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Preliminary report on Schlumberger resistivity soundings at Clara and Raheenmore bogs, Co Offaly.

by

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Chapter 1

Introduction

This report concerns geophysical reconnaissance surveys at Clara and Raheenmore bogs to determine the most appropriate methodology to be utilised in finding the depth to bedrock and the thickness and nature of the individual overlying layers. This information will be useful in providing controls on the spaceform of the bogs at Clara and Raheenmore.

It was decided to carry out Resistivity Vertical Electric Soundings (VES) using the Schlumberger array, the end to end separation of the current electrodes being a maximum of 1,000m apart, to ensure that bedrock could be determined.

The technique was used largely at Raheenmore where fourteen soundings were carried out, chiefly along two traverses covering a wide geographical area, but also on land at the margin of the bog, to determine the depth of bedrock around the edge of the bog.

At Clara work was restricted to a short traverse of four soundings parallel to the main road,four short-length soundings on an esker to the north of the bog, and two soundings on a ridge west of the soak, at the southern edge of the bog.

The interpretations contained in this report are based on "quick-look" methods using a computer interpretation package. The depth to bedrock and apparent resistivities quoted are likely to be modified when a more rigorous interpretation has been carried out,however relative depths to bedrock between soundings are likely to be accurate. It should be noted that all depths are referred to ground level since no topographic data were available at time of survey.

The interpretation of the nature of peat and sediments overlying the bedrock is likely to be altered in the light of future geological and geophysical surveys.

Chapter 2

Data Acquisition

The Schlumberger soundings were carried out using AB/2 spacings suitable for use in a computer interpretation program. The AB/2 spacings used can be seen in Appendices A and B.

The resistivity instrument used was an ABEM SAS 300 Terrameter with a current output setting of usually 10mA. The AB/2 distances were marked on each cable and this saved a lot of time in surveying in the electrode positions. Radiotelephones were used for communications. Schlumberger sounding numbers for Raheenmore and Clara bogs are prefixed RHS and CLS respectively.

At Raheenmore the soundings were carried out at 200m intervals along two traverse lines approximately 600m apart running North-West to South-East relative to the National Grid (see Fig 2.1) . Since no grid had been provided, these lines were laid so as to use traverse lines used in the EM-34 Survey where possible. The centre of each sounding was marked by a bamboo cane with five red horizontal stripes so as these locations can be reoccupied at a later date. These traverse lines largely occupy the central zone of the bog. The National Grid References for the centres of the soundings at Raheenmore bog are given in the table below.

Sounding RHSVES	Easting (m)	Northing (m)	Remarks
01	243890	232400	Bog
03	244020	232050	Bog
04	244140	232080	Bog
05	244230	231960	Bog
06	243810	231440	Farmland
07	243790	232530	Bog margin
08	243420	232510	Farmland
09	243280	232240	Bog
10	243370	232060	Bog
12	243470	231880	Bog
13	243570	231710	Bog
14	243670	231540	Bog

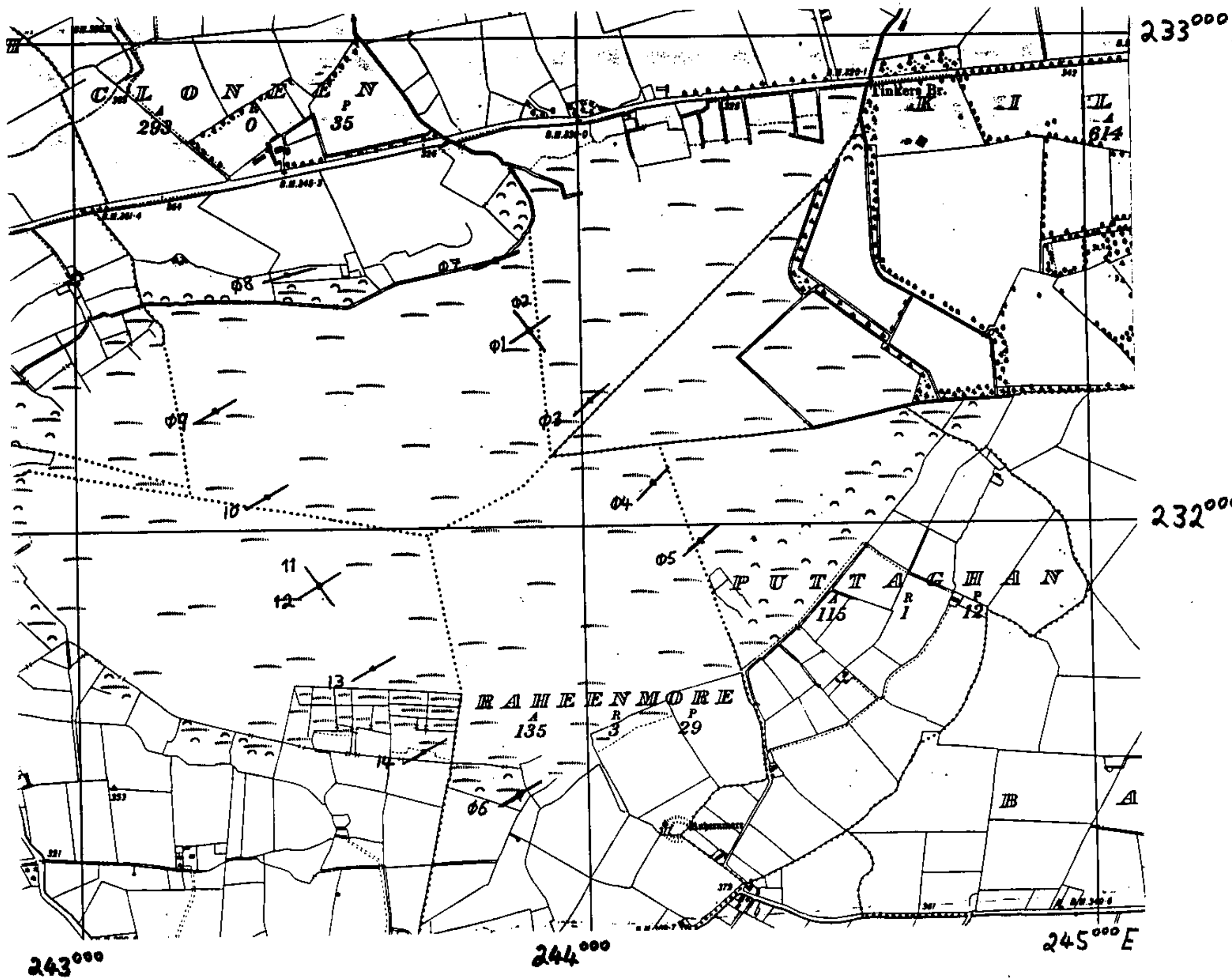


Figure 2.1: Location map for Schlumberger resistivity soundings at Raheenmore Bog

At Clara bog four Schlumberger soundings were taken at 300m intervals along a line running South (see Fig 2.2) , parallel to the main road. Four other short soundings were taken parallel to each other, at 40m intervals on an esker to the north of the bog, and two soundings were taken across the longitudinal axis of the ridge near the soak. All of the above soundings utilised the EM-34 survey lines which were already marked on the bog. The survey lines on Clara, although restricted in number, covered a variety of topographical areas in order to assess the diversity of Clara bog in relation to Raheenmore. The National Grid References for the centres of the soundings at Clara bog are given in the table below.

Sounding CLSVES	Easting (m)	Northing (m)	Remarks
01	224800	230530	Bog
03	224710	230250	Bog
04	224620	229960	Bog
05	224240	230970	Esker
06	224250	230920	Esker
07	224250	330890	Bog margin
08	224260	230860	Bog
09	223960	229960	Ridge
10	223720	230000	Ridge

To assess whether the subsurface resistivity distribution was anisotropic an additional sounding was carried out at certain locations with the array being rotated through 90 degrees. At Raheenmore soundings RHSVES01 and 02, and RHSVES10 and 11,share the same centres. At Clara soundings CLSVES02 and 03 share the same centre.

This work was largely carried out by two people, with two soundings being carried out each day.

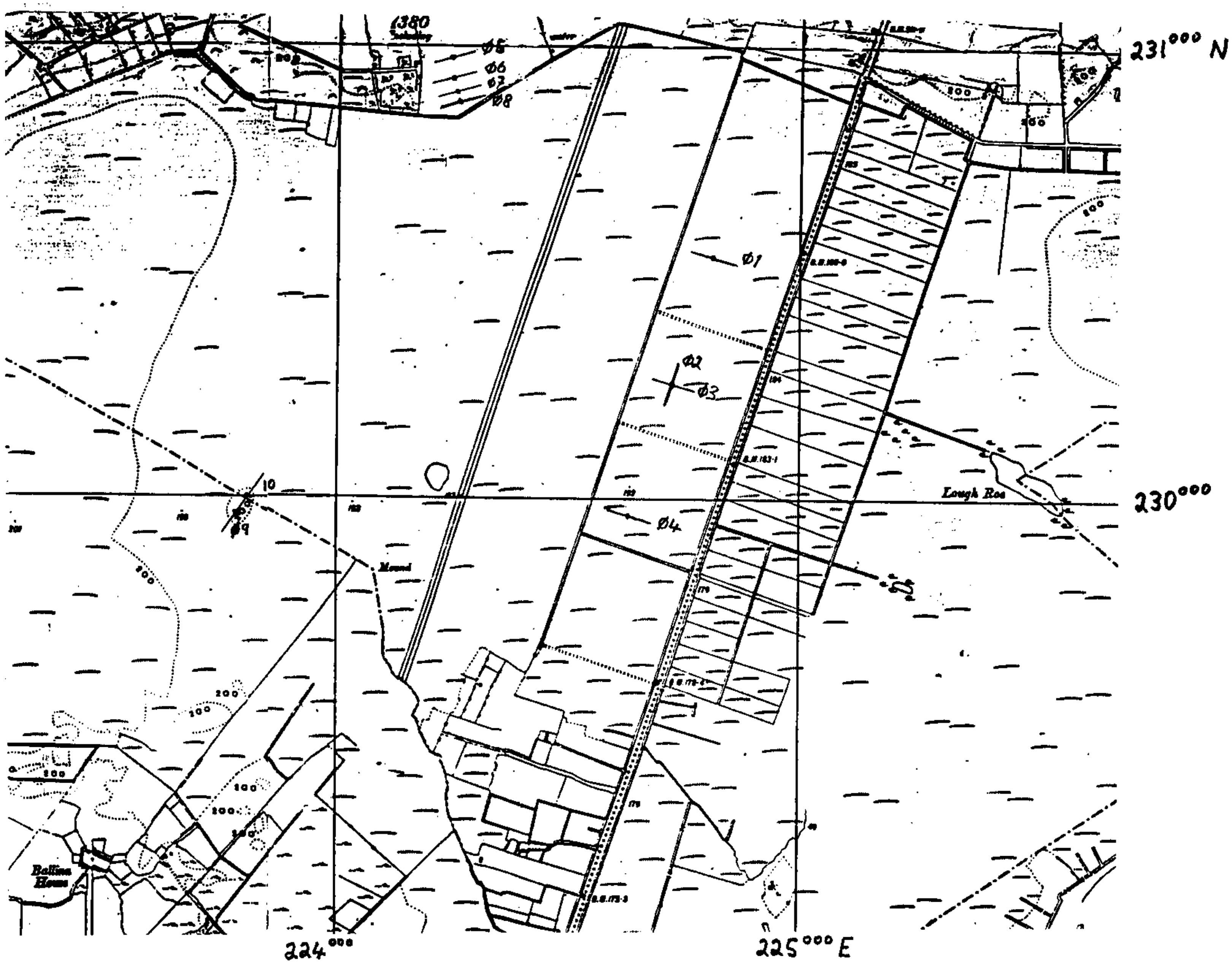


Figure 2.2: Location map for Schlumberger soundings at Clara Bog

Chapter 3

Data Reduction and Processing

First stage field data reduction used a computer program written in the Lotus environment and implemented on the computer at the Clara field office. The calculated results can be found in Appendices A and B. The second stage was to input the AB/2 spacings and calculated apparent resistivities to an interpretation program called Resint (version 3.1) written by D.T.Biewinga and also implemented on the computer at Clara. This program allows smoothing of the vertical electric sounding curves and then interactive and automatic calculation of layer thicknesses and apparent resistivities which may give rise to the measured Vertical Electric Sounding curve. All twenty four curves were processed in this way and the results are given in Appendices C and D.

Chapter 4

Interpretation

4.1 Raheenmore

At soundings RHSVES07 and RHSVES08 which are located at the northern edge of the bog,it can be seen that bedrock appears to be quite deep at approximately 50m and 70m below ground level for each sounding respectively (see fig4.1). This is interesting since outcrop can be found at or near the surface some 1000m west of sounding RHSVES08. For both soundings the layers above the bedrock have similar resistivities of about 180 ohm-m. This could be represented by saturated gravel-tills. In the case of sounding 08 this layer is 46m thick ,while it is 60m thick at sounding 07,which is located just within the limits of the bog.There is an upper layer resistivity of 40-70 ohm-m seen in both soundings which could be represented by clay. This is at the surface at RHSVES08 and at a depth of approximately 5.5m at 07. The surface layer in the latter has an apparent resistivity of about 135 ohm-m which is likely to be due to less saturated peat.

Along the Easterly traverse(RHSVES01,03,04), the bedrock profile appears to form a dome shape in the centre of the bog ,and then shoals to 1.2m at RHSVES05.

The peat layers in the centre of the bog vary accordingly ,with the deepest peat layer of 25m at RHSVES04 where bedrock is at a depth of 63m. At RHSVES01 and 03 the peat layers are at shallower depths of 6.3m and 15.5m respectively, which correspond to the shallower depth of the crest of the dome shaped bedrock at a depth of approximately 40m. The pattern of associated shallow peat layer with shallow depths of bedrock is also evident at RHSVES05 where the bedrock is found at a depth of just below 1m, resulting in a very thin top layer of peat.

At soundings RHSVES07,01,03 and 04 where four layers are evident, all show the second layer from the surface to be approximately 3m in thickness,even though the depth of this layer varies from 6m to 25m at the respective sounding locations.

The layer above the bedrock is thickest where bedrock is deepest. At sounding RHSVES07 this layer is approximately 60m thick going from a depth of 9m to 69m, while at soundings RHSVES01,03 and 04 this layer shows in thicknesses of 30m, 23m and 35m, and extends from depths of 10m to 40m, 20m to 43m, and 28m to 63m respectively.

The layer above the bedrock has the highest resistivity of 181 ohm-m at sounding RHSVES07, where it is thickest,and the lowest resistivity of 61 ohm-m at sounding RHSVES03 where it is thinnest. The resistivity of this layer at RHSVES01 and RHSVES04 is similar at 81 ohm-m since both these layers have only a 5m variation in thickness. If this layer

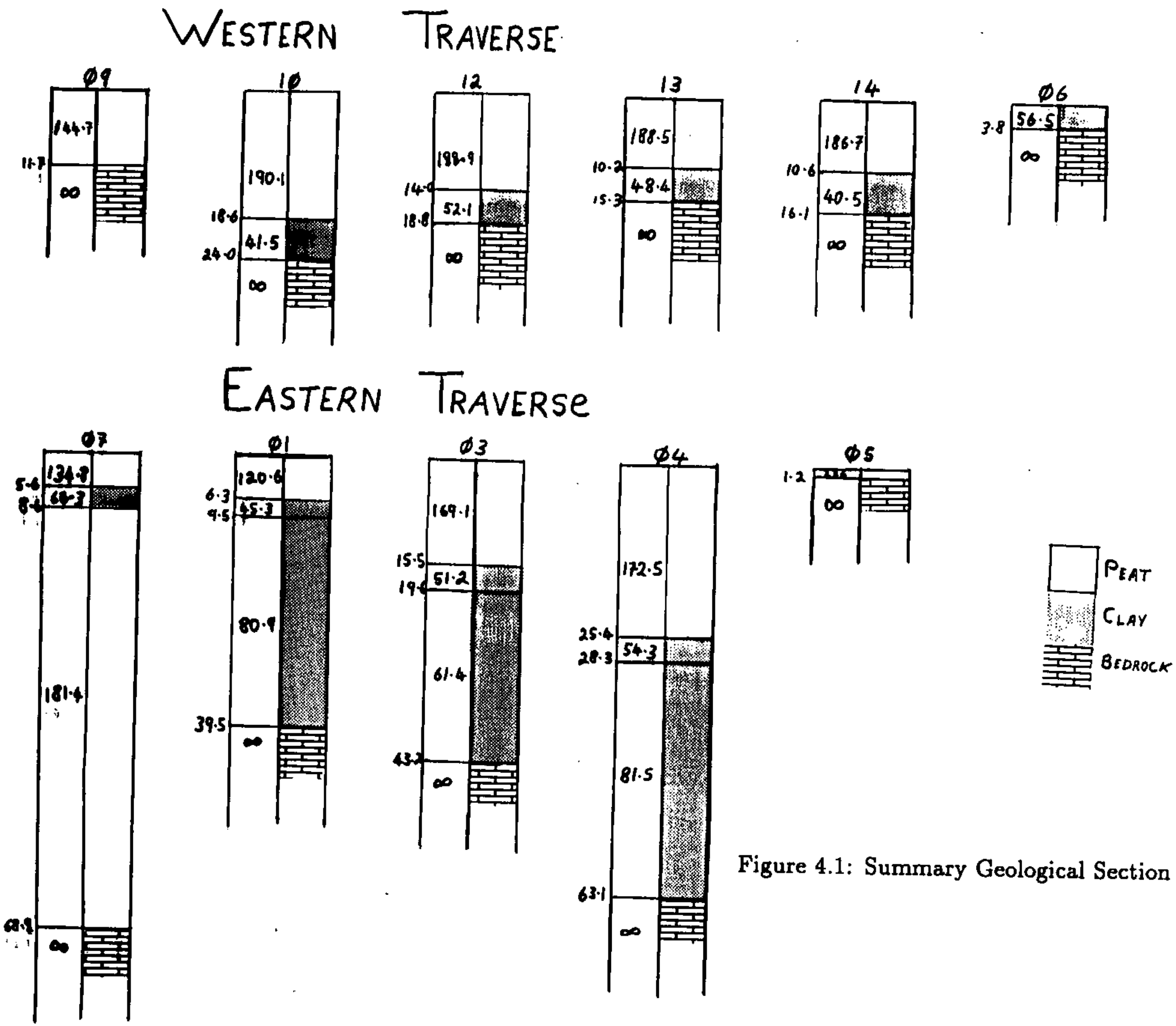


Figure 4.1: Summary Geological Section at Raheenmore Bog

comprises of the same material at all locations then the variation in resistivity could be due to clay content lowering the value, or gravels/cobbles raising the value.

The resistivity of the second layer above the bedrock is greatest at 66 ohm-m on RHSVES07,which is probably due to the clay nature of this layer on the margin of the bog. Similar resistivities of 45,51 and 54 ohm-m are recorded at soundings RHSVES01,03 and 04 respectively.

The resistivity of the surface layer of peat is approximately 170 ohm-m at soundings RHSVES03 and 04 where the peat is thickest at 15m and 25m respectively. The resistivities of 120 ohm-m and 135 ohm-m are recorded at soundings RHSVES01 and 07 respectively, where peat is approximately 6m deep and slightly more saturated. The higher resistivity of 236 ohm-m for the top layer is found at sounding RHSVES05 where the top layer is only 1.2m thick. This is probably due to the dryness of the peat close to the margin of the bog, and also its closeness to the bedrock.

Soundings RHSVES06 which situated on farmland to the south of Raheenmore has only one layer, less than 4m thick, above the bedrock. This layer's low resistivity of 56 ohm-m is probably due to the loose gravelly clay nature of the soil in the field, which could be saturated.

Bedrock depths along the Westerly traverse(soundings RHSVES09,10,12,13 and 14) are relatively uniform,fluctuating above and below the 20m mark. At 12m bedrock is shallowest on the Northern end at sounding RHSVES09, and deepest at sounding RHSVES10 where it is at a depth of 24m. Bedrock depths of 19m,15m and 16m are relatively similar at soundings RHSVES12,13 and 14 respectively.

Unlike the Easterly traverse, where four layers are standard, three layers appear to be the norm along the Westerly traverse. The middle layer varies insignificantly in thickness along soundings RHSVES10,12,13 and 14, being approximately 5m thick, and at depths of approximately 19m, 14m, 10m and 11m respectively.

Sounding RHSVES09 only records two layers,the top peat layer being 12m thick. The Westerly traverse also differs from Easterly traverse in that peat thickness in the former is more uniform with a lower range of thickness varying between 10m and 19m. The resistivities of the peat layers at soundings RHSVES10,12,13 and 14 are similar at approximately 190 ohm-m.The resistivity along sounding RHSVES09 is slightly lower at 145 ohm-m,which could be due to increased saturation.

The resistivity of the middle layer is also relatively similar in soundings RHSVES10,12,13 and 14,ranging from 41 ohm-m to 52 ohm-m.

For soundings RHSVES01 and 02, and RHSVES10 and 11, which share the same centres, it can be seen that at large AB/2 spacings the curves are coincident. This would indicate that the ground under investigation is homogeneous at depth. For shorter AB/2 spacings there is a degree of variability between the curves. This suggests lateral inhomogeneity along the axes of the soundings at shallow depths. This feature can be attributed to shallow lateral variation in the unconsolidated peat and till layers whilst the deeper layers are more compacted lying on an homogeneous bedrock. A similar situation can be seen in the two soundings from Clara which share the same centre, namely CLSVES02 and 03.

4.2 Clara

Soundings CLSVES01,03 and 04, which run along the traverse parallel to the road, reveal a three layered structure (see fig4.2). Peat varies in thickness from 8m at sounding CLSVES04 to 14m at sounding CLSVES01 and 03. Resistivities for this layer are similar at soundings CLSVES01 and 03,being 152 ohm-m, but slightly higher at sounding CLSVES04 where it is about 170 ohm-m. The higher resistivity for the peat layer at soundings CLSVES04 is probably due to the fact that this line is close to the southern end of the bog where turf cutting is carried out,and thus resulting in the peat being less saturated.

The layer above the bedrock is found at depths of 15m,14m and 8m at soundings 01, 03 and 04 respectively. This layer is quite thin at sounding CLSVES03 where it is only 2m thick,but is twice this thickness at soundings CLSVES01 and 04 where it is 4m and 5m, respectively. The resistivity for this layer ranges from 22 and 34 ohm-m for soundings CLSVES04 and 01 respectively,to 85 ohm-m for sounding CLSVES03 where this layer is thinnest.

CLSVES05 and 06 which were surveyed on the slope of the esker,show bedrock to be at depths of 7m and 14m respectively. Bedrock on the margin of the bog, at the base of the esker (CLSVES07) gets shallower in relation to the ground surface as it rises to 9m,but then drops once more at CLSVES08 to a depth of 15m. The summary section for the depth of bedrock along the lines surveyed on the esker seem to suggest that the bedrock surface is undulating beneath the overburden, however if the estimated height of the ground surface is taken into account at each of the respective soundings,then this shows that the bedrock slopes gently downwards towards the bog since the ground surface varies in height by about 10m along the survey soundings from CLSVES06 to 08.

Soundings CLSVES09 and 10 show bedrock to be at depths of approximately 12m and 9m respectively.Since the ground surface at sounding CLSVES09 is approximately 2m higher than that of CLSVES10,then the bedrock on the ridge is at a uniform depth along the longitudinal axis of the ridge. Sounding CLSVES09 shows only one layer of overburden approximately 12m thick,with a resistivity of 145 ohm-m comparable to that of the peat layers at the other survey soundings taken at Clara. The sounding at CLSVES10 shows two layers of overburden.The surface is very thin at only 2m thick, while the second layer has a thickness of 7m. The slight resistivity difference between the surface layer and the layer underneath of 123 and 175 ohm-m respectively, is likely to be due to the lighter spongy nature of the surface layer compared to the more compact nature of the peat in the layer underneath.

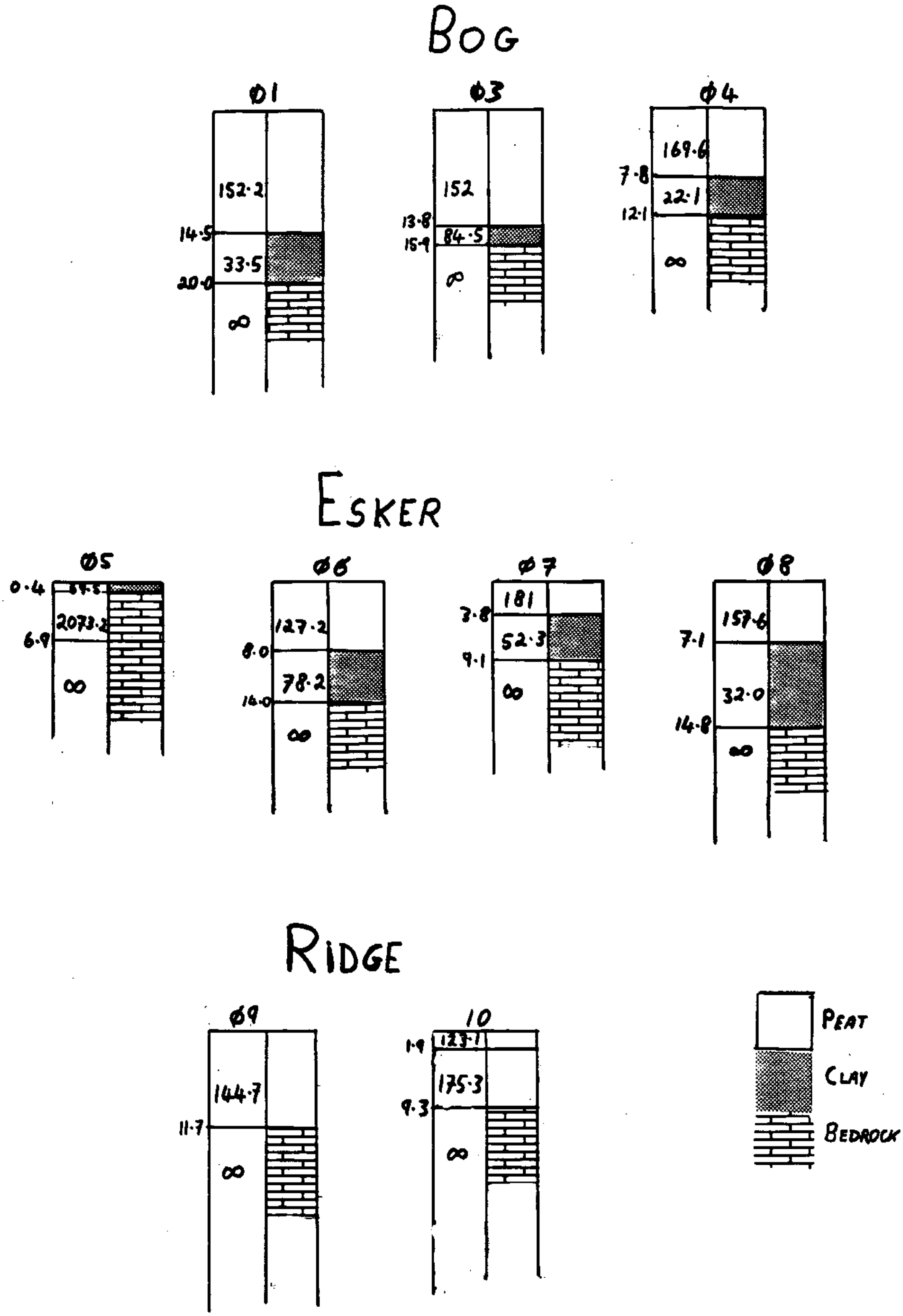


Figure 4.2: Summary Geological Section at Clara Bog

Chapter 5

Conclusions

At both Raheenmore and Clara, Vertical Electric Soundings using Schlumberger Array can sucessfully resolve depths to bedrock when using a maximum AB/2 distance of 500m. In some areas a maximum AB/2 distance of 200m would be capable of resolving bedrock.

5.1 Raheenmore

At Raheenmore the underlying bedrock varies considerably both in depth and general configuration. The maximum depth to bedrock is at approximately 70m, while the minimum depth is little more than 1m. The traverse to the East of Raheenmore shows the bedrock to be varying in depth from very shallow (1m) to very deep (70m). On the contrary,the Westerly traverse shows the bedrock to be a relatively horizontal layer with a smaller variation in depth of between 12 and 24m.

The variation in depth to bedrock between the western and eastern traverses, which are about 600m apart, might indicate a fault line somewhere between the two traverses. In addition the difference in depth to bedrock at the Northern end of the bog and outcrop occurring in the vicinity might also support the arguement of faulting in the area.

5.2 Clara

The Clara bog area is much more diverse in nature in comparison to the compact Raheenmore bog, however the variation in the depths to bedrock is less in comparison to that at Raheenmore. At Clara, the soundings taken parallel to the road show bedrock to be at a maximum depth of 20m, while bedrock on the ridge near the soak at the Southern end of the bog,is at a maximum depth of 12m,and the maximum depth of bedrock on the esker at the Northern end of the bog, is at a depth of 15m. However this information is inadequate to build up a more complete general picture of the depth of bedrock at Clara due to the limited number of soundings taken on the bog. A survey covering a much larger geographical area is needed to more accurately quantify the spaceform of Clara bog.

Chapter 6

Recommendations

1) The height of the centres of all soundings should be levelled in to provide accurate data on the depth of each layer in relation to a common datum.

2) Where bedrock was found to be shallow (10-20m) it should be possible to use the offset Wenner Array (Barker Cable) which should speed up the time taken to collect data.

3) Using the same centres, the soundings made on the esker at Clara should be repeated using the Barker Cable to try and quantify the lateral errors likely to be due to a non-layered sequence and topographic effects.

4) Further soundings at Raheenmore bog using the Schlumberger Array should be made at the locations given in Fig 6.1. These will enable various hypothesis to be tested as to the nature of the changes in the depth of bedrock going from West to East, and also at the northern edge. Further soundings are also necessary at the Eastern margin and at various locations on the rim and outer reaches of the bog to quantify the depth to bedrock and nature of overburden.

5) At Clara further traverses are needed to map the nature of overburden and depth to bedrock.Use of the Barker Cable on this site may speed up surveying operations due to the shallower nature of the bedrock in Clara.

6)If a fault or faults are found to run in the vicinity of either bog then these could possibly be mapped using a combination of EM-VLF and EM-VLF-R and a series of trial traverses should be carried out to test the suitability of this method.

7) Where bedrock is less than 20m below ground level at the edge of the bog, a series of test co-linear dipole-dipole pseudosections could be carried out to provide information on the nature and attitude of sediments in these areas.

8)The establishment of a semi-permanent / permanent survey grid on both bogs would facilitate the setting out of survey lines and thus prevent time loss in continually having to lay out lines each time a different survey is carried out.

9) Co-ordinated levelling between the Hydrological and Geophysical projects would result in more comprehensive and efficient set of data being produced by the setting up of a network of height control points on each bog.

10) It would be preferable to have an extra person available when carrying out Vertical Electric Soundings as this would speed up data collection. In addition, a third person would be necessary for safety reasons when laying cables across roads, such as at Clara bog.

11) For correlation and calibration purposes, a Cobra deep overburden sampler could be used at certain sounding sites to collect continuous cores of overburden,down to bedrock.

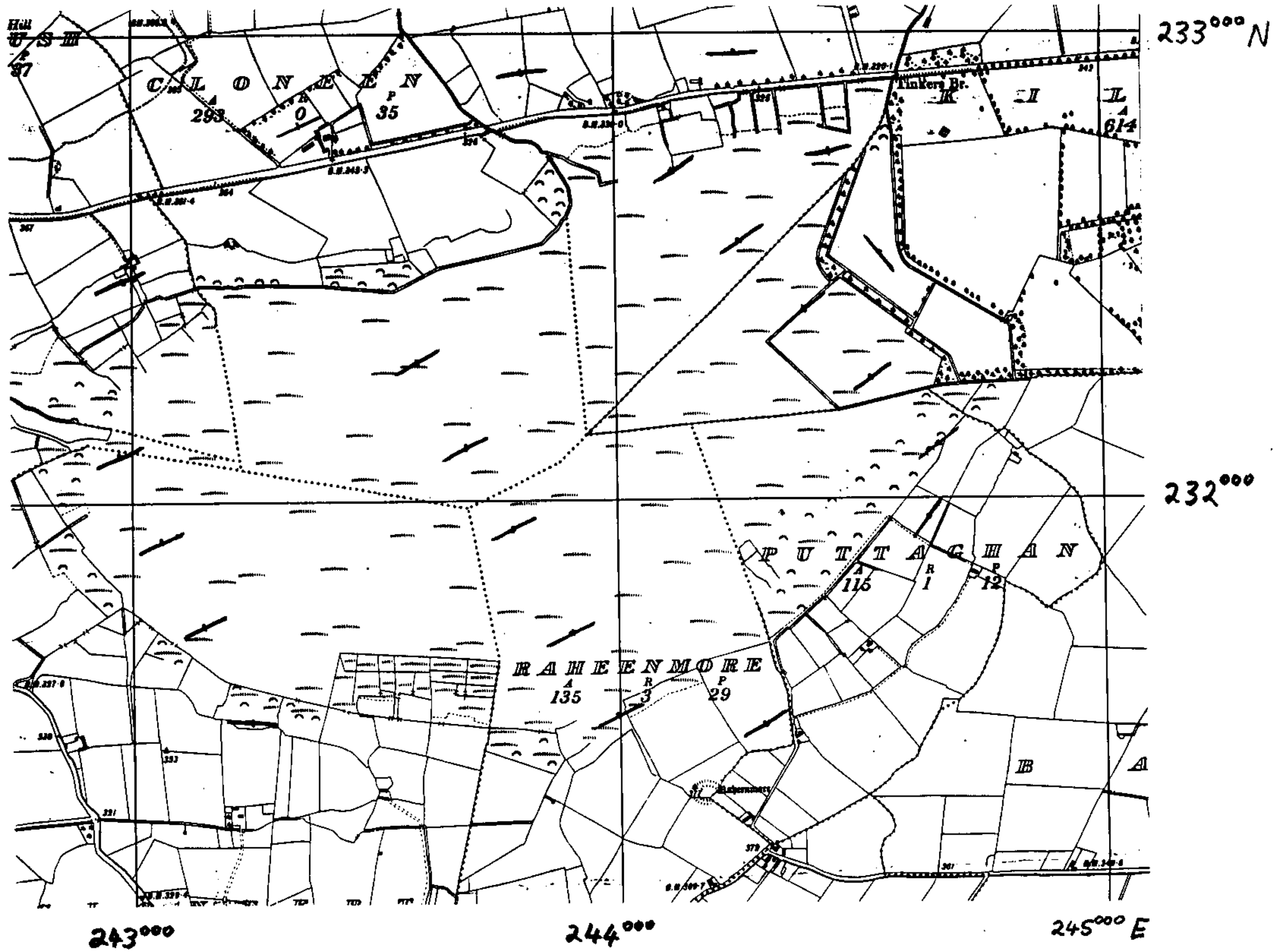


Figure 6.1: Suggested Locations of Schlumberger Soundings

This would be particularly useful in ares where conventional drilling techniques are impossible due to the weight of the drilling rig. A Cobra drill is available at U.C.G.

Appendix A

Raheenmore Calculated Apparent Resistivities

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	29.3000	184.10	RHSVES01
2.50	0.50	1.00	18.85	6.1900	116.68	KEVIN BARTON
4.00	0.50	1.00	49.48	1.3470	66.65	
6.00	0.50	1.00	112.31	0.9650	108.38	
4.00	1.00	2.00	23.56	2.8400	66.92	
6.00	1.00	2.00	54.98	1.8630	102.42	
8.00	1.00	2.00	98.96	1.1110	109.94	
10.00	1.00	2.00	155.51	0.6600	102.64	
12.00	1.00	2.00	224.62	0.4150	93.22	
8.00	2.00	4.00	47.12	2.1900	103.20	
10.00	2.00	4.00	75.40	1.3030	98.24	
12.00	2.00	4.00	109.96	0.8280	91.04	
15.00	2.00	4.00	173.57	0.5050	87.65	
20.00	2.00	4.00	311.02	0.3180	98.90	
15.00	5.00	10.00	62.83	1.4330	90.04	
20.00	5.00	10.00	117.81	0.7800	91.89	
25.00	5.00	10.00	188.50	0.4640	87.46	
30.00	5.00	10.00	274.89	0.3100	85.22	
40.00	5.00	10.00	494.80	0.1925	95.25	
30.00	10.00	20.00	125.66	0.6900	86.71	
40.00	10.00	20.00	235.62	0.3920	92.36	
50.00	10.00	20.00	376.99	0.2710	102.16	
60.00	10.00	20.00	549.78	0.2290	125.90	
75.00	10.00	20.00	867.86	0.2030	176.18	
100.00	10.00	20.00	1555.09	0.1281	199.21	
60.00	20.00	40.00	251.33	0.5030	126.42	
75.00	20.00	40.00	410.37	0.4350	178.51	
100.00	20.00	40.00	753.98	0.2770	208.85	
125.00	20.00	40.00	1195.77	0.2000	239.15	
150.00	20.00	40.00	1735.73	0.1537	266.78	
175.00	20.00	40.00	2373.87	0.1006	238.81	
125.00	40.00	80.00	550.76	0.4050	223.06	
150.00	40.00	80.00	820.74	0.3180	261.00	
175.00	40.00	80.00	1139.81	0.2060	234.80	
200.00	40.00	80.00	1507.96	0.1856	279.88	
250.00	40.00	80.00	2391.54	0.1493	357.06	
300.00	40.00	80.00	3471.46	0.1987	689.78	
350.00	40.00	80.00	4747.73	0.1762	836.55	
400.00	40.00	80.00	6220.35	0.1525	948.60	
350.00	50.00	100.00	3769.91	0.2380	897.24	
400.00	50.00	100.00	4948.01	0.1925	952.49	
500.00	50.00	100.00	7775.44	0.1337	1039.58	

Figure A.1: Apparent Resistivity Data for RHSVES01

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	26.1000	163.99	RHSVES02
2.50	0.50	1.00	18.85	9.4900	178.88	90 DEGR.
4.00	0.50	1.00	49.48	3.4600	171.20	ON LINE
6.00	0.50	1.00	112.31	1.3640	153.19	RHSVES01
4.00	1.00	2.00	23.56	7.1100	167.53	
6.00	1.00	2.00	54.98	2.8600	157.24	
8.00	1.00	2.00	98.96	1.5180	150.22	
10.00	1.00	2.00	155.51	0.9000	139.96	
12.00	1.00	2.00	224.62	0.6040	135.67	
8.00	2.00	4.00	47.12	3.0900	145.61	
10.00	2.00	4.00	75.40	1.8640	140.54	
12.00	2.00	4.00	109.96	1.2280	135.03	
15.00	2.00	4.00	173.57	0.7600	131.92	
20.00	2.00	4.00	311.02	0.4100	127.52	
15.00	5.00	10.00	62.83	2.1300	133.83	
20.00	5.00	10.00	117.81	1.0860	127.94	
25.00	5.00	10.00	188.50	0.6730	126.86	
30.00	5.00	10.00	274.89	0.4680	128.65	
40.00	5.00	10.00	494.80	0.2740	135.58	
30.00	10.00	20.00	125.66	0.9970	125.29	
40.00	10.00	20.00	235.62	0.5570	131.24	
50.00	10.00	20.00	376.99	0.3580	134.96	
60.00	10.00	20.00	549.78	0.2520	138.54	
75.00	10.00	20.00	867.86	0.1623	140.85	
100.00	10.00	20.00	1555.09	0.0921	143.22	
60.00	20.00	40.00	251.33	0.5440	136.72	
75.00	20.00	40.00	410.37	0.3410	139.94	
100.00	20.00	40.00	753.98	0.1906	143.71	
125.00	20.00	40.00	1195.77	0.1382	165.26	
150.00	20.00	40.00	1735.73	0.0918	159.34	
175.00	20.00	40.00	2373.87	0.0785	186.35	
125.00	40.00	80.00	550.76	0.2870	158.07	
150.00	40.00	80.00	820.74	0.1562	128.20	
175.00	40.00	80.00	1139.81	0.1597	182.03	

Figure A.2: Apparent Resistivity Data for RHSVES02

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	27.3000	171.53	RHSVES03
2.50	0.50	1.00	18.85	11.0600	208.48	200 M. FROM
4.00	0.50	1.00	49.48	4.0500	200.39	RHSVES01
6.00	0.50	1.00	112.31	1.8460	207.33	COURSE 150 DEGR
4.00	1.00	2.00	23.56	8.2800	195.09	
6.00	1.00	2.00	54.98	3.6100	198.47	
8.00	1.00	2.00	98.96	2.1000	207.82	
10.00	1.00	2.00	155.51	1.3390	208.23	
12.00	1.00	2.00	224.62	0.8960	201.26	
8.00	2.00	4.00	47.12	4.4200	208.29	
10.00	2.00	4.00	75.40	2.8200	212.62	
12.00	2.00	4.00	109.96	1.8640	204.96	
15.00	2.00	4.00	173.57	1.1620	201.69	
20.00	2.00	4.00	311.02	0.5860	182.26	
15.00	5.00	10.00	62.83	3.1300	196.66	
20.00	5.00	10.00	117.81	1.5730	185.31	
25.00	5.00	10.00	188.50	0.9200	173.42	
30.00	5.00	10.00	274.89	0.5930	163.01	
40.00	5.00	10.00	494.80	0.3030	149.92	
30.00	10.00	20.00	125.66	1.2720	159.84	
40.00	10.00	20.00	235.62	0.6200	146.08	
50.00	10.00	20.00	376.99	0.3750	141.37	
60.00	10.00	20.00	549.78	0.2510	137.99	
75.00	10.00	20.00	867.86	0.1598	138.68	
100.00	10.00	20.00	1555.09	0.1037	161.26	
60.00	20.00	40.00	251.33	0.5610	140.99	
75.00	20.00	40.00	410.37	0.3380	138.71	
100.00	20.00	40.00	753.98	0.2080	156.83	
125.00	20.00	40.00	1195.77	0.1475	176.38	
150.00	20.00	40.00	1735.73	0.0992	172.18	
175.00	20.00	40.00	2373.87	0.0736	174.72	
125.00	40.00	80.00	550.76	0.2770	152.56	
150.00	40.00	80.00	820.74	0.2210	181.38	
175.00	40.00	80.00	1139.81	0.1350	153.87	
200.00	40.00	80.00	1507.96	0.1310	197.54	
250.00	40.00	80.00	2391.54	0.1903	455.11	
300.00	40.00	80.00	3471.46	0.1712	594.31	
350.00	40.00	80.00	4747.73	0.0992	470.98	
400.00	40.00	80.00	6220.35	0.0756	470.26	
350.00	50.00	100.00	3769.91	0.1408	530.80	
400.00	50.00	100.00	4948.01	0.2460	1217.21	
500.00	50.00	100.00	7775.44	0.0736	572.27	

Figure A.3: Apparent Resistivty Data for RHSVES03

AB/2	MN/2	2(MN/2)	K	MEASURING	PROGRAM	
1.50	0.50	1.00	6.28	22.7000	142.63	RHSVES04
2.50	0.50	1.00	18.85	8.8400	166.63	400 M. FROM
4.00	0.50	1.00	49.48	3.6700	181.59	RHSVES01
6.00	0.50	1.00	112.31	1.6530	185.65	COURSE 150 DEGR
4.00	1.00	2.00	23.56	7.5000	176.71	
6.00	1.00	2.00	54.98	3.3000	181.43	
8.00	1.00	2.00	98.96	1.8510	183.18	
10.00	1.00	2.00	155.51	0.6980	108.55	
12.00	1.00	2.00	224.62	0.5060	113.66	
8.00	2.00	4.00	47.12	3.9100	184.25	
10.00	2.00	4.00	75.40	2.4400	183.97	
12.00	2.00	4.00	109.96	1.7170	188.79	
15.00	2.00	4.00	173.57	1.0260	178.09	
20.00	2.00	4.00	311.02	0.5430	168.88	
15.00	5.00	10.00	62.83	2.8100	176.56	
20.00	5.00	10.00	117.81	1.4410	169.76	
25.00	5.00	10.00	188.50	0.8650	163.05	
30.00	5.00	10.00	274.89	0.5680	156.14	
40.00	5.00	10.00	494.80	0.3010	148.94	
30.00	10.00	20.00	125.66	1.2520	157.33	
40.00	10.00	20.00	235.62	0.6320	148.91	
50.00	10.00	20.00	376.99	0.3820	144.01	
60.00	10.00	20.00	549.78	0.2600	142.94	
75.00	10.00	20.00	867.86	0.1610	139.73	
100.00	10.00	20.00	1555.09	0.1027	159.71	
60.00	20.00	40.00	251.33	0.5670	142.50	
75.00	20.00	40.00	410.37	0.3140	128.86	
100.00	20.00	40.00	753.98	0.2110	159.09	
125.00	20.00	40.00	1195.77	0.1642	196.35	
150.00	20.00	40.00	1735.73	0.1285	223.04	
175.00	20.00	40.00	2373.87	0.1046	248.31	
125.00	40.00	80.00	550.76	0.3340	183.95	
150.00	40.00	80.00	820.74	0.2640	216.68	
175.00	40.00	80.00	1139.81	0.2020	230.24	
200.00	40.00	80.00	1507.96	0.1805	272.19	
250.00	40.00	80.00	2391.54	0.1517	362.80	
300.00	40.00	80.00	3471.46	0.1525	529.40	
350.00	40.00	80.00	4747.73	0.1367	649.01	
400.00	40.00	80.00	6220.35	0.1036	644.43	
350.00	50.00	100.00	3769.91	0.2330	878.39	
400.00	50.00	100.00	4948.01	0.1322	654.13	
500.00	50.00	100.00	7775.44	0.1036	805.54	

Figure A.4: Apparent Resistivity Data for RHSVES04

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	27.3000	171.53	RHSVES05
2.50	0.50	1.00	18.85	10.6700	201.12	550 M. FROM
4.00	0.50	1.00	49.48	4.1800	206.83	RHSVES01
6.00	0.50	1.00	112.31	1.7950	201.60	COURSE 150 DEGR
4.00	1.00	2.00	23.56	8.4400	198.86	
6.00	1.00	2.00	54.98	3.6000	197.92	
8.00	1.00	2.00	98.96	1.9750	195.45	
10.00	1.00	2.00	155.51	1.1820	183.81	
12.00	1.00	2.00	224.62	0.8140	182.84	
8.00	2.00	4.00	47.12	3.9100	184.25	
10.00	2.00	4.00	75.40	2.4200	182.46	
12.00	2.00	4.00	109.96	1.6290	179.12	
15.00	2.00	4.00	173.57	1.0360	179.82	
20.00	2.00	4.00	311.02	0.6040	187.85	
15.00	5.00	10.00	62.83	2.8900	181.58	
20.00	5.00	10.00	117.81	1.6110	189.79	
25.00	5.00	10.00	188.50	1.0910	205.65	
30.00	5.00	10.00	274.89	0.8570	235.58	
40.00	5.00	10.00	494.80	0.5910	292.43	
30.00	10.00	20.00	125.66	1.8120	227.70	
40.00	10.00	20.00	235.62	1.1980	282.27	
50.00	10.00	20.00	376.99	0.8850	333.64	
60.00	10.00	20.00	549.78	0.6990	384.30	
75.00	10.00	20.00	867.86	0.5070	440.01	
100.00	10.00	20.00	1555.09	0.3460	538.06	
60.00	20.00	40.00	251.33	1.4730	370.21	
75.00	20.00	40.00	410.37	1.0730	440.33	
100.00	20.00	40.00	753.98	0.7190	542.11	
125.00	20.00	40.00	1195.77	0.5140	614.63	
150.00	20.00	40.00	1735.73	0.3730	647.43	
175.00	20.00	40.00	2373.87	0.2840	674.18	
125.00	40.00	80.00	550.76	1.0930	601.98	
150.00	40.00	80.00	820.74	0.7980	654.95	
175.00	40.00	80.00	1139.81	0.6050	689.58	
200.00	40.00	80.00	1507.96	0.4450	671.04	
250.00	40.00	80.00	2391.54	0.3070	734.20	
300.00	40.00	80.00	3471.46	0.2660	923.41	
350.00	40.00	80.00	4747.73	0.2300	1091.98	
400.00	40.00	80.00	6220.35	0.1646	1023.87	
350.00	50.00	100.00	3769.91	0.2910	1097.04	
400.00	50.00	100.00	4948.01	0.2070	1024.24	
500.00	50.00	100.00	7775.44	0.1558	1211.41	

Figure A.5: Apparent Resistivity Data for RHSVES05

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	11.5300	72.45	RHSVES06
2.50	0.50	1.00	18.85	2.9300	55.23	C. MALLON FIELDS
4.00	0.50	1.00	49.48	1.4530	71.89	LINE IS 150
6.00	0.50	1.00	112.31	0.8350	93.78	M. FROM EM34
4.00	1.00	2.00	23.56	2.9600	69.74	LINE C, FIRST
6.00	1.00	2.00	54.98	1.7020	93.57	FIELD AFTER
8.00	1.00	2.00	98.96	1.1580	114.60	BOG
10.00	1.00	2.00	155.51	0.8850	137.63	
12.00	1.00	2.00	224.62	0.6980	156.79	STONES IN FIELD
8.00	2.00	4.00	47.12	2.4400	114.98	SANDSTONE
10.00	2.00	4.00	75.40	1.8120	136.62	LIMESTONE
12.00	2.00	4.00	109.96	1.4370	158.01	SILTSTONE
15.00	2.00	4.00	173.57	1.1380	197.53	SIO2-STONES
20.00	2.00	4.00	311.02	0.8600	267.48	
15.00	5.00	10.00	62.83	2.7800	174.67	CHURCH SIDE
20.00	5.00	10.00	117.81	2.0300	239.15	
25.00	5.00	10.00	188.50	1.6470	310.45	180 TO 50 M.
30.00	5.00	10.00	274.89	1.4130	388.42	RECLAMED BOG
40.00	5.00	10.00	494.80	0.9090	449.77	
30.00	10.00	20.00	125.66	2.9100	365.68	
40.00	10.00	20.00	235.62	1.8630	438.96	
50.00	10.00	20.00	376.99	1.4380	542.11	
60.00	10.00	20.00	549.78	1.1660	641.04	
75.00	10.00	20.00	867.86	0.9180	796.70	
100.00	10.00	20.00	1555.09	0.6560	1020.14	
60.00	20.00	40.00	251.33	2.3000	578.05	
75.00	20.00	40.00	410.37	1.7880	733.74	
100.00	20.00	40.00	753.98	1.2640	953.03	
125.00	20.00	40.00	1195.77	0.9000	1076.19	
150.00	20.00	40.00	1735.73	0.6810	1182.03	
175.00	20.00	40.00	2373.87	0.5160	1224.91	
125.00	40.00	80.00	550.76	2.1400	1178.63	
150.00	40.00	80.00	820.74	1.5890	1304.16	
175.00	40.00	80.00	1139.81	1.1850	1350.67	
200.00	40.00	80.00	1507.96	0.9750	1470.27	
250.00	40.00	80.00	2391.54	0.6910	1652.55	
300.00	40.00	80.00	3471.46	0.4790	1662.83	
350.00	40.00	80.00	4747.73	0.3100	1471.80	
400.00	40.00	80.00	6220.35	0.2290	1424.46	
350.00	50.00	100.00	3769.91	0.3920	1477.81	
400.00	50.00	100.00	4948.01	0.2870	1420.08	
500.00	50.00	100.00	7775.44	0.1852	1440.01	

Figure A.6: Apparent Resistivity Data for RHSVES06

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	20.9000	131.32	RHSVES07
2.50	0.50	1.00	18.85	7.5300	141.94	EDGE BOG
4.00	0.50	1.00	49.48	2.6400	130.63	LINE 76 DEGR.
6.00	0.50	1.00	112.31	1.0560	118.60	TO 256 DEGR.
4.00	1.00	2.00	23.56	5.8000	136.66	
6.00	1.00	2.00	54.98	2.1900	120.40	290 TO 150 M.
8.00	1.00	2.00	98.96	1.1750	116.28	CUT AWAY BOG
10.00	1.00	2.00	155.51	0.7080	110.10	2 M. DEEP
12.00	1.00	2.00	224.62	0.5150	115.68	
8.00	2.00	4.00	47.12	2.6100	122.99	
10.00	2.00	4.00	75.40	1.6080	121.24	
12.00	2.00	4.00	109.96	1.1690	128.54	
15.00	2.00	4.00	173.57	0.7440	129.14	
20.00	2.00	4.00	311.02	0.4320	134.36	
15.00	5.00	10.00	62.83	2.3000	144.51	
20.00	5.00	10.00	117.81	1.3060	153.86	
25.00	5.00	10.00	188.50	0.8330	157.02	
30.00	5.00	10.00	274.89	0.6000	164.93	
40.00	5.00	10.00	494.80	0.3610	178.62	
30.00	10.00	20.00	125.66	1.2890	161.98	
40.00	10.00	20.00	235.62	0.7490	176.48	
50.00	10.00	20.00	376.99	0.5010	188.87	
60.00	10.00	20.00	549.78	0.3600	197.92	
75.00	10.00	20.00	867.86	0.2460	213.49	
100.00	10.00	20.00	1555.09	0.1606	249.75	
60.00	20.00	40.00	251.33	0.7590	190.76	
75.00	20.00	40.00	410.37	0.5090	208.88	
100.00	20.00	40.00	753.98	0.3280	247.31	
125.00	20.00	40.00	1195.77	0.2440	291.77	
150.00	20.00	40.00	1735.73	0.1893	328.57	
175.00	20.00	40.00	2373.87	0.1532	363.68	
125.00	40.00	80.00	550.76	0.5180	285.29	
150.00	40.00	80.00	820.74	0.3960	325.01	
175.00	40.00	80.00	1139.81	0.3150	359.04	
200.00	40.00	80.00	1507.96	0.2600	392.07	
250.00	40.00	80.00	2391.54	0.2070	495.05	
300.00	40.00	80.00	3471.46	0.1815	630.07	
350.00	40.00	80.00	4747.73	0.1651	783.85	
400.00	40.00	80.00	6220.35	0.1492	928.08	
350.00	50.00	100.00	3769.91	0.2070	780.37	
400.00	50.00	100.00	4948.01	0.1886	933.19	
500.00	50.00	100.00	7775.44	0.1597	1241.74	

Figure A.7: Apparent Resistivity Data for RHSVES07

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	7.4000	46.50	RHSVES08
2.50	0.50	1.00	18.85	2.6600	50.14	
4.00	0.50	1.00	49.48	1.1970	59.23	KILLEEN, ROHAN
6.00	0.50	1.00	112.31	0.6550	73.56	HARTE, BRENNAN
4.00	1.00	2.00	23.56	2.4400	57.49	FIELDS
6.00	1.00	2.00	54.98	1.2960	71.25	
8.00	1.00	2.00	98.96	0.8450	83.62	60 TO 140 DEGR.
10.00	1.00	2.00	155.51	0.6270	97.50	
12.00	1.00	2.00	224.62	0.4880	109.62	
8.00	2.00	4.00	47.12	1.7130	80.72	
10.00	2.00	4.00	75.40	1.2450	93.87	
12.00	2.00	4.00	109.96	0.9580	105.34	
15.00	2.00	4.00	173.57	0.6980	121.15	
20.00	2.00	4.00	311.02	0.4770	148.36	
15.00	5.00	10.00	62.83	1.8760	117.87	
20.00	5.00	10.00	117.81	1.2580	148.20	
25.00	5.00	10.00	188.50	0.7790	146.84	
30.00	5.00	10.00	274.89	0.5700	156.69	
40.00	5.00	10.00	494.80	0.3370	166.75	
30.00	10.00	20.00	125.66	1.2130	152.43	
40.00	10.00	20.00	235.62	0.7080	166.82	
50.00	10.00	20.00	376.99	0.4760	179.45	
60.00	10.00	20.00	549.78	0.3560	195.72	
75.00	10.00	20.00	867.86	0.2620	227.38	
100.00	10.00	20.00	1555.09	0.1920	298.58	
60.00	20.00	40.00	251.33	0.7320	183.97	
75.00	20.00	40.00	410.37	0.5230	214.62	
100.00	20.00	40.00	753.98	0.3710	279.73	
125.00	20.00	40.00	1195.77	0.2960	353.95	
150.00	20.00	40.00	1735.73	0.2470	428.73	
175.00	20.00	40.00	2373.87	0.2040	484.27	
125.00	40.00	80.00	550.76	0.6380	351.39	
150.00	40.00	80.00	820.74	0.5220	428.43	
175.00	40.00	80.00	1139.81	0.4320	492.40	
200.00	40.00	80.00	1507.96	0.3570	538.34	
250.00	40.00	80.00	2391.54	0.2520	602.67	
300.00	40.00	80.00	3471.46	0.2010	697.76	
350.00	40.00	80.00	4747.73	0.1656	786.22	
350.00	50.00	100.00	3769.91	0.2030	765.29	
400.00	50.00	100.00	4948.01	0.1792	886.68	

Figure A.8: Apparent Resistivity Data for RHSVES08

AB/2	MN/2	2(MN/2)	K	MEASURING	PROGRAM	
1.50	0.50	1.00	6.28	29.2000	183.47	RHSVES09
2.50	0.50	1.00	18.85	11.3300	213.57	
4.00	0.50	1.00	49.48	4.4600	220.68	STICK D26, EM34
6.00	0.50	1.00	112.31	1.6920	190.03	LINE D
4.00	1.00	2.00	23.56	8.4400	198.86	
6.00	1.00	2.00	54.98	3.6500	200.67	71 TO 251 DEGR
8.00	1.00	2.00	98.96	1.8210	180.21	
10.00	1.00	2.00	155.51	1.2700	197.50	
12.00	1.00	2.00	224.62	0.8460	190.03	
8.00	2.00	4.00	47.12	4.1900	197.45	
10.00	2.00	4.00	75.40	2.5200	190.00	
12.00	2.00	4.00	109.96	1.6810	184.84	
15.00	2.00	4.00	173.57	1.0240	177.74	
20.00	2.00	4.00	311.02	0.5340	166.08	
15.00	5.00	10.00	62.83	2.9400	184.73	
20.00	5.00	10.00	117.81	1.4520	171.06	
25.00	5.00	10.00	188.50	0.8660	163.24	
30.00	5.00	10.00	274.89	0.5680	156.14	
40.00	5.00	10.00	494.80	0.3230	159.82	
30.00	10.00	20.00	125.66	1.2440	156.33	
40.00	10.00	20.00	235.62	0.7030	165.64	
50.00	10.00	20.00	376.99	0.4370	164.75	
60.00	10.00	20.00	549.78	0.3200	175.93	
75.00	10.00	20.00	867.86	0.2270	197.01	
100.00	10.00	20.00	1555.09	0.1750	272.14	
60.00	20.00	40.00	251.33	0.6810	171.15	
75.00	20.00	40.00	410.37	0.4740	194.52	
100.00	20.00	40.00	753.98	0.3560	268.42	
125.00	20.00	40.00	1195.77	0.2860	341.99	
150.00	20.00	40.00	1735.73	0.2290	397.48	
175.00	20.00	40.00	2373.87	0.1731	410.92	
125.00	40.00	80.00	550.76	0.5750	316.69	
150.00	40.00	80.00	820.74	0.4560	374.26	
175.00	40.00	80.00	1139.81	0.3470	395.51	
200.00	40.00	80.00	1507.96	0.2900	437.31	
250.00	40.00	80.00	2391.54	0.3570	853.78	
300.00	40.00	80.00	3471.46	0.0778	270.08	
350.00	40.00	80.00	4747.73	0.2790	1324.62	
350.00	50.00	100.00	3769.91	0.2690	1014.11	
400.00	50.00	100.00	4948.01	0.2330	1152.89	

Figure A.9: Apparent Resistivity Data for RHSVES09

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	27.9000	175.30	RHSVES10
2.50	0.50	1.00	18.85	9.7600	183.97	
4.00	0.50	1.00	49.48	3.7300	184.56	60 TO 240 DEGR.
6.00	0.50	1.00	112.31	1.6390	184.08	
4.00	1.00	2.00	23.56	8.7800	206.87	200 M FROM
6.00	1.00	2.00	54.98	3.7600	206.72	RHSVES09
8.00	1.00	2.00	98.96	1.9750	195.45	COURSE 150 DEGR
10.00	1.00	2.00	155.51	1.2200	189.72	
12.00	1.00	2.00	224.62	0.8290	186.21	LINE D4 AT 415 M.
8.00	2.00	4.00	47.12	4.3900	206.87	
10.00	2.00	4.00	75.40	2.6700	201.31	460-490 M. HOLLOW
12.00	2.00	4.00	109.96	1.7970	197.59	2 M DEEP GRADUAL
15.00	2.00	4.00	173.57	1.0870	188.67	SLOPE
20.00	2.00	4.00	311.02	0.6820	212.11	490-500 CUT AWAY
15.00	5.00	10.00	62.83	3.1800	199.81	BOG 1 M DEEP
20.00	5.00	10.00	117.81	1.6000	188.50	
25.00	5.00	10.00	188.50	0.9450	178.13	
30.00	5.00	10.00	274.89	0.6450	177.30	
40.00	5.00	10.00	494.80	0.3960	195.94	
30.00	10.00	20.00	125.66	1.4490	182.09	
40.00	10.00	20.00	235.62	0.8180	192.74	
50.00	10.00	20.00	376.99	0.5780	217.90	
60.00	10.00	20.00	549.78	0.4640	255.10	
75.00	10.00	20.00	867.86	0.3540	307.22	
100.00	10.00	20.00	1555.09	0.4990	775.99	
60.00	20.00	40.00	251.33	0.9690	243.54	
75.00	20.00	40.00	410.37	0.7300	299.57	
100.00	20.00	40.00	753.98	0.9880	744.93	
125.00	20.00	40.00	1195.77	0.7330	876.50	
150.00	20.00	40.00	1735.73	0.4080	708.18	
175.00	20.00	40.00	2373.87	0.3510	833.23	
125.00	40.00	80.00	550.76	1.4450	795.85	
150.00	40.00	80.00	820.74	0.8720	715.69	
175.00	40.00	80.00	1139.81	0.7290	830.92	
200.00	40.00	80.00	1507.96	0.5330	803.75	
250.00	40.00	80.00	2391.54	0.2990	715.07	
300.00	40.00	80.00	3471.46	0.3130	1086.57	
350.00	40.00	80.00	4747.73	0.2800	1329.36	
400.00	40.00	80.00	6220.35	0.2400	1492.88	
350.00	50.00	100.00	3769.91	0.3410	1285.54	
400.00	50.00	100.00	4948.01	0.2940	1454.71	
500.00	50.00	100.00	7775.44	0.2320	1803.90	

Figure A.10: Apparent Resistivity Data for RHSVES10

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	29.4000	184.73	RHSVES11
2.50	0.50	1.00	18.85	10.5000	197.92	
4.00	0.50	1.00	49.48	4.4100	218.21	AT 470 M.
6.00	0.50	1.00	112.31	1.9190	215.53	CROSSING
4.00	1.00	2.00	23.56	9.4200	221.95	TRANSECT HYDR.
6.00	1.00	2.00	54.98	3.9300	216.06	NR. 20 AND 21
8.00	1.00	2.00	98.96	2.1500	212.76	AT 2 M DISTANCE
10.00	1.00	2.00	155.51	1.4520	225.80	
12.00	1.00	2.00	224.62	0.9830	220.81	
8.00	2.00	4.00	47.12	4.4600	210.17	
10.00	2.00	4.00	75.40	2.8100	211.87	
12.00	2.00	4.00	109.96	1.9100	210.02	
15.00	2.00	4.00	173.57	3.2700	567.58	
20.00	2.00	4.00	311.02	0.6450	200.61	
15.00	5.00	10.00	62.83	3.2700	205.46	
20.00	5.00	10.00	117.81	1.7010	200.39	
25.00	5.00	10.00	188.50	1.0610	199.99	
30.00	5.00	10.00	274.89	0.7500	206.17	
40.00	5.00	10.00	494.80	0.4820	238.49	
30.00	10.00	20.00	125.66	1.6380	205.84	
40.00	10.00	20.00	235.62	0.9990	235.38	
50.00	10.00	20.00	376.99	0.7360	277.47	
60.00	10.00	20.00	549.78	0.5940	326.57	
75.00	10.00	20.00	867.86	0.4670	405.29	
100.00	10.00	20.00	1555.09	0.3760	584.71	
60.00	20.00	40.00	251.33	1.2320	309.64	
75.00	20.00	40.00	410.37	0.9550	391.90	
100.00	20.00	40.00	753.98	0.7560	570.01	
125.00	20.00	40.00	1195.77	0.6250	747.36	
150.00	20.00	40.00	1735.73	0.4410	765.46	
175.00	20.00	40.00	2373.87	0.3800	902.07	
125.00	40.00	80.00	550.76	1.2470	686.80	
150.00	40.00	80.00	820.74	0.8820	723.89	
175.00	40.00	80.00	1139.81	0.6930	789.89	
200.00	40.00	80.00	1507.96	0.5510	830.89	
250.00	40.00	80.00	2391.54	0.3960	947.05	
300.00	40.00	80.00	3471.46	0.3370	1169.88	
350.00	40.00	80.00	4747.73	0.2700	1281.89	
400.00	40.00	80.00	6220.35	0.2330	1449.34	
350.00	50.00	100.00	3769.91	0.3590	1353.40	
400.00	50.00	100.00	4948.01	0.3020	1494.30	
500.00	50.00	100.00	7775.44	0.2410	1873.88	

Figure A.11: Apparent Resistivity Data for RHSVES11

AB/2	MN/2	2(MN/2)	K	MEASURING	PROGRAM	
1.50	0.50	1.00	6.28	25.7000	161.48	RSVES12
2.50	0.50	1.00	18.85	9.9000	186.61	
4.00	0.50	1.00	49.48	3.9800	196.93	SAME CENTRE
6.00	0.50	1.00	112.31	4.1100	461.60	AS RSVES11
4.00	1.00	2.00	23.56	9.3300	219.83	CHANGE 90 DEGR.
6.00	1.00	2.00	54.98	2.1200	116.55	
8.00	1.00	2.00	98.96	2.2700	224.64	
10.00	1.00	2.00	155.51	1.4280	222.07	
12.00	1.00	2.00	224.62	0.9620	216.09	
8.00	2.00	4.00	47.12	4.6600	219.60	
10.00	2.00	4.00	75.40	2.8800	217.15	
12.00	2.00	4.00	109.96	1.9280	211.99	
15.00	2.00	4.00	173.57	1.1890	206.38	
20.00	2.00	4.00	311.02	0.6400	199.05	
15.00	5.00	10.00	62.83	2.5100	157.71	
20.00	5.00	10.00	117.81	0.5180	61.03	
25.00	5.00	10.00	188.50	0.3710	69.93	
30.00	5.00	10.00	274.89	0.3990	109.68	
40.00	5.00	10.00	494.80	0.4860	240.47	
30.00	10.00	20.00	125.66	1.6260	204.33	
40.00	10.00	20.00	235.62	0.9870	232.56	
50.00	10.00	20.00	376.99	0.7330	276.33	
60.00	10.00	20.00	549.78	0.5860	322.17	
75.00	10.00	20.00	867.86	0.2330	202.21	
100.00	10.00	20.00	1555.09	0.3870	601.82	
60.00	20.00	40.00	251.33	0.5290	132.95	
75.00	20.00	40.00	410.37	0.3790	155.53	
100.00	20.00	40.00	753.98	0.8170	616.00	
125.00	20.00	40.00	1195.77	0.6670	797.58	
150.00	20.00	40.00	1735.73	0.7410	1286.18	
175.00	20.00	40.00	2373.87	0.2860	678.93	
125.00	40.00	80.00	550.76	1.3480	742.43	
150.00	40.00	80.00	820.74	1.0290	844.54	
175.00	40.00	80.00	1139.81	0.7770	885.63	
200.00	40.00	80.00	1507.96	0.5850	882.16	
250.00	40.00	80.00	2391.54	0.4100	980.53	
300.00	40.00	80.00	3471.46	0.6220	2159.25	
350.00	40.00	80.00	4747.73	0.2920	1386.34	
400.00	40.00	80.00	6220.35	0.2760	1716.82	
350.00	50.00	100.00	3769.91	0.5880	2216.71	
400.00	50.00	100.00	4948.01	0.7800	3859.45	
500.00	50.00	100.00	7775.44	0.2410	1873.88	

Figure A.12: Apparent Resistivity Data for RHSVES12

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	28.7000	180.33	RHSVES13
2.50	0.50	1.00	18.85	10.1500	191.32	
4.00	0.50	1.00	49.48	3.9400	194.95	600 M. FROM
6.00	0.50	1.00	112.31	1.7060	191.60	STICK D26
4.00	1.00	2.00	23.56	7.9400	187.08	COURSE 150 DEGR
6.00	1.00	2.00	54.98	3.4500	189.67	
8.00	1.00	2.00	98.96	1.8460	182.68	
10.00	1.00	2.00	155.51	1.1770	183.03	
12.00	1.00	2.00	224.62	0.7950	178.58	
8.00	2.00	4.00	47.12	3.7000	174.36	
10.00	2.00	4.00	75.40	2.2600	170.40	
12.00	2.00	4.00	109.96	1.5190	167.02	
15.00	2.00	4.00	173.57	0.9760	169.41	
20.00	2.00	4.00	311.02	0.5460	169.82	
15.00	5.00	10.00	62.83	2.6700	167.76	
20.00	5.00	10.00	117.81	1.4330	168.82	
25.00	5.00	10.00	188.50	0.9420	177.56	
30.00	5.00	10.00	274.89	0.6970	191.60	
40.00	5.00	10.00	494.80	0.4730	234.04	
30.00	10.00	20.00	125.66	1.4760	185.48	
40.00	10.00	20.00	235.62	0.9580	225.72	
50.00	10.00	20.00	376.99	0.7140	269.17	
60.00	10.00	20.00	549.78	0.5680	312.27	
75.00	10.00	20.00	867.86	0.6800	590.15	
100.00	10.00	20.00	1555.09	0.5380	836.64	
60.00	20.00	40.00	251.33	1.1720	294.56	
75.00	20.00	40.00	410.37	1.2350	506.81	
100.00	20.00	40.00	753.98	1.0750	810.53	
125.00	20.00	40.00	1195.77	0.8770	1048.69	
150.00	20.00	40.00	1735.73	0.6590	1143.85	
175.00	20.00	40.00	2373.87	0.4910	1165.57	
125.00	40.00	80.00	550.76	1.7510	964.38	
150.00	40.00	80.00	820.74	1.3110	1075.99	
175.00	40.00	80.00	1139.81	0.7100	809.26	
200.00	40.00	80.00	1507.96	0.5110	770.57	
250.00	40.00	80.00	2391.54	0.3650	872.91	
300.00	40.00	80.00	3471.46	0.3600	1249.73	
350.00	40.00	80.00	4747.73	0.5250	2492.56	
350.00	50.00	100.00	3769.91	0.4020	1515.50	

Figure A.13: Apparent Resistivity Data for RHSVES13

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	28.2000	177.19	RHSVES14
2.50	0.50	1.00	18.85	10.0500	189.44	
4.00	0.50	1.00	49.48	3.9500	195.45	800 M. FROM
6.00	0.50	1.00	112.31	1.7180	192.95	STICK D26
4.00	1.00	2.00	23.56	8.0800	190.38	
6.00	1.00	2.00	54.98	3.4100	187.47	PARALLEL TO
8.00	1.00	2.00	98.96	1.7890	177.04	LINE RSVES13
10.00	1.00	2.00	155.51	1.0820	168.26	
12.00	1.00	2.00	224.62	0.7210	161.95	
8.00	2.00	4.00	47.12	3.8300	180.48	
10.00	2.00	4.00	75.40	2.2700	171.15	
12.00	2.00	4.00	109.96	1.5200	167.13	
15.00	2.00	4.00	173.57	0.9170	159.17	
20.00	2.00	4.00	311.02	0.5070	157.69	
15.00	5.00	10.00	62.83	0.2590	16.27	
20.00	5.00	10.00	117.81	1.3610	160.34	
25.00	5.00	10.00	188.50	0.8940	168.52	
30.00	5.00	10.00	274.89	0.6740	185.28	
40.00	5.00	10.00	494.80	0.4300	212.76	
30.00	10.00	20.00	125.66	1.4120	177.44	
40.00	10.00	20.00	235.62	0.9090	214.18	
50.00	10.00	20.00	376.99	0.6650	250.70	
60.00	10.00	20.00	549.78	0.5210	286.43	
75.00	10.00	20.00	867.86	0.4320	374.92	
100.00	10.00	20.00	1555.09	0.3260	506.96	
60.00	20.00	40.00	251.33	1.1630	292.29	
75.00	20.00	40.00	410.37	0.8860	363.59	
100.00	20.00	40.00	753.98	0.6940	523.26	
125.00	20.00	40.00	1195.77	0.5540	662.46	
125.00	40.00	80.00	550.76	1.1370	626.21	

Figure A.14: Apparent Resistivity Data for RHSVES14

Appendix B

Clara Calculated Apparent Resistivities

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	22.3000	140.12	CLSVES01
2.50	0.50	1.00	18.85	8.2300	155.13	
4.00	0.50	1.00	49.48	3.2800	162.29	ON 300 M. STICK
6.00	0.50	1.00	112.31	1.4630	164.31	FROM EM34 LINE
4.00	1.00	2.00	23.56	6.4600	152.21	MA1
6.00	1.00	2.00	54.98	2.8000	153.94	
8.00	1.00	2.00	98.96	1.5800	156.36	288 AND 108 DEGR.
10.00	1.00	2.00	155.51	0.9430	146.64	
12.00	1.00	2.00	224.62	0.6240	140.17	
8.00	2.00	4.00	47.12	3.5500	167.29	
10.00	2.00	4.00	75.40	2.1100	159.09	
12.00	2.00	4.00	109.96	1.3780	151.52	
15.00	2.00	4.00	173.57	0.8180	141.98	
20.00	2.00	4.00	311.02	0.4260	132.49	
15.00	5.00	10.00	62.83	2.3100	145.14	
20.00	5.00	10.00	117.81	1.2440	146.56	
25.00	5.00	10.00	188.50	0.7020	132.32	
30.00	5.00	10.00	274.89	0.5010	137.72	
40.00	5.00	10.00	494.80	0.3190	157.84	
30.00	10.00	20.00	125.66	1.1070	139.11	
40.00	10.00	20.00	235.62	0.6650	156.69	
50.00	10.00	20.00	376.99	0.4920	185.48	
60.00	10.00	20.00	549.78	0.3880	213.31	
75.00	10.00	20.00	867.86	0.3030	262.96	
100.00	10.00	20.00	1555.09	0.2130	331.23	
60.00	20.00	40.00	251.33	0.8460	212.62	
75.00	20.00	40.00	410.37	0.6400	262.64	
100.00	20.00	40.00	753.98	0.4430	334.01	
125.00	20.00	40.00	1195.77	0.3290	393.41	
150.00	20.00	40.00	1735.73	0.2630	456.50	
175.00	20.00	40.00	2373.87	0.2210	524.62	
125.00	40.00	80.00	550.76	0.7220	397.65	
150.00	40.00	80.00	820.74	0.5650	463.72	
175.00	40.00	80.00	1139.81	0.4700	535.71	
200.00	40.00	80.00	1507.96	0.3970	598.66	
250.00	40.00	80.00	2391.54	0.2970	710.29	
300.00	40.00	80.00	3471.46	0.2360	819.26	
350.00	40.00	80.00	4747.73	0.1932	917.26	
400.00	40.00	80.00	6220.35	0.1587	987.17	
350.00	50.00	100.00	3769.91	0.2450	923.63	
400.00	50.00	100.00	4948.01	0.2820	1395.34	
500.00	50.00	100.00	7775.44	0.1420	1104.11	

Figure B.1: Apparent Resistivity Data for CLSVES01

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	24.5000	153.94	CLSVES02
2.50	0.50	1.00	18.85	8.6200	162.48	
4.00	0.50	1.00	49.48	3.6100	178.62	ON 600 M STICK
6.00	0.50	1.00	112.31	1.5070	169.25	FROM LINE MA1
4.00	1.00	2.00	23.56	7.1600	168.70	
6.00	1.00	2.00	54.98	2.73	150.09	198 AND 18 DEGR.
8.00	1.00	2.00	98.96	1.3570	134.29	
10.00	1.00	2.00	155.51	0.9850	153.18	
12.00	1.00	2.00	224.62	0.7190	161.50	
8.00	2.00	4.00	47.12	3.1000	146.08	
10.00	2.00	4.00	75.40	2.0800	156.83	
12.00	2.00	4.00	109.96	1.4790	162.62	
15.00	2.00	4.00	173.57	1.1600	201.34	
20.00	2.00	4.00	311.02	0.6820	212.11	
15.00	5.00	10.00	62.83	2.8700	180.33	
20.00	5.00	10.00	117.81	1.6180	190.62	
25.00	5.00	10.00	188.50	1.1660	219.79	
30.00	5.00	10.00	274.89	0.9060	249.05	
40.00	5.00	10.00	494.80	0.6570	325.08	
30.00	10.00	20.00	125.66	1.8420	231.47	
40.00	10.00	20.00	235.62	1.2990	306.07	
50.00	10.00	20.00	376.99	0.9910	373.60	
60.00	10.00	20.00	549.78	0.7910	434.87	
75.00	10.00	20.00	867.86	0.6100	529.40	
100.00	10.00	20.00	1555.09	0.4410	685.79	
60.00	20.00	40.00	251.33	1.5370	386.29	
75.00	20.00	40.00	410.37	1.1770	483.01	
100.00	20.00	40.00	753.98	0.8450	637.11	
125.00	20.00	40.00	1195.77	0.6230	744.96	
150.00	20.00	40.00	1735.73	0.4760	826.21	
175.00	20.00	40.00	2373.87	0.3780	897.32	
125.00	40.00	80.00	550.76	1.2520	689.55	
150.00	40.00	80.00	820.74	0.9370	769.03	
175.00	40.00	80.00	1139.81	0.7500	854.86	
200.00	40.00	80.00	1507.96	0.4980	750.97	
250.00	40.00	80.00	2391.54	0.3860	923.13	
300.00	40.00	80.00	3471.46	0.2860	992.84	
350.00	40.00	80.00	4747.73	0.2310	1096.73	
400.00	40.00	80.00	6220.35	0.1933	1202.39	
350.00	50.00	100.00	3769.91	0.2870	1081.96	
400.00	50.00	100.00	4948.01	0.2380	1177.63	
500.00	50.00	100.00	7775.44	0.1718	1335.82	

Figure B.2: Apparent Resistivity Data for CLSVES02

AB/2	MN/2	2(MN/2)	K	MEASURING	PROGRAM	
1.50	0.50	1.00	6.28	20.4000	128.18	CLSVES03
2.50	0.50	1.00	18.85	8.0400	151.55	
4.00	0.50	1.00	49.48	3.0600	151.41	90 DEGR. ON
6.00	0.50	1.00	112.31	1.3450	151.06	CLSVES02
4.00	1.00	2.00	23.56	6.7200	158.34	
6.00	1.00	2.00	54.98	3.0300	166.58	
8.00	1.00	2.00	98.96	1.6810	166.35	
10.00	1.00	2.00	155.51	1.0670	165.93	
12.00	1.00	2.00	224.62	0.7250	162.85	
8.00	2.00	4.00	47.12	3.5700	168.23	
10.00	2.00	4.00	75.40	2.3100	174.17	
12.00	2.00	4.00	109.96	1.4910	163.94	
15.00	2.00	4.00	173.57	0.9840	170.80	
20.00	2.00	4.00	311.02	0.6010	186.92	
15.00	5.00	10.00	62.83	2.6500	166.50	
20.00	5.00	10.00	117.81	1.5330	180.60	
25.00	5.00	10.00	188.50	1.0910	205.65	
30.00	5.00	10.00	274.89	0.8670	238.33	
40.00	5.00	10.00	494.80	0.6250	309.25	
30.00	10.00	20.00	125.66	1.7710	222.55	
40.00	10.00	20.00	235.62	1.2430	292.87	
50.00	10.00	20.00	376.99	0.9800	369.45	
60.00	10.00	20.00	549.78	0.7980	438.72	
75.00	10.00	20.00	867.86	0.6110	530.27	
100.00	10.00	20.00	1555.09	0.3920	609.57	
60.00	20.00	40.00	251.33	1.6350	410.92	
75.00	20.00	40.00	410.37	1.2350	506.81	
100.00	20.00	40.00	753.98	0.9510	717.04	
125.00	20.00	40.00	1195.77	0.6430	768.88	
150.00	20.00	40.00	1735.73	0.4040	701.23	
175.00	20.00	40.00	2373.87	0.3200	759.64	
125.00	40.00	80.00	550.76	1.0610	584.36	
150.00	40.00	80.00	820.74	0.7800	640.18	
175.00	40.00	80.00	1139.81	0.6120	697.56	
200.00	40.00	80.00	1507.96	0.5180	781.13	
250.00	40.00	80.00	2391.54	0.4020	961.40	
300.00	40.00	80.00	3471.46	0.3140	1090.04	
350.00	40.00	80.00	4747.73	0.2550	1210.67	
400.00	40.00	80.00	6220.35	0.2100	1306.27	
350.00	50.00	100.00	3769.91	0.3090	1164.90	
400.00	50.00	100.00	4948.01	0.2510	1241.95	
500.00	50.00	100.00	7775.44	0.1675	1302.39	

Figure B.3: Apparent Resistivity Data for CLSVES03

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	22.7000	142.63	CLSVES04
2.50	0.50	1.00	18.85	9.2600	174.55	CLARA BOG
4.00	0.50	1.00	49.48	3.5600	176.15	900 M STICK
6.00	0.50	1.00	112.31	1.5900	178.58	EM34 LINE
4.00	1.00	2.00	23.56	7.5500	177.89	
6.00	1.00	2.00	54.98	3.0800	169.33	
8.00	1.00	2.00	98.96	1.6100	159.33	
10.00	1.00	2.00	155.51	0.9340	145.25	
12.00	1.00	2.00	224.62	0.5860	131.63	
8.00	2.00	4.00	47.12	3.2500	153.15	
10.00	2.00	4.00	75.40	1.8430	138.96	
12.00	2.00	4.00	109.96	1.1720	128.87	
15.00	2.00	4.00	173.57	0.6680	115.95	
20.00	2.00	4.00	311.02	0.3560	110.72	
15.00	5.00	10.00	62.83	1.8440	115.86	
20.00	5.00	10.00	117.81	0.9220	108.62	
25.00	5.00	10.00	188.50	0.6040	113.85	
30.00	5.00	10.00	274.89	0.4590	126.17	
40.00	5.00	10.00	494.80	0.3190	157.84	
30.00	10.00	20.00	125.66	0.9730	122.27	
40.00	10.00	20.00	235.62	0.6540	154.10	
50.00	10.00	20.00	376.99	0.5090	191.89	
60.00	10.00	20.00	549.78	0.4100	225.41	
75.00	10.00	20.00	867.86	0.3180	275.98	
100.00	10.00	20.00	1555.09	0.2320	360.78	
60.00	20.00	40.00	251.33	0.8580	215.64	
75.00	20.00	40.00	410.37	0.6510	267.15	
100.00	20.00	40.00	753.98	0.4710	355.13	
125.00	20.00	40.00	1195.77	0.3780	452.00	
150.00	20.00	40.00	1735.73	0.3080	534.60	
175.00	20.00	40.00	2373.87	0.2400	569.73	
125.00	40.00	80.00	550.76	0.7780	428.49	
150.00	40.00	80.00	820.74	0.6110	501.47	
175.00	40.00	80.00	1139.81	0.4870	555.09	
200.00	40.00	80.00	1507.96	0.4050	610.73	
250.00	40.00	80.00	2391.54	0.3110	743.77	
300.00	40.00	80.00	3471.46	0.2540	881.75	
350.00	40.00	80.00	4747.73	0.2110	1001.77	
400.00	40.00	80.00	6220.35	0.1770	1101.00	
350.00	50.00	100.00	3769.91	0.2590	976.41	
400.00	50.00	100.00	4948.01	0.2170	1073.72	
500.00	50.00	100.00	7775.44	0.1563	1215.30	

Figure B.4: Apparent Resistivity Data for CLSVES04

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	41.0000	257.61	CLSVES05
2.50	0.50	1.00	18.85	19.0100	358.33	TOP ESKER
4.00	0.50	1.00	49.48	10.3800	513.60	FOURTH POINT
6.00	0.50	1.00	112.31	6.5900	740.14	EM34 MOST TO
4.00	1.00	2.00	23.56	21.5000	506.58	CLARA TOWN
6.00	1.00	2.00	54.98	18.6400	1024.79	
8.00	1.00	2.00	98.96	12.3300	1220.18	1/3 UP TO HILL
10.00	1.00	2.00	155.51	6.3000	979.71	(40 METER)
12.00	1.00	2.00	224.62	4.8000	1078.19	
8.00	2.00	4.00	47.12	20.7000	975.46	36 DEGR.
10.00	2.00	4.00	75.40	14.4800	1091.77	
12.00	2.00	4.00	109.96	11.0000	1209.51	
15.00	2.00	4.00	173.57	7.5600	1312.21	
20.00	2.00	4.00	311.02	4.2900	1334.27	
15.00	5.00	10.00	62.83	19.2100	1207.00	
20.00	5.00	10.00	117.81	10.8000	1272.35	
25.00	5.00	10.00	188.50	6.3900	1204.49	
30.00	5.00	10.00	274.89	4.3400	1193.02	
40.00	5.00	10.00	494.80	2.2900	1133.09	
30.00	10.00	20.00	125.66	9.5700	1202.60	
40.00	10.00	20.00	235.62	4.9100	1156.89	
50.00	10.00	20.00	376.99	3.0800	1161.13	
60.00	10.00	20.00	549.78	1.8520	1018.19	
75.00	10.00	20.00	867.86	1.2740	1105.66	
100.00	10.00	20.00	1555.09	0.8020	1247.18	
60.00	20.00	40.00	251.33	3.9000	980.18	
75.00	20.00	40.00	410.37	2.6000	1066.96	
100.00	20.00	40.00	753.98	1.5760	1188.28	
125.00	20.00	40.00	1195.77	1.0100	1207.73	
150.00	20.00	40.00	1735.73	0.7610	1320.89	
175.00	20.00	40.00	2373.87	0.6090	1445.68	
125.00	40.00	80.00	550.76	1.9530	1075.64	
150.00	40.00	80.00	820.74	1.4350	1177.76	
175.00	40.00	80.00	1139.81	1.1420	1301.66	
200.00	40.00	80.00	1507.96	0.9510	1434.07	

Figure B.5: Apparent Resistivity Data for CLSVES05

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	15.4300	96.95	CLSVES06
2.50	0.50	1.00	18.85	6.4700	121.96	
4.00	0.50	1.00	49.48	3.0500	150.91	60 METER DOWN
6.00	0.50	1.00	112.31	1.4380	161.50	FROM CLSVES05
4.00	1.00	2.00	23.56	5.8900	136.78	ON ESKER
6.00	1.00	2.00	54.98	2.7800	152.84	
8.00	1.00	2.00	98.96	1.5400	152.40	86 DEGR.
10.00	1.00	2.00	155.51	0.8800	136.85	
12.00	1.00	2.00	224.62	0.5830	130.96	ON LINE MOST TO
8.00	2.00	4.00	47.12	3.2400	152.68	CLARA TOWN
10.00	2.00	4.00	75.40	1.8210	137.30	
12.00	2.00	4.00	109.96	1.1580	127.33	
15.00	2.00	4.00	173.57	0.7320	127.06	
20.00	2.00	4.00	311.02	0.4550	141.51	
15.00	5.00	10.00	62.83	2.0900	131.32	
20.00	5.00	10.00	117.81	1.2500	147.26	
25.00	5.00	10.00	188.50	0.8970	169.08	
30.00	5.00	10.00	274.89	0.7120	195.72	
40.00	5.00	10.00	494.80	0.5360	265.21	
30.00	10.00	20.00	125.66	1.5980	200.81	
40.00	10.00	20.00	235.62	1.1480	270.49	
50.00	10.00	20.00	376.99	0.9170	345.70	
60.00	10.00	20.00	549.78	0.7520	413.43	
75.00	10.00	20.00	867.86	0.5940	515.51	
100.00	10.00	20.00	1555.09	0.5160	802.43	
60.00	20.00	40.00	251.33	1.5750	395.84	
75.00	20.00	40.00	410.37	1.2210	501.06	
100.00	20.00	40.00	753.98	0.8510	641.64	
125.00	20.00	40.00	1195.77	0.6260	748.55	
150.00	20.00	40.00	1735.73	0.5060	878.28	
175.00	20.00	40.00	2373.87	0.3960	940.05	
125.00	40.00	80.00	550.76	1.3030	717.64	
150.00	40.00	80.00	820.74	1.0400	853.57	
175.00	40.00	80.00	1139.81	0.8100	923.25	
200.00	40.00	80.00	1507.96	0.6600	995.26	

Figure B.6: Apparent Resistivity Data for CLSVES06

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	26.7000	167.76	CLSVES07
2.50	0.50	1.00	18.85	10.0400	189.25	
4.00	0.50	1.00	49.48	3.2700	161.80	10 M. FROM BUCHES
6.00	0.50	1.00	112.31	1.2640	141.96	FIRST 10 M.
4.00	1.00	2.00	23.56	6.4900	152.92	ON BOG
6.00	1.00	2.00	54.98	2.5900	142.39	BETWEEN BOG AND
8.00	1.00	2.00	98.96	1.2670	125.38	ESKER
10.00	1.00	2.00	155.51	0.7460	116.01	
12.00	1.00	2.00	224.62	0.5020	112.76	86 DEGR
8.00	2.00	4.00	47.12	2.5500	120.17	
10.00	2.00	4.00	75.40	1.4800	111.59	EM34 LINE MOST
12.00	2.00	4.00	109.96	1.0050	110.51	TO CLARA TOWN
15.00	2.00	4.00	173.57	0.6950	120.63	
20.00	2.00	4.00	311.02	0.4400	136.85	
15.00	5.00	10.00	62.83	1.9220	120.76	
20.00	5.00	10.00	117.81	1.1290	133.01	
25.00	5.00	10.00	188.50	0.7840	147.78	
30.00	5.00	10.00	274.89	0.6110	167.96	
40.00	5.00	10.00	494.80	0.4140	204.85	
30.00	10.00	20.00	125.66	1.3070	164.24	
40.00	10.00	20.00	235.62	0.8650	203.81	
50.00	10.00	20.00	376.99	0.6280	236.75	
60.00	10.00	20.00	549.78	0.5050	277.64	
75.00	10.00	20.00	867.86	0.3890	337.60	
60.00	20.00	40.00	251.33	1.0420	261.88	
75.00	20.00	40.00	410.37	0.7950	326.24	

Figure B.7: Apparent Resistivity Data for CLSVES07

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	22.9000	143.88	CLSVES08
2.50	0.50	1.00	18.85	8.3800	157.96	
4.00	0.50	1.00	49.48	2.9500	145.97	50 METER IN
6.00	0.50	1.00	112.31	1.2190	136.91	BOG
4.00	1.00	2.00	23.56	7.0400	165.88	BELOW P.J.FLEMMING
6.00	1.00	2.00	54.98	2.8500	156.69	FIELD
8.00	1.00	2.00	98.96	1.4200	140.52	
10.00	1.00	2.00	155.51	0.8280	128.76	85 TO 265 DEGR
12.00	1.00	2.00	224.62	0.5190	116.58	
8.00	2.00	4.00	47.12	2.9400	138.54	ON EM34 LINE
10.00	2.00	4.00	75.40	1.6960	127.88	MOST AWAY FROM
12.00	2.00	4.00	109.96	1.0770	118.42	CLARA
15.00	2.00	4.00	173.57	0.5990	103.97	
20.00	2.00	4.00	311.02	0.2950	91.75	125 TO 175 M.
15.00	5.00	10.00	62.83	1.7340	108.95	WATELAND
20.00	5.00	10.00	117.81	0.7960	93.78	1 M. DOWN
25.00	5.00	10.00	188.50	0.5000	94.25	175 TO 200 M.
30.00	5.00	10.00	274.89	0.3790	104.18	GRASSLAND
40.00	5.00	10.00	494.80	0.2650	131.12	
30.00	10.00	20.00	125.66	0.8250	103.67	
40.00	10.00	20.00	235.62	0.5620	132.42	
50.00	10.00	20.00	376.99	0.4440	167.38	
60.00	10.00	20.00	549.78	0.3640	200.12	
75.00	10.00	20.00	867.86	0.2950	256.02	
100.00	10.00	20.00	1555.09	0.2260	351.45	
60.00	20.00	40.00	251.33	0.7680	193.02	
75.00	20.00	40.00	410.37	0.6100	250.33	
100.00	20.00	40.00	753.98	0.4640	349.85	
125.00	20.00	40.00	1195.77	0.3860	461.57	
150.00	20.00	40.00	1735.73	0.3270	567.58	
125.00	40.00	80.00	550.76	0.8360	460.44	
150.00	40.00	80.00	820.74	0.7060	579.44	
175.00	40.00	80.00	1139.81	0.5770	657.67	

Figure B.8: Apparent Resistivity Data for CLSVES08

AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	20.8000	130.69	CLSVES09
2.50	0.50	1.00	18.85	7.5200	141.75	
4.00	0.50	1.00	49.48	3.3000	163.28	TOP RIDGE
6.00	0.50	1.00	112.31	1.6980	190.71	226 TO 46 DEGR
4.00	1.00	2.00	23.56	5.3700	126.53	
6.00	1.00	2.00	54.98	2.7300	150.09	85 M. FROM
8.00	1.00	2.00	98.96	1.6680	165.07	WHITE TUBE
10.00	1.00	2.00	155.51	1.2170	189.25	
12.00	1.00	2.00	224.62	0.8850	198.79	
8.00	2.00	4.00	47.12	3.3800	159.28	
10.00	2.00	4.00	75.40	2.4000	180.96	
12.00	2.00	4.00	109.96	1.7320	190.44	
15.00	2.00	4.00	173.57	1.2540	217.66	
20.00	2.00	4.00	311.02	0.8430	262.19	
15.00	5.00	10.00	62.83	3.0600	192.27	
20.00	5.00	10.00	117.81	2.0800	245.04	
25.00	5.00	10.00	188.50	1.5430	290.85	
30.00	5.00	10.00	274.89	1.2400	340.86	
40.00	5.00	10.00	494.80	0.8500	420.58	
30.00	10.00	20.00	125.66	2.5600	321.70	
40.00	10.00	20.00	235.62	1.7510	412.57	
50.00	10.00	20.00	376.99	1.2950	488.20	
60.00	10.00	20.00	549.78	1.0340	568.47	
75.00	10.00	20.00	867.86	0.7610	660.45	
100.00	10.00	20.00	1555.09	0.5190	807.09	
60.00	20.00	40.00	251.33	2.1600	542.87	
75.00	20.00	40.00	410.37	1.9900	816.64	
100.00	20.00	40.00	753.98	1.0840	817.32	
125.00	20.00	40.00	1195.77	0.7940	949.44	
150.00	20.00	40.00	1735.73	0.6200	1076.15	
175.00	20.00	40.00	2373.87	0.5180	1229.66	
125.00	40.00	80.00	550.76	1.6830	926.93	
150.00	40.00	80.00	820.74	1.3040	1070.25	
175.00	40.00	80.00	1139.81	1.0790	1229.85	
200.00	40.00	80.00	1507.96	0.9120	1375.26	
250.00	40.00	80.00	2391.54	0.6580	1573.63	
300.00	40.00	80.00	3471.46	0.4800	1666.30	
350.00	40.00	80.00	4747.73	0.3800	1804.14	
400.00	40.00	80.00	6220.35	0.3080	1915.87	
350.00	50.00	100.00	3769.91	0.5010	1888.73	
400.00	50.00	100.00	4948.01	0.3830	1895.09	
500.00	50.00	100.00	7775.44	0.2820	2192.67	

Figure B.9: Apparent Resistivity Data for CLSVES09

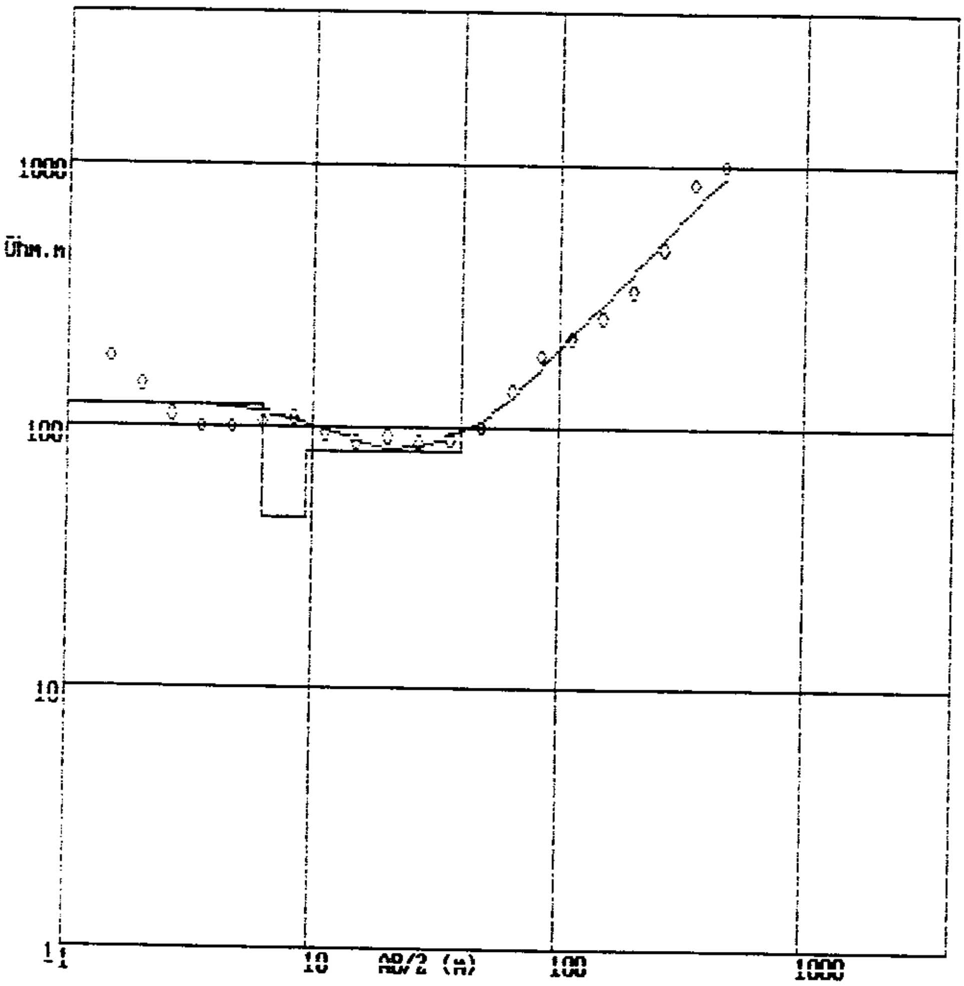
AB/2	MN/2	2(MN/2)	K	MEASURING PROGRAM		
1.50	0.50	1.00	6.28	18.2500	114.67	CLSVES10
2.50	0.50	1.00	18.85	7.0100	132.14	
4.00	0.50	1.00	49.48	3.0700	151.90	70 M FROM CLSVES09
6.00	0.50	1.00	112.31	1.5550	174.65	
4.00	1.00	2.00	23.56	6.3800	150.33	
6.00	1.00	2.00	54.98	3.0000	164.93	
8.00	1.00	2.00	98.96	1.7930	177.44	
10.00	1.00	2.00	155.51	1.2370	192.36	
12.00	1.00	2.00	224.62	0.9680	217.44	
8.00	2.00	4.00	47.12	3.6800	173.42	
10.00	2.00	4.00	75.40	2.5400	191.51	
12.00	2.00	4.00	109.96	1.8620	204.74	
15.00	2.00	4.00	173.57	1.3250	229.98	
20.00	2.00	4.00	311.02	0.8790	273.38	
15.00	5.00	10.00	62.83	3.5300	221.80	
20.00	5.00	10.00	117.81	2.2800	268.61	
25.00	5.00	10.00	188.50	1.6900	318.56	
30.00	5.00	10.00	274.89	1.3330	366.43	
40.00	5.00	10.00	494.80	0.9200	455.22	
30.00	10.00	20.00	125.66	2.7400	344.32	
40.00	10.00	20.00	235.62	1.8550	437.07	
50.00	10.00	20.00	376.99	0.5260	198.30	
60.00	10.00	20.00	549.78	0.3360	184.73	
75.00	10.00	20.00	867.86	0.8200	711.65	
60.00	20.00	40.00	251.33	2.3000	578.05	
75.00	20.00	40.00	410.37	1.6440	674.65	
100.00	20.00	40.00	753.98	1.0880	820.33	

Figure B.10: Apparent Resistivity Data for CLSVES10

Appendix C

Raheenmore Interpreted Resistivity Sounding Curves

Date of the measurement : 14/03/1990.
Location : RAHEENMORE.
Map nr. : RHSVES01
Measuring station nr. : CENTRE AT 243 910 E, 232 400 N.
Curve Fitting RMS Error : 13.5 %

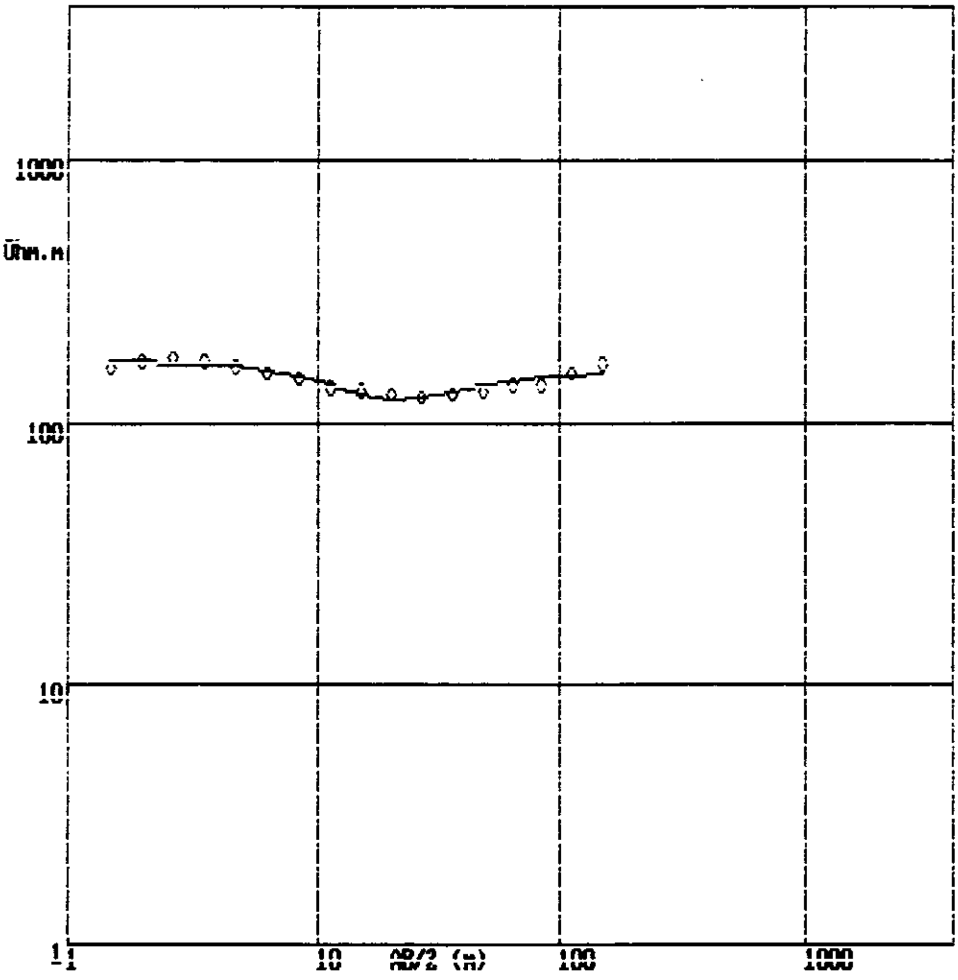


Model parameters :

Layer	Thickness	Resistivity
1	6.3	120.6
2	3.2	45.3
3	30.0	80.9
4	INF.	19494.3

Figure C.1: Interpreted Resistivity Sounding Curve for RHSVES01

Date of the measurement	:	15/03/90
Location	:	RAHEENMORE
Map nr.	:	02
Measuring station nr.	:	RHSVES02
Curve Fitting RMS Error	:	3.8 %

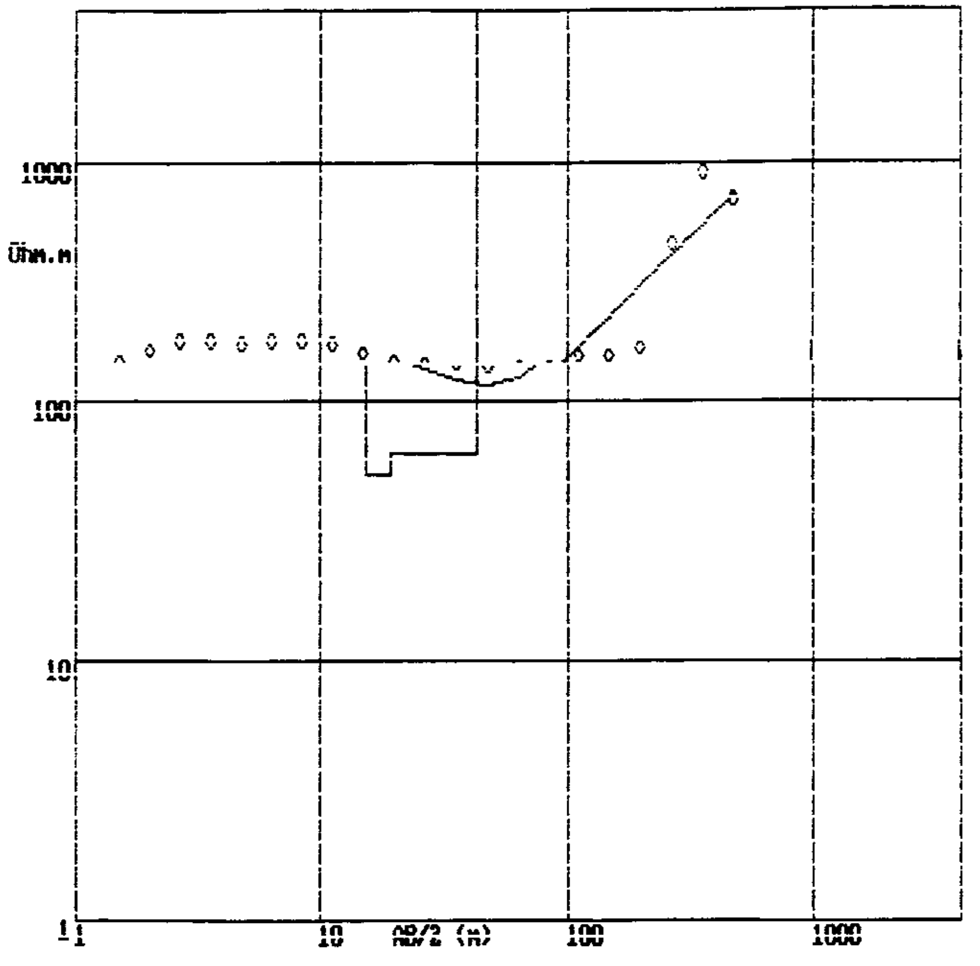


Model parameters :

Layer	Thickness	Resistivity
1	6.6	171.5
2	3.2	51.6
3	INF.	158.7

Figure C.2: Interpreted Resistivity Sounding Curve for RHSVES02

Date of the measurement	:	15/03/90
Location	:	RAHEENMORE
Map nr.	:	03
Measuring station nr.	:	RHSVES03
Curve Fitting RMS Error	:	25.0 %

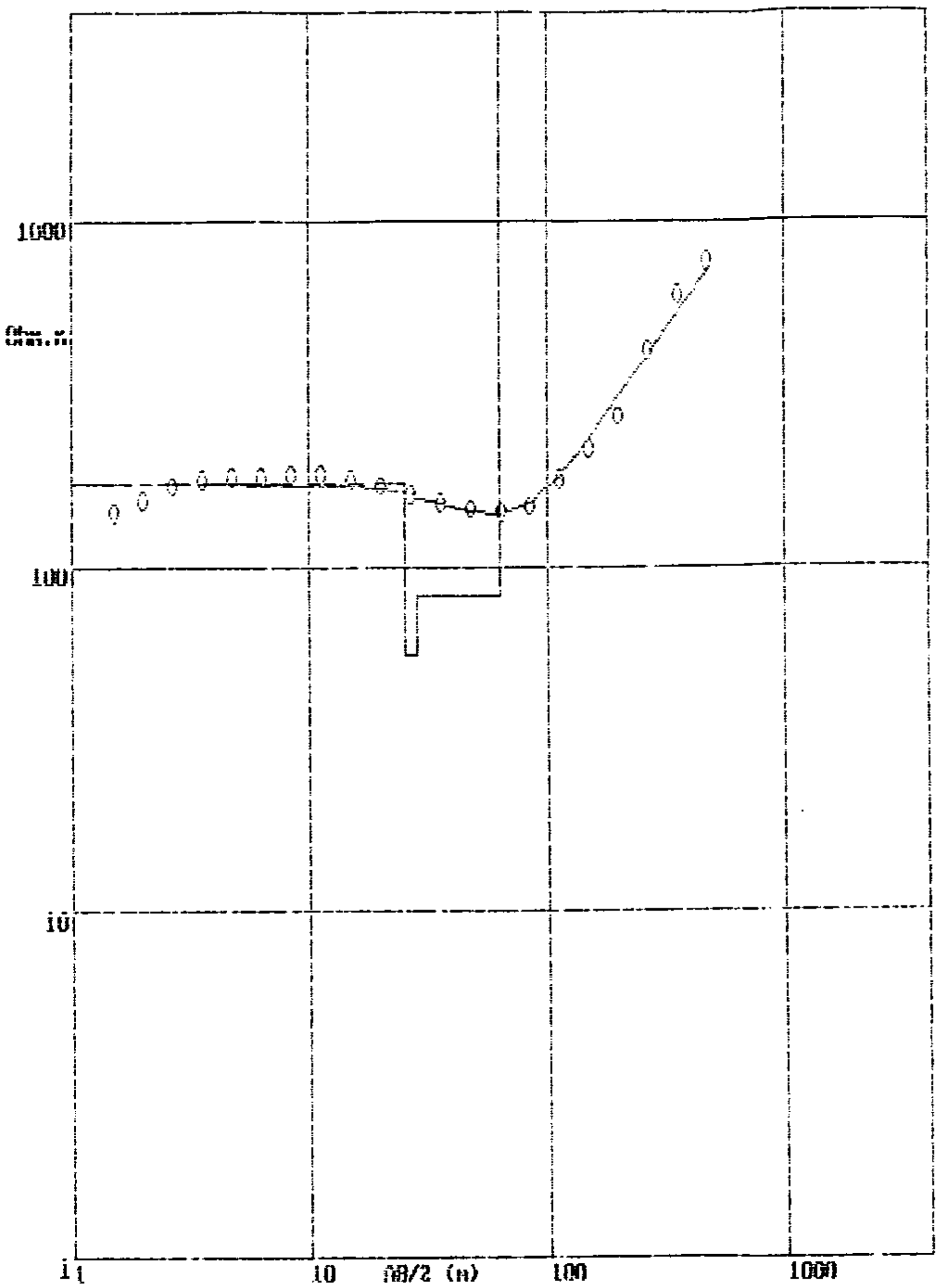


Model parameters :

Layer	Thickness	Resistivity
1	15.5	169.1
2	4.1	51.2
3	23.6	61.4
4	INF.	5541.6

Figure C.3: Interpreted Resistivity Sounding Curve for RHSVES03

Date of the measurement : 16/03/90
Location : raheen
Map nr. : 04
Measuring station nr. : rhsves04
Curve Fitting RMS Error : 7.4 %

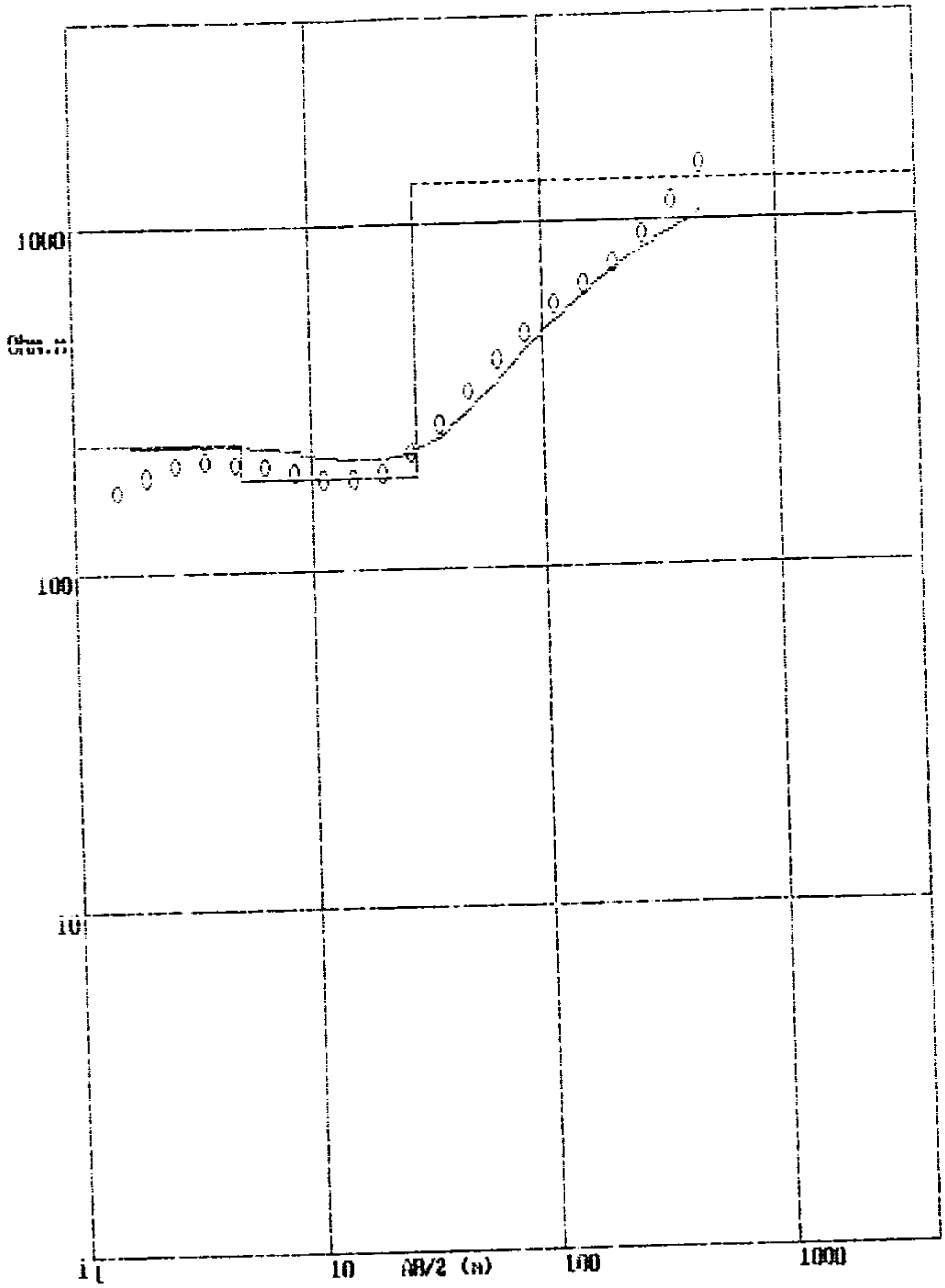


Model parameters :

Layer	Thickness	Resistivity
1	25.4	172.3
2	2.9	54.3
3	34.8	81.5
4	INF.	10000.0

Figure C.4: Interpreted Resistivity Sounding Curve for RHSVES04

Date of the measurement	:	16/03/90
Location	:	rahson
Map nr.	:	05
Measuring station nr.	:	rhsves05
Curve Fitting RMS Error	:	15.2 %

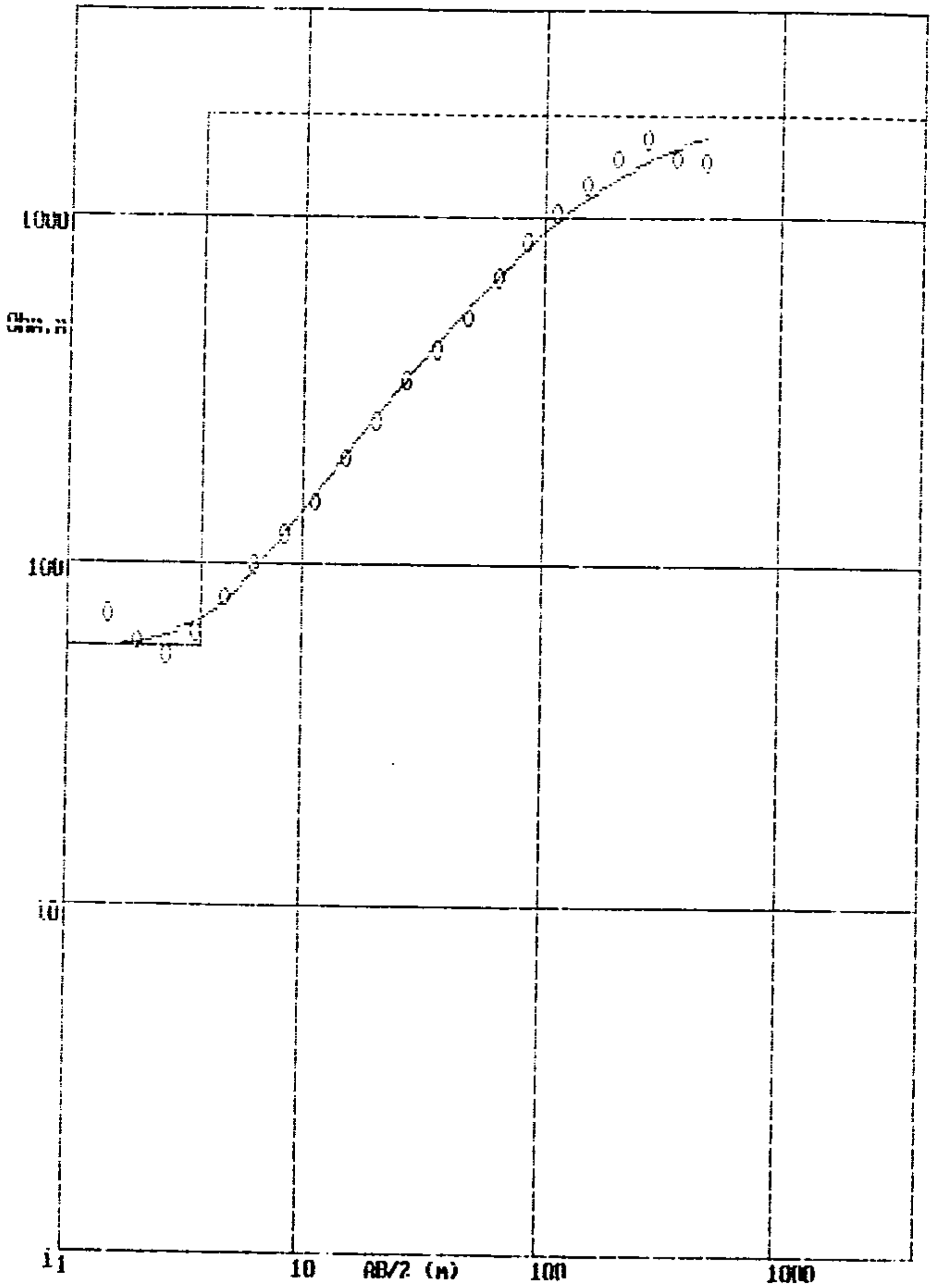


Model parameters :

Layer	Thickness	Resistivity
1	5.0	230.2
2	23.5	182.6
3	INF.	1313.3

Figure C.5: Interpreted Resistivity Sounding Curve for RHSVES05

Date of the measurement : 17/03/90
Location : c.mallon fields
Map nr. : 06
Measuring station nr. : rhsves06
Curve Fitting RMS Error : 8.5 %

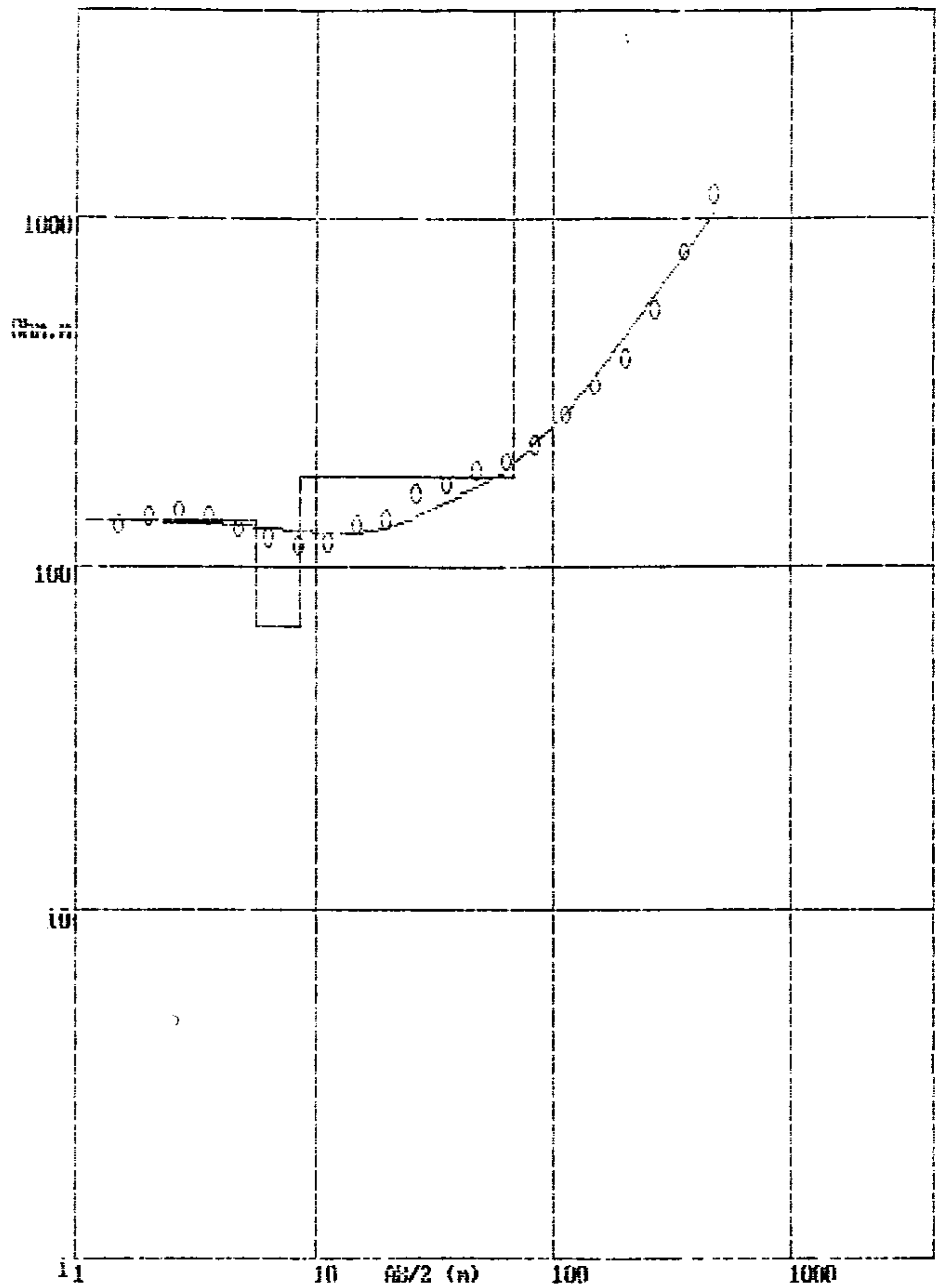


Model parameters :

Layer	Thickness	Resistivity
1	3.8	56.5
2	INF.	1946.4

Figure C.6: Interpreted Resistivity Sounding Curve for RHSVES06

Date of the measurement	:	20/03/90
Location	:	raheen
Map nr.	:	07
Measuring station nr.	:	rhsves07
Curve Fitting RMS Error	:	7.9 %

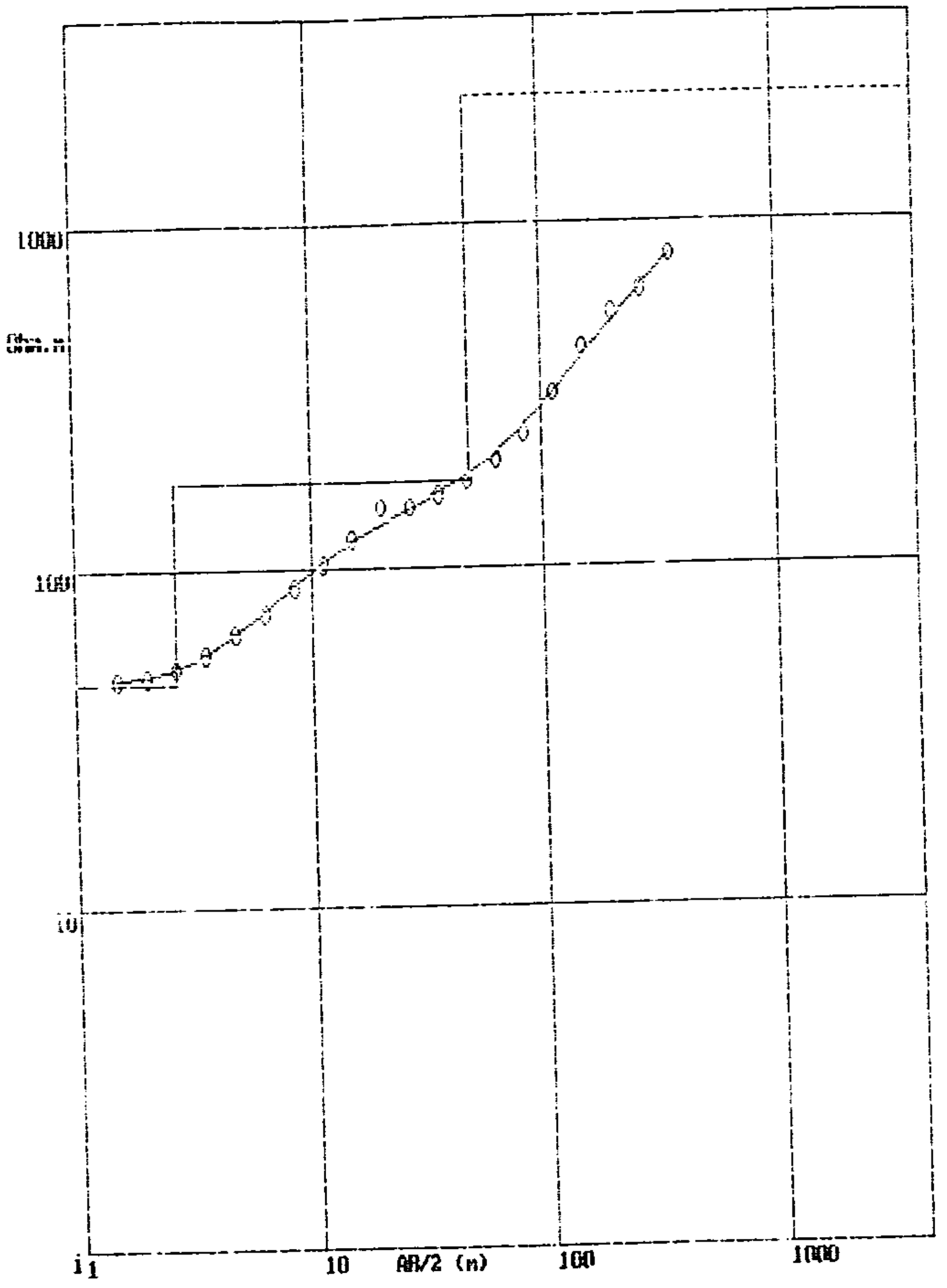


Model parameters :

Layer	Thickness	Resistivity
1	5.6	134.8
2	3.0	66.3
3	60.3	181.4
4	INF.	9110.2

Figure C.7: Interpreted Resistivity Sounding Curve for RHSVES07

Date of the measurement : 20/03/90
Location : harte fields
Map nr. : 08
Measuring station nr. : rhsves08
Curve Fitting RMS Error : 3.7 %



Model parameters :

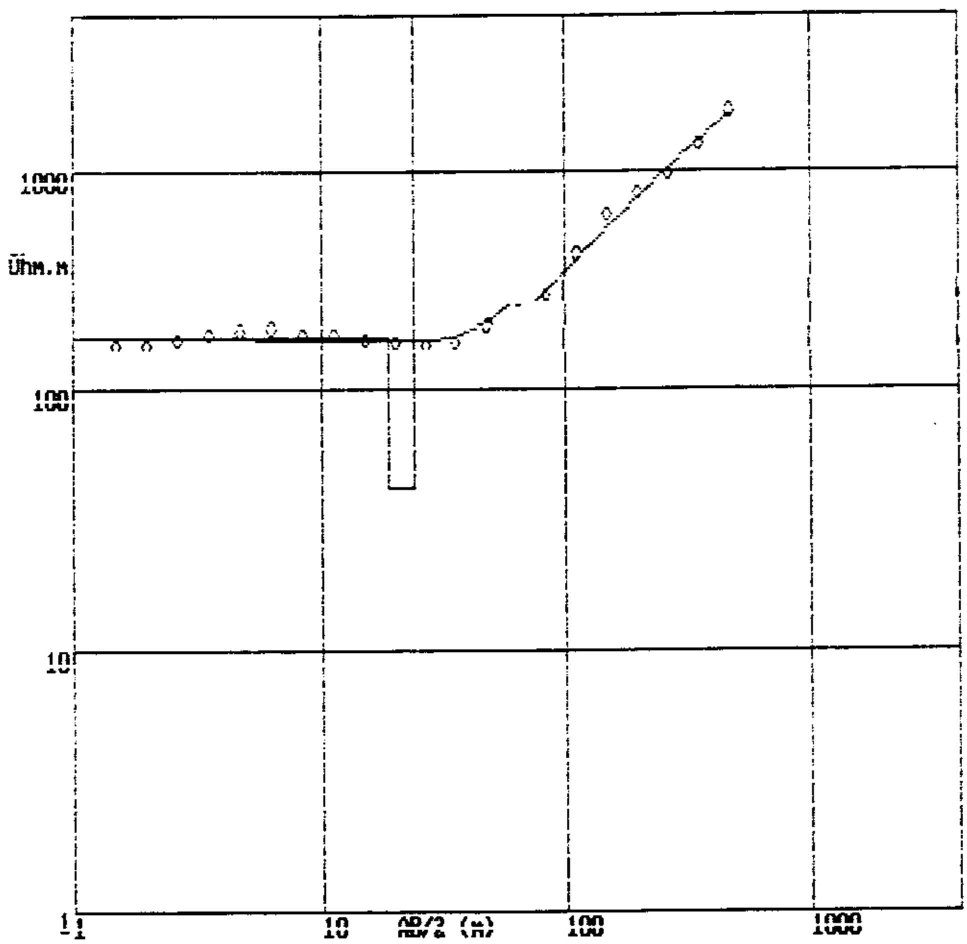
Layer	Thickness	Resistivity
1	2.7	45.7
2	45.9	176.2
3	INF.	2355.1

Figure C.8: Interpreted Resistivity Sounding Curve for RHSVES08

NOT AVAILABLE

Figure C.9: Interpreted Resistivity Sounding Curve for RHSVES09

Date of the measurement : 22/03/90
Location : raheen
Map nr. : 10
Measuring station nr. : rhsves10
Curve Fitting RMS Error : 5.7 %

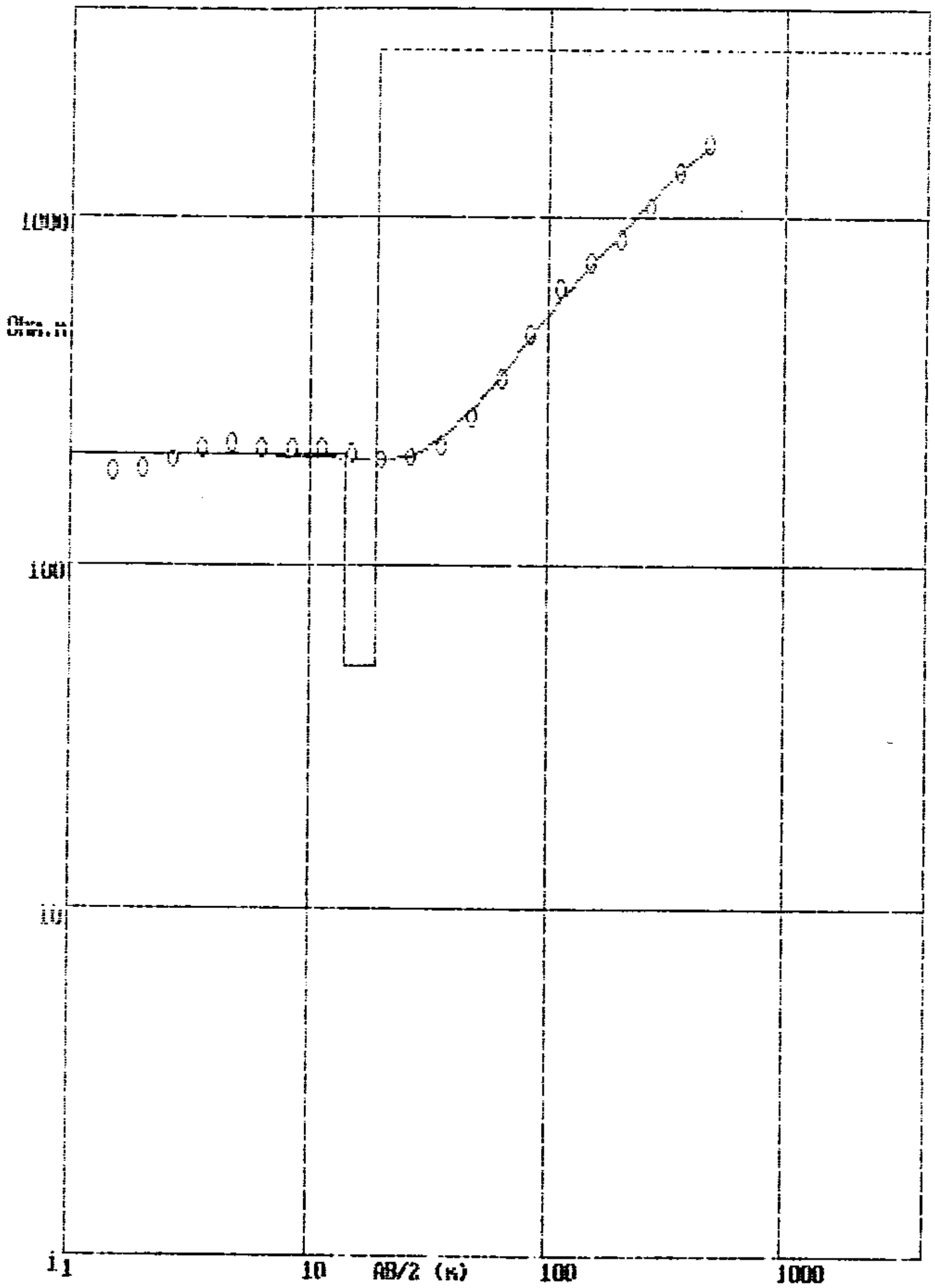


Model parameters :

Layer	Thickness	Resistivity	Interpretation
1	18.6	190.1	
2	5.4	41.5	
3	INF.	7957.6	

Figure C.10: Interpreted Resistivity Sounding Curve for RHSVES10

Date of the measurement	:	22/03/90
Location	:	raheen
Map nr.	:	11
Measuring station nr.	:	rhsves11
Curve Fitting RMS Error	:	5.1 %

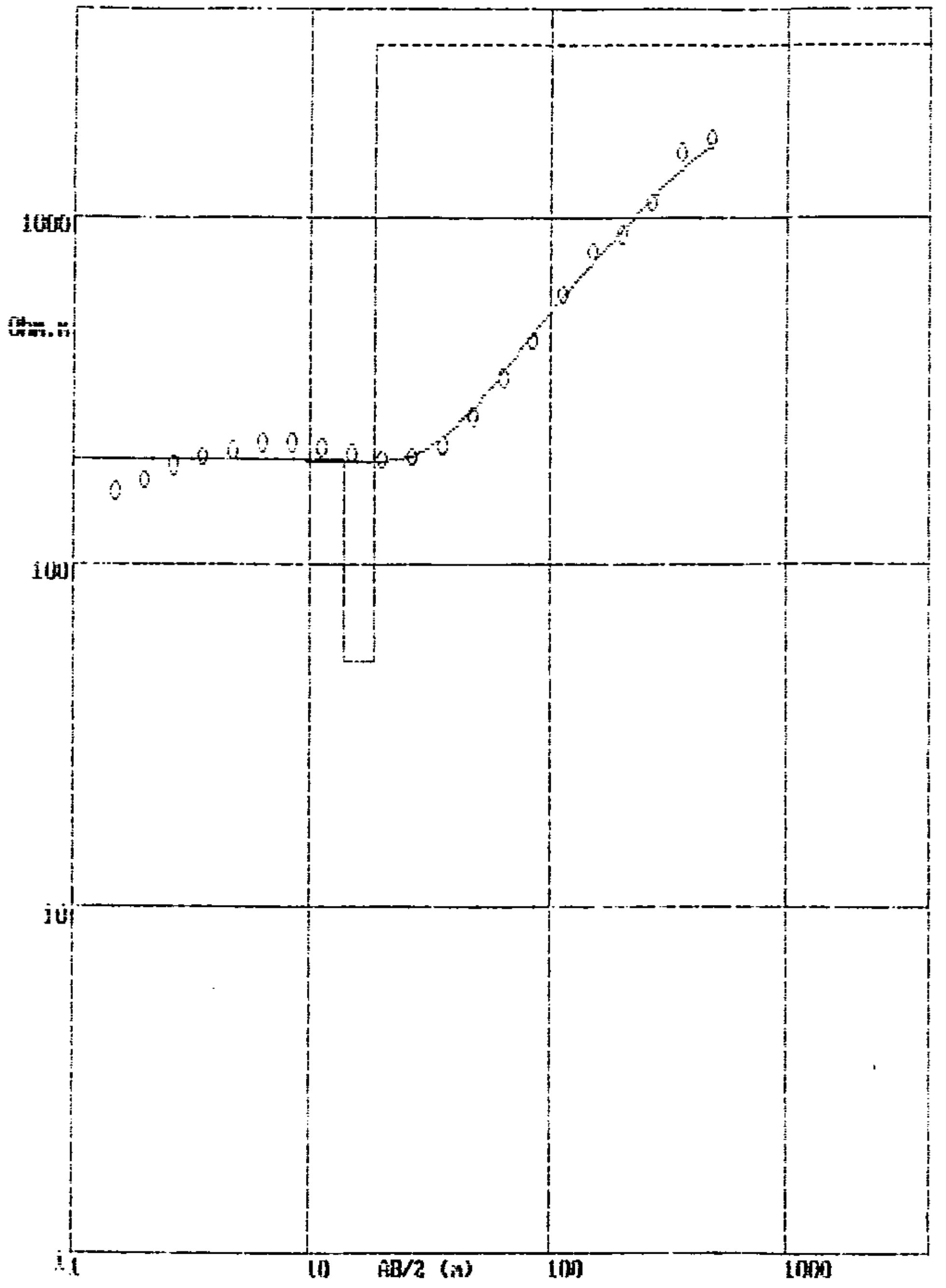


Model parameters :

Layer	Thickness	Resistivity
1	14.3	207.0
2	4.9	50.8
3	INF.	2994.4

Figure C.11: Interpreted Resistivity Sounding Curve for RHSVES11

Date of the measurement : 23/03/90
Location : raheen
Map nr. : 12
Measuring station nr. : rhsves12
Curve Fitting RMS Error : 8.3 %

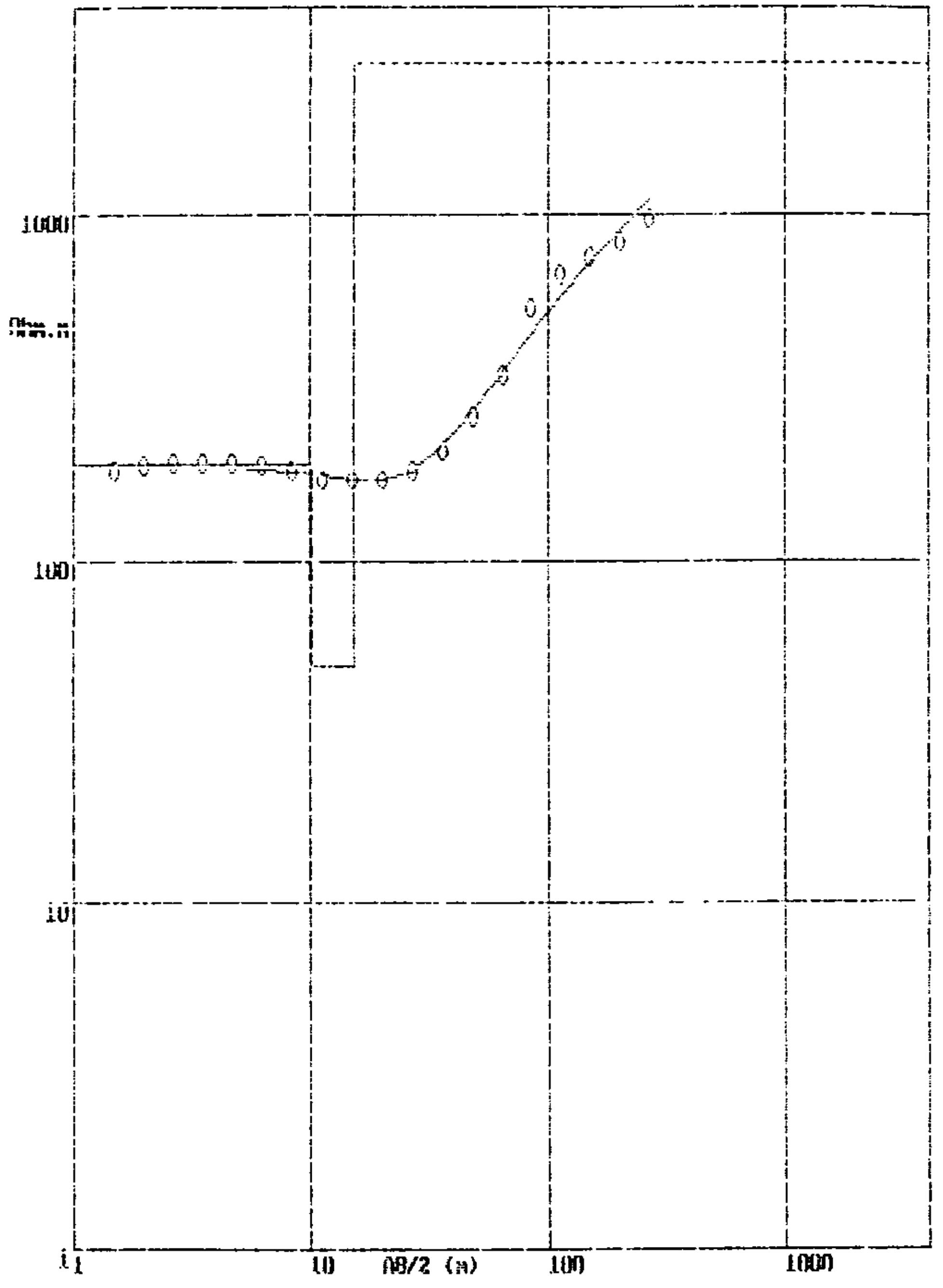


Model parameters :

Layer	Thickness	Resistivity
1	14.0	199.9
2	4.8	52.1
3	INF.	3109.1

Figure C.12: Interpreted Resistivity Sounding Curve for RHSVES12

Date of the measurement	:	27/03/90
Location	:	raheen
Map nr.	:	13
Measuring station nr.	:	rhsves13
Curve Fitting RMS Error	:	6.6 %

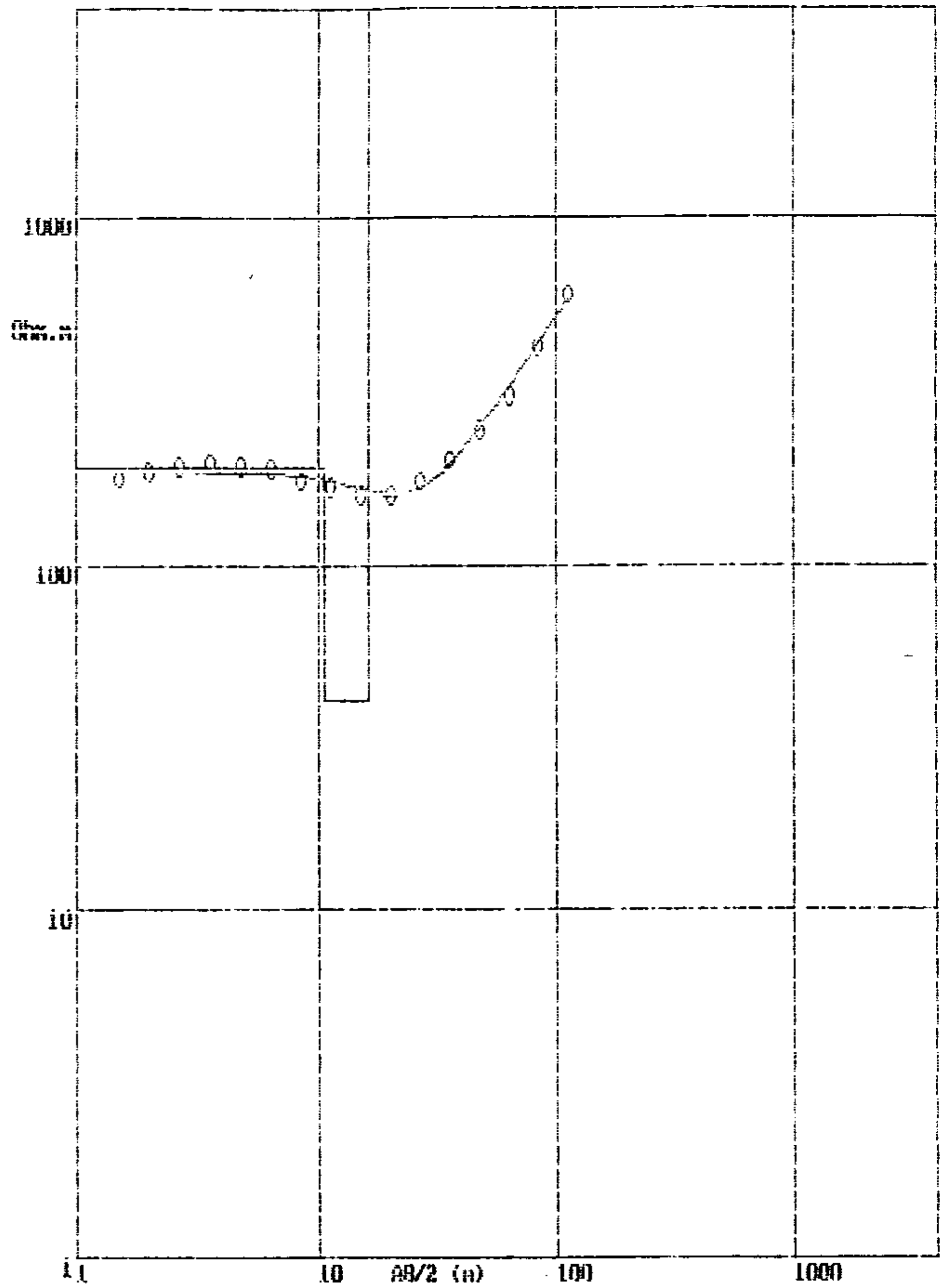


Model parameters :

Layer	Thickness	Resistivity
1	10.2	188.5
2	5.1	48.4
3	INF.	2743.2

Figure C.13: Interpreted Resistivity Sounding Curve for RHSVES13

Date of the measurement : 27/08/90
Location : raheen
Map nr. : 14
Measuring station nr. : rhsves14
Curve Fitting RMS Error : 3.4 %



Model parameters :

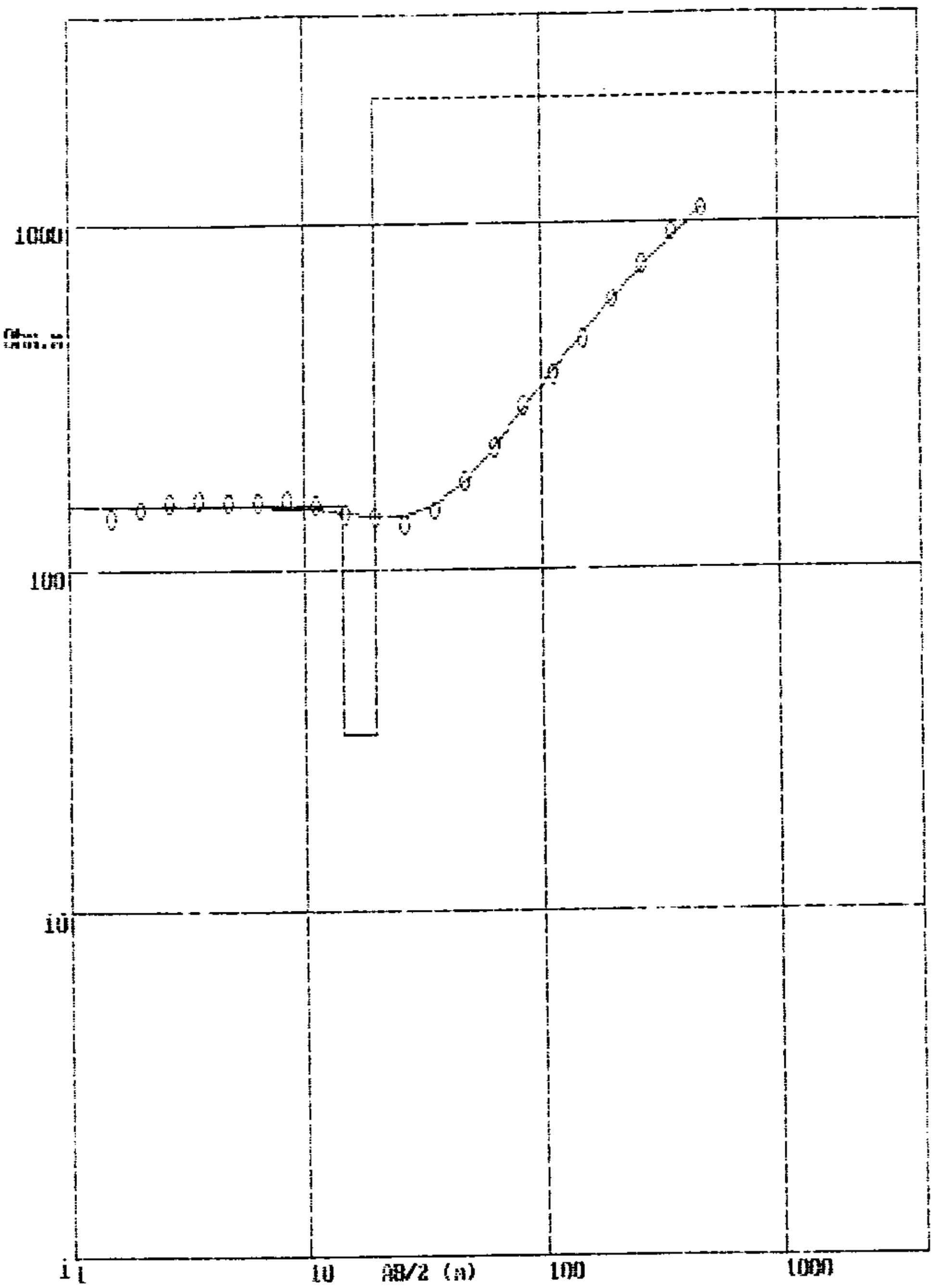
Layer	Thickness	Resistivity
1	10.6	186.7
2	5.5	40.5
3	INF.	30235.6

Figure C.14: Interpreted Resistivity Sounding Curve for RHSVES14

Appendix D

Clara Interpreted Resistivity Sounding Curves

Date of the measurement	:	28/03/90
Location	:	Clara bog
Map nr.	:	01
Measuring station nr.	:	CLSVES01
Curve Fitting RMS Error	:	3.1 %

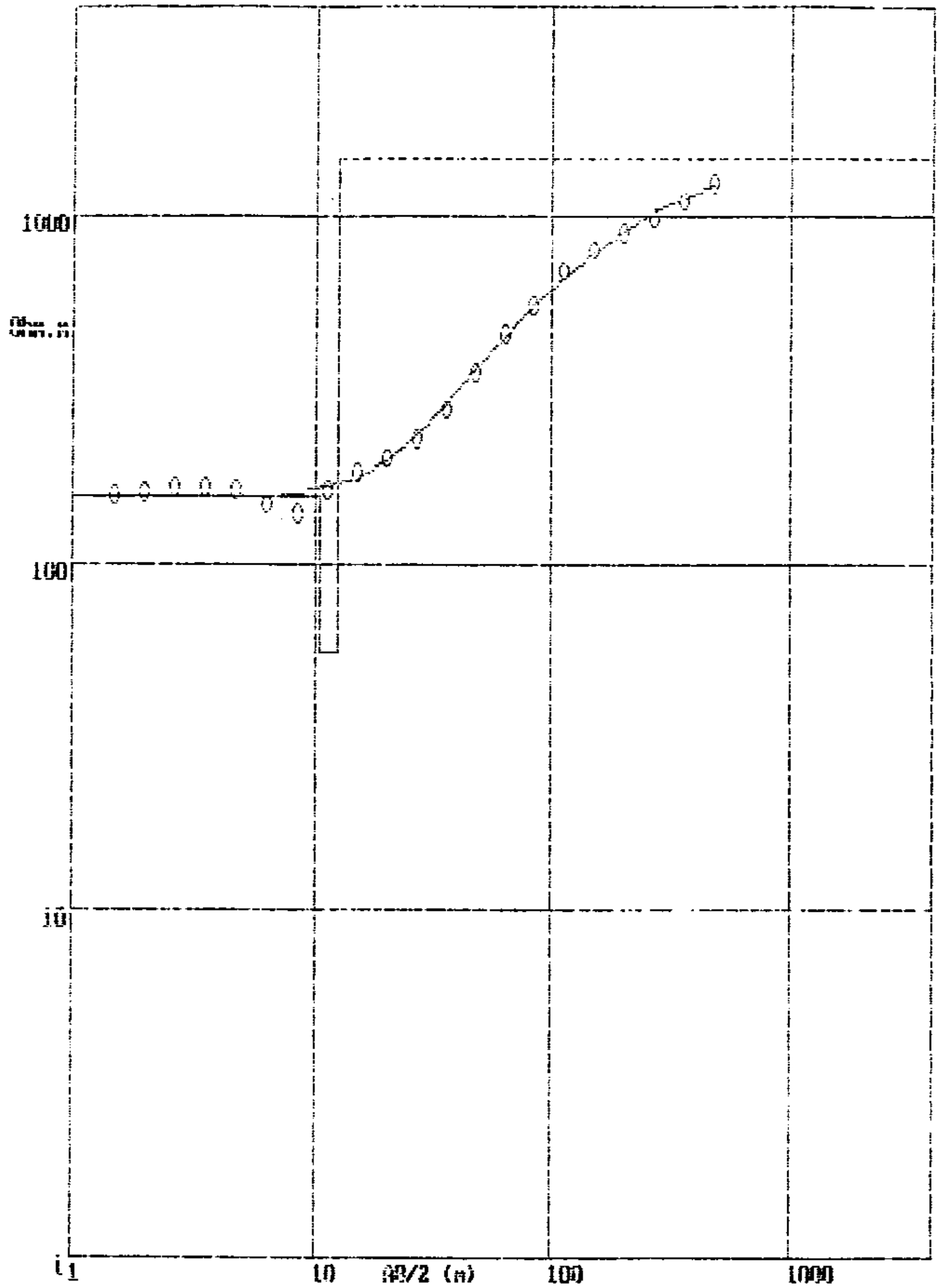


Model parameters :

Layer	Thickness	Resistivity
1	14.5	152.2
2	5.5	33.5
3	INF	2281.1

Figure D.1: Interpreted Resistivity Sounding Curve for CLSVES01

Date of the measurement	:	28/08/90
Location	:	Clara bog
Map nr.	:	02
Measuring station nr.	:	CLSVES02
Curve Fitting RMS Error	:	4.7 %

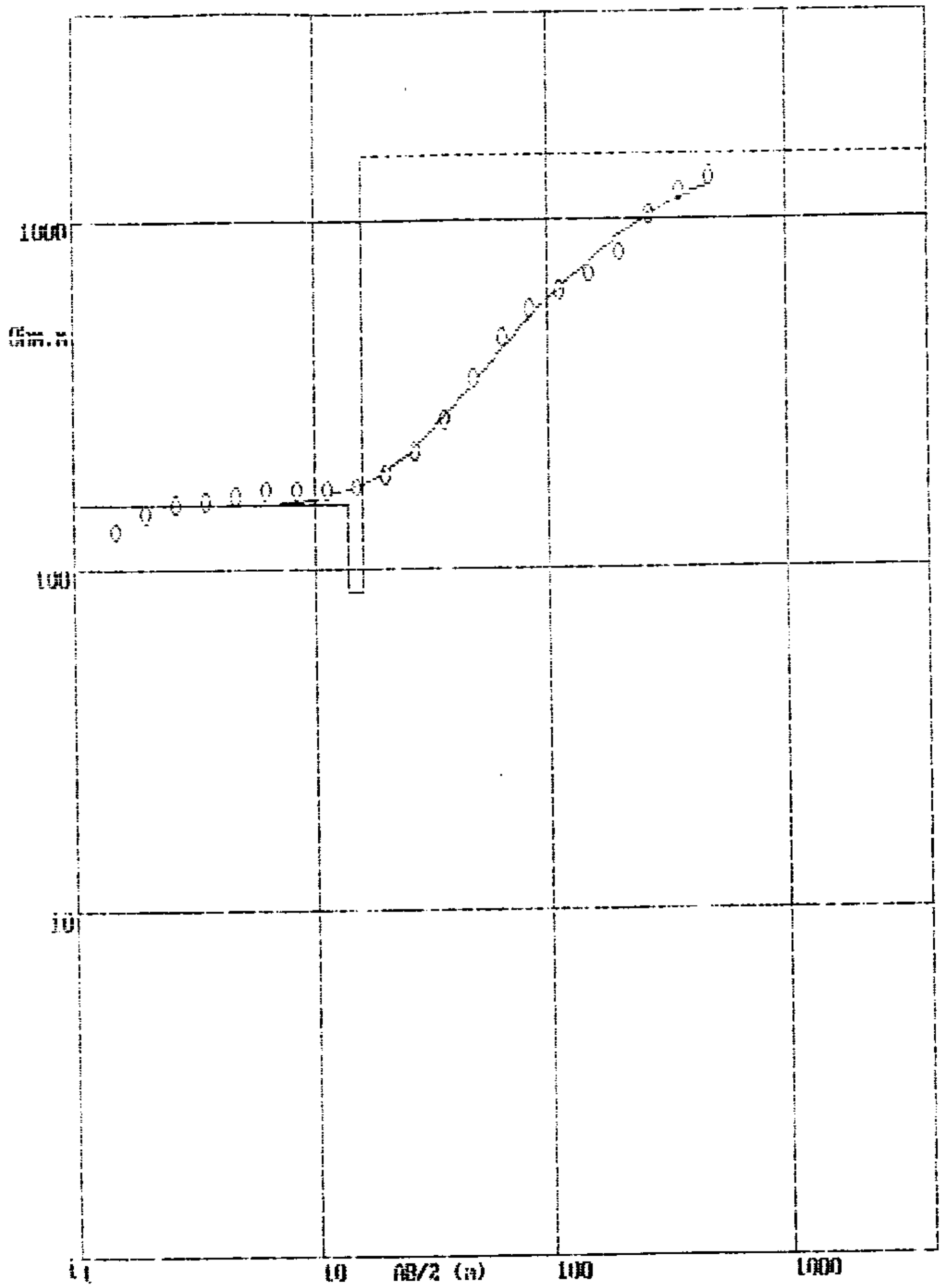


Model parameters :

Layer	Thickness	Resistivity
1	10.5	154.9
2	2.0	54.8
3	INF.	1439.3

Figure D.2: Interpreted Resistivity Sounding Curve for CLSVES02

Date of the measurement	:	28/03/90
Location	:	Clara bog
Map nr.	:	03
Measuring station nr.	:	CLSVES03
Curve Fitting RMS Error	:	6.7 %

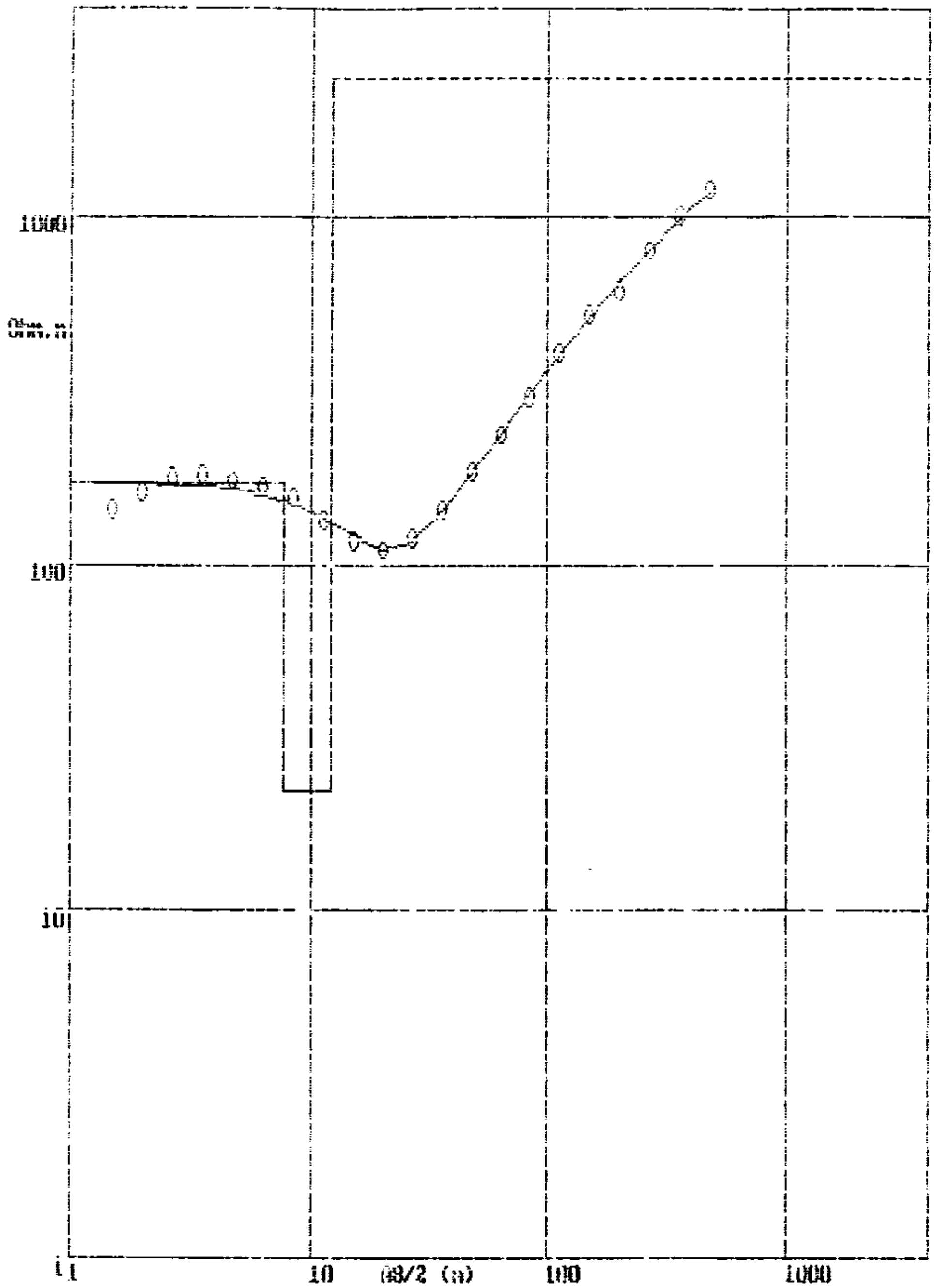


Model parameters :

Layer	Thickness	Resistivity
1	13.8	152.0
2	2.1	84.5
3	INF.	1337.4

Figure D.3: Interpreted Resistivity Sounding Curve for CLSVES03

Date of the measurement	:	31/01/1990
Location	:	clara bog
Map nr.	:	04
Measuring station nr.	:	CLSVES04
Curve Fitting RMS Error	:	5.2 %

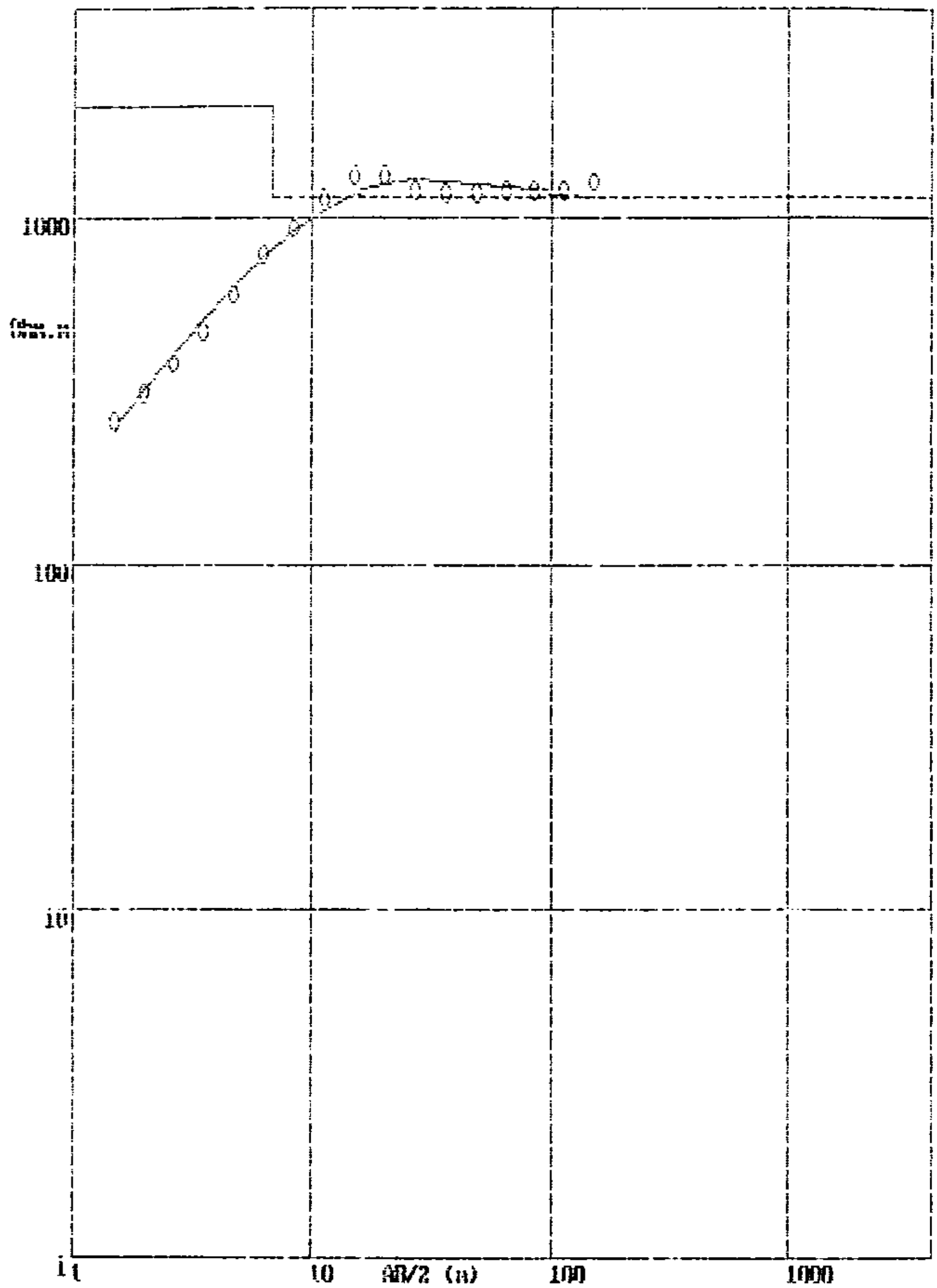


Model parameters :

Layer	Thickness	Resistivity
1	7.8	169.6
2	4.3	22.1
3	INF.	2534.7

Figure D.4: Interpreted Resistivity Sounding Curve for CLSVES04

Date of the measurement	:	29/03/1990
Location	:	CLARA BOG
Map nr.	:	05
Measuring station nr.	:	CLSVES05
Curve Fitting RMS Error	:	6.1 %

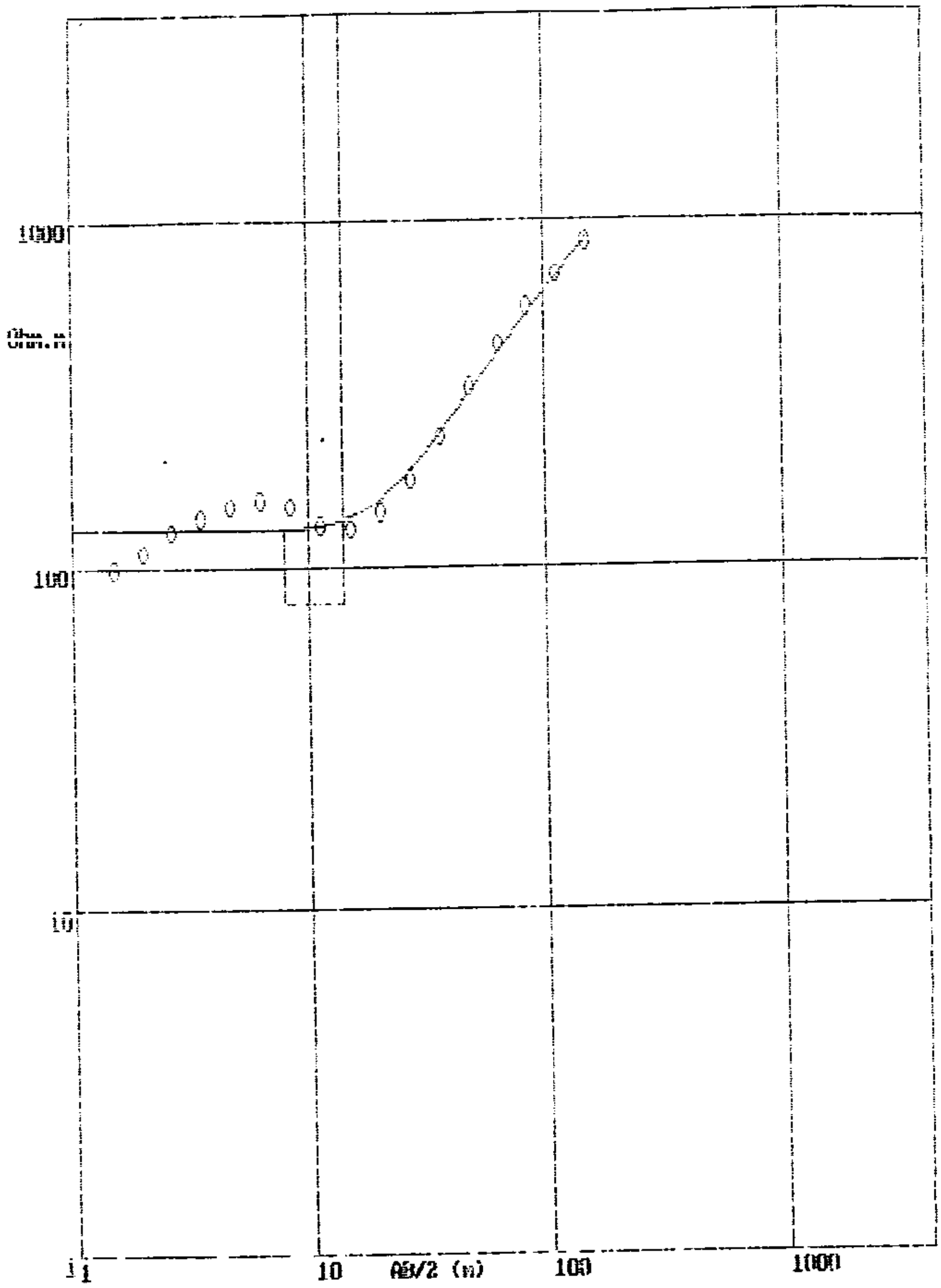


Model parameters :

Layer	Thickness	Resistivity
1	0.4	69.5
2	6.5	2073.2
3	INF.	1135.8

Figure D.5: Interpreted Resistivity Sounding Curve for CLSVES05

Date of the measurement	:	29/03/1990
Location	:	CLARA BOG
Map nr.	:	06
Measuring station nr.	:	CLSVES06
Curve Fitting RMS Error	:	11.5 %

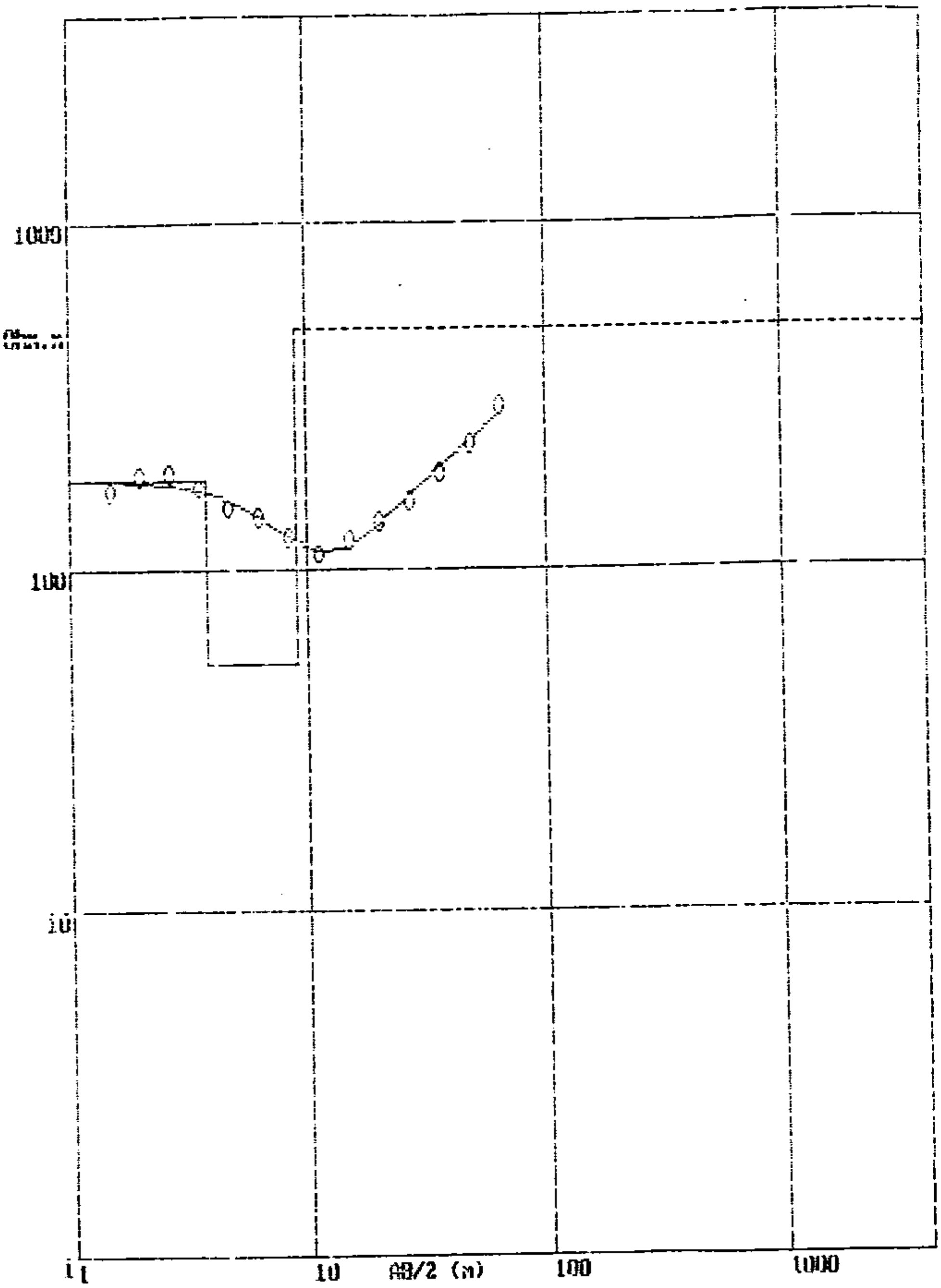


Model parameters :

Layer	Thickness	Resistivity
1	8.0	127.2
2	6.0	78.2
3	INF.	4220.5

Figure D.6: Interpreted Resistivity Sounding Curve for CLSVES06

Date of the measurement	:	29/03/1990
Location	:	CLARA BOG
Map nr.	:	07
Measuring station nr.	:	CLSVES07
Curve Fitting RMS Error	:	4.1 %

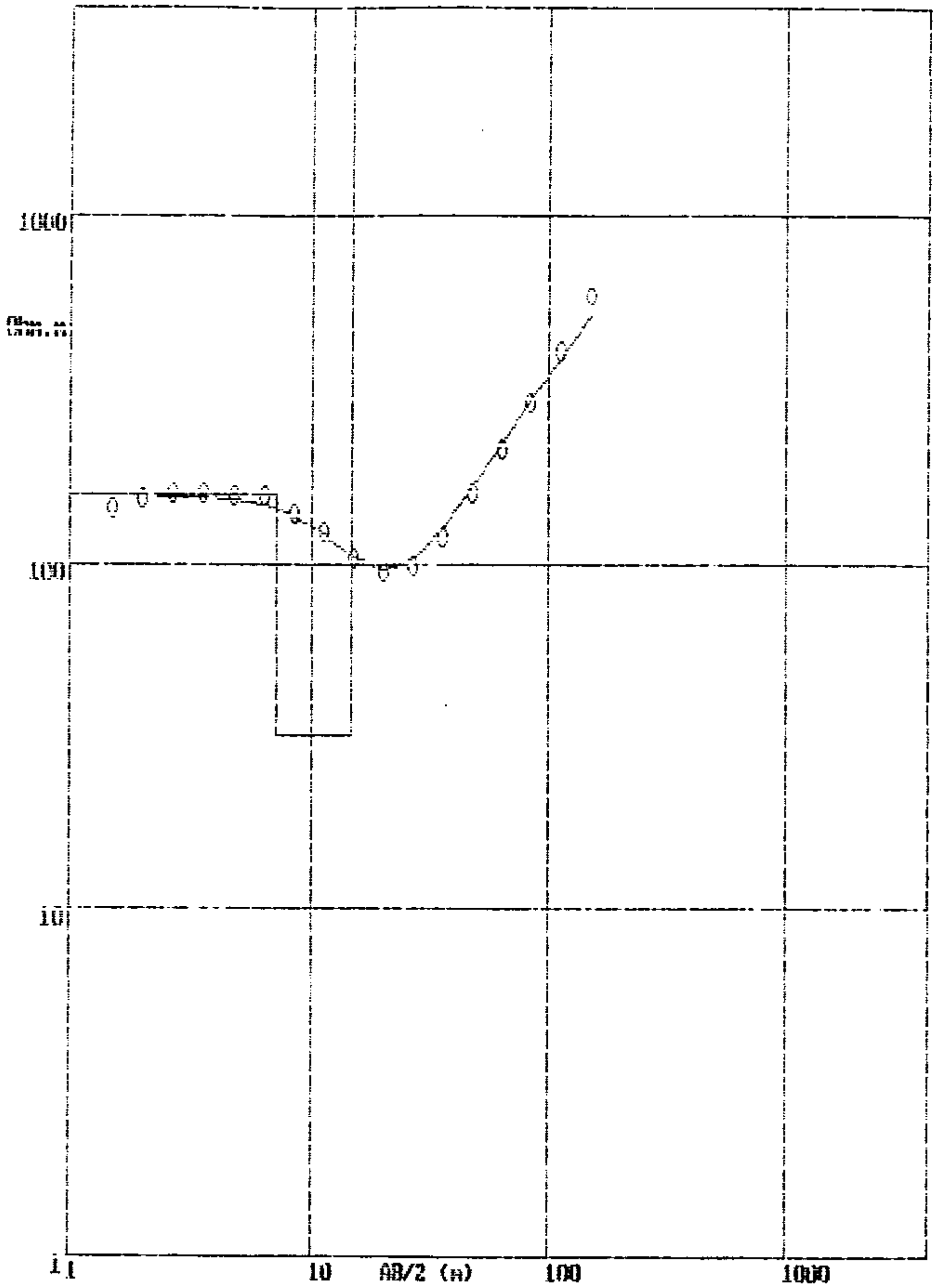


Model parameters :

Layer	Thickness	Resistivity
1	3.8	181.0
2	5.3	52.3
3	INF.	494.3

Figure D.7: Interpreted Resistivity Sounding Curve for CLSVES07

Date of the measurement	:	29/08/1990
Location	:	Clara bog
Map nr.	:	08
Measuring station nr.	:	CLSVES08
Curve Fitting RMS Error	:	4.6 %

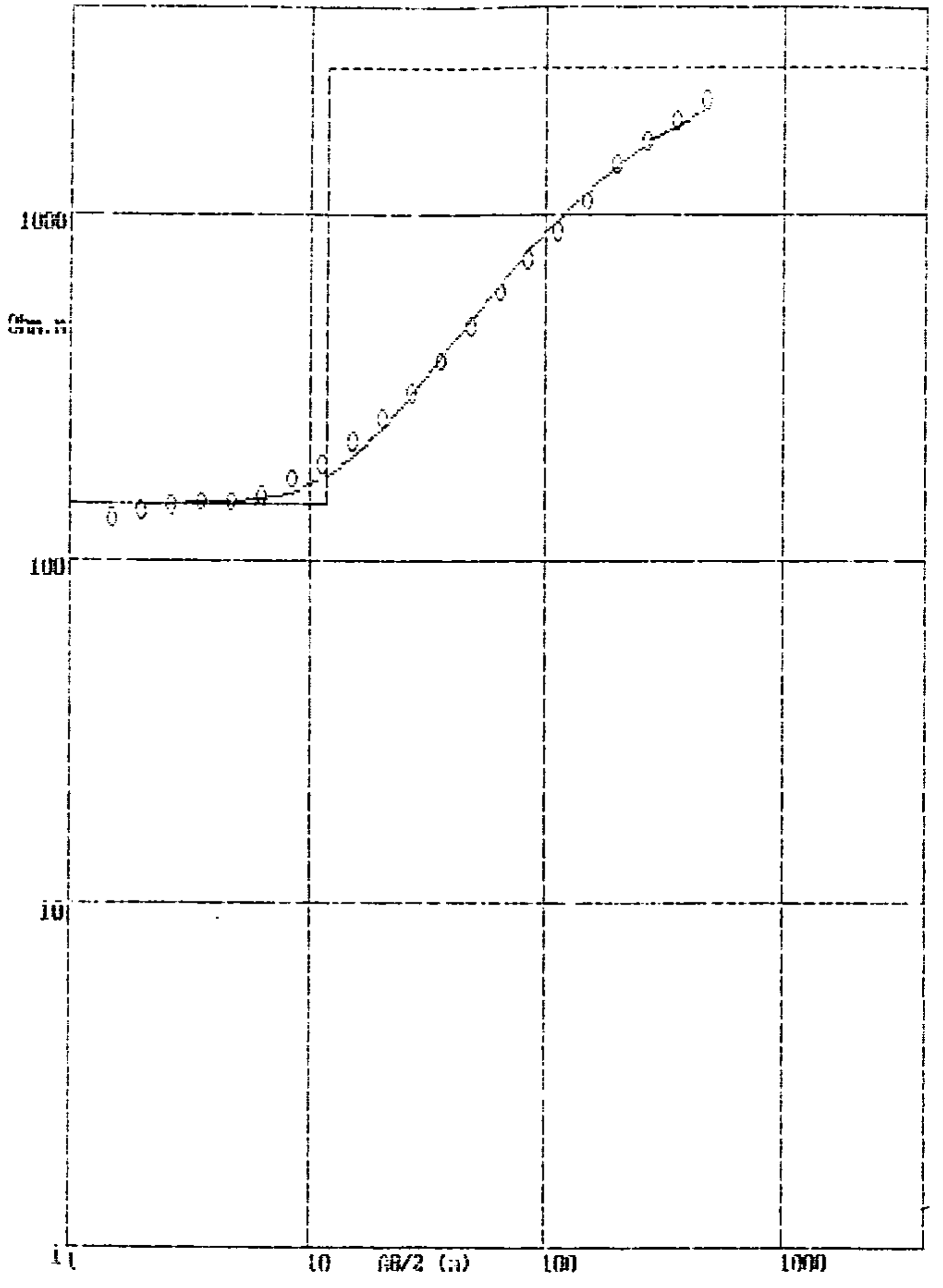


Model parameters :

Layer	Thickness	Resistivity
1	7.1	157.6
2	7.7	32.0
3	INF.	26355.3

Figure D.8: Interpreted Resistivity Sounding Curve for CLSVES08

Date of the measurement	:	31/08/1990
Location	:	clara bog
Map nr.	:	RIDGE 09
Measuring station nr.	:	CLSVES09
Curve Fitting RMS Error	:	5.7 %

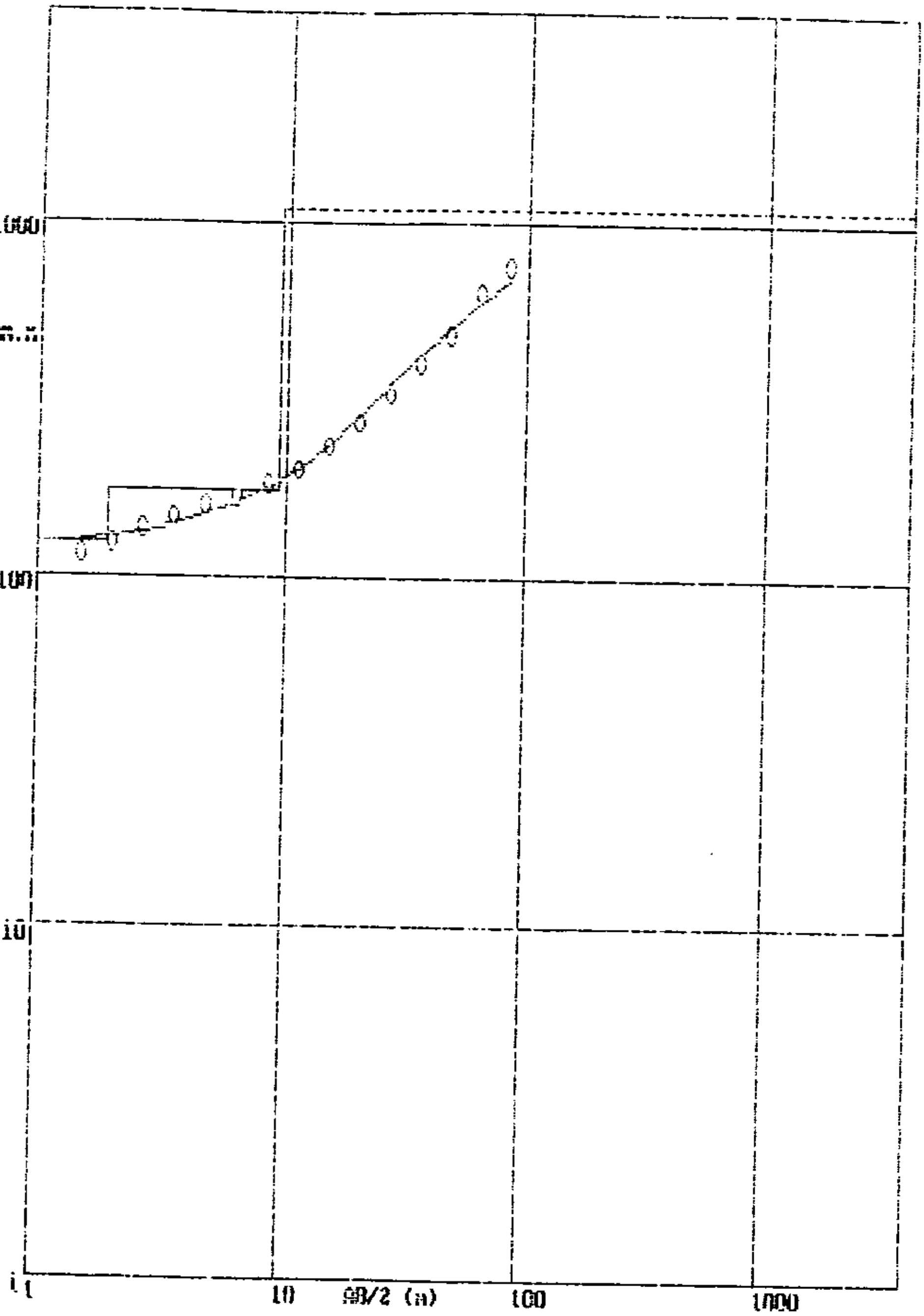


Model parameters :

Layer	Thickness	Resistivity
1	11.7	144.7
2	INF.	2594.5

Figure D.9: Interpreted Resistivity Sounding Curve for CLSVES08

Date of the measurement	:	29/03/1990
Location	:	Clara bog
Map nr.	:	10
Measuring station nr.	:	CLSVES10
Curve Fitting RMS Error	:	5.0 %



Model parameters :

Layer	Thickness	Resistivity
1	1.9	123.1
2	7.4	175.3
3	INF.	1075.6

Figure D.10: Interpreted Resistivity Sounding Curve for CLSVES10