YX	23	YX	XY	37	YX	XY	51	YX	XY
10	YX	XY	24	XY	YX	38	XY	YX	52	YX	XY
11	XY	YX	25	XY	YX	39	XY	YX	53	YX	XY
12	XY	YX	26	XY	YX	40	XY	YX	54	YX	XY
13	XY	YX	27	YX	XY	41	YX	XY			
14	YX	XY	28	YX	XY	42	XY	YX			



Stn. ST01 May 12 1986



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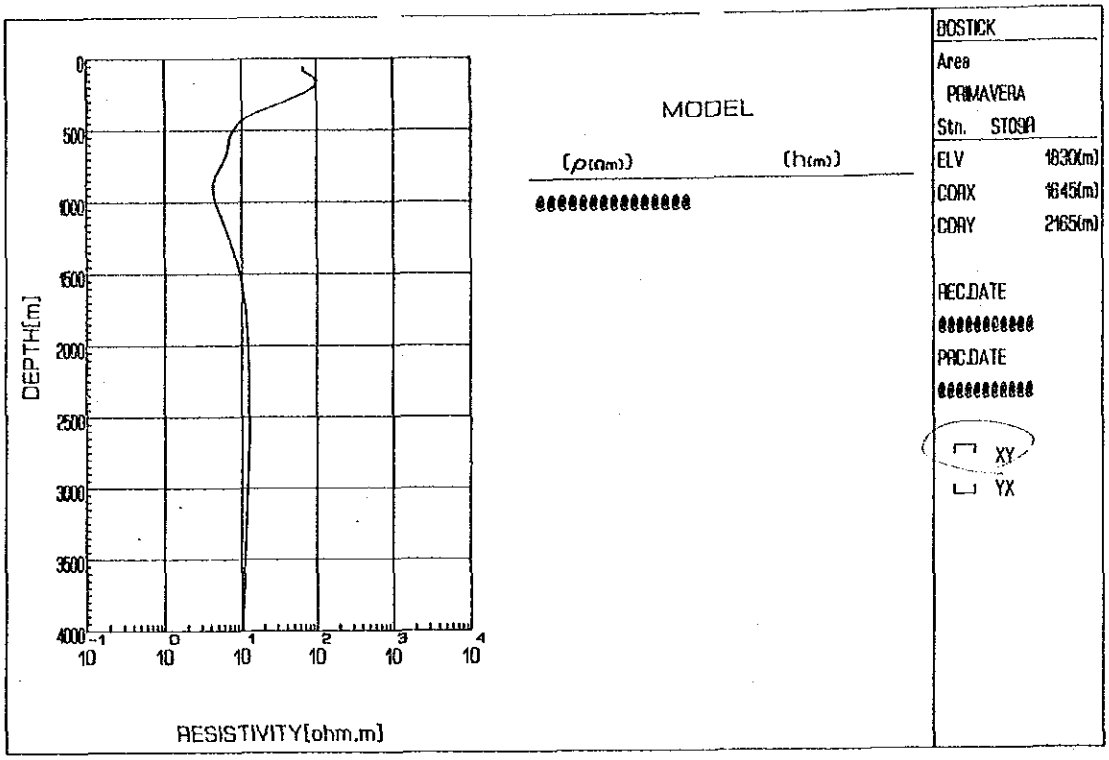

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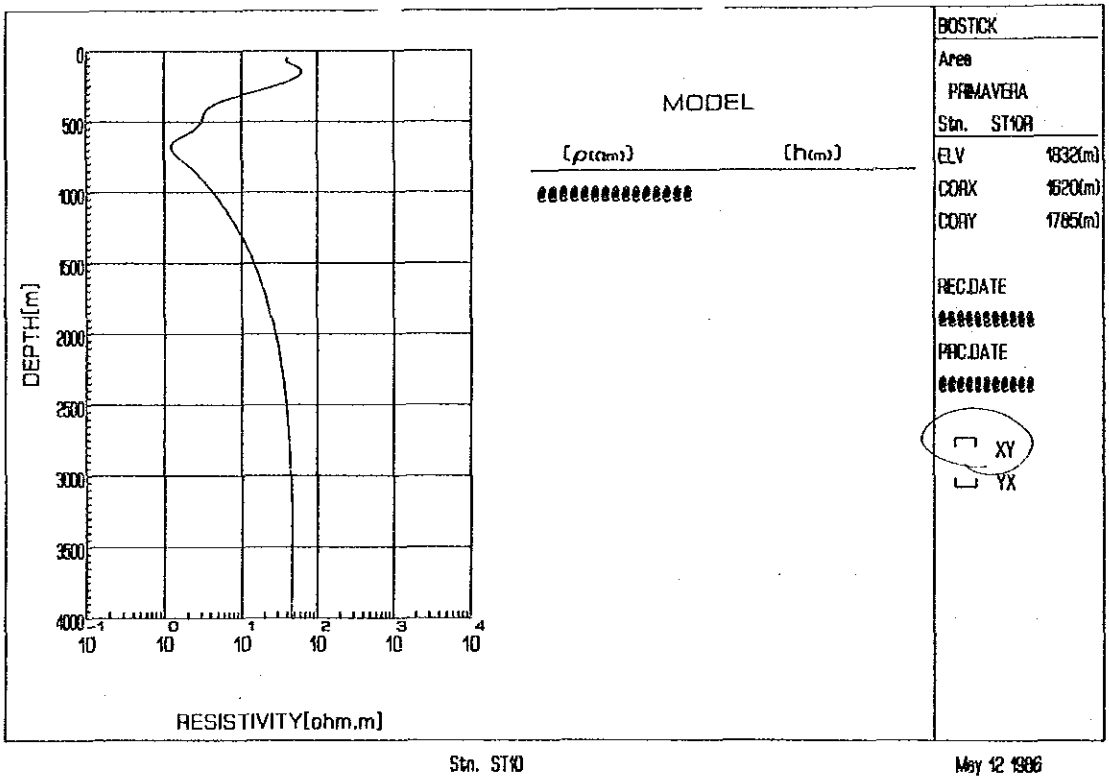
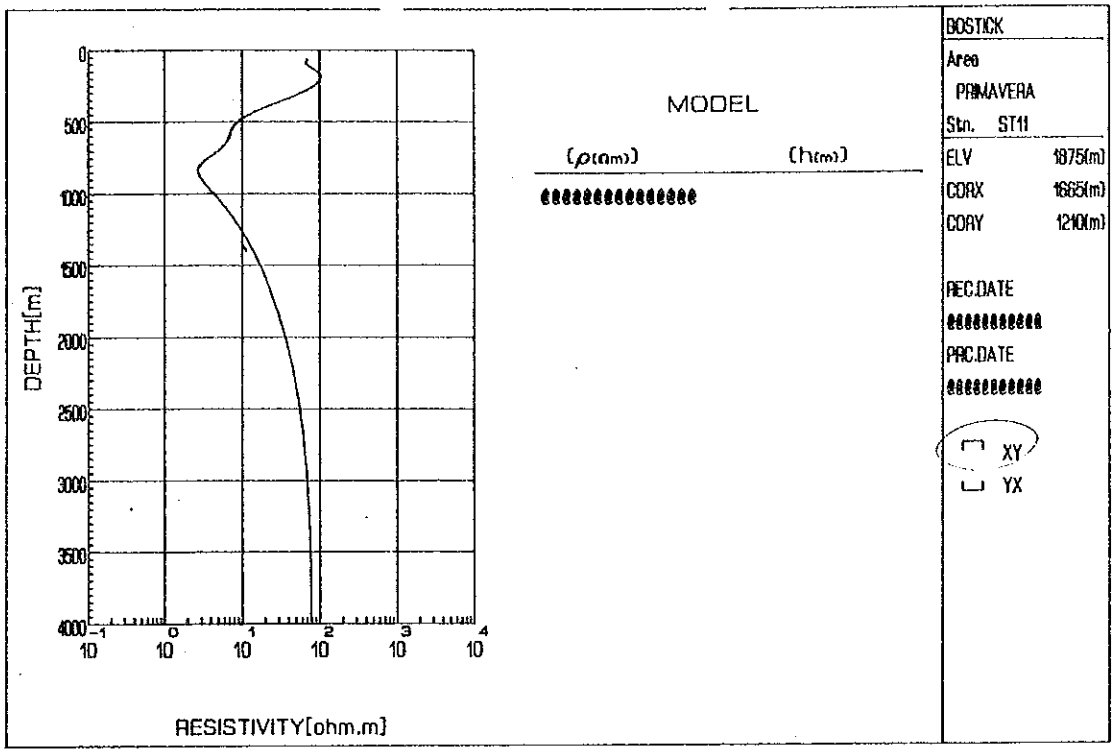


Stn. ST10 May 12 1986



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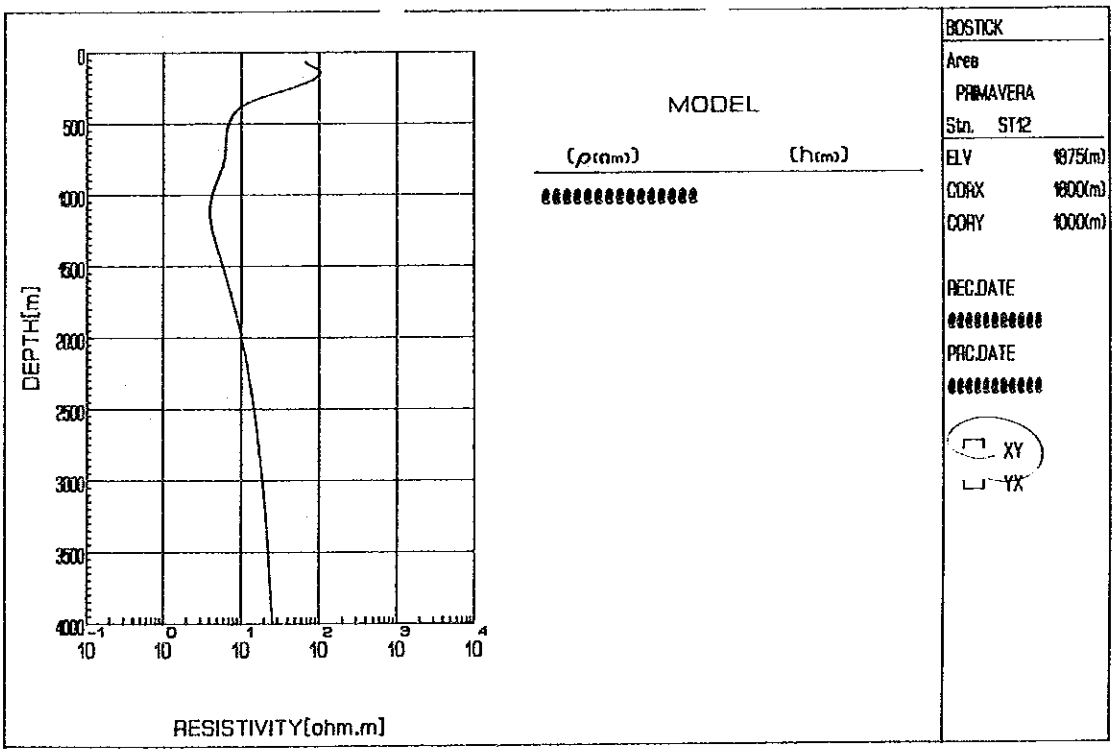
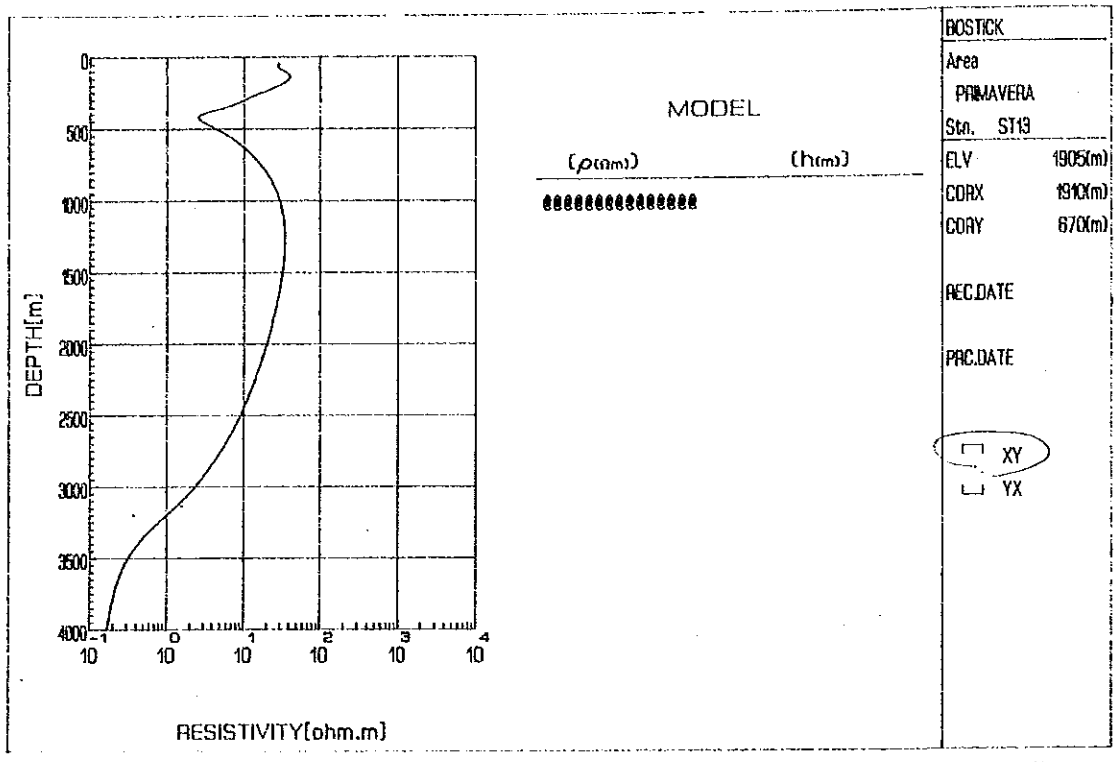
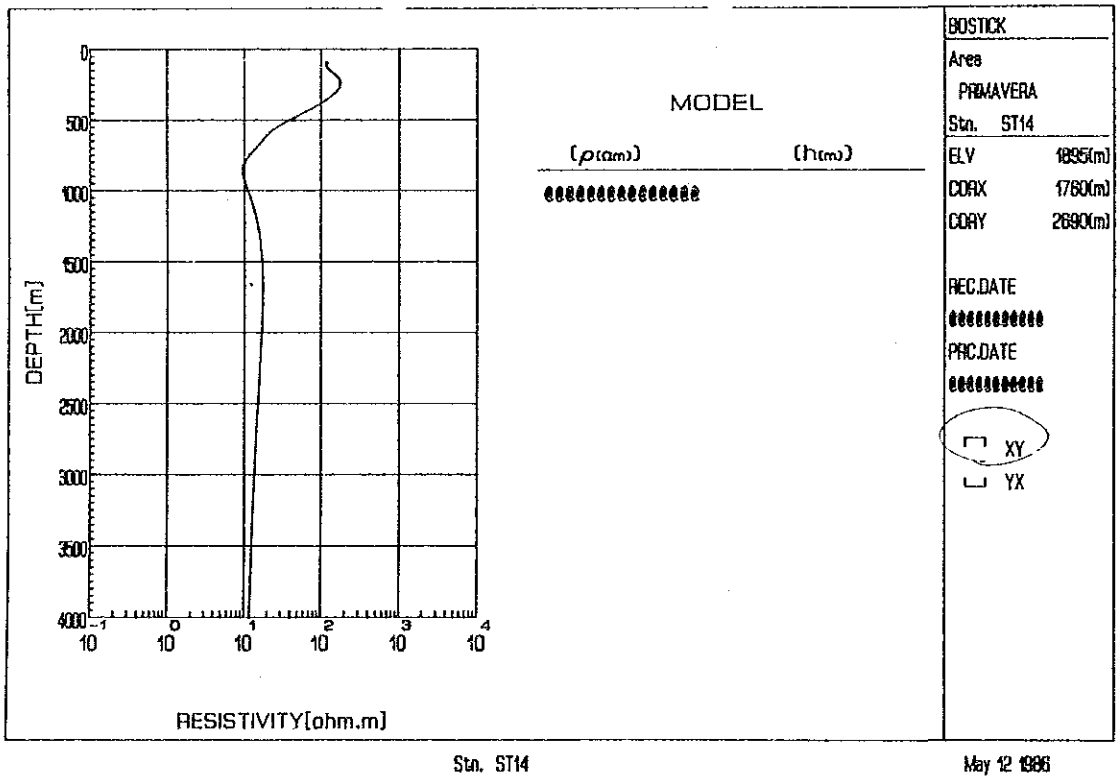
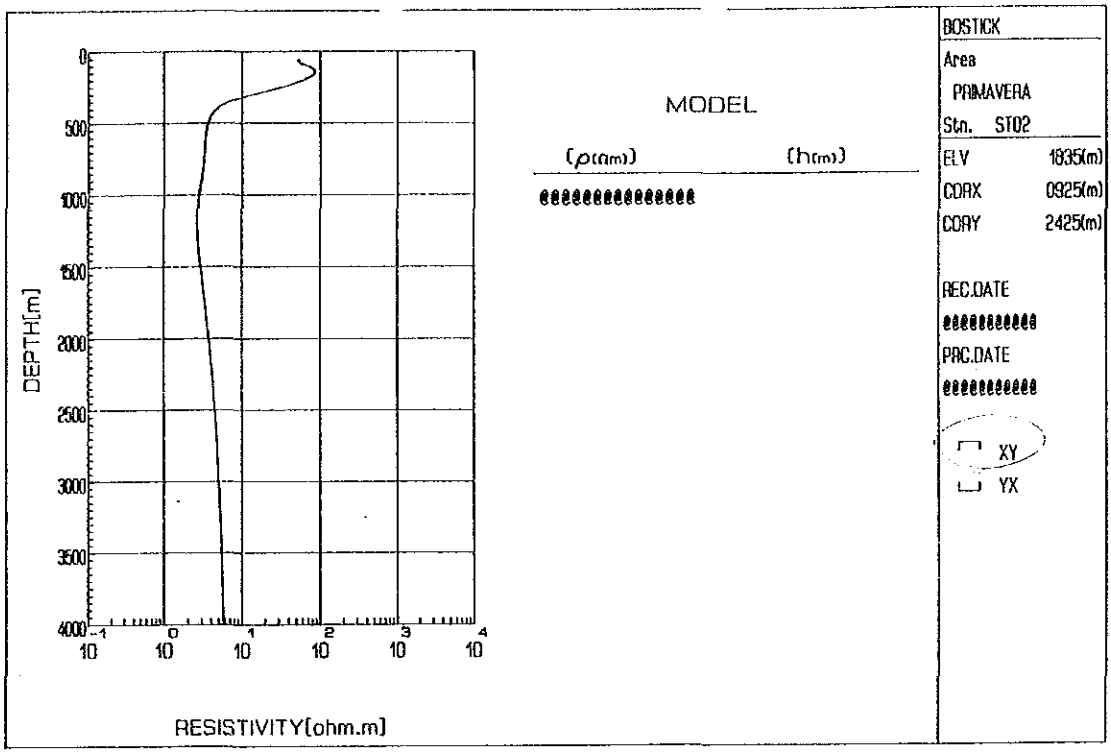


Stn. ST12 May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST13
ELV 1905(m)
CORX 1910(m)
CORY 670(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST13
May 14 1986


BOSTICK
Area
PRIMAVERA
Stn. ST14
ELV 1895(m)
CORX 1760(m)
CORY 2690(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST14
May 12 1986



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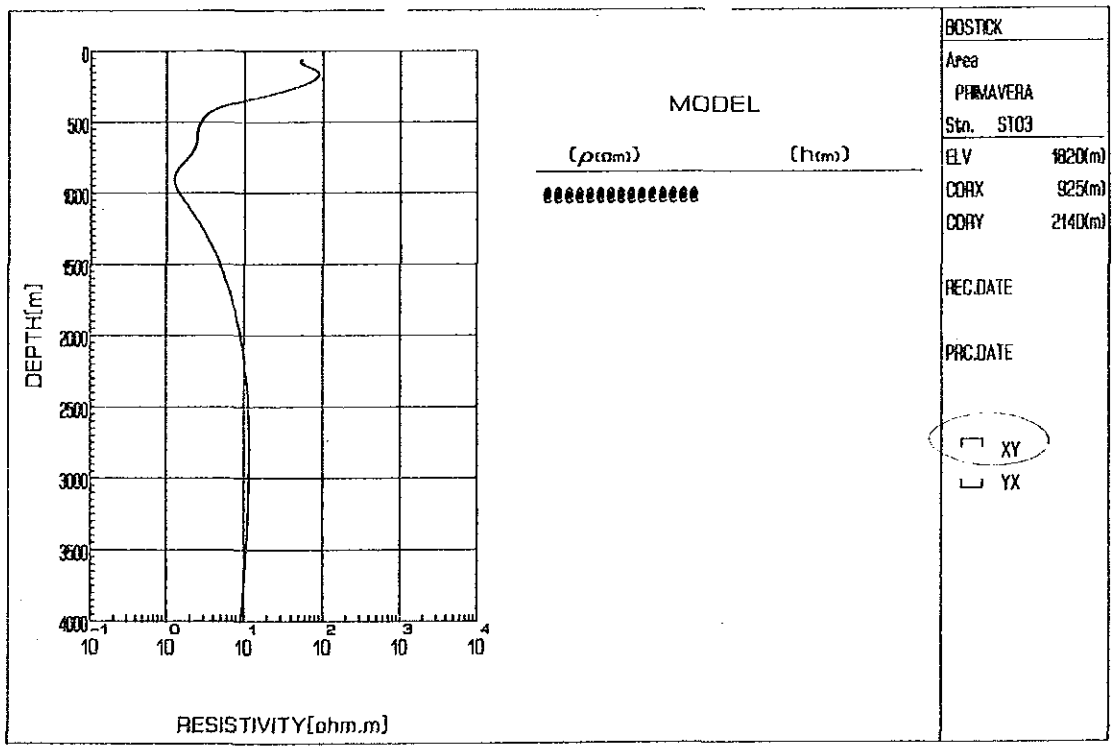

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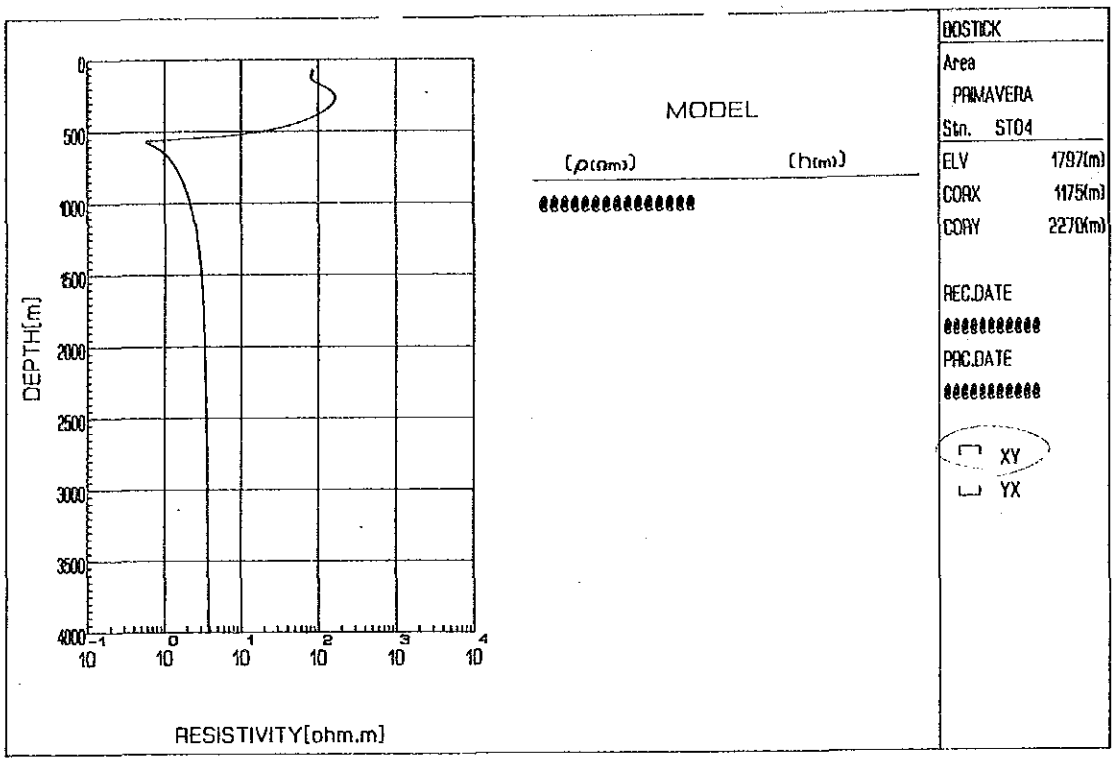

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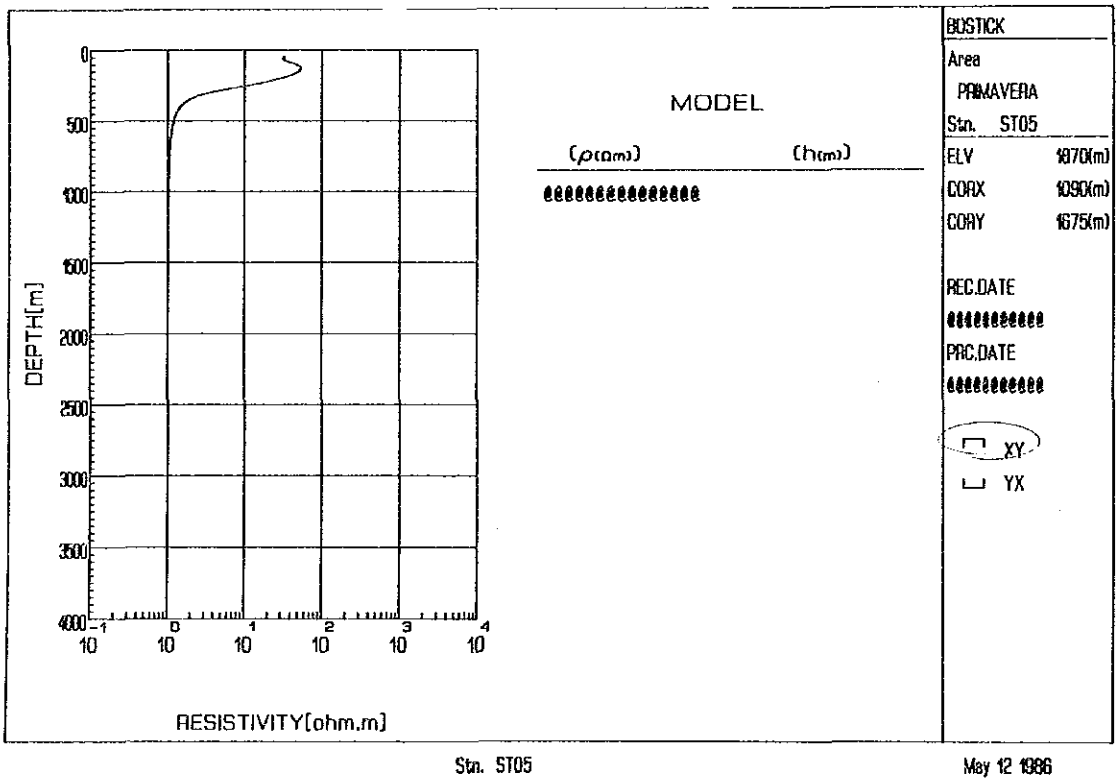

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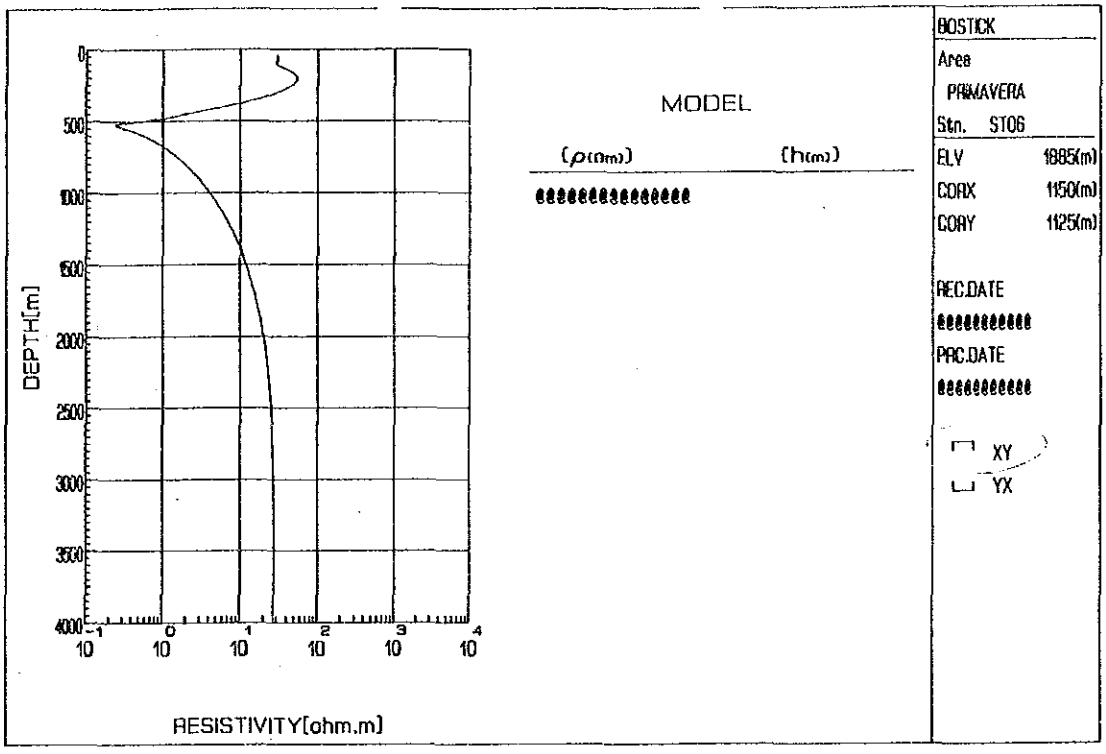
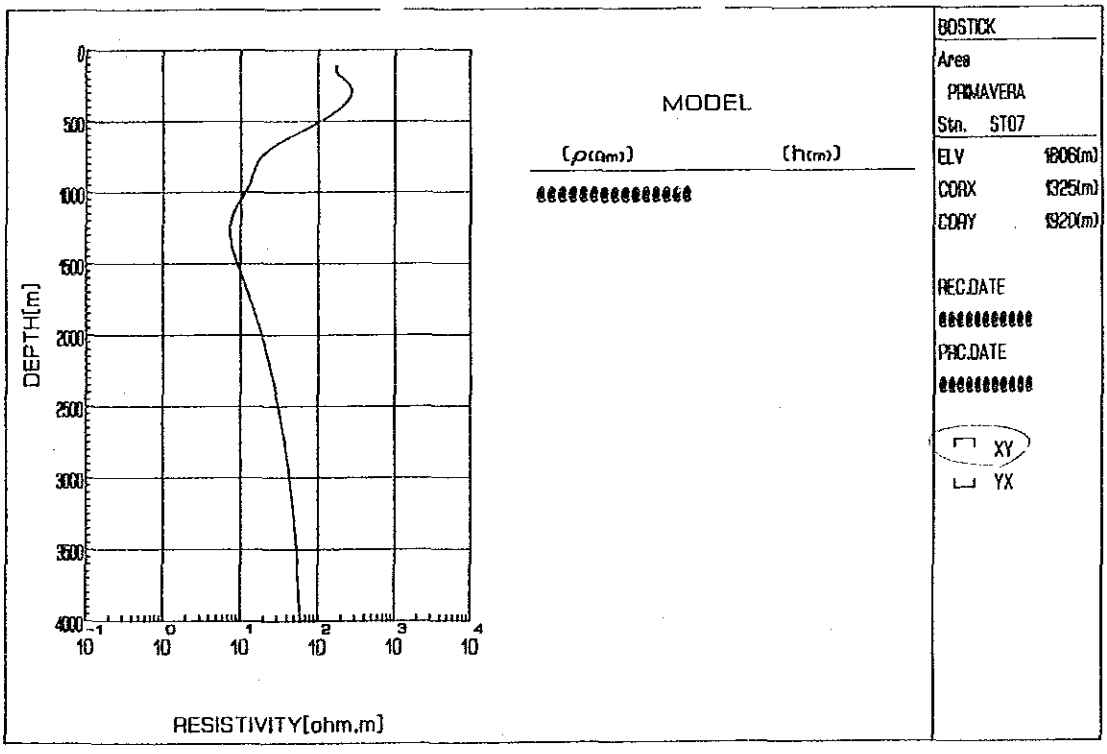
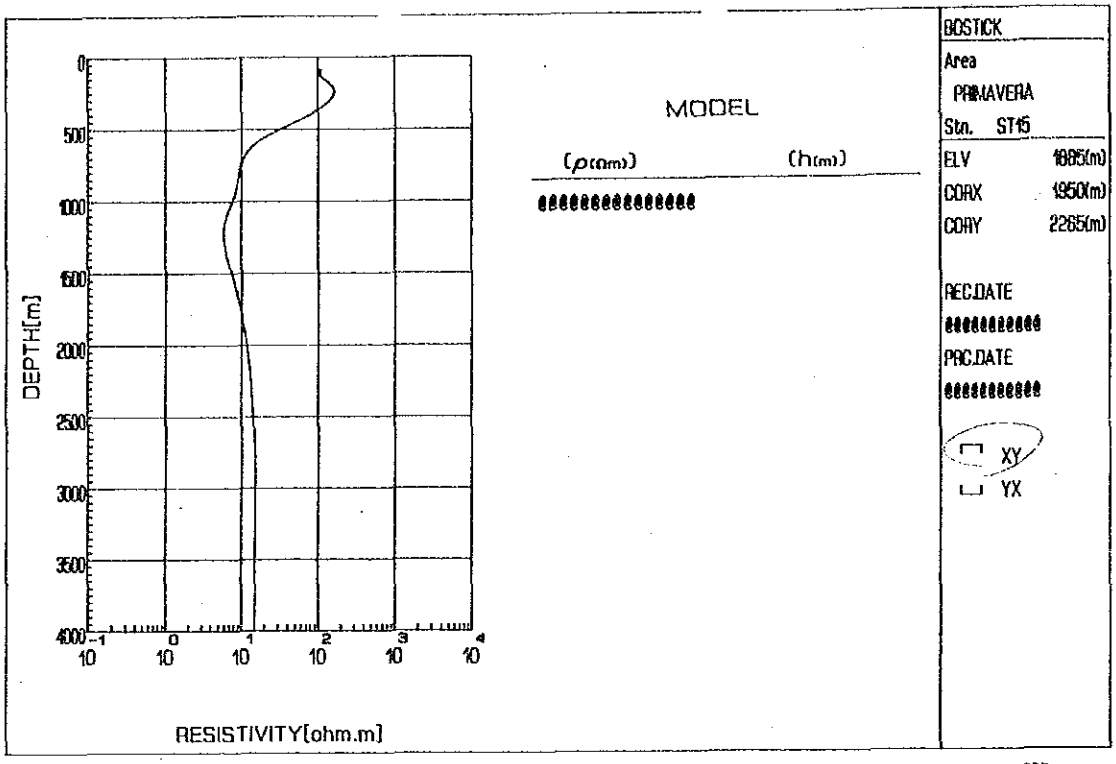

BOSTICK
Area
PRIMAVERA
Stn. ST06
ELV 1885(m)
CORX 1150(m)
CORY 1125(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST06
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST07
ELV 1806(m)
CORX 1325(m)
CORY 1920(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST07
May 12 1986



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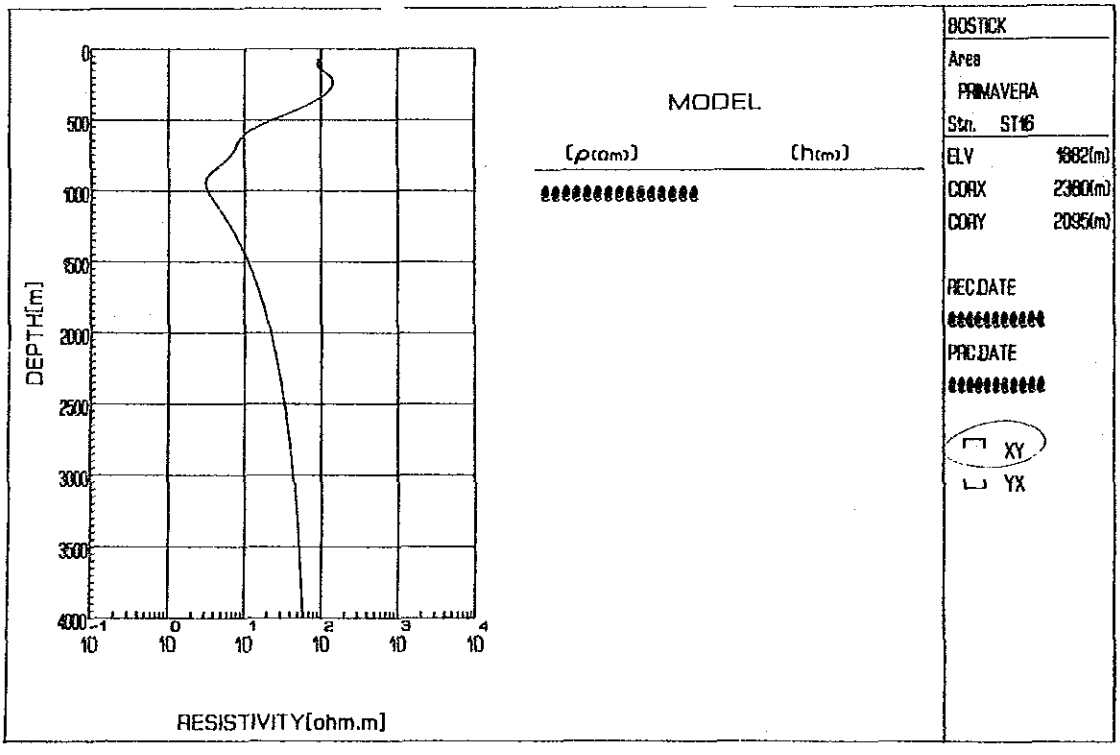

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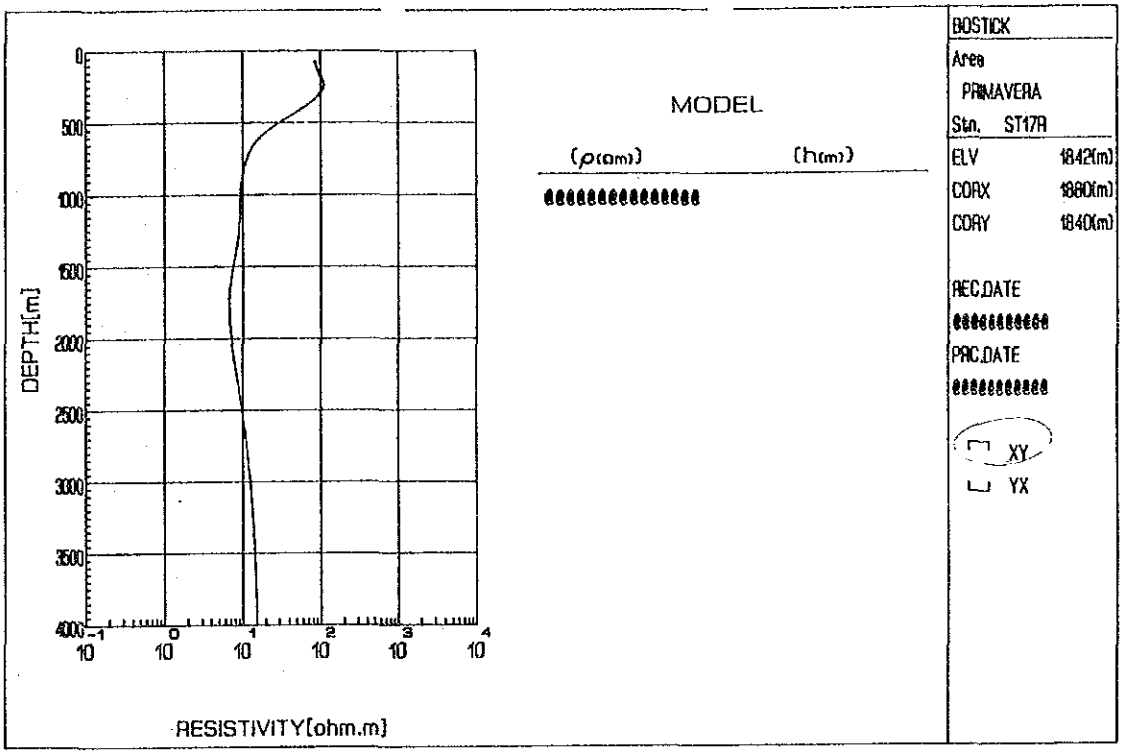
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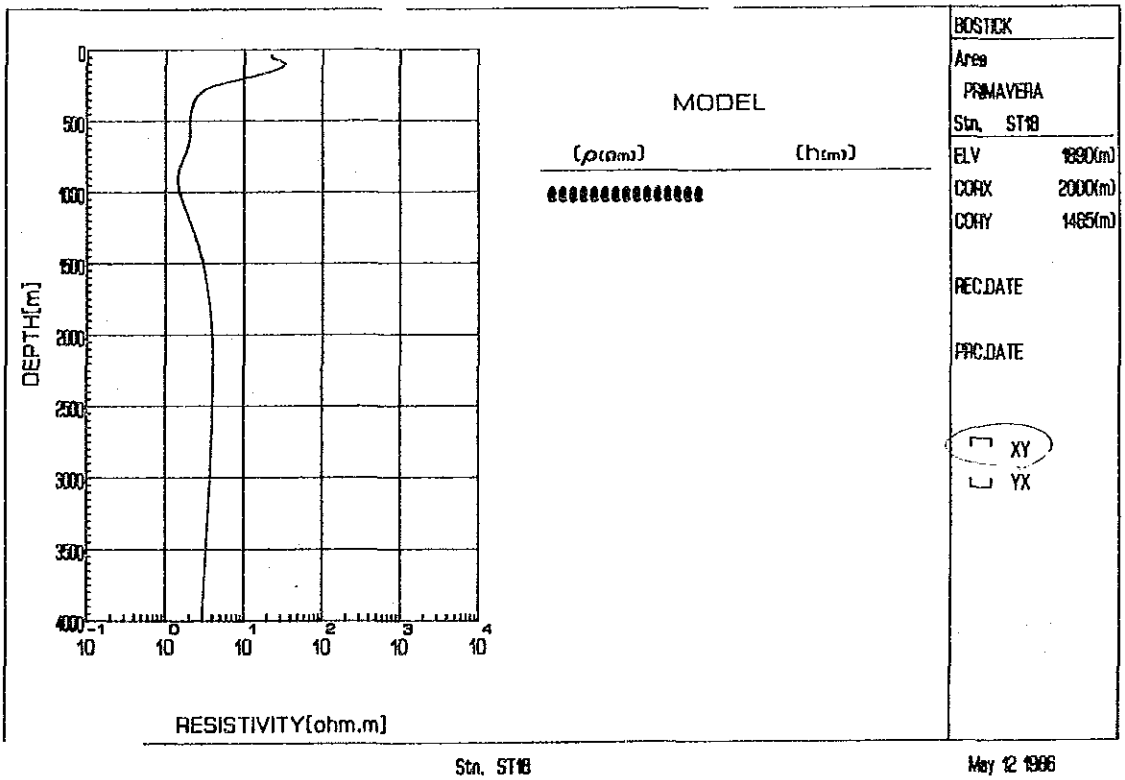
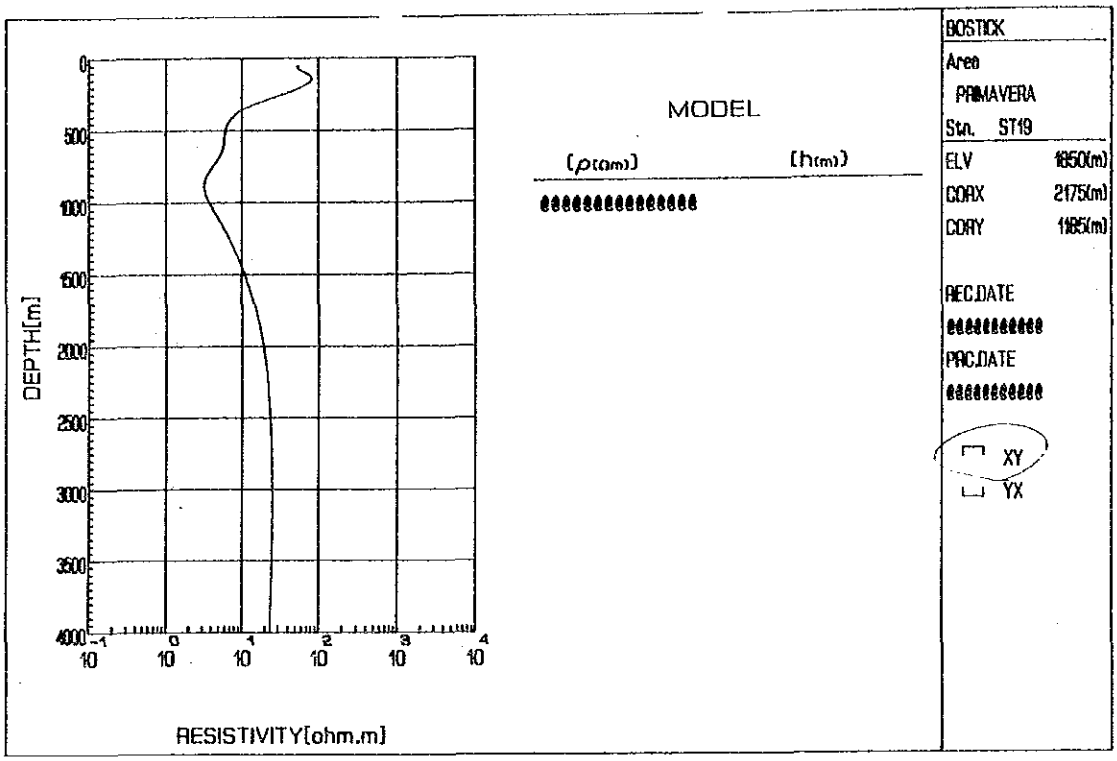
Area
PRIMAVERA
Stn. ST17R
ELV 1842(m)
CORX 1880(m)
CORY 1840(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST17
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST18
ELV 1890(m)
CORX 2000(m)
CORY 1465(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST18
May 12 1986



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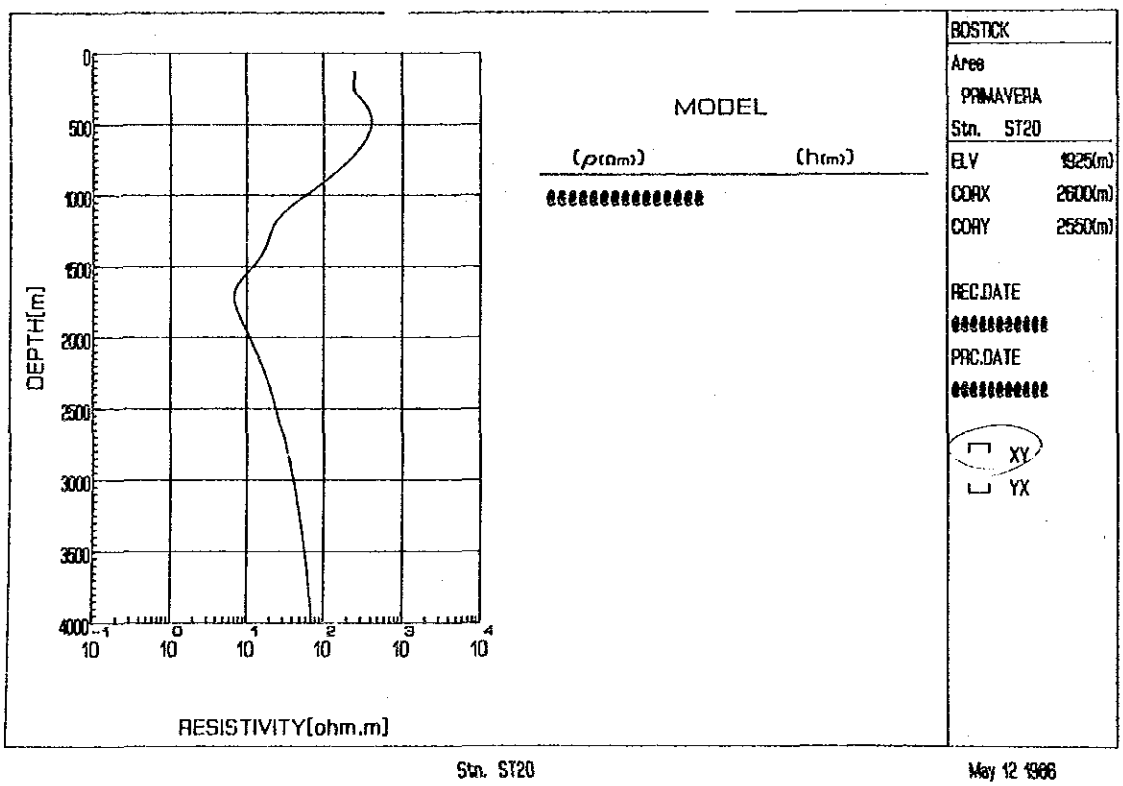

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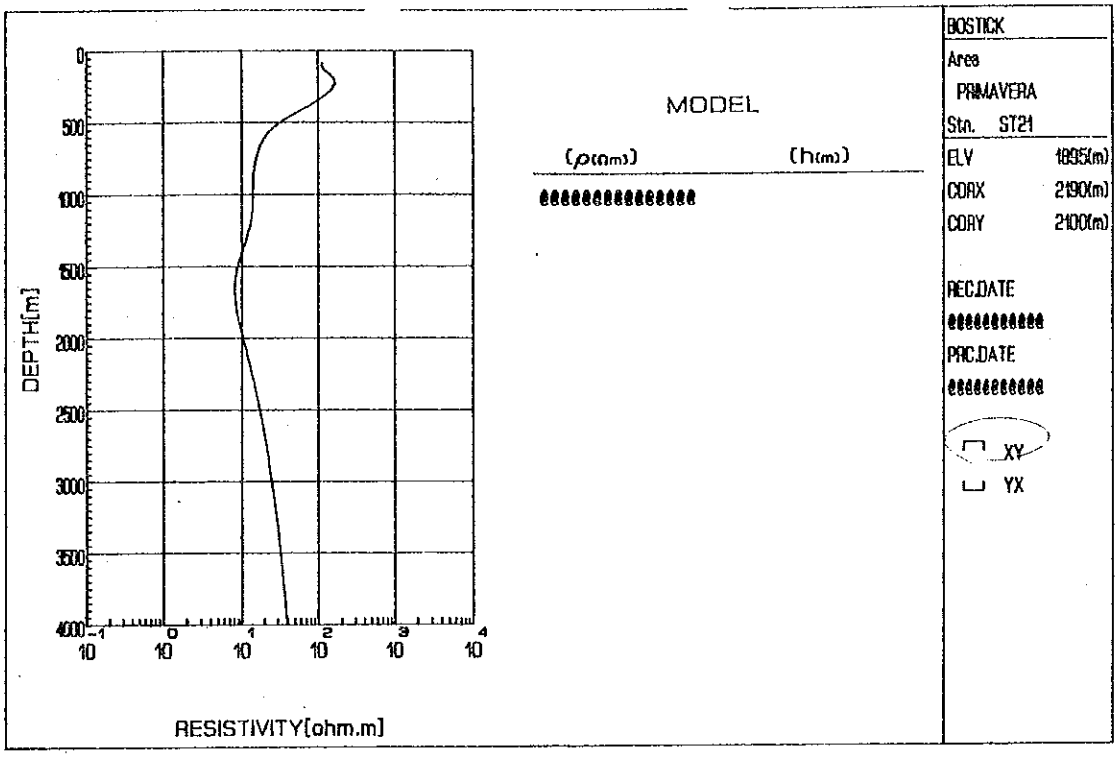

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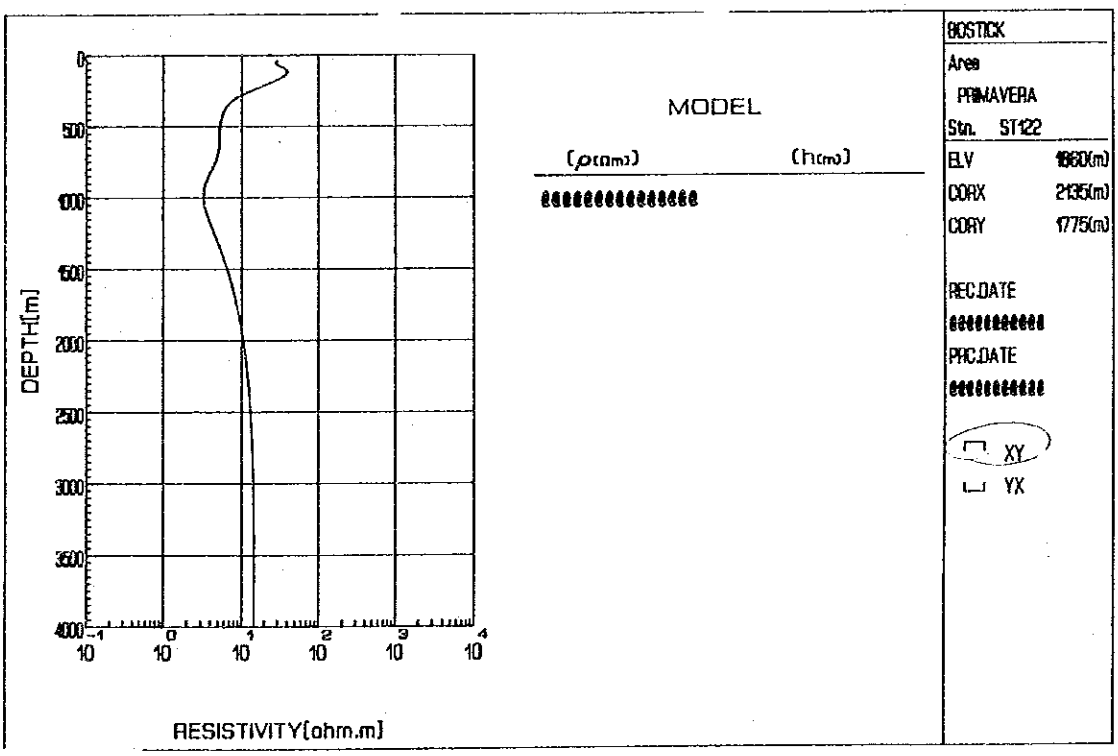

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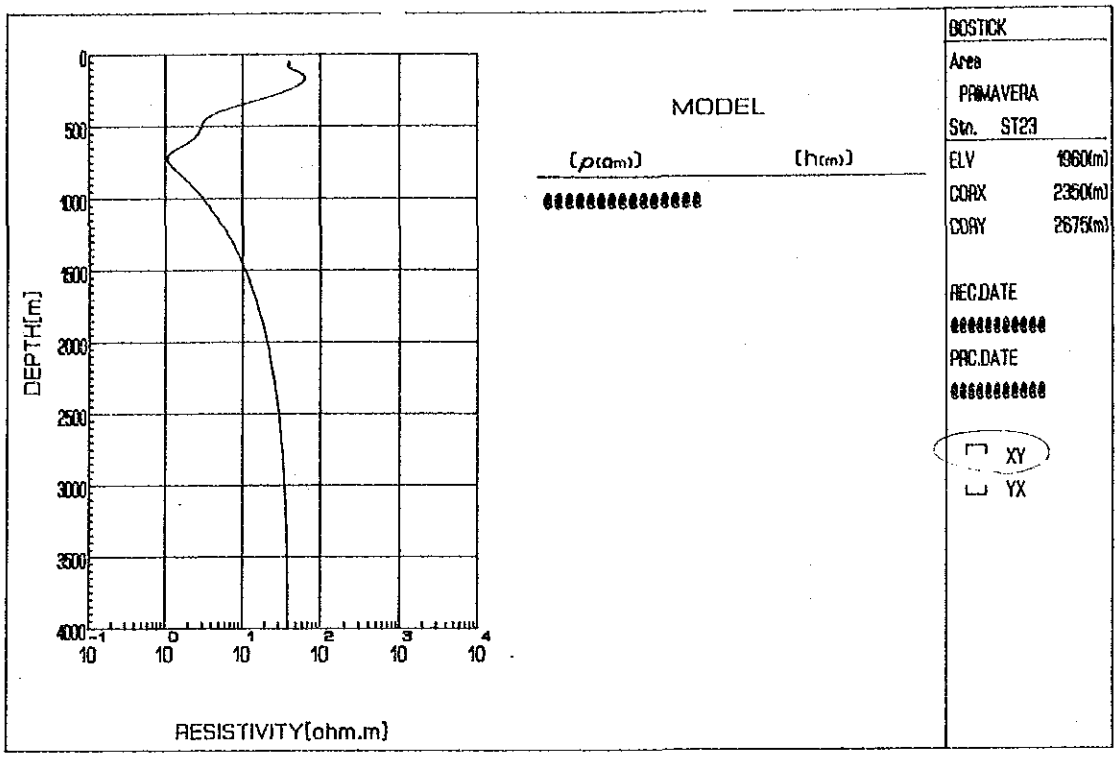

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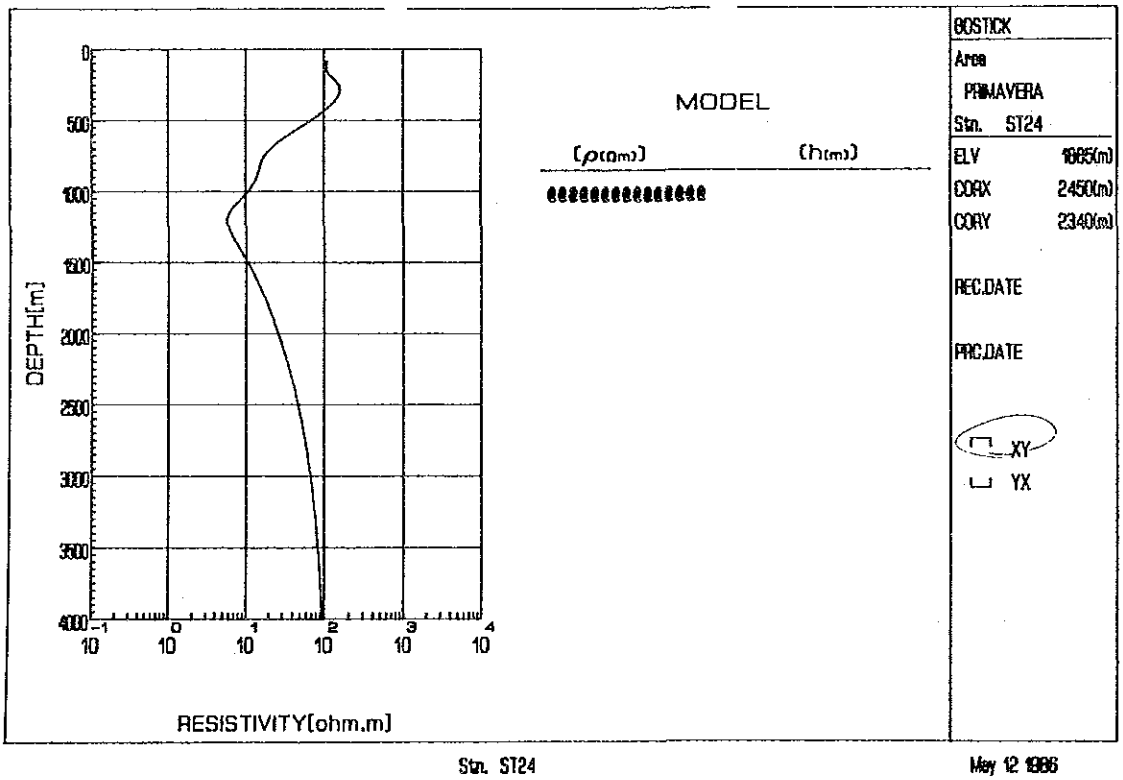

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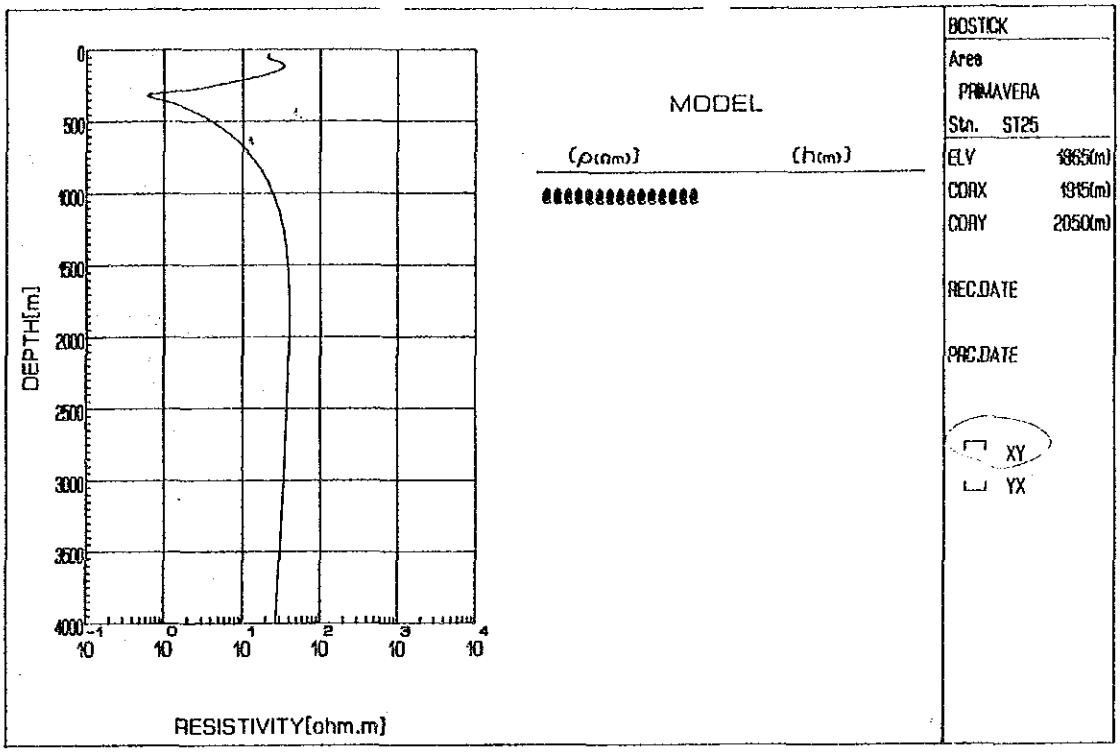

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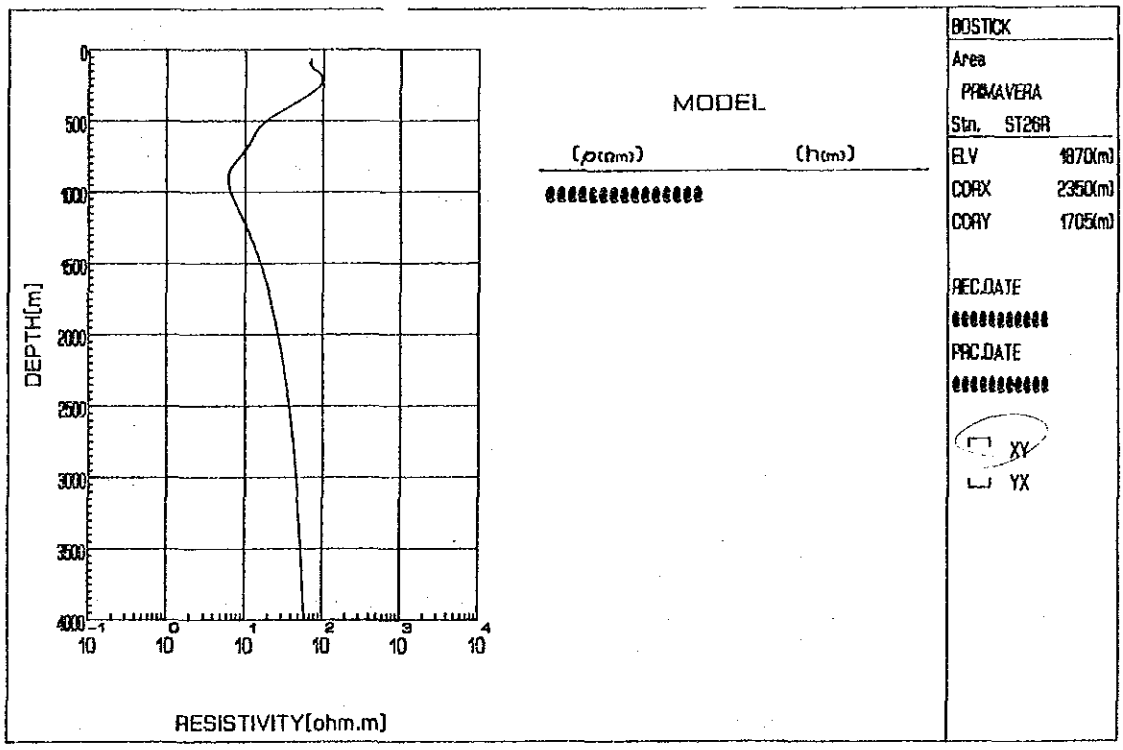

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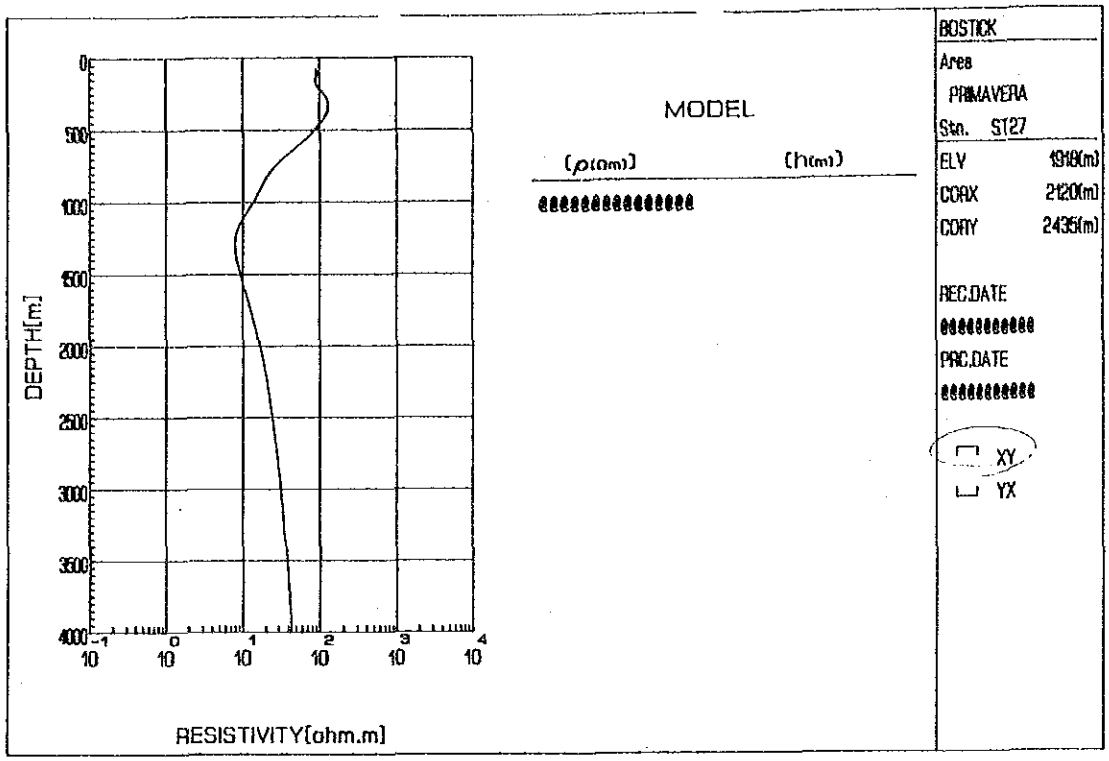
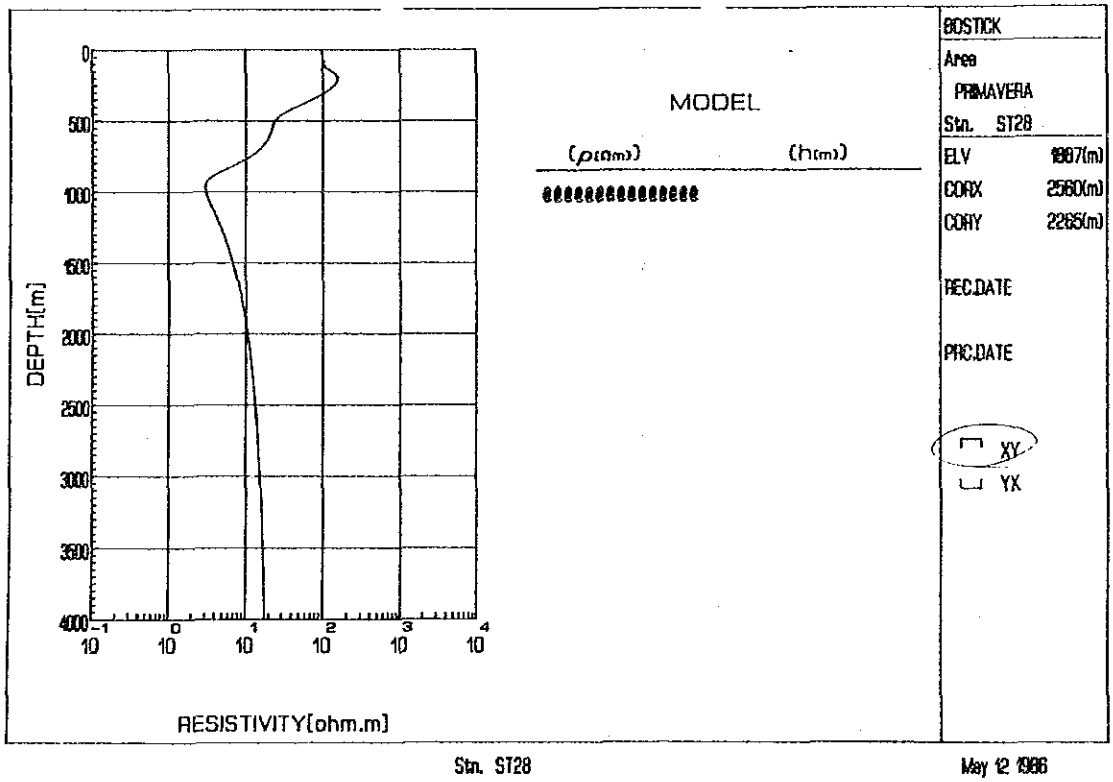
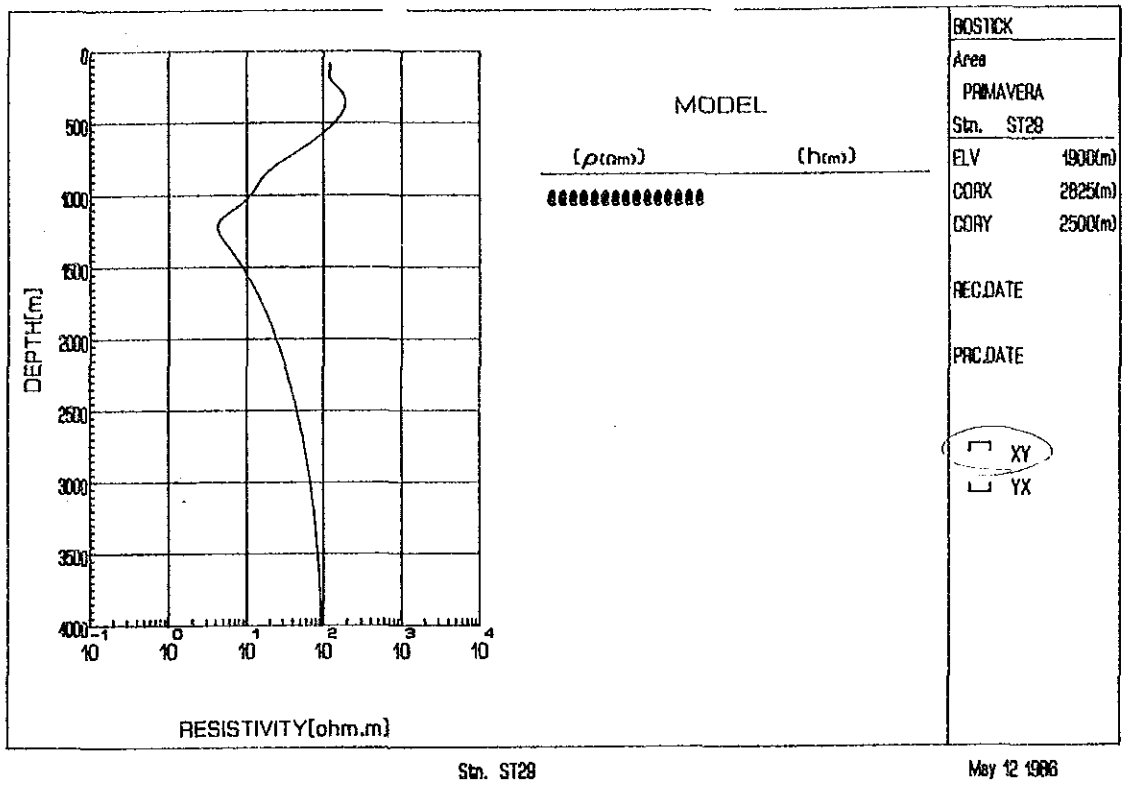
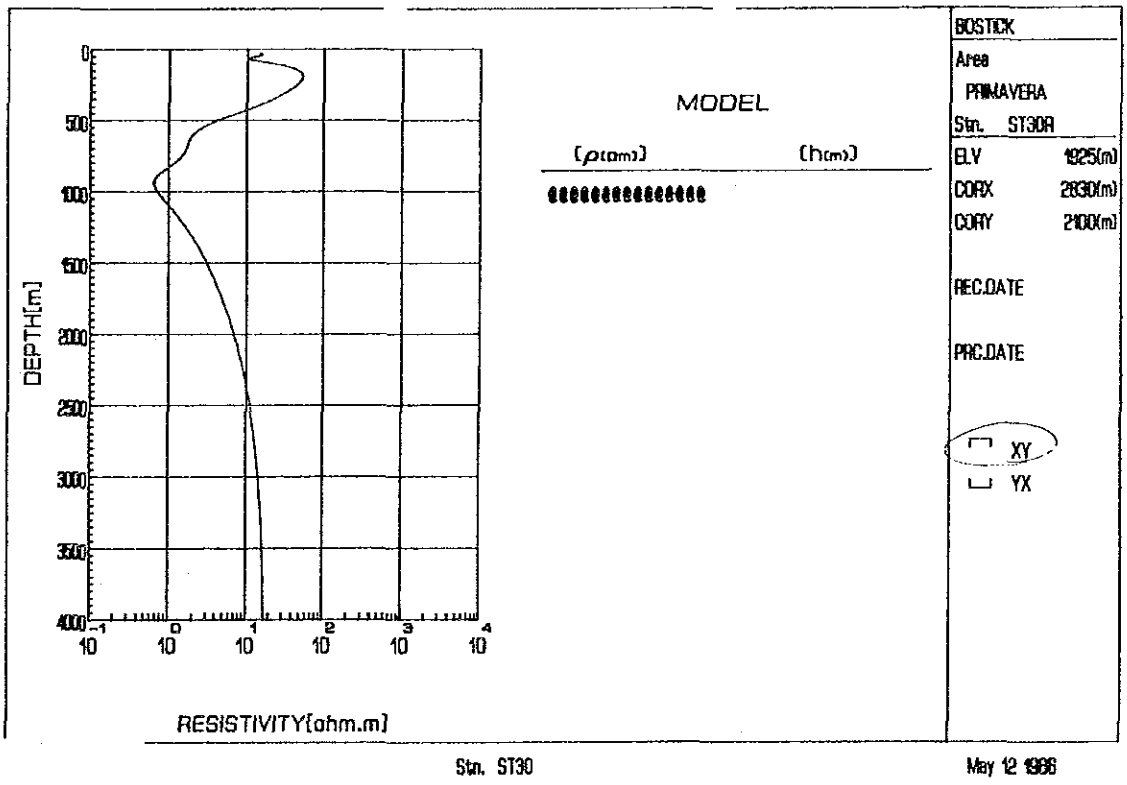

BOSTICK
Area
PRIMAVERA
Stn. ST27
ELV 1918(m)
CORX 2120(m)
CORY 2435(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST27
May 12 1996


BOSTICK
Area
PRIMAVERA
Stn. ST28
ELV 1967(m)
CORX 2560(m)
CORY 2265(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST28
May 12 1996


BOSTICK
Area
PRIMAVERA
Stn. ST28
ELV 1900(m)
CORX 2825(m)
CORY 2500(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST28
May 12 1986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Stn. ST30R
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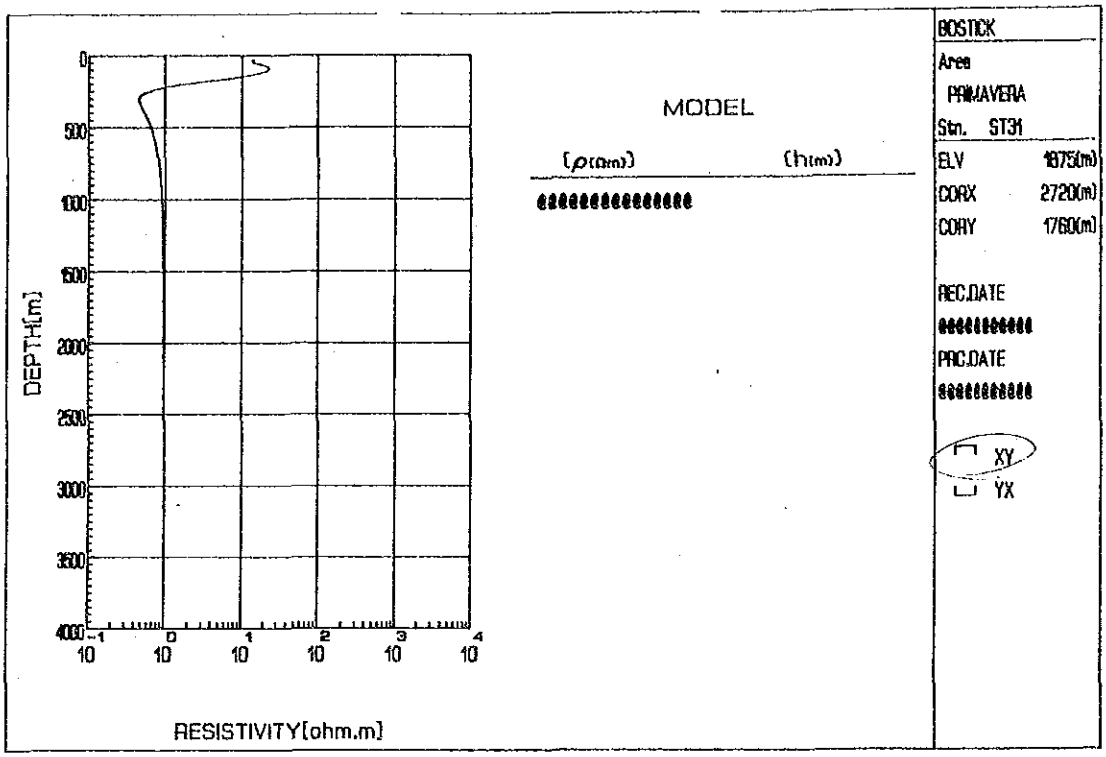
CORX 2830(m)
CORY 2100(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST30
May 12 1986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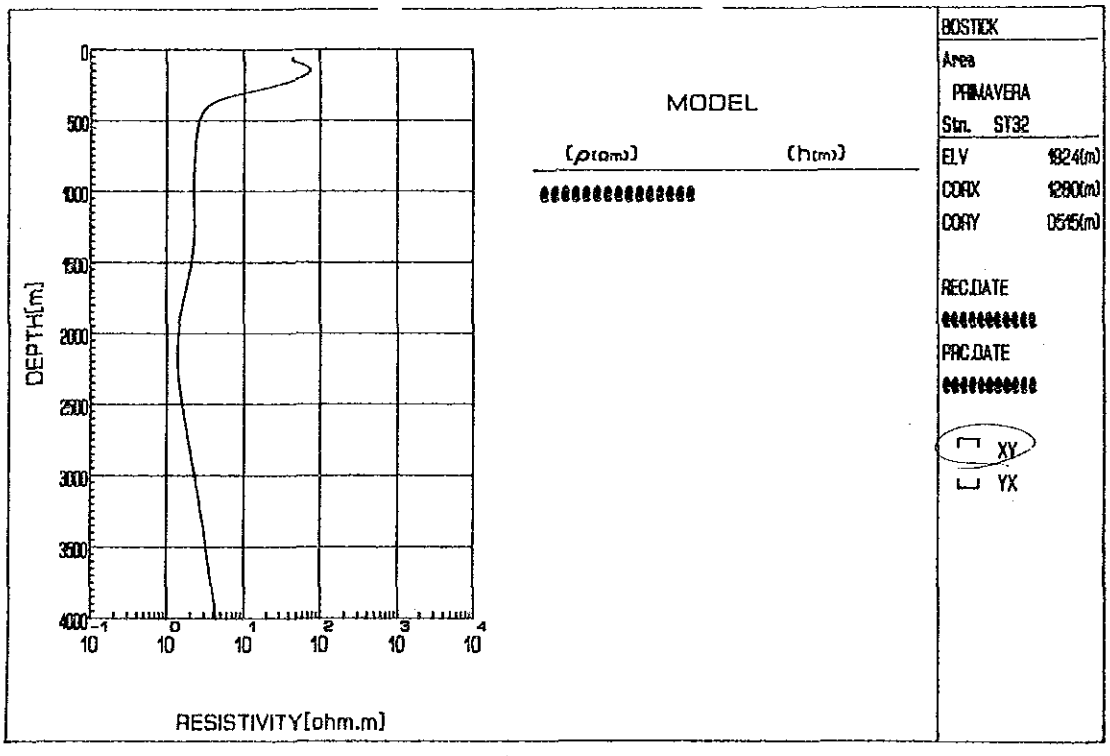
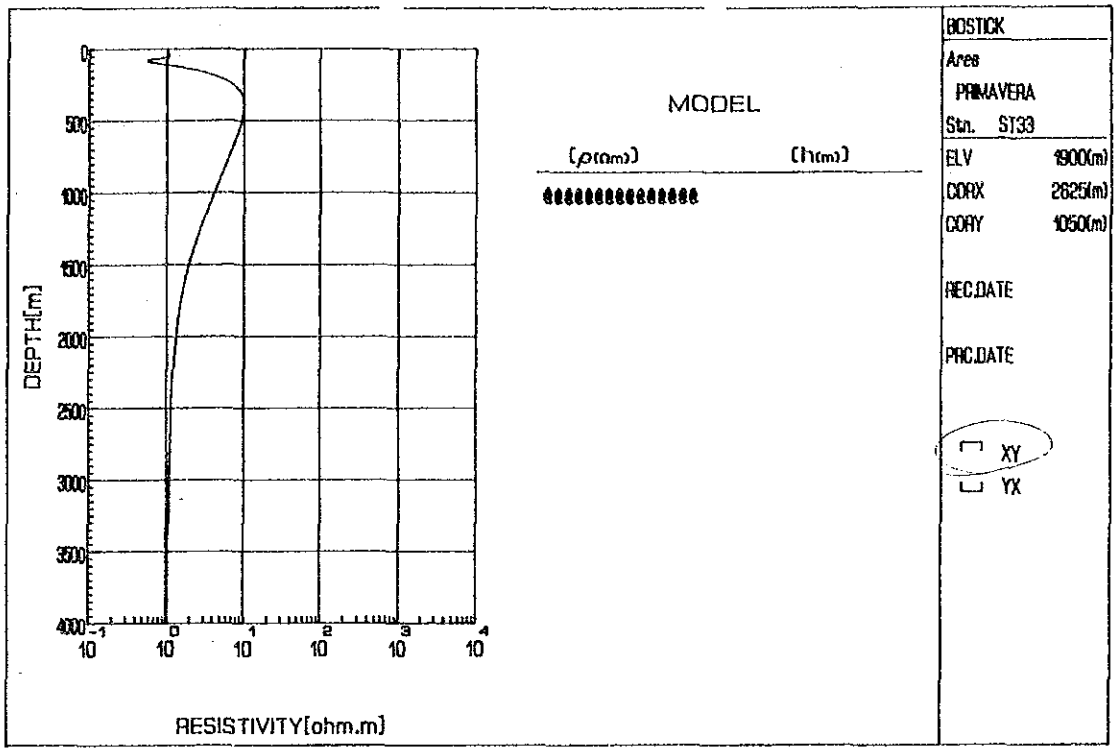
Area
PRIMAVERA
Stn. ST31
ELV 1875(m)
CORX 2720(m)
CORY 1760(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST31
May 12 1996


BOSTICK
Area
PRIMAVERA
Stn. ST32
ELV 1824(m)
CORX 1280(m)
CORY 0515(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST32
May 12 1996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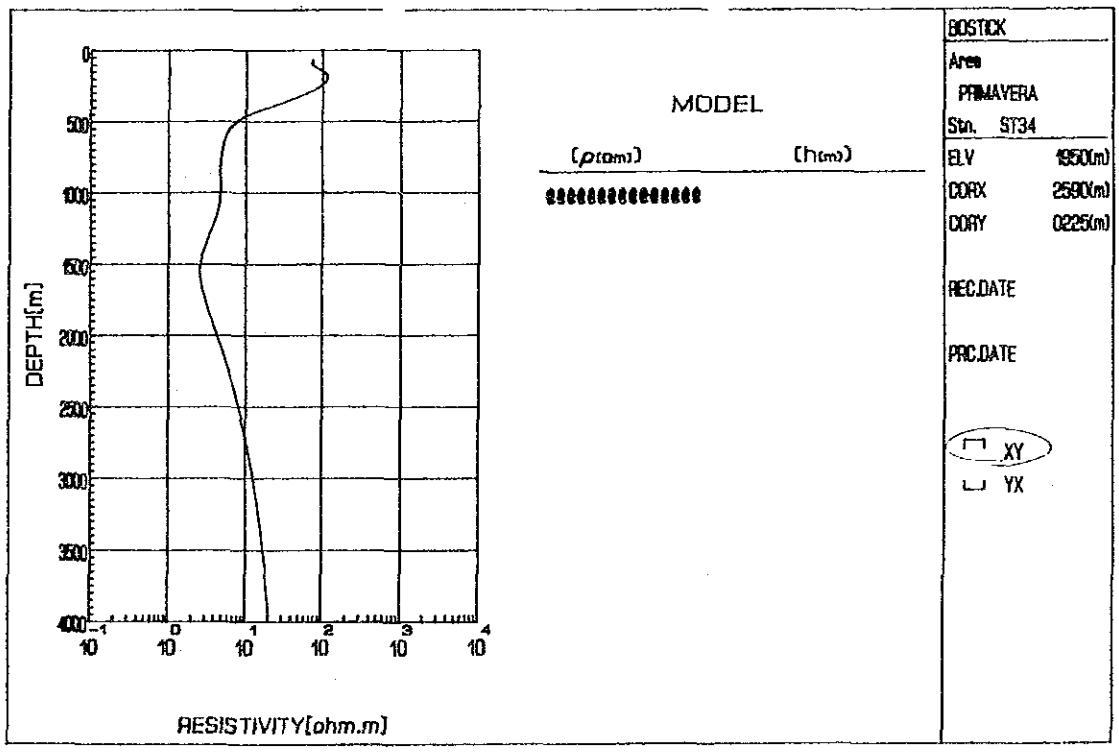
Area
PRIMAVERA
Stn. ST33
ELV 1900(m)
CORX 2625(m)
CORY 1050(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST33
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST34
ELV 1950(m)
CORX 2590(m)
CORY 0225(m)
REC.DATE
PRC.DATE
XY
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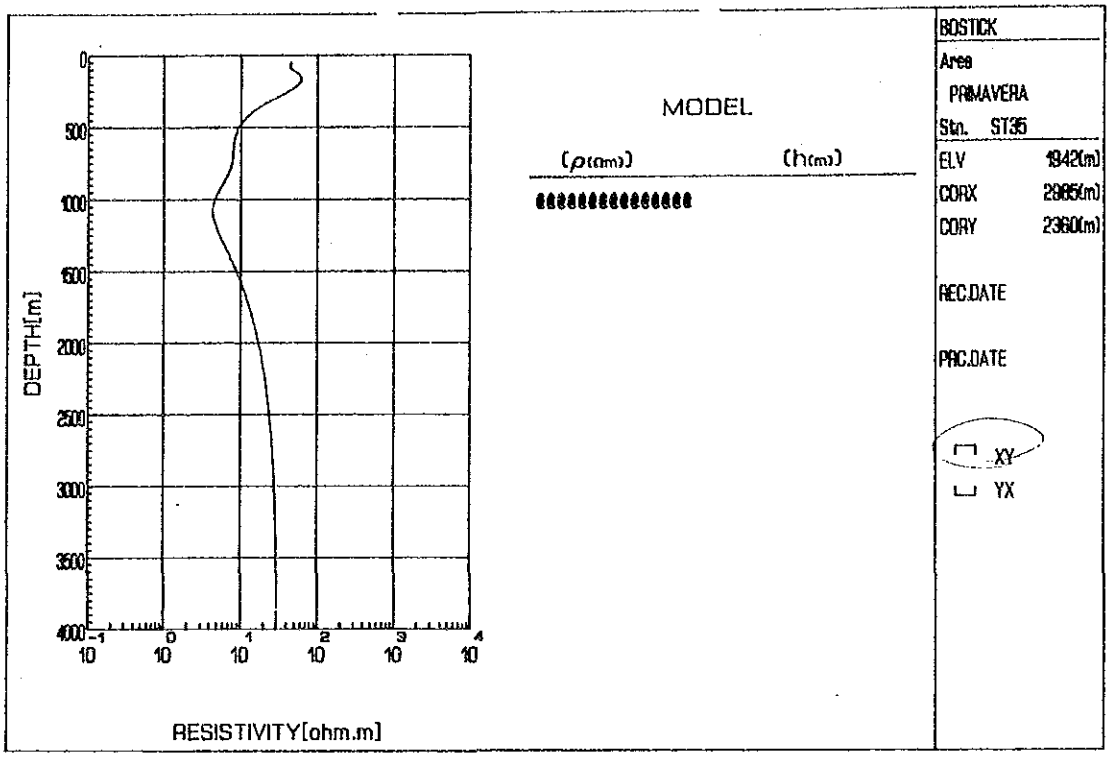
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST34
May 12 1986



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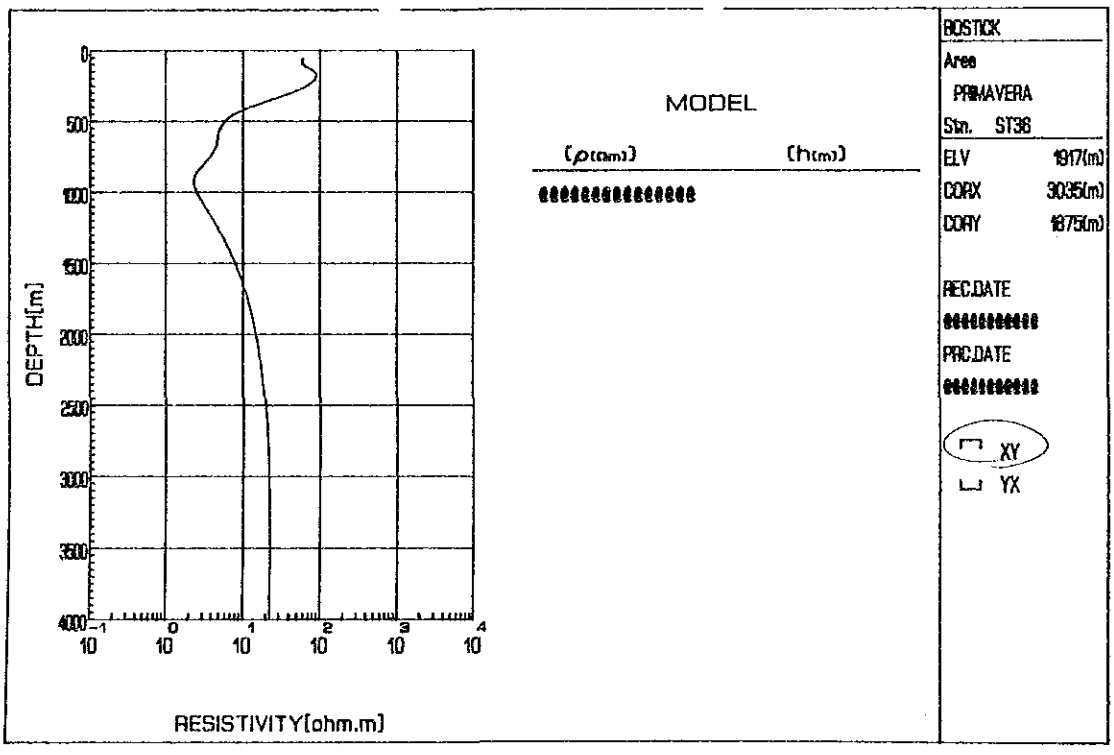

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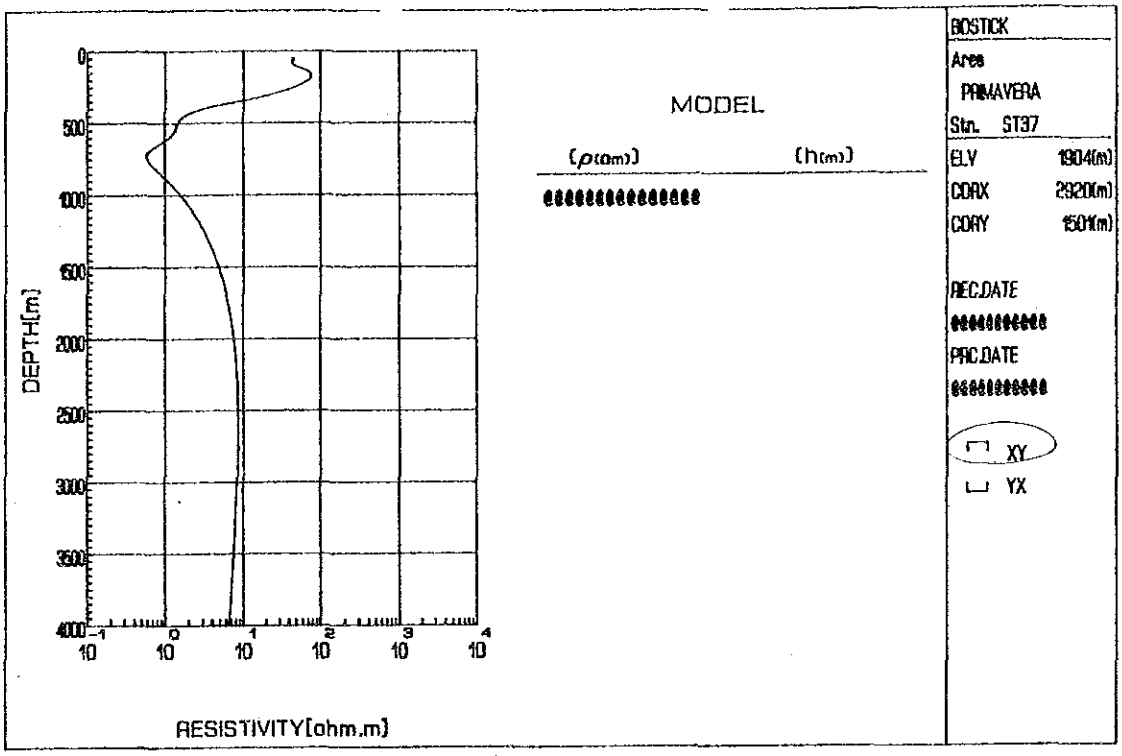

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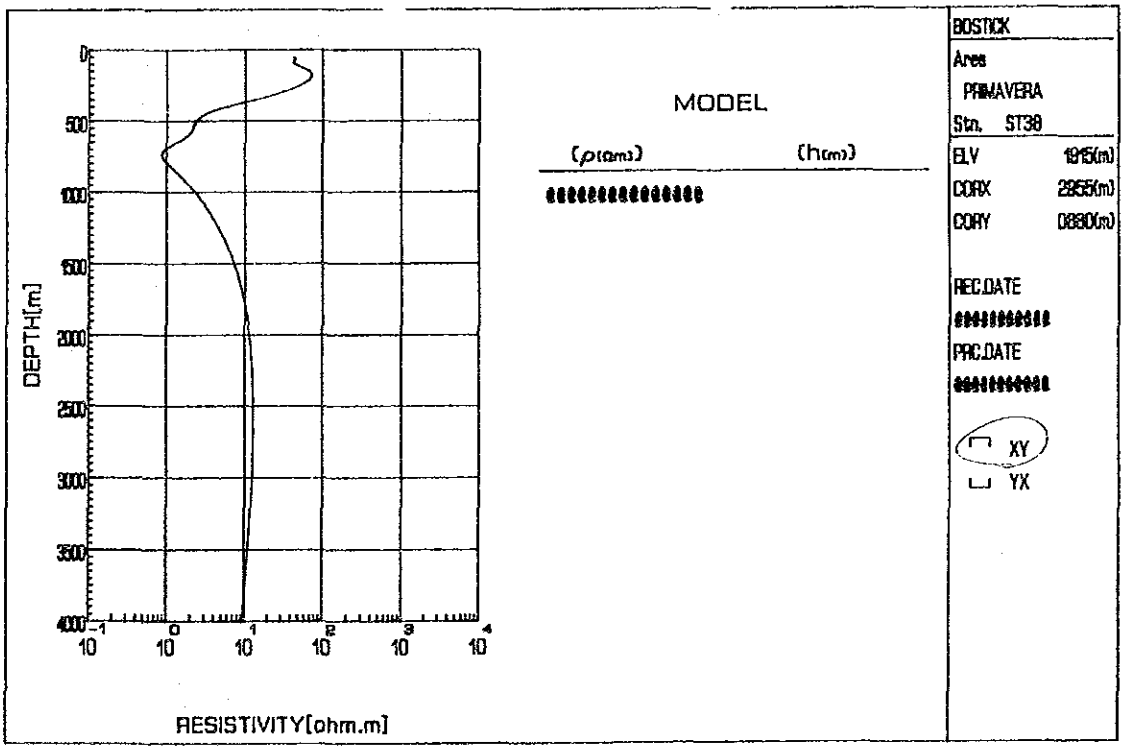
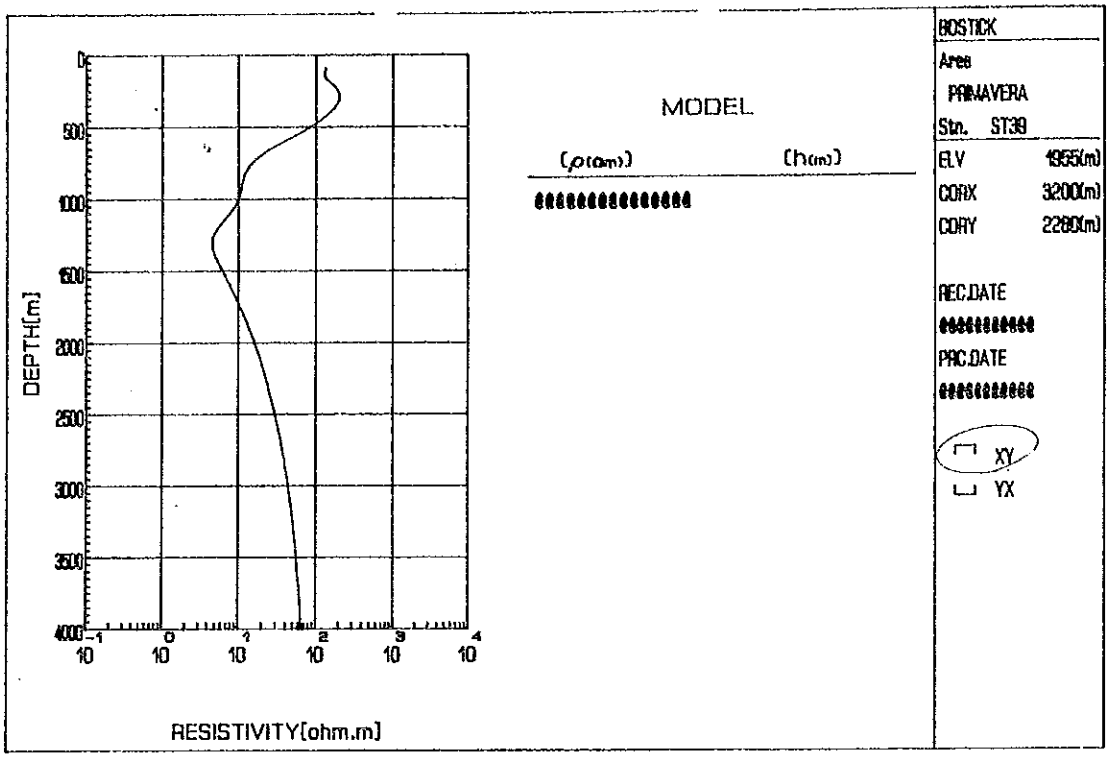


Stn. ST38 May 12 1966



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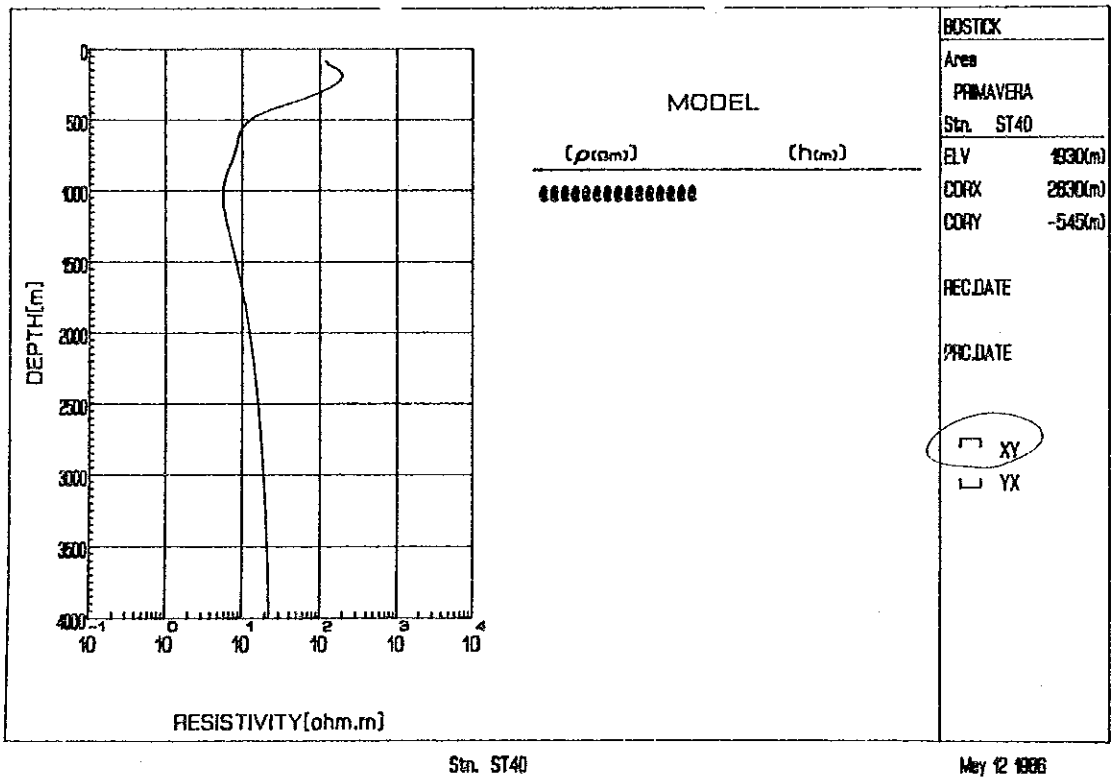

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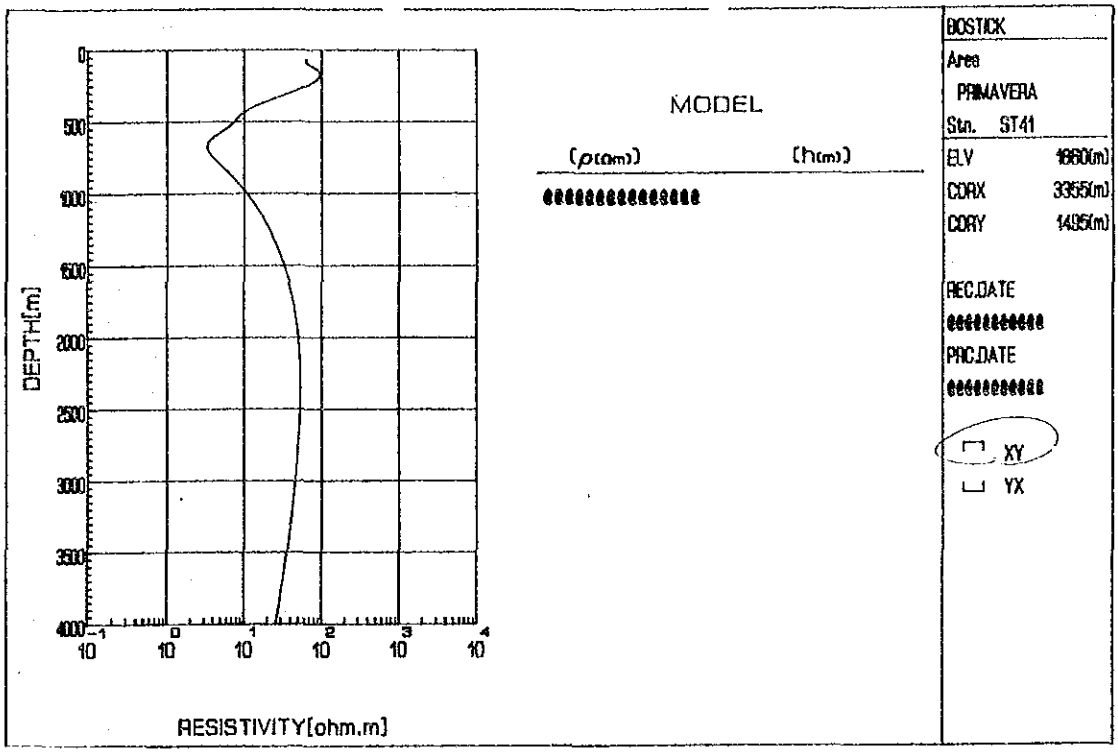

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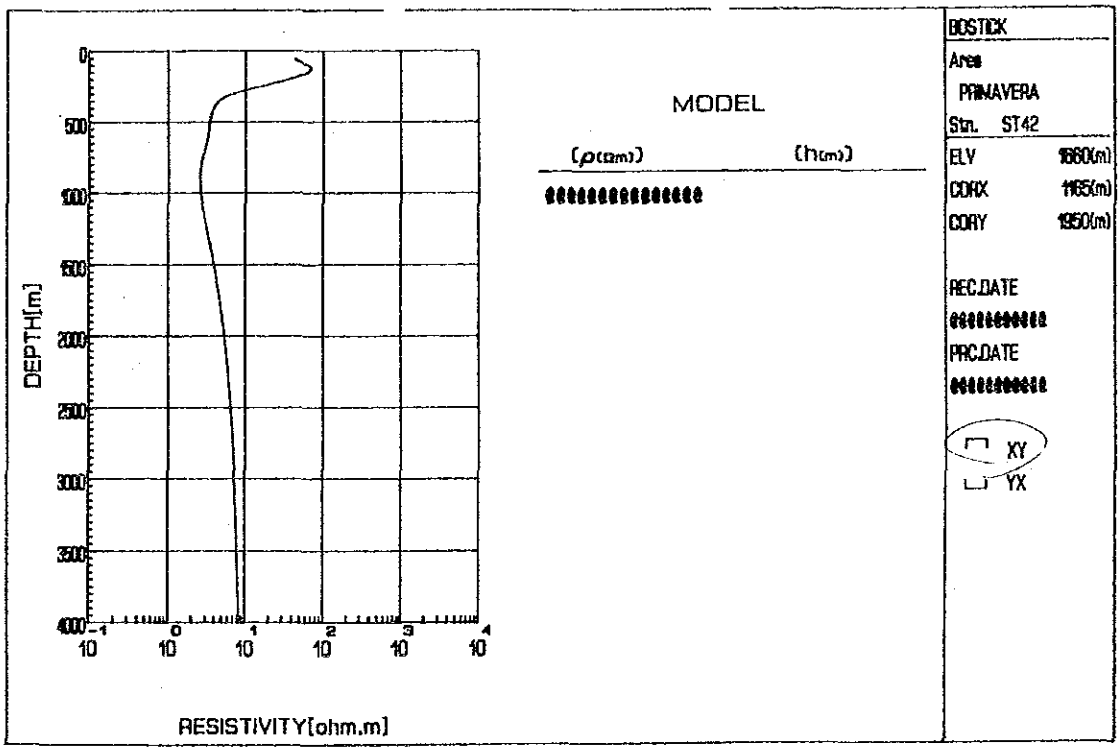

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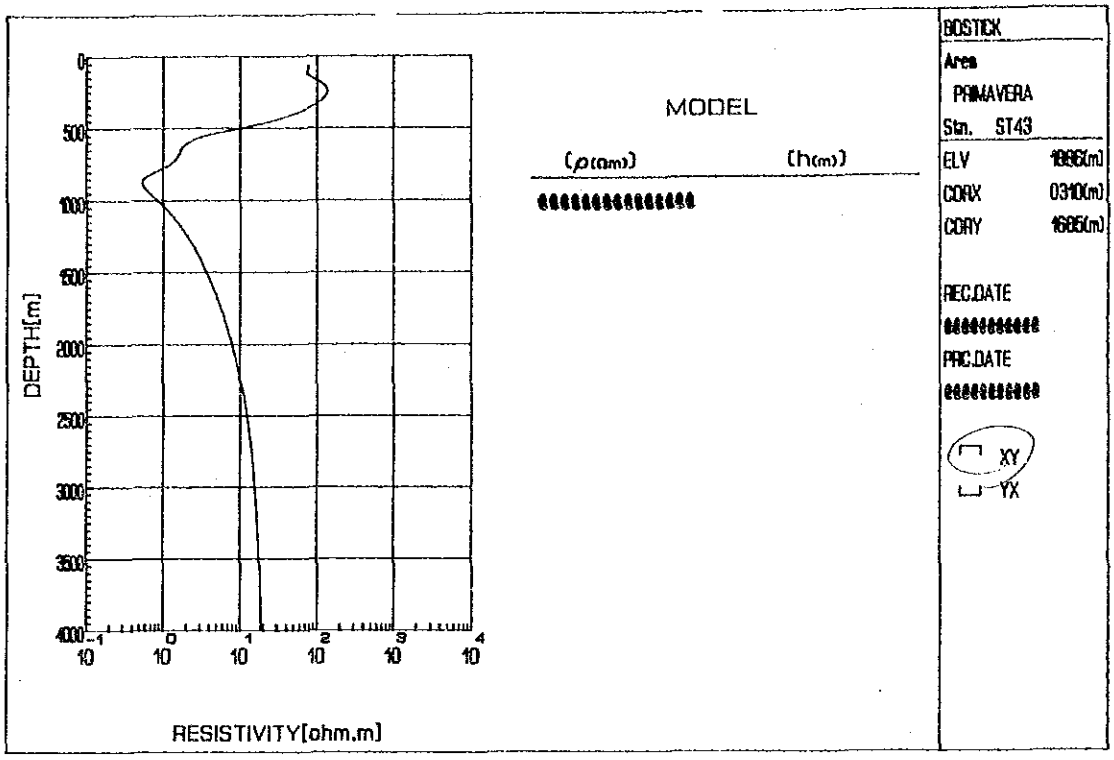
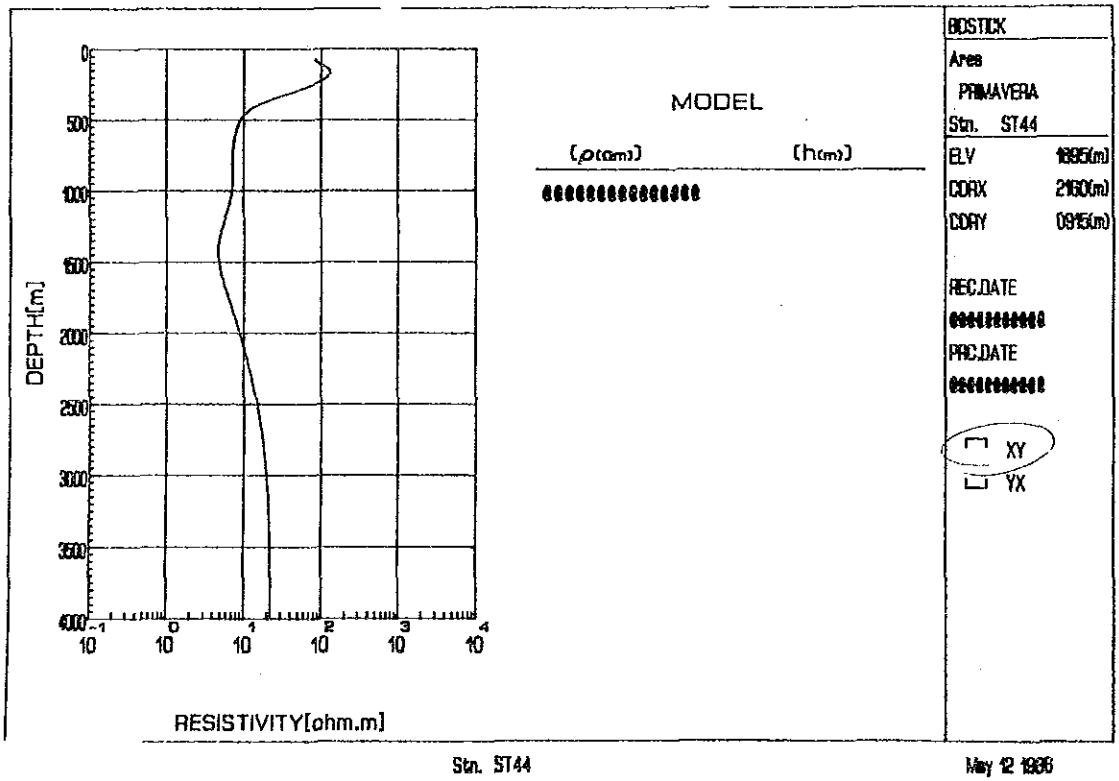
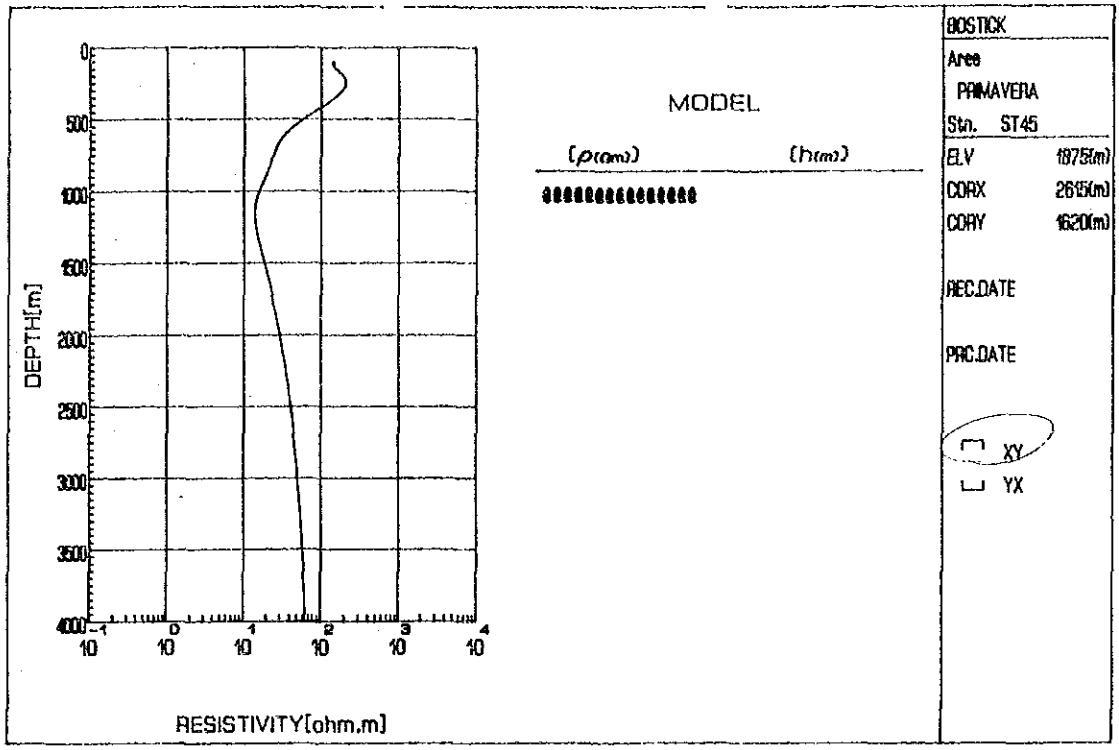


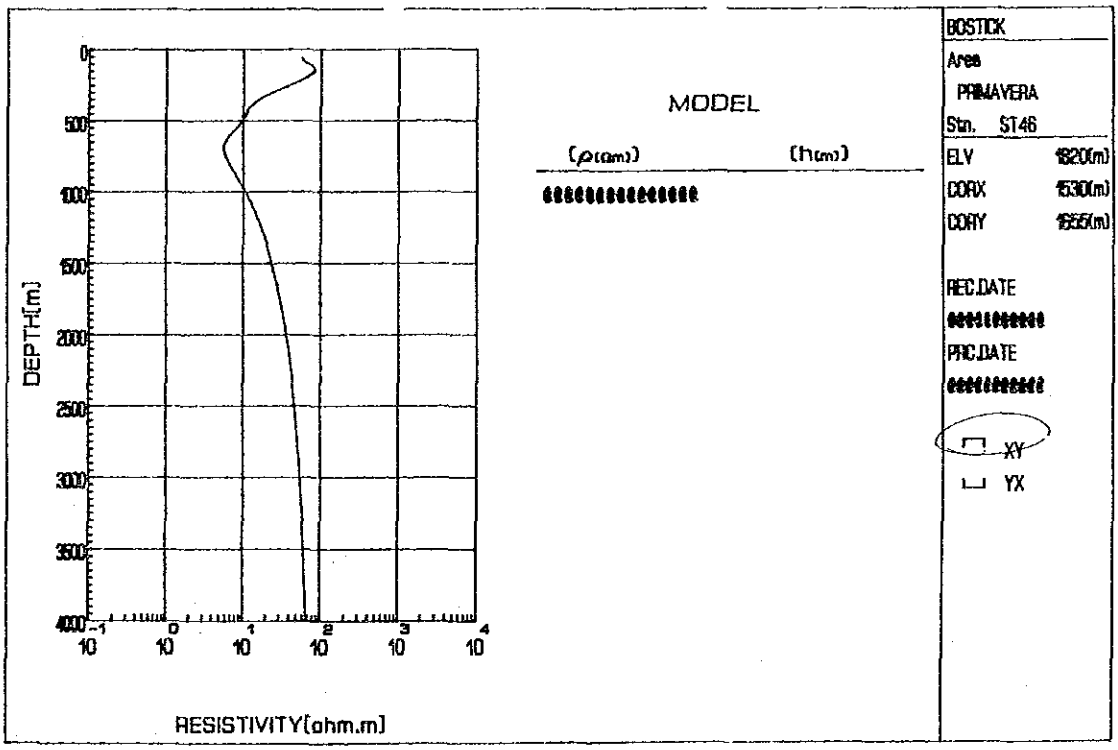
Stn. ST43 May 12 1986



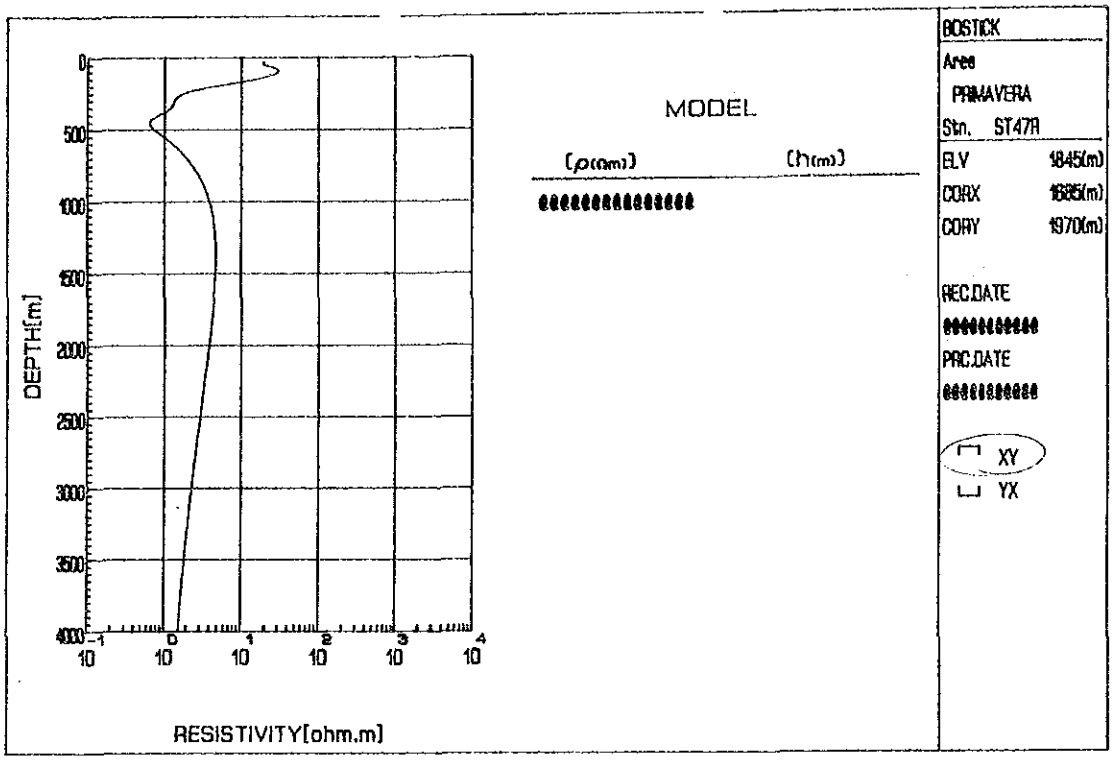
Stn. ST44 May 12 1986



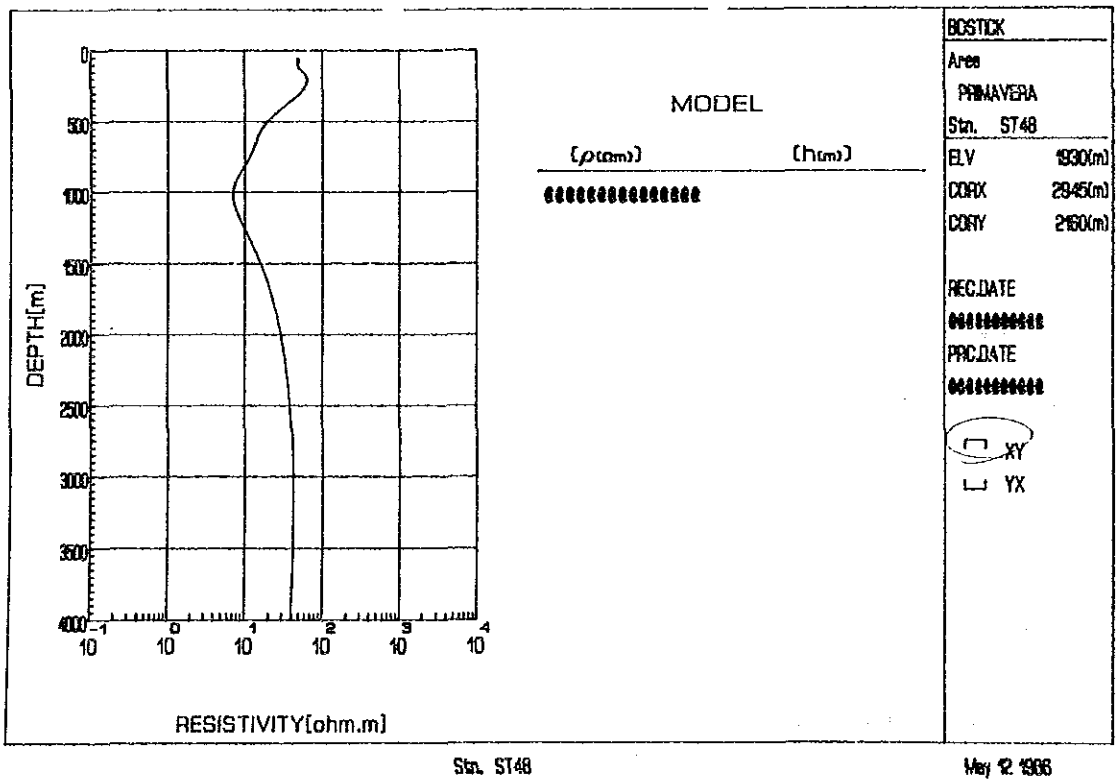
Stn. ST45 May 12 1988



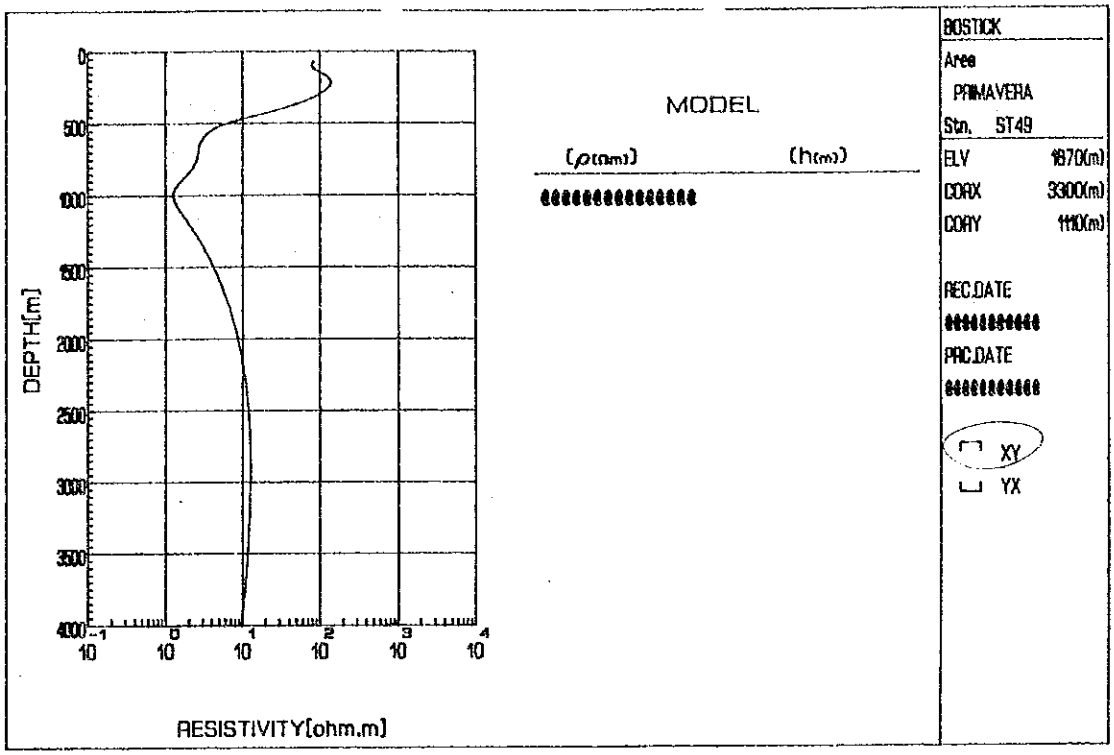
Stn. ST46 May 12 1988

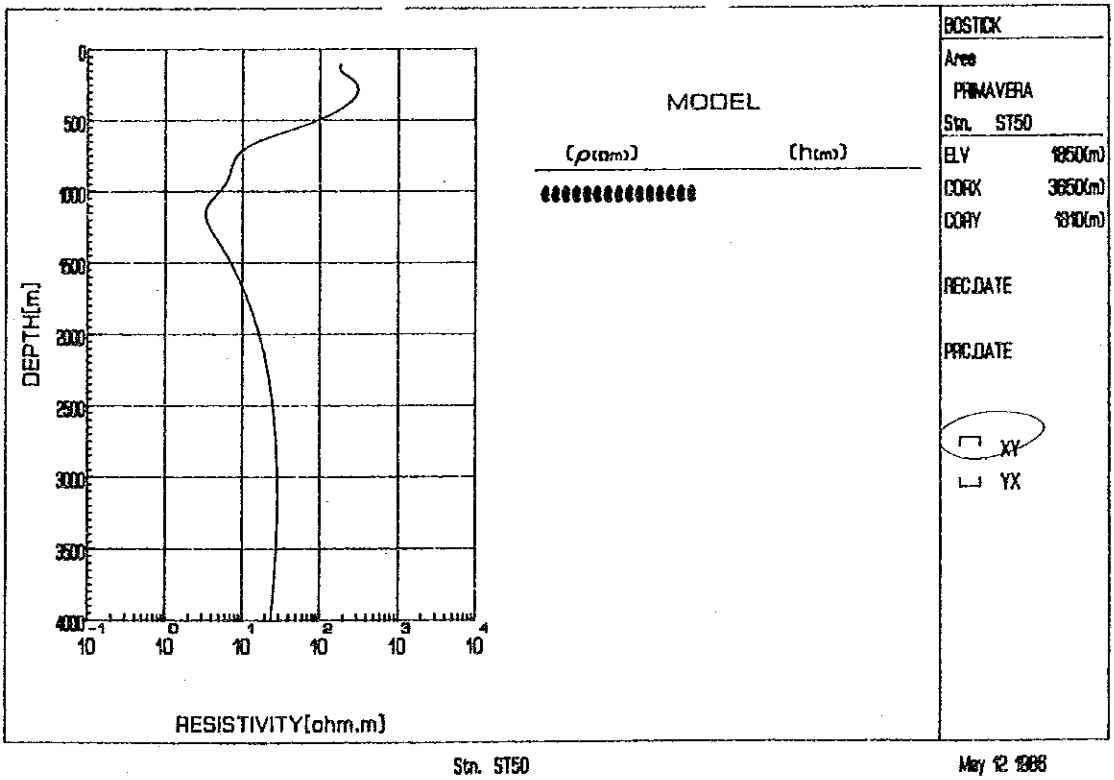


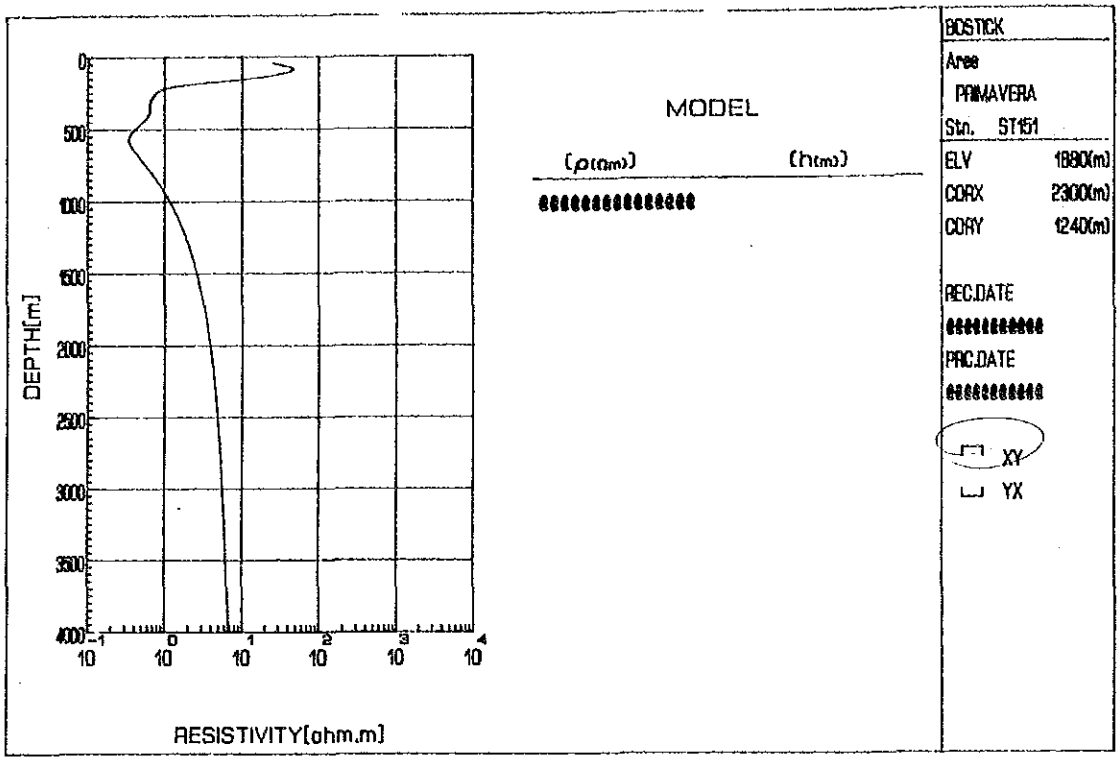
Stn. ST47 May 12 1986



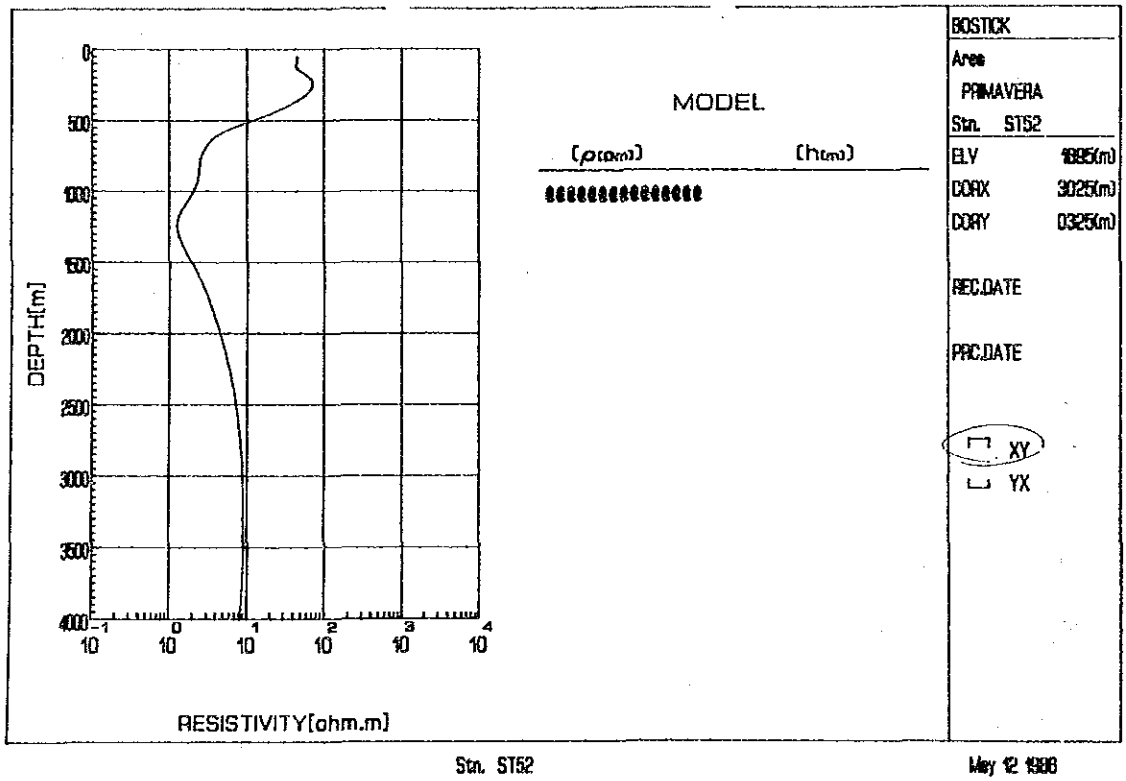
Stn. ST48 May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST49
ELV 1870(m)
CORX 3300(m)
CORY 1110(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST49
May 12 1998

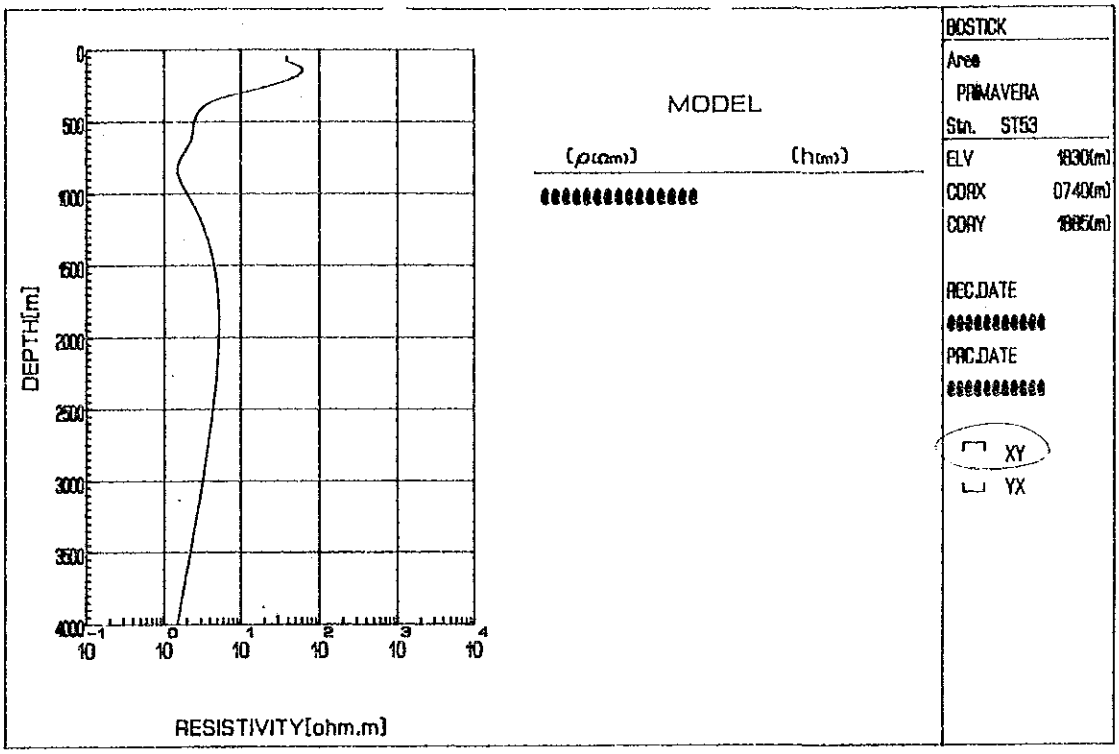

BOSTICK
Area
PRIMAVERA
Stn. ST50
ELV 1850(m)
CORX 3650(m)
CORY 1810(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST50
May 12 1998

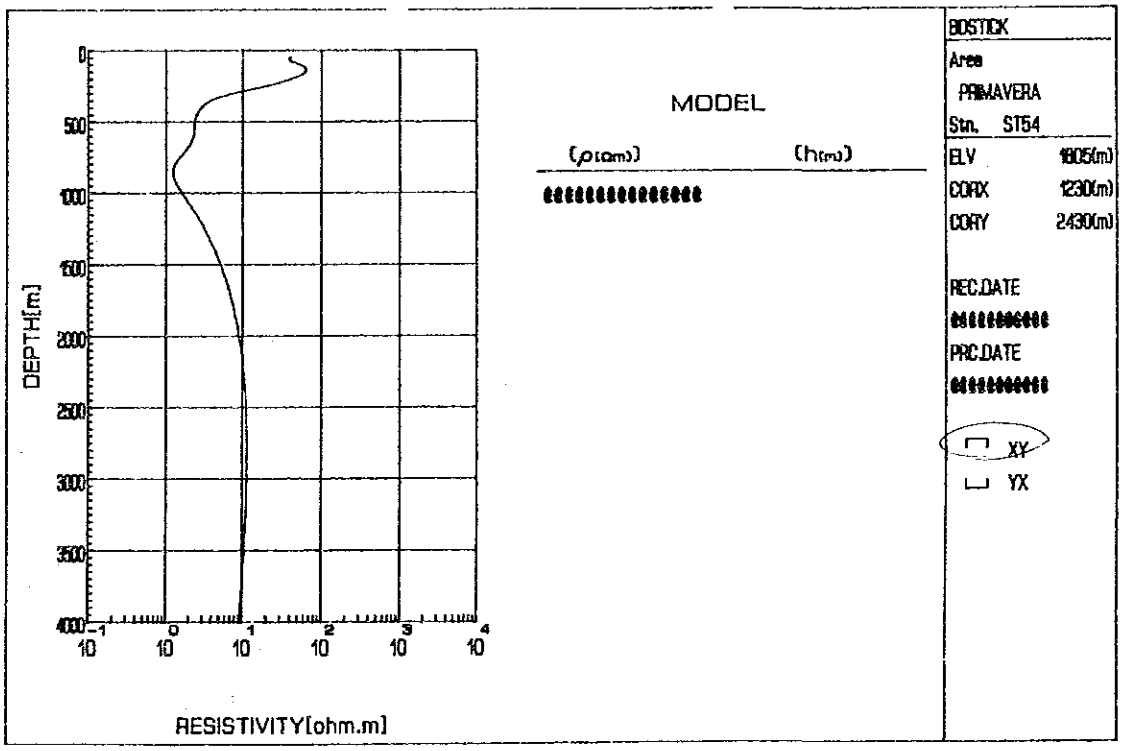


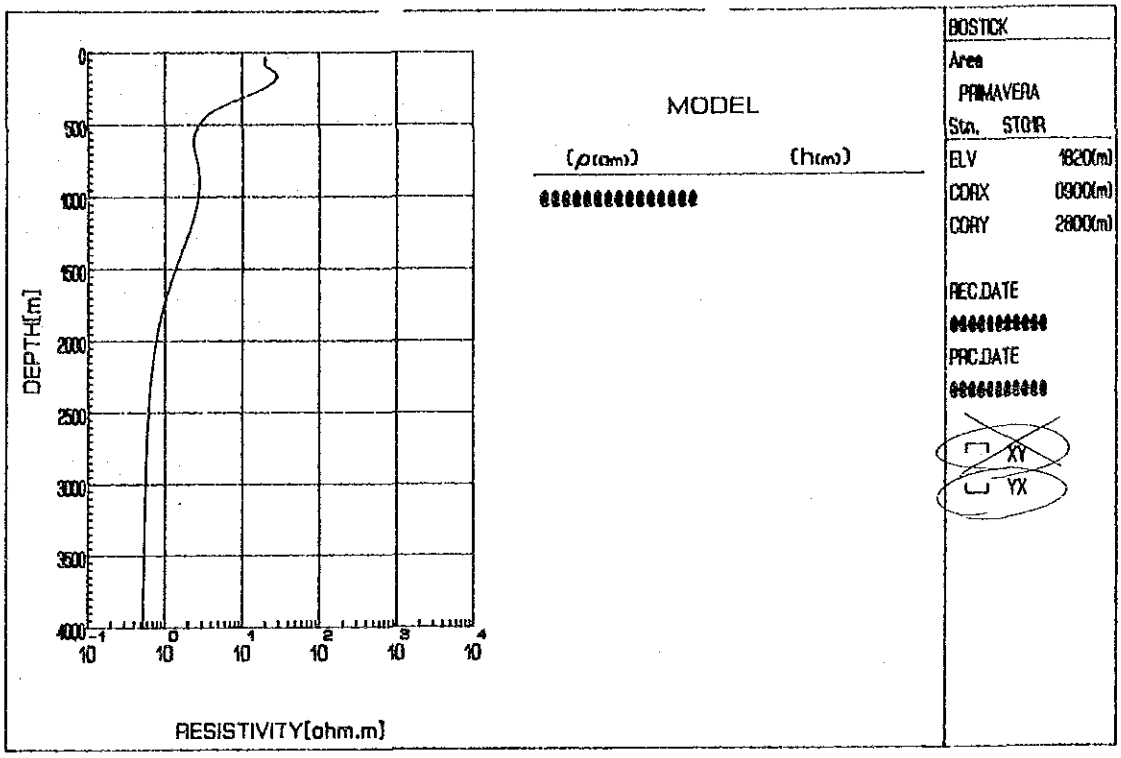
Stn. ST15 May 12 1986



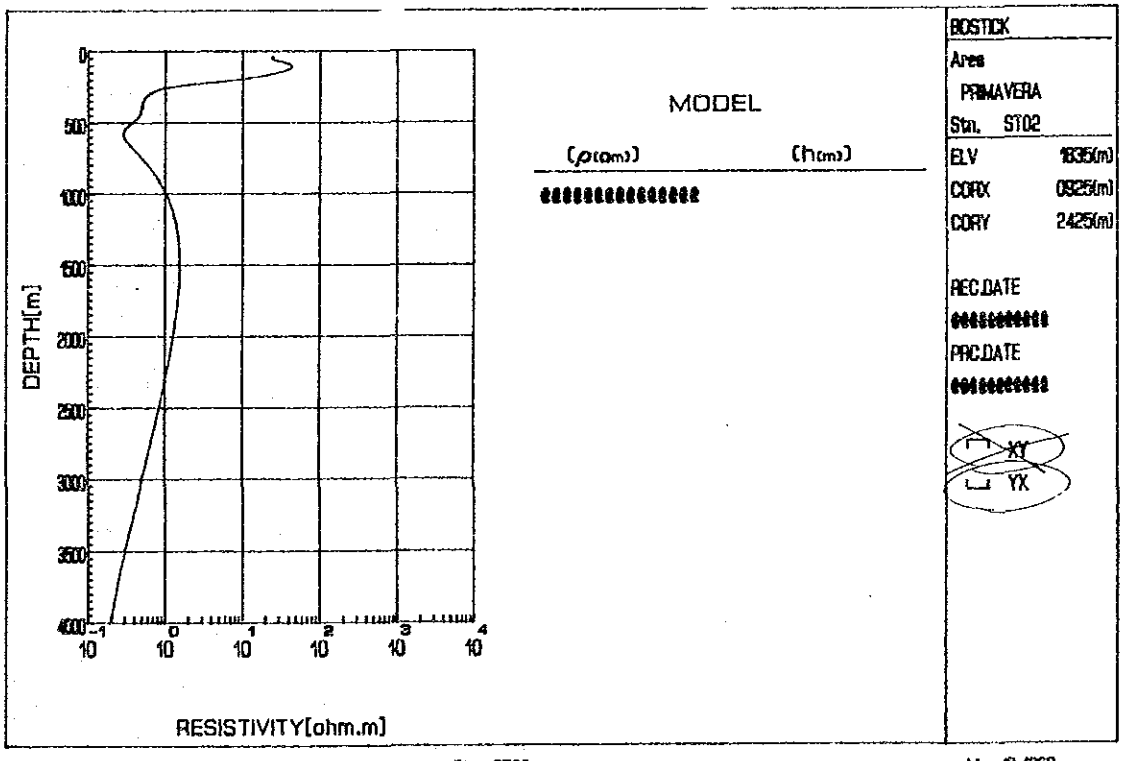
Stn. ST52 May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST53
ELV 1830(m)
CORX 0740(m)
CORY 1885(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST53
May 12 1986

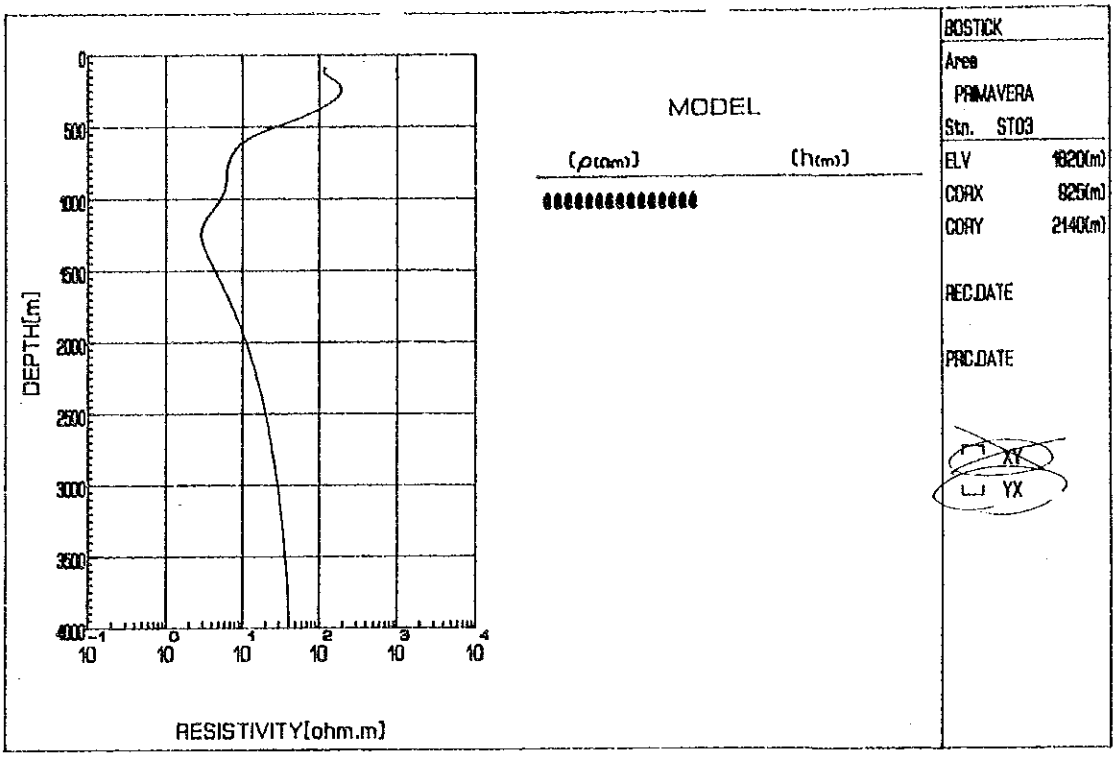

BOSTICK
Area
PRIMAVERA
Stn. ST54
ELV 1805(m)
CORX 1230(m)
CORY 2430(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST54
May 12 1986



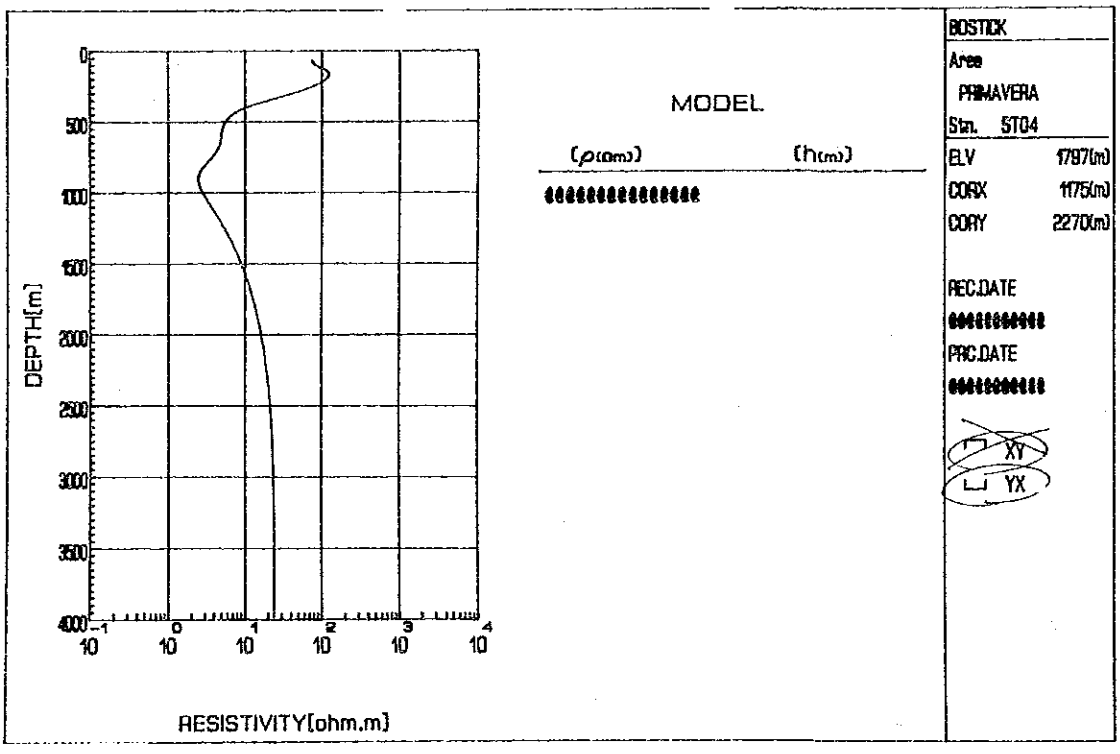
Stn. ST01 May 12 1998



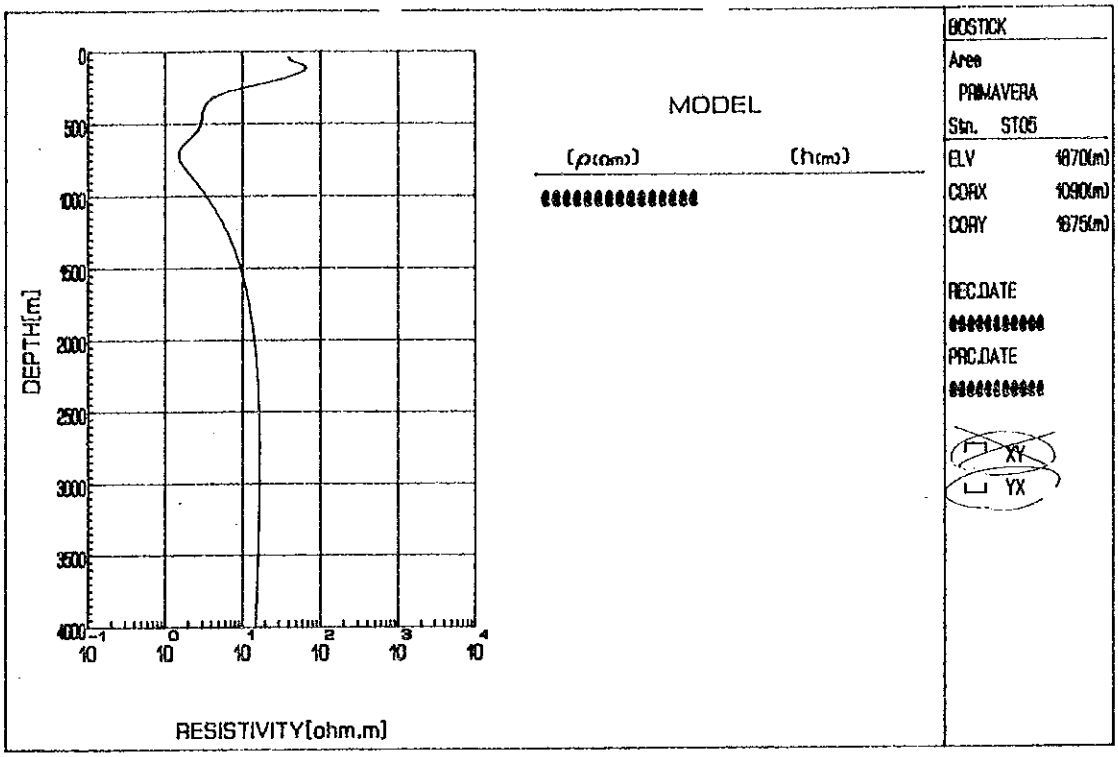
Stn. ST02 May 12 1998

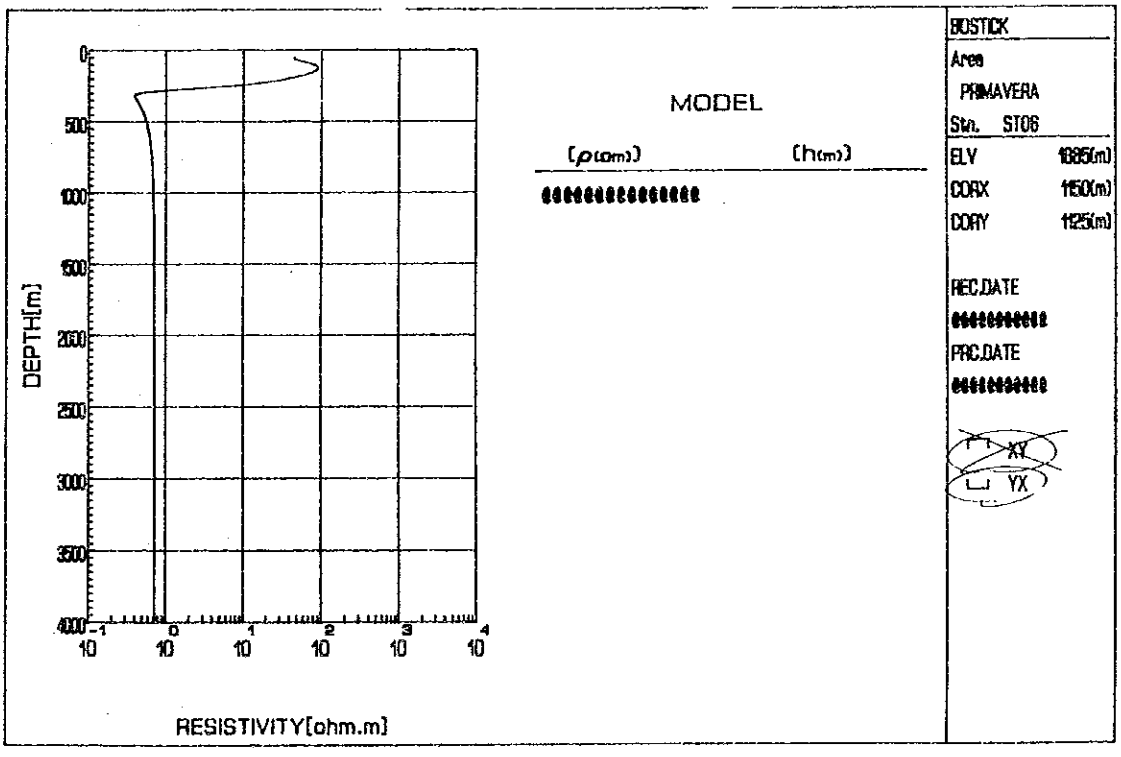


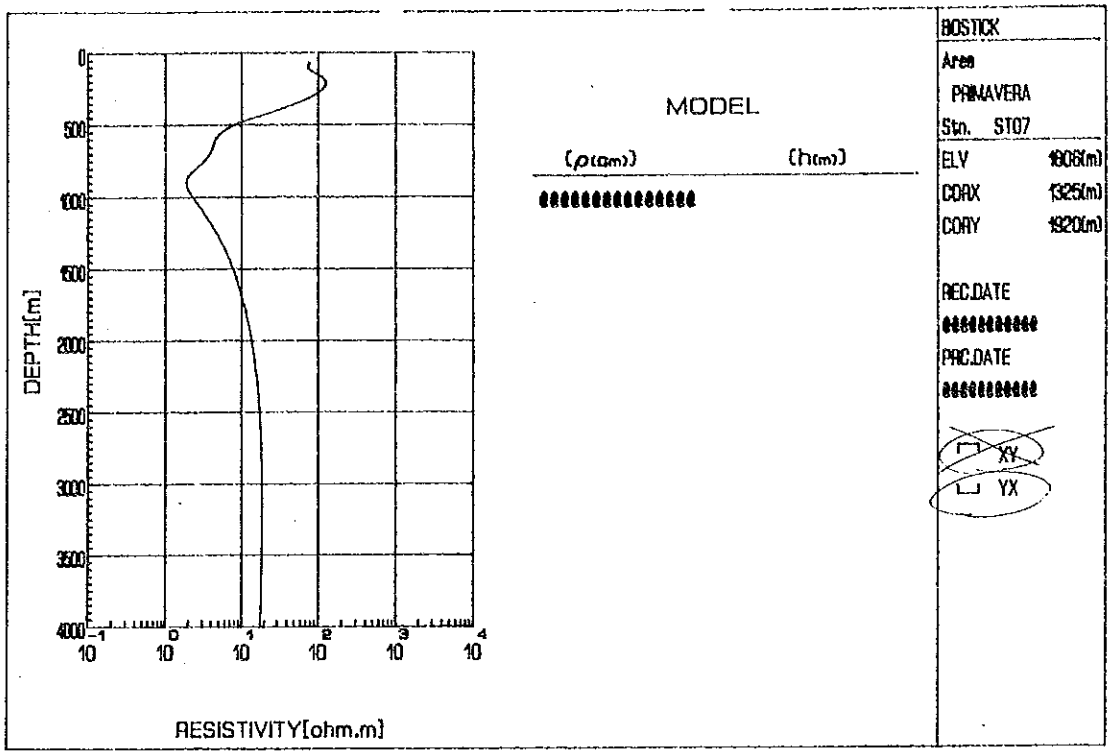
Stn. ST03 May 12 1998

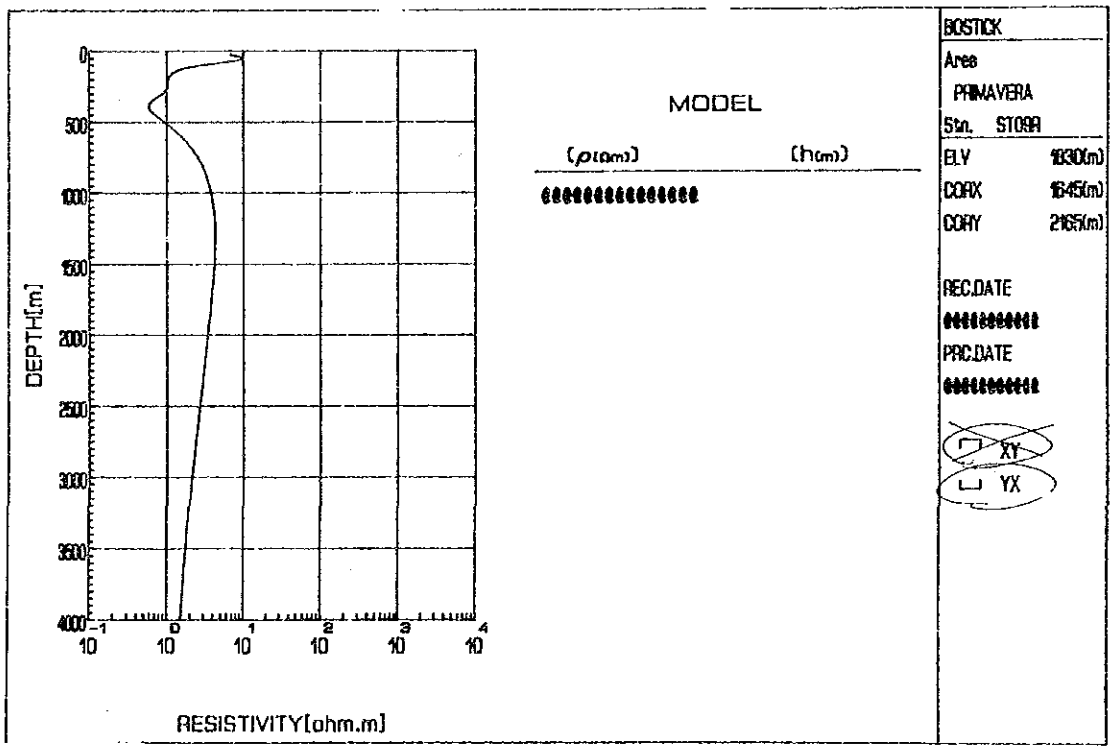


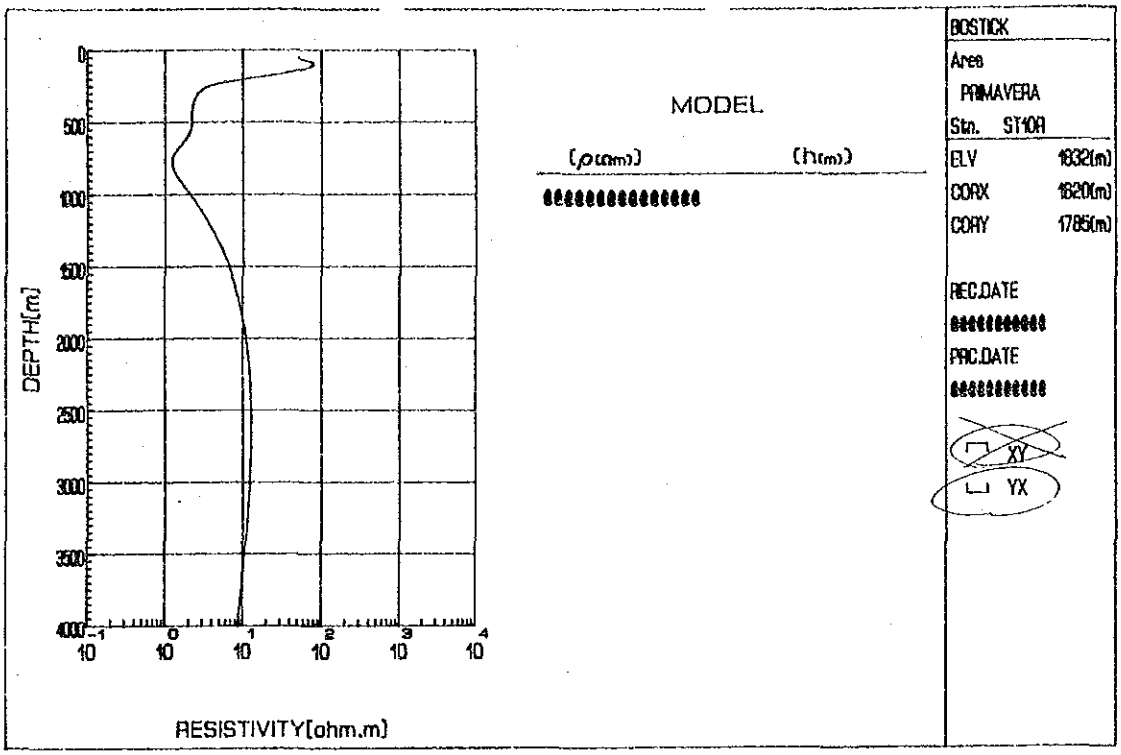
Stn. ST04 May 12 1998


BOSTICK
Area
PRIMAVERA
Stn. ST05
ELV 1870(m)
CORX 1090(m)
CORY 1875(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST05
May 12 1986

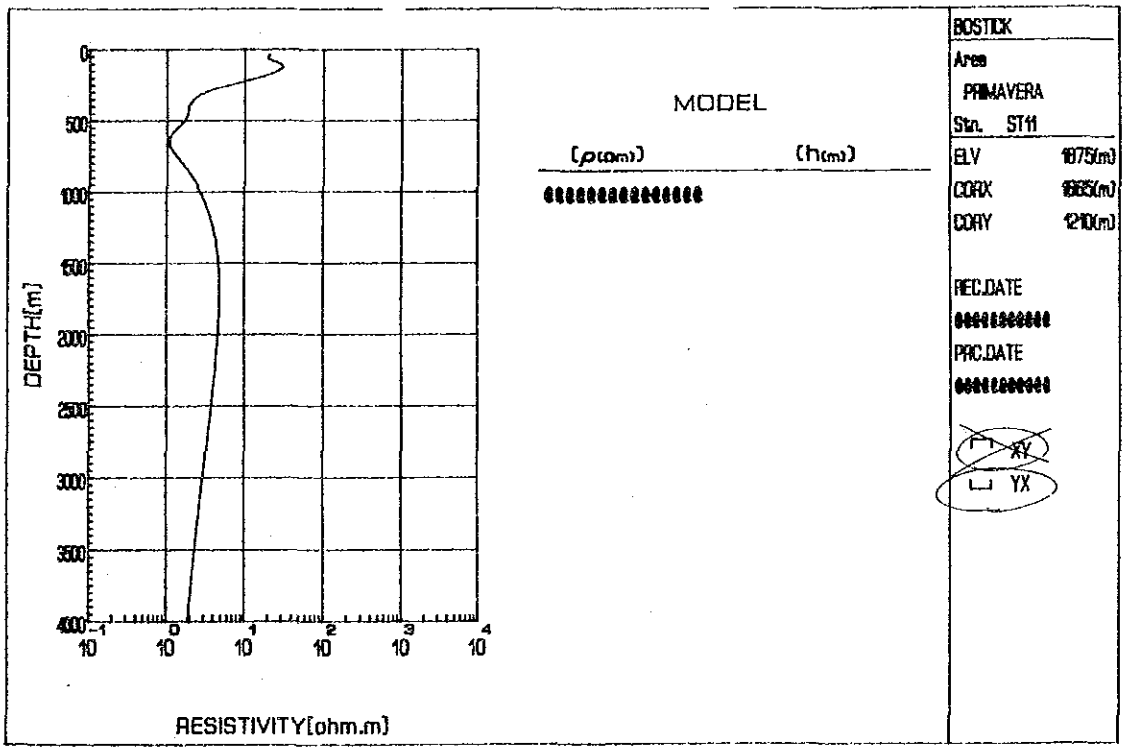

BOSTICK
Area
PRIMAVERA
Stn. ST06
ELV 1885(m)
CORX 1150(m)
CORY 1125(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST06
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST07
ELV 1806(m)
CORX 1325(m)
CORY 1920(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST07
May 12 1986

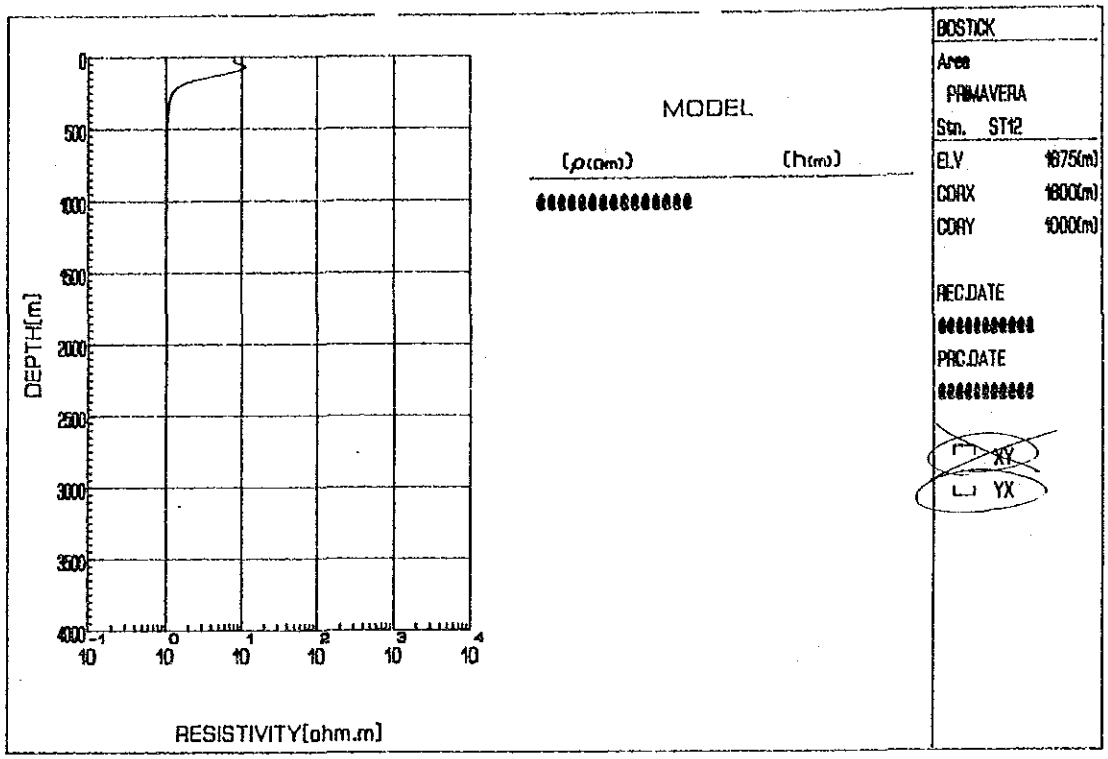

BOSTICK
Area
PRIMAVERA
Stn. ST09R
ELV 1930(m)
CORX 1645(m)
CORY 2165(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST09
May 12 1986



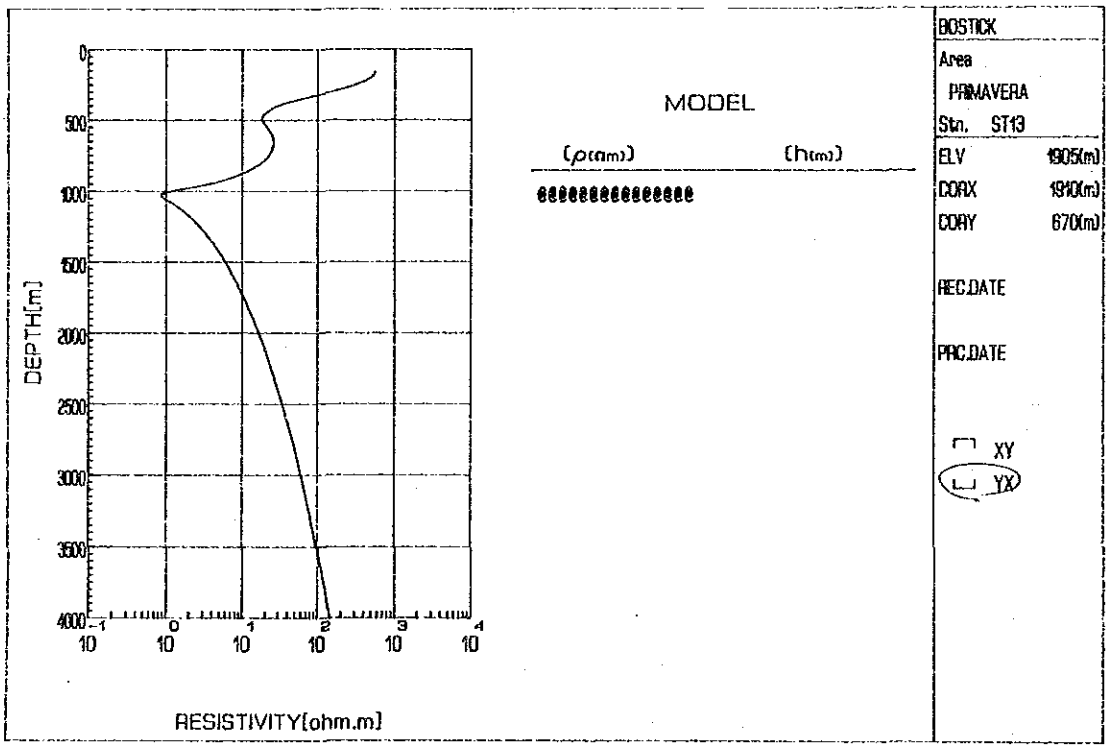
Stn. ST10 May 12 1986



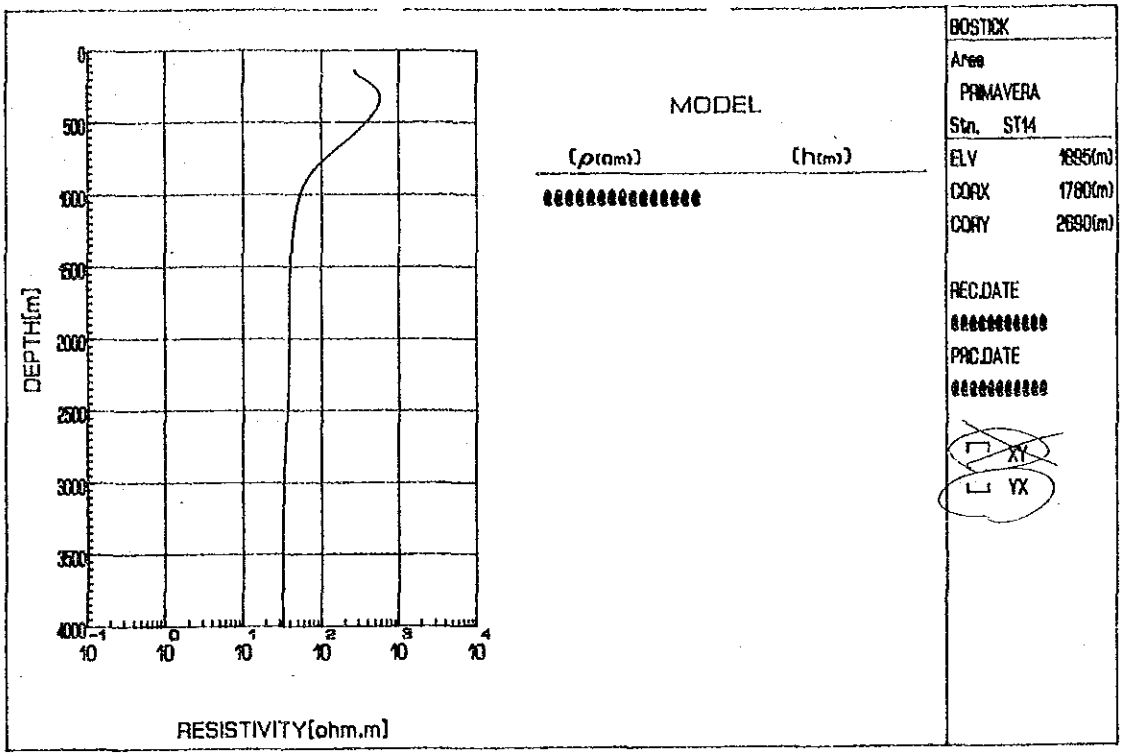
Stn. ST11 May 12 1986



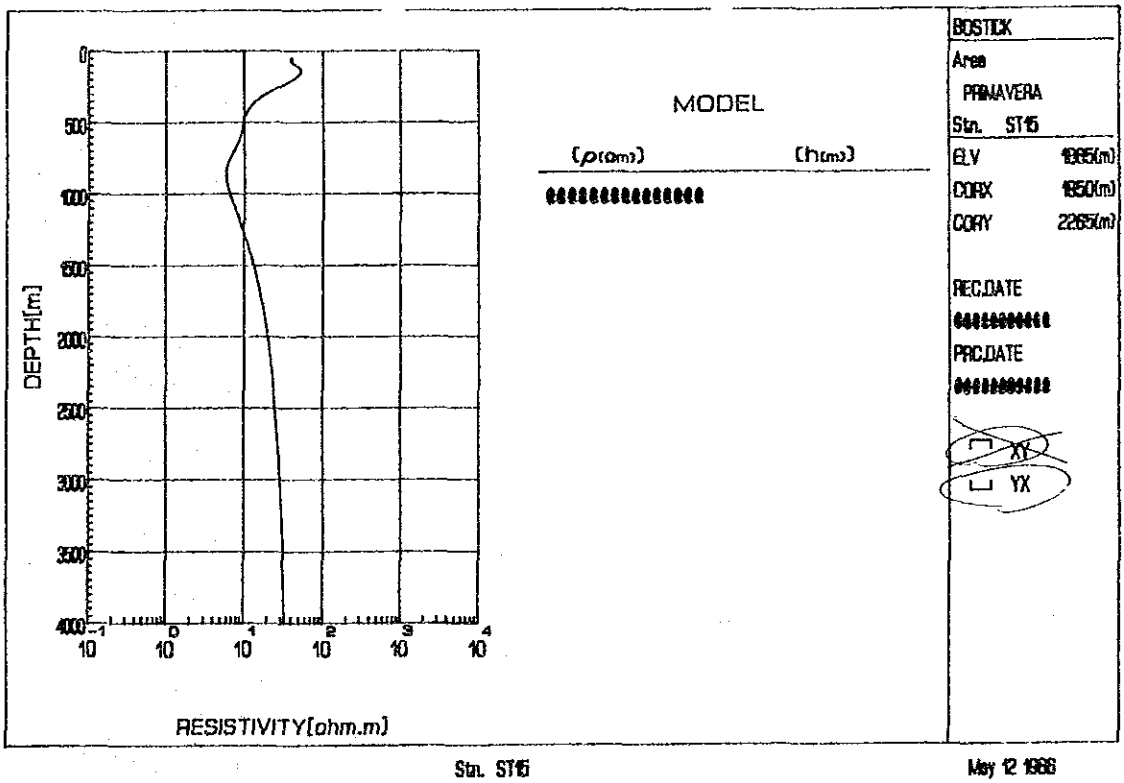
Stn. ST12 May 12 1986



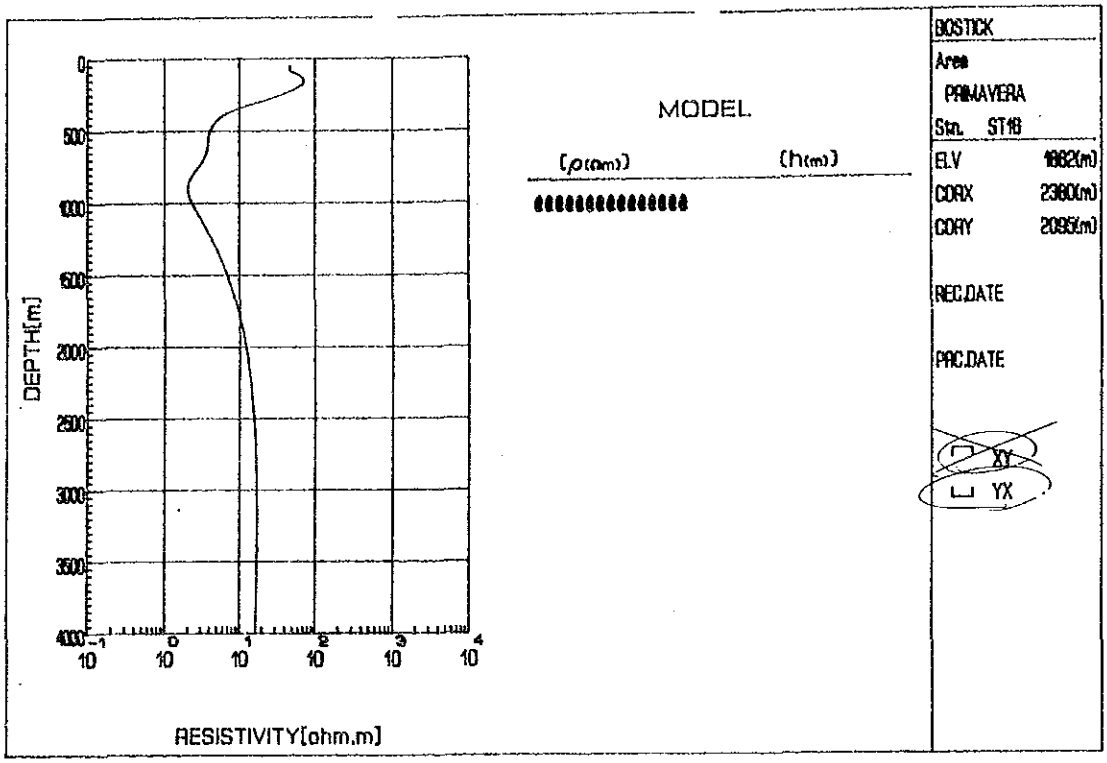
Stn. ST13 May 14 1986



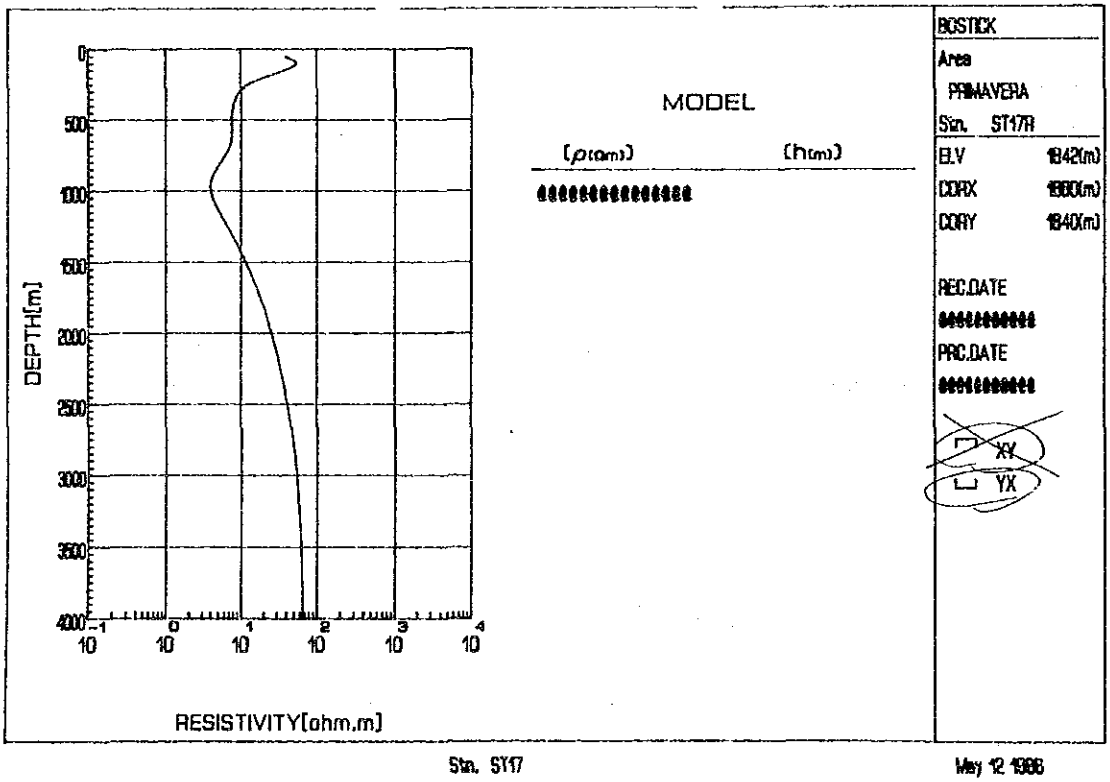
Stn. ST14 May 12 1986



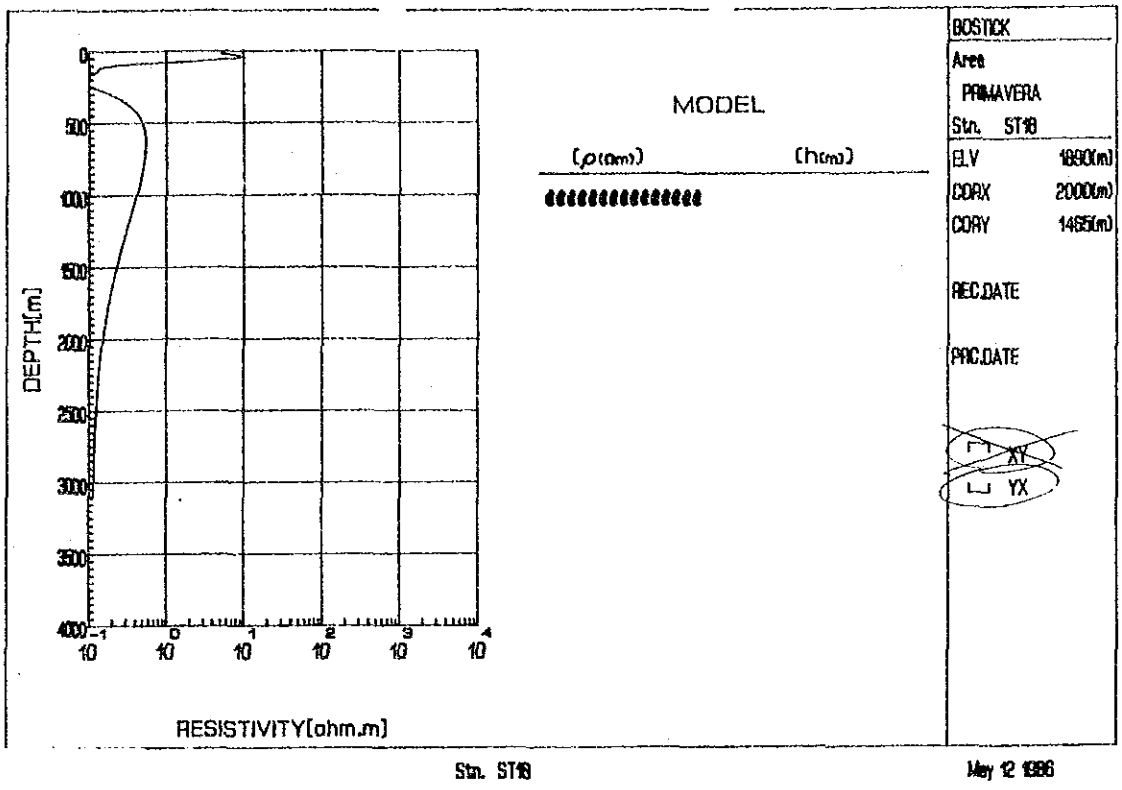
Stn. ST15 May 12 1986



Stn. ST16 May 12 1986



Stn. ST17 May 12 1986


DEPTH[m]
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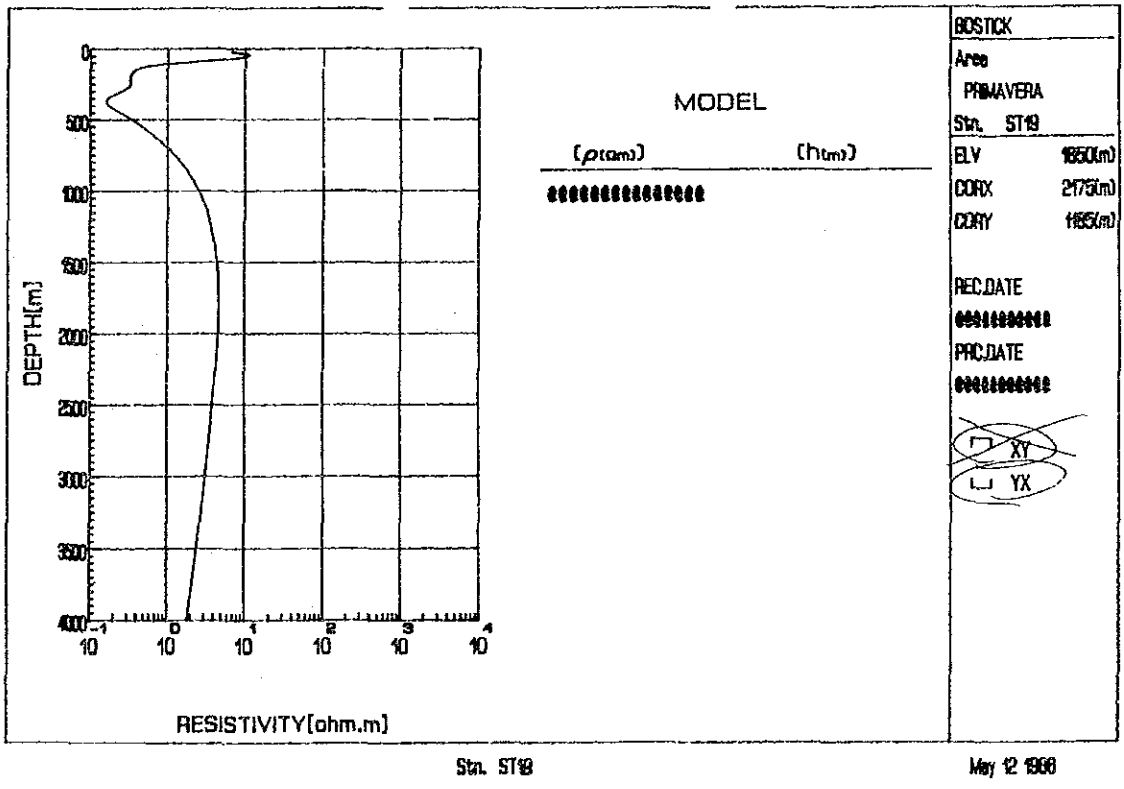
1000
1500
2000
2500
3000
3500
4000
10^-1
10^0
10^1
10^2
10^3
10^4
RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST18
ELV 1890(m)
CORX 20000(m)
CORY 14850(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST18
May 12 1996


DEPTH[m]
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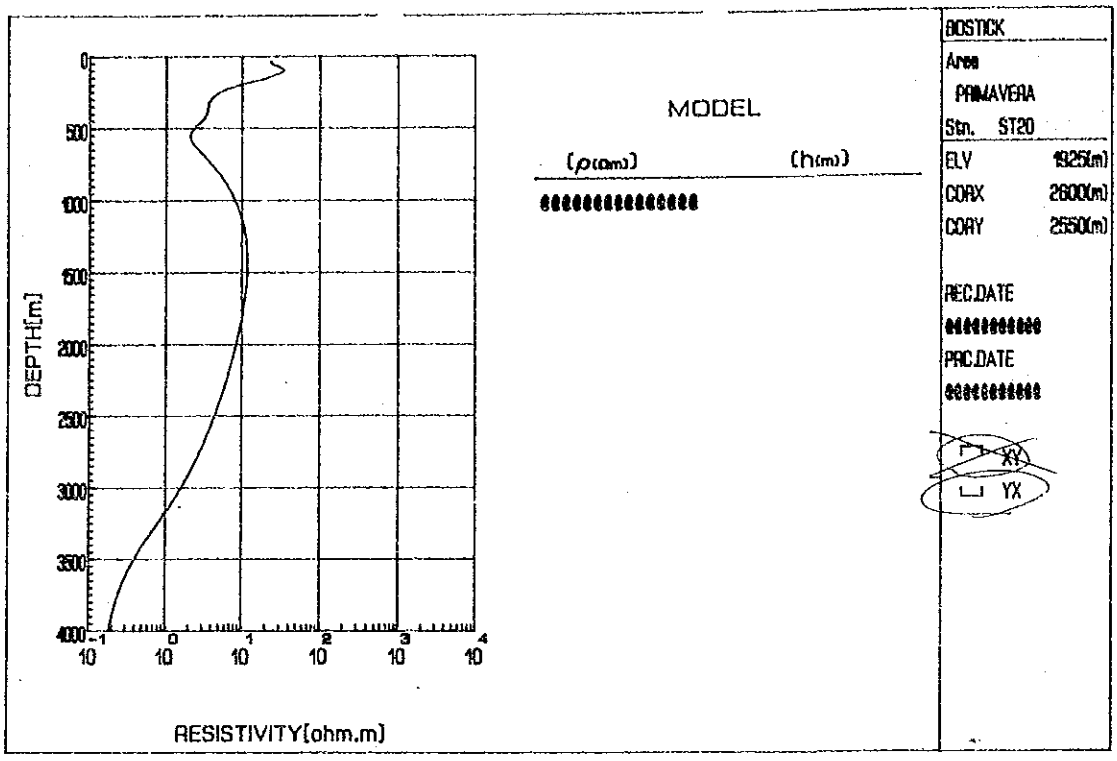
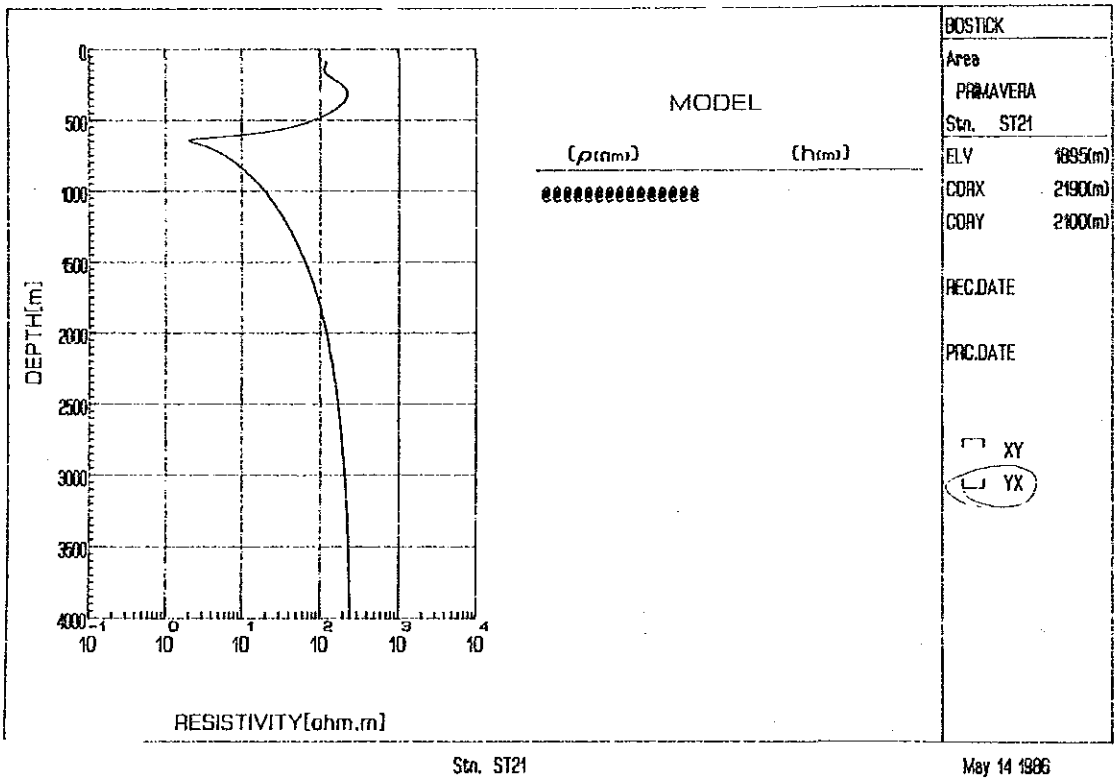
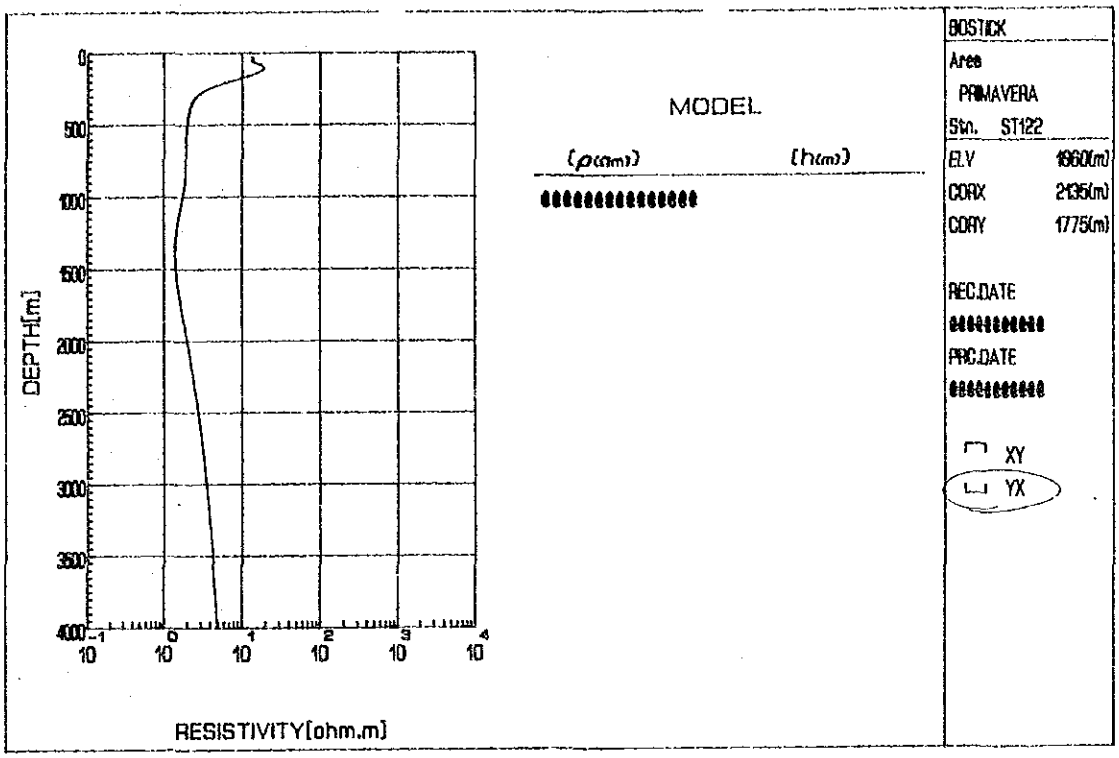
1000
1500
2000
2500
3000
3500
4000
10^-1
10^0
10^1
10^2
10^3
10^4
RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST19
ELV 1950(m)
CORX 21750(m)
CORY 14550(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST19
May 12 1996



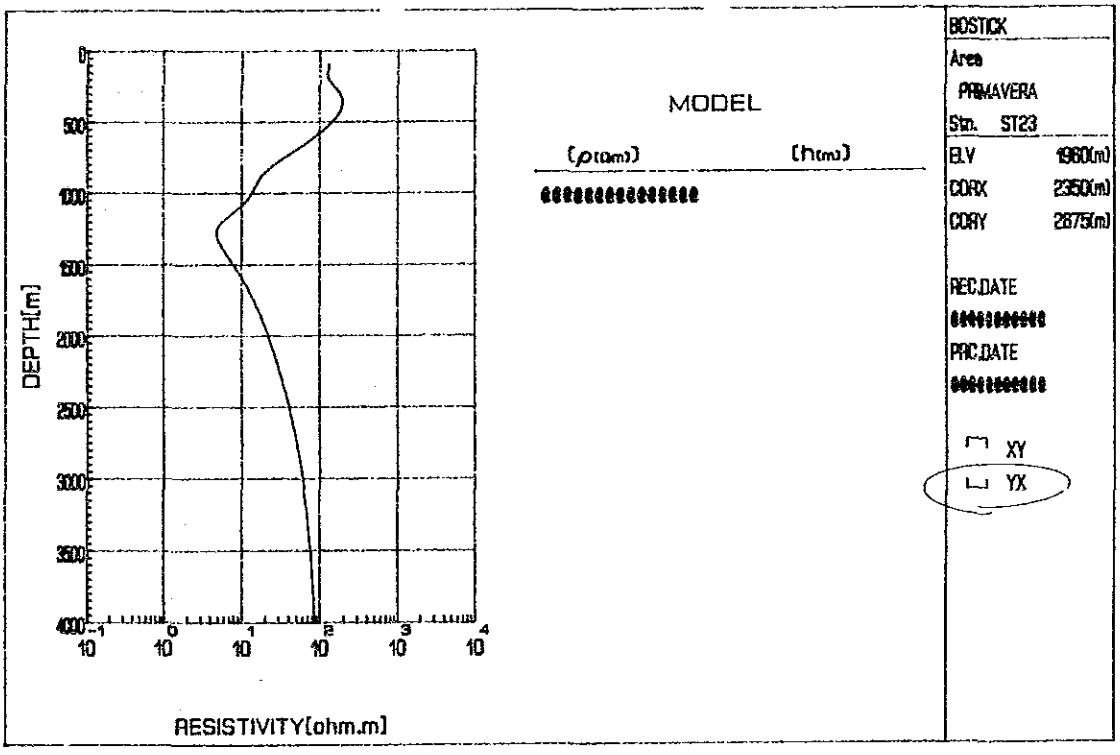
Stn. ST20 May 12 1986



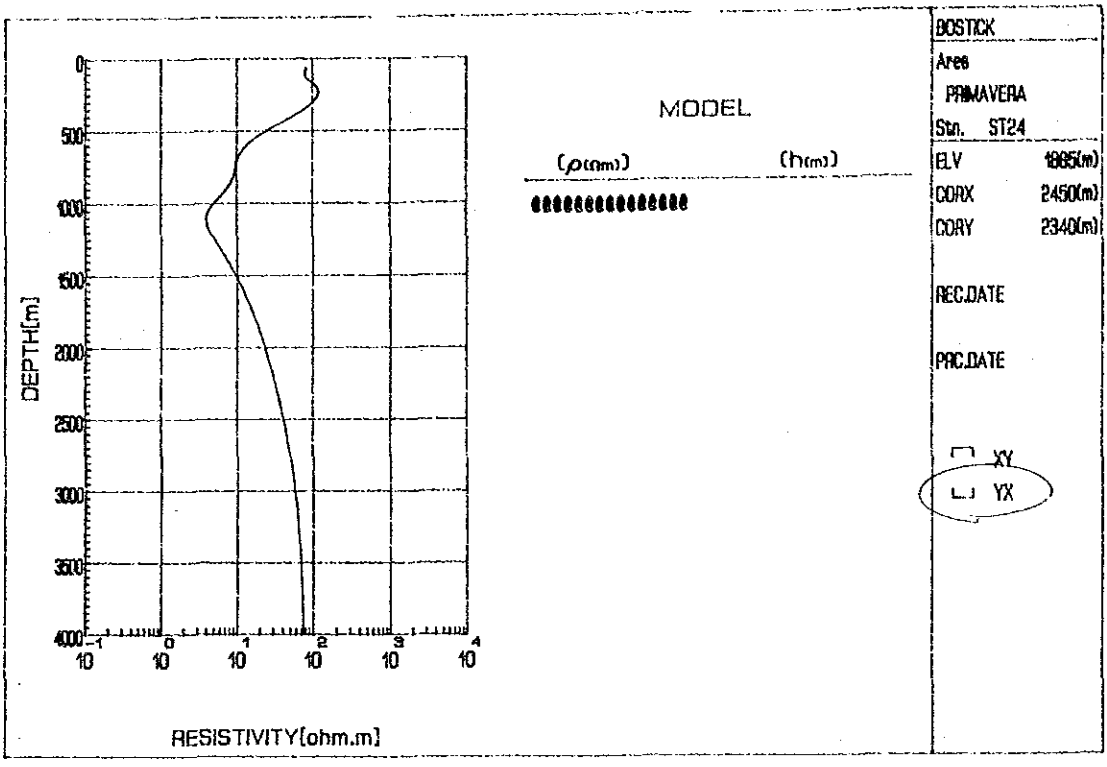
Stn. ST21 May 14 1986

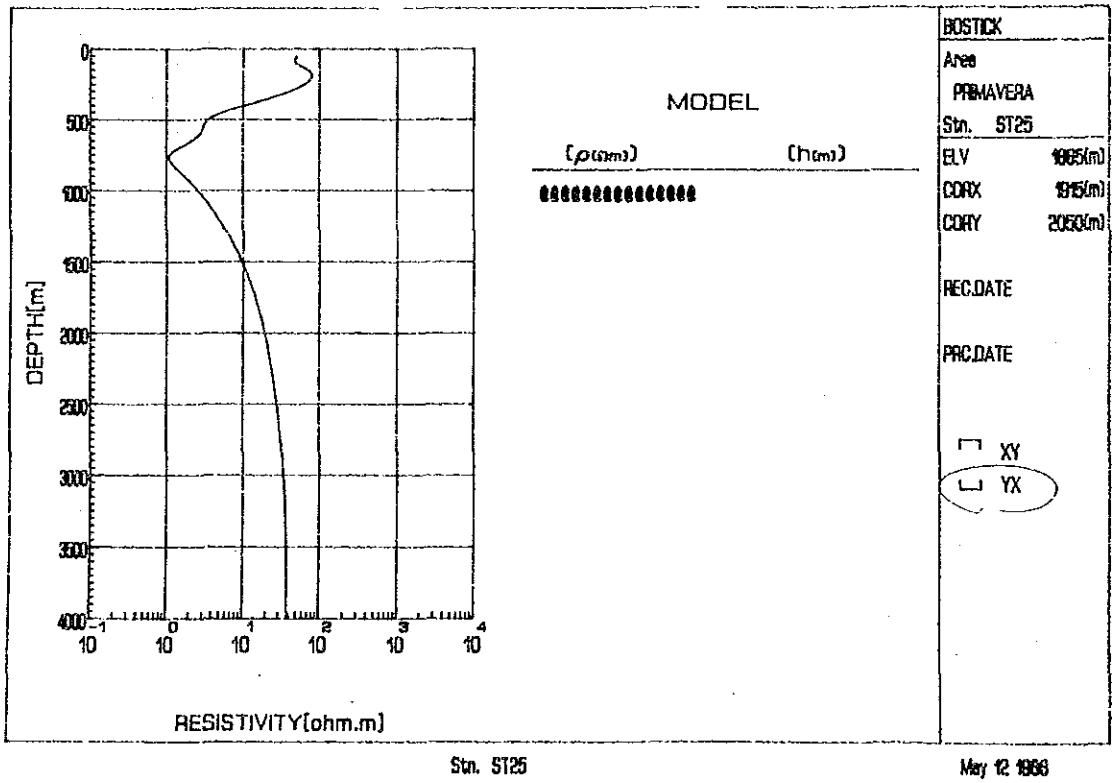


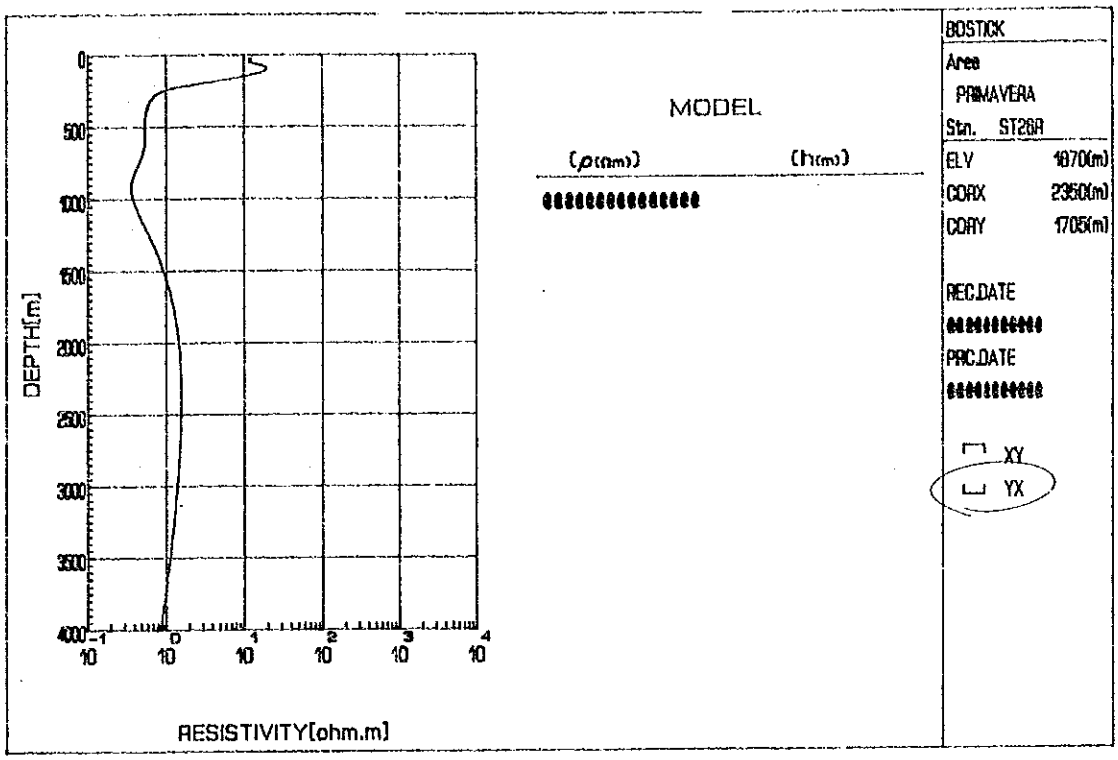
Sta. ST12 May 12 1986

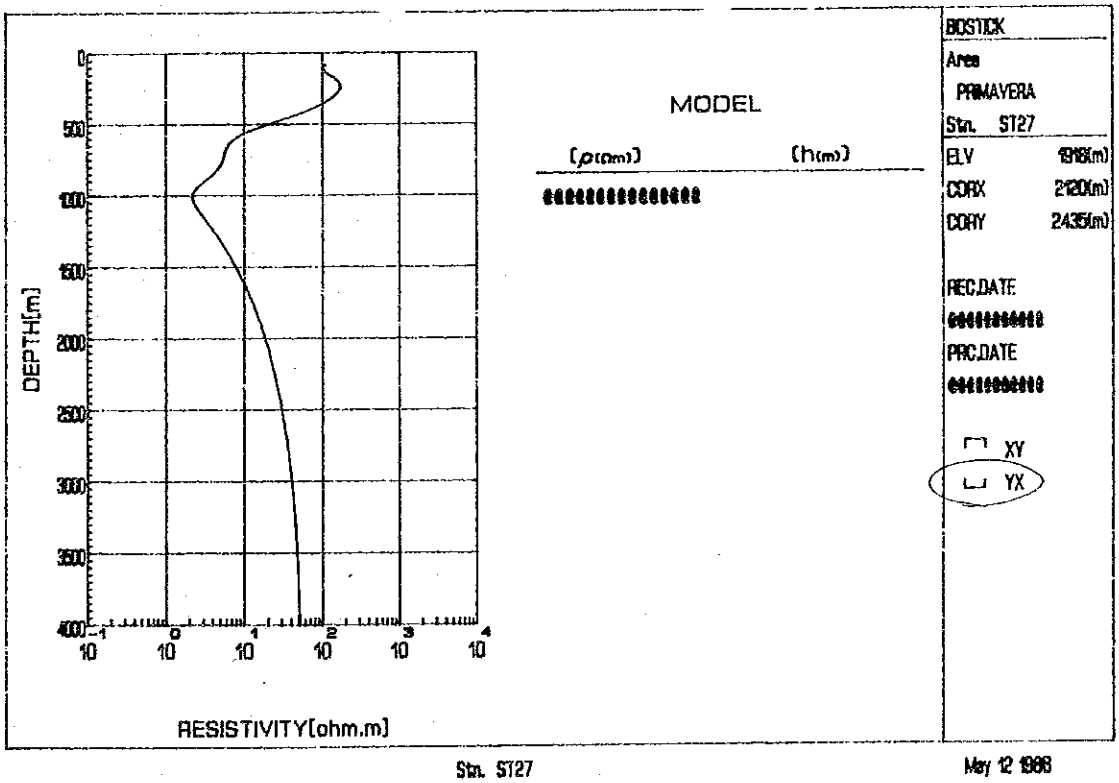


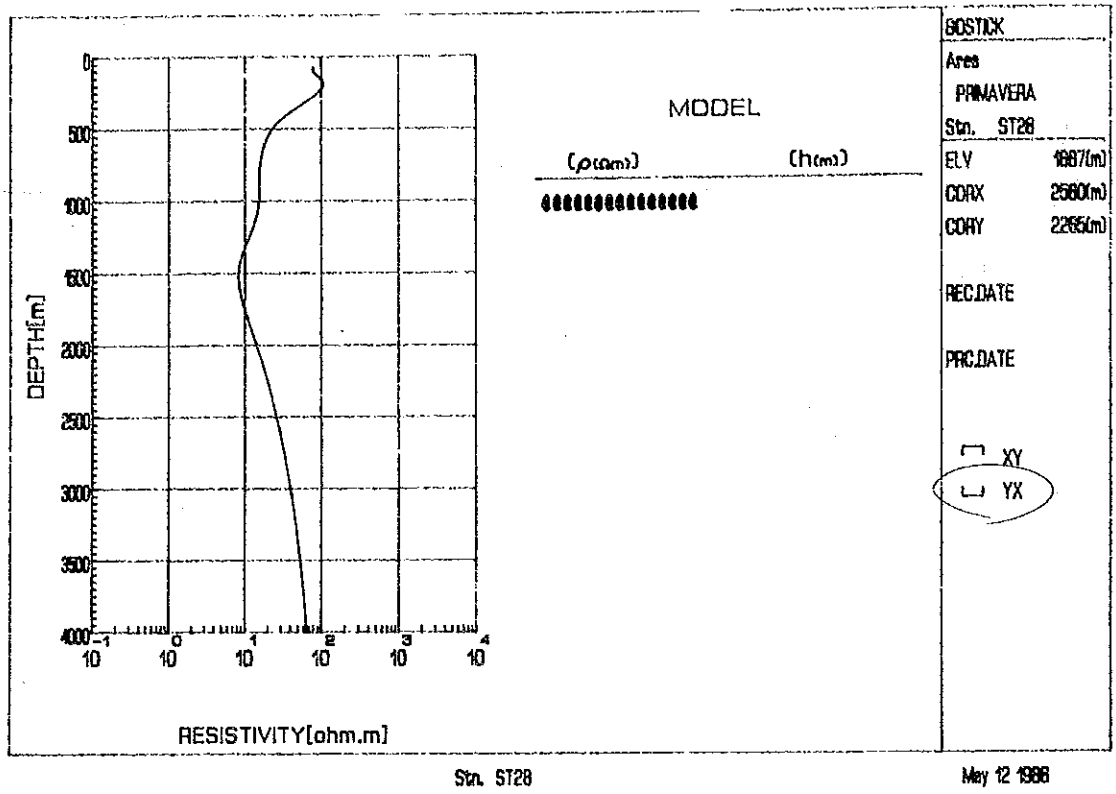
Sta. ST23 May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST24
ELV 1985(m)
CORX 2450(m)
CORY 2340(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH(m)
RESISTIVITY(ohm.m)
Stn. ST24
May 12 1966


BOSTICK
Area
PRIMAVERA
Stn. ST25
ELV 1985(m)
CORX 1915(m)
CORY 2050(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH(m)
RESISTIVITY(ohm.m)
Stn. ST25
May 12 1966


BOSTICK
Area
PRIMAVERA
Stn. ST26R
ELV 1870(m)
CORX 2350(m)
CORY 1705(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST26
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST27
ELV 1916(m)
CORX 2120(m)
CORY 2435(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST27
May 12 1986


DEPTH[m]
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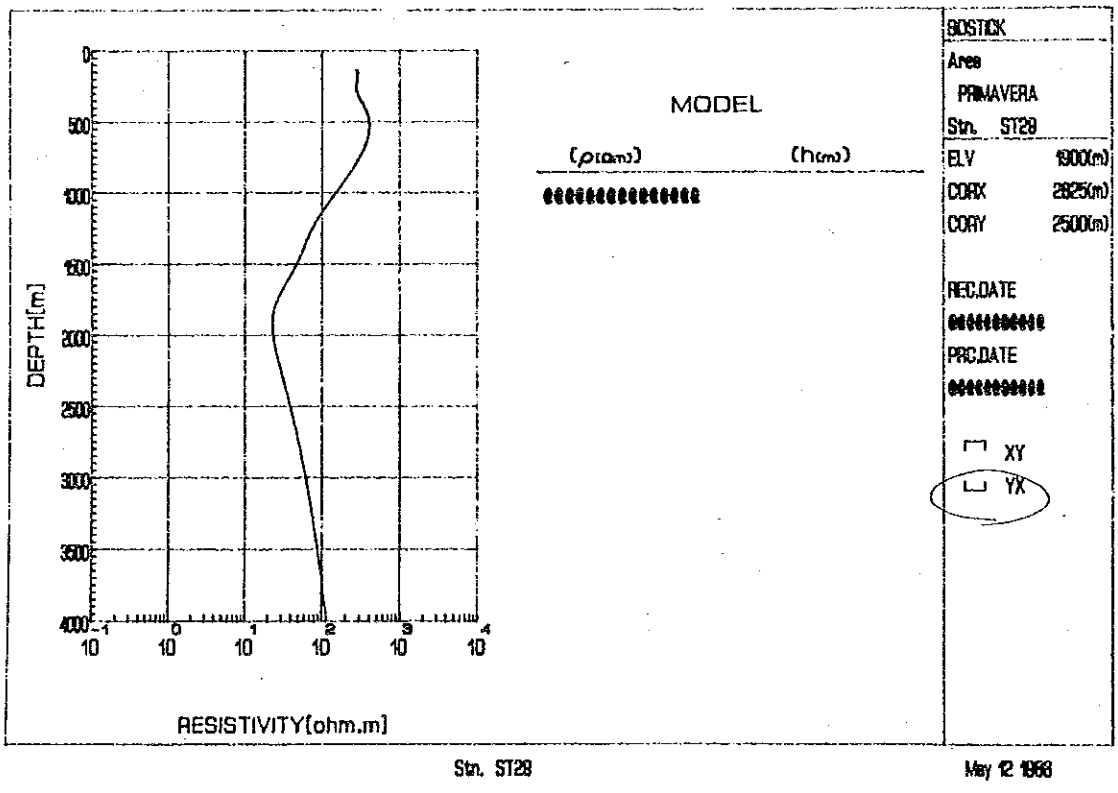
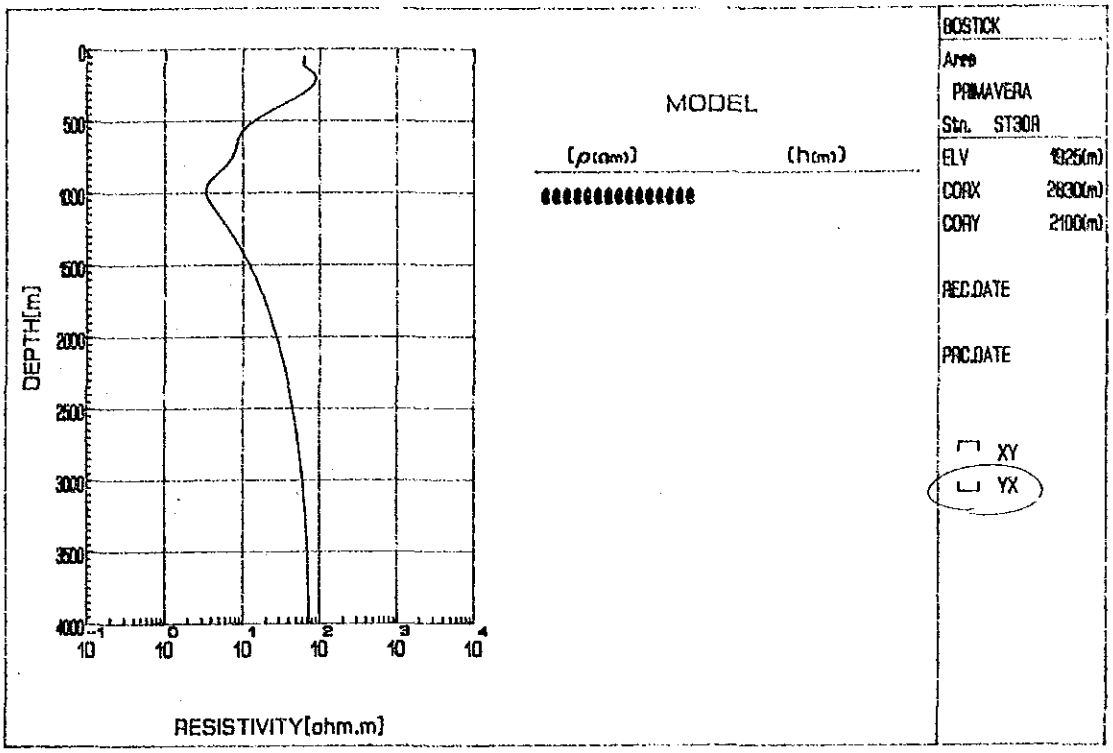
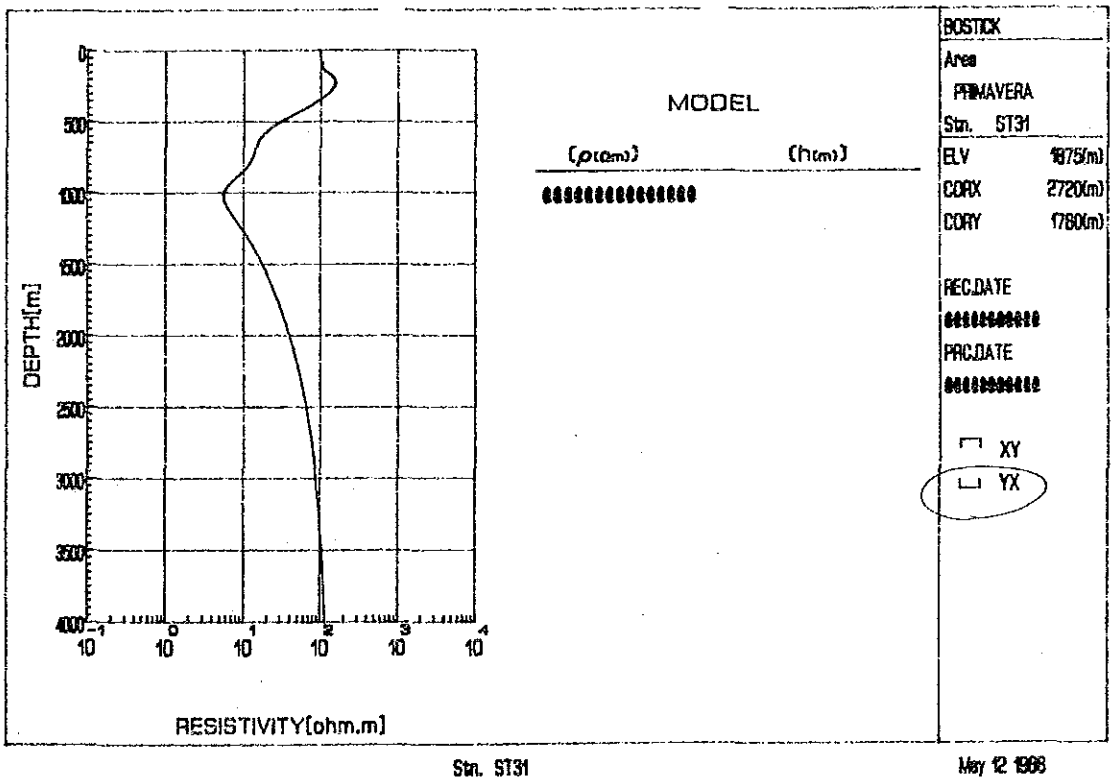
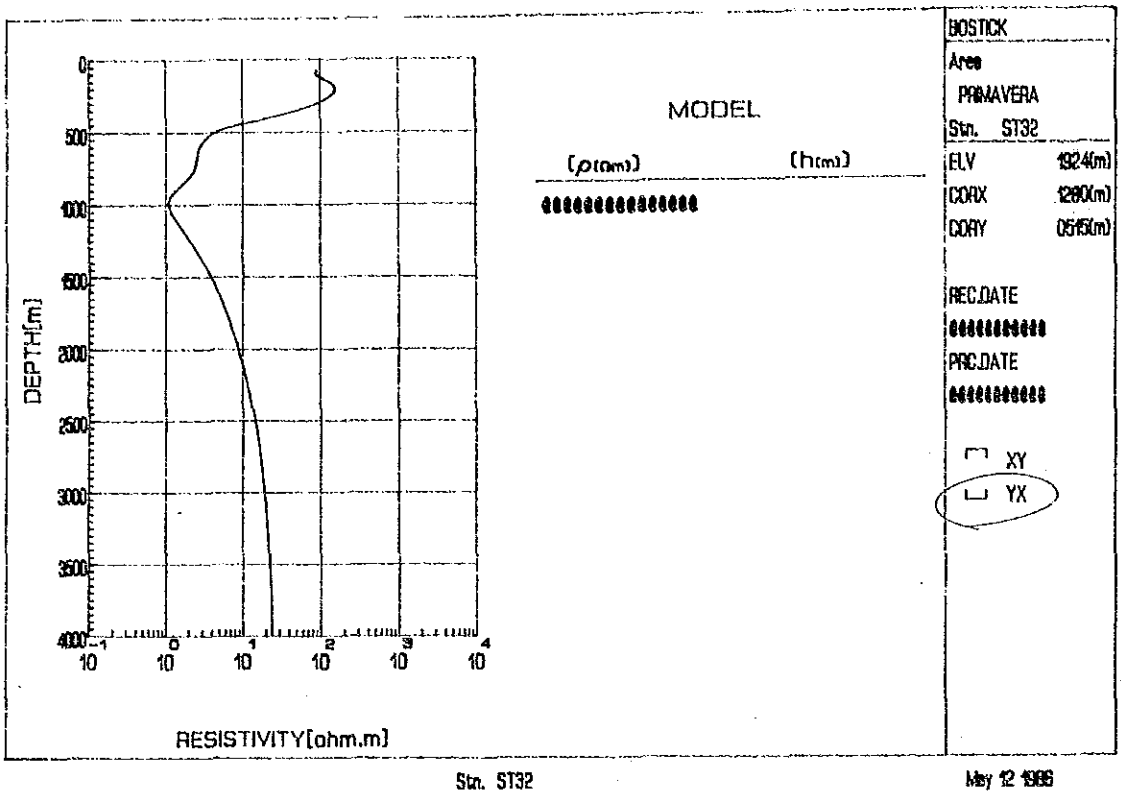
1000
1500
2000
2500
3000
3500
4000
10^-1 10^0 10^1 10^2 10^3 10^4
RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST28
ELV 1887(m)
CORX 2560(m)
CORY 2265(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST28
May 12 1988

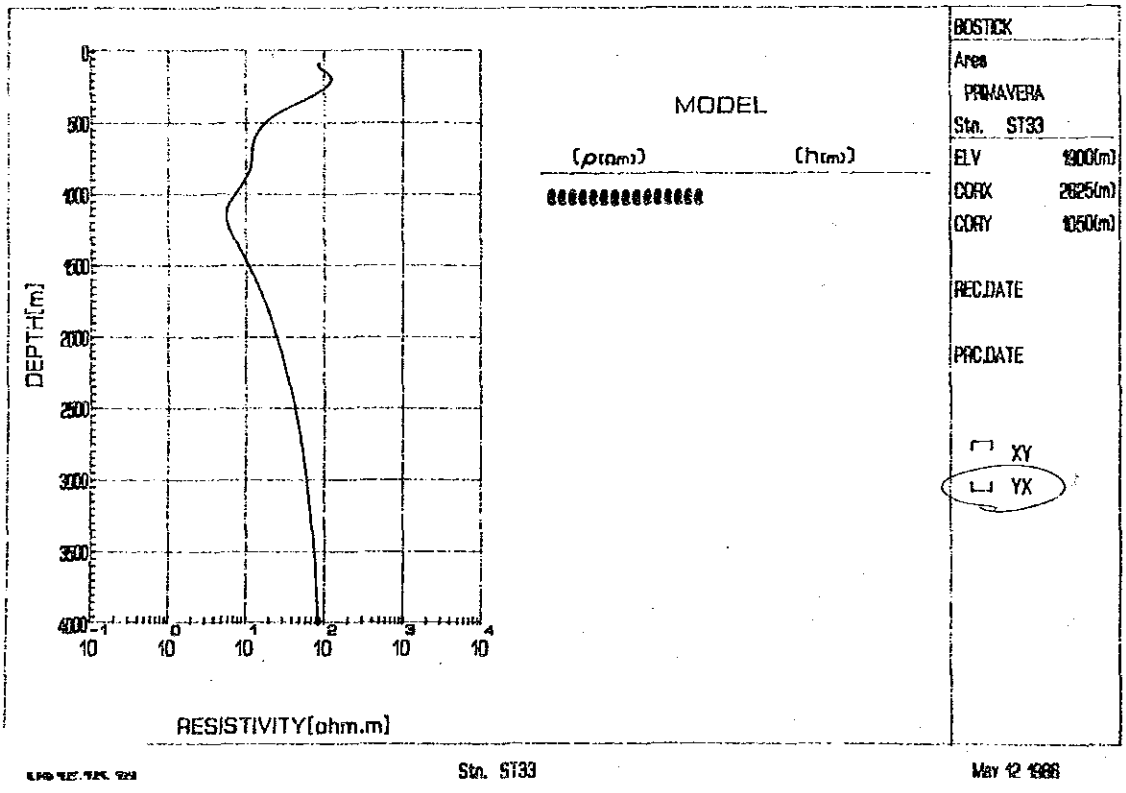

DEPTH[m]
0
500
1000
1500
2000
2500
3000
3500
4000
10^-1 10^0 10^1 10^2 10^3 10^4
RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST29
ELV 1900(m)
CORX 2625(m)
CORY 2500(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST29
May 12 1988


BOSTICK
Area
PRIMAVERA
Stn. ST30R
ELV 1925(m)
CORX 2830(m)
CORY 2100(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST30
May 12 1986

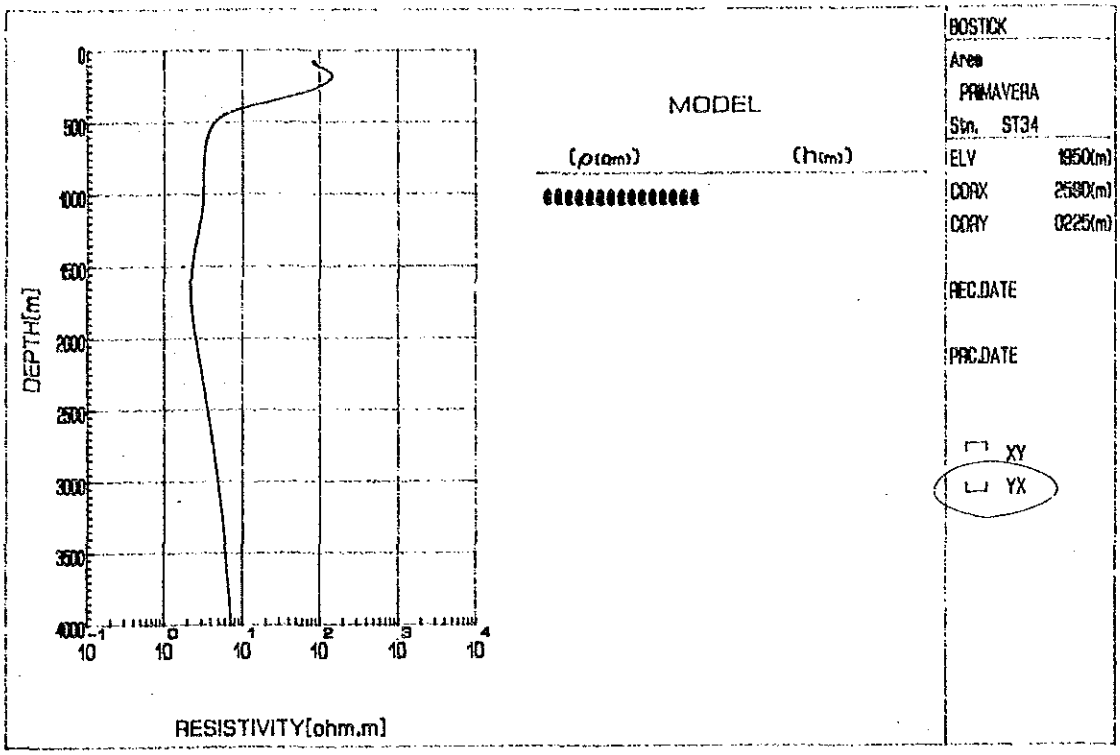

BOSTICK
Area
PRIMAVERA
Stn. ST31
ELV 1875(m)
CORX 2720(m)
CORY 1760(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST31
May 12 1986

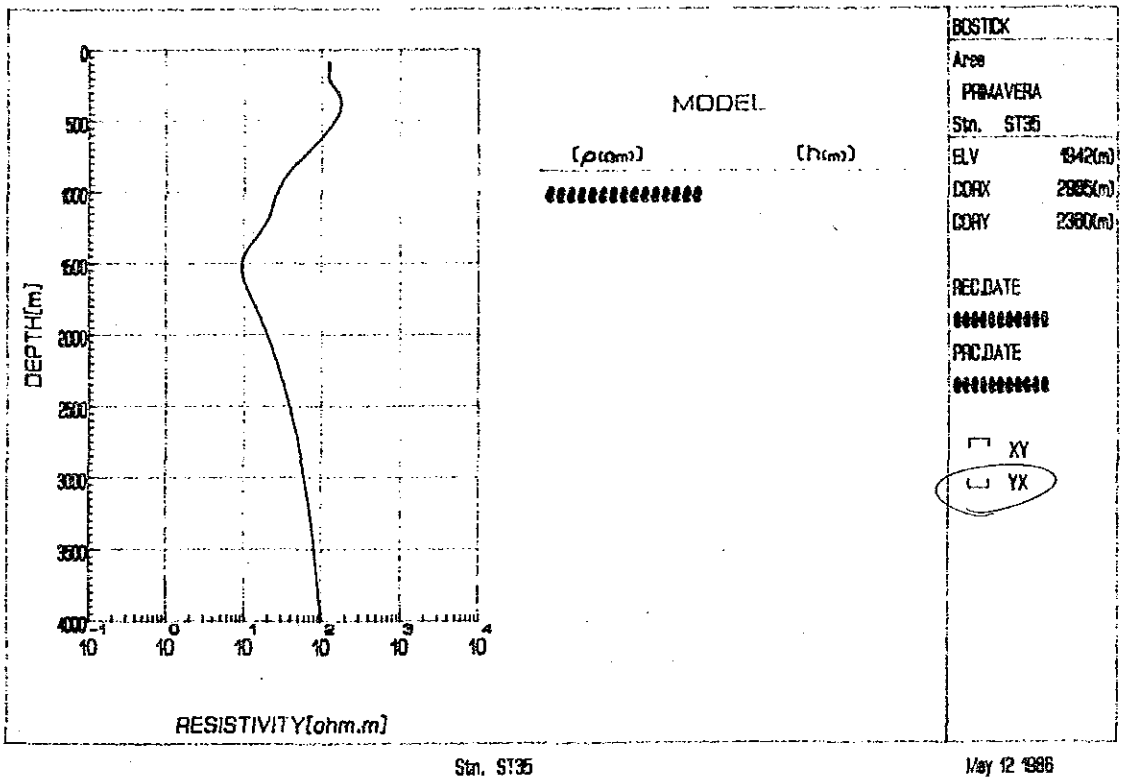


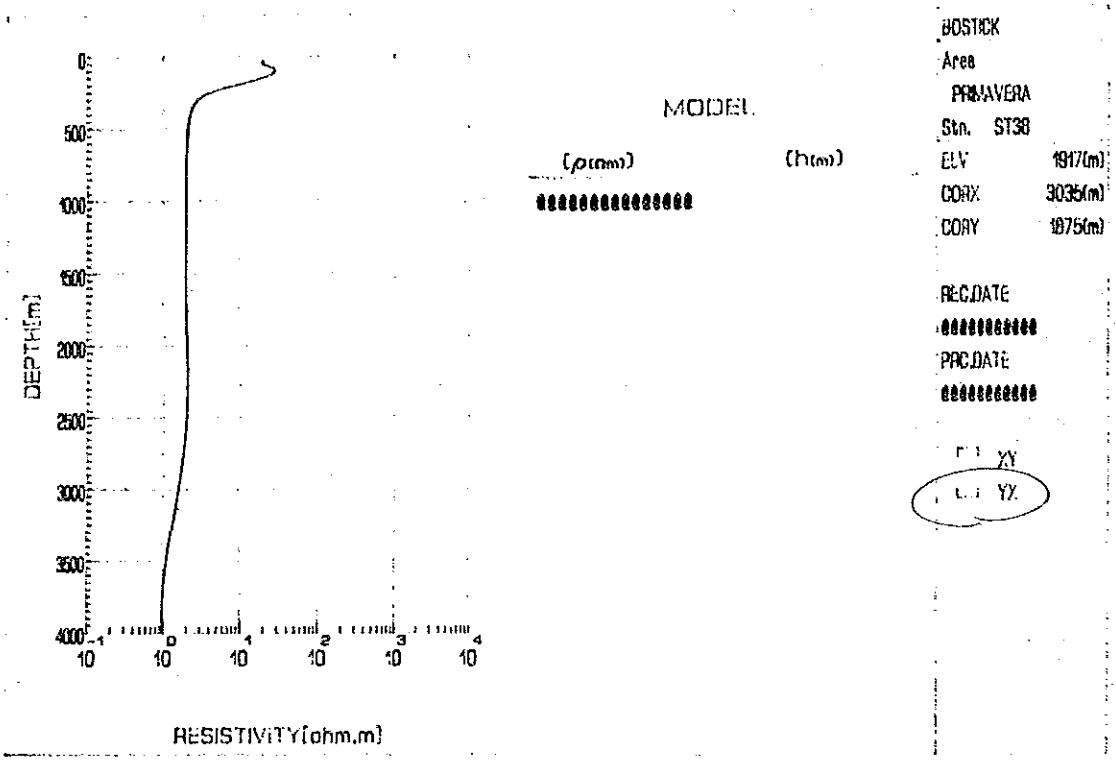
Stn. ST32 May 12 1996

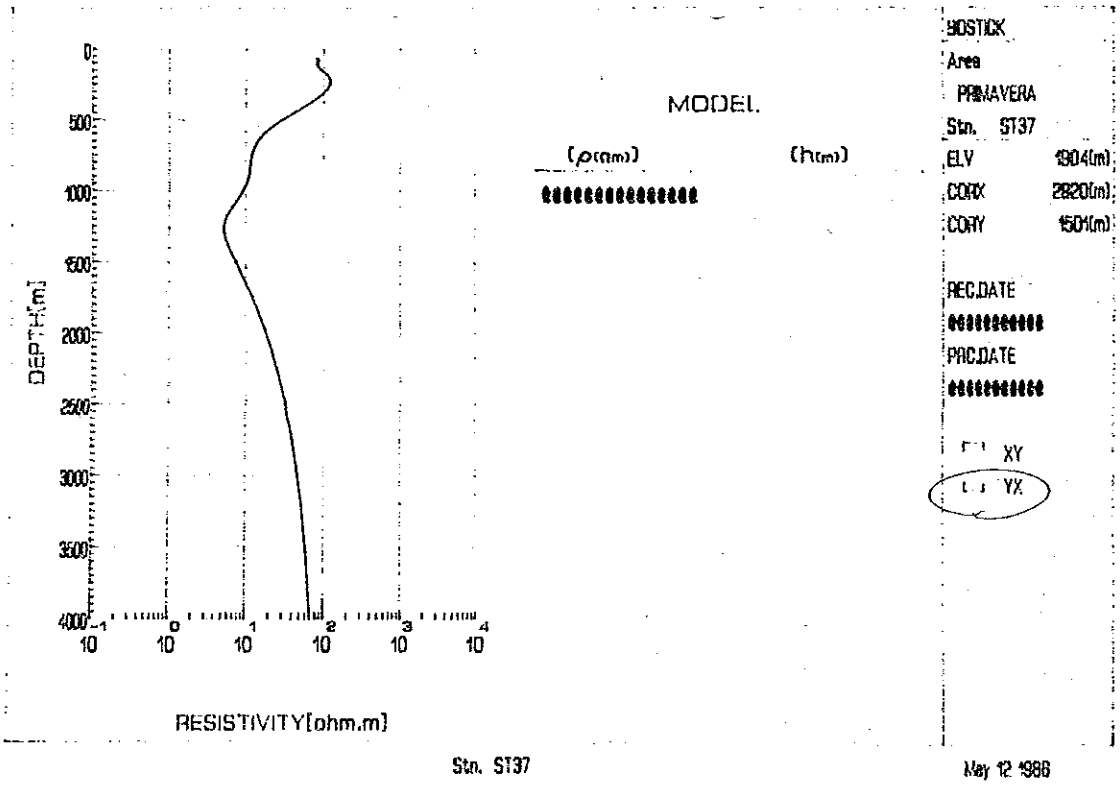


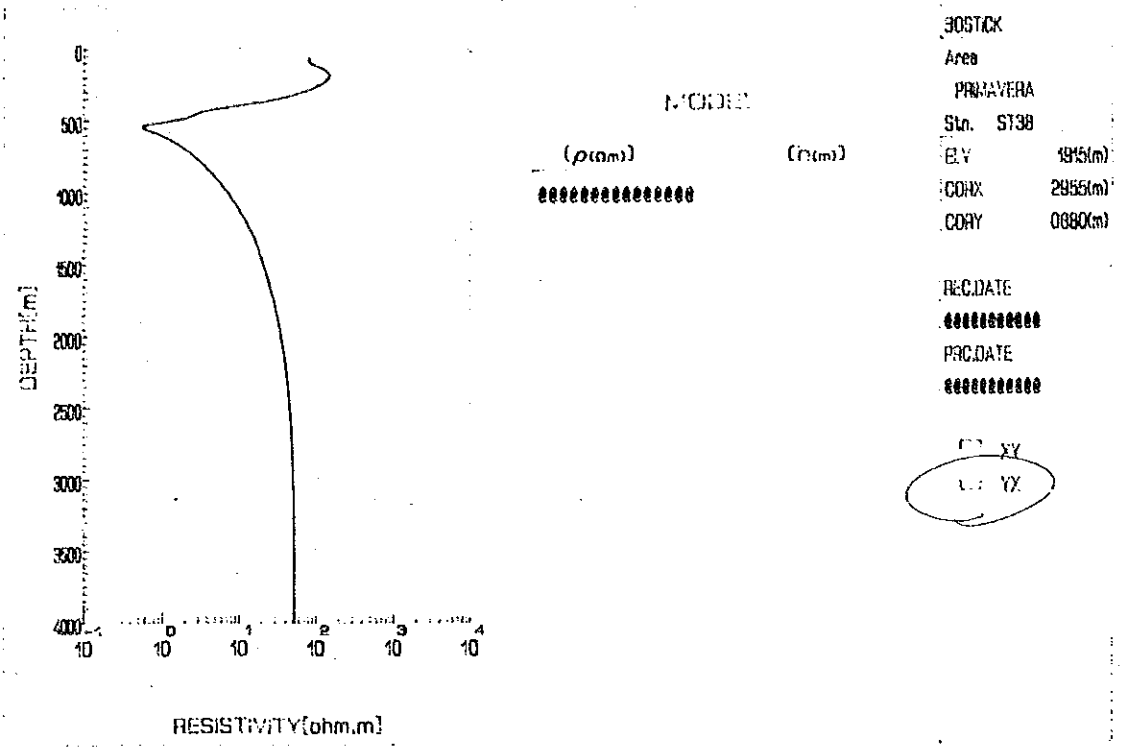
Stn. ST33 May 12 1996

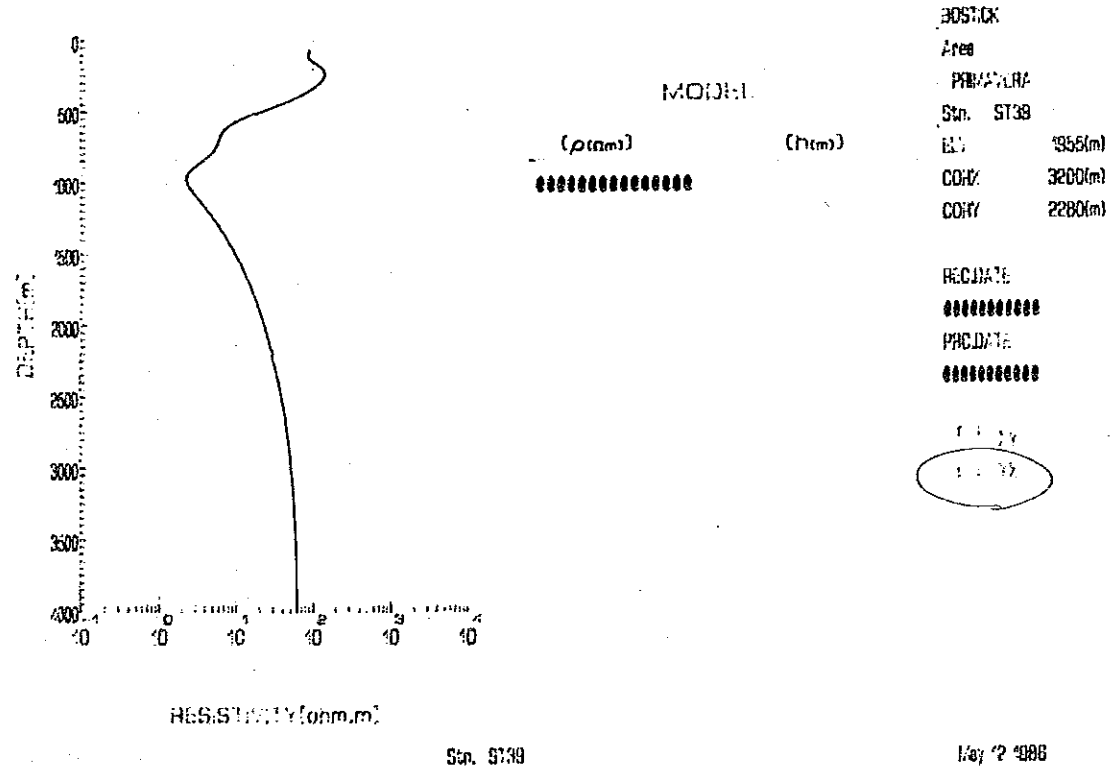

BOSTICK
Area
PRIMAVERA
Stn. ST34
ELV 1950(m)
CORX 2590(m)
CORY 0225(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST34
May 12 1986

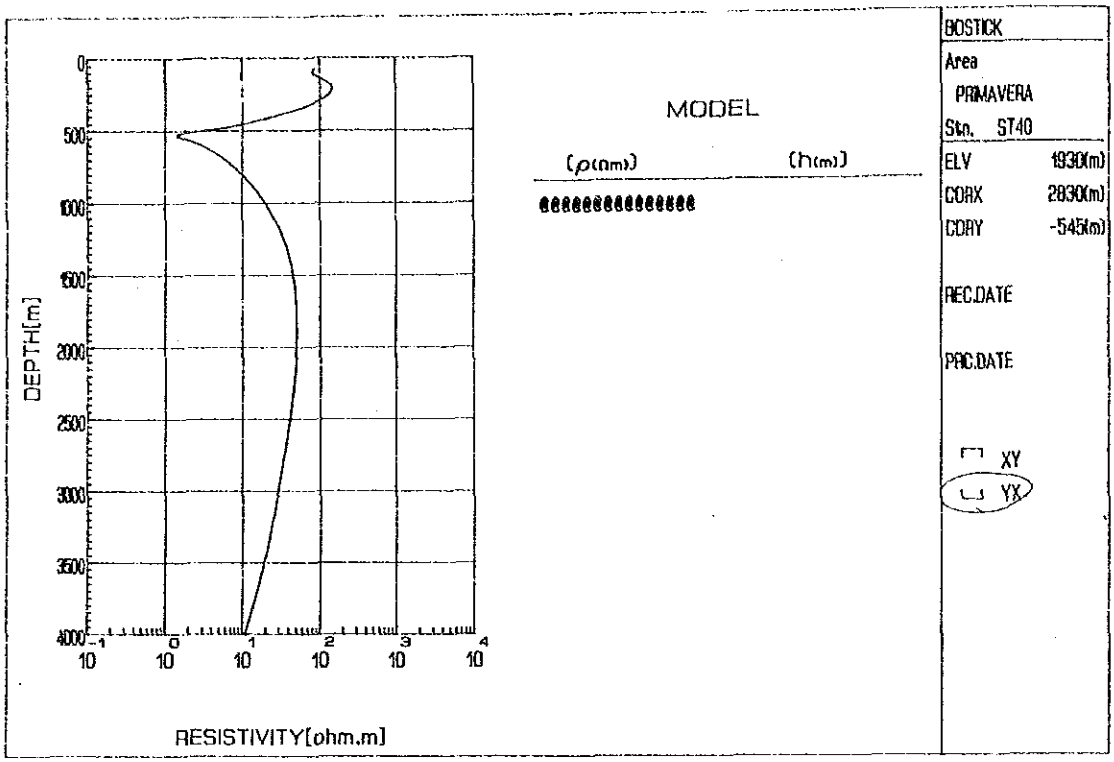

BOSTICK
Area
PRIMAVERA
Stn. ST35
ELV 1942(m)
CORX 2985(m)
CORY 2360(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST35
May 12 1986

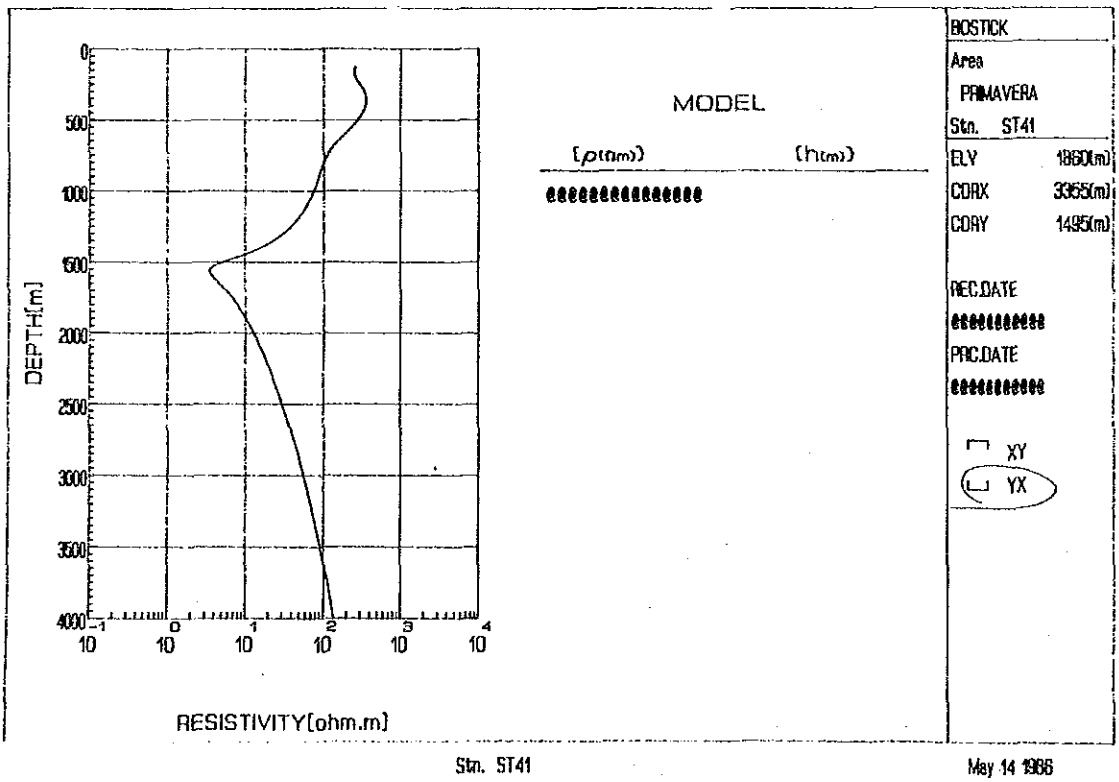

MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST38
ELV 1917(m)
CORX 3035(m)
CORY 1875(m)
REC.DATE
PRC.DATE
XY
YX
DEPTH(m)
RESISTIVITY(ohm.m)
Stn. ST38
May 12 1986

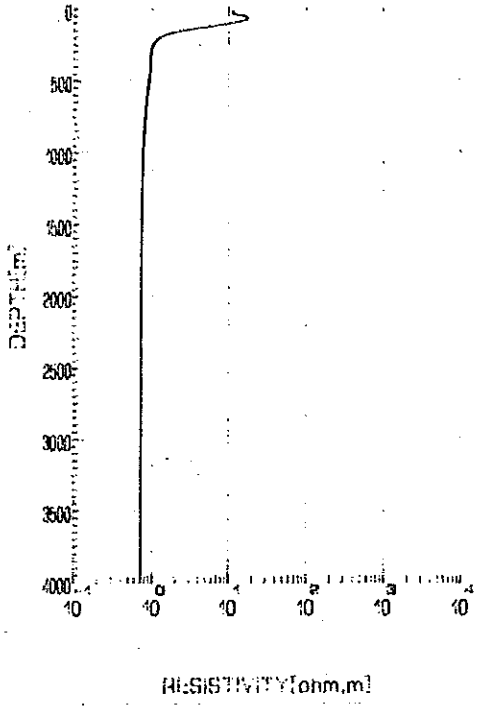

MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST37
ELV 1904(m)
CORX 2820(m)
CORY 1501(m)
REC.DATE
PRC.DATE
XY
YX
DEPTH(m)
RESISTIVITY(ohm.m)
Stn. ST37
May 12 1986


BOSTICK
Area
PRIMAVERA
Stn. ST38
E.Y 1915(m)
CORX 2955(m)
CORY 0680(m)
REC.DATE
PRC.DATE
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST38
May 2 1986


BOSTICK
Area
PRIMAVERA
Stn. ST39
E.Y 1955(m)
CORX 3200(m)
CORY 2280(m)
REC.DATE
PRC.DATE
RESISTIVITY[ohm.m]
Stn. ST39
May 2 1986


BOSTICK
Area
PRIMAVERA
Stn. ST40
ELV 1930(m)
CORX 2830(m)
CORY -545(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST40
May 14 1986


BOSTICK
Area
PRIMAVERA
Stn. ST41
ELV 1860(m)
CORX 3955(m)
CORY 1495(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm)) (h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST41
May 14 1986



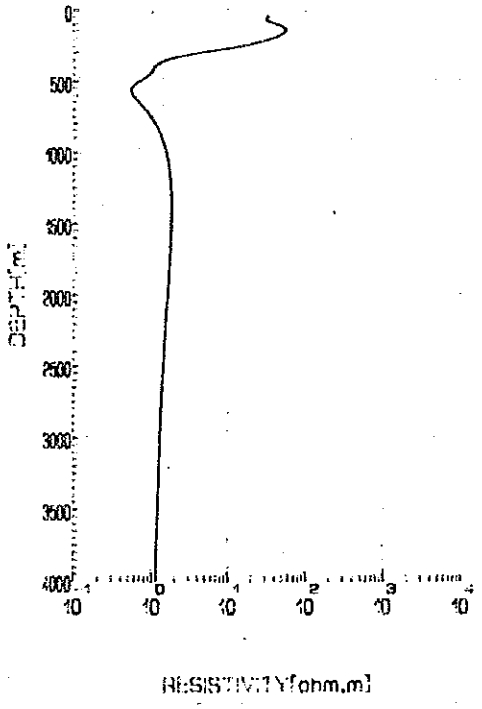
MODEL

(ρ(ohm))	(h(m))
●●●●●●●●●●●●●●●●	

BOSTICK
Area
PRIMAVERA
Sta. ST42
ELV 1860(m)
CORX 1765(m)
CORY 1950(m)

RECDATE
●●●●●●●●●●●
PRCDATE
●●●●●●●●●●●

Stn. ST42 May 12 1986



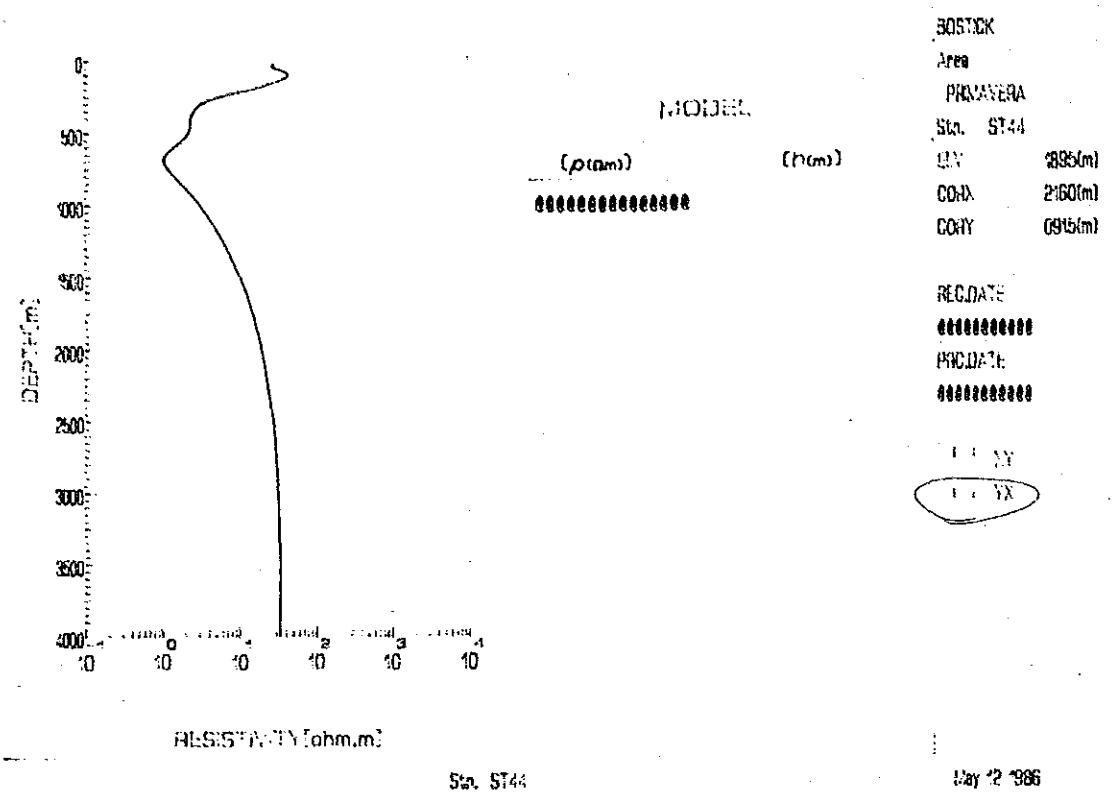
MODEL

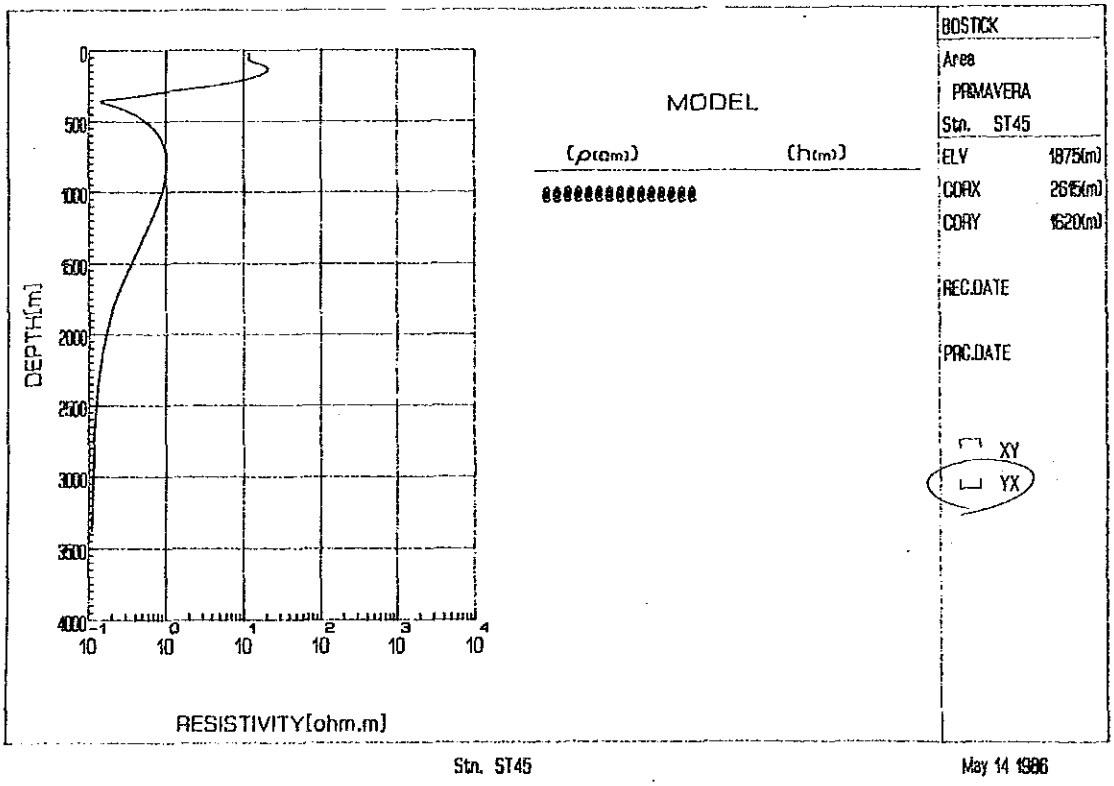
(ρ(ohm))	(h(m))
●●●●●●●●●●●●●●●●	

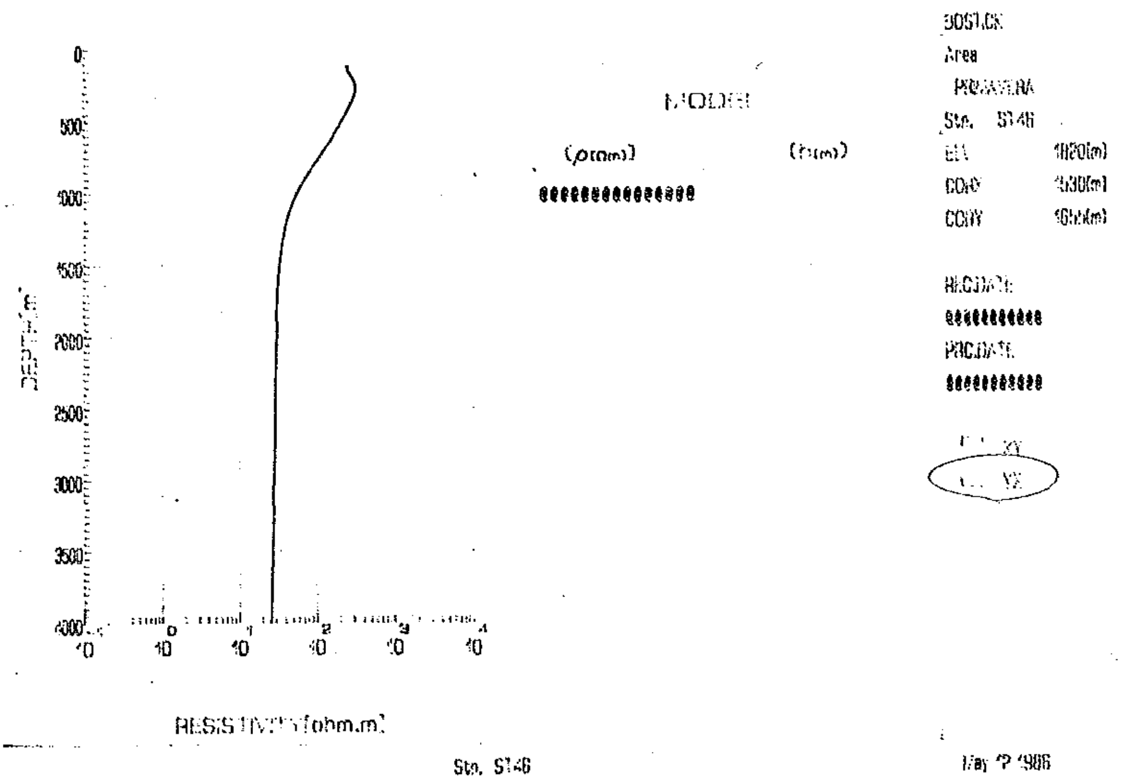
BOSTICK
Area
PRIMAVERA
Sta. ST43
ELV 1866(m)
CORX 0340(m)
CORY 1685(m)

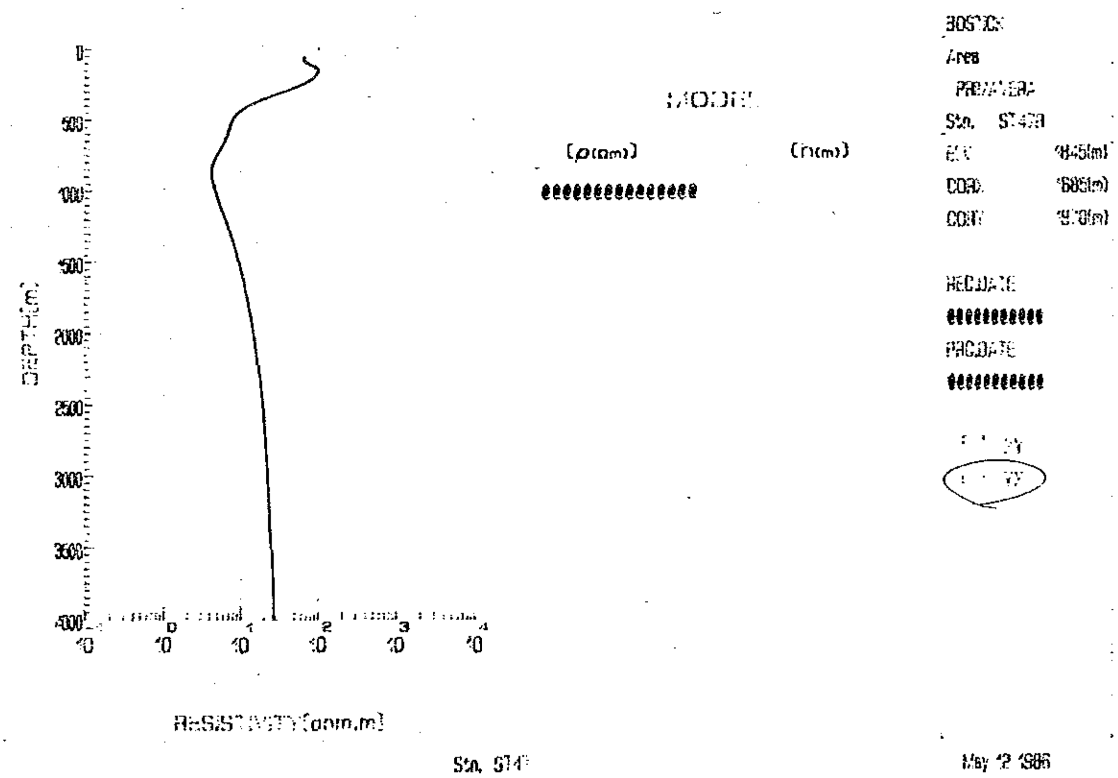
RECDATE
●●●●●●●●●●●
PRCDATE
●●●●●●●●●●●

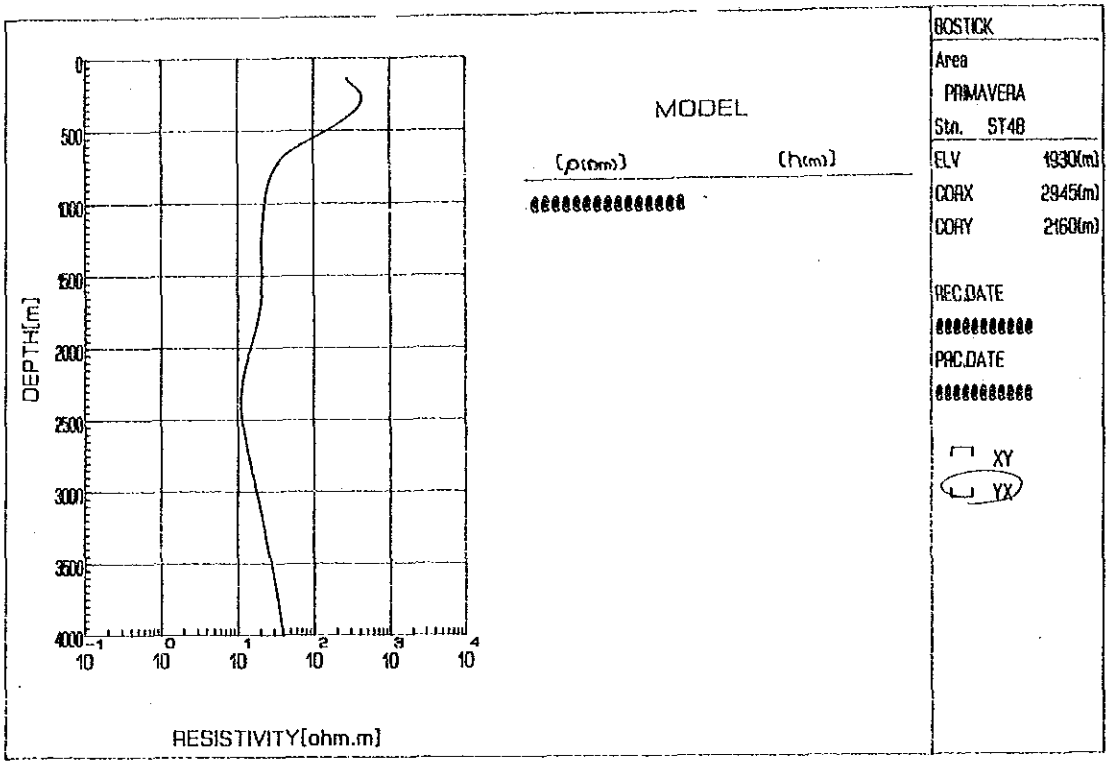
Stn. ST43 May 12 1986


BOSTICK
Area
PRIMAVERA
Sta. ST44
ELV 2895(m)
CORX 2160(m)
CORY 0915(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH(m)
RESISTIVITY(ohm.m)
Sta. ST44
May 12 1986

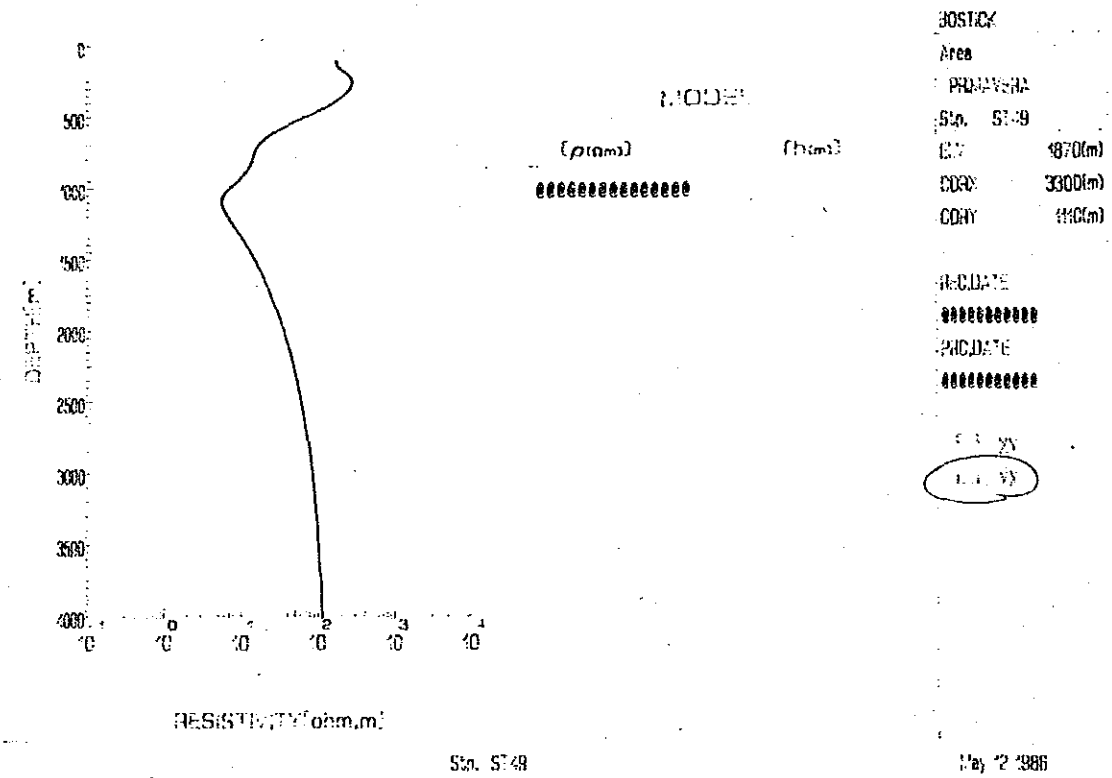

BOSTICK
Area
PRIMAVERA
Sta. ST45
ELV 1875(m)
CORX 2615(m)
CORY 1520(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(ohm)) (h(m))
DEPTH(m)
RESISTIVITY(ohm.m)
Sta. ST45
May 14 1986


MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Sto. S146
DEPTH(m)
RESISTIVITY(ohm.m)
Sto. S146

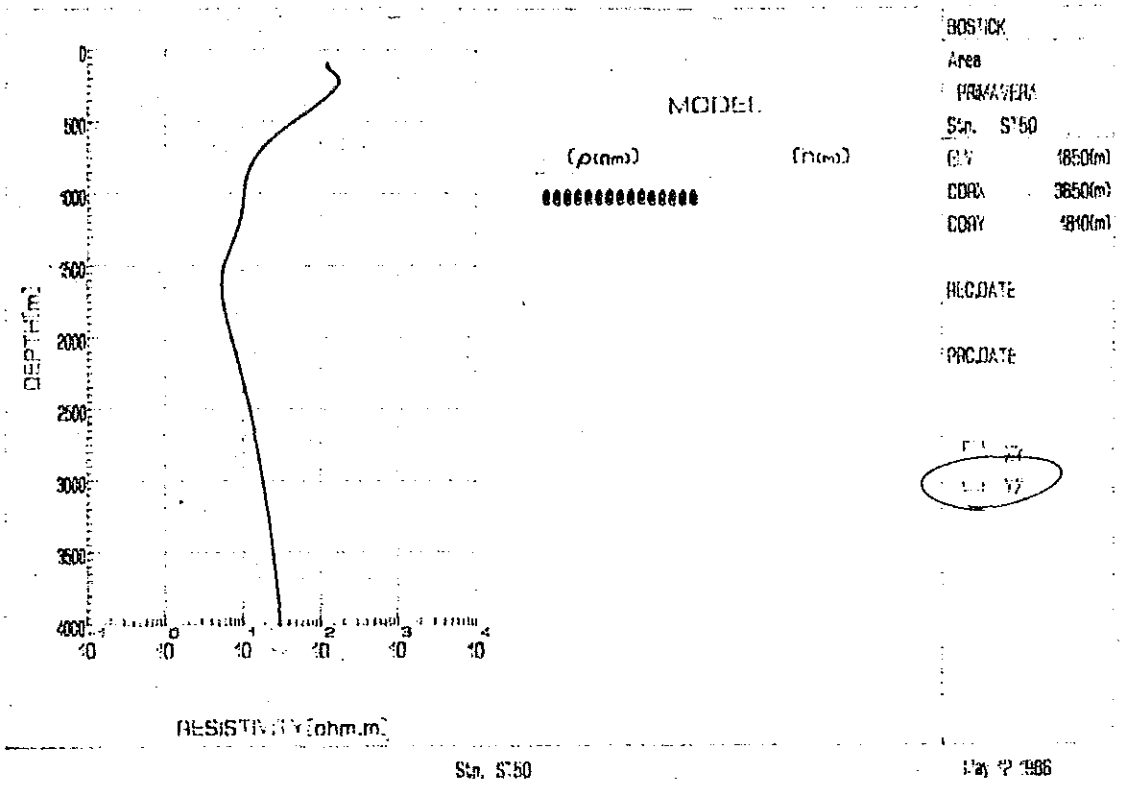

MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
DEPTH(m)
RESISTIVITY(ohm.m)



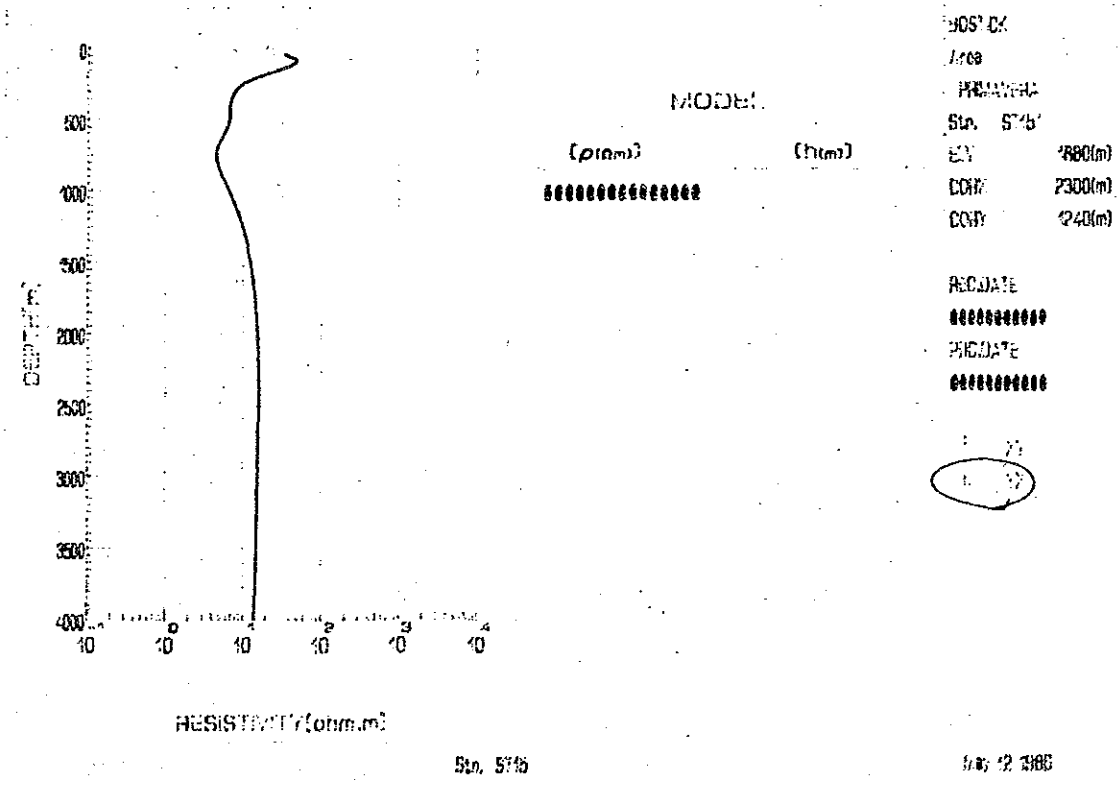
Stn. ST48 May 14 1986



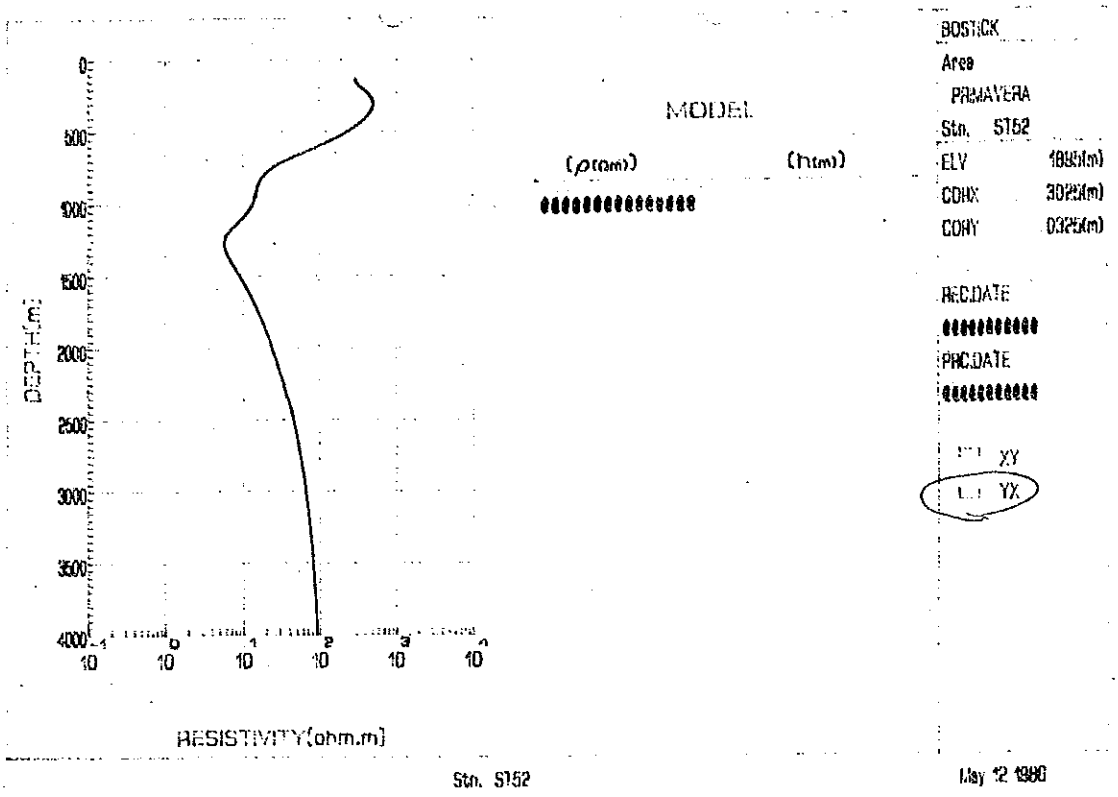
Stn. ST48 May 12 1986

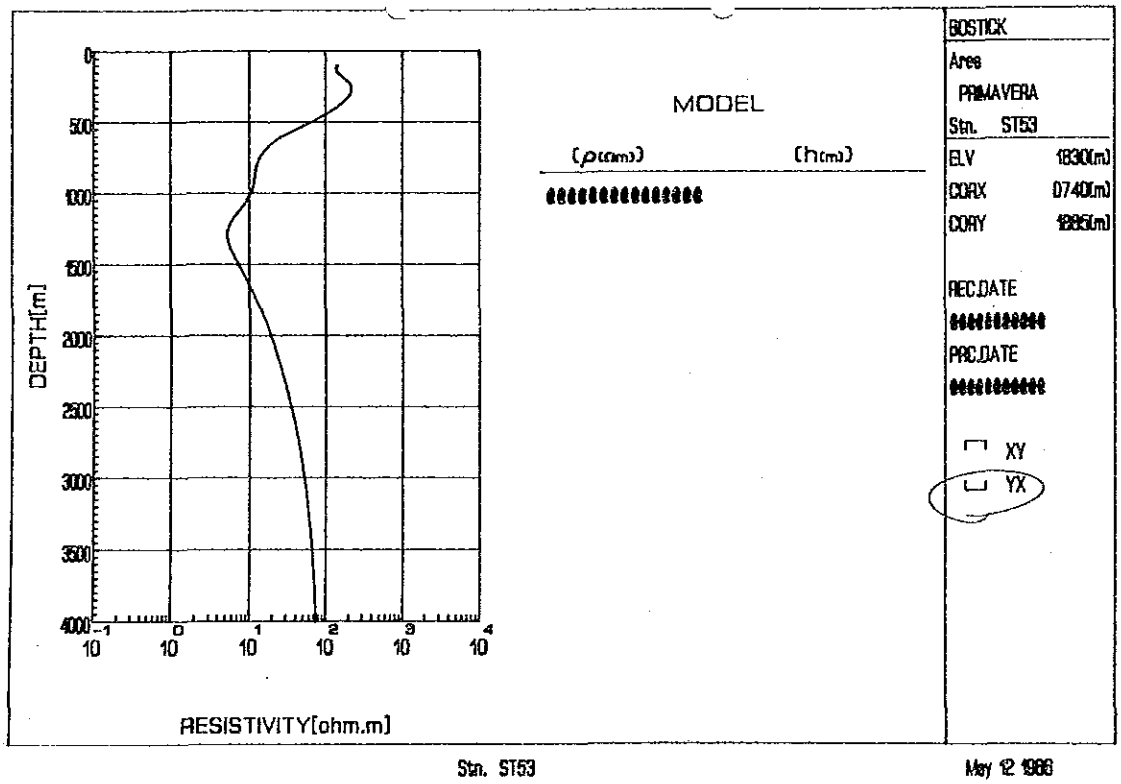


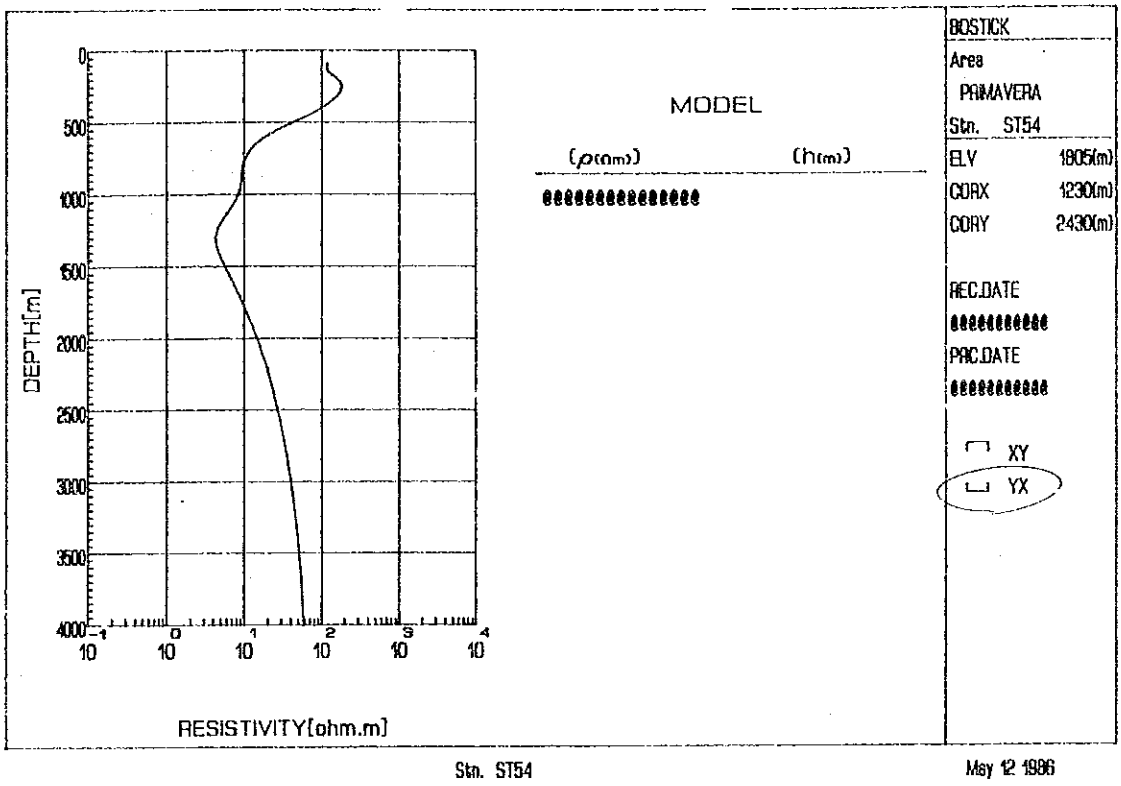
Sta. S'50 May '2 1986

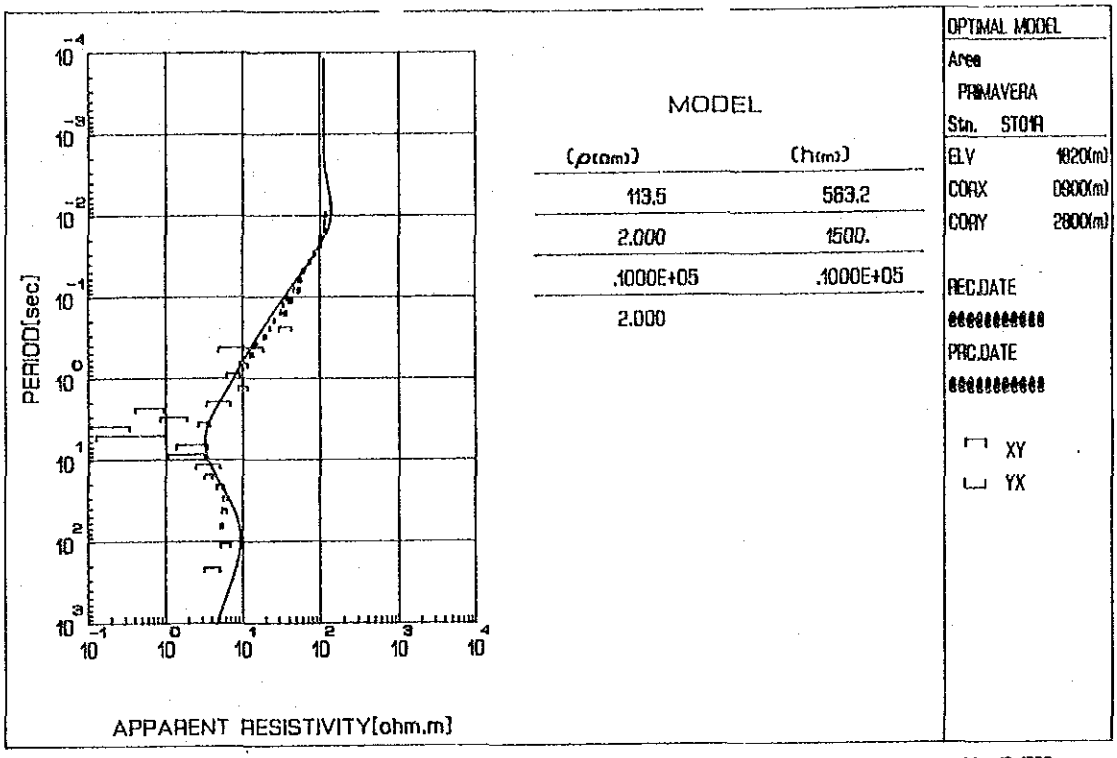


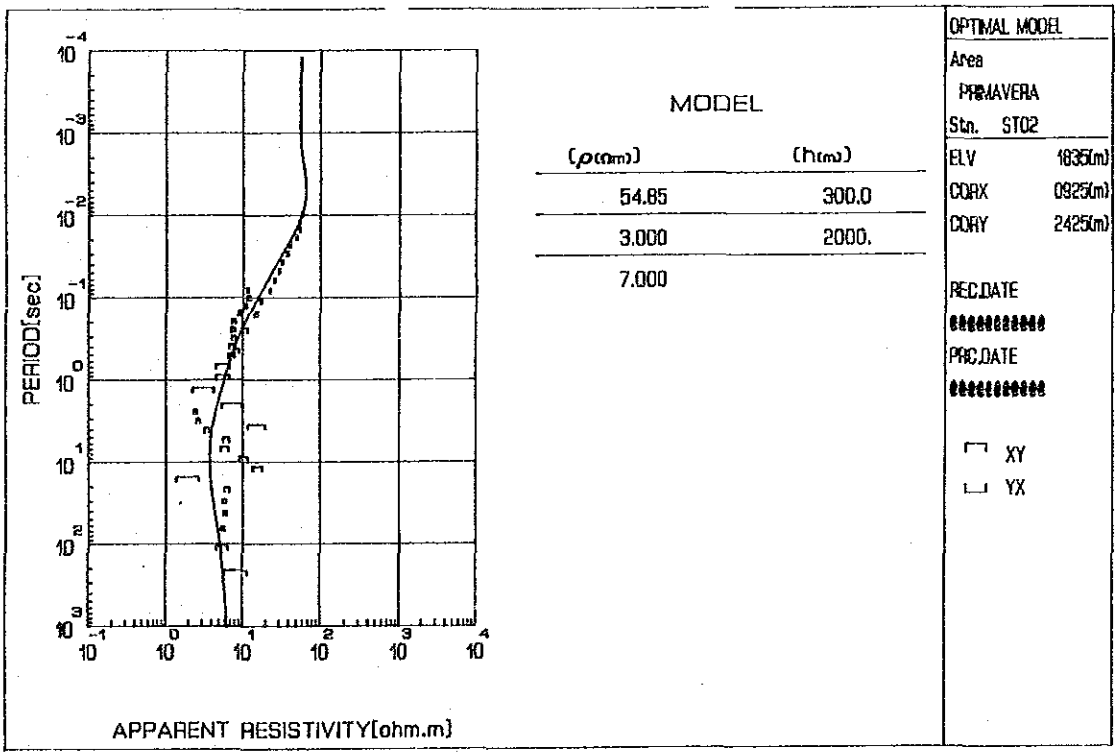
Sta. S'45 May '2 1986

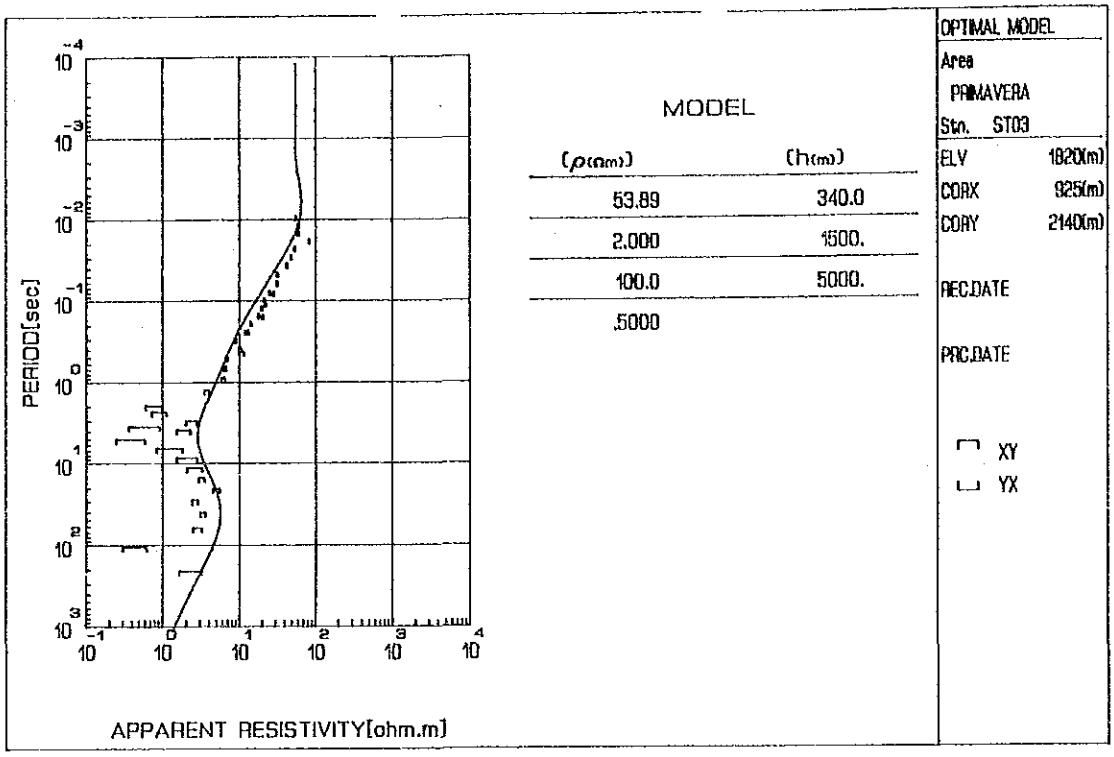

MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST52
ELV 1855(m)
CORX 3022(m)
CORY 0325(m)
REC.DATE
PRC.DATE
XY
YX
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST52
May 12 1986


MODEL
(ρ(Ωm))
(h(m))
BOSTICK
Area
PRIMAVERA
Stn. ST53
ELV 1830(m)
CORX 0740(m)
CORY 1985(m)
REC.DATE
PRC.DATE
XY
YX
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST53
May 12 1986

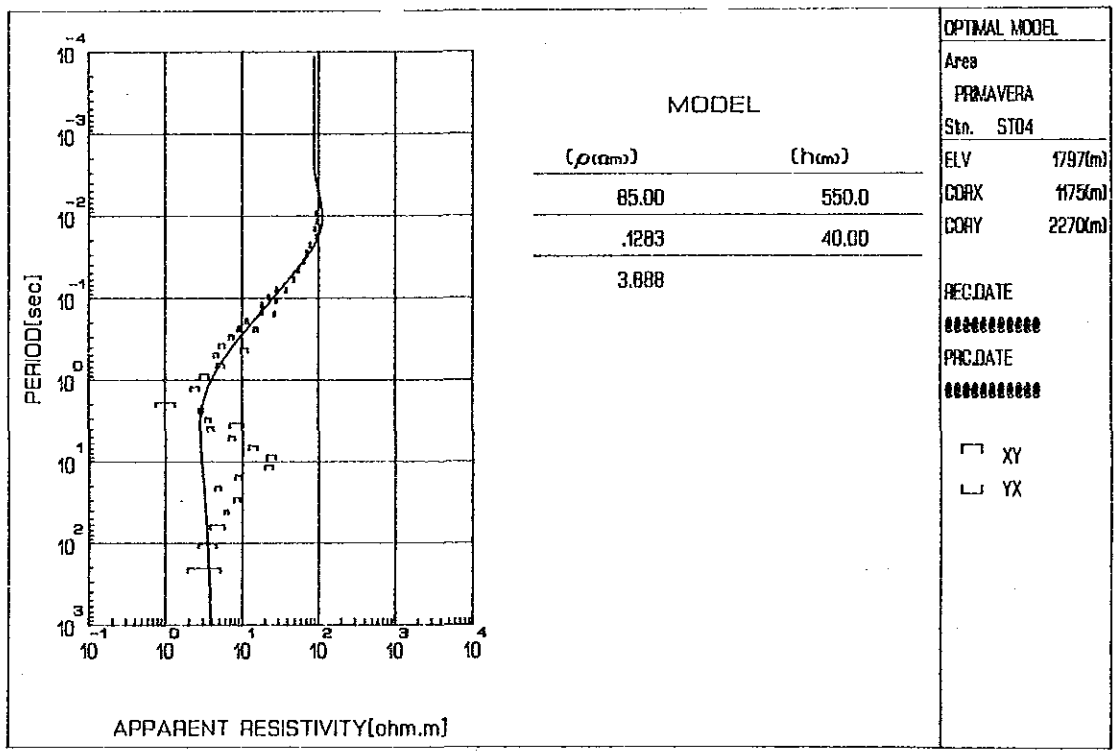

BOSTICK
Area
PRIMAVERA
Stn. ST54
ELV 1805(m)
CORX 1230(m)
CORY 2430(m)
REC.DATE
PRC.DATE
XY
YX
MODEL
(ρ(Ωm))
(h(m))
DEPTH[m]
RESISTIVITY[ohm.m]
Stn. ST54
May 12 1986


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
113.5 563.2
2.000 1500.
.1000E+05 .1000E+05
2.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST01R
ELV 1920(m)
CORX 0900(m)
CORY 2800(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST01
May 10 1986

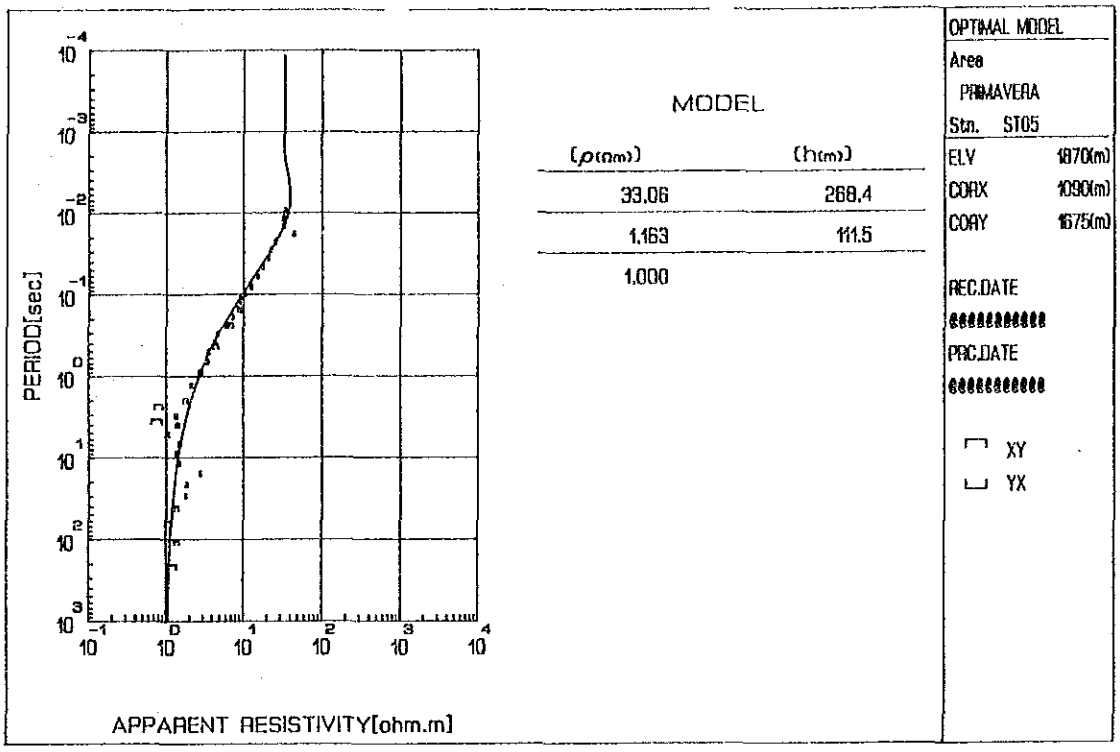

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
54.85 300.0
3.000 2000.
7.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST02
ELV 1835(m)
CORX 0925(m)
CORY 2425(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST02
May 10 1986

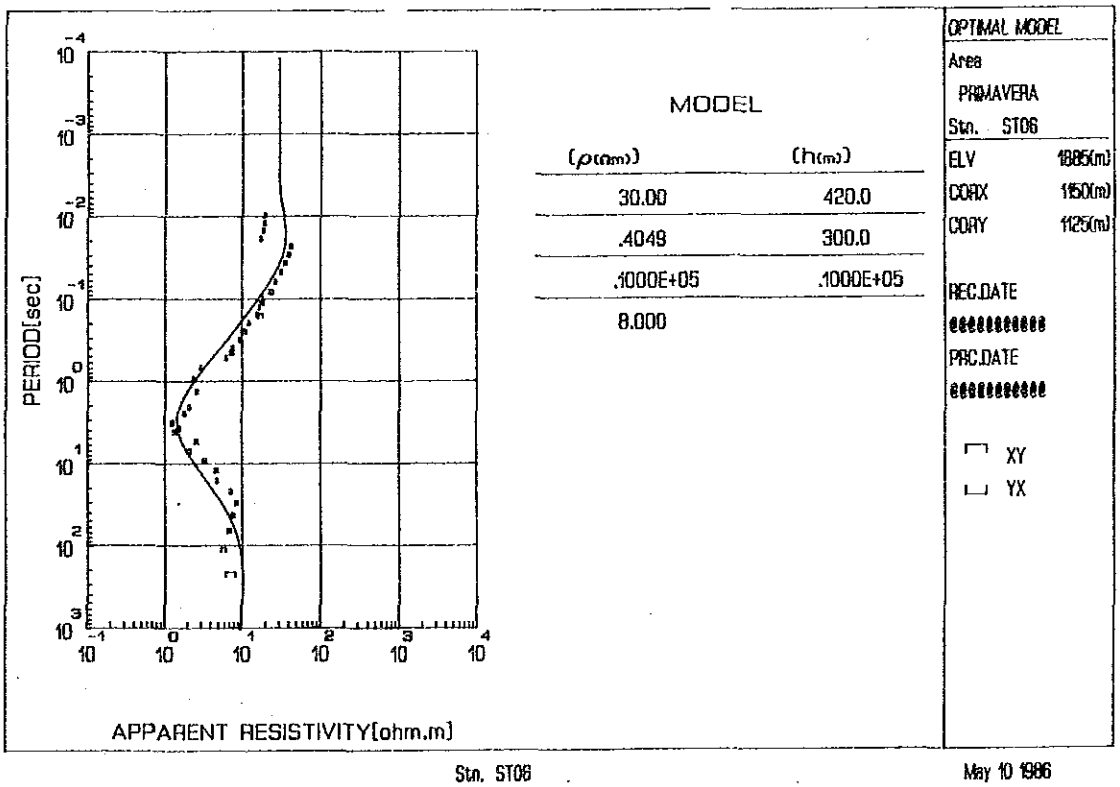


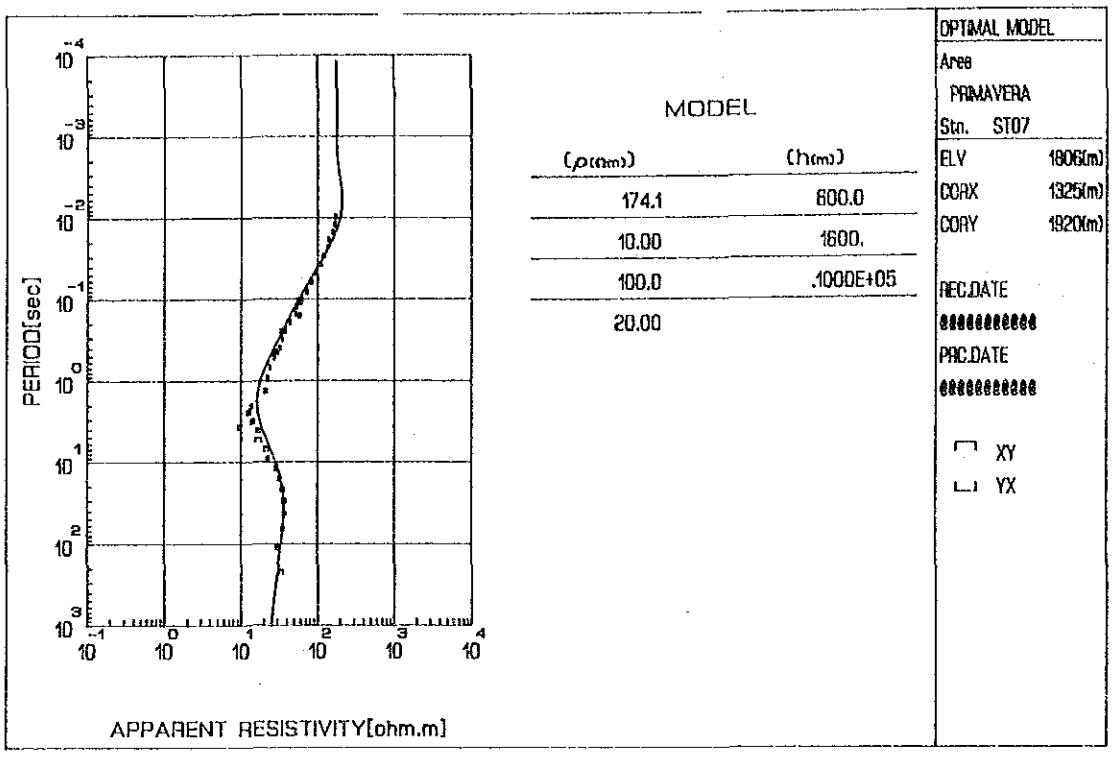
Stn. ST03 May 10 1986



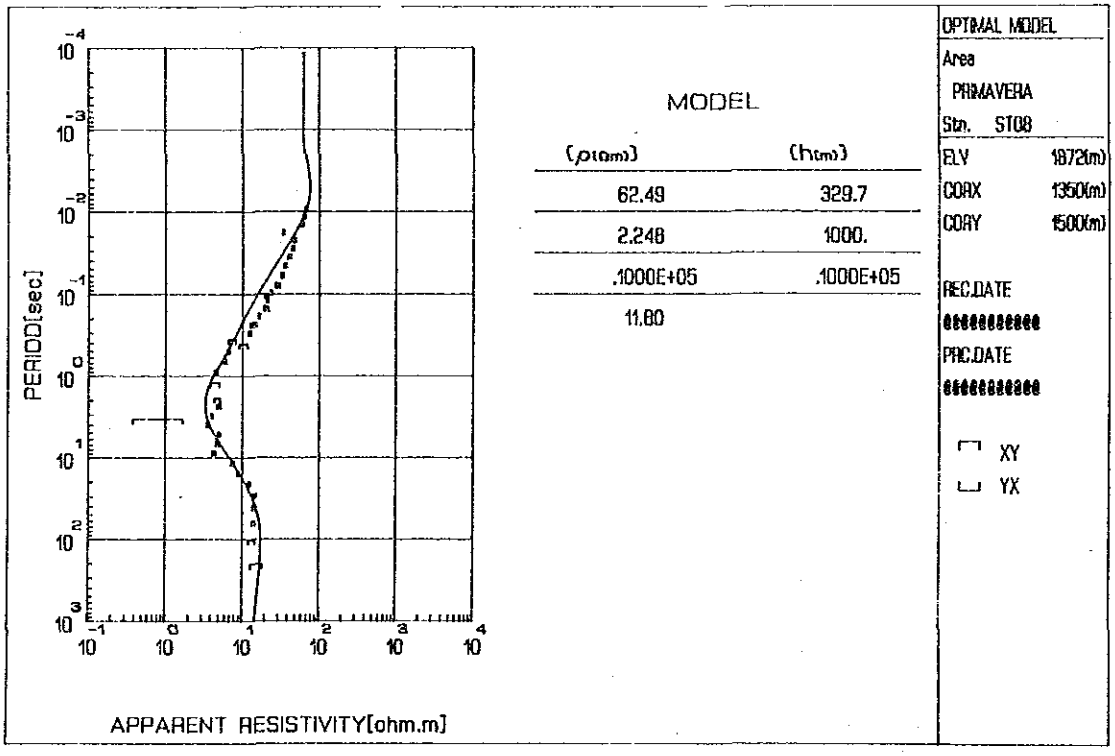
Stn. ST04 May 10 1986


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
33.06 268.4
1.163 111.5
1.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST05
ELV 1870(m)
CORX 1090(m)
CORY 1675(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST05
May 10 1986

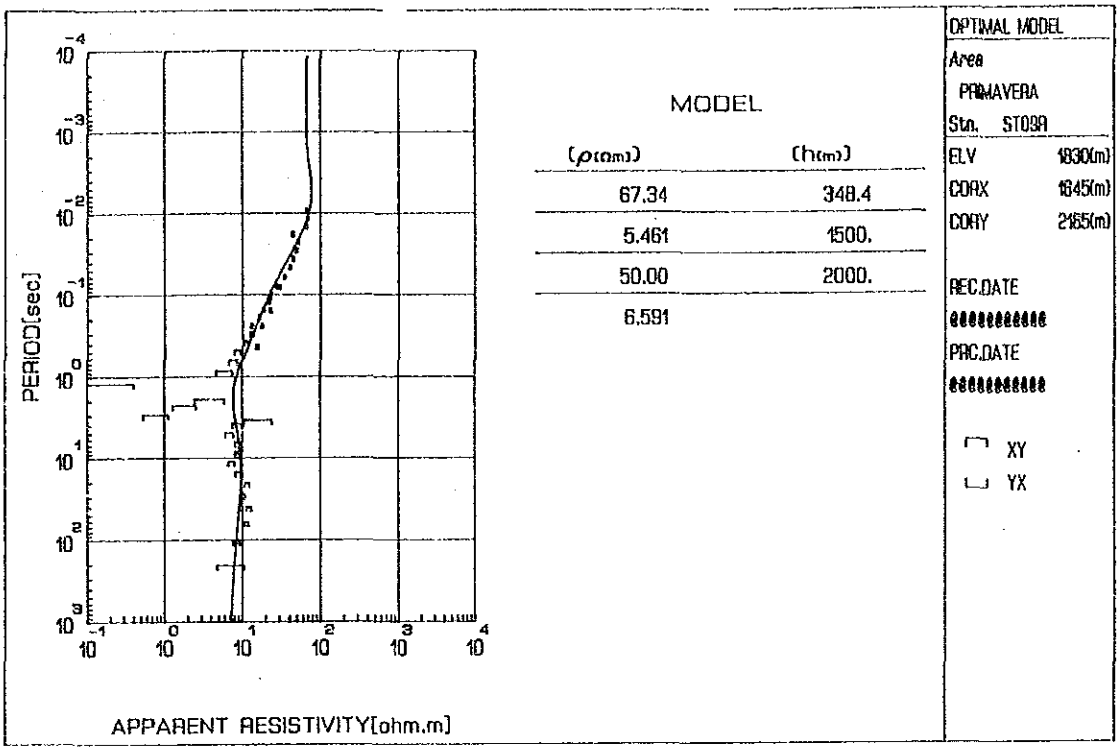

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
30.00 420.0
.4049 300.0
.1000E+05 .1000E+05
8.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST06
ELV 1885(m)
CORX 1150(m)
CORY 1125(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST06
May 10 1986

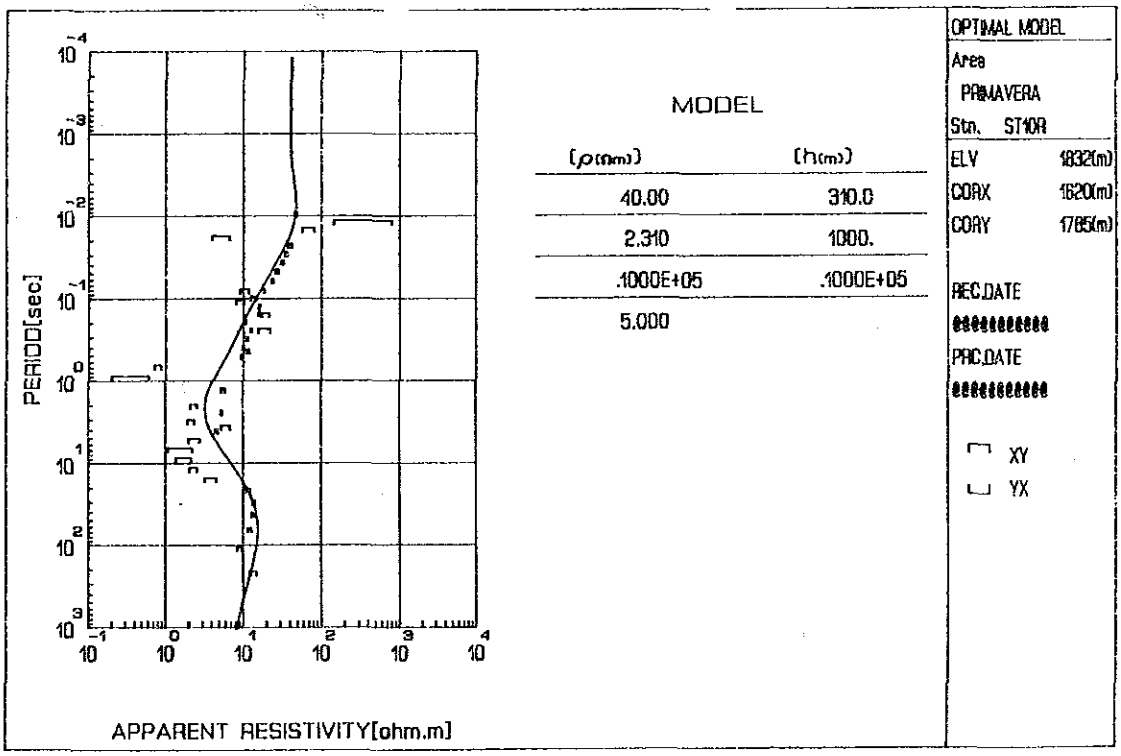


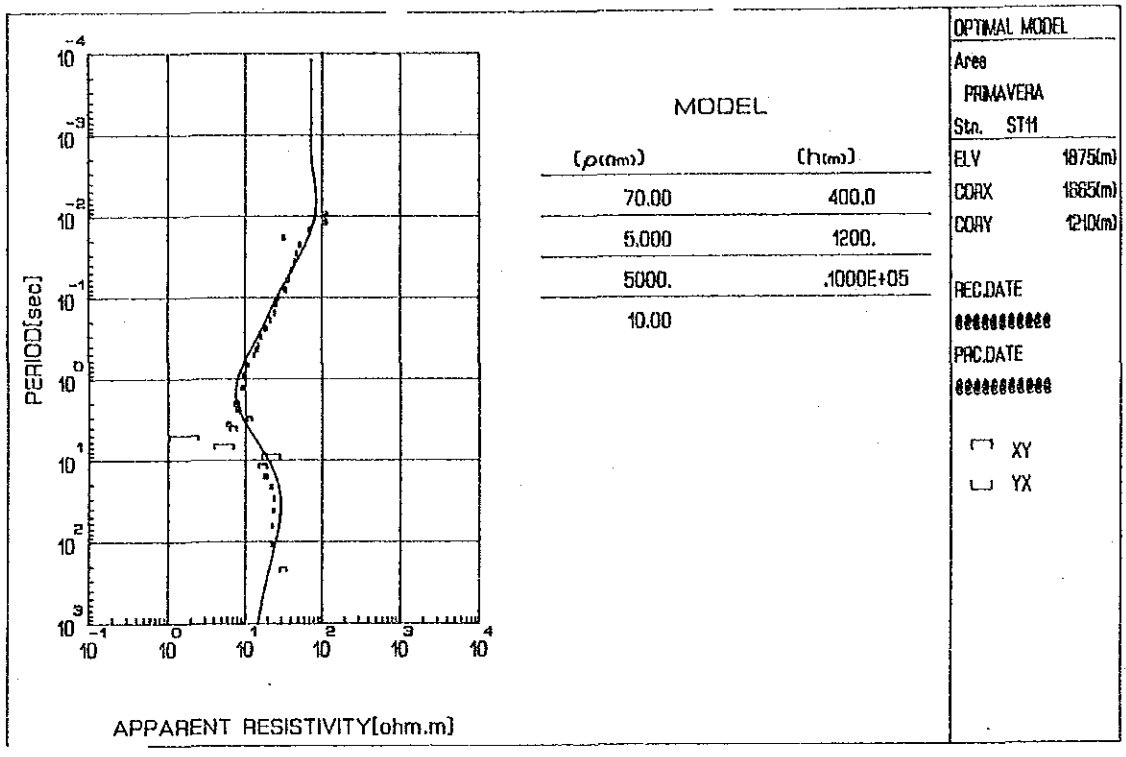
Stn. ST07 May 10 1996



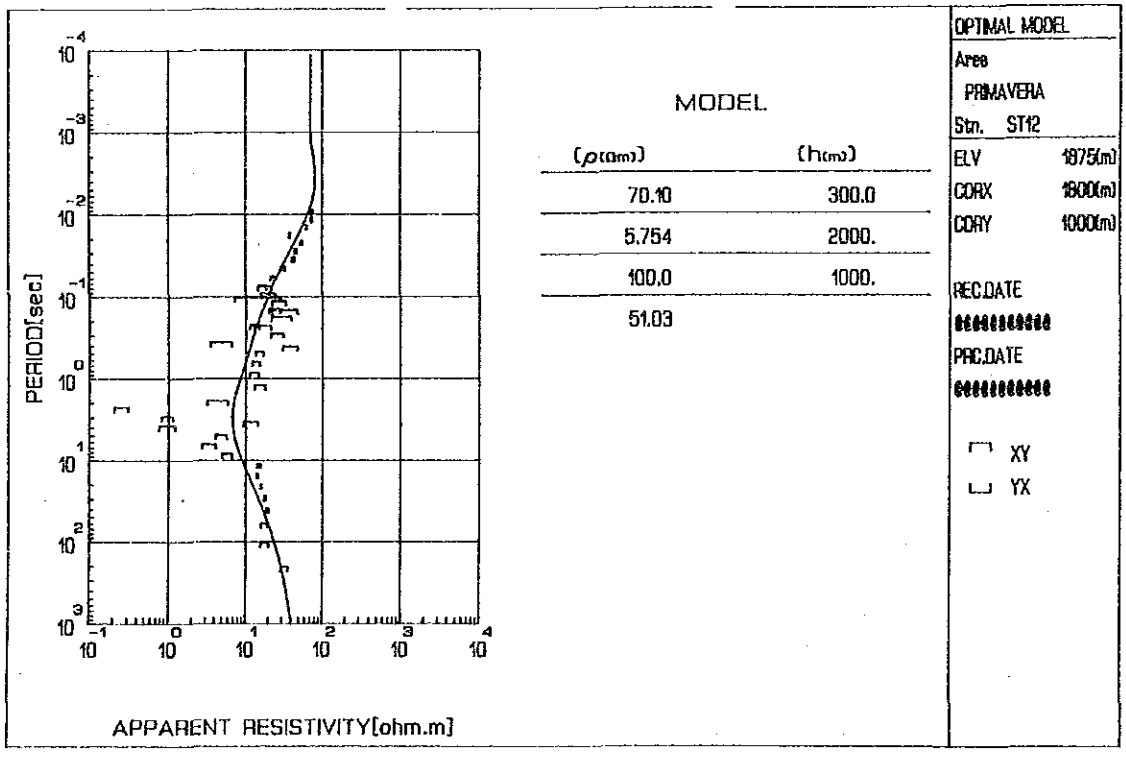
Stn. ST08 May 10 1996


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
67.34 348.4
5.461 1500.
50.00 2000.
6.591
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST09R
ELV 1830(m)
CORX 1645(m)
CORY 2165(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST09
May 10 1996

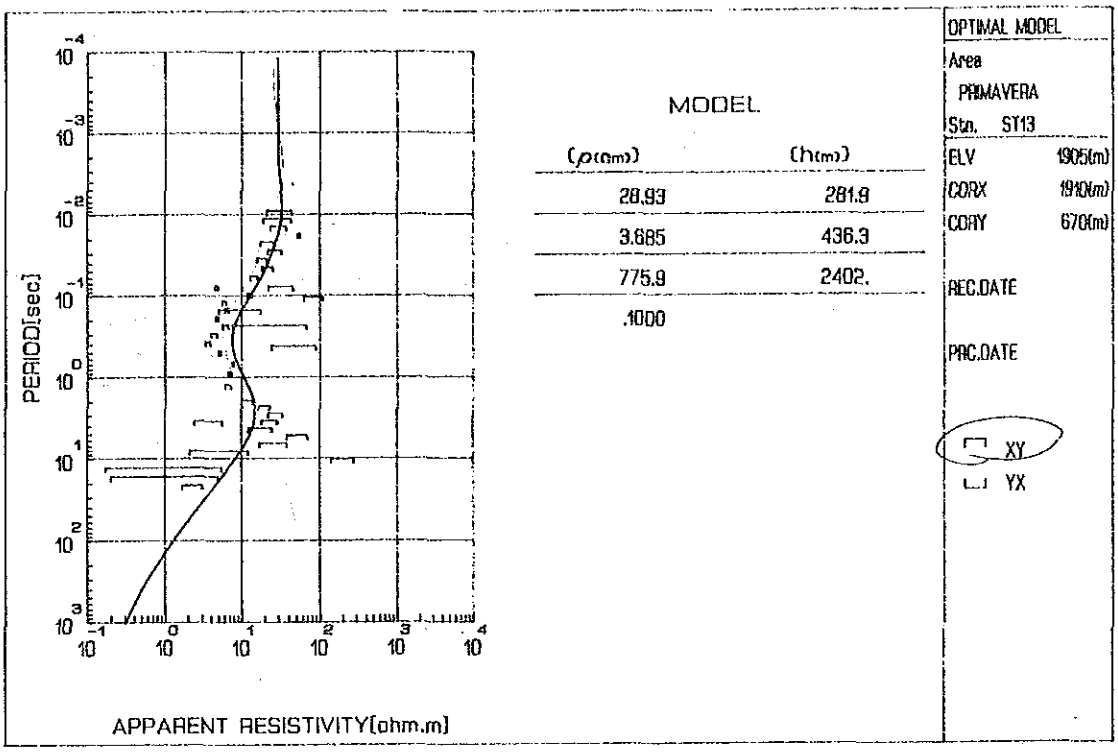

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
40.00 310.0
2.310 1000.
.1000E+05 .1000E+05
5.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST10R
ELV 1832(m)
CORX 1620(m)
CORY 1765(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST10
May 10 1996



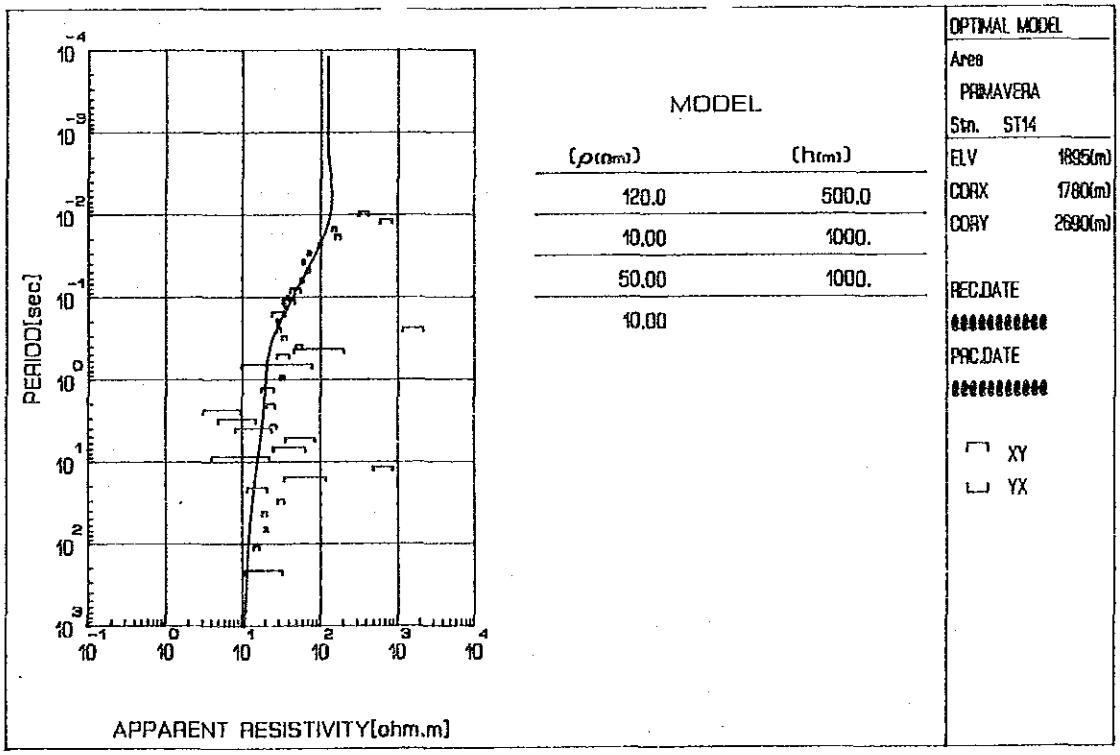
Stn. ST11 May 10 1996



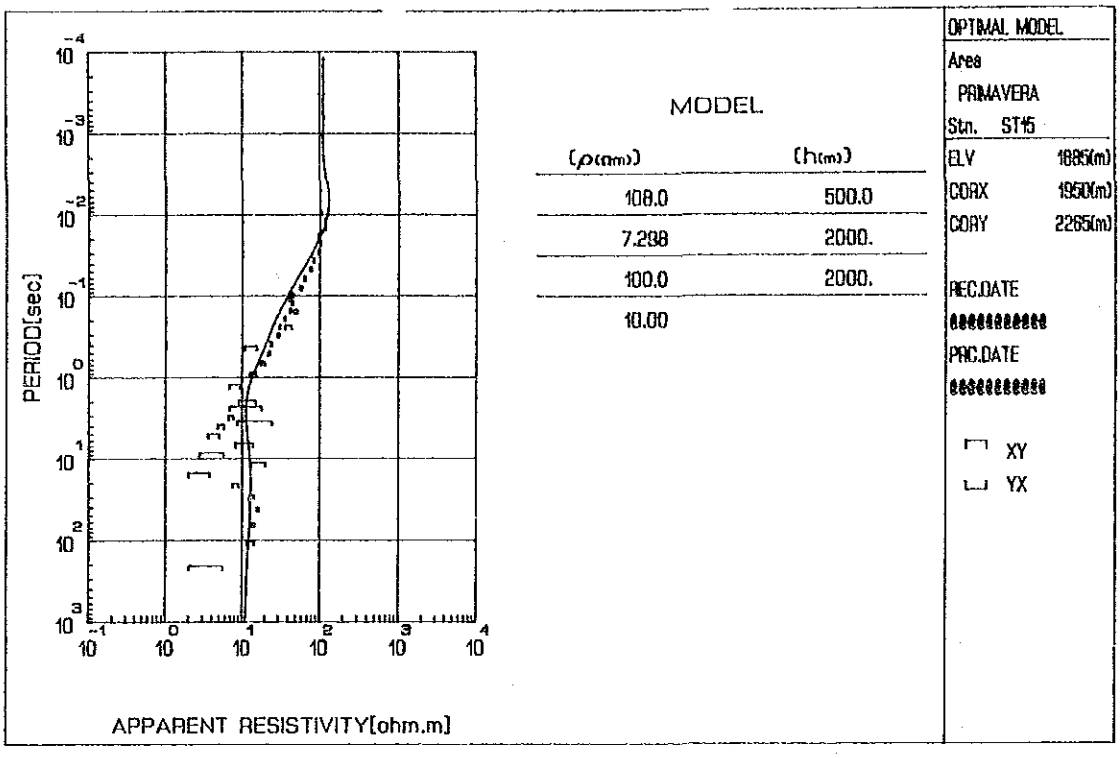
Stn. ST12 May 10 1996



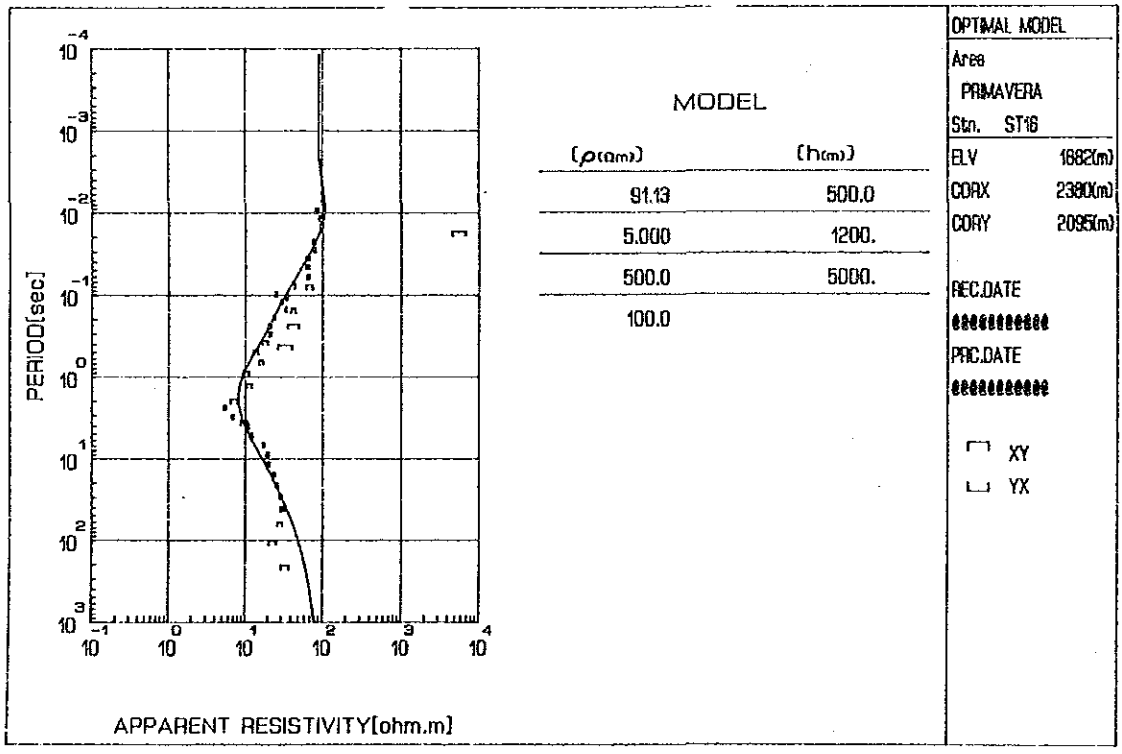
Stn. ST13 May 14 1996



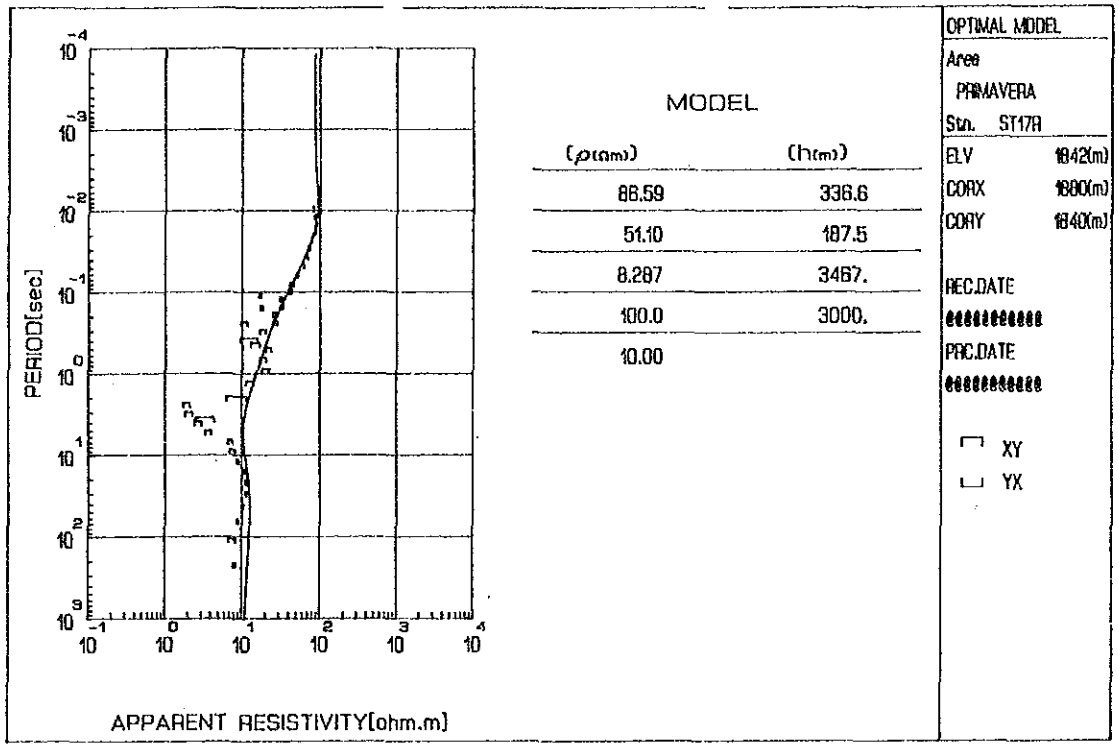
Stn. ST14 May 10 1996



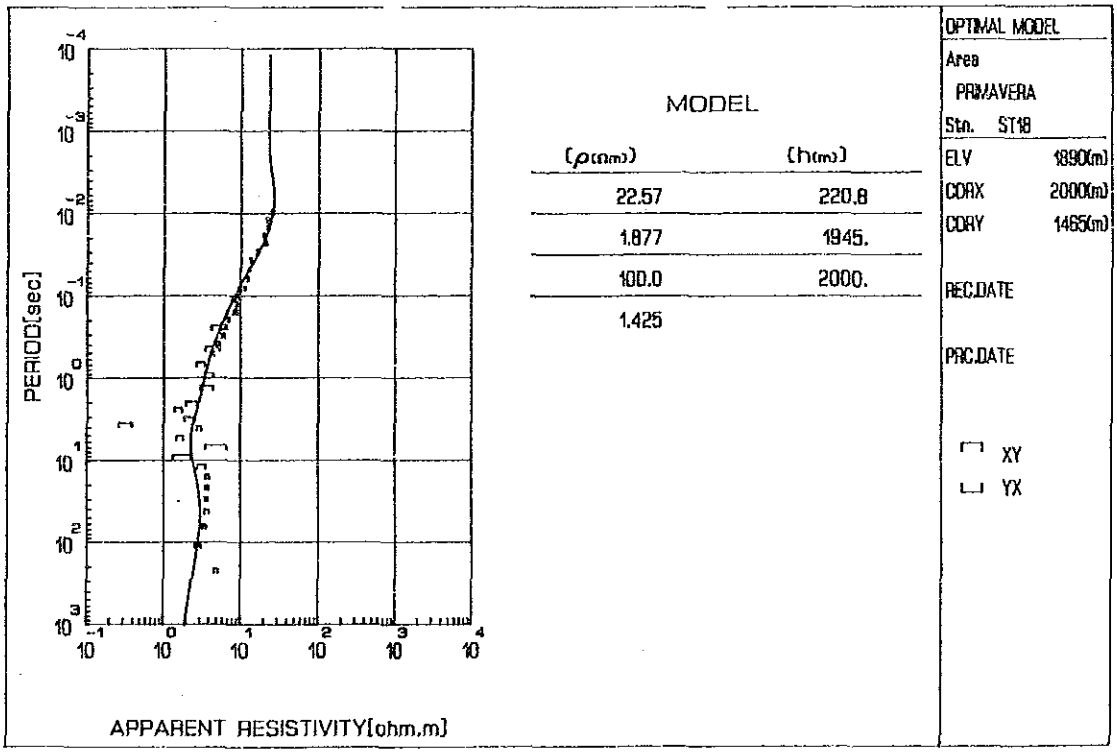
Stn. ST15 May 10 1986



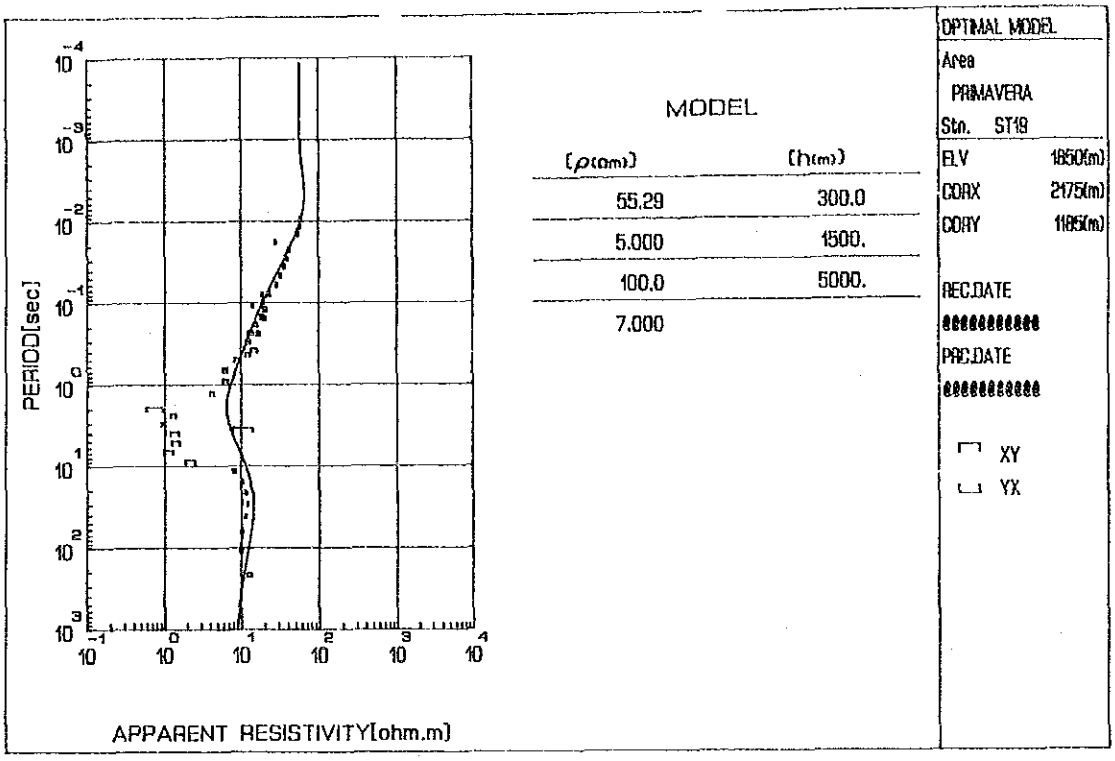
Stn. ST16 May 10 1986



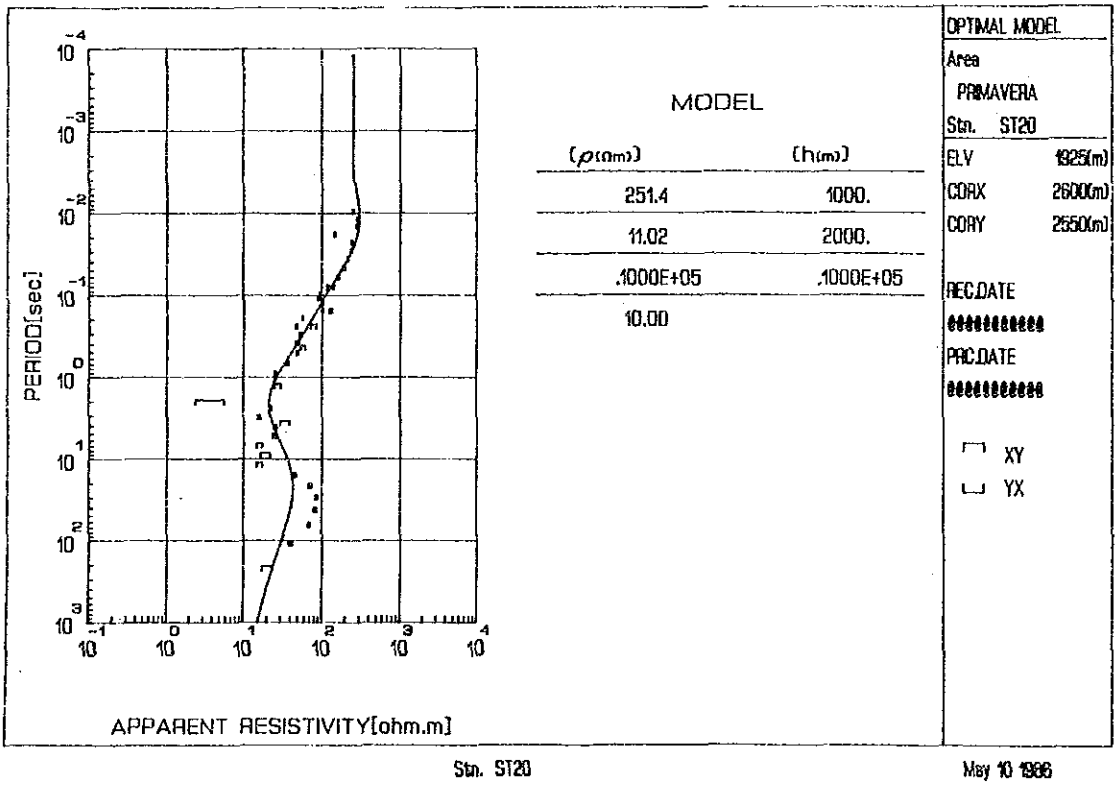
Stn. ST17 May 10 1986



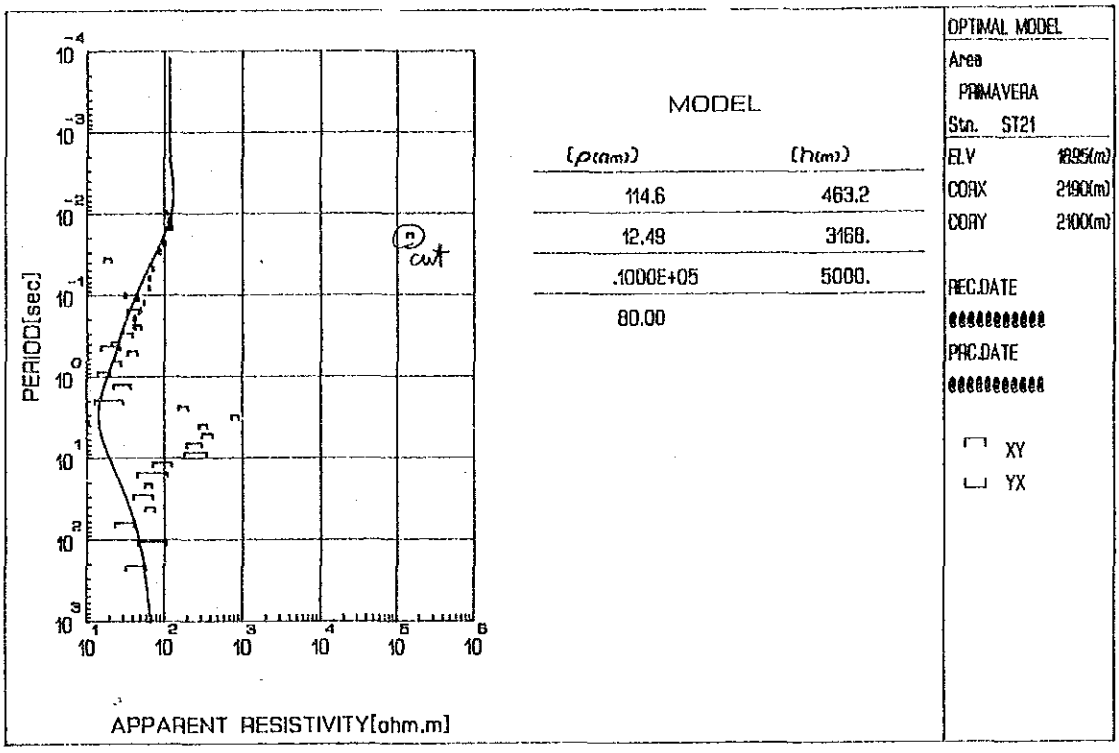
Stn. ST18 May 10 1986



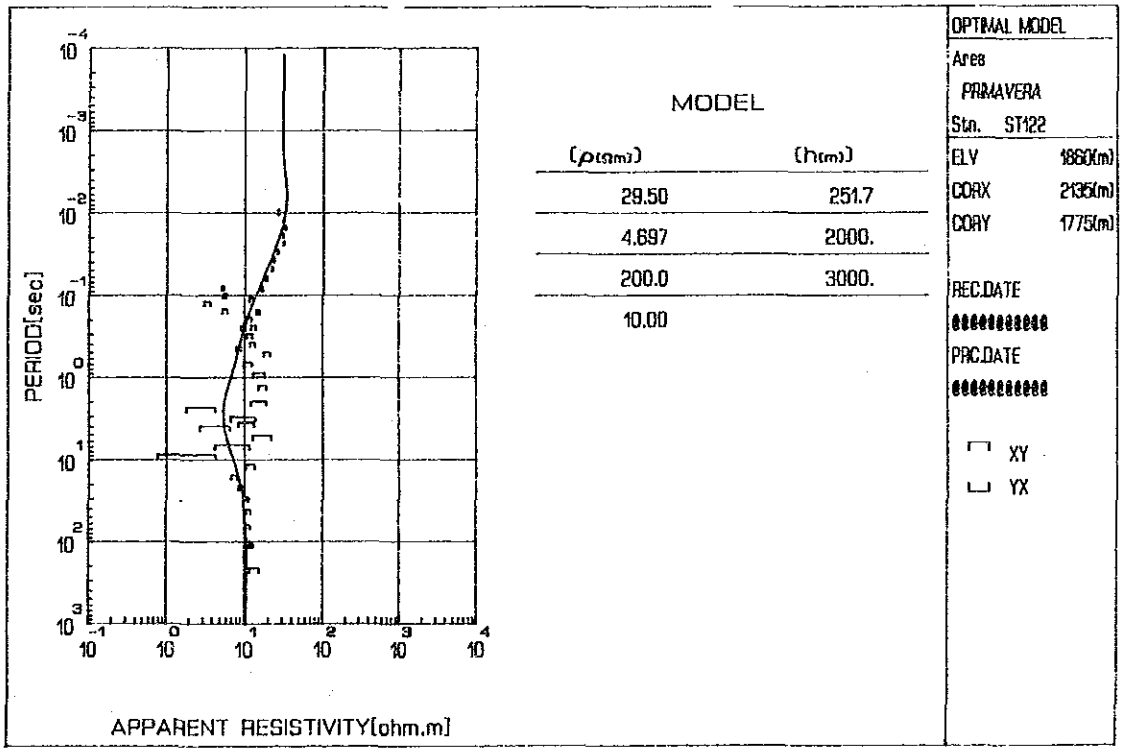
Stn. ST19 May 10 1986



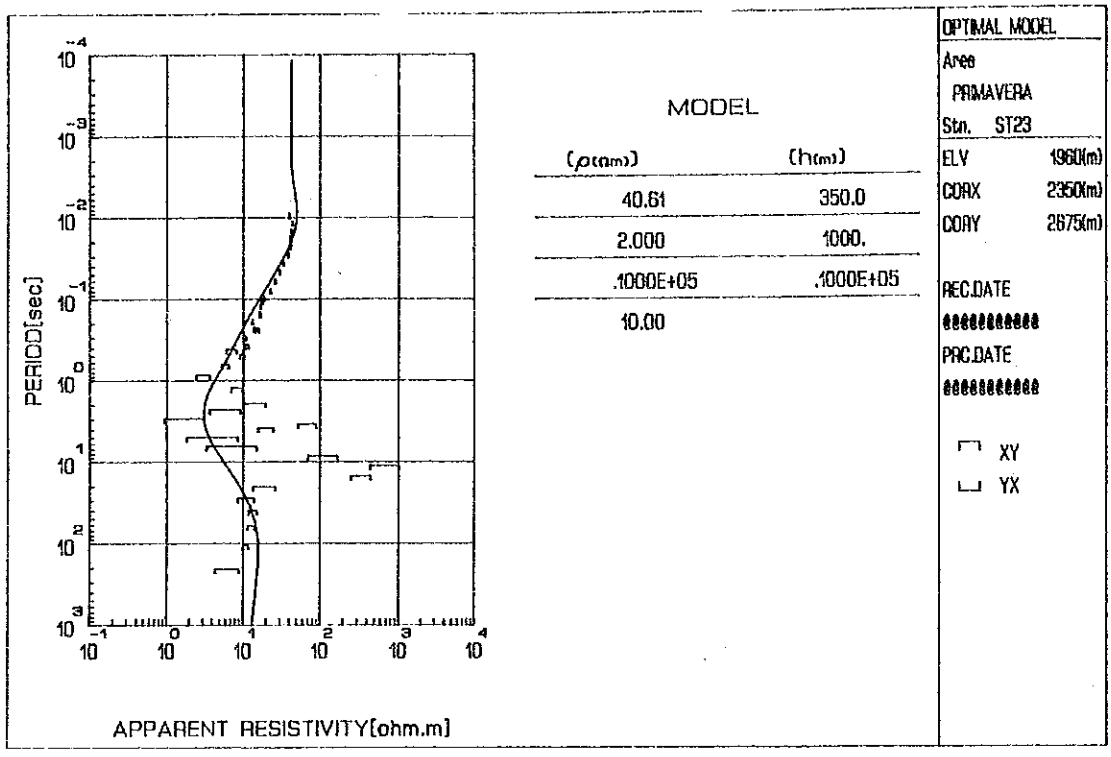
Stn. ST20 May 10 1986



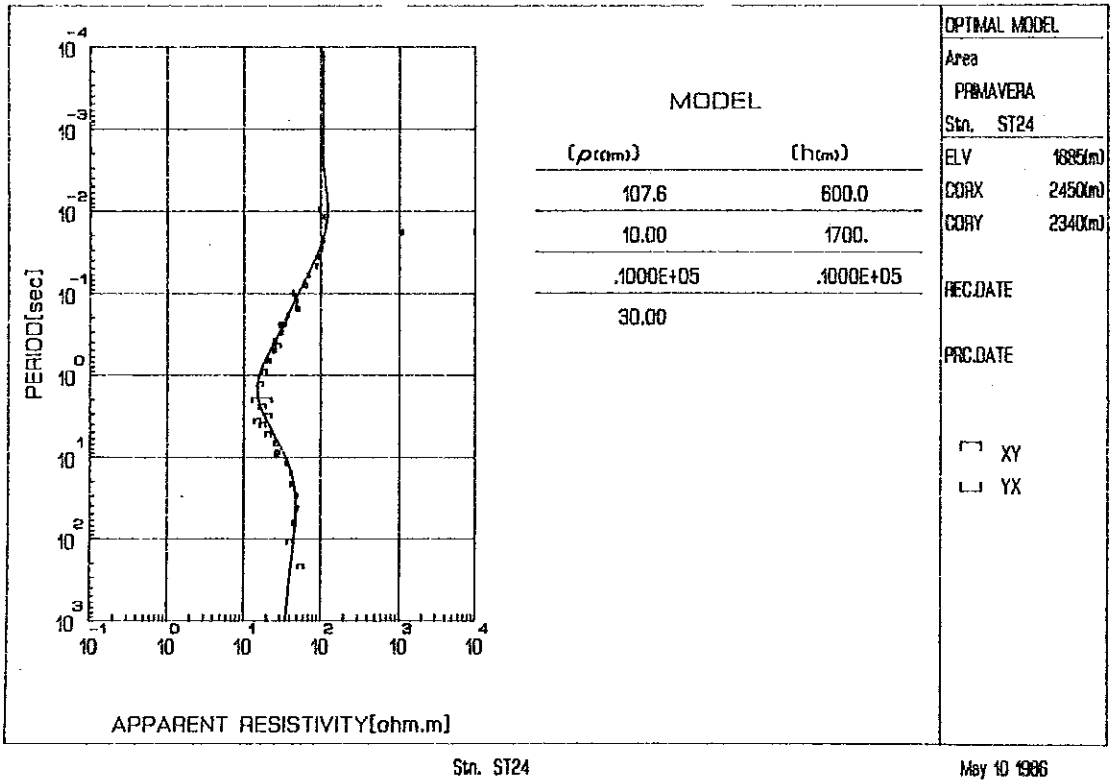
Stn. ST21 May 10 1986



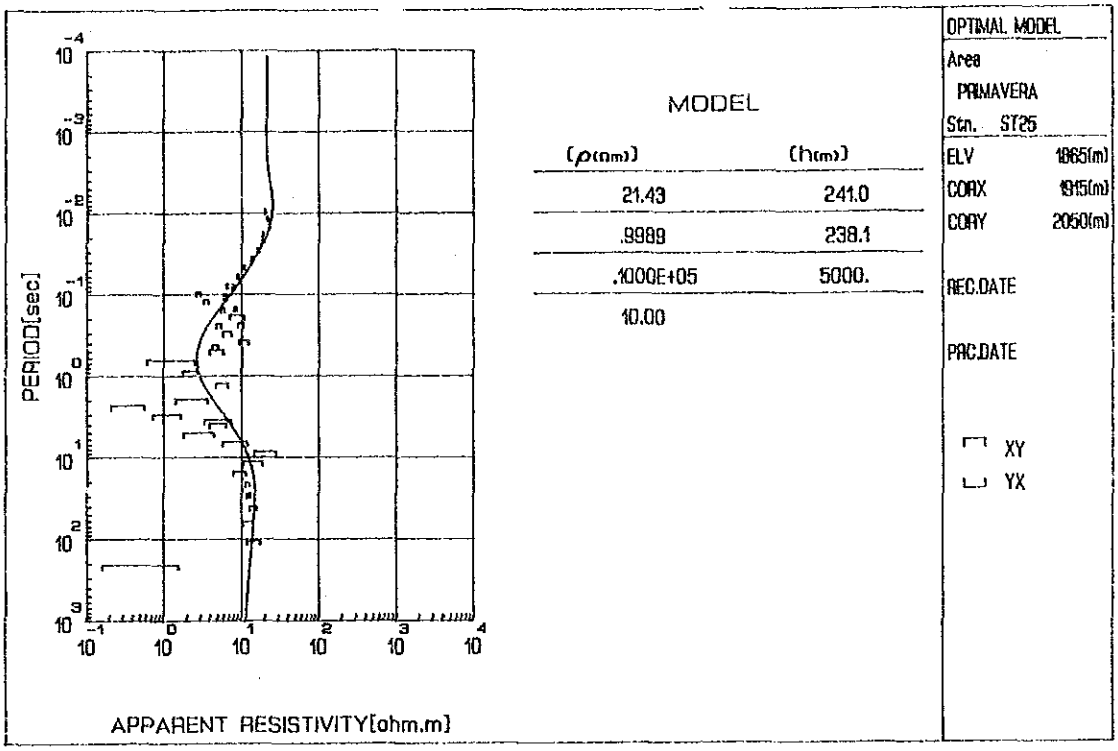
Stn. ST12 May 10 1986



Stn. ST23 May 10 1996



Stn. ST24 May 10 1996


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
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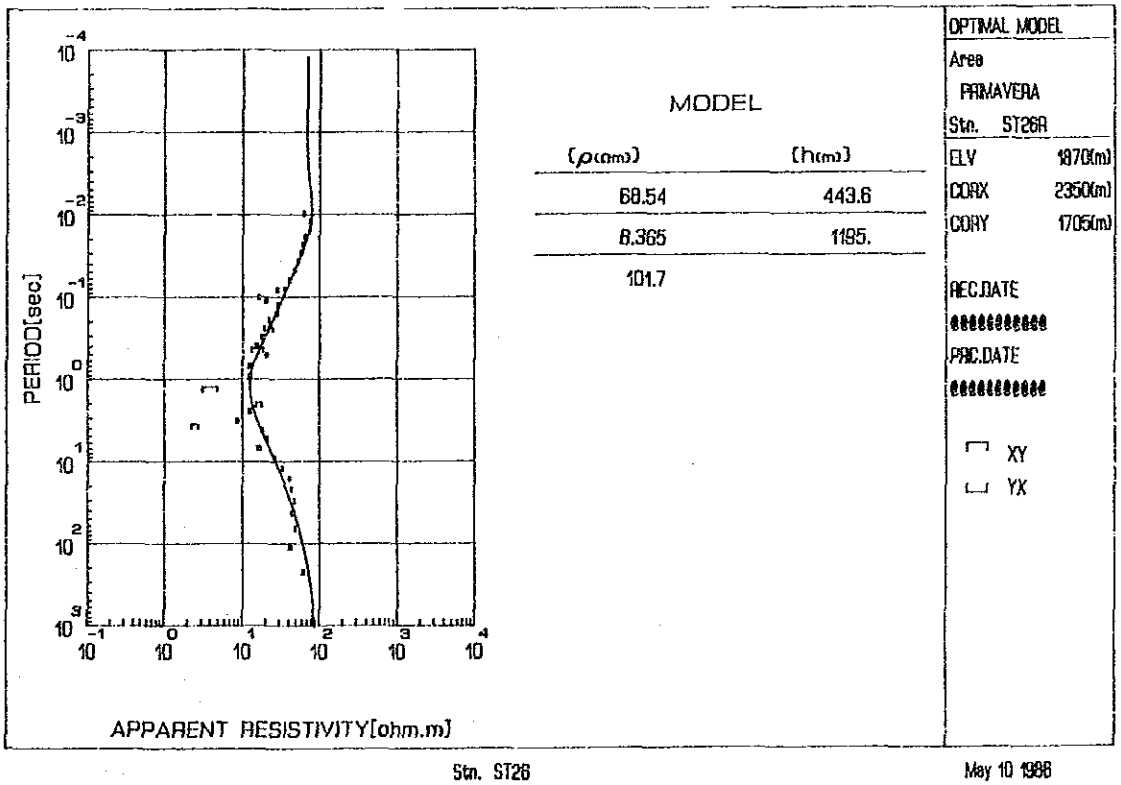
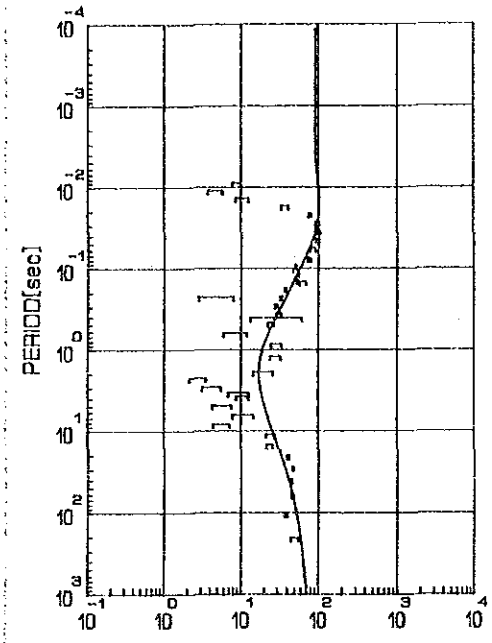
.9989 238.1
.1000E+05 5000.
10.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST25
ELV 1865(m)
CORX 1915(m)
CORY 2050(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST25
May 10 1988


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
68.54 443.6
8.365 1185.
101.7
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST26R
ELV 1870(m)
CORX 2350(m)
CORY 1705(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST26
May 10 1988



MODEL

(ρ(Ωm))	(h(m))
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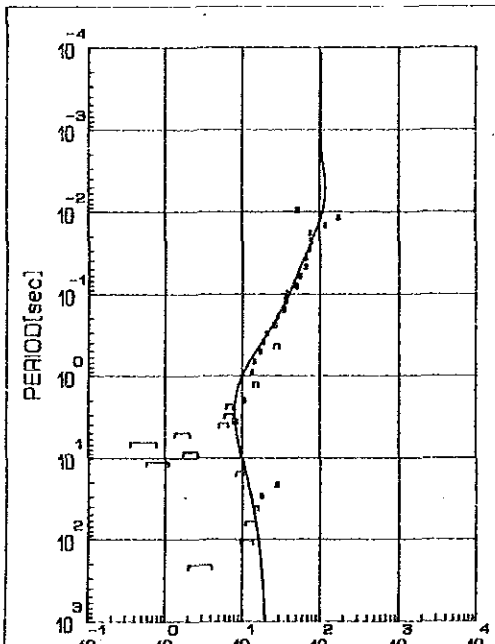
10.00	1500.
80.00	

OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST27
ELV 1918(m)
CORX 2120(m)
CORY 2435(m)
REC.DATE
[redacted]
PRC.DATE
[redacted]
XY
YX

Stn. ST27

May 10 1986



MODEL

(ρ(Ωm))	(h(m))
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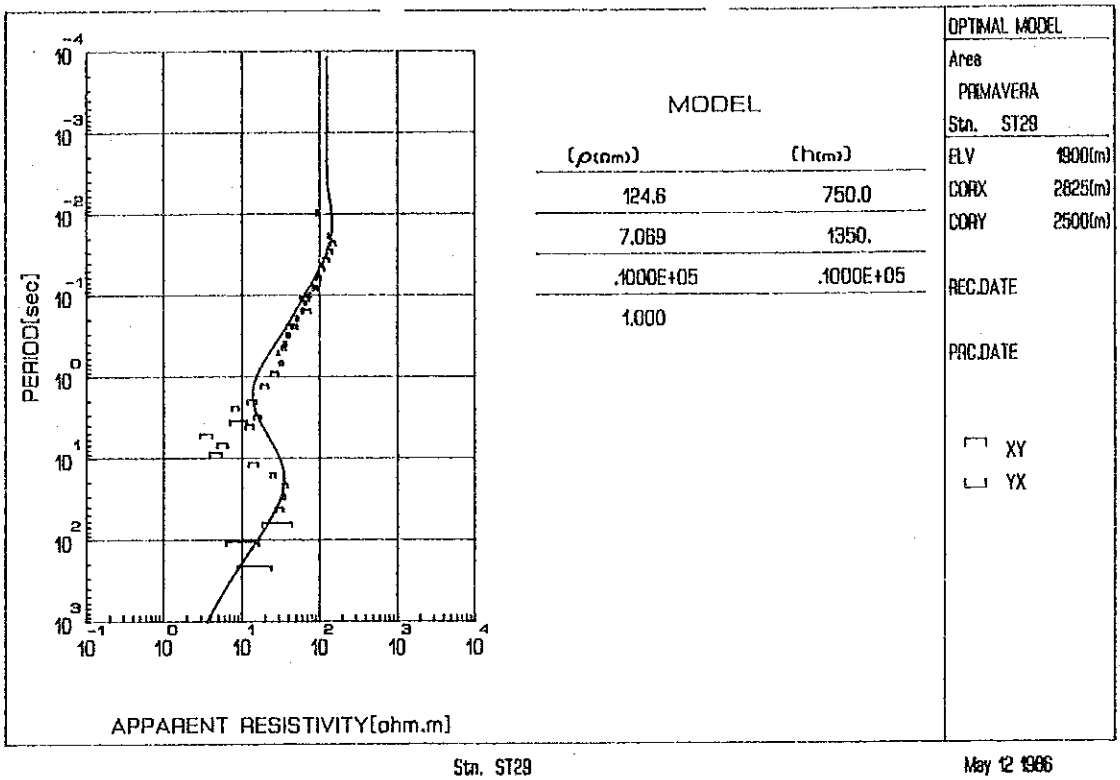
10.19	442.0
252.2	10.00
1454.	10.00
1,978	347.8
21.82	

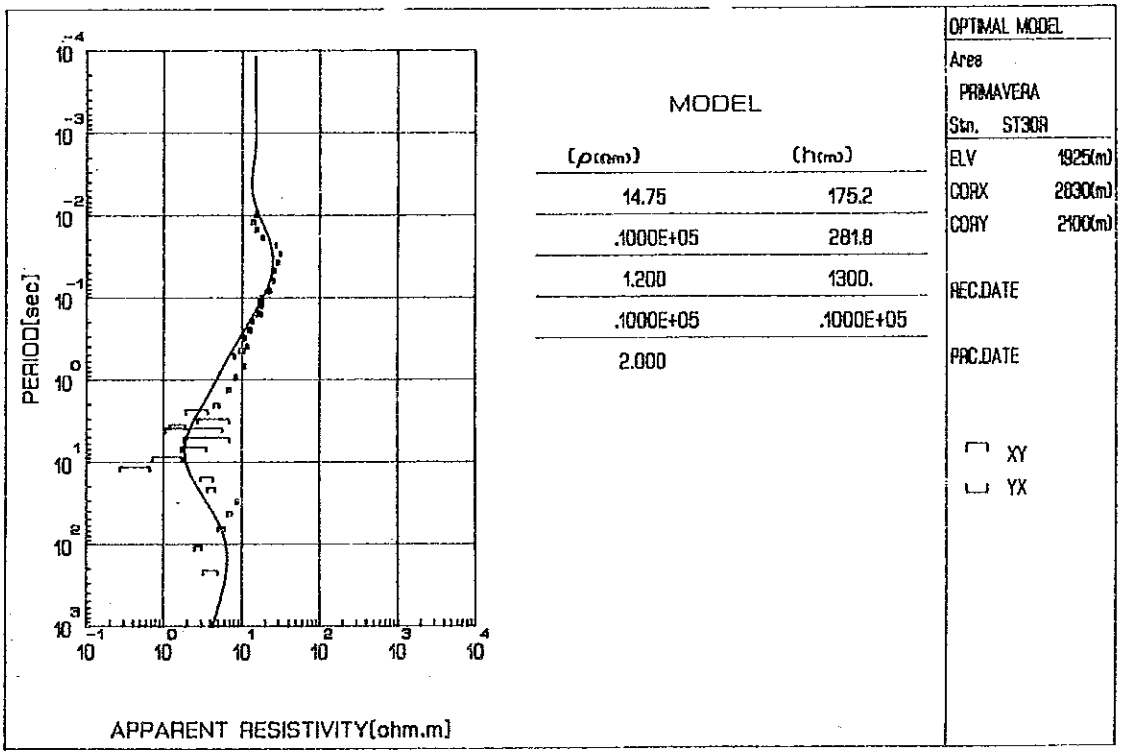
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST28
ELV 1887(m)
CORX 2560(m)
CORY 2265(m)
REC.DATE
PRC.DATE
XY
YX

Stn. ST28

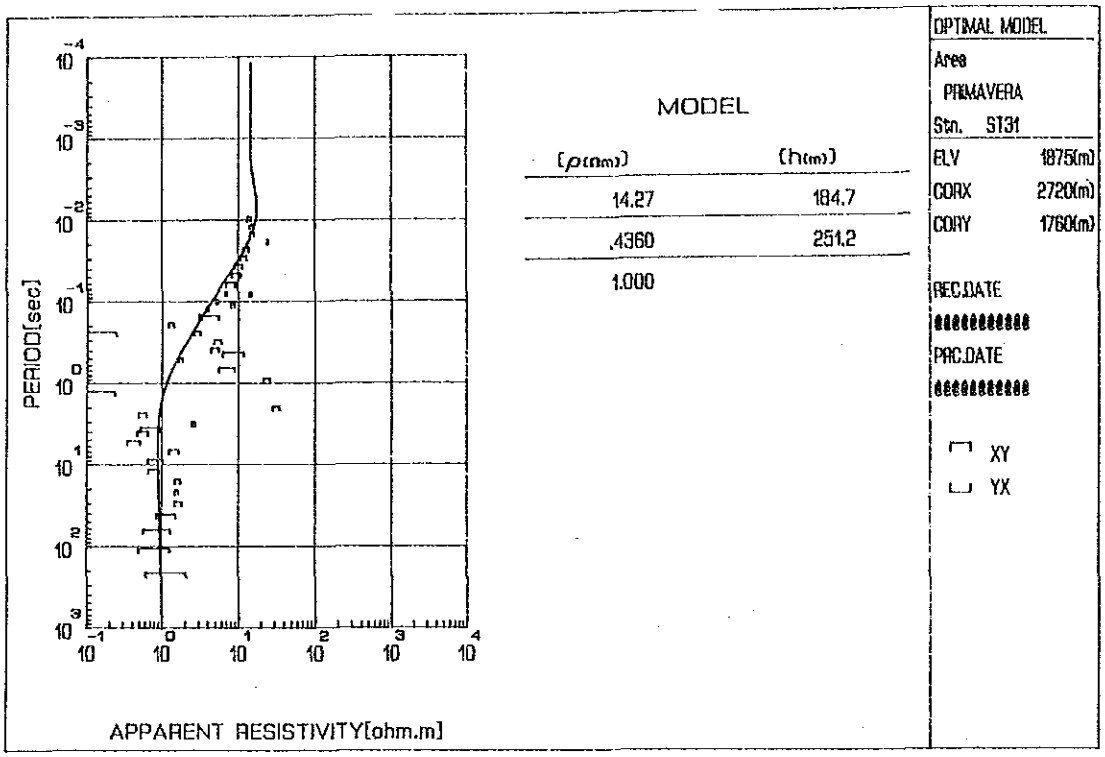
May 12 1986



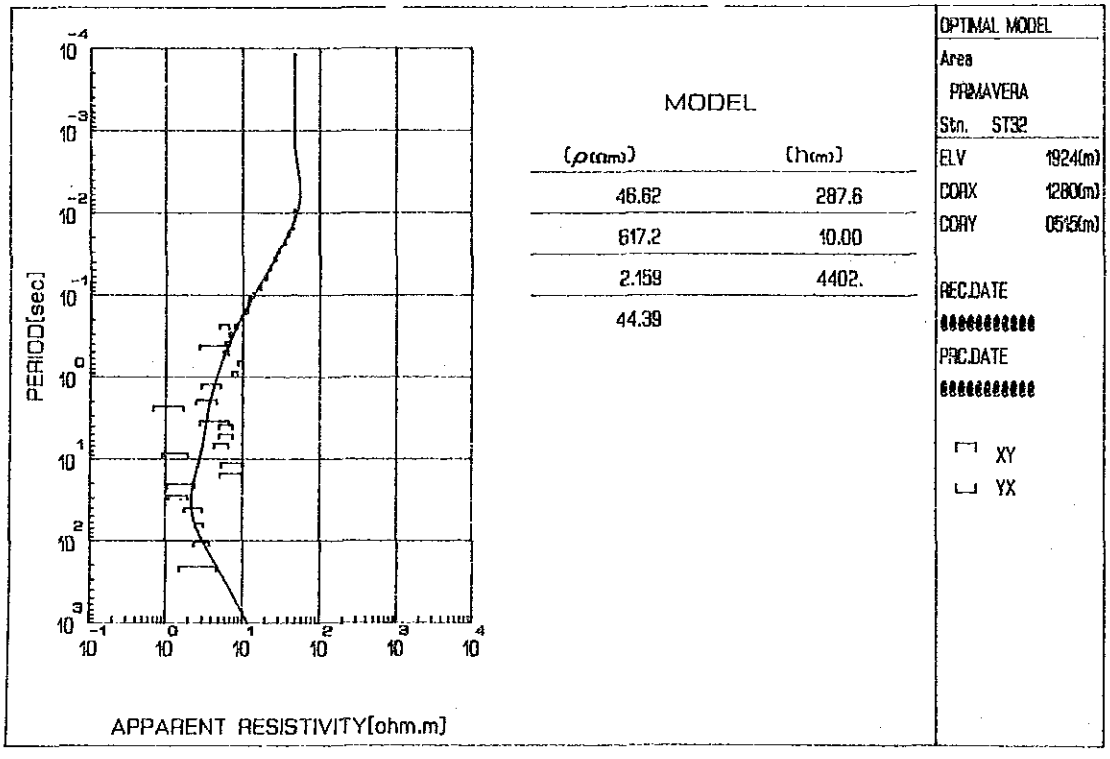
Stn. ST29 May 12 1986



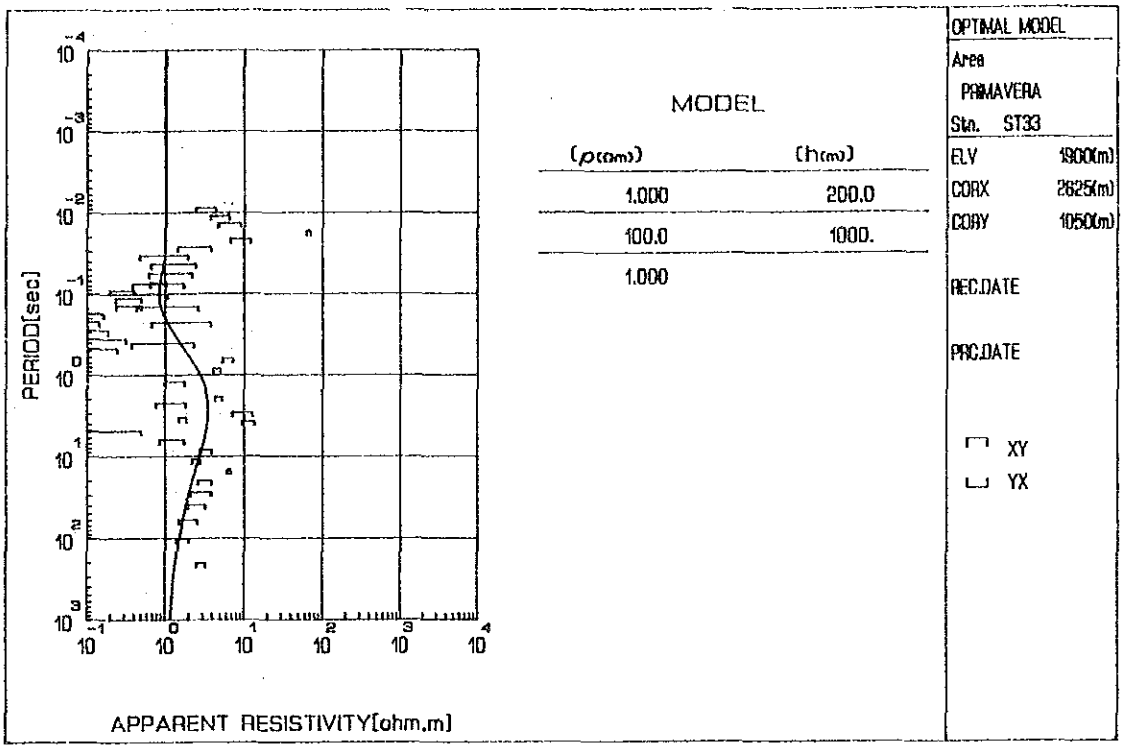
Stn. ST30 May 12 1986



Stn. ST31 May 12 1996



Stn. ST32 May 12 1996


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
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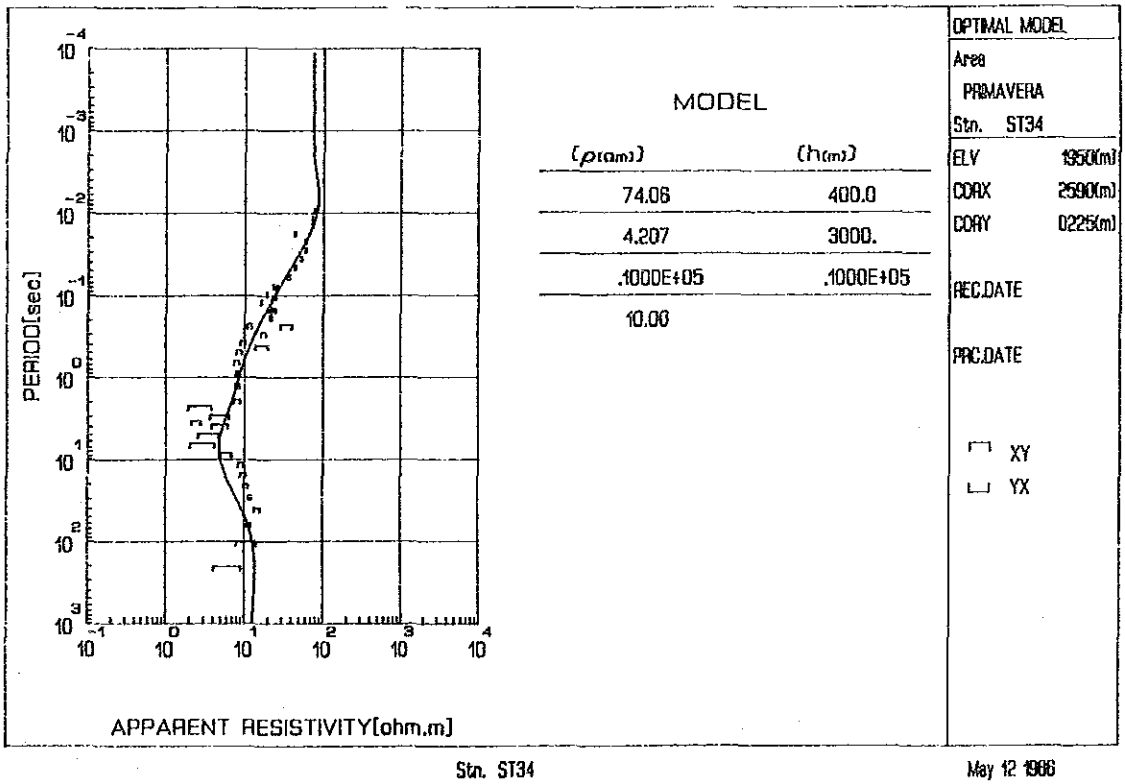
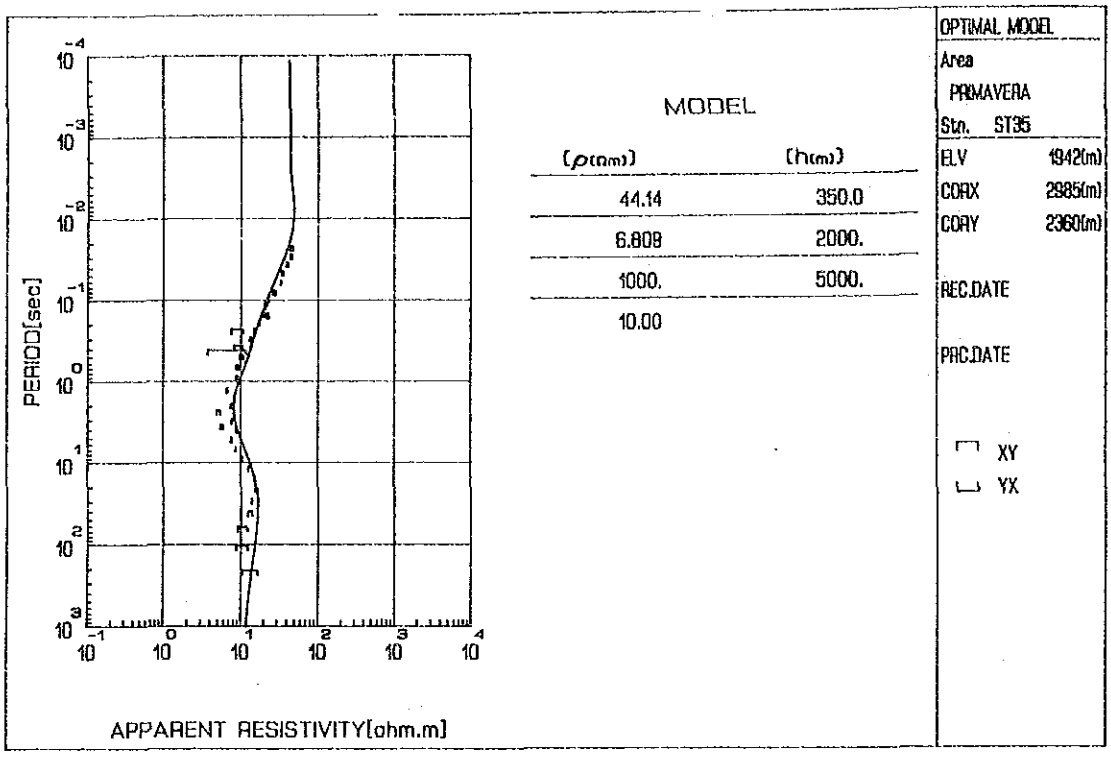
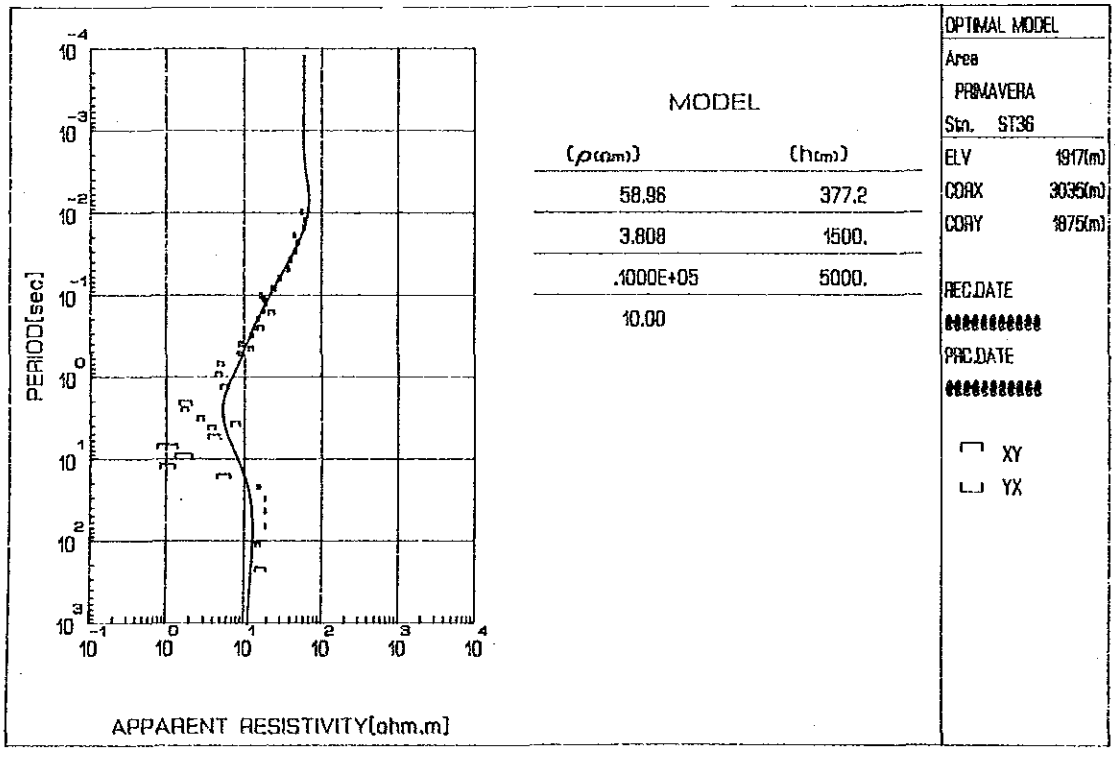
100.0 1000.
1.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST33
ELV 1900(m)
CORX 2625(m)
CORY 1050(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST33
May 12 1986

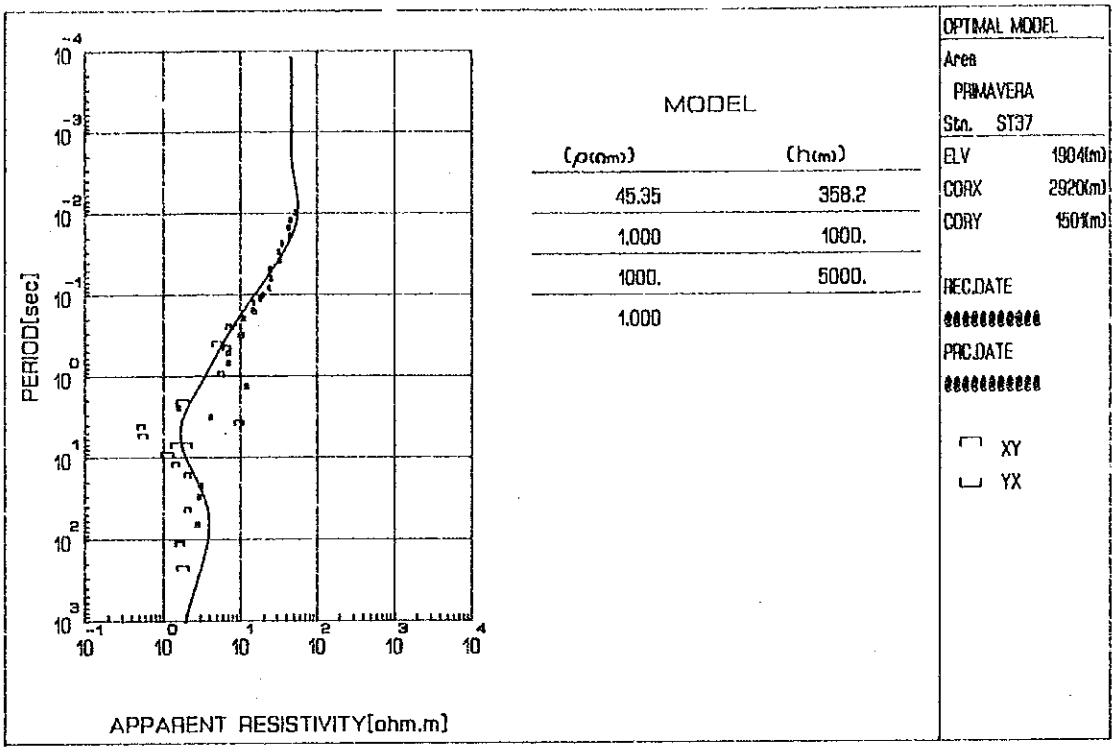

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
74.06 400.0
4.207 3000.
.1000E+05 .1000E+05
10.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST34
ELV 1950(m)
CORX 2590(m)
CORY 0225(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST34
May 12 1986



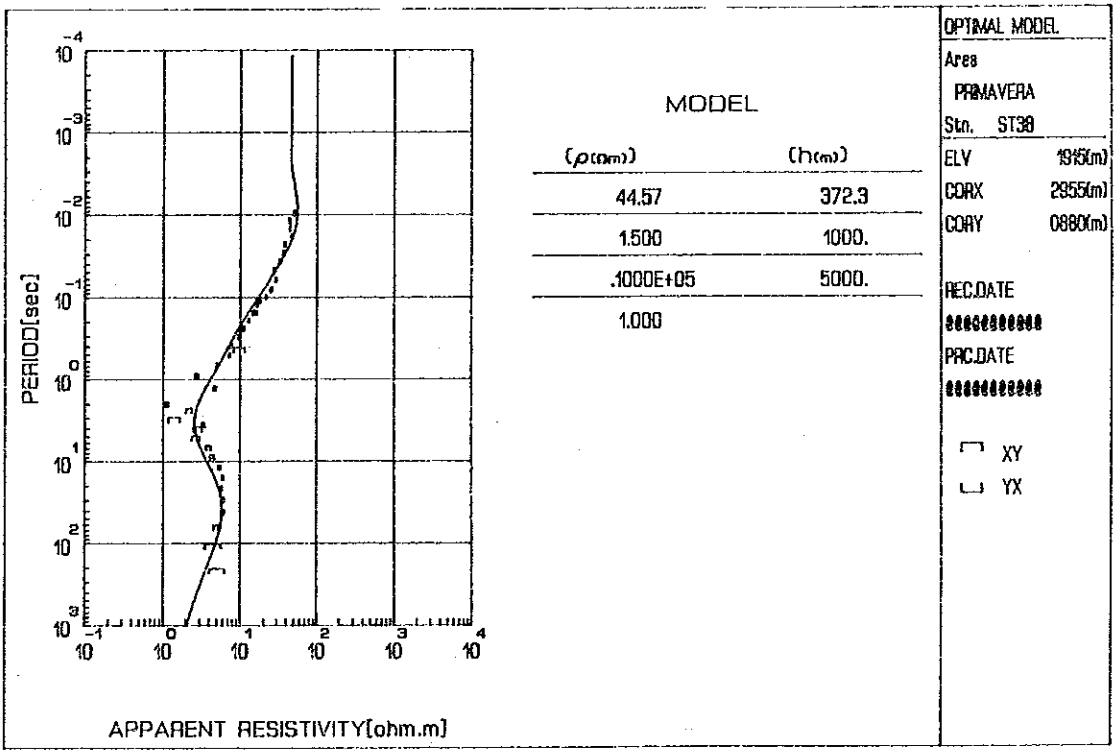
Stn. ST35 May 12 1986



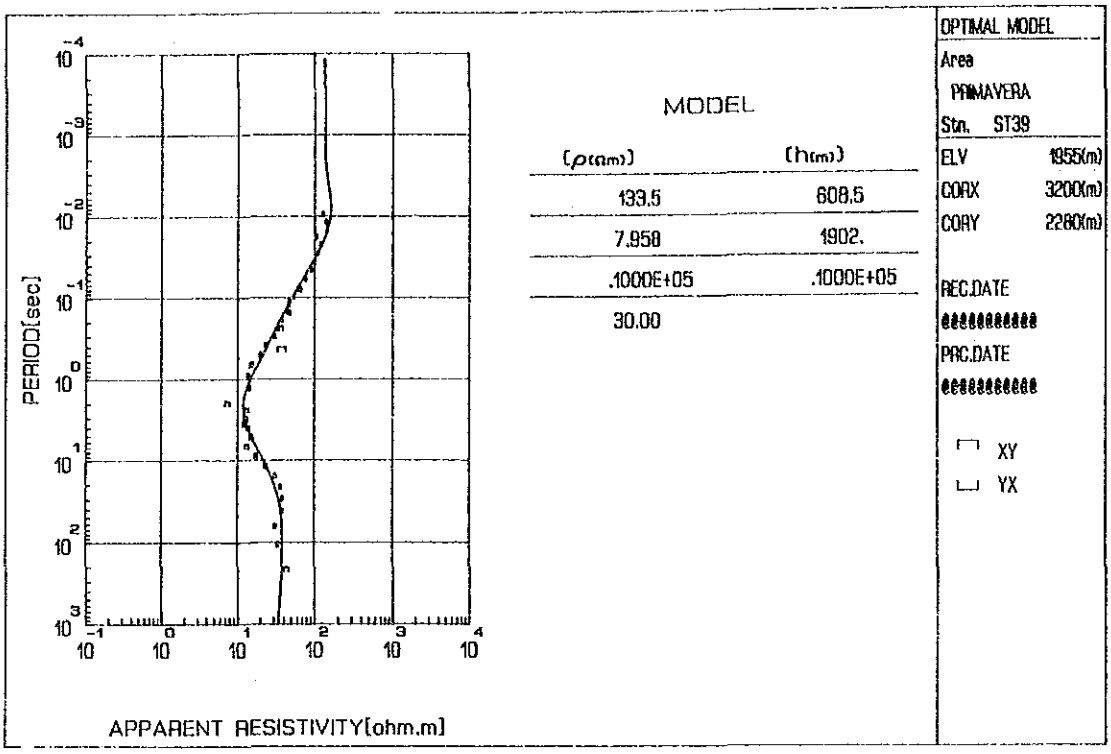
Stn. ST36 May 12 1986



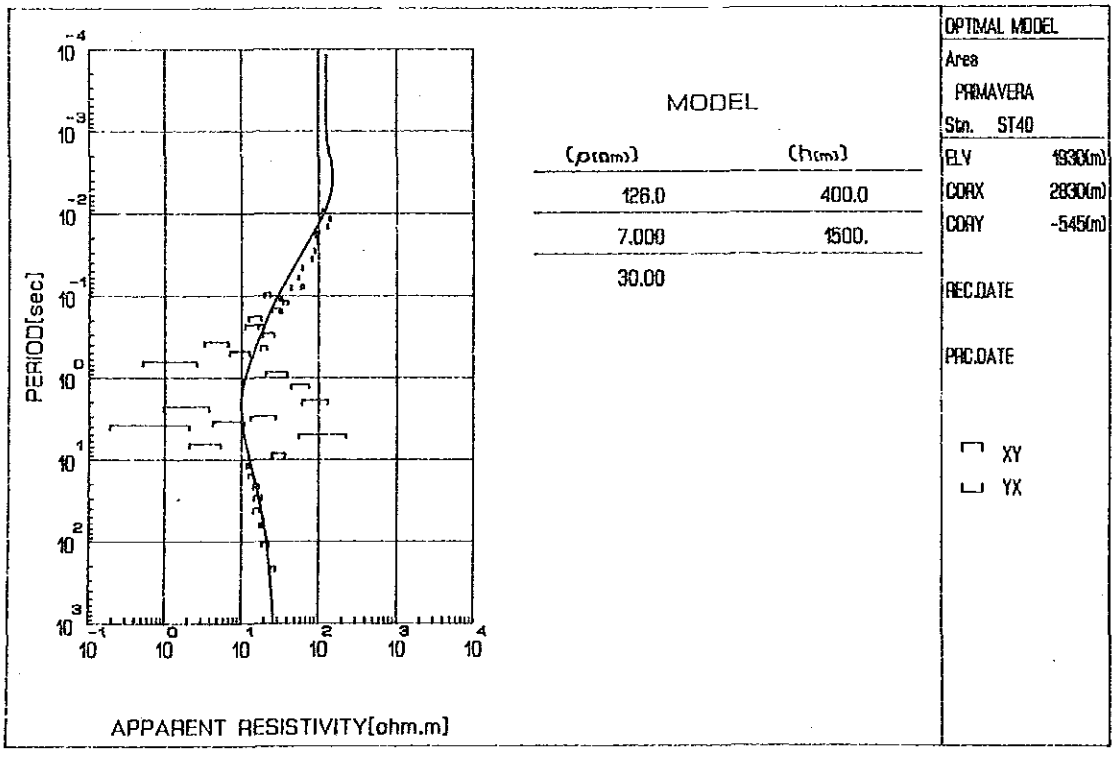
Stn. ST37 May 12 1986



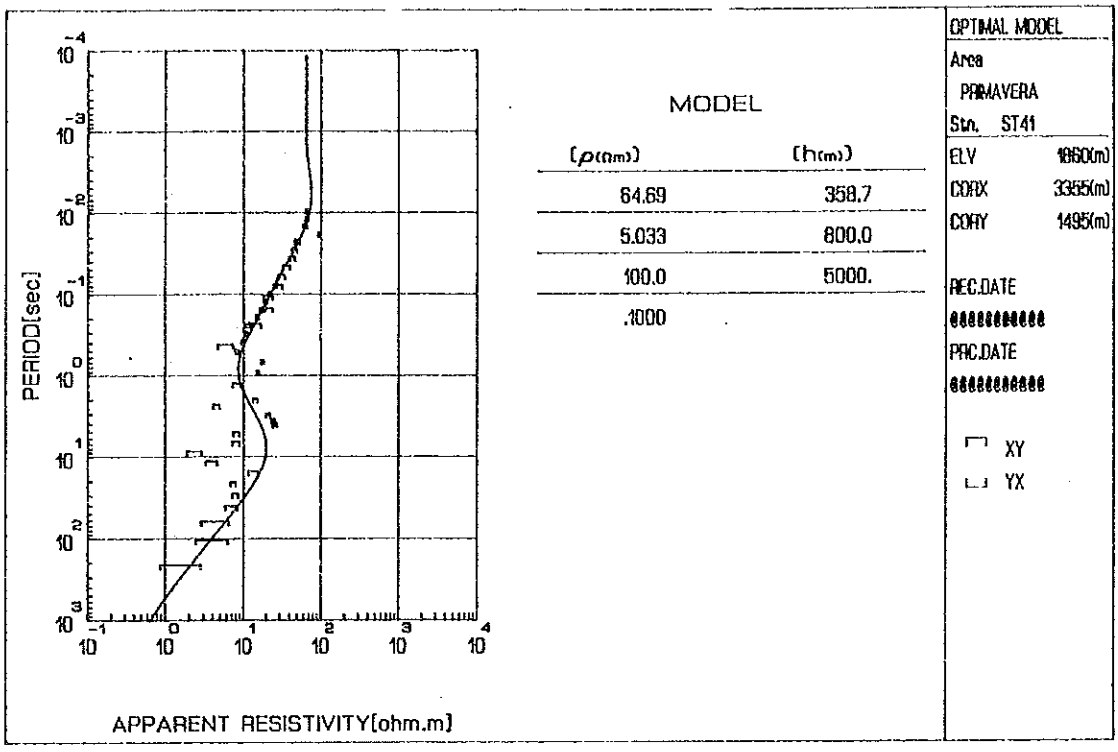
Stn. ST38 May 12 1986



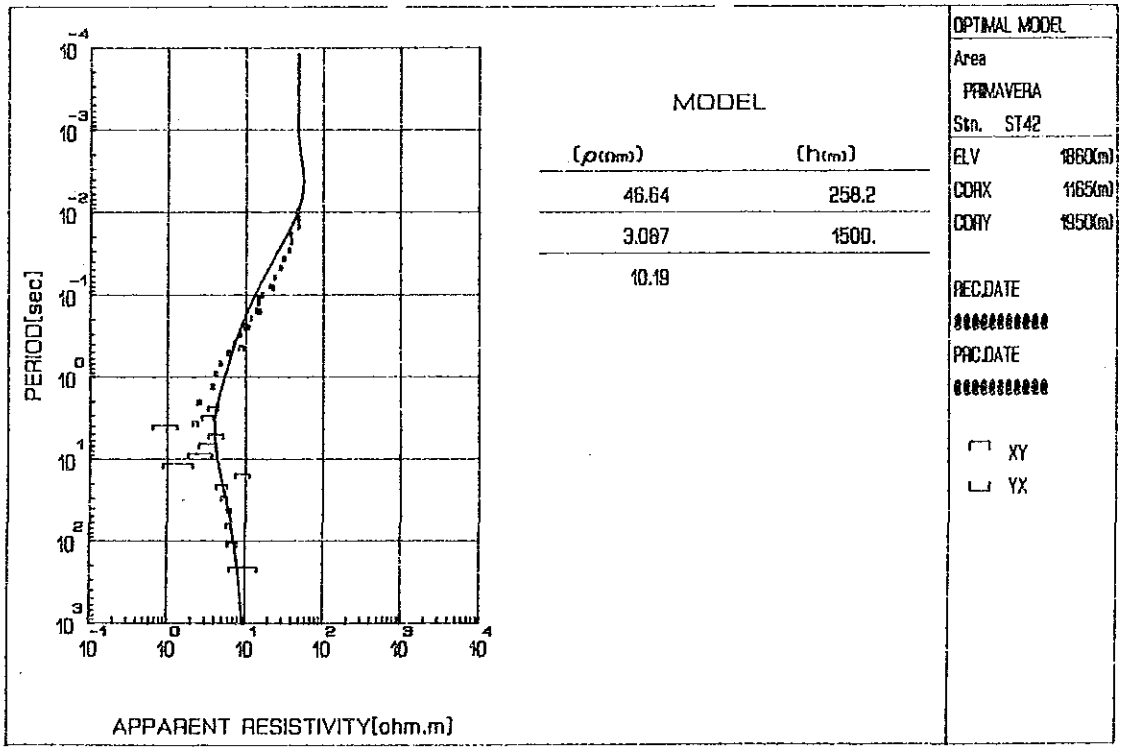
Stn. ST39 May 12 1986



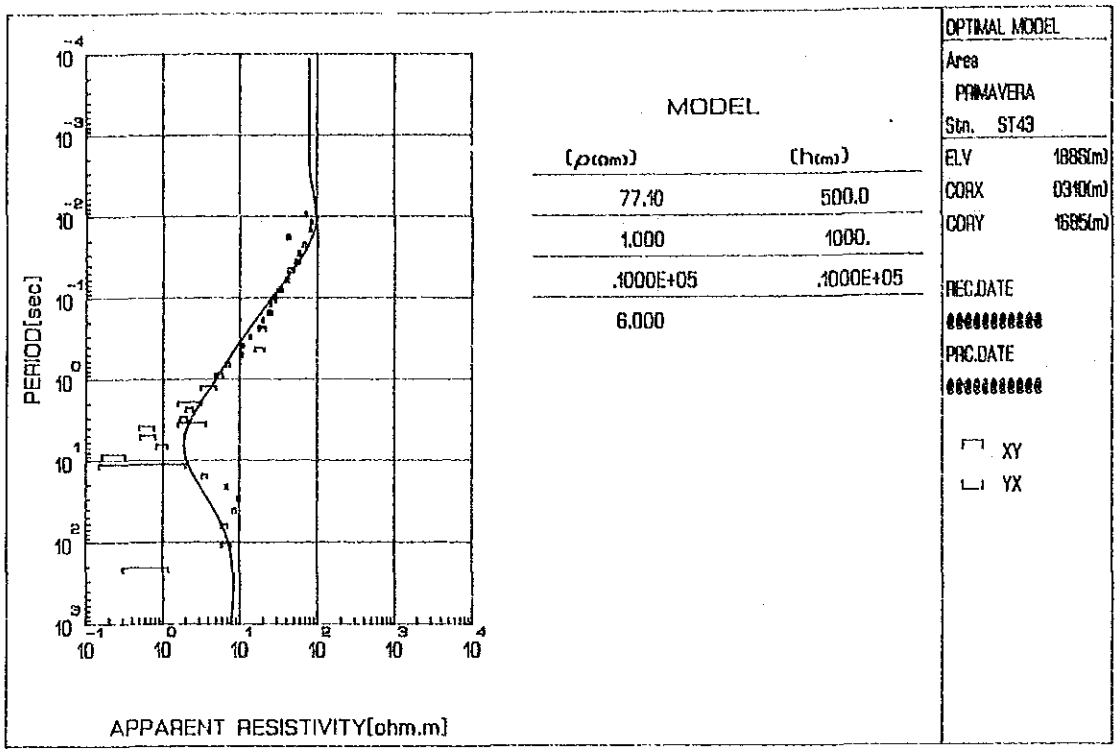
Stn. ST40 May 12 1986



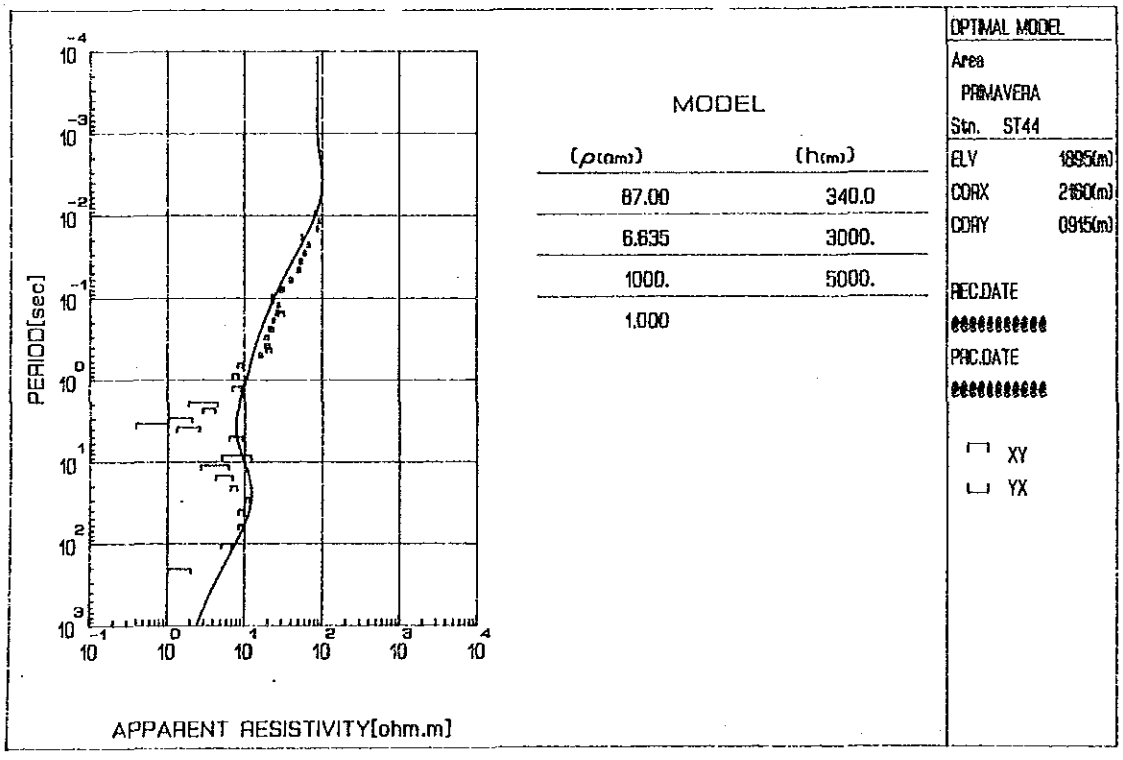
Stn. ST41 May 12 1986



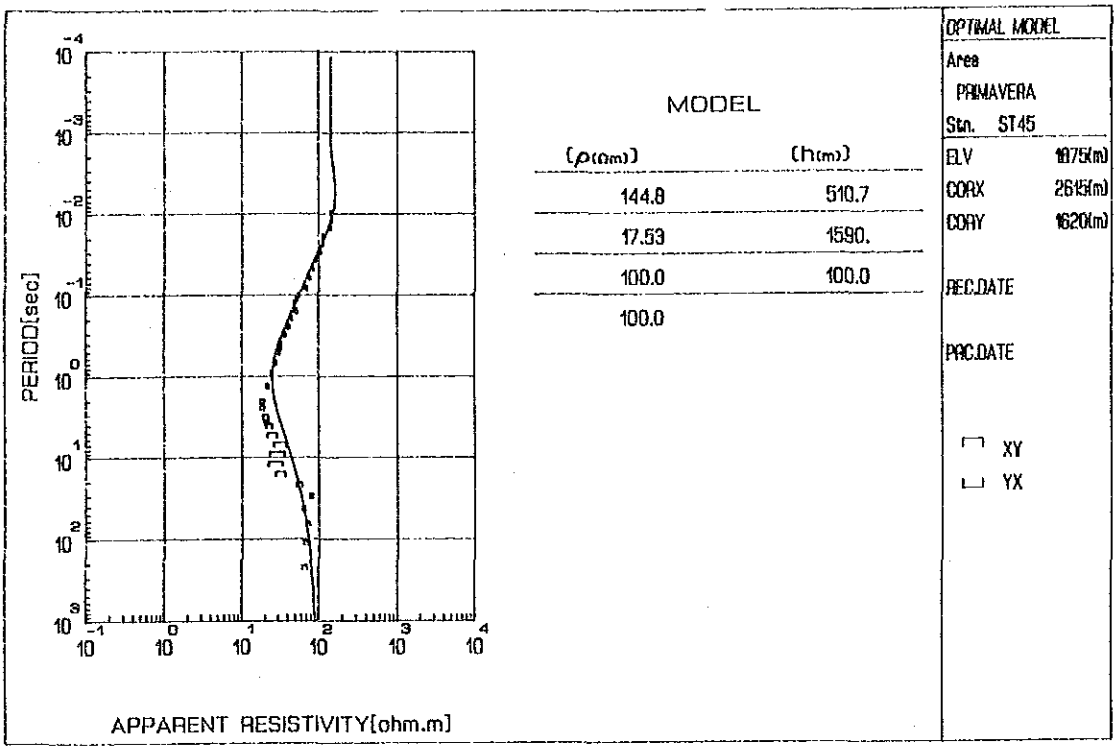
Stn. ST42 May 12 1986



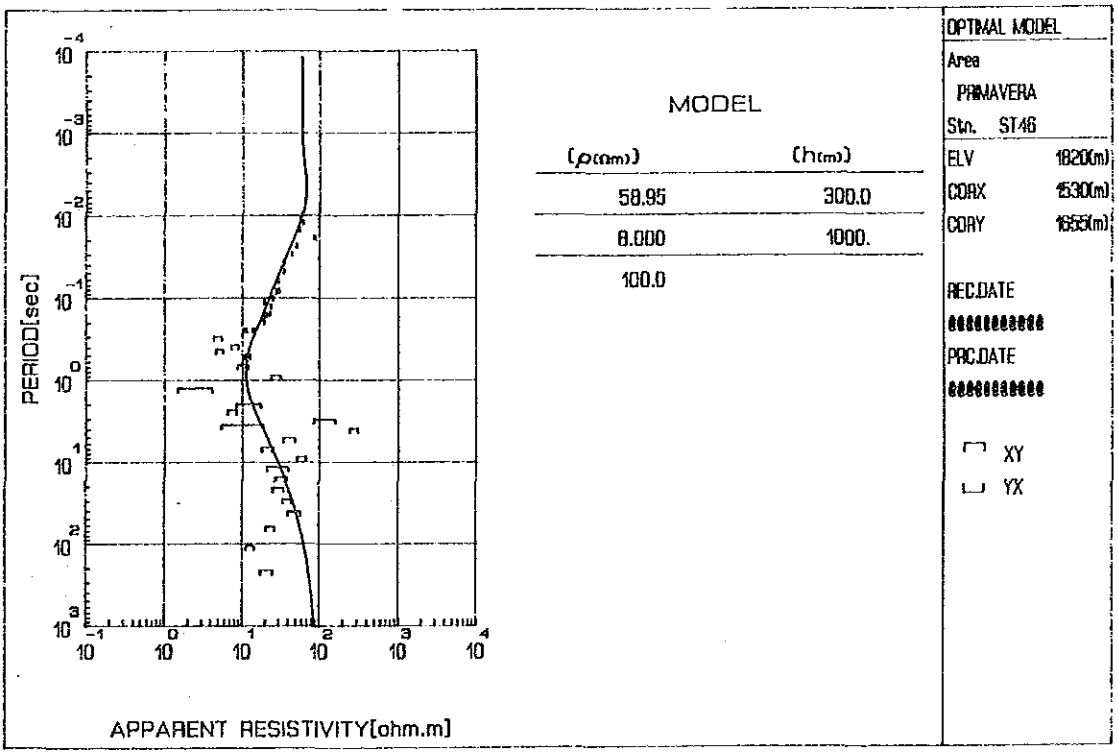
Stn. ST43 May 12 1986



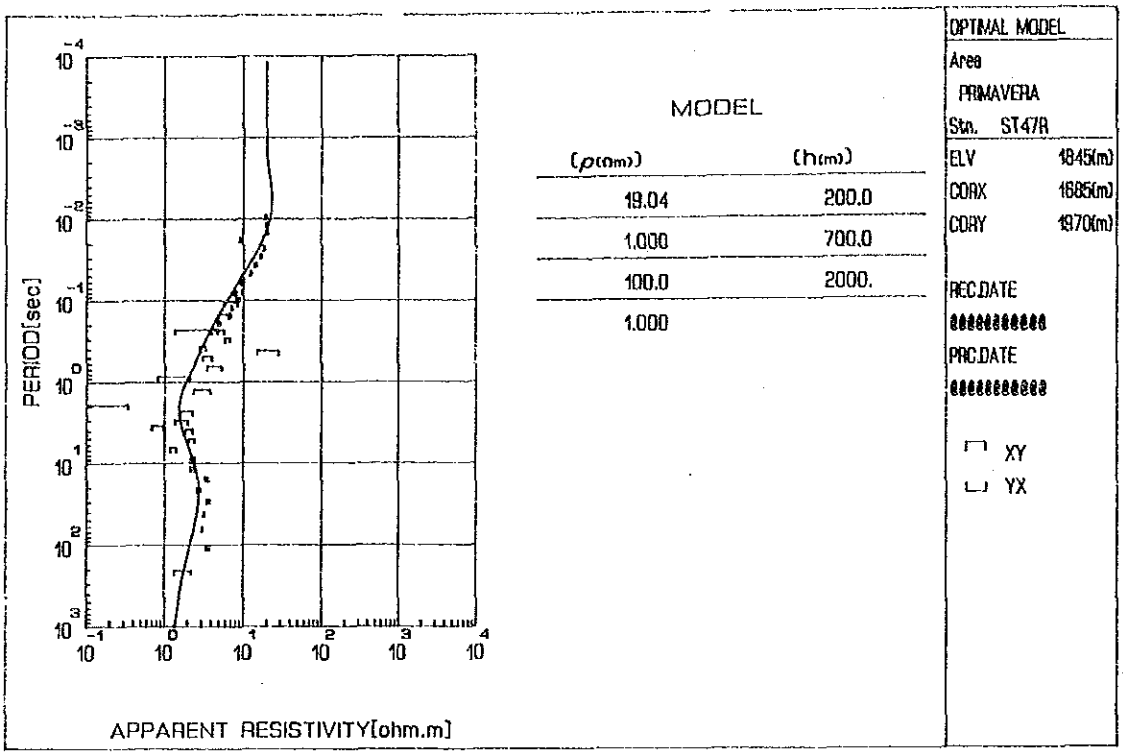
Stn. ST44 May 12 1986



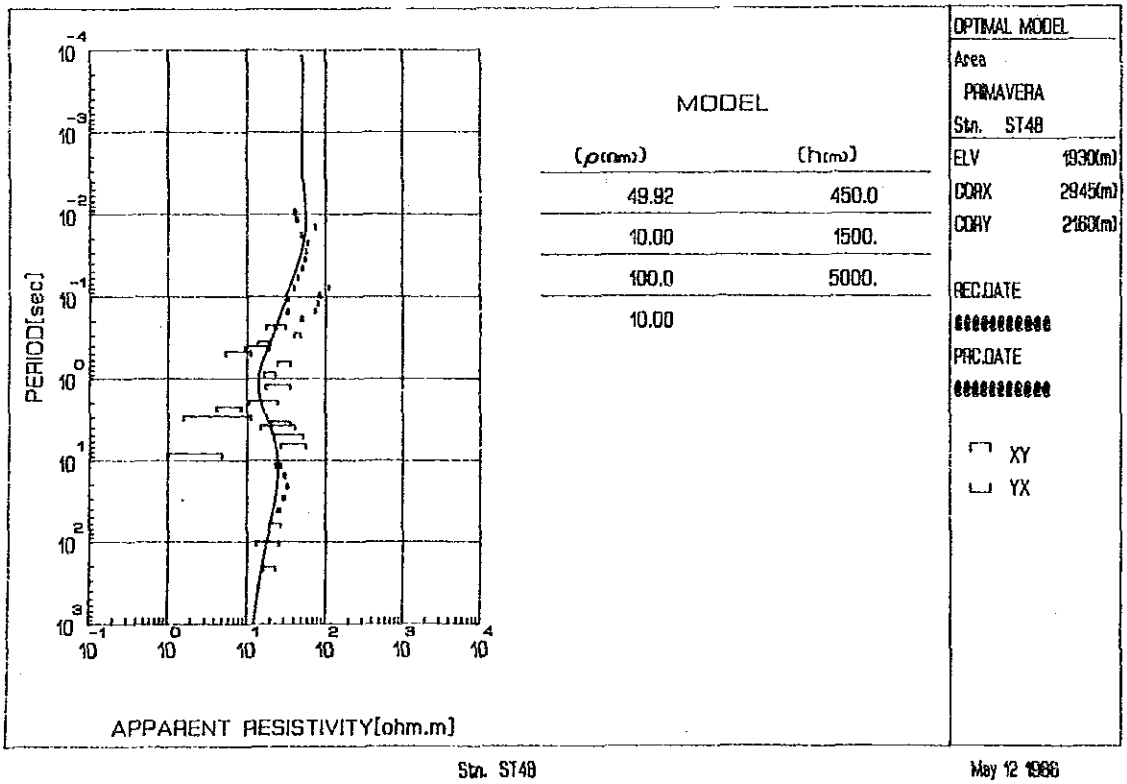
Stn. ST45 May 12 1996



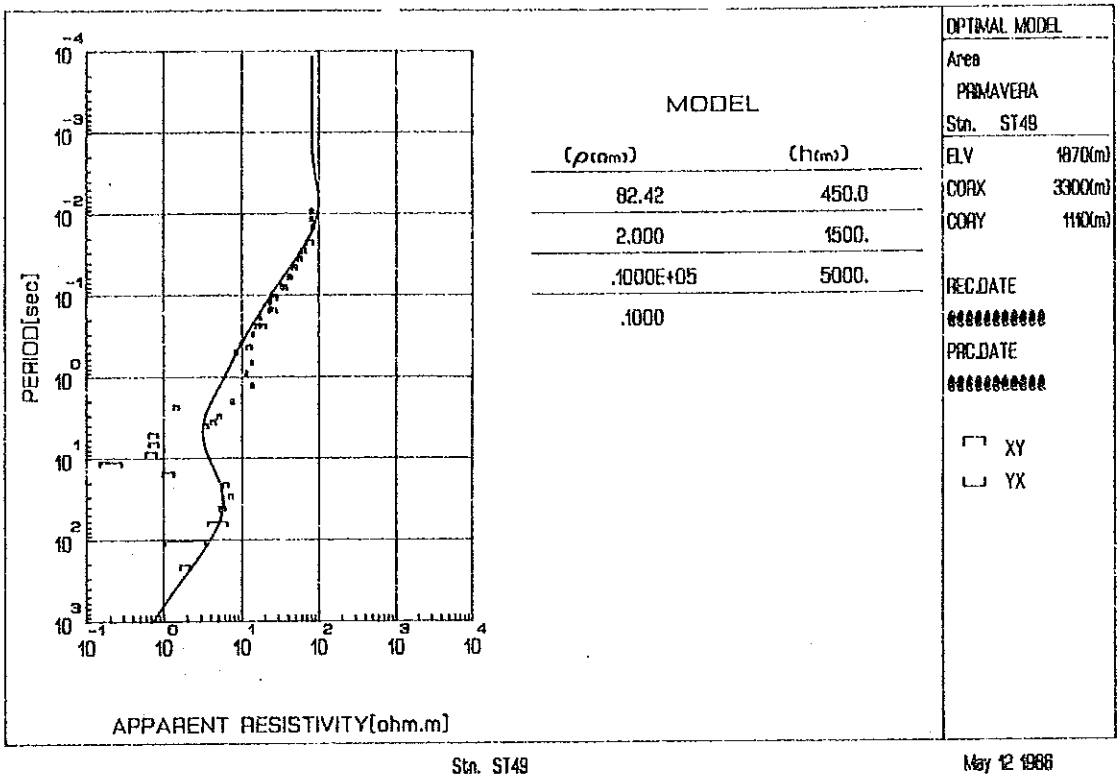
Stn. ST46 May 12 1996



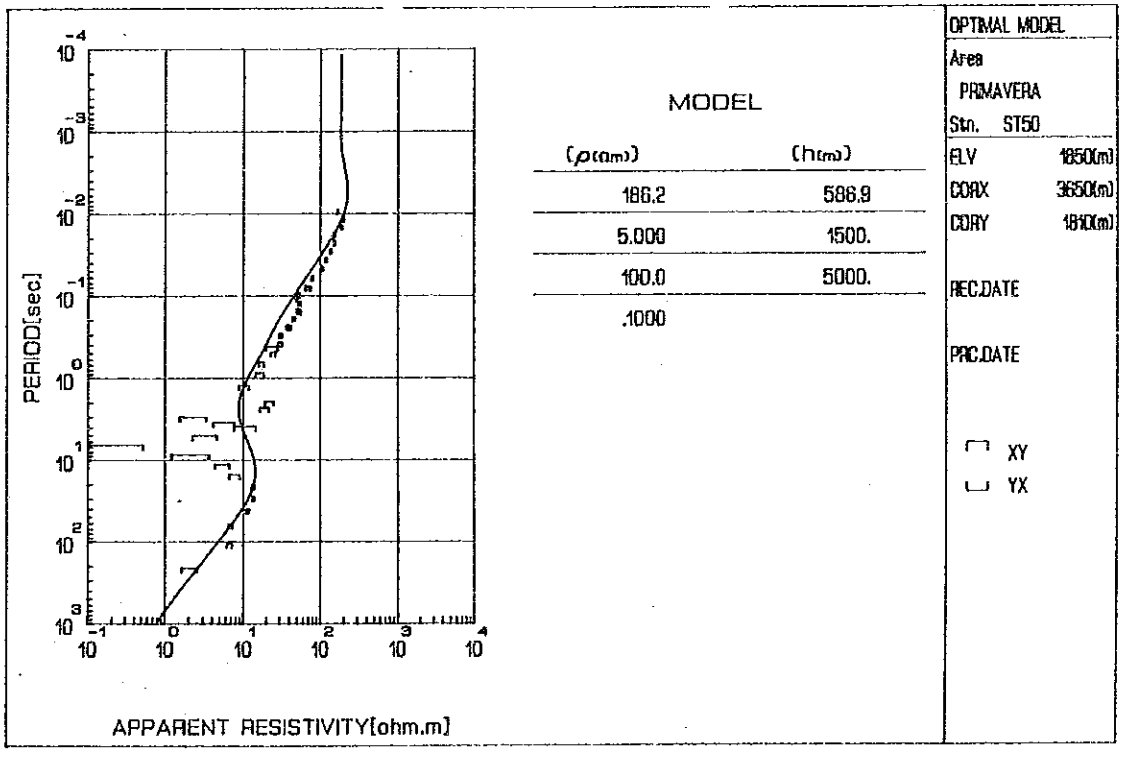
Stn. ST47 May 12 1986



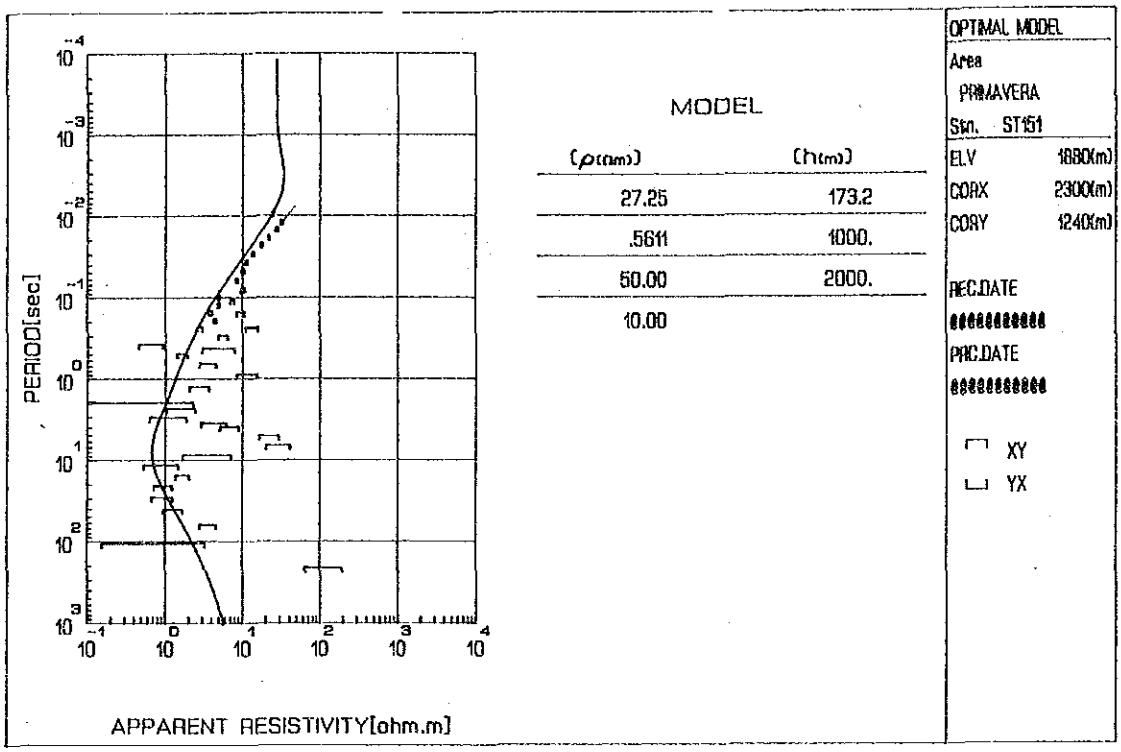
Stn. ST48 May 12 1986



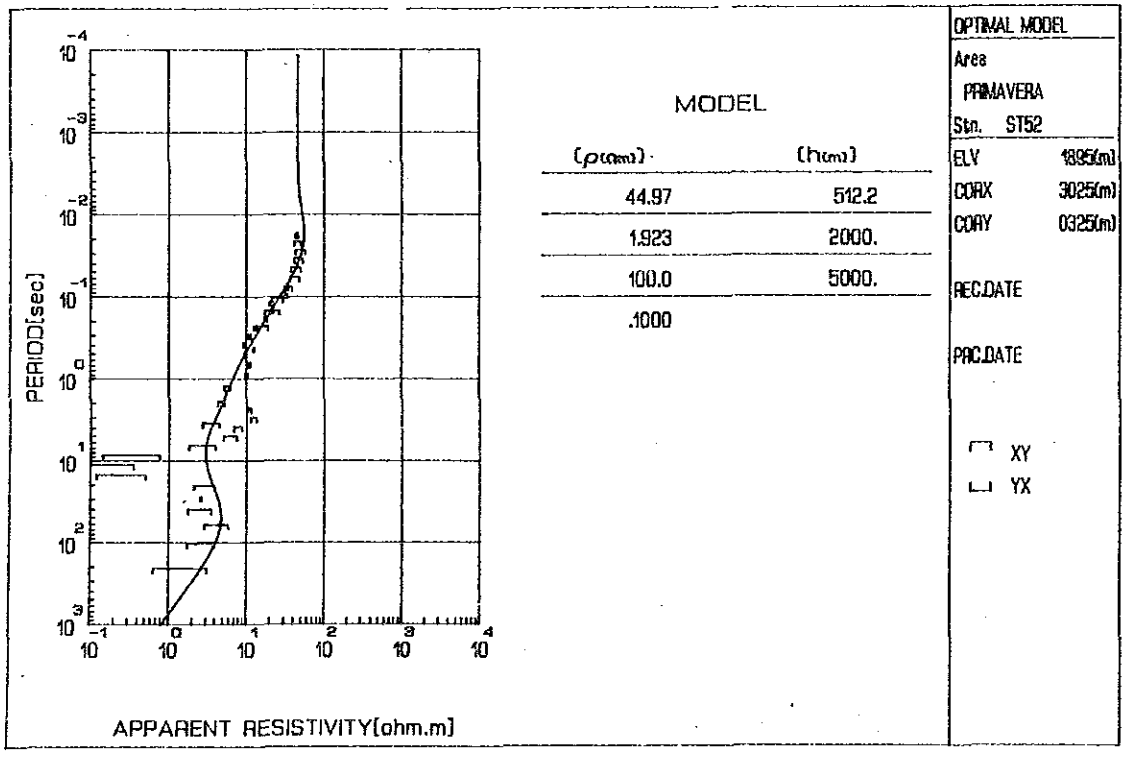
Stn. ST49 May 12 1986



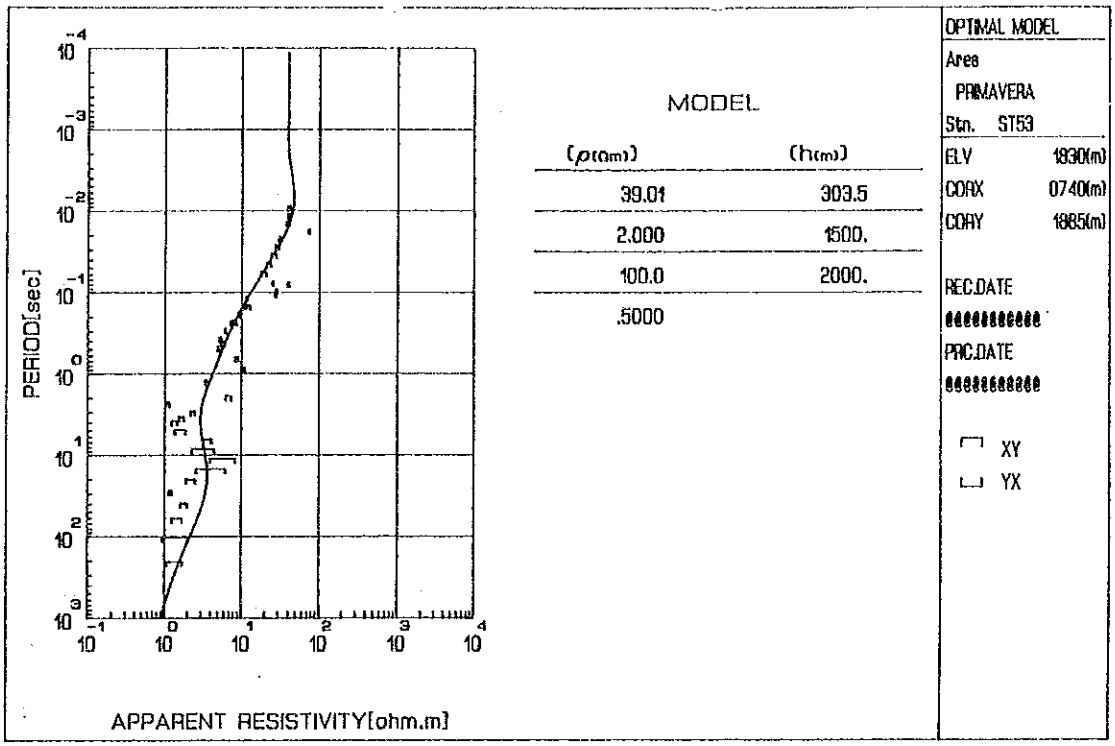
Stn. ST50 May 12 1986



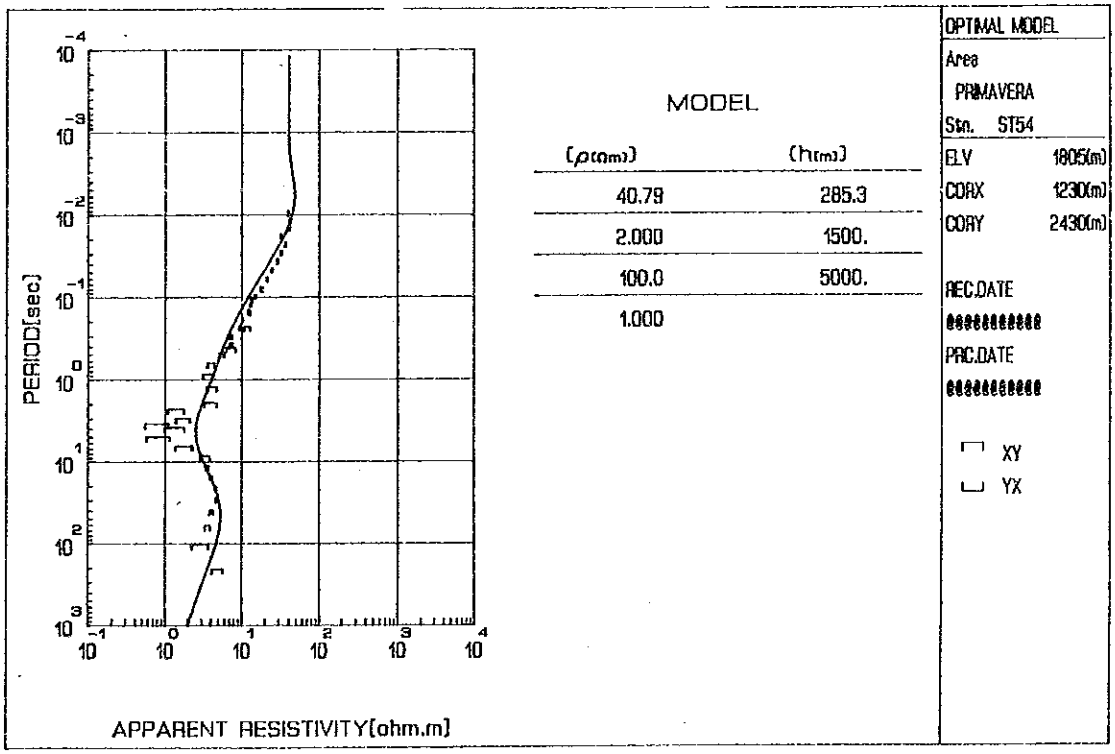
Stn. ST15 May 12 1986



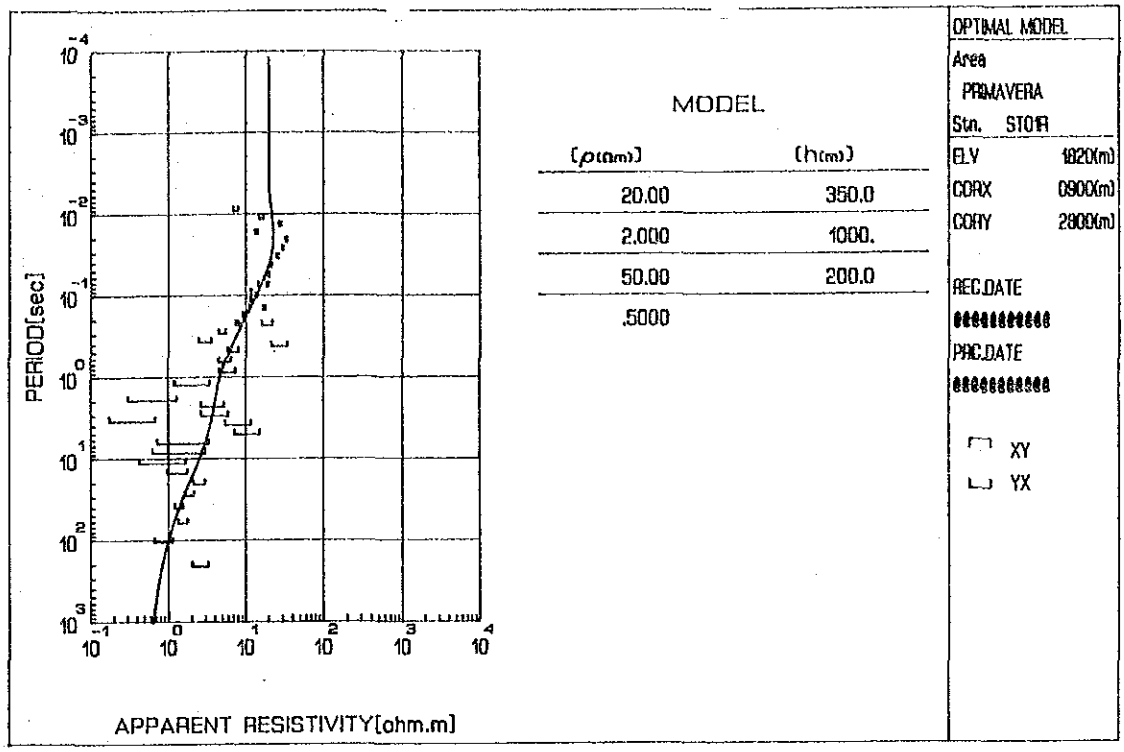
Stn. ST52 May 12 1986



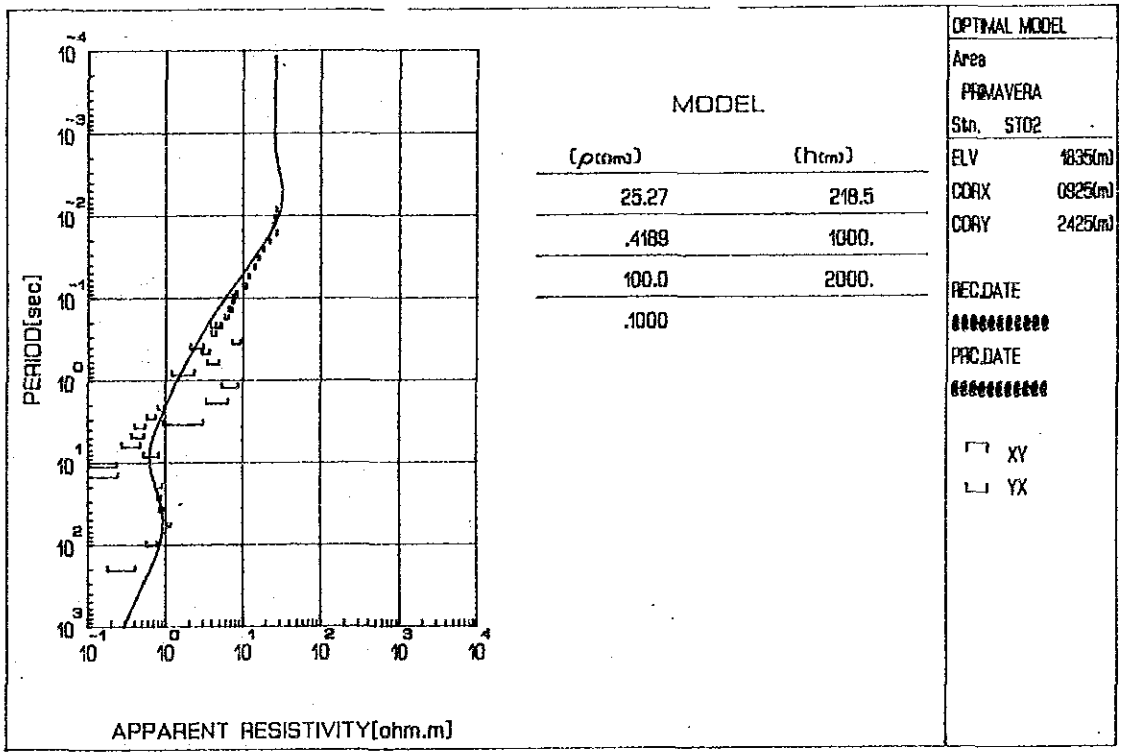
Stn. ST53 May 12 1986



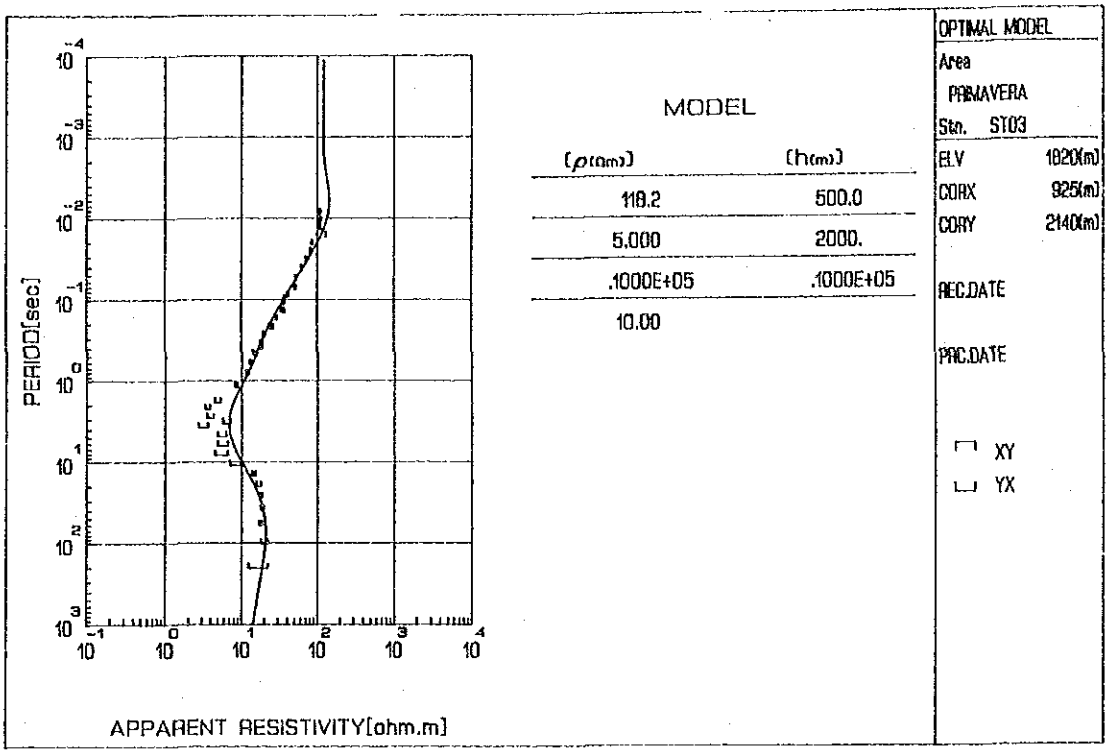
Stn. ST54 May 12 1986



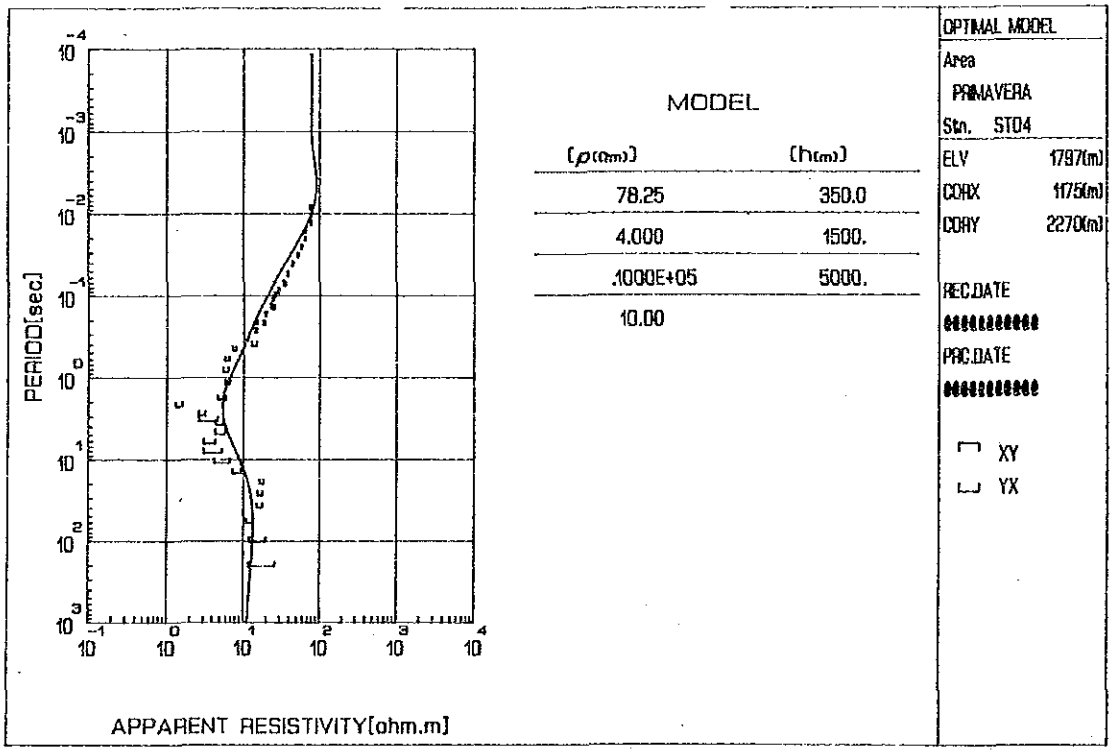
Stn. ST01 May 12 1986



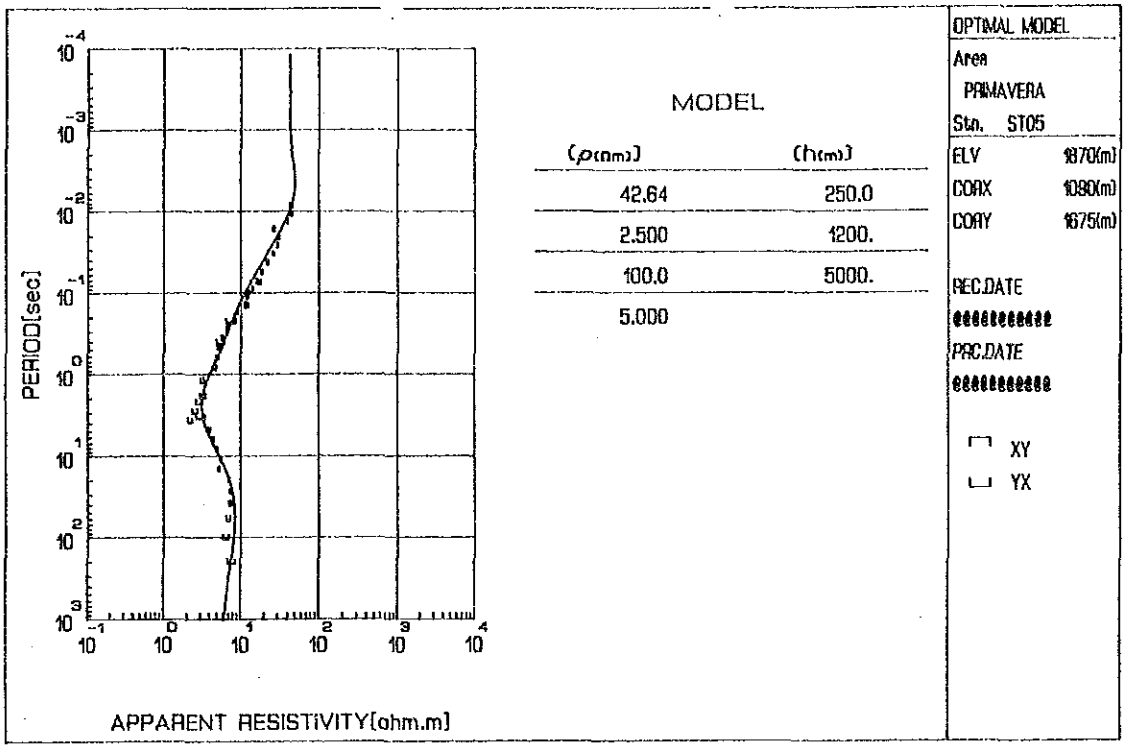
Stn. ST02 May 12 1986



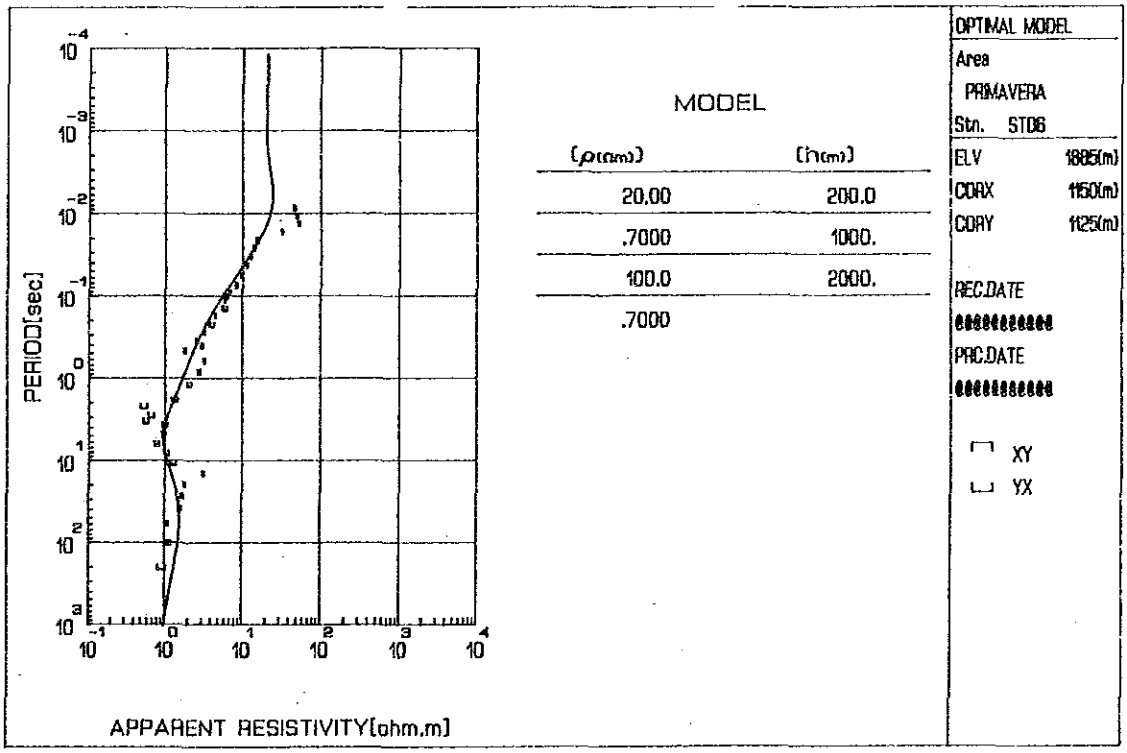
Stn. ST03 May 12 1996



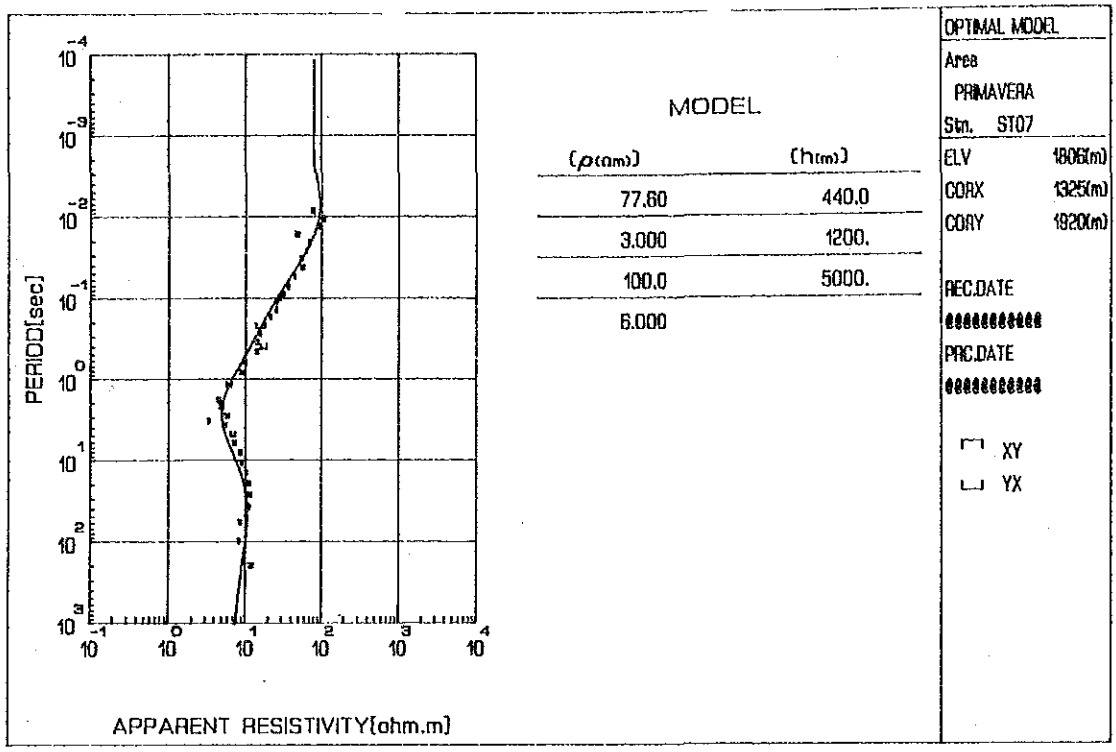
Stn. ST04 May 12 1996



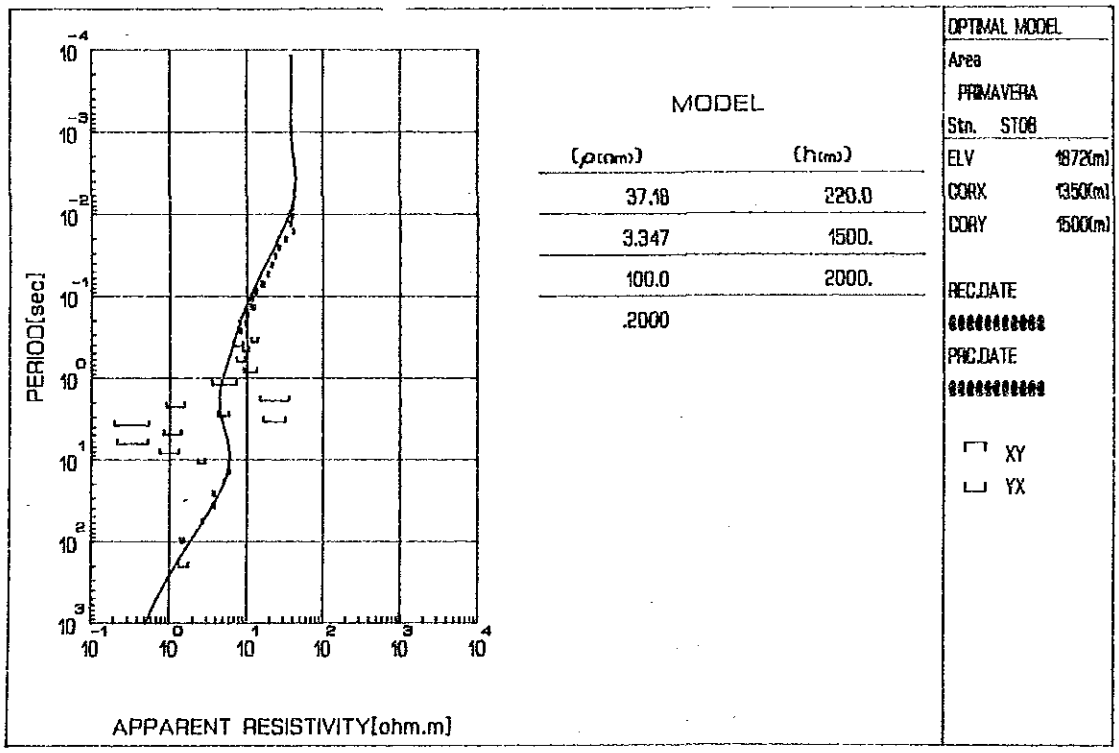
Stn. ST05 May 12 1986



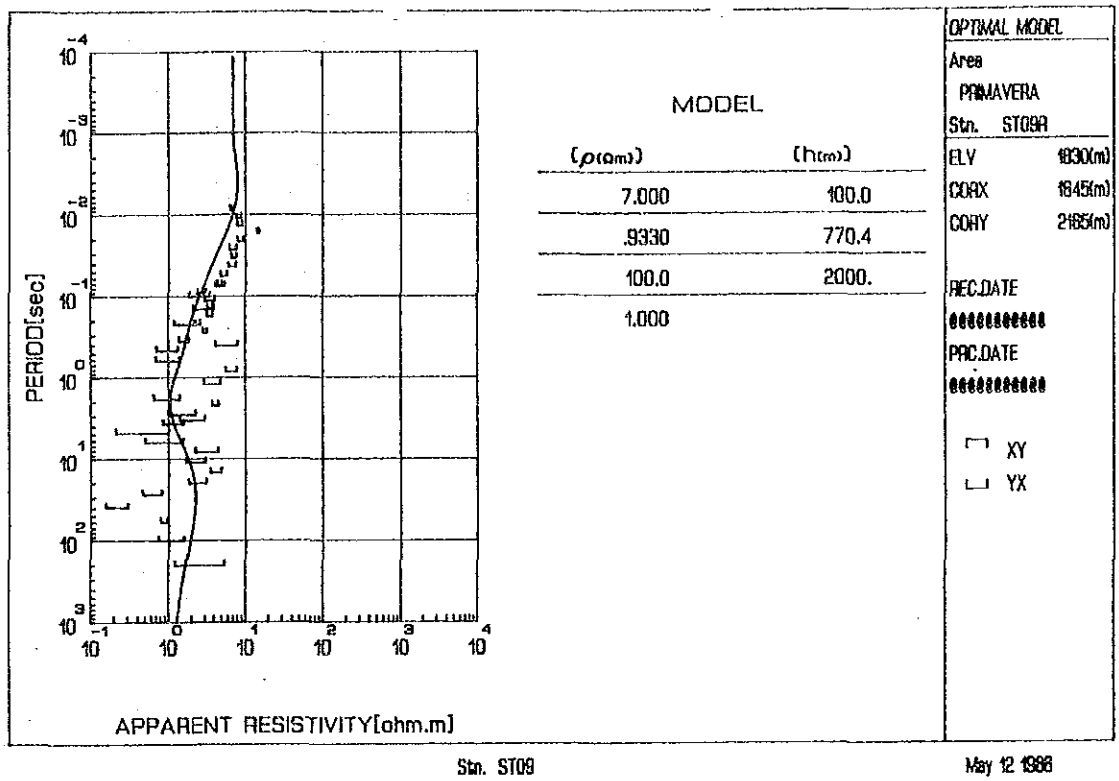
Stn. ST06 May 12 1986



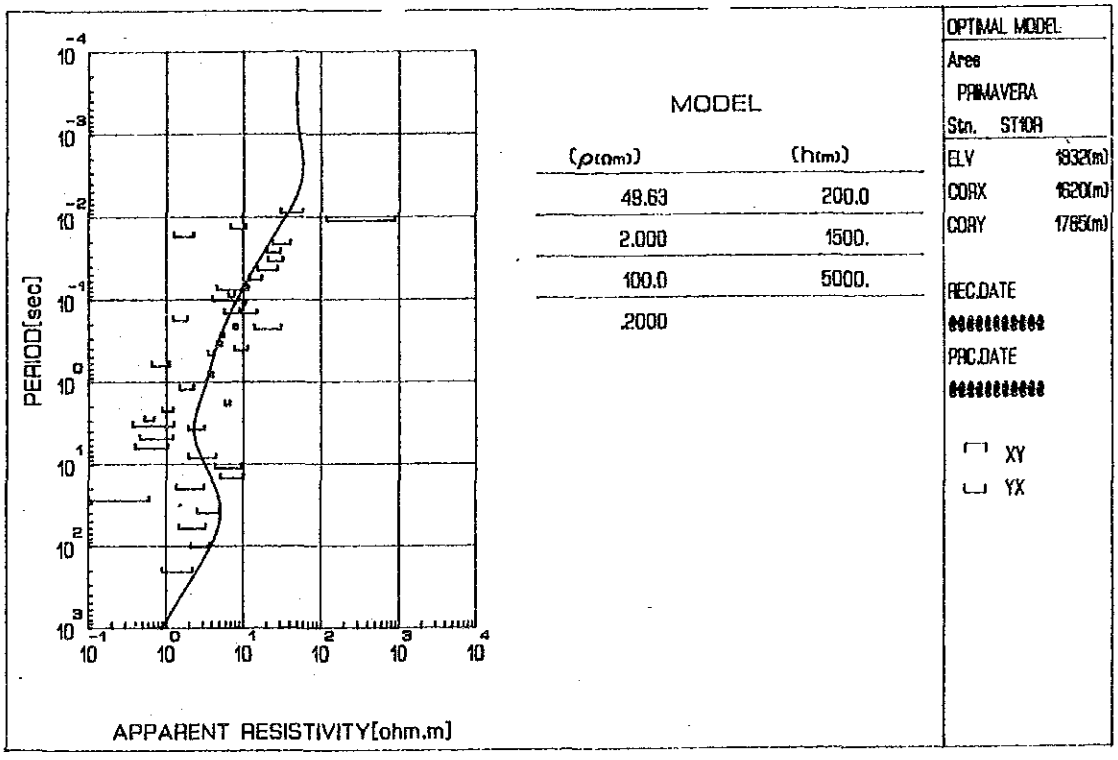
Stn. ST07 May 12 1986



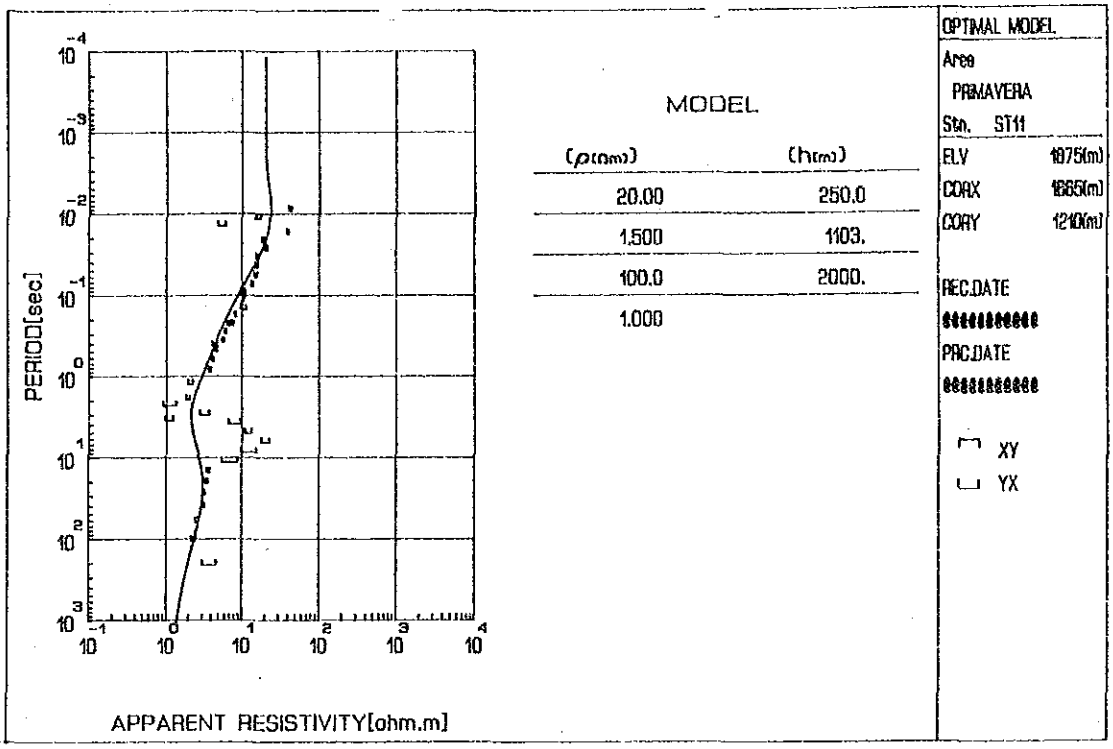
Stn. ST08 May 12 1986



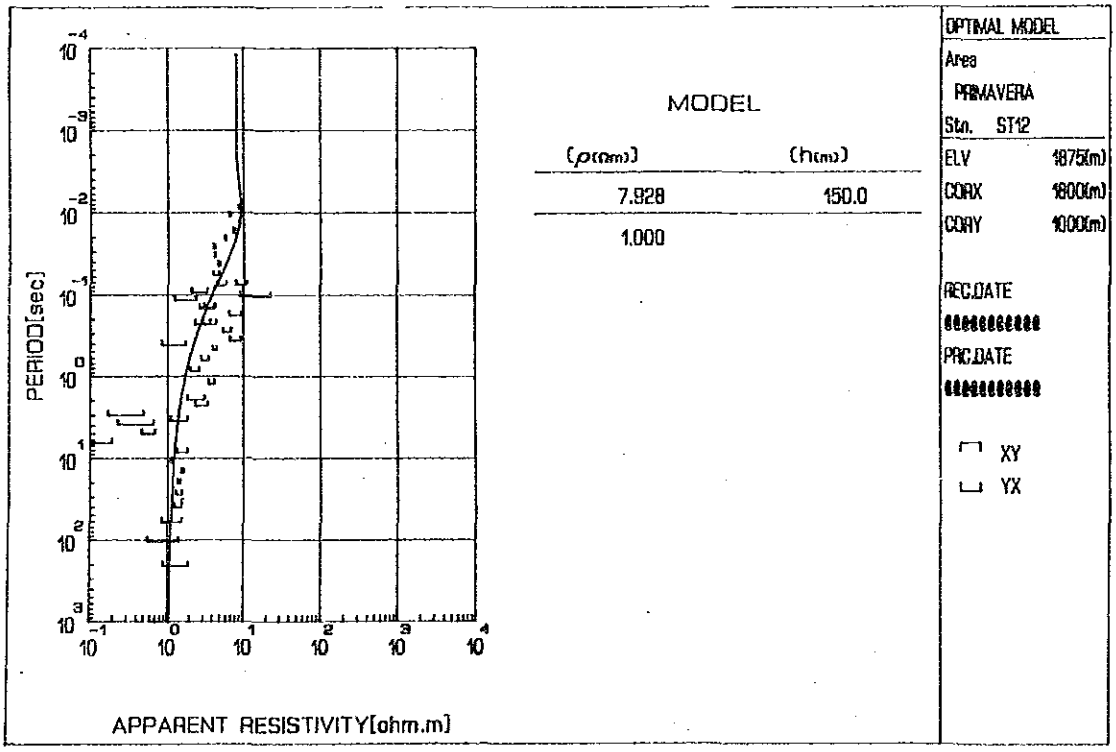
Stn. ST09 May 12 1988



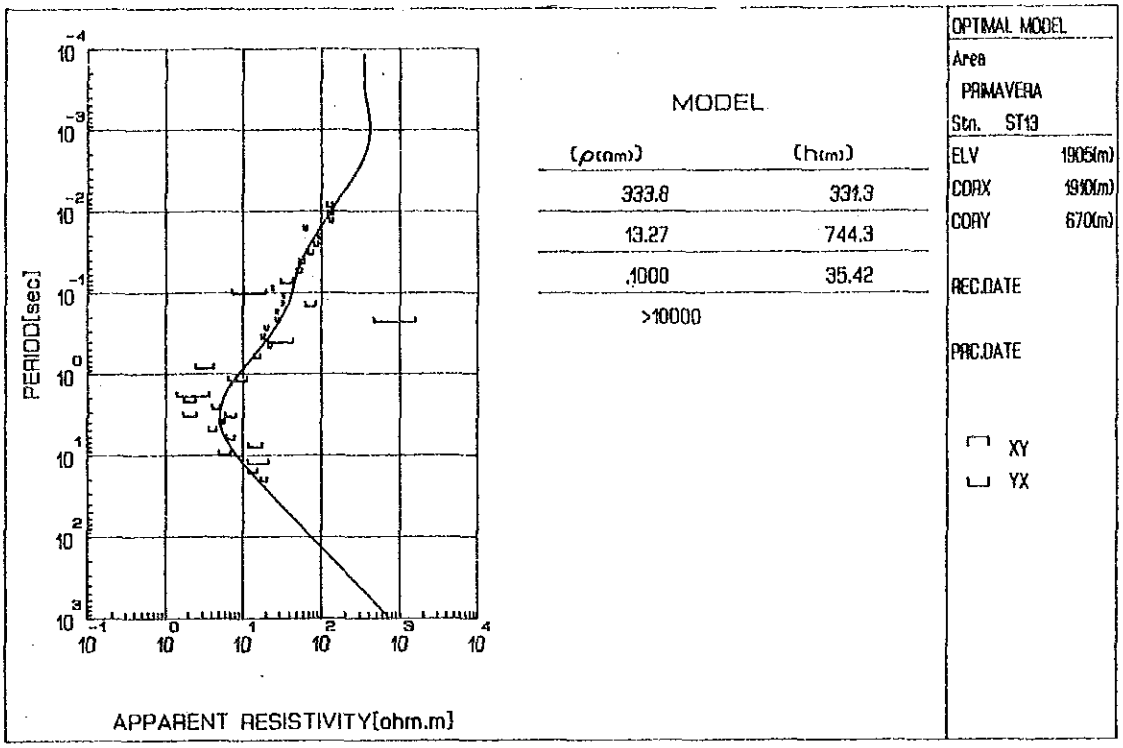
Stn. ST10 May 12 1988



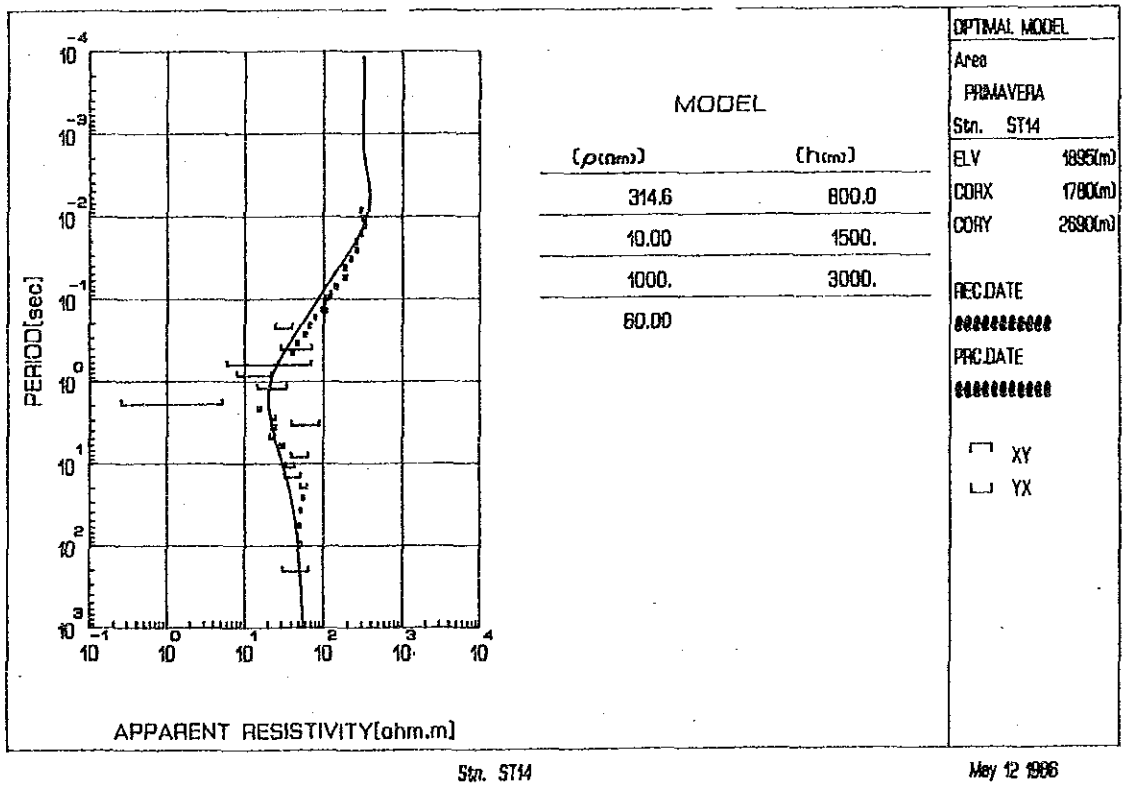
Stn. ST11 May 12 1988



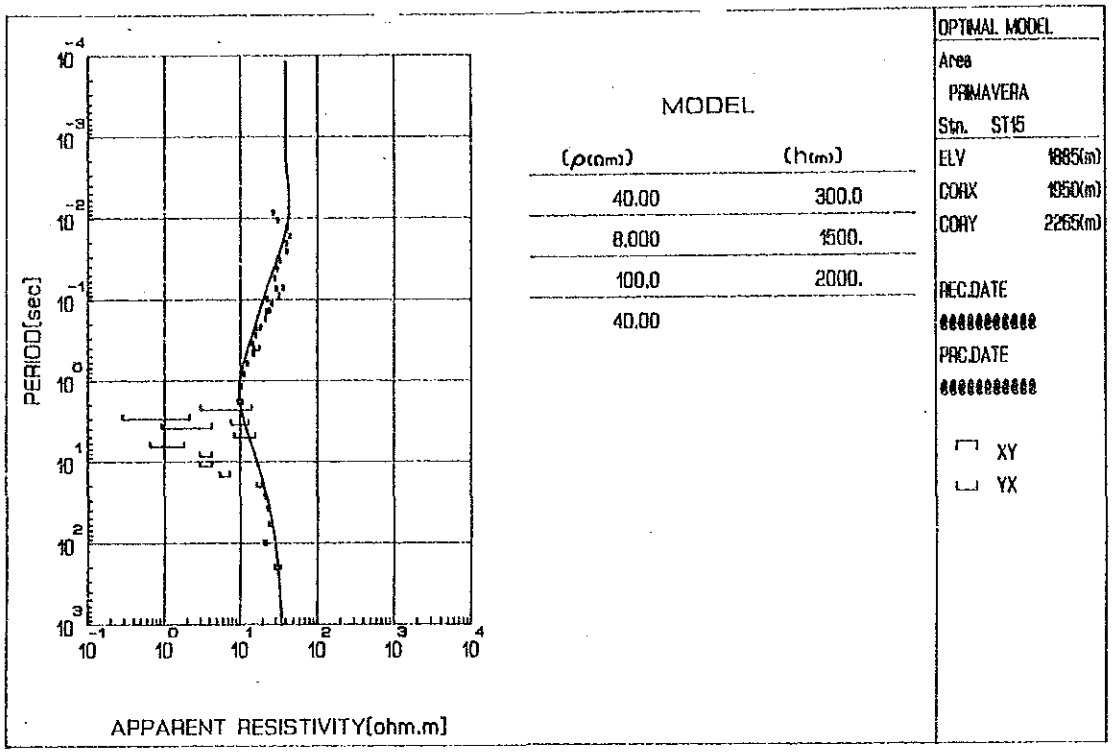
Stn. ST12 May 12 1988



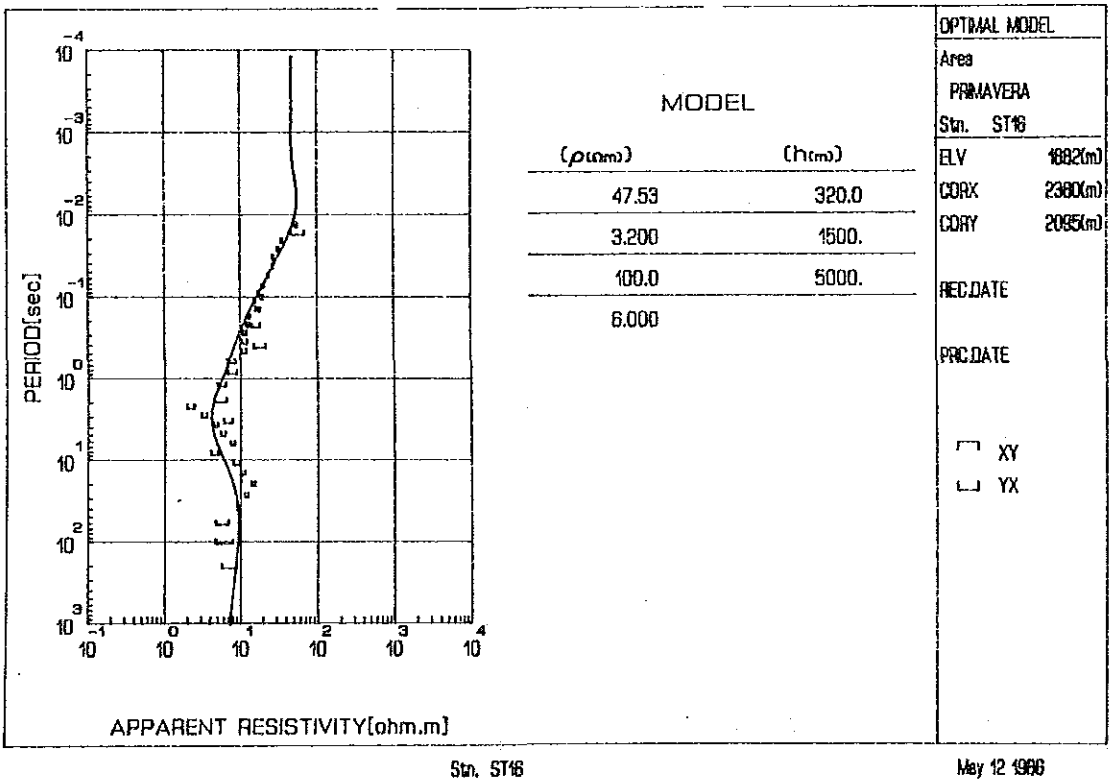
Stn. ST13 May 14 1996



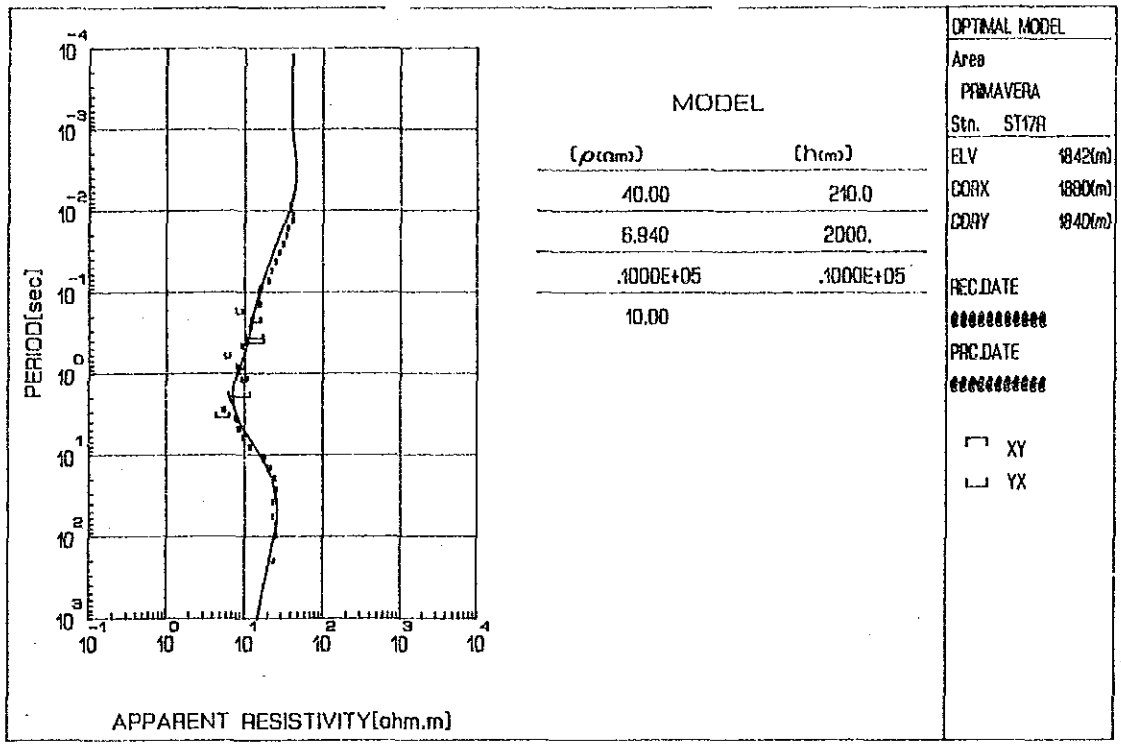
Stn. ST14 May 12 1996



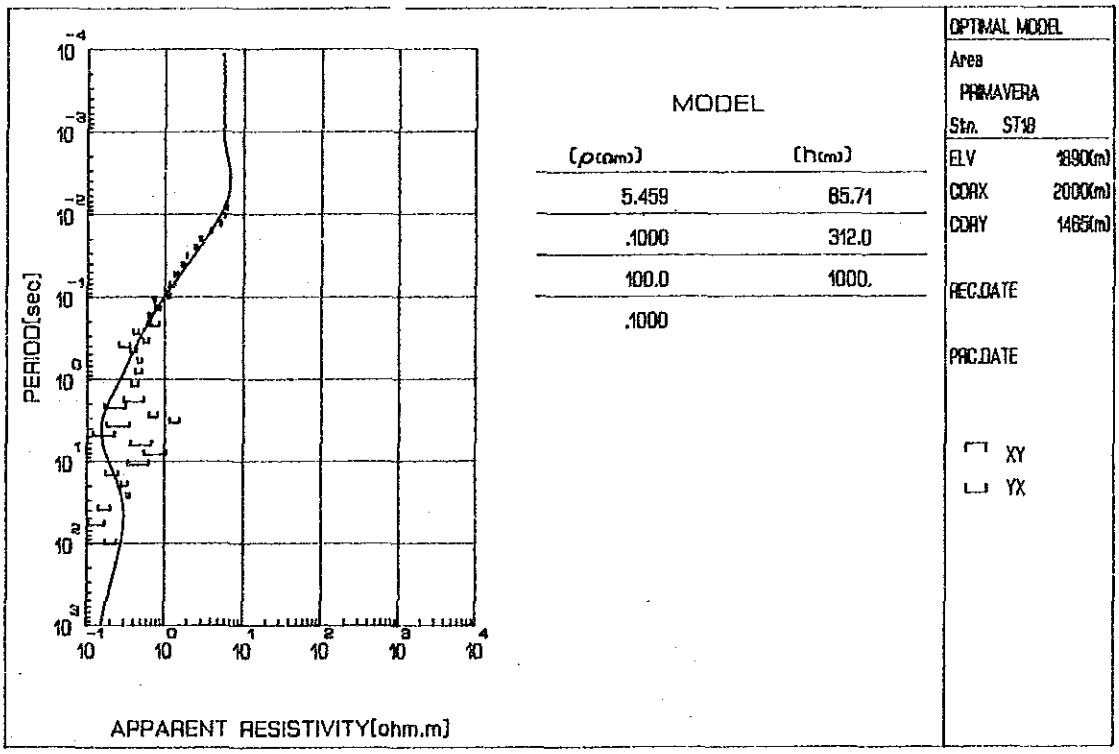
Stn. ST15 May 12 1996



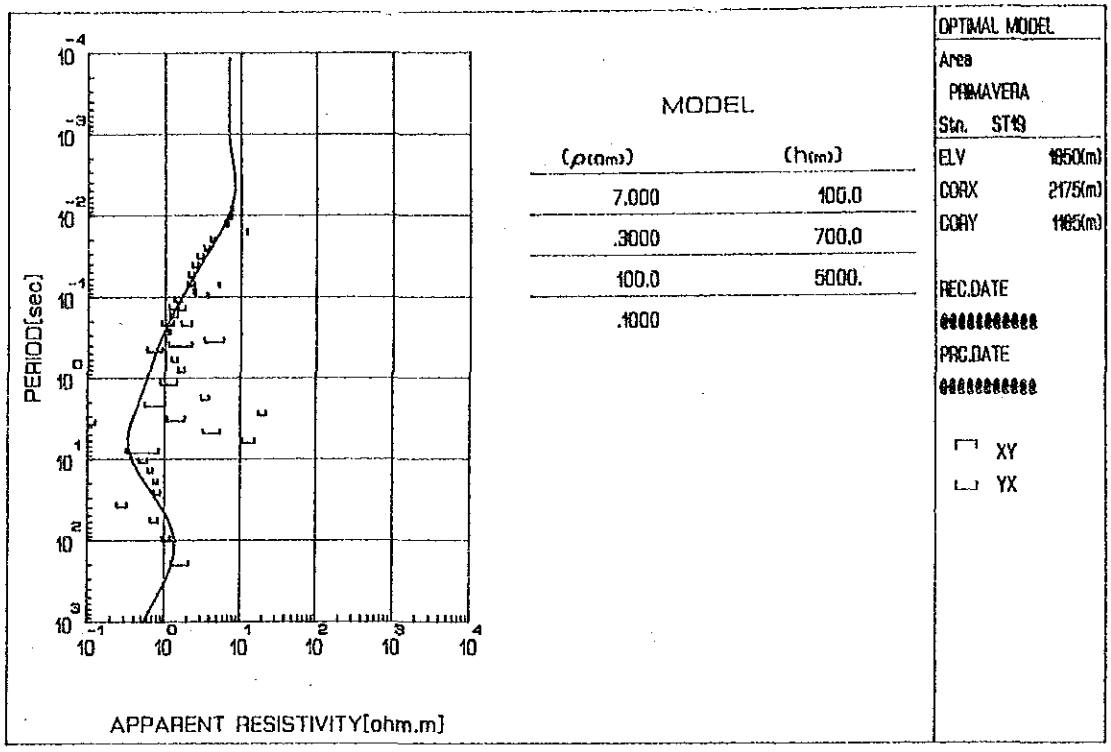
Stn. ST16 May 12 1996



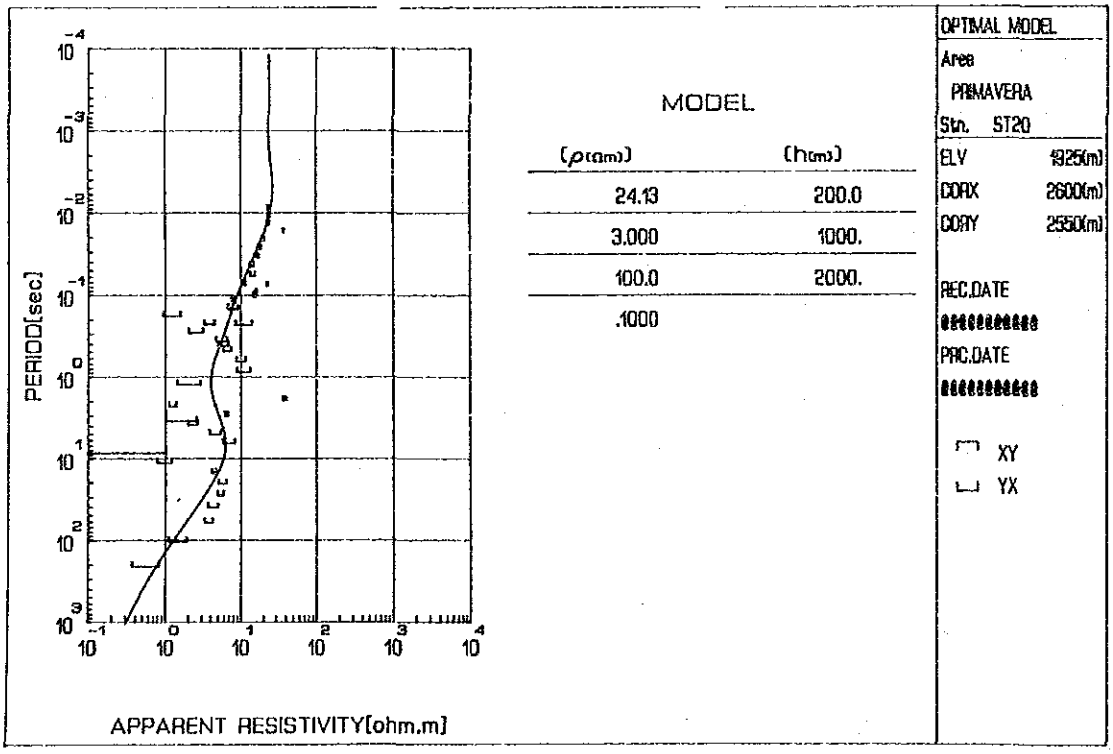
Stn. ST17 May 12 1986



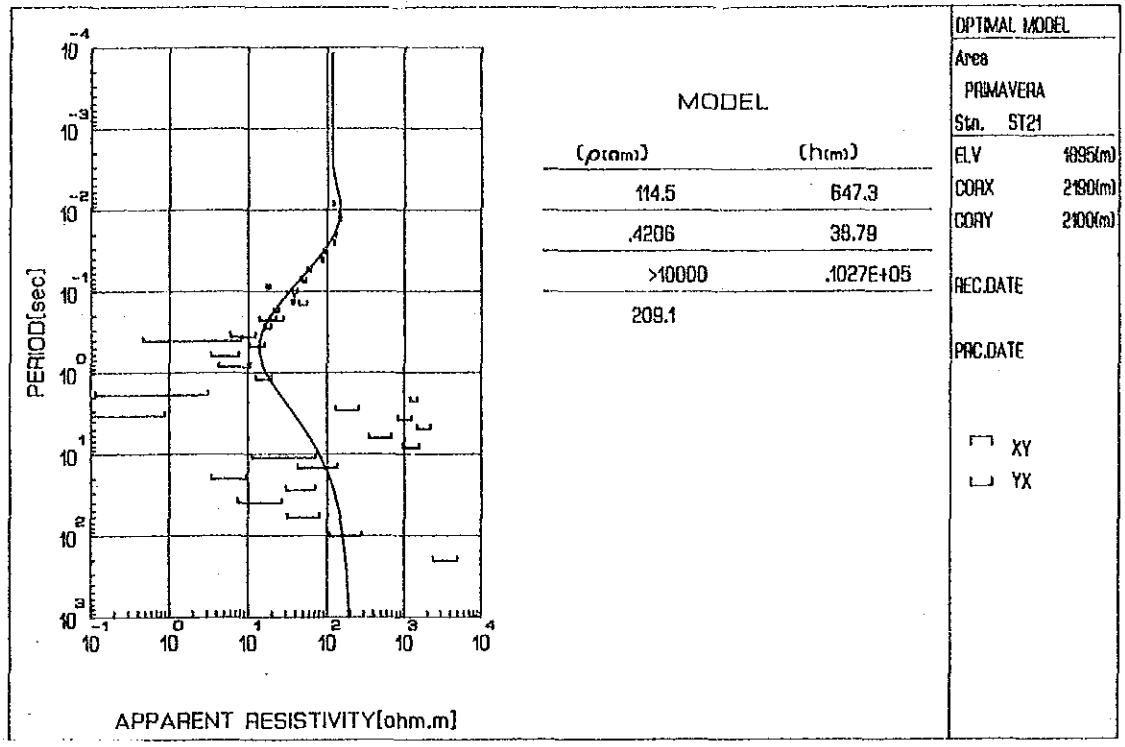
Stn. ST18 May 12 1986



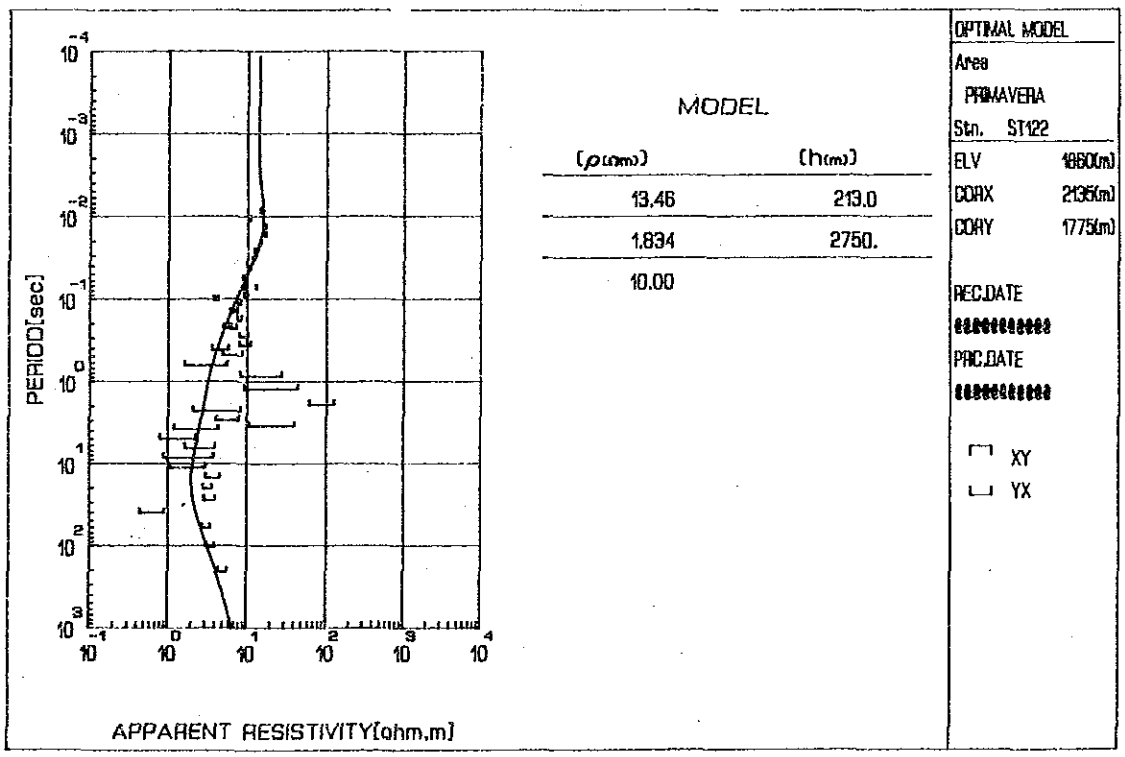
Stn. ST19 May 12 1996



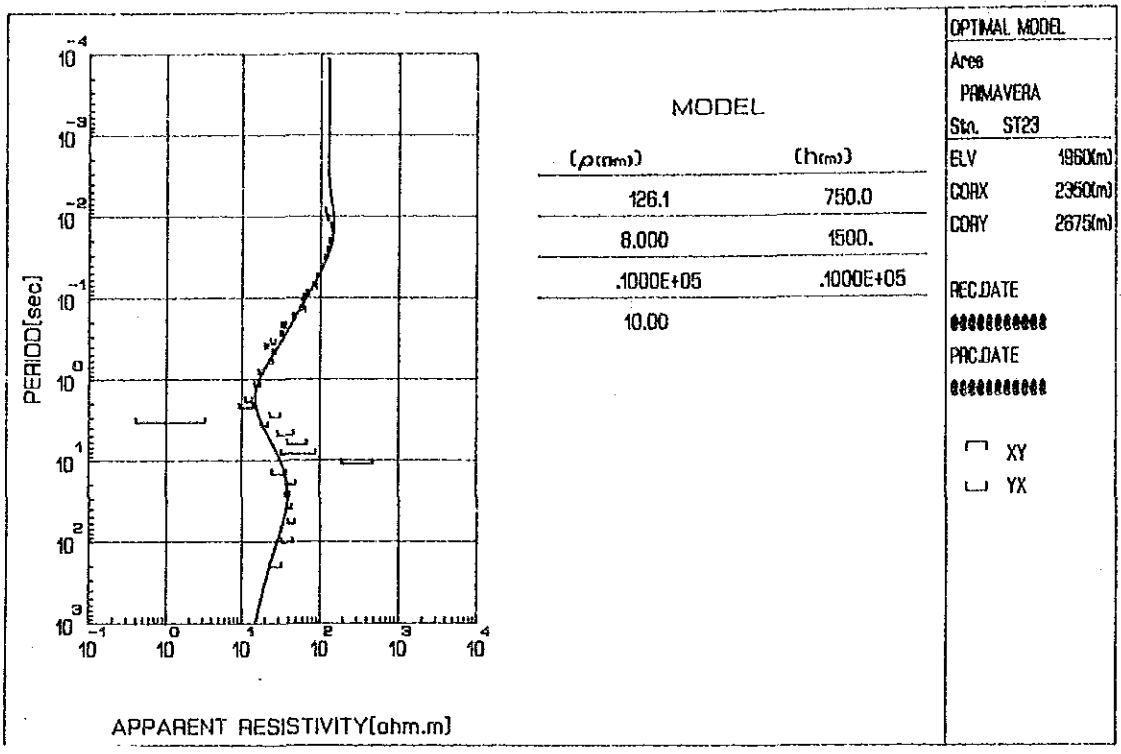
Stn. ST20 May 12 1996



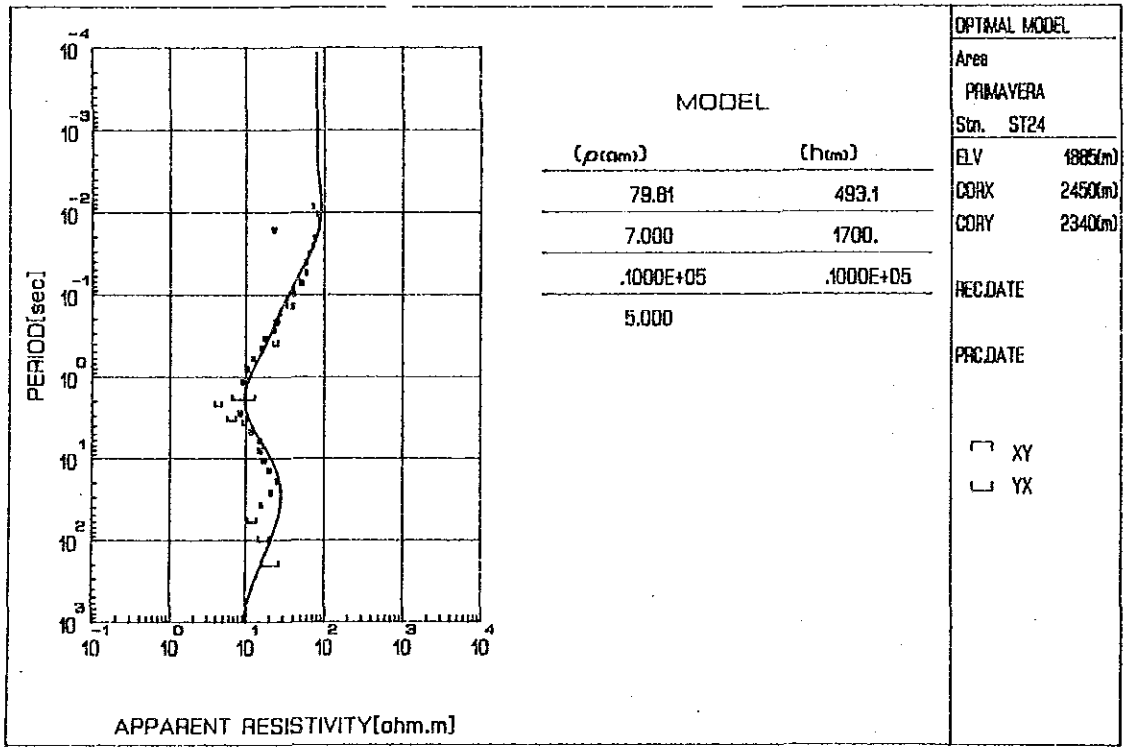
Stn. ST21 May 14 1986



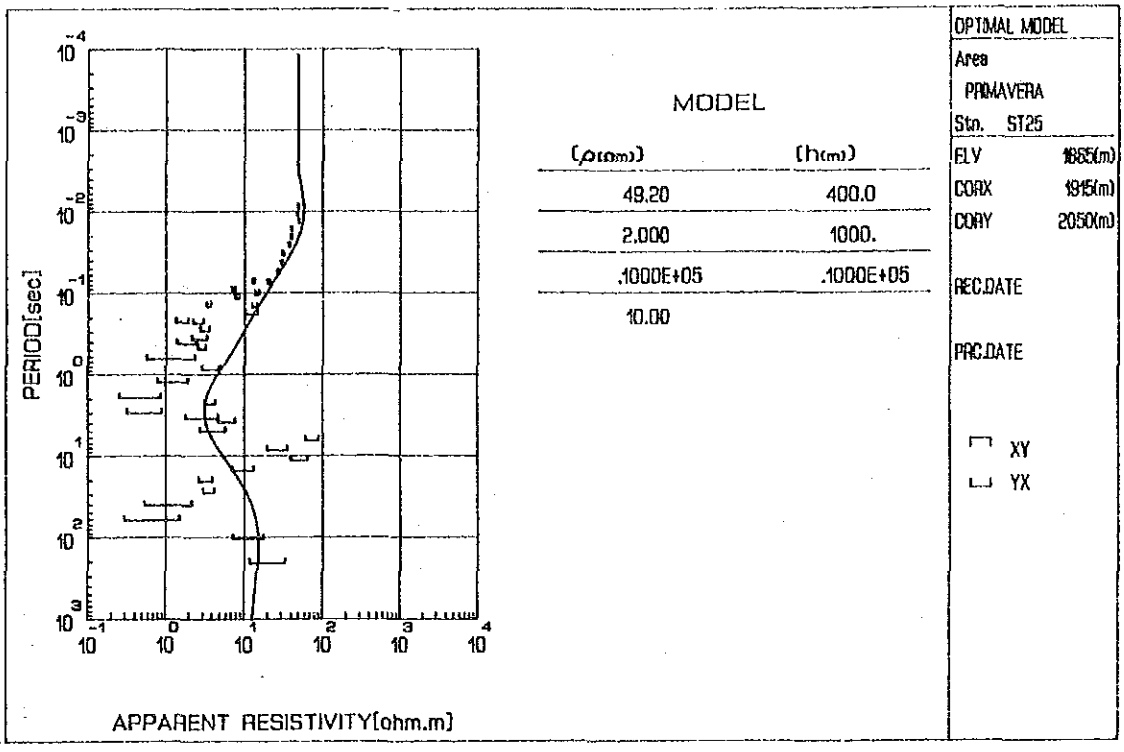
Stn. ST122 May 12 1986



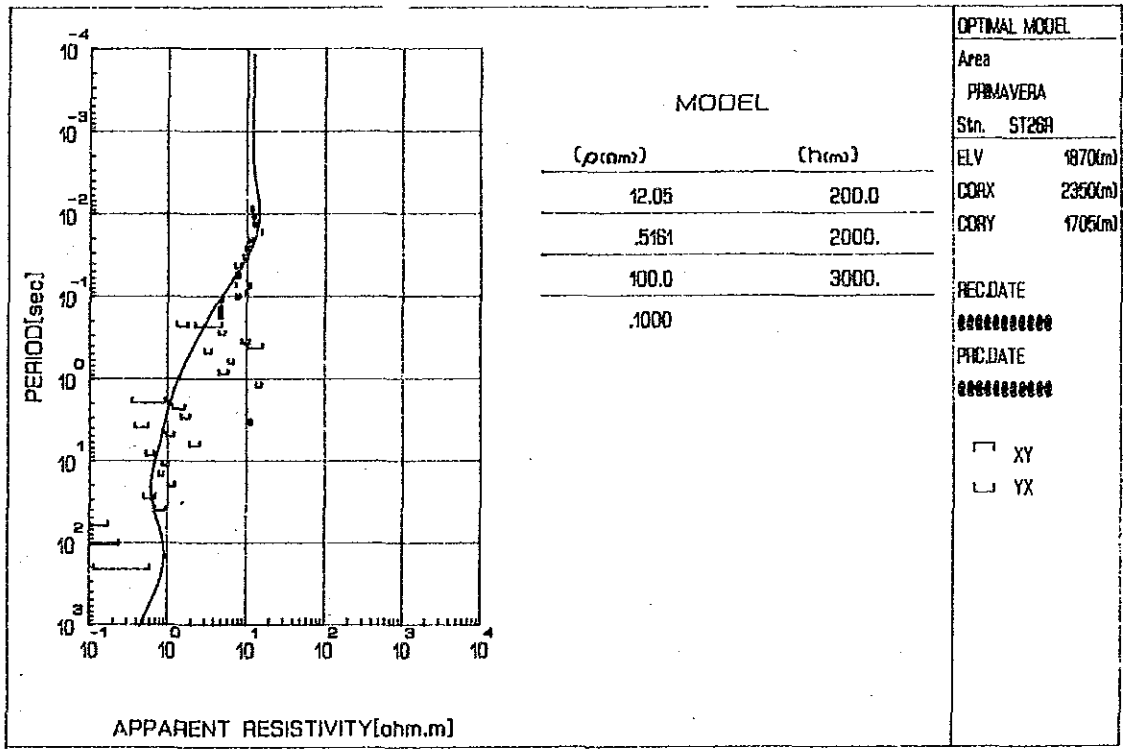
Stn. ST23 May 12 1986



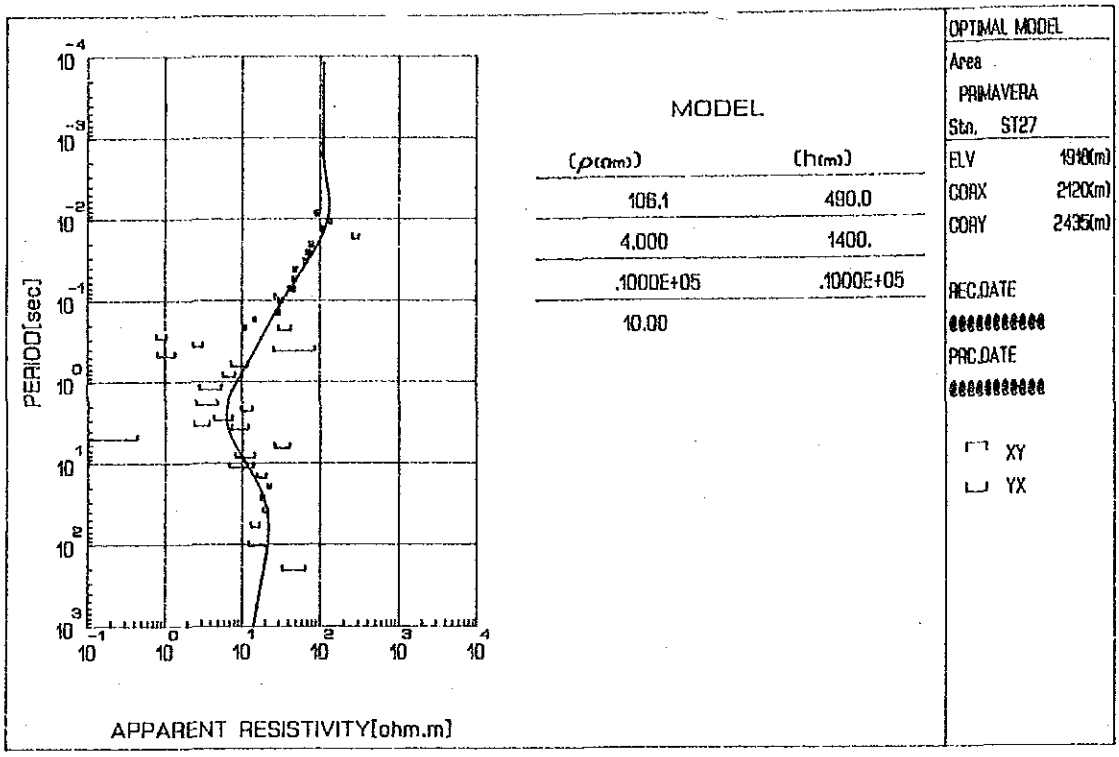
Stn. ST24 May 12 1986



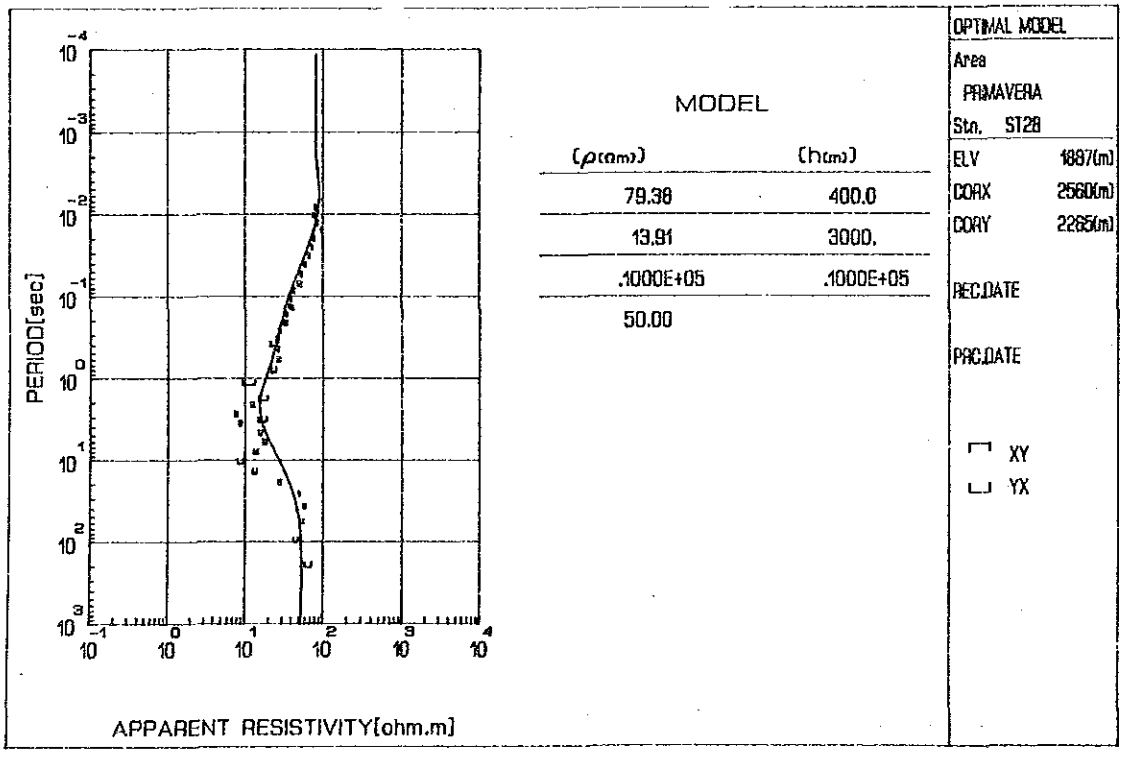
Stn. ST25 May 12 1996



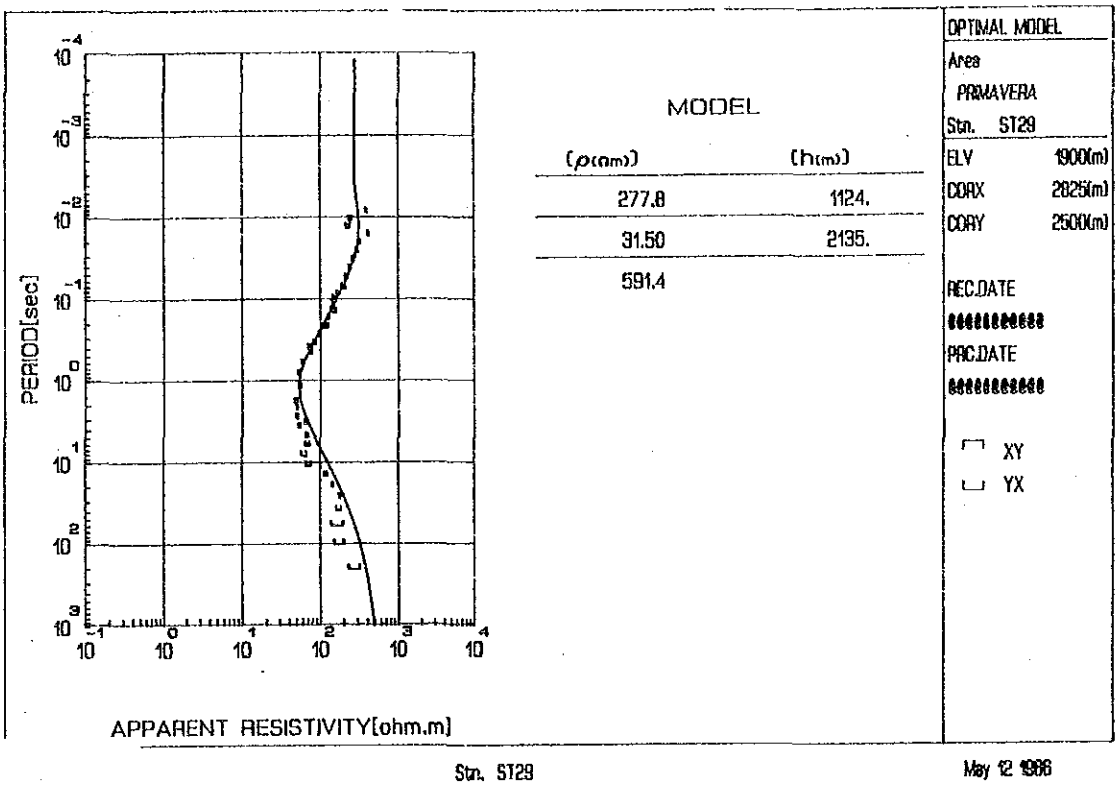
Stn. ST26 May 12 1996

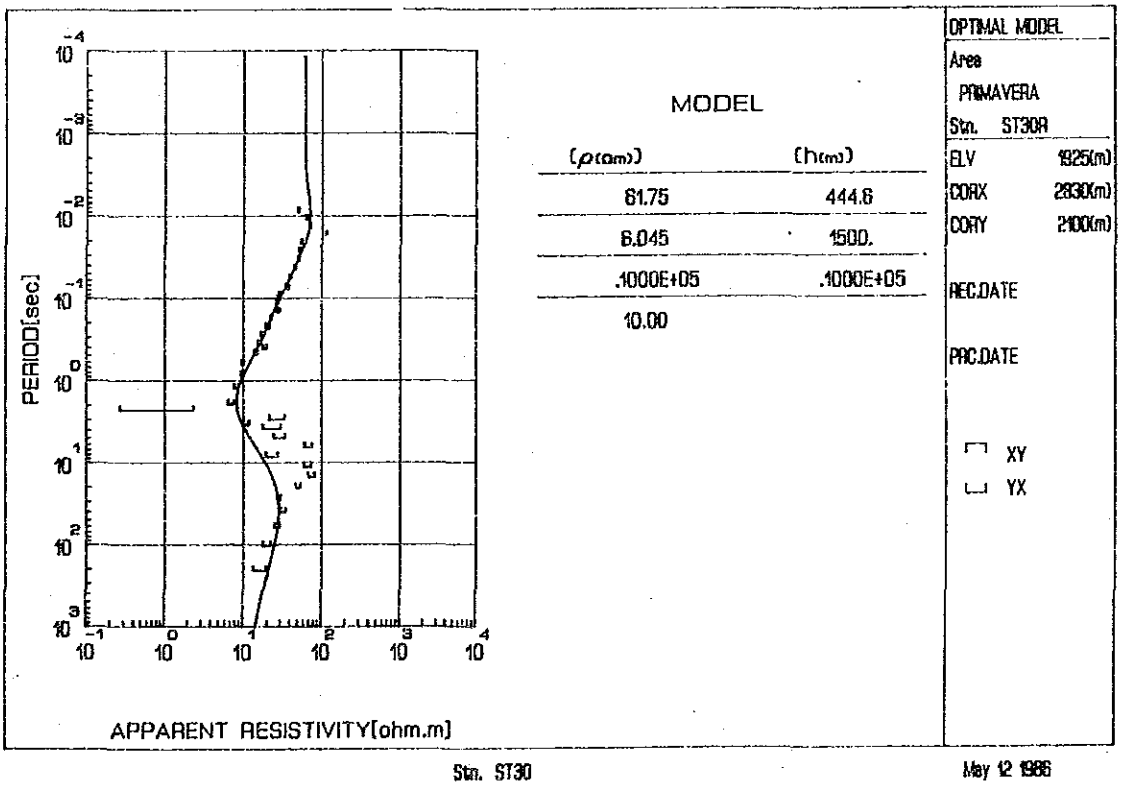


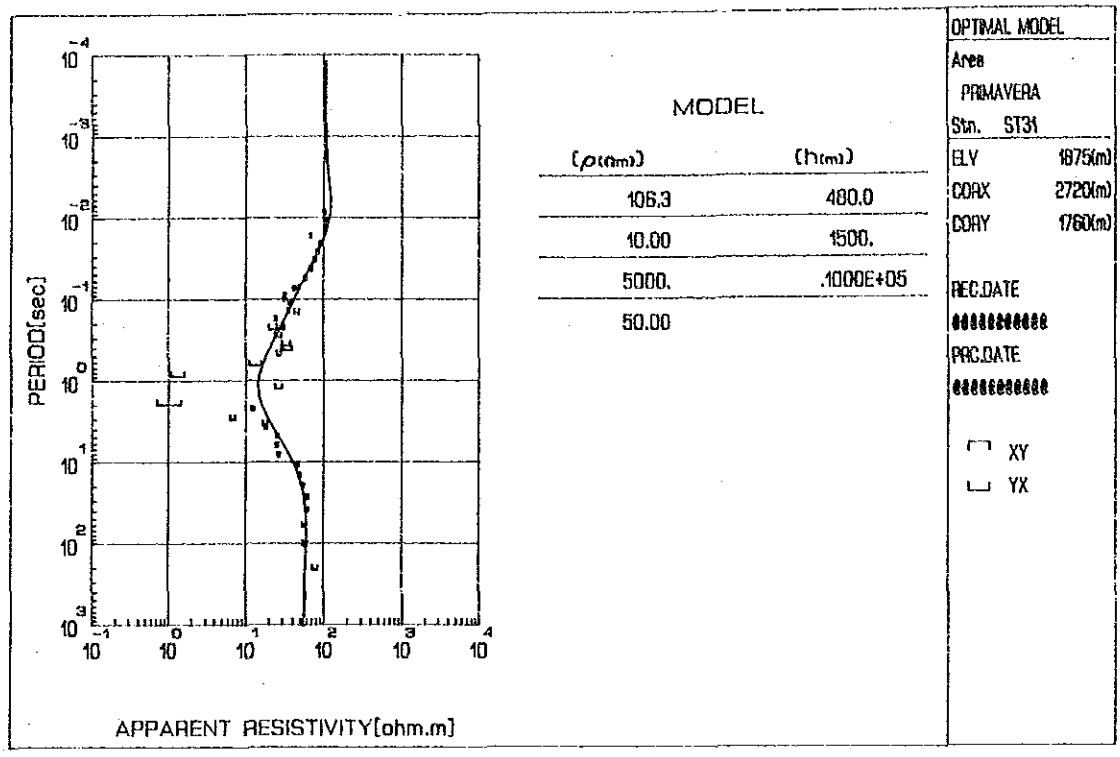
Sta. ST27 May 12 1986



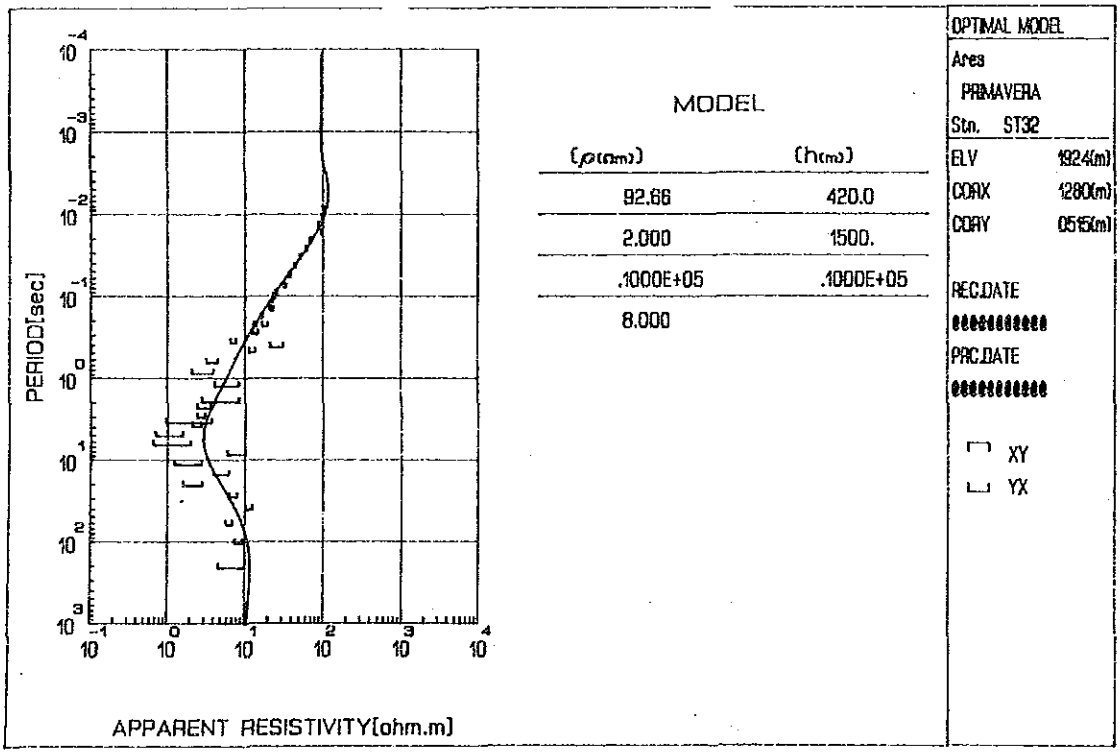
Sta. ST28 May 12 1986


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
277.8 1124.
31.50 2135.
591.4
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST29
ELV 1900(m)
CORX 2625(m)
CORY 2500(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST29
May 12 1986

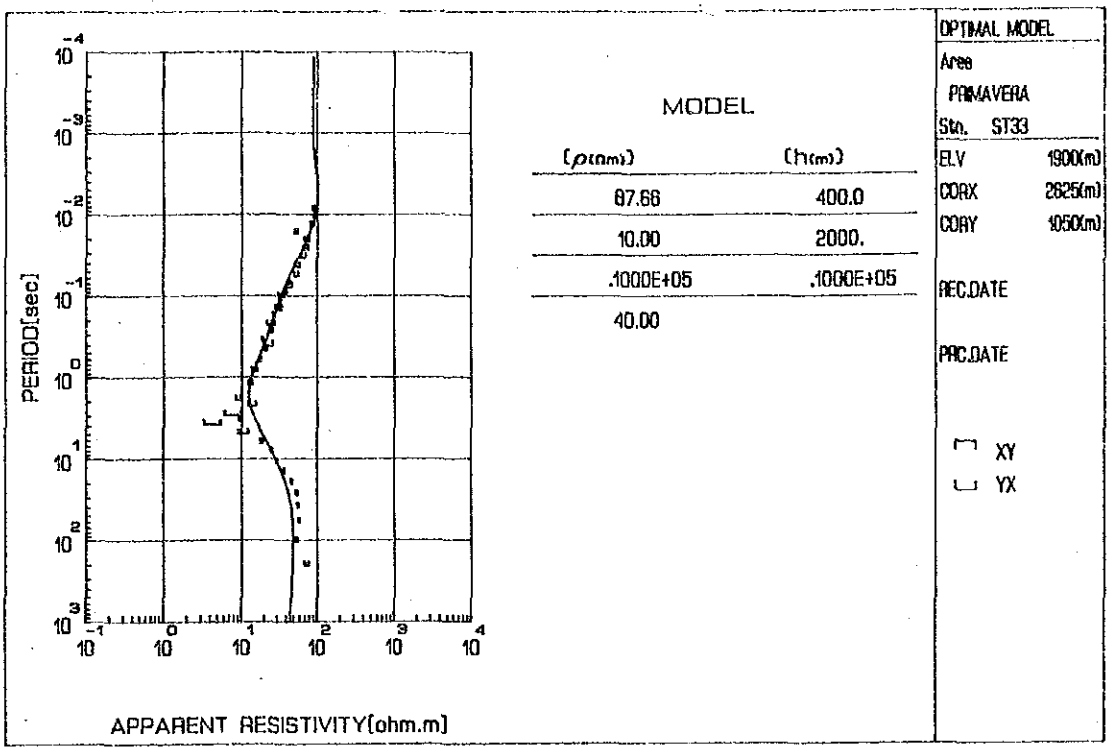

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
61.75 444.6
6.045 1500.
.1000E+05 .1000E+05
10.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST30R
ELV 1925(m)
CORX 2930(m)
CORY 2100(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST30
May 12 1986



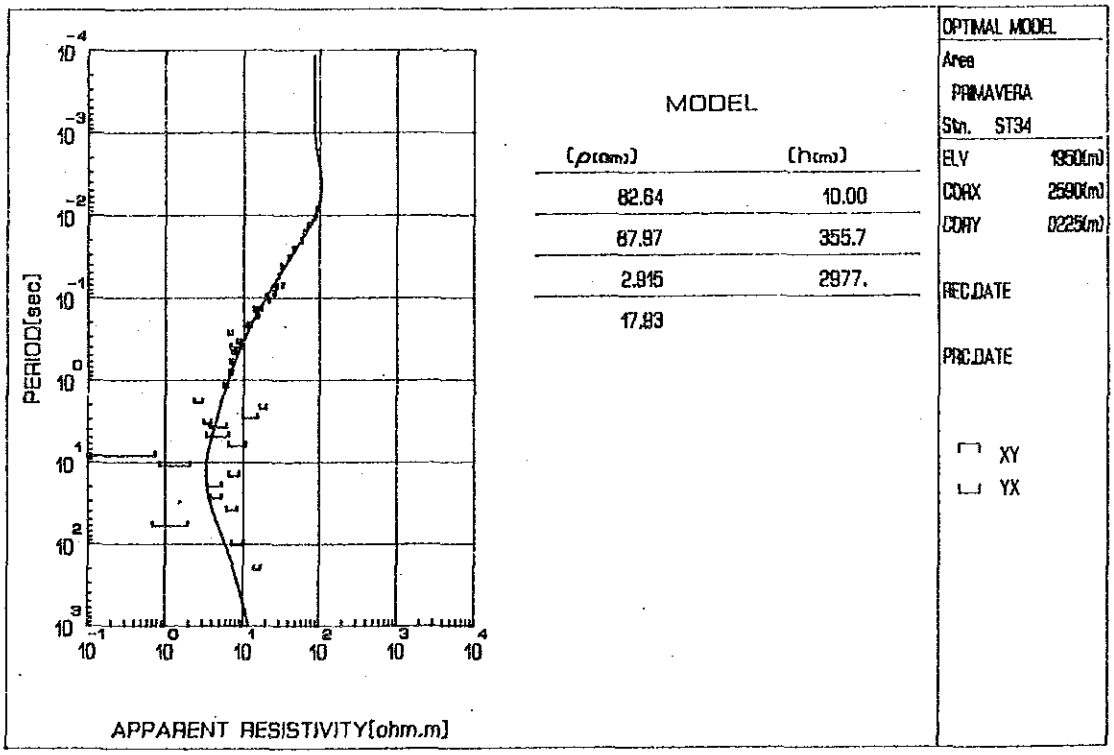
Stn. ST31 May 12 1986



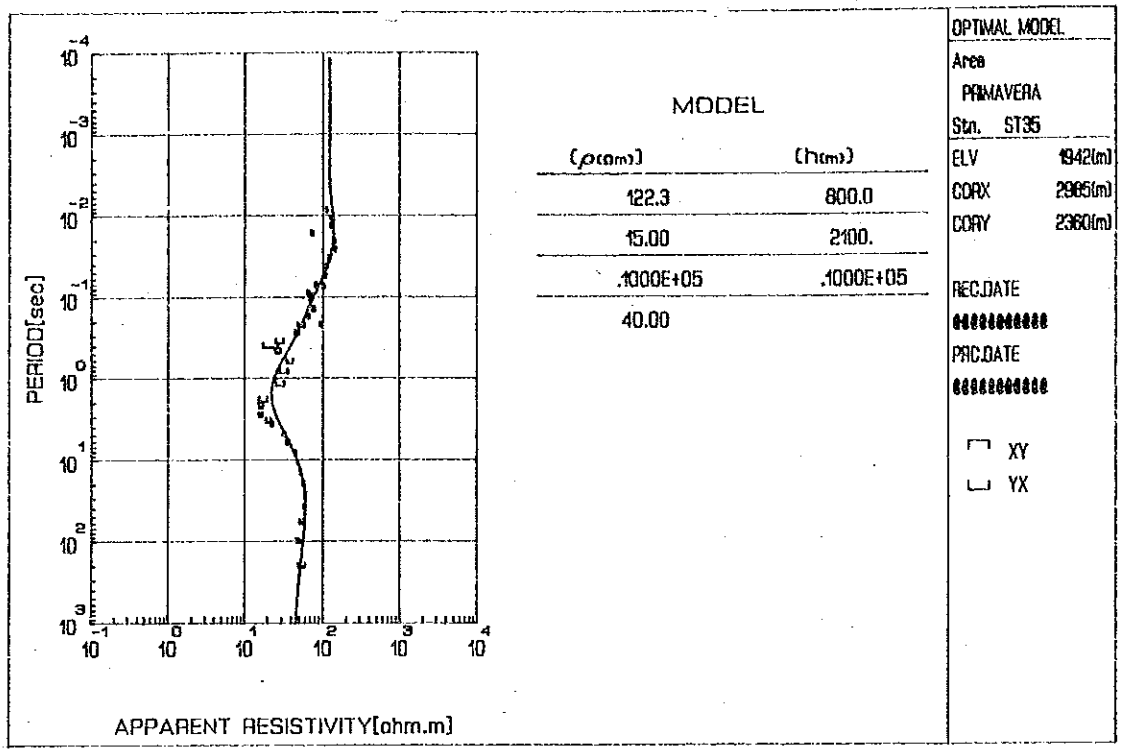
Stn. ST32 May 12 1986



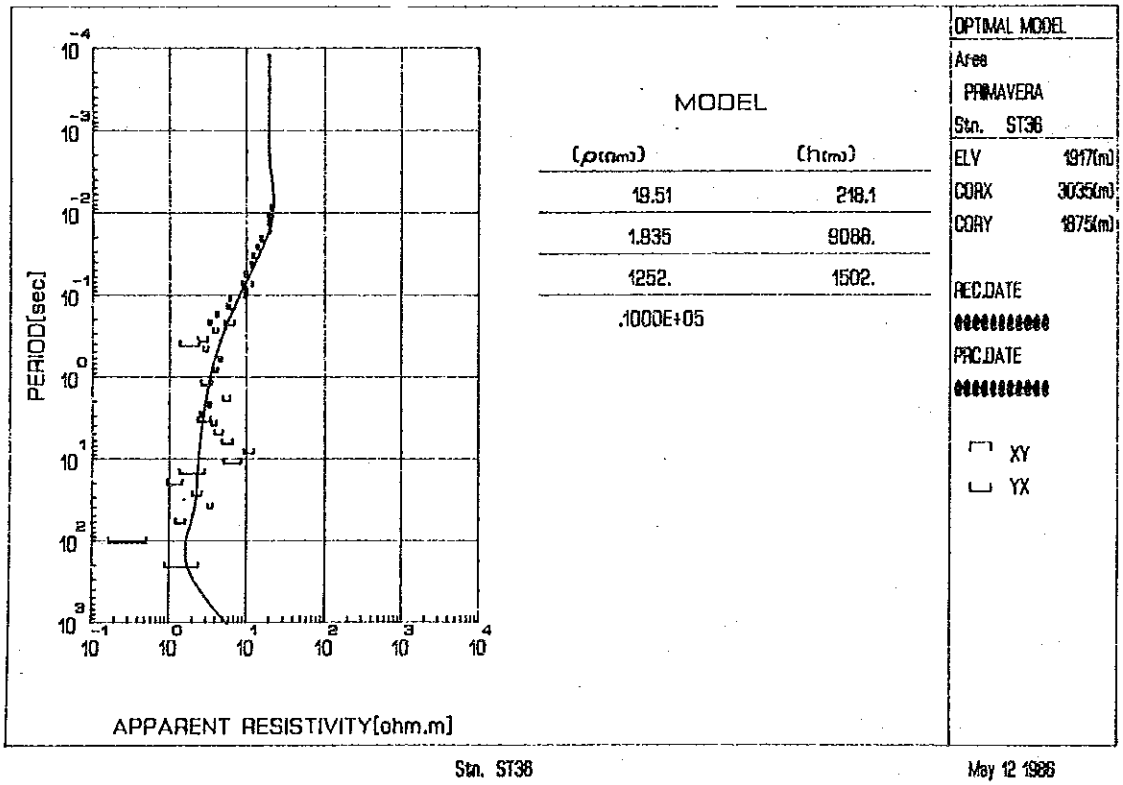
Stn. ST33 May 12 1986



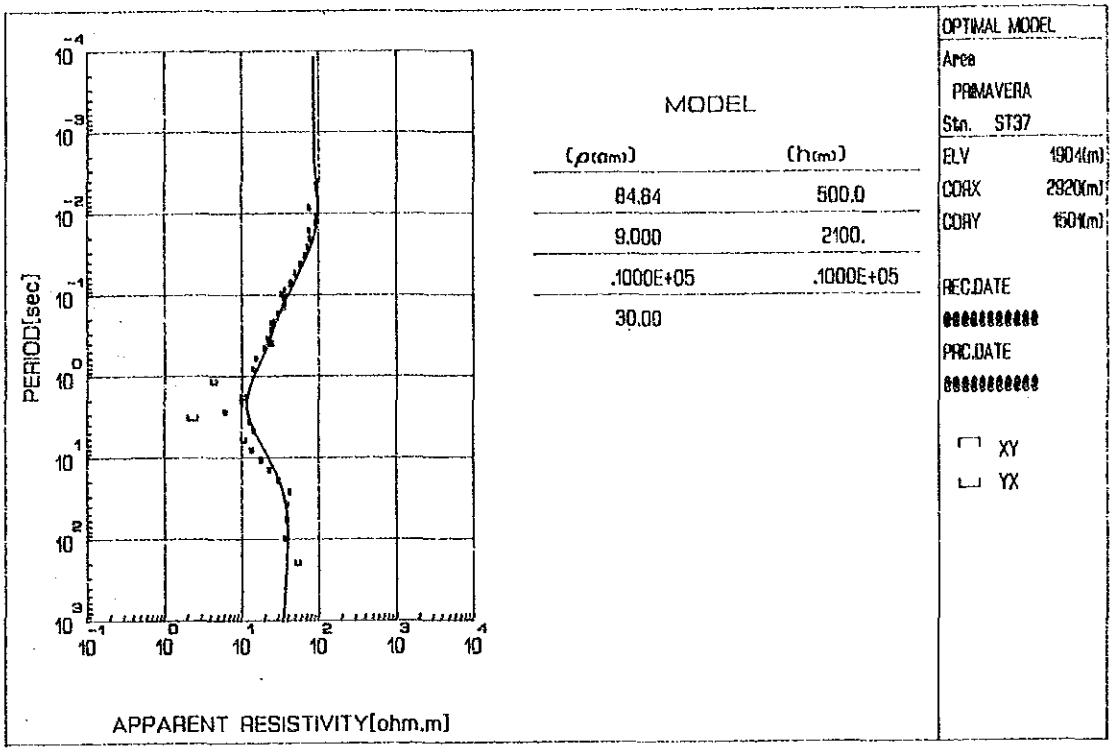
Stn. ST34 May 12 1986



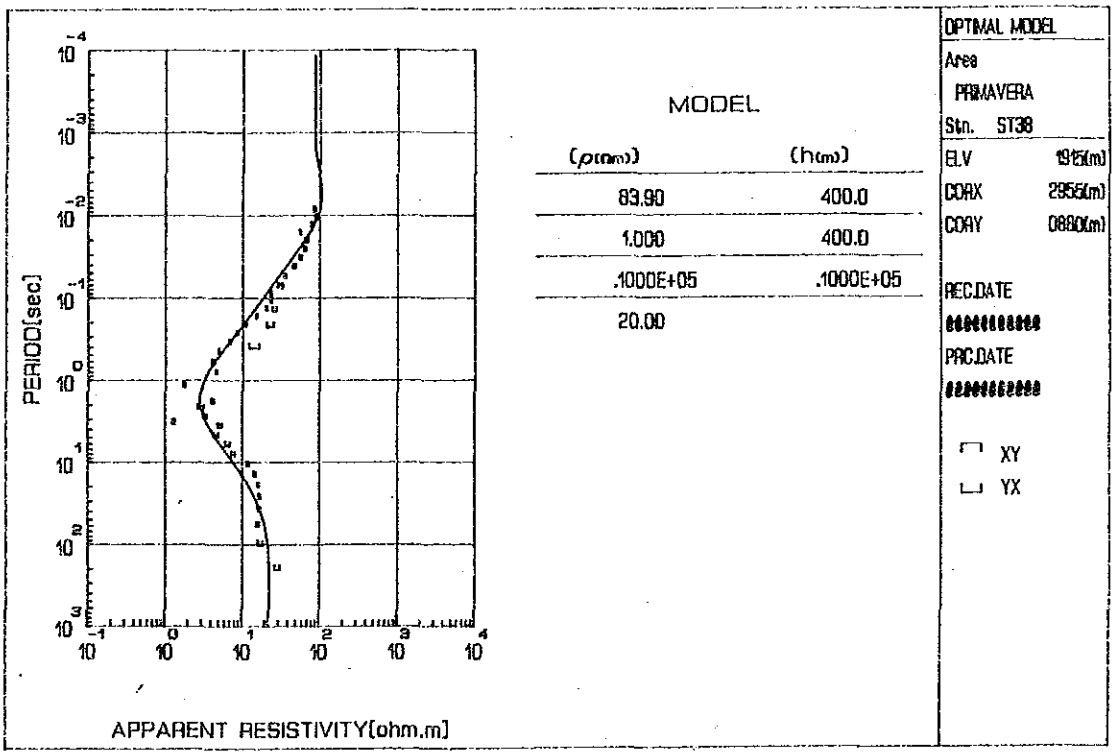
Stn. ST35 May 12 1986



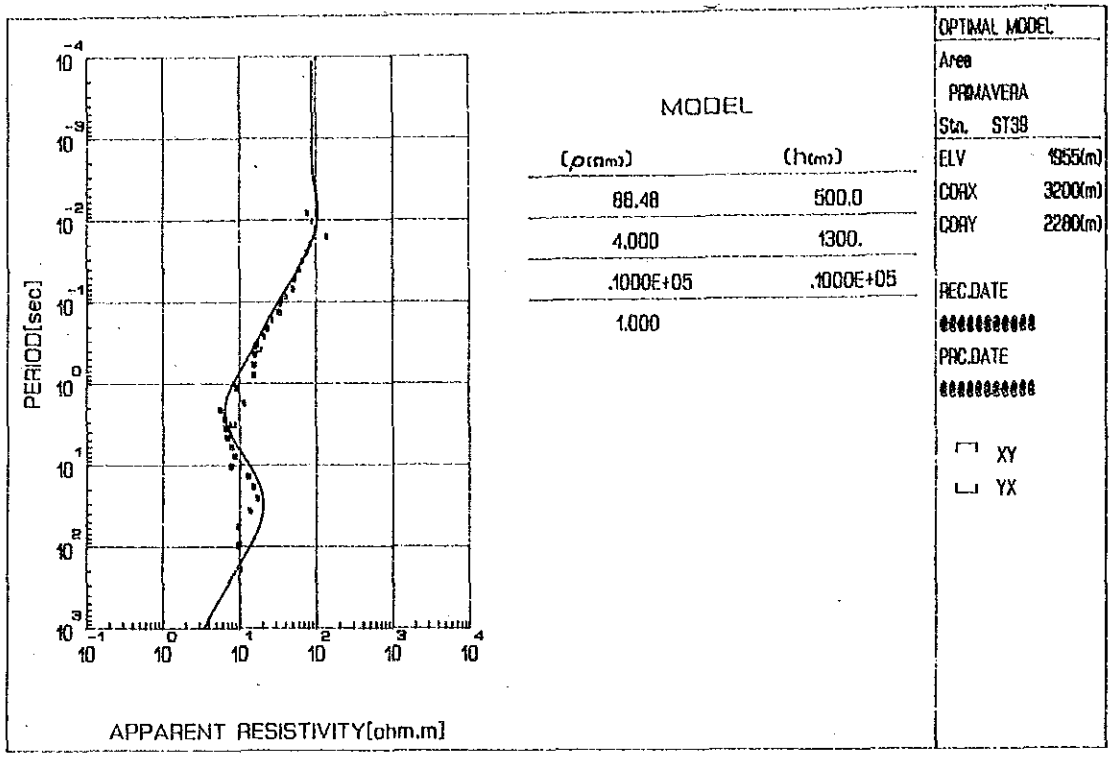
Stn. ST36 May 12 1986



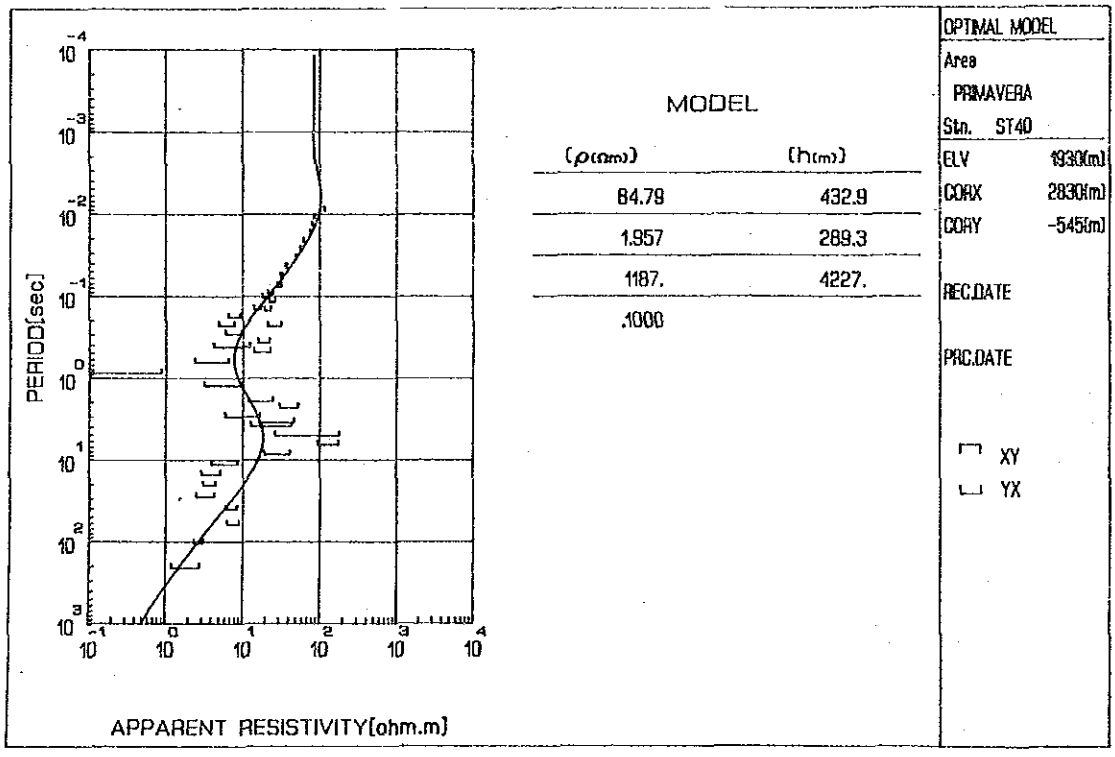
Stn. ST37 May 12 1996



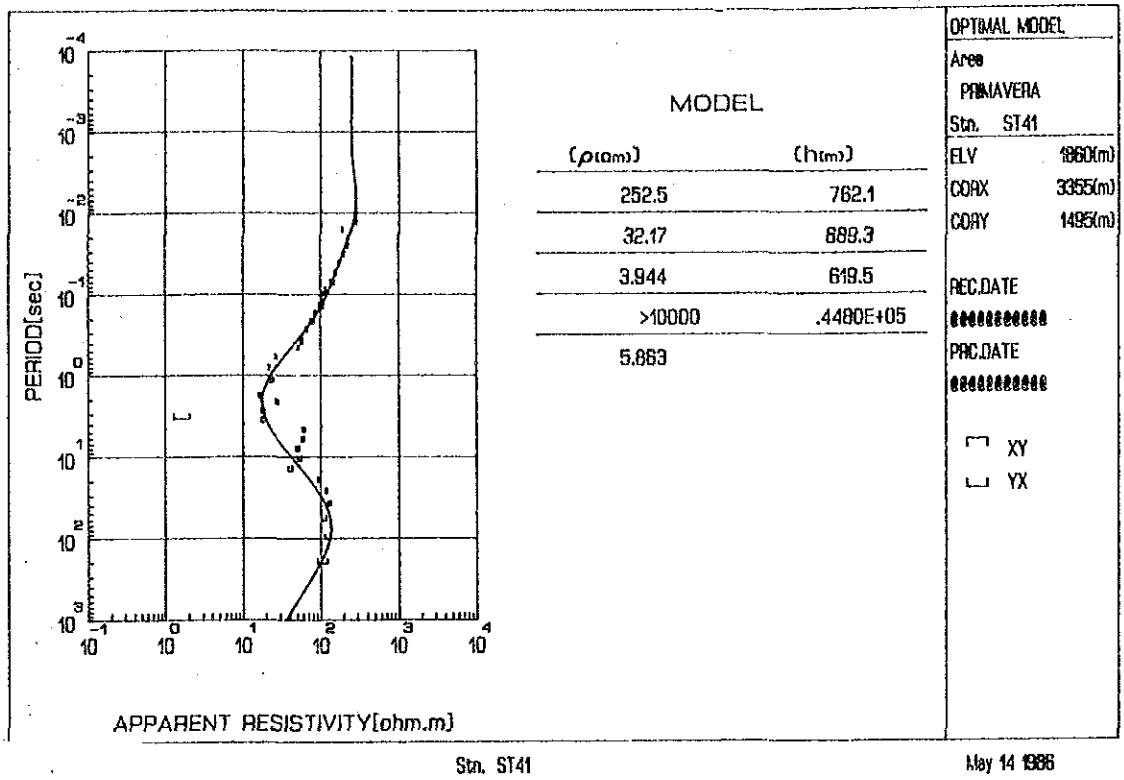
Stn. ST38 May 12 1996



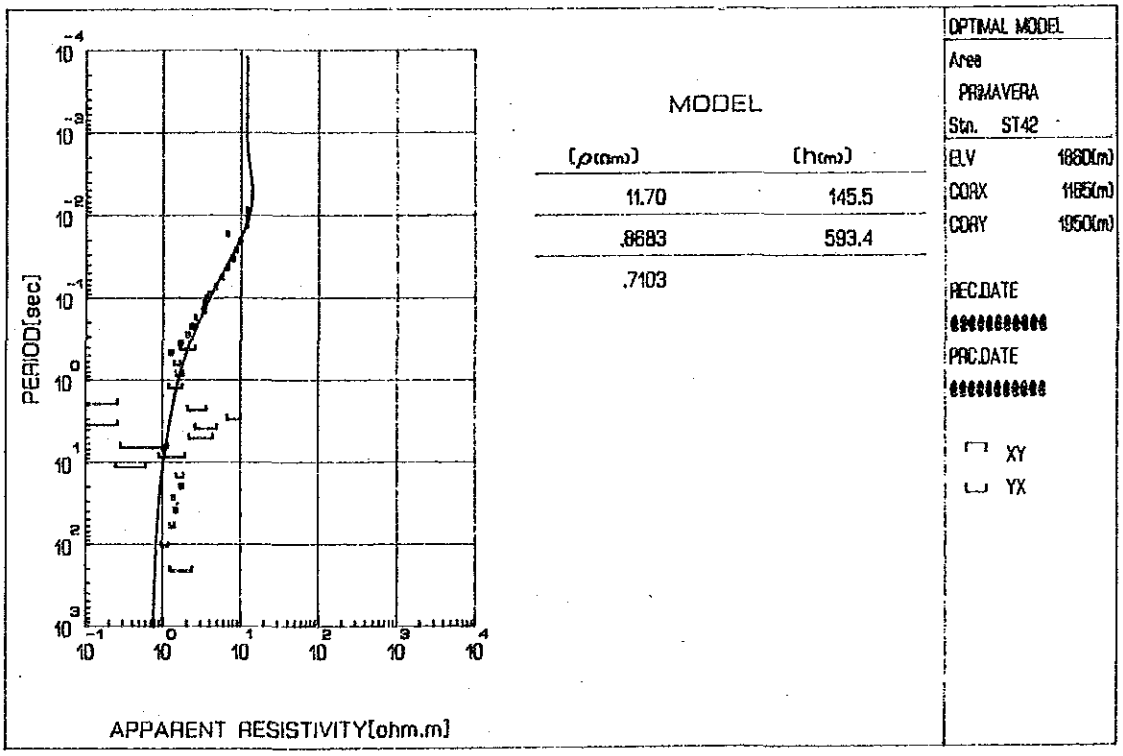
Stn. ST39 May 12 1986



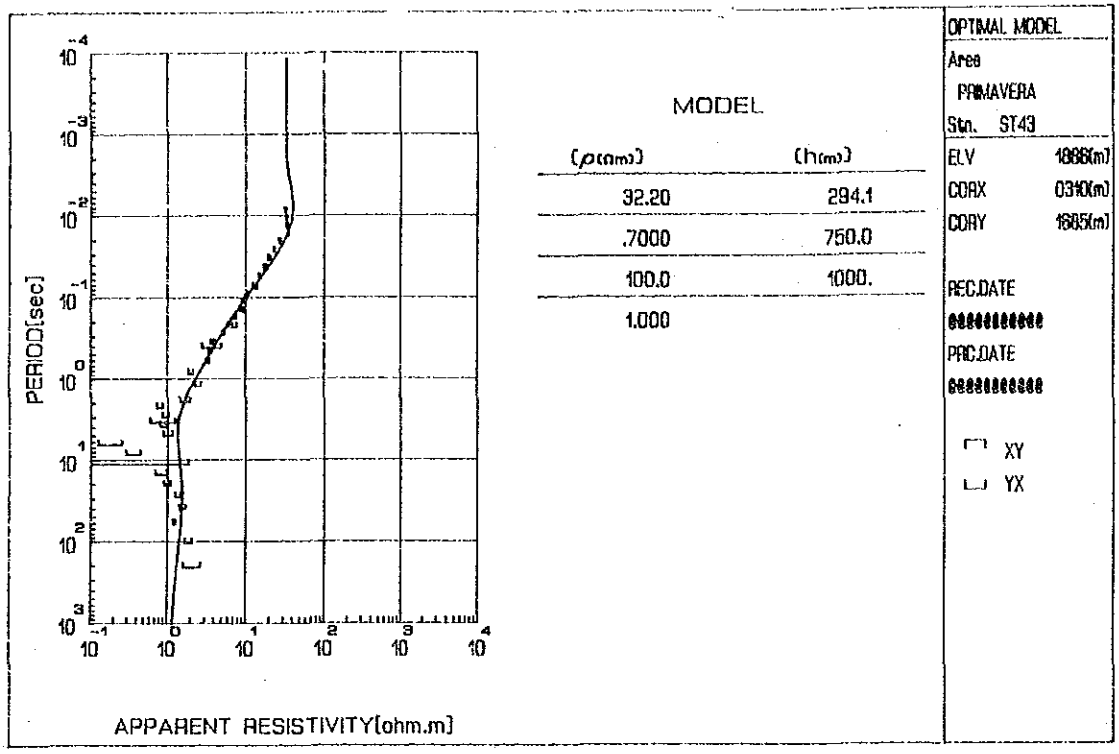
Stn. ST40 May 14 1986



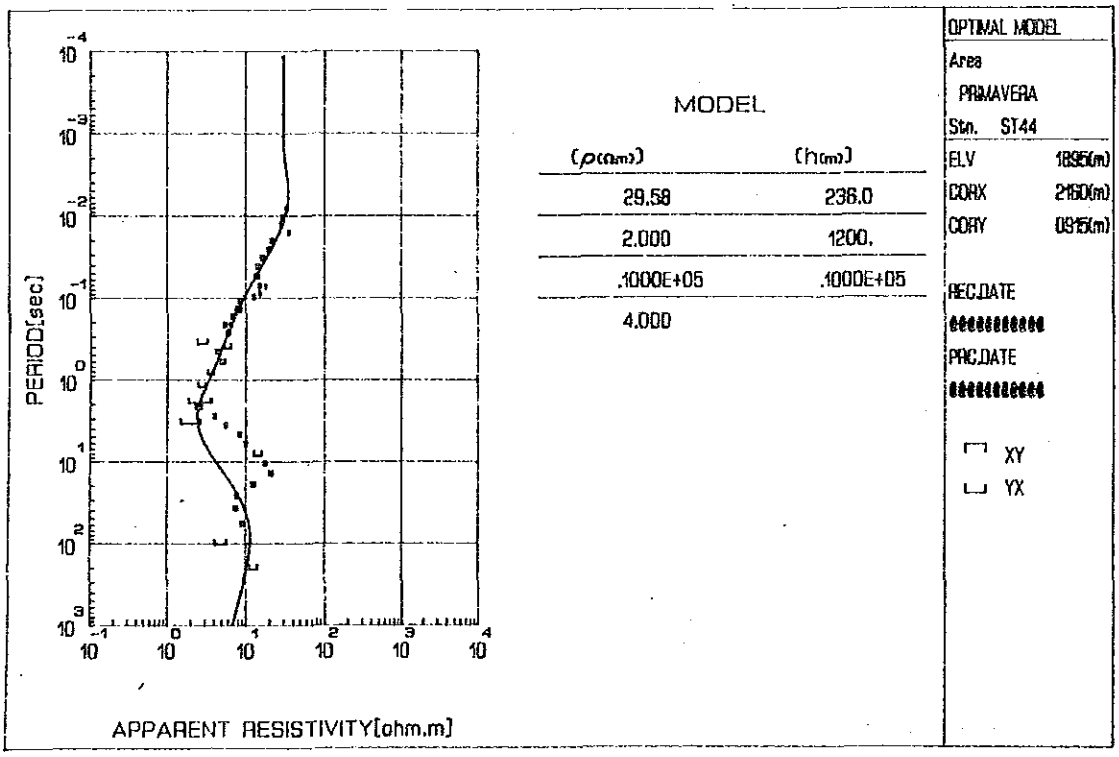
Stn. ST41 May 14 1986



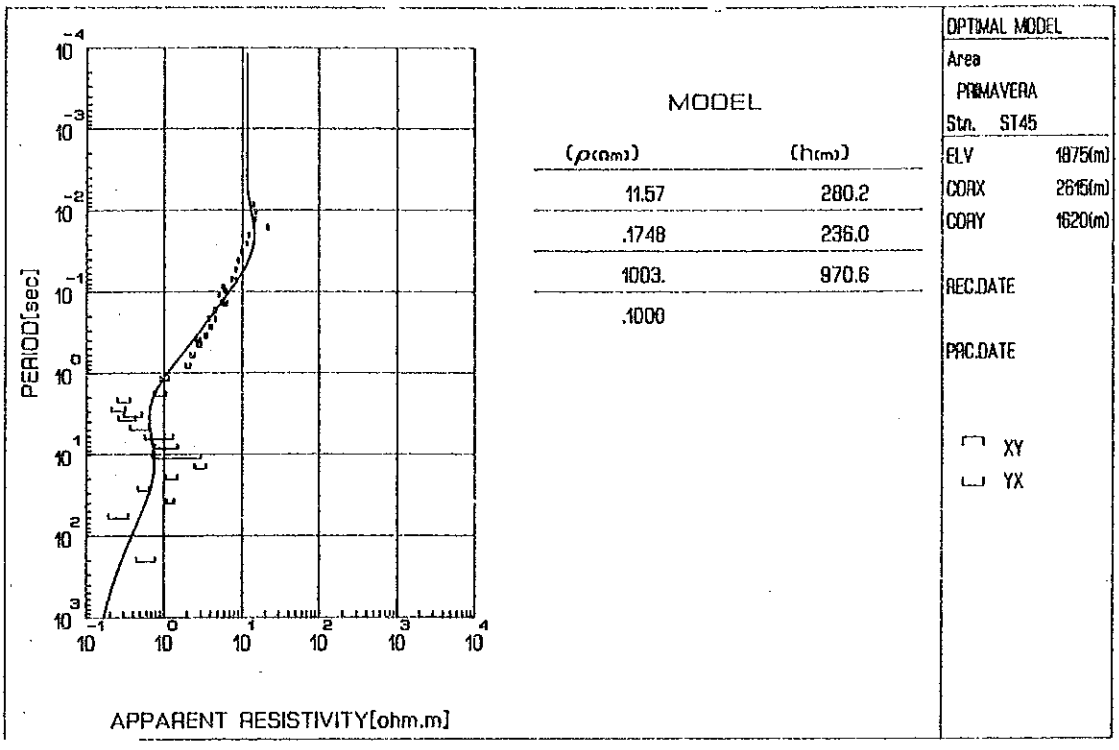
Stn. ST42 May 12 1986

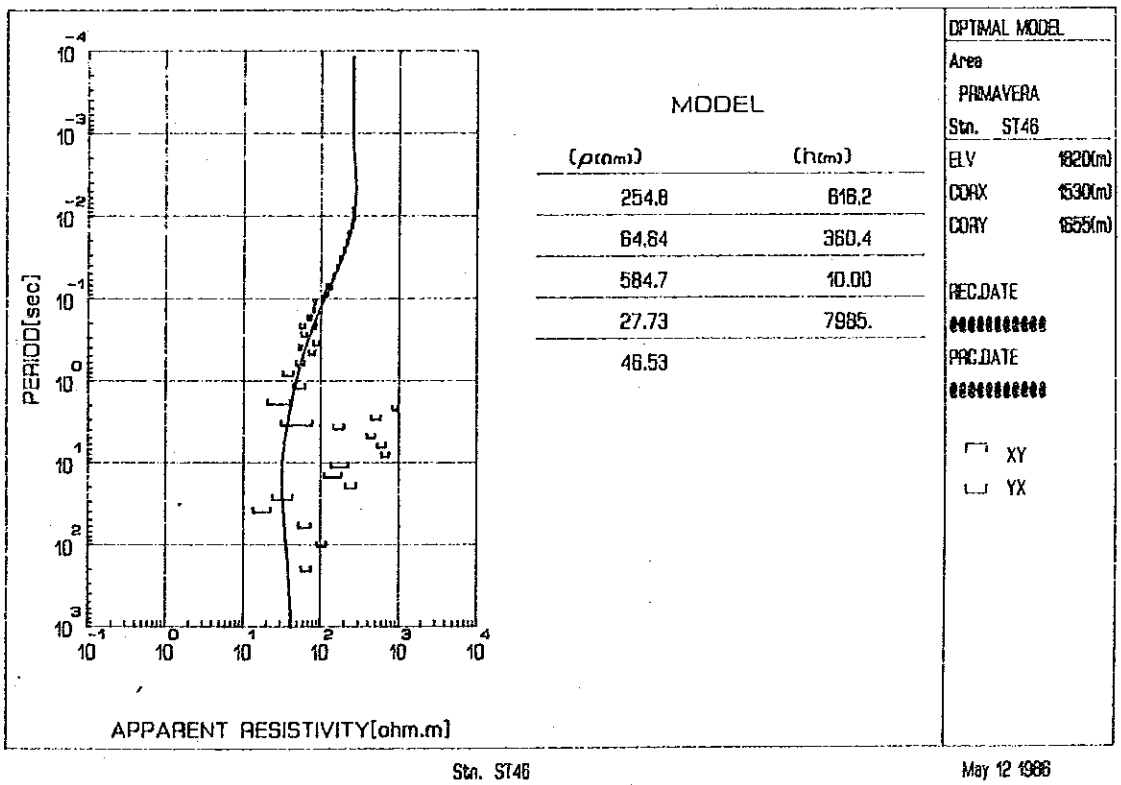


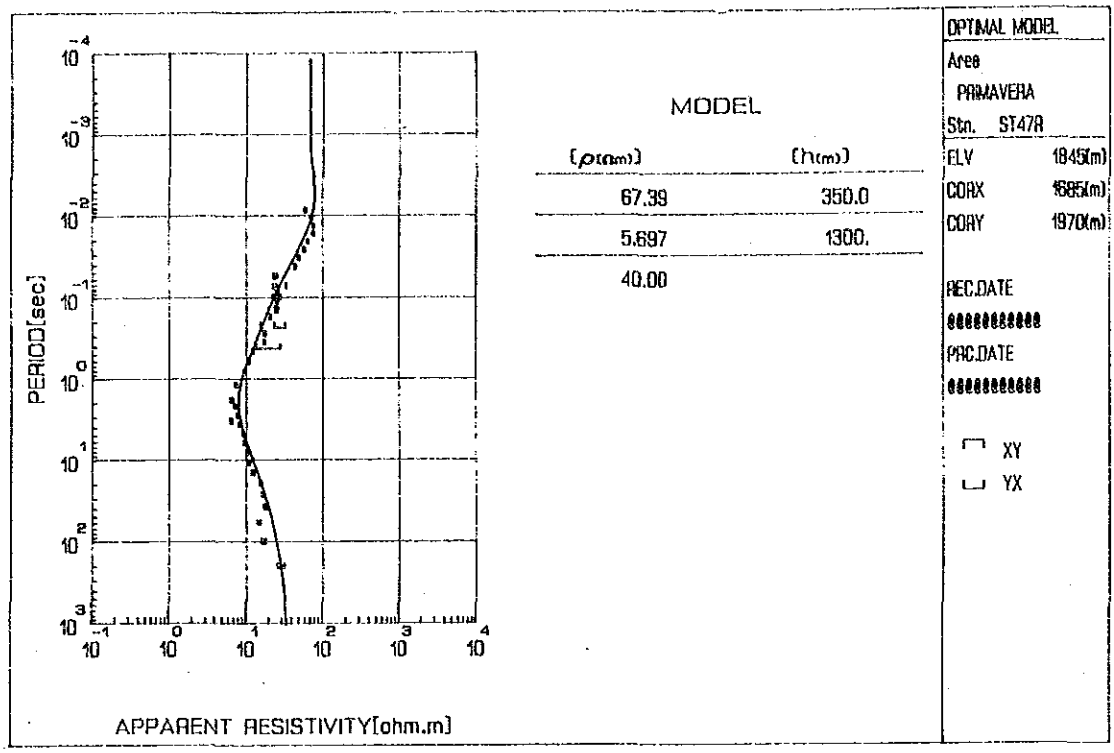
Stn. ST43 May 12 1986



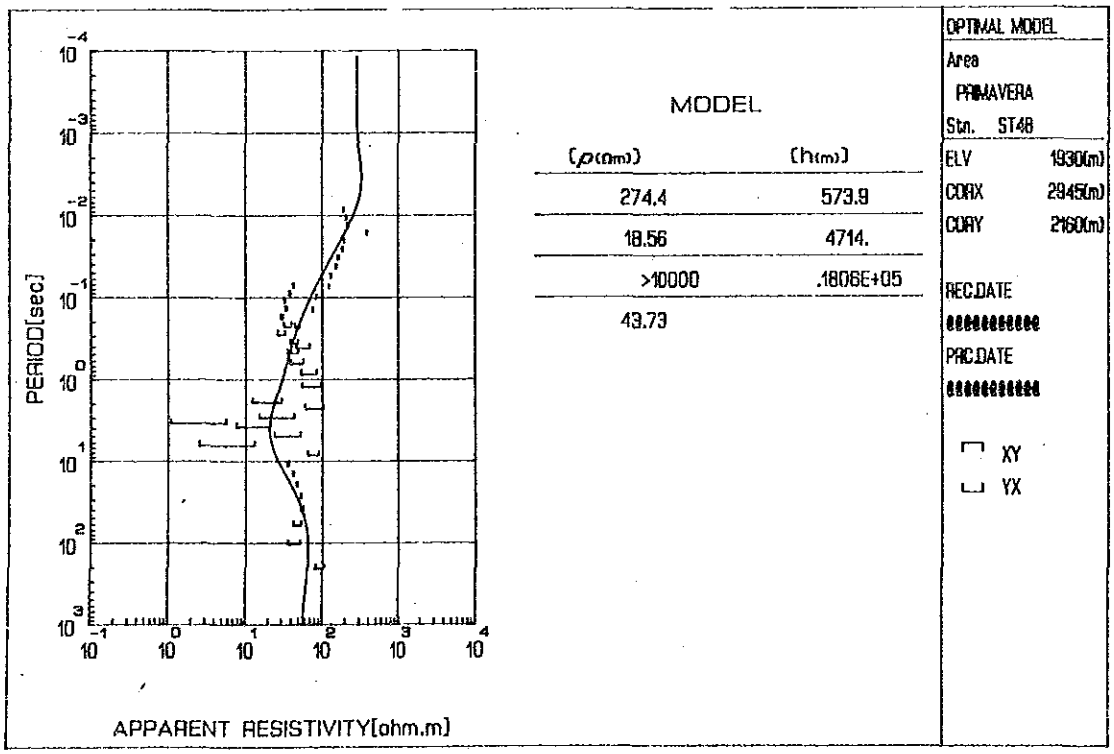
Stn. ST44 May 12 1986


PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
11.57 280.2
.1748 236.0
1003. 970.6
.1000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST45
ELV 1875(m)
CORX 2615(m)
CORY 1620(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST45
May 14 1986

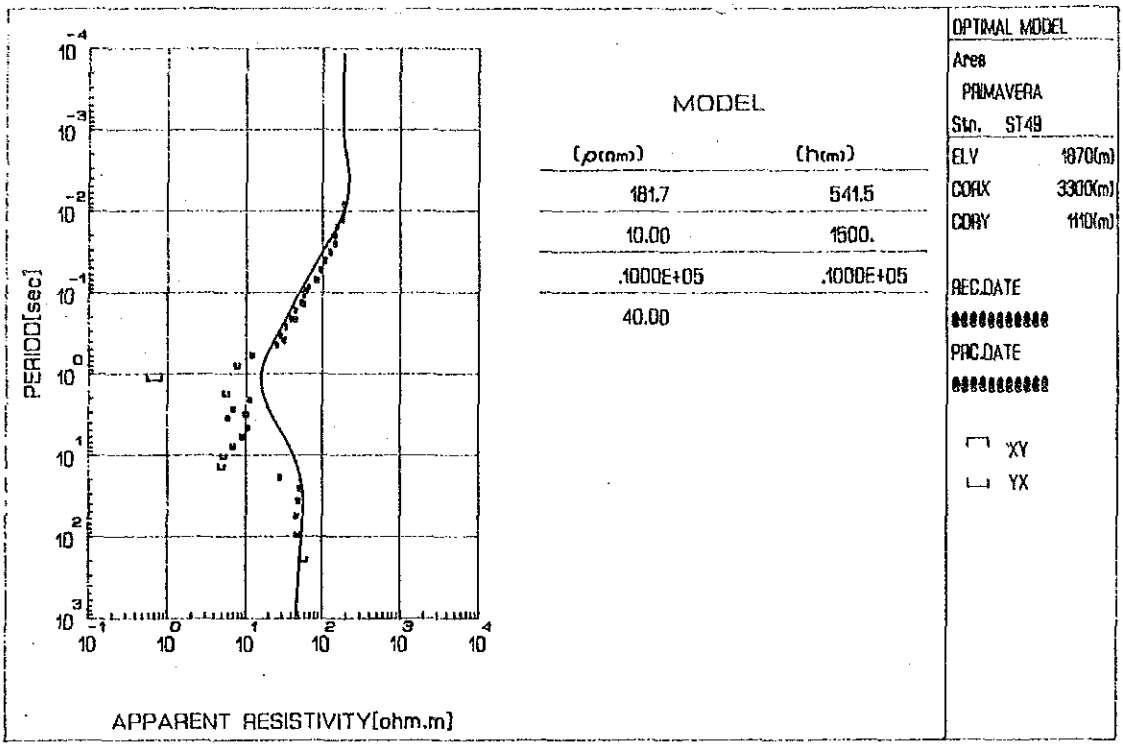

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
254.8 616.2
64.84 360.4
584.7 10.00
27.73 7985.
46.53
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST46
ELV 1820(m)
CORX 1530(m)
CORY 1655(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST46
May 12 1986



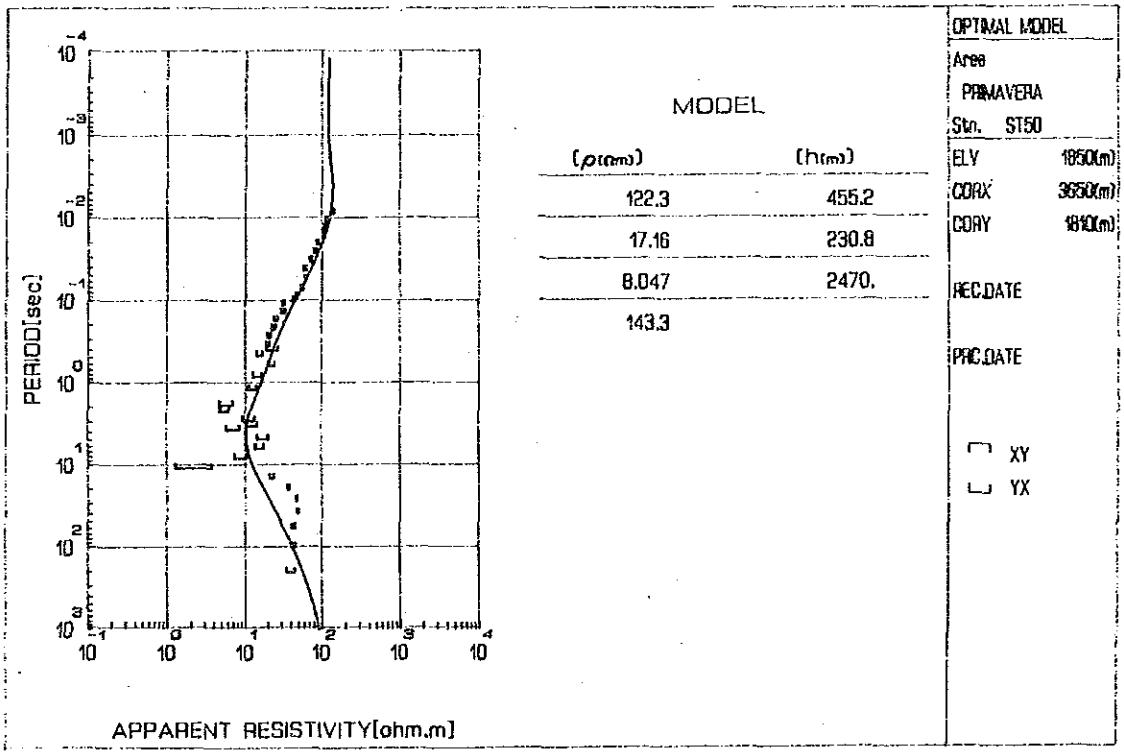
Stn. ST47 May 12 1986



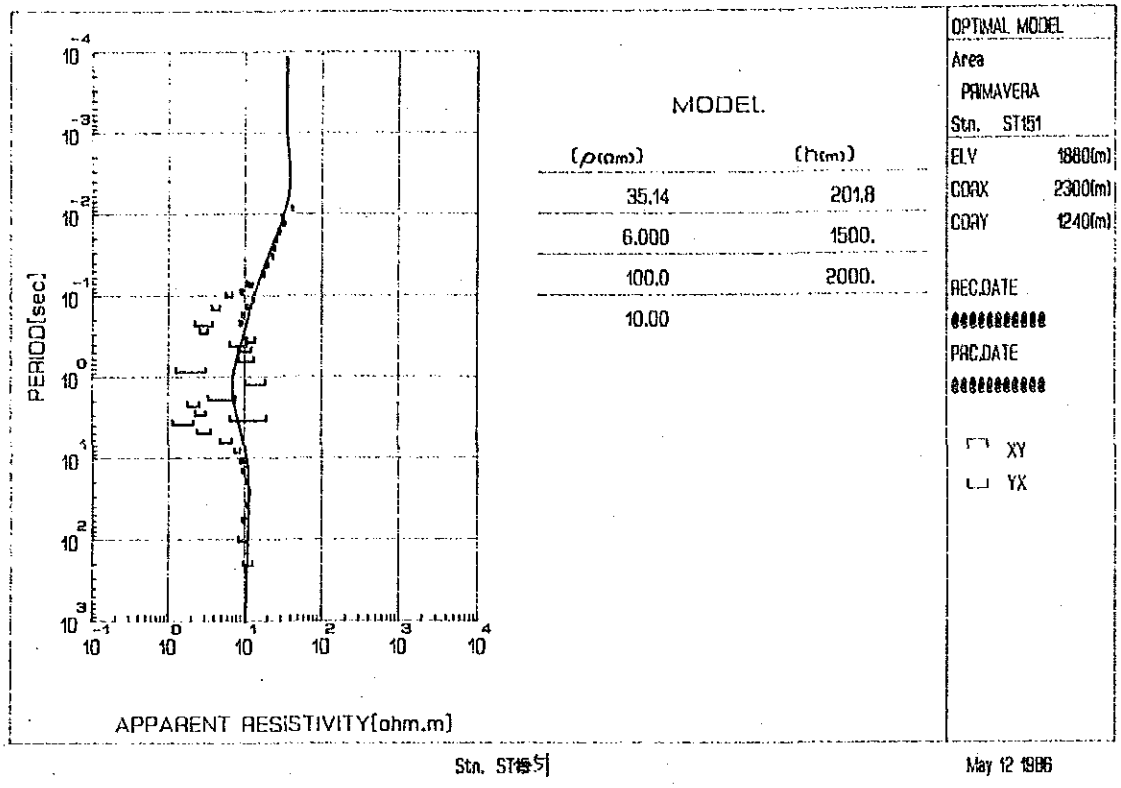
Stn. ST48 May 14 1986

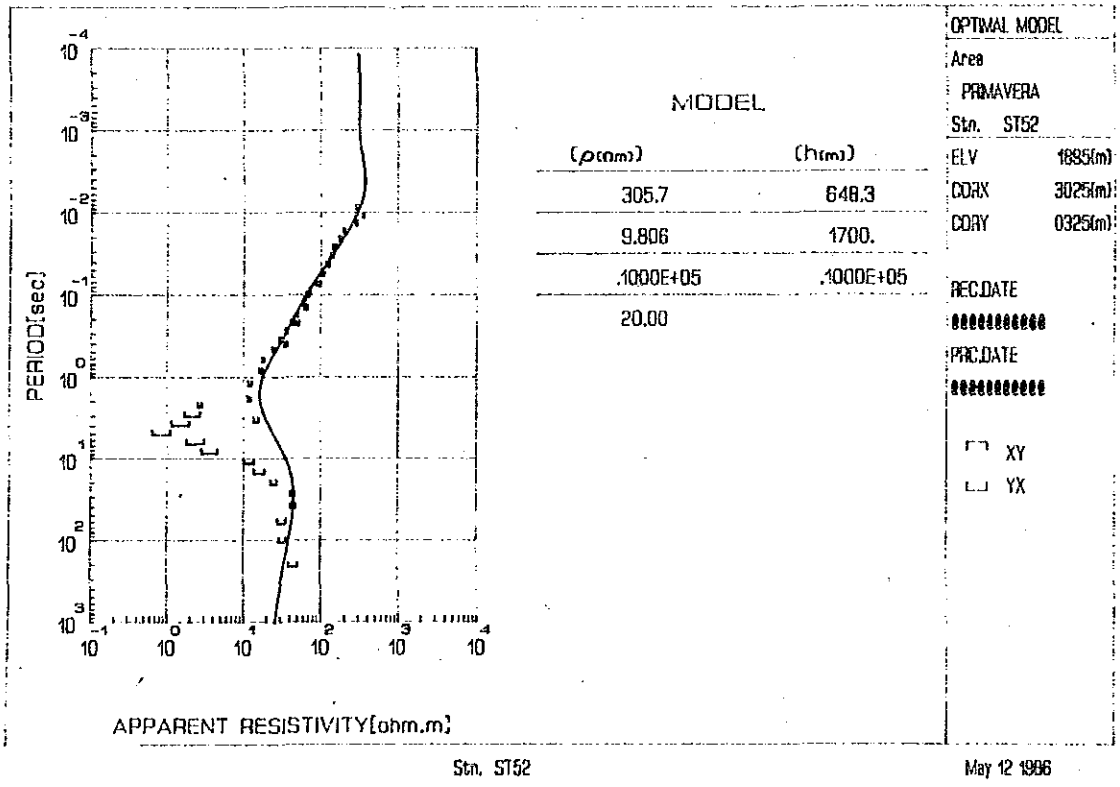


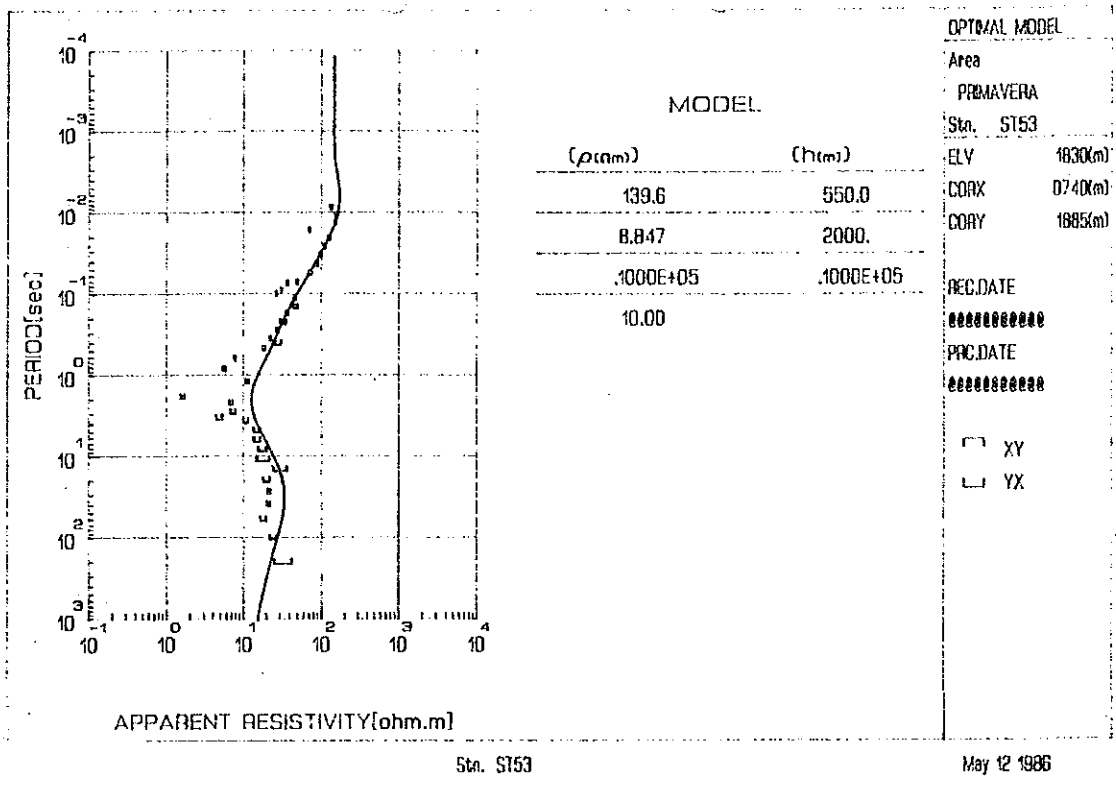
Stn. ST49 May 12 1986

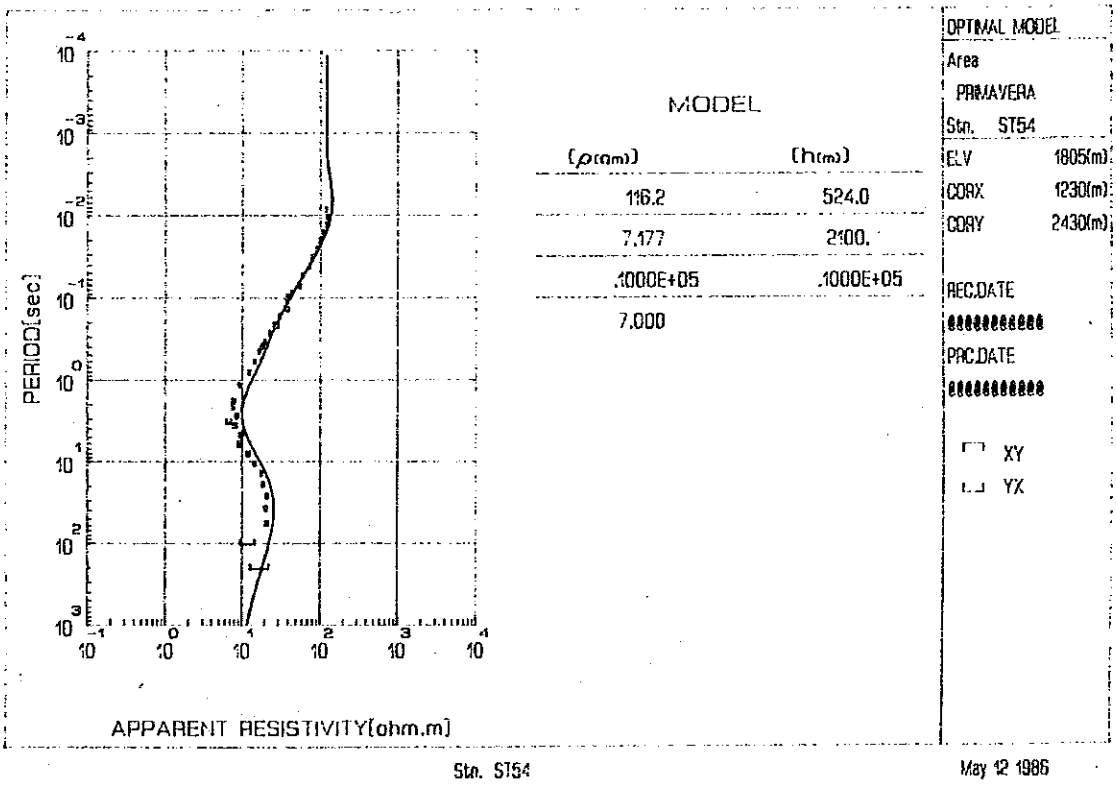


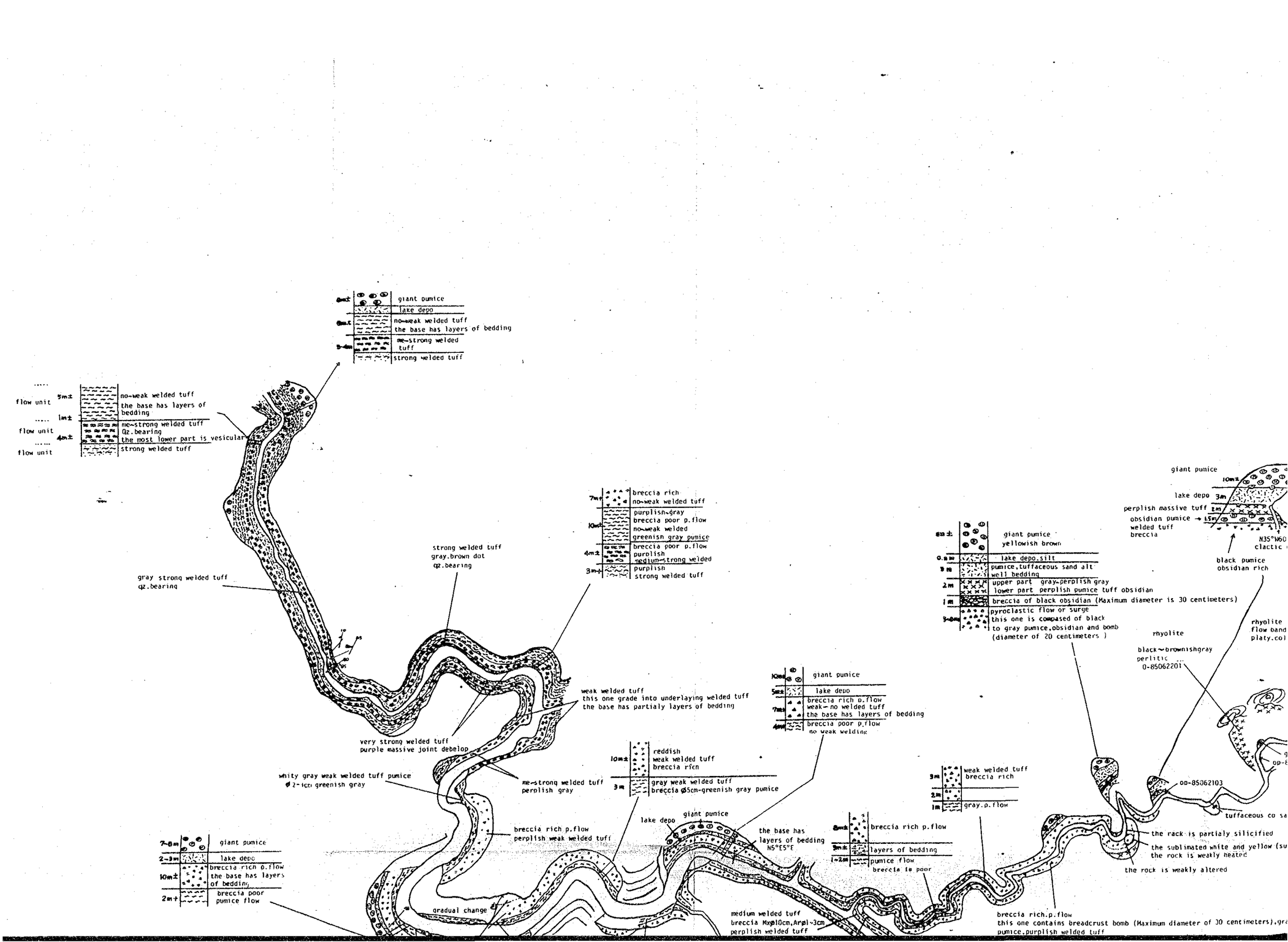
Stn. ST50 May 12 1986

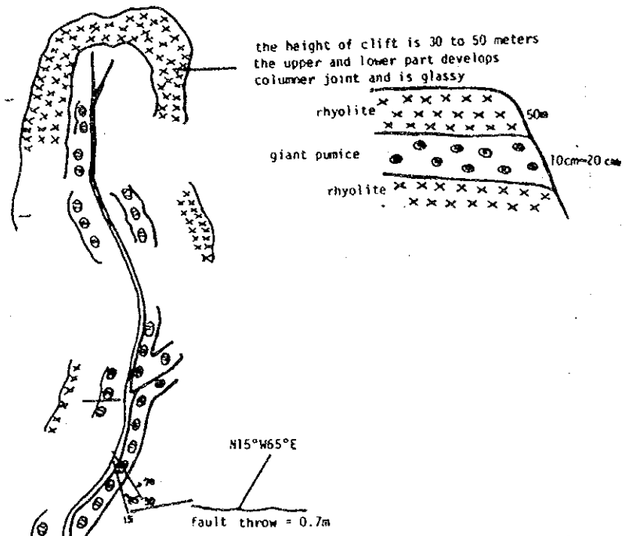

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
35.14 201.8
6.000 1500.
100.0 2000.
10.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST51
ELV 1880(m)
COAX 2300(m)
COAY 1240(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST51
May 12 1996

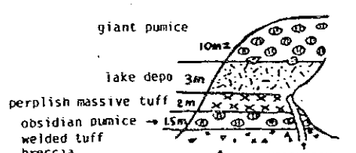

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(Ωm)) (h(m))
305.7 648.3
9.806 1700.
.1000E+05 .1000E+05
20.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST52
ELV 1895(m)
COAX 3025(m)
COAY 0325(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST52
May 12 1996

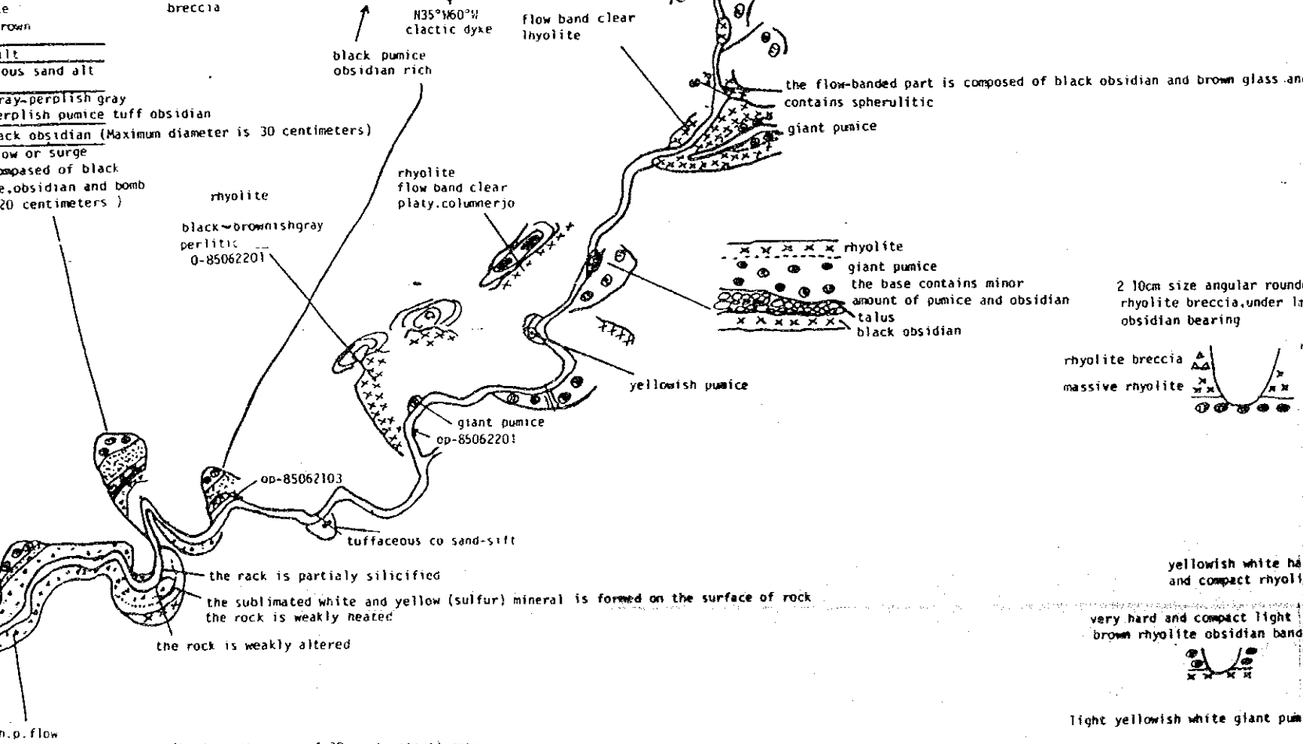

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
139.6 550.0
8.847 2000.
.1000E+05 .1000E+05
10.00
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST53
ELV 1830(m)
CORX 0740(m)
CORY 1885(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST53
May 12 1986

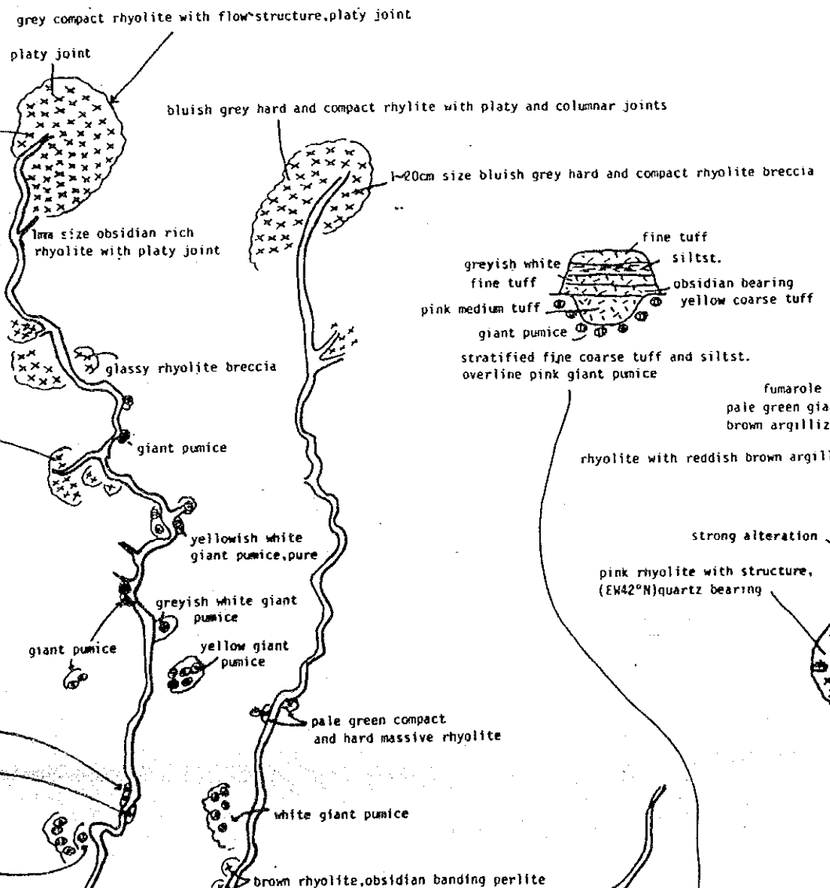

PERIOD[sec]
APPARENT RESISTIVITY[ohm.m]
MODEL
(ρ(ohm)) (h(m))
116.2 524.0
7.177 2900.
.1000E+05 .1000E+05
7.000
OPTIMAL MODEL
Area
PRIMAVERA
Stn. ST54
ELV 1805(m)
CORX 1230(m)
CORY 2430(m)
REC.DATE
PRC.DATE
XY
YX
Stn. ST54
May 12 1986


giant pumice
lake depo
no~weak welded tuff
the base has layers of bedding
me~strong welded
tuff
strong welded tuff
flow unit
no~weak welded tuff
the base has layers of bedding
me~strong welded tuff
Qz.bearing
the most lower part is vesicular
strong welded tuff
breccia rich
no~weak welded tuff
purplish~gray
breccia poor p.flow
no~weak welded
greenish gray pumice
breccia poor p.flow
purplish
medium~strong welded
purplish
strong welded tuff
strong welded tuff
gray.brown dot
qz.bearing
gray strong welded tuff
qz.bearing
weak welded tuff
this one grade into underlaying welded tuff
the base has partialy layers of bedding
very strong welded tuff
purple massive joint debelop
whity gray weak welded tuff pumice
ø2~1cm greenish gray
me~strong welded tuff
perplish gray
reddish
weak welded tuff
breccia rich
gray weak welded tuff
breccia ø5cm~greenish gray pumice
giant pumice
lake depo
breccia rich p.flow
weak~no welded tuff
the base has layers of bedding
breccia poor p.flow
no weak welding
giant pumice
lake depo
breccia rich p.flow
perplish weak welded tuff
lake depo
giant pumice
the base has
layers of bedding
N5°E5°E
giant pumice
lake depo
breccia rich p.flow
the base has layers
of bedding
breccia poor
pumice flow
gradual change
medium welded tuff
breccia Mxø10cm,Avgl~3cm
perplish welded tuff
breccia rich p.flow
layers of bedding
pumice flow
breccia is poor
weak welded tuff
breccia rich
gray.p.flow
giant pumice
yellowish brown
lake depo.silt
pumice,tuffaceous sand alt
well bedding
upper part gray~perplish gray
lower part perplish pumice tuff obsidian
breccia of black obsidian (Maximum diameter is 30 centimeters)
pyroclastic flow or surge
this one is composed of black
to gray pumice,obsidian and bomb
(diameter of 20 centimeters)
giant pumice
lake depo
perplish massive tuff
obsidian pumice
welded tuff
breccia
N35°W60
clactic
black pumice
obsidian rich
rhyolite
rhyolite
flow band
platy.col
black~brownishgray
perlitic
OD-85062201
OD-85062103
tuffaceous co sa
the rock is partialy silicified
the sublimated white and yellow (su
the rock is weakly heated
the rock is weakly altered
breccia rich.p.flow
this one contains breadcrust bomb (Maximum diameter of 30 centimeters),gra
pumice,purplish welded tuff


the height of clift is 30 to 50 meters
the upper and lower part develops
columner joint and is glassy
rhyolite
50m
giant pumice
10cm~20 cm
rhyolite
N15°W65°E
fault throw = 0.7m

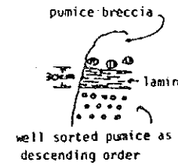

giant pumice
10m±
lake depo 3m
perplish massive tuff 2m
obsidian pumice 1.5m
welded tuff
breccia
N35°W60°W
clactic dyke


black pumice
obsidian rich
flow band clear
lhyolite
the flow-banded part is composed of black obsidian and brown glass and
contains spherulitic
giant pumice
rhyolite
flow band clear
platy.columnerjo
rhyolite
giant pumice
the base contains minor
amount of pumice and obsidian
talus
black obsidian
rhyolite
black~brownishgray
perlitic
0-85062201
yellowish pumice
giant pumice
op-85062201
op-85062103
tuffaceous co sand-sift
the rack is partialy silicified
the sublimated white and yellow (sulfur) mineral is formed on the surface of rock
the rock is weakly heated
the rock is weakly altered


grey compact rhyolite with flow-structure,platy joint
platy joint
columnar joint
bluish grey hard and compact rhylite with platy and columnar joints
1~20cm size bluish grey hard and compact rhyolite breccia
1mm size obsidian rich
rhyolite with platy joint
glassy rhyolite breccia
2 10cm size angular rounded
rhyolite breccia,under 1mm
obsidian bearing
giant pumice
rhyolite breccia
massive rhyolite
yellowish white
giant pumice,pure
greyish white giant
pumice
giant pumice
yellow giant
pumice
yellowish white hard
and compact rhyolite
very hard and compact light
brown rhyolite obsidian banding
pale green compact
and hard massive rhyolite
white giant pumice
light yellowish white giant pumice
brown rhyolite,obsidian banding perlite

fine tuff
greyish white
fine tuff
siltst.
obsidian bearing
pink medium tuff
yellow coarse tuff
giant pumice
stratified fine coarse tuff and siltst.
overline pink giant pumice

fumarole zone at the direction of N20° 30°E
pale green giant pumice with reddish
brown argillization
rhyolite with reddish brown argillization
strong alteration
pink rhyolite with structure,
(EW42°N)quartz bearing
PR-4
N50°W
greyish white pumice
7m
2.5m


pumice breccia
lamin
well sorted pumice as
descending order

joint

t rhylite with platy and columnar joints

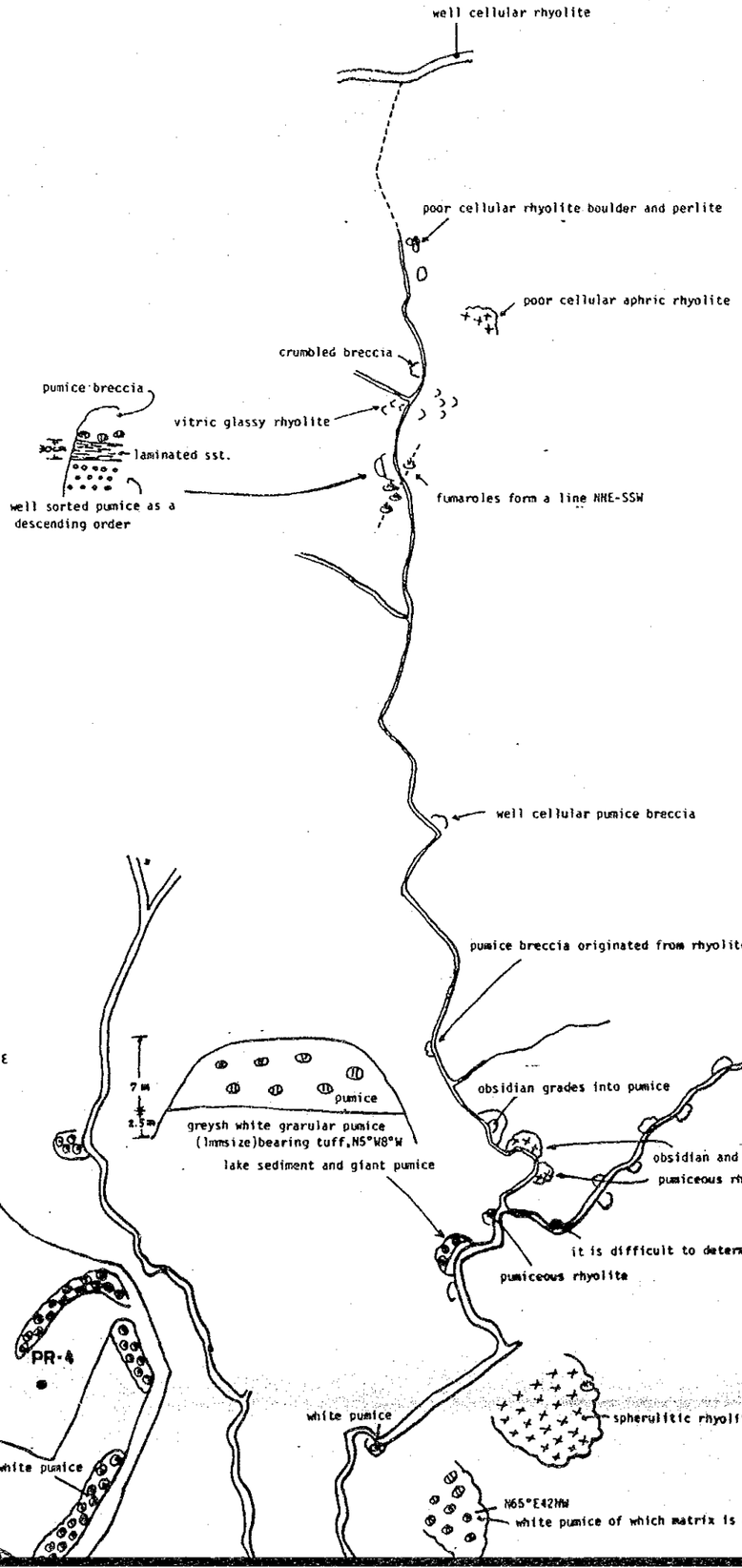
20cm size bluish grey hard and compact rhyolite breccia

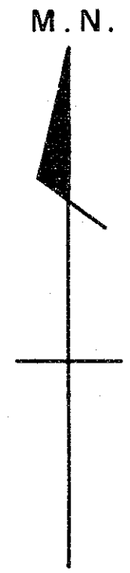
stratified fine coarse tuff and siltst.
overline pink giant pumice

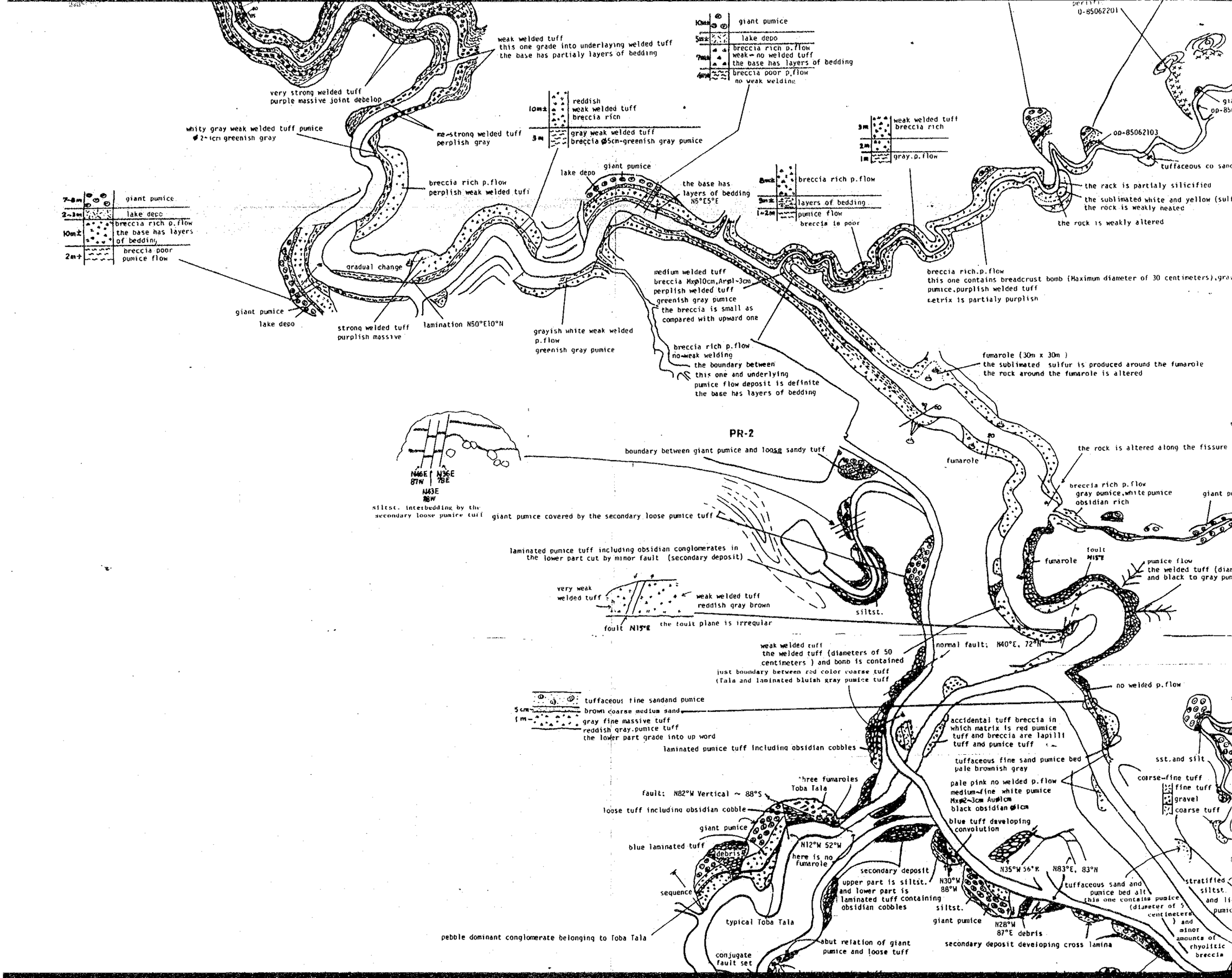
en compact
massive rhyolite

umice

bsidian banding perlite






weak welded tuff
this one grade into underlaying welded tuff
the base has partialy layers of bedding
very strong welded tuff
purple massive joint debelop
white gray weak welded tuff pumice
φ2~1cm greenish gray
~strong welded tuff
perplish gray
breccia rich p.flow
perplish weak welded tuf
giant pumice
lake depo
breccia rich p.flow
the base has layers of bedding
breccia poor
pumice flow
gradual change
giant pumice
lake depo
strong welded tuff
purplish massive
lamination N50°E10°N
reddish
weak welded tuff
breccia rich
gray weak welded tuff
breccia φ5cm-greenish gray pumice
giant pumice
lake depo
breccia rich p.flow
no~weak welded tuff
the base has layers of bedding
breccia poor p.flow
no weak welding
grayish white weak welded
p.flow
greenish gray pumice
the base has
layers of bedding
N5°E5°E
breccia rich p.flow
layers of bedding
pumice flow
breccia is poor
weak welded tuff
breccia rich
gray.p.flow
medium welded tuff
breccia Mxφ10cm,Arφ1~3cm
perplish welded tuff
greenish gray pumice
the breccia is small as
compared with upward one
breccia rich p.flow
no~weak welding
the boundary between
this one and underlying
pumice flow deposit is definite
the base has layers of bedding
op-85062201
op-85062103
tuffaceous co sand
the rock is partialy silicified
the sublimated white and yellow (sul
the rock is weakly neated
the rock is weakly altered
breccia rich.p.flow
this one contains breadcrust bomb (Maximum diameter of 30 centimeters),gra
pumice,purplish welded tuff
matrix is partialy purplish
fumarole (30m x 30m)
the sublimated sulfur is produced around the fumarole
the rock around the fumarole is altered
PR-2
boundary between giant pumice and loose sandy tuff
fumarole
the rock is altered along the fissure
breccia rich p.flow
gray pumice,white pumice
obsidian rich
giant pu
N46E 87W
N36E 78E
N43E 88W
siltst. interbedding by the
secondary loose pumice tuff
giant pumice covered by the secondary loose pumice tuff
laminated pumice tuff including obsidian conglomerates in
the lower part cut by minor fault (secondary deposit)
very weak
welded tuff
weak welded tuff
reddish gray brown
fault N15°E
the fault plane is irregular
siltst.
fault
N15°E
fumarole
pumice flow
the welded tuff (dian
and black to gray pum
weak welded tuff
the welded tuff (diameters of 50
centimeters) and bomb is contained
just boundary between red color coarse tuff
(Tala and laminated bluish gray pumice tuff
normal fault; N40°E, 72°N
no welded p.flow
tuffaceous fine sandand pumice
brown coarse medium sand
gray fine massive tuff
reddish gray.pumice tuff
the lower part grade into up word
5cm
1m
laminated pumice tuff including obsidian cobbles
accidental tuff breccia in
which matrix is red pumice
tuff and breccia are lapilli
tuff and pumice tuff
tuffaceous fine sand pumice bed
pale brownish gray
sst.and silt
three fumaroles
Toba Tala
fault; N82°W Vertical ~ 88°S
loose tuff including obsidian cobble
giant pumice
blue laminated tuff
debris
N12°W 52°W
here is no
fumarole
pale pink no welded p.flow
medium~fine white pumice
Mxφ2~3cm Auφ1cm
black obsidian φ1cm
blue tuff daveloping
convolution
coarse~fine tuff
fine tuff
gravel
coarse tuff
secondary deposit
upper part is siltst.
and lower part is
laminated tuff containing
obsidian cobbles
N30°W
88°W
siltst.
giant pumice
N28°W
87°E debris
N35°W 56°E
N83°E, 83°N
tuffaceous sand and
pumice bed alt
this one contains pumice
(diameter of 5
centimeters
) and
minor
amounts of
rhyolitic
breccia
stratified
siltst.
and li
pumic
sequence
typical Toba Tala
pebble dominant conglomerate belonging to Toba Tala
abut relation of giant
pumice and loose tuff
secondary deposit developing cross lamina
conjugate
fault set

perlitic
0-85062201
rhyolite
giant pumice
the base contains minor amount of pumice and obsidian
talus
black obsidian
yellowish pumice
giant pumice
op-85062201
op-85062103
weak welded tuff breccia rich
gray.p.flow
tuffaceous co sand-silt
the rack is partialy silicified
the sublimated white and yellow (sulfur) mineral is formed on the surface of rock
the rock is weakly heated
the rock is weakly altered
breccia rich.p.flow
this one contains breadcrust bomb (Maximum diameter of 30 centimeters),gray pumice,purplish welded tuff
matrix is partialy purplish
2 10cm size angular rounded rhyolite breccia,under 1am obsidian bearing
rhyolite breccia
massive rhyolite
giant pumice
yellowish white giant pumice,pure
greyish white giant pumice
giant pumice
yellow giant pumice
yellowish white hard and compact rhyolite
very hard and compact light brown rhyolite obsidian banding
pale green compact and hard massive rhyolite
white giant pumice
light yellowish white giant pumice
brown rhyolite,obsidian banding perlite
overline pink giant pumice
fumarole zone at the direction of N
pale green giant pumice with reddish brown argillization
rhyolite with reddish brown argillization
strong alteration
pink rhyolite with structure, (EW42°N)quartz bearing
N50°W
grey
rhyolite
fumarole (30m x 30m)
the sublimated sulfur is produced around the fumarole
the rock around the fumarole is altered
sandy silt
mas.silt
pumiceous sst.
giant pumice
yellowish white giant pumice and white siltst.
white giant pumice
giant pumice
yellow giant pumice
yellowish white giant pumice
obsidian banding rhyolite
white giant pumice
giant pumice
stratified yellow tuff (N42°W12°S)overlation giant pumice
light greyish white giant pumice
white giant pumice
stratified yellow coarse sandy tuff (N85°W14°S)
upper most air fall
rhyolite and perlite boulder
fumarole
the rock is altered along the fissure
breccia rich p.flow
gray pumice,white pumice
obsidian rich
giant pumice
fumarole
fault
N15°E
pumice flow
the welded tuff (diameter of 20 to 30 centimeters) and black to gray pumice(bomb)is contained
laminated silt (sdy)
laminated silt?
fault
granules and silty sst.
very hard vesicular glassy rhyolite obsidian rich, flow structure
perlite(2 25cm size)bearing pumice
giant pumice and grey fine tuff-sst.
vesicular glassy obsidian rich rhyolite,partly columnar joint
light grey hard glassy rhyolite, pumice bearing
white medium tuff
white medium tuff overlain giant pumice
gravel bearing yellow coarse tuff
giant pumice
10~40cm size obsidian rich rhyolite breccia with strong black alteration. margion of rhyolite dome
gray siltst. and pumice
PR-18
20cm size subangular yellowish white~blue rhyolite with strong reddish brown alteration ,fumarole
vesicular glassy rhyolite
pumice
coarse tuff
fine tuff
siltst.
coarse tuff
3.5m
vesicular glassy rhyolite
light yellowish white giant pumice
vesicular glassy rhyolite with sparse obsidian white pumice rhyolite
obsidian overlain by pumice block
normal fault; N40°E, 72°N
no welded p.flow
accidental tuff breccia in which matrix is red pumice tuff and breccia are lapilli tuff and pumice tuff
tuffaceous fine sand pumice bed pale brownish gray
pale pink no welded p.flow medium~fine white pumice Mx@2~3cm Au@1cm black obsidian @1cm
blue tuff developing convolution
N30°W 88°W
N35°W 56°E
N83°E, 83°N
siltst.
giant pumice
N28°W 87°E debris
secondary deposit developing cross lamina
tuffaceous sand and pumice bed alt this one contains pumice (diameter of 5 centimeters) and minor amounts of rhyolitic breccia
stratified siltst. and light yellow pumiceous tuff
fumarole at the direction of N10°W alteration
white alteration of giant pumice
giant pumice
sst.and silt
coarse~fine tuff
fine tuff
gravel
coarse tuff
laminated grey siltst.
conglomerate
light yellow giant pumice overlain siltst. and light yellow pumiceous tuff
stratified greyish white coarse tuff and light grey fine tuff (N18°E6°SE)
alteration stratified coarse grey tuff and gravel (N72°W9°S)
green gravel
coarse yellow tuff (N60°E40°SE)
gravel
loose tuff with gravels of obsidian (over5mmsize),tuff and coarse tuff(5 15cm size)
coarse tuff (N32°E10°NW)
gravel overlain stratified fine and coarse tuff (N40°W,0°)
giant pumice overlain tuff and siltst.(N22°E2°W)
clastik dyke of 1m thick strikes N45°W and dips 73°W
laminated tuffaceous sst.
giant pumice
laminated sst.
laminated granule
pinkish tuff
pinkish tuff breccia
loose pumiceous tuff coarse tuff
gravel
0.5m coarse tuff
2m 0.2 8cm size pumice
cm
50 2~5mm size pumice bearing coarse tuff
60 0.2~1cm size pumice
50 pumice bearing coarse tuff
10 coarse tuff
30 silt bearing coarse tuff
30 fine sandy tuff
landslide originated from fault
altered zone (W=2m?)and fumaroles
2m-wide altered zone
fumarole
N-S crack?
fumarole
fissure of N20°W develops only Toba Tala
altered zone and fumarole form a line of N10°E, 80°W
Toba Tala also cut by fault
medium-hot place
open crack
altered zone 3m wide
fumarole and
white-weak-altered zone
crack
big fault

fumarolic zone at the direction of N20° 30°E

pale green giant pumice with reddish brown argillization

rhyolite with reddish brown argillization

strong alteration

pink rhyolite with structure, (EW42°N)quartz bearing

PR-4

N50°W

greyish white pumice

rhyolite

n compact massive rhyolite

nice

sidian banding perlite

giant pumice

stratified yellow tuff (N42°W12°S)overlation giant pumice

ish white giant pumice

giant pumice

stratified yellow coarse sandy tuff (N85°W14°S)

10-40cm size obsidian rich rhyolite breccia with strong black alteration. margion of rhyolite dome

gray siltst. and pumice

PR-18

giant pumice

cular glassy lite

pumice
coarse tuff
fine tuff
3.5m siltst.
coarse tuff

vesicular glassy rhyolite with sparse obsidian white pumice rhyolite

obsidian overlain by pumice block

7m
2.5m
pumice

greysh white grarular pumice (1mmsize)bearing tuff, N5°W8°W

lake sediment and giant pumice

obsidian grades into pumice

obsidian and rhyolite well developing flow structure

pumiceous rhyolite

it is difficult to determine the rock name because of very strong white alteration, pumice

pumiceous rhyolite

white pumice

spherulitic rhyolite forms fault scarp

N65°E42NW

white pumice of which matrix is amorphous silica having foliations

pumice breccia

rhyolite

vesicular glassy rhyolite with reddish brown alteration

rhyolite breccia

strong alteration

vecicular rhyolite with reddish brown argillization

laminated light gray siltst.

0.5-15cm size dark gray glassy rhyolite breccia, reddish brown argillization

2-15cm size pumice block with strong white alteration

it is difficult to clear the rock name because of strong reddish brown alteration quartz (1mmsize bearring)

light grey glassy rhyolite

fine coarse yellowish grey tuff (lower part) and massive white siltst. (lower part)(85062101)

very hard and massive reddish brown vesicular rhyolite, silicification

white pumice and siltst.

white pumice

pinkish brown granular obsidian banding (5mm widch)rhyolite, (N45°E60°NW)

siltst.

20cm size subangular yellowish white-blue rhyolite with strong reddish brown alteration, fumarole

obsidian rich rhyolite with flow structure

fumarole

rhyolite

vesicular glassy rhyolite (N20° 30°W)N30°E42°W N20°E38°W

grey glassy vesicular rhyolite with flow structure (N8E50W)

4mmsize brown

visicular glassy rhyolite

eight pink

NO. 21, rhyolite overlain by giant pumice

rhyolite overlain by giant pumice

siltst.

sst. and pumice belong to the upper part of lake sediment

pumice block with reddish brown alteration

eight bruish white rhyolite with strong alteration, quartz(1mm size)rich

reddish brown alteration

giant pumice contains breccia of obsidian and rhyolite

giant pumice, siltst, and rhyolite

rhyolite body

normal sediment underlain by giant pumice coninues parking place

the same contact of NO. 21

the nothern wing of anticline, N64°E, 2°NW

siltst. contains pebble size pumice in the lower part

boundary between lake sediment and giant pumice without obsidian

giant pumice contains breccia of obsidian

rhythmically thin bedded siltst. and fine tuff which orientation is N40°W, 7°SW

fresh or pumiceous rhyolite showing block

rhyolite

obsidian having flow structure of N70°W

obsidian

spherulite and obsidian developing flow structure

flow structure of spherulite is N70°W, 48°W

pumice

an alternation of fresh obsidian and spherulite block

obsidian showing flow structure

rhyolite, sst. and pumice

rhyolite of which foliation is N60°W, 86°W

spherulite having foliation of N44°W, 58°NE

fumaroles form a line of N60°E

a conjugate set of N40°W, 58°E and N40°W, 77°W

loose pumice tuff including pebble to granule pumice and lithic fragment

pumiceous sst to gravel containing lithic fragment

NO. 23, an alternation of sst. and siltst.

massive tuff overlain by NO. 23

white massive and laminated taffaceous siltst. containing rhyolite breccia

laminated sst. underlain bu massive tuffaceous silt containing rhyolite fragment

landslide originated from fault

2m-wide alteredzone

altered zone (W=2m?)and fumaroles

fumarole

N-S crack?

fumarole

conjugate set

altered zone 0.3m(?)

laminated silt(5m+)

fault accompanied by slicken side

giant pumice

white-weak altered zone

crack

small graben

the boundary between loose sst. and hard siltst. having the orientation of N26°E, 75°E

the upper part of giant pumice

the same outcrop of NO. 24

laminated pumice tuff and sst.

white massive tuff extends

hard siltst.

massive tuff underlain by pumice tuff including rhyolite breccia and large pumice

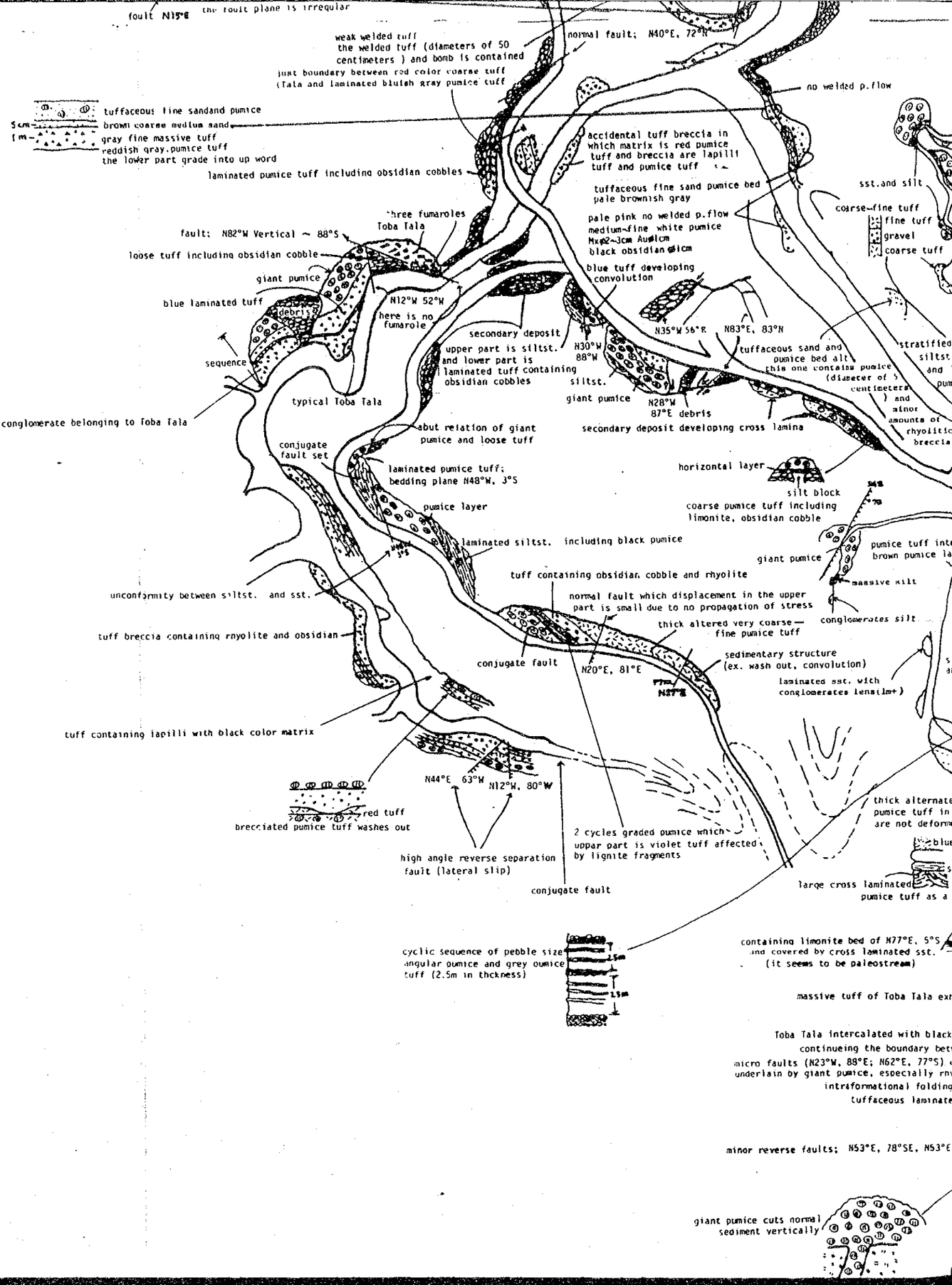
altered zone 3m wide

fumarole and 2m-wide altered zone

big fault

4m-wide altered zone

open crack .6m-wide


fault N15°E
the fault plane is irregular
weak welded tuff
the welded tuff (diameters of 50 centimeters) and bomb is contained
just boundary between red color coarse tuff (Tala and laminated bluish gray pumice tuff
normal fault; N40°E, 72°W
no welded p.flow
tuffaceous fine sandand pumice
brown coarse medium sand
gray fine massive tuff
reddish gray,pumice tuff
the lower part grade into up word
laminated pumice tuff including obsidian cobbles
accidental tuff breccia in which matrix is red pumice tuff and breccia are lapilli tuff and pumice tuff
tuffaceous fine sand pumice bed pale brownish gray
pale pink no welded p.flow medium~fine white pumice Mx@2~3cm Au@1cm black obsidian@1cm
sst.and silt
coarse~fine tuff
fine tuff
gravel
coarse tuff
three fumaroles Toba Tala
fault; N82°W Vertical ~ 88°S
loose tuff including obsidian cobble
giant pumice
blue laminated tuff
debris
N12°W 52°W
here is no fumarole
blue tuff developing convolution
secondary deposit
upper part is siltst. and lower part is laminated tuff containing obsidian cobbles
N35°W 56°E
N83°E, 83°N
N30°W 88°W
tuffaceous sand and pumice bed alt
this one contains pumice (diameter of 5 centimeters) and minor amounts of rhyolitic breccia
stratified siltst and pum
sequence
typical Toba Tala
siltst.
giant pumice
N28°W 87°E debris
pebble dominant conglomerate belonging to Toba Tala
about relation of giant pumice and loose tuff
secondary deposit developing cross lamina
conjugate fault set
laminated pumice tuff; bedding plane N48°W, 3°S
horizontal layer
silt block
pumice layer
coarse pumice tuff including limonite, obsidian cobble
laminated siltst. including black pumice
pumice tuff int brown pumice la
giant pumice
tuff containing obsidian cobble and rhyolite
massive silt
unconformity between siltst. and sst.
normal fault which displacement in the upper part is small due to no propagation of stress
conglomerates silt
thick altered very coarse— fine pumice tuff
tuff breccia containing rhyolite and obsidian
conjugate fault
N20°E, 81°E
N37°E
sedimentary structure (ex. wash out, convolution)
laminated sst. with conglomerates lens(1m+)
tuff containing lapilli with black color matrix
N44°E 63°W
N12°W, 80°W
thick alternate pumice tuff in are not deform
red tuff
brecciated pumice tuff washes out
2 cycles graded pumice which upper part is violet tuff affected by lignite fragments
high angle reverse separation fault (lateral slip)
conjugate fault
large cross laminated pumice tuff as a
cyclic sequence of pebble size angular pumice and grey pumice tuff (2.5m in thickness)
2.5m
1.5m
containing limonite bed of N77°E, 5°S and covered by cross laminated sst. (it seems to be paleostream)
massive tuff of Toba Tala ex
Toba Tala intercalated with black
continueing the boundary bet
micro faults (N23°W, 88°E; N62°E, 77°S)
underlain by giant pumice, especially rh
intraformational folding
tuffaceous laminate
minor reverse faults; N53°E, 78°SE, N53°E
giant pumice cuts normal sediment vertically

normal fault; N40°E, 72°W

no welded p.flow

accidental tuff breccia in which matrix is red pumice tuff and breccia are lapilli tuff and pumice tuff

tuffaceous fine sand pumice bed pale brownish gray

pale pink no welded p.flow medium~fine white pumice Mx@2~3cm Au@1cm black obsidian @1cm

blue tuff developing convolution

N35°W 56°E

N83°E, 83°N

N30°W 88°W

N28°W 87°E debris

tuffaceous sand and pumice bed alt this one contains pumice (diameter of 5 centimeters) and minor amounts of rhyolitic breccia

secondary deposit developing cross lamina

giant pumice

siltst.

horizontal layer

silt block

coarse pumice tuff including limonite, obsidian cobble

pumice tuff intercalated with brown pumice layer of several cm

massive silt

conglomerates silt

giant pumice

cross laminated sst.

normal fault which displacement in the upper part is small due to no propagation of stress

thick altered very coarse~fine pumice tuff

N20°E, 81°E

sedimentary structure (ex. wash out, convolution)

laminated sst. with conglomerates lens(1m+)

2 cycles graded pumice which upper part is violet tuff affected by lignite fragments

conjugate fault

thick alternated pebble size pumice and pumice tuff in high cliff (15m in height) are not deformed

blue tuffaceous sst.

siltst.

large cross laminated pumice tuff as a descending order.

containing limonite bed of N77°E, 5°S and covered by cross laminated sst. (it seems to be paleostream)

massive tuff of Toba Tala exhibits red color near the paleo-surface

Toba Tala intercalated with black vitric tuff breccia

continueing the boundary between giant pumice and sandy tuff

micro faults (N23°W, 88°E; N62°E, 77°S) develop on siltst. underlain by giant pumice, especially rhysmic laminated hard shale

intraformational folding and minor faults

tuffaceous laminated siltst.

minor reverse faults; N53°E, 78°SE, N53°E, 70°NW

giant pumice cuts normal sediment vertically

normal fault; N50°E, 82°E

siltst.

open fracture (N56°W, 88°N) develops within Toba Tala

contact between Toba Tala and giant pumice

minor faults cut only the Toba Tala

syncline

thinning of irregular surface of Toba Tala

fault breccia

conjugate step faults

fumarole emits from fault

pyroclastic flow including boulder size tuff block

siltst.

fine tuff and siltst. underlain by giant pumice

limonite percolates

giant pumice continues

folded siltst.

siltst.

fault of N32°E 65°W without fumarole

overlain by laminated pumice tuff and pumice block

paraconformable

siltst.

pumiceous sand intercalating 0.3

reworked materials

siltst, giant pumice and loose sst.

PR-8

PR-1

conjugate fault

light gray laminated fine tuff~silt

minor normal fault of N45°E, 68°E

giant pumice is underlain by well laminated fine tuff and pumice tuff

large scale cross laminated sst. and tuff

many minor normal fault, representative one is N30°W, 70°E

debris

bedding is N62°E, 20°N

laminated sst cut by clastic dyke

red matrix tuff breccia

boundary between Toba Tala and sst.

rhysmic laminated tuff

giant pumice as a ascending order

blue~yellow laminated sst.

tuff

pumice tuff

extention of N015 fault; N32°E, 72°SE

just boundary between massive red tuff and laminated pumice of which basal part consists of basal breccia

blue sst. developing ripple marker

conjugate fault

siltst. forming a syncline contacts giant pumice block

sandy tuff and red tuff breccia including pebble size pumice as a descending order

giant pumice

siltst.

pumice bearing

loose pumiceous tuff coarse tuff

gravel

fumarole at the direction of N10°W alteration

white alteration of giant pumice

giant pumice

sst.and silt

coarse~fine tuff

fine tuff

gravel

coarse tuff

laminated grey siltst.

green gravel

coarse yellow tuff (N60°E40°SE)

gravel

alteration stratified coarse grey tuff and gravel (N72°W9°S)

conglomerate

light yellow giant pumice overlain siltst. and light yellow pumiceous tuff

stratified greyish white coarse tuff and light grey fine tuff (N18°E6°SE)

loose tuff with gravels of obsidian (over5mmsize),tuff and coarse tuff(5 15cm size)

coarse tuff (N32°E10°NW)

gravel overlain stratified fine and coarse tuff (N40°W,0°)

giant pumice overlain tuff and siltst.(N22°E2°W)

clastik dyke of 1m thick strikes N65°W and dips 73°W

laminated medium tuff

laminated tuffaceous sst. gentle cross bedding pal.curr.540°W

laminated siltst.

stratified siltst. and light yellow pumiceous tuff

0.5m coarse tuff

2m 0.2 8cm size pumice

vesicular glassy rhyolite

light yellowish white giant pumice

vesicular glassy rhyolite

giant pumice

pumice

coarse tuff

fine tuff

siltst.

coarse tuff

3.5m

cm

50 2~5mm size pumice bearing coarse tuff

60 0.2~1cm size pumice

50 pumice bearing coarse tuff

10 coarse tuff

30 silt bearing coarse tuff

30 fine sandy tuff

giant pumice

laminated sst.

laminated granule

pinkish tuff

pinkish tuff breccia

4~5m-thick silt and sst.

4m-thick silt and sst.

1m-wide altered zone

Toba Tala also cut by fault

altertd zone W=3m

giant pumice plunges southward and slides to Toba Tala

altered zone land-slided

0.3m altered zone 3m-wide

normal separation fault of N30°E, 60°E cuts giant pumice

C7m-thick sst. and silt

conglomerates(6m+): lower boundary with channel structure upper 2m part:cross bedding gray sst.

pumiceous sst.

pumiceous sst. intercalating pumice layers

pumiceous layer

gravel layer

laminated silt

channel structure

conglomerates with brown loamy matrix c.4m

on-land(?)air-fall small pumice and pumiceous sand

fumarole and altered zone

fumarole and altered zone(W=5m)

massive fine tuff(silt)and laminated silt displ 3m+?

interfingering zone

altered zone 1m

reworked materials

fissure of N20°W develops only Toba Tala

altered zone and fumarole form a line of N10°E, 80°W

medium~hot place

altered zone W=3m

open crack 0.6m-wide

2m-wide

1.5m-wide

altered zone

0.6m-wide

fumarole

N-S crack?

fumarole

2m-wide alteredzone

altered zone (W=2m?)and fumaroles

landslide originated from fault

altered zone 3m wide

fumarole and 2m-wide altered zone

4m-wide altered zone

big fault

white-weak-altered zone

crack

giant pumice

the boundar

loose sst.

siltst. ha

orientat

N26°E.

PR-8

weak-altered

stratified fine tuff

fine sandy silt

PR-5

altered zone

pale brown fine laminated si

gray partly tuff

silt

clastic dike

giant pumice

W=2m

of fumarol

laminated silt?

perlite lens 3x8m in siltst

giant pumice

stratified(banded) silt

vesicular glassy rhyoli

(N20° 30°W)N30°E42°W N20°E

4mmsize brown

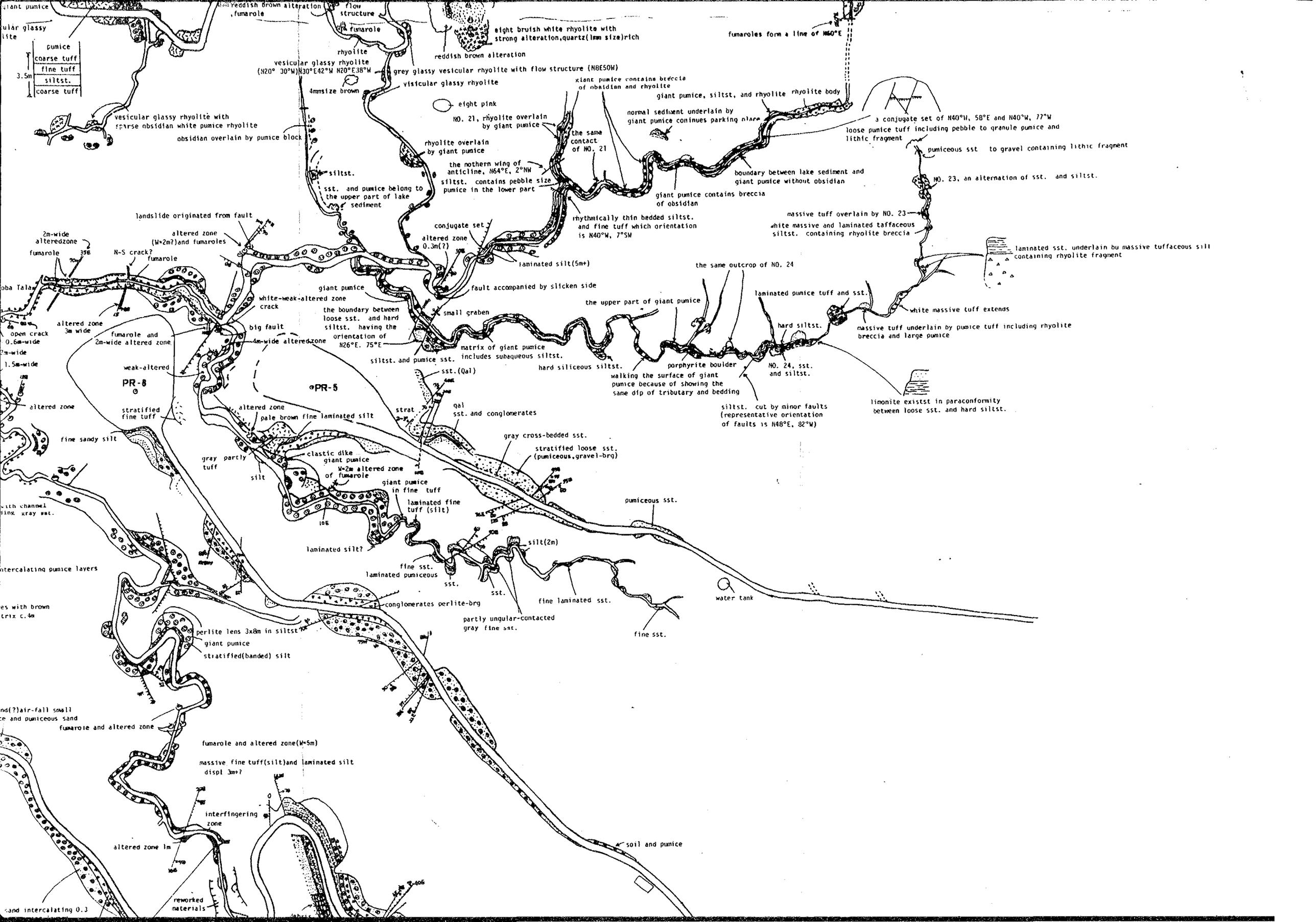
obsidian overlain by pumice block

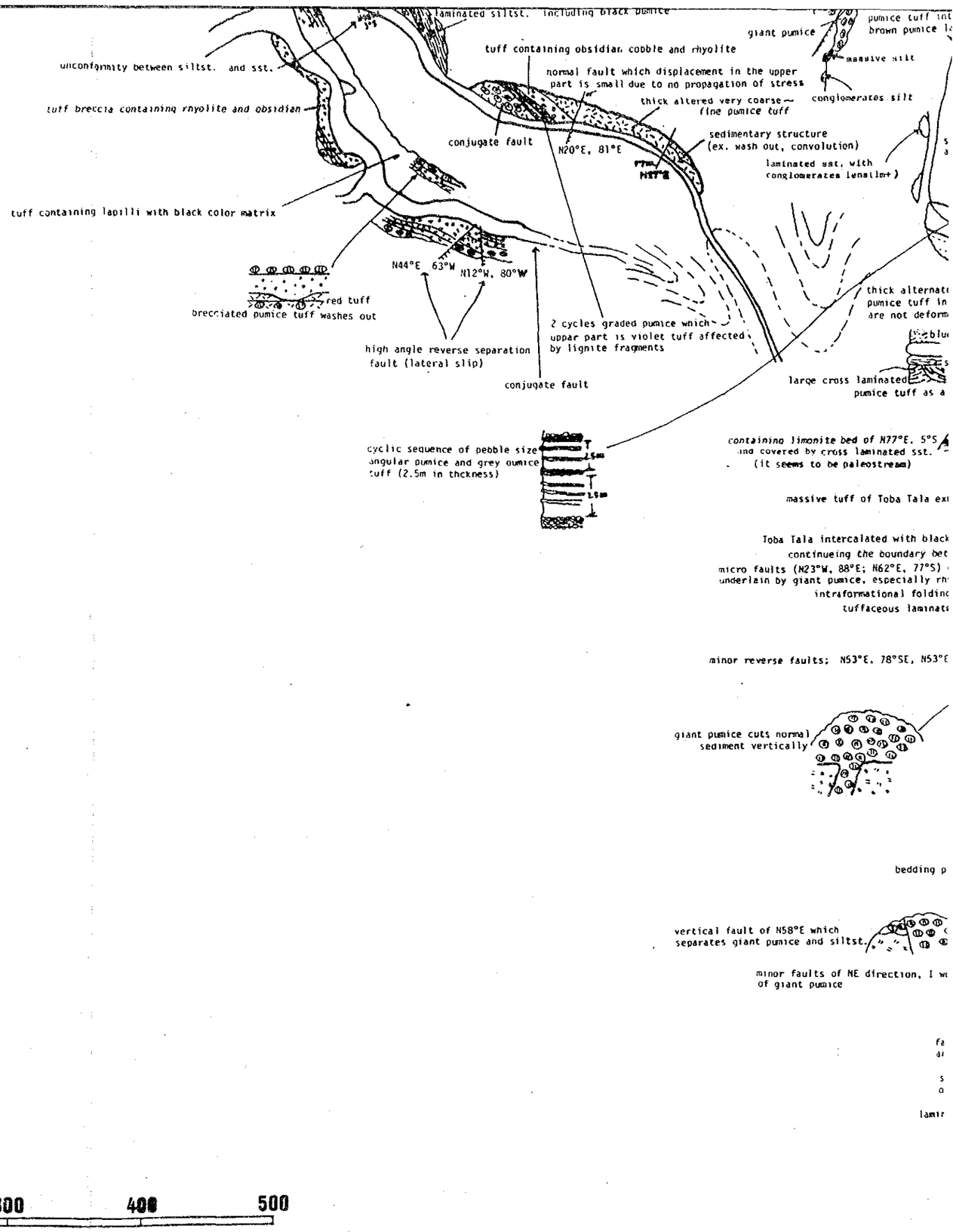
siltst.

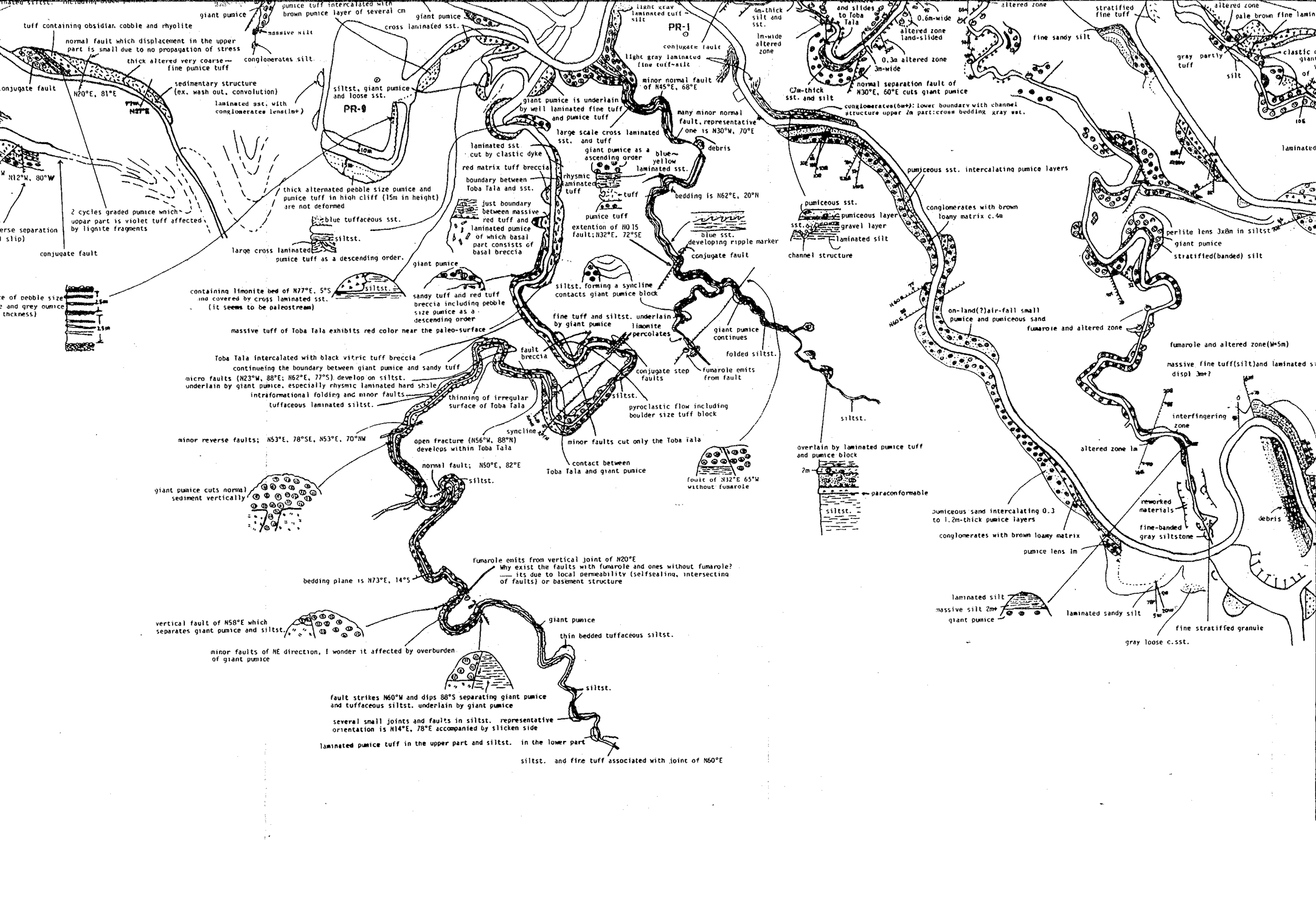
sst. and

the upper

sed


giant pumice
ular glassy
lite
pumice
coarse tuff
fine tuff
siltst.
coarse tuff
3.5m
vesicular glassy rhyolite with
coarse obsidian white pumice rhyolite
obsidian overlain by pumice block
reddish brown alteration
, fumarole
flow
structure
fumarole
rhyolite
vesicular glassy rhyolite
(N20° 30°W)N30°E42°W N20°E38°W
4mmsize brown
visicular glassy rhyolite
reddish brown alteration
eight bruish white rhyolite with
strong alteration,quartz(1mm size)rich
fumaroles form a line of N60°E
grey glassy vesicular rhyolite with flow structure (N8E50W)
eight pink
NO. 21, rhyolite overlain
by giant pumice
rhyolite overlain
by giant pumice
siltst.
sst. and pumice belong to
the upper part of lake
sediment
xiant pumice contains breccia
of obsidian and rhyolite
giant pumice, siltst, and rhyolite
rhyolite body
normal sediment underlain by
giant pumice coninues parking place
the same
contact
of NO. 21
the nothern wing of
anticline, N64°E, 2°NW
siltst. contains pebble size
pumice in the lower part
boundary between lake sediment and
giant pumice without obsidian
giant pumice contains breccia
of obsidian
rhythmically thin bedded siltst.
and fine tuff which orientation
is N40°W, 7°SW
a conjugate set of N40°W, 58°E and N40°W, 77°W
loose pumice tuff including pebble to granule pumice and
lithic fragment
pumiceous sst to gravel containing lithic fragment
NO. 23, an alternation of sst. and siltst.
massive tuff overlain by NO. 23
white massive and laminated taffaceous
siltst. containing rhyolite breccia
laminated sst. underlain bu massive tuffaceous sill
containing rhyolite fragment
landslide originated from fault
altered zone
(W=2m?)and fumaroles
conjugate set
altered zone
0.3m(?)
laminated silt(5m+)
2m-wide
alteredzone
fumarole
N-S crack?
fumarole
oba Talas
giant pumice
fault accompanied by slicken side
the same outcrop of NO. 24
laminated pumice tuff and sst.
white massive tuff extends
massive tuff underlain by pumice tuff including rhyolite
breccia and large pumice
white-weak-altered zone
crack
small graben
the upper part of giant pumice
hard siltst.
altered zone
3m wide
fumarole and
2m-wide altered zone
big fault
4m-wide altered zone
the boundary between
loose sst. and hard
siltst. having the
orientation of
N26°E. 75°E
matrix of giant pumice
includes subaqueous siltst.
siltst. and pumice sst.
hard siliceous siltst.
porphyrite boulder
walking the surface of giant
pumice because of showing the
same dip of tributary and bedding
NO. 24, sst.
and siltst.
siltst. cut by minor faults
(representative orientation
of faults is N48°E, 82°W)
limonite existst in paraconformity
between loose sst. and hard siltst.
open crack
0.6m-wide
2m-wide
1.5m-wide
weak-altered
PR-8
PR-5
sst.(Qal)
altered zone
stratified
fine tuff
altered zone
pale brown fine laminated silt
strat
qal
sst. and conglomerates
fine sandy silt
gray cross-bedded sst.
stratified loose sst.
(pumiceous,gravel-brg)
gray partly
tuff
silt
clastic dike
giant pumice
W=2m altered zone
of fumarole
giant pumice
in fine tuff
laminated fine
tuff (silt)
pumiceous sst.
laminated silt?
silt(2m)
fine sst.
laminated pumiceous
sst.
sst.
fine laminated sst.
water tank
conglomerates perlite-brg
partly ungular-contacted
gray fine sst.
fine sst.
perlite lens 3x8m in siltst
giant pumice
stratified(banded) silt
fumarole and altered zone
fumarole and altered zone(W=5m)
massive fine tuff(silt)and laminated silt
displ 3m+?
interfingering
zone
altered zone 1m
soil and pumice
reworked
materials


laminated siltst. including black pumice
unconformity between siltst. and sst.
tuff breccia containing rhyolite and obsidian
tuff containing lapilli with black color matrix
red tuff
brecciated pumice tuff washes out
high angle reverse separation fault (lateral slip)
N44°E 63°W
N12°W, 80°W
conjugate fault
tuff containing obsidian cobble and rhyolite
normal fault which displacement in the upper part is small due to no propagation of stress
conjugate fault
N20°E, 81°E
thick altered very coarse — fine pumice tuff
sedimentary structure (ex. wash out, convolution)
2 cycles graded pumice which uppar part is violet tuff affected by lignite fragments
cyclic sequence of pebble size angular pumice and grey pumice tuff (2.5m in thckness)
2.5m
2.5m
giant pumice
massive silt
conglomerates silt
laminated sst. with conglomerates lens(lm+)
large cross laminated
pumice tuff as a
containing limonite bed of N77°E, 5°S
and covered by cross laminated sst.
(it seems to be paleostream)
massive tuff of Toba Tala ex
Toba Tala intercalated with black
continueing the boundary bet
micro faults (N23°W, 88°E; N62°E, 77°S)
underlain by giant pumice, especially rh
intraformational foldinc
tuffaceous laminat
minor reverse faults; N53°E, 78°SE, N53°E
giant pumice cuts normal sediment vertically
bedding p
vertical fault of N58°E which separates giant pumice and siltst.
minor faults of NE direction, I w
of giant pumice
0
100
200
300
400
500


tuff containing obsidian cobble and rhyolite
normal fault which displacement in the upper part is small due to no propagation of stress
thick altered very coarse — fine pumice tuff
sedimentary structure (ex. wash out, convolution)
laminated sst. with conglomerates lens(1m+)
conjugate fault
N20°E, 81°E
N27°E
N12°W, 80°W
2 cycles graded pumice which upper part is violet tuff affected by lignite fragments
conjugate fault
giant pumice
massive silt
conglomerates silt
pumice tuff intercalated with brown pumice layer of several cm
giant pumice
cross laminated sst.
siltst, giant pumice and loose sst.
PR-9
10m
15m
thick alternated pebble size pumice and pumice tuff in high cliff (15m in height) are not deformed
blue tuffaceous sst.
siltst.
large cross laminated pumice tuff as a descending order.
giant pumice
siltst.
containing limonite bed of N77°E, 5°S and covered by cross laminated sst. (it seems to be paleostream)
massive tuff of Toba Tala exhibits red color near the paleo-surface
Toba Tala intercalated with black vitric tuff breccia
continueing the boundary between giant pumice and sandy tuff
micro faults (N23°W, 88°E; N62°E, 77°S) develop on siltst.
underlain by giant pumice, especially rhysmic laminated hard shale
intraformational folding and minor faults
tuffaceous laminated siltst.
minor reverse faults; N53°E, 78°SE, N53°E, 70°NW
giant pumice cuts normal sediment vertically
open fracture (N56°W, 88°N) develops within Toba Tala
normal fault; N50°E, 82°E
siltst.
bedding plane is N73°E, 14°S
fumarole emits from vertical joint of N20°E
Why exist the faults with fumarole and ones without fumarole? — its due to local permeability (selfsealing, intersecting of faults) or basement structure
vertical fault of N58°E which separates giant pumice and siltst.
minor faults of NE direction, I wonder it affected by overburden of giant pumice
giant pumice
thin bedded tuffaceous siltst.
siltst.
fault strikes N60°W and dips 88°S separating giant pumice and tuffaceous siltst. underlain by giant pumice
several small joints and faults in siltst. representative orientation is N14°E, 78°E accompanied by slicken side
laminated pumice tuff in the upper part and siltst. in the lower part
siltst. and fire tuff associated with joint of N60°E
giant pumice
cross laminated sst.
light gray laminated tuff~silt
PR-1
conjugate fault
light gray laminated fine tuff~silt
minor normal fault of N45°E, 68°E
giant pumice is underlain by well laminated fine tuff and pumice tuff
large scale cross laminated sst. and tuff
many minor normal fault, representative one is N30°W, 70°E
debris
laminated sst cut by clastic dyke
red matrix tuff breccia
boundary between Toba Tala and sst.
giant pumice as a ascending order
blue~yellow laminated sst.
rhysmic laminated tuff
tuff
pumice tuff
extention of NO 15 fault; N32°E, 72°SE
bedding is N62°E, 20°N
just boundary between massive red tuff and laminated pumice of which basal part consists of basal breccia
blue sst.
developing ripple marker
conjugate fault
siltst. forming a syncline contacts giant pumice block
sandy tuff and red tuff breccia including pebble size pumice as a descending order
fine tuff and siltst. underlain by giant pumice
limonite percolates
giant pumice continues
folded siltst.
fault breccia
conjugate step faults
fumarole emits from fault
thinning of irregular surface of Toba Tala
siltst.
pyroclastic flow including boulder size tuff block
syncline
minor faults cut only the Toba tala
contact between Toba Tala and giant pumice
siltst.
overlain by laminated pumice tuff and pumice block
2m
paraconformable
siltst.
fault of N32°E 65°W without fumarole
4m-thick silt and sst.
1m-wide altered zone
and slides to Toba Tala
0.6m-wide altered zone land-slided
0.3a altered zone 3m-wide
normal separation fault of N30°E, 60°E cuts giant pumice
C2m-thick sst. and silt
conglomerates(6m+): lower boundary with channel structure upper 2m part: cross bedding gray sst.
pumiceous sst. intercalating pumice layers
pumiceous sst.
pumiceous layer
gravel layer
laminated silt
channel structure
conglomerates with brown loamy matrix c.4m
altered zone
stratified fine tuff
fine sandy silt
gray partly tuff
altered zone
pale brown fine lamin
clastic
giant
silt
of
laminated
perlite lens 3x8m in siltst
giant pumice
stratified(banded) silt
on-land(?)air-fall small pumice and pumiceous sand
fumarole and altered zone
fumarole and altered zone(W=5m)
massive fine tuff(silt)and laminated si
displ 3m+?
interfingering zone
altered zone 1m
pumiceous sand intercalating 0.3 to 1.2m-thick pumice layers
conglomerates with brown loamy matrix
pumice lens 1m
reworked materials
fine-banded gray siltstone
debris
laminated silt
massive silt 2m+
giant pumice
laminated sandy silt
fine stratiffed granule
gray loose c.sst.

altered zone
stratified fine tuff
fine sandy silt
with channel
ding gray sst.
ntercalating pumice layers
es with brown
trix c.4m
nd(?)air-fall small
e and pumiceous sand
fumarole and altered zone
sand intercalating 0.3
nick pumice layers
erates with brown loamy matrix
pumice lens 1m
nated silt
silt 2m+
pumice
altered zone
pale brown fine laminated silt
gray partly tuff
silt
clastic dike
giant pumice
W=2m altered zone of fumarole
giant pumice in fine tuff
laminated fine tuff (silt)
laminated silt?
fine sst. laminated pumiceous
sst.
sst.
silt(2m)
fine laminated sst.
partly ungular-contacted gray fine sst.
fine sst.
water tank
conglomerates perlite-brg
perlite lens 3x8m in siltst
giant pumice
stratified(banded) silt
fumarole and altered zone(W=5m)
massive fine tuff(silt)and laminated silt
displ 3m+?
interfingering zone
altered zone 1m
reworked materials
fine-banded gray siltstone
laminated sandy silt
fine stratified granule
gray loose c.sst.
strat
qal
sst. and conglomerates
gray cross-bedded sst.
stratified loose sst. (pumiceous,gravel-brg)
pumiceous sst.
siltst. cut by minor faults (representative orientation of faults is N48°E, 82°W)
limonite existst in paraconformity between loose sst. and hard siltst.
soil and pumice
debris
pumiceous sand intercalating 0.3 to 1.2 pumice layers
conglomerates with brown loamy matrix
fine-banded sandy silt~silty sst. intercalating 0.4m-thich gray tuff and 1.7m-thick massive silt

JICA

メキシコ合衆国ラ・プリマベーラ地熱開発計画調査　報告書　別添資料

平成元年二月

国際協