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U.S. Geological Survey Section of Geophysics
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ELECTRICAL RESISTIVITY SURVEY
OF THE BRISTOL, PENNSYLVANIA AREA
A PRELIMINARY REPORT

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ILLUSTRATIONS

(All in pocket attached to back cover.)

- Figure 1 - Maps of Bristol area, Pennsylvania, showing locations of resistivity stations and drill holes.
- Figure 2 - Profile AA'.
- Figure 3 - Profile BB'.
- Figure 4 - Profile CC'.
- Figure 5 - Profile DD'.
- Figure 6 - Profile EE'.
- Figure 7 - Profile FF'.
- Figure 8 - Profiles GG', HH', II', JJ', and KK'.
- Figure 9 - Map showing resistivity line locations, directions, altitude of bedrock, and buried channels, Bristol area, Pennsylvania.

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ELECTRICAL RESISTIVITY SURVEY
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Introduction

The geophysical work in the Bristol, Pennsylvania area was undertaken upon request of the Groundwater Division Office, Philadelphia, Pennsylvania. The field work was performed during the period April 21 to May 9, 1947; the apparent resistivity curves were interpreted during January and February 1947; and the report was written subsequent to the interpretation of the curves.

The generous assistance and cooperation of Mr. Jack B. Graham and his staff is gratefully acknowledged. Without the field assistance given by Messrs. Robert Huber, John Kammerer, Norman Klein, Jerry Ludlow, and others who filled in for a few days, the survey could not have been accomplished. The writer is grateful to the Warner Company and King Farms, Inc. for their courtesy in extending permission to utilize their properties for the geophysical measurements. It is also a pleasure to acknowledge the assistance of George J. Edwards in recording and taking the measurements.

Field Measurements.

The Gish-Rooney earth resistivity apparatus as modified by the Geophysical Instrument Company, Arlington, Va. was used to make the measurements. The electrodes were copper-clad steel rods with steel

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driving heads and were pushed or driven into the earth to make contact for the potential and current connections to the instrument. The earth around the electrodes was wetted and tamped whenever better contact was needed.

Character of the earth materials and the depth to bedrock were of main importance in this survey, consequently depth profiling was used throughout. A modification of the Lee variation of the Wenner electrode configuration was used, and the electrode intervals expanded outward from the central station. With this method three apparent resistivity curves were obtained at each station; one in each direction from the center and one over the full interval. These are termed P_1 , P_2 , and Full curves. Bearings for the line direction are referred to P_1 and are corrected for declination. Power for driving the instrument was supplied by the truck battery, and current to pass through the earth was provided by a bank of extra heavy duty "B" batteries. Fundamental technique of operation is described by the maker of the instrument or will be found in the literature, as for example, Heiland.^{1/}

^{1/} Heiland, C.A., Geophysical exploration, Prentice-Hall, 1940.

Interpretation of the resistivity curves.

In part, the resistivity curves were interpreted by means of procedures described in the literature. A suggestive list of references on interpretation is given which is not intended to be complete.^{2/}

^{2/} Hummel, J.N., A theoretical study of apparent resistivity in surface potential methods; A.I.M.E. Tech. Pub. No. 418, 1931.

Roman, Irwin, How to compute tables for determining electrical resistivity of underlying beds and their application to geophysical problems, U.S. Dept. Commerce, Bur. Mines, Tech. Paper No. 502, 1931.

Roman, Irwin, Superposition in the interpretation of two-layer earth-resistivity curves, U.S.G.S. Bull. 927-A, 18 pp., 1941.

Tagg, G.F., Interpretation of earth resistivity curves; A.I.M.E. Tech. Pub. No. 755, 1937.

Watson, R.J., A contribution to the theory of the interpretation of resistivity measurements obtained from surface potential observations; A.I.M.E. Tech. Pub. No. 518, 1934.

Watson, R.J., and Johnson, J.F., On the extension of two-layer methods of interpretation of earth-resistivity data to three or more layers; Geophysics, 3, 1, 7-21, 1938.

The methods described in the references cited are founded upon theoretical and mathematical principles, and have been found to be, on the whole, more reliable than any of the empirical methods that have been advanced. Furthermore, all of the above methods are based on the theory of electrical images ^{3/} and apply to two, three, or more layers.

^{3/} Jeans, J.F., Mathematical theory of electricity and magnetism, Cambridge U. Press, 1925.

Summary of Results

The electrical resistivity work was carried out in the area shown on Figure 1 and extends from the town of Croydon, Pa., which is located about 2 miles southwest of Bristol, to approximately the city limits of Morrisville, Pa., which is about 9 miles northeast of Bristol. This area is contained on four U.S. Army, Corps of Engineers, Quadrangle maps; namely, Beverly, Pa. - N.J.; Bristol, Pa.- N.J.; Trenton West, Pa. - N.J.; Trenton East, N.J. - Pa.

In all, eleven profiles were completed spaced about one mile apart. Each profile had from a minimum of one to a maximum of eight resistivity stations, with a total of thirty-five stations in the whole survey. The minimum electrode interval to which a resistivity depth profile was completed at a station was 140 feet, while the maximum electrode interval completed was 600 feet.

It was not always possible to locate the resistivity line centers at the sites selected by the members of the Philadelphia Groundwater Office, and alternate selections often had to be made as the survey progressed. This was made necessary on account of poor topography; proximity of water-mains, sewers, culverts, telephone cables and other buried conductors; nearness to the electrified Pennsylvania Railroad System; and the interference expected from ground-return power lines. The locations of the resistivity line centers and the directions in which the electrode intervals were expanded is also shown in Figure 1. The general direction of the profiles is from northwest to southeast and they are indicated on Figure 1 as solid lines lettered AA' to KK' inclusive. Resistivity lines may be associated with the proper profile by the prefixed letter of the profile.

Copies of the resistivity curves, interpretations of the resistivity curves, and drillers logs of the area are included in this report following the text. The interpretations of the resistivity curves are depicted graphically in Figures 2 to 8, and each interpretation is shown approximately in its proper position with respect to the different profiles. All are plotted at the proper altitude with reference to

mean sea level, M.S.L. The interpreted depths to bedrock are indicated with a solid line. The legend for coloring is given on Figure 2. Where another color appears discontinuously in the horizontal direction, it indicates the presence of this material in lesser amount than the one having the color indicated continuously in the same direction. Discontinuity in the vertical indicates a change of material or layering. Doubtful bedrock interpretations are indicated with a question mark.

So that a clearer picture of the bedrock surface over the entire area could be gathered, Figure 9 was prepared. Resistivity line centers and directions, profile lines, and resistivity line numbers are shown in similitude to Figure 1 but without any distracting surface features. Locations of drill holes are also shown. Adjacent to each station the altitude of bedrock with respect to M.S.L. is given. It is almost immediately noticed that two deep channels appear to be present and they are so indicated on Figure 9 with dashed and dotted lines. The presence of a third channel is suspected because of the great depth to bedrock at station I 1. This may be a tributary to one of the buried main channels or else another channel occupied by the river at some time in the past.

It should be emphasized that the number of depth profiles made in this survey is inadequate to correctly depict the course and width of each channel. Many times as much work would need to be done as has been completed on the present survey in order to obtain this information. It is, also, probably not practical to consider pursuing the problem because of the large amount of farming and development on the whole area.

It was assumed from the drilling information that the bedrock would be, in the main, schist, but information from the same source also showed quartz rock at one location and thin white crystalline rock at another place. Weathered rock was also found at several places where drilling was performed. The computed resistivity for the bedrock varied through a wide range; 34.1 to 517.5×10^3 ohm cms. It is assumed on the basis of experience, as no exposures of formations were available for test, that the low values indicate weathered schist and the high values are representative of fresh, unweathered schist or, perhaps, may even be some other type of bedrock.

The top soil layer was also exceedingly variable in its electrical character varying from 4.5 to 162.5×10^3 ohm cms. The soil layer was usually thin, 2.5 to 6.5 ft. approximately, and was frequently intermixed with clay, sand, gravel, or boulders or various groupings of the latter materials. The presence of clay caused the low resistivity, while the sand, gravel and boulders intermixed in the soil caused the high resistivity. The section on interpretations of the apparent resistivity curves indicate the probable content of these materials.

Nearly the whole area of this survey is underlain by sand and/or gravel. These materials, likewise, are highly variable in their electrical properties varying from 32.1 to $1,309.3 \times 10^3$ ohm cms. Clay is probably the main cause of the wide variation in electrical resistivity, and the presence or absence of clay is indicated in the interpretations. The deposits of sand and gravel that appear to be very good are so indicated in the interpretations.

The deposits underlying the sand-gravel beds are variable in their

electrical resistivity ranging from 2.3 to 104.8×10^3 ohm cms. This variation is considered to be caused by the amount of clay intermixed with the sand and gravel deposits.

Water could be obtained from the sand and/or gravel deposits at nearly any place in the area surveyed, but the yield might not be high as the bed is rather thin. Furthermore, the quality of the water might not be satisfactory as the bed is too near the surface of the earth. The next lower bed contains clay in variable amounts, as was previously noted, but it is a possible aquifer. It is to be expected that the best locations for water-well drilling will be those where this layer has the highest resistivity. The best possibilities for water-well drilling then appear to be near resistivity lines F1, A1, D-1A, D1, D-2A, and D-3A. A few other locations are fair possibilities; B1, B2, F3, G1, I1, and J1.

Reference to Figure 9 shows that the resistivity lines in the DD' profile lie on or near one of the geophysically determined deeply buried channels. This series of resistivity lines has already been indicated as the best location for water-well drilling, and, augmented with the fact that they seem to overlie a buried channel, their worth for drilling is appreciably enhanced. The gravel deposits in this channel doubtlessly have better prospects for continuity and recharge than some of the others determined in the survey, unless those happen to be connected with the main channel through unexpected buried channels.

Conclusion

The electrical resistivity studies in this area have shown the practical value of the geophysical technique for locating sand and gravel deposits and classifying these deposits with respect to their clay content. The studies have also shown the usefulness of the method for determining the depth to bedrock and outlining the salient features of the buried bedrock topography. Through the evaluation and grading of the sand-gravel deposits by means of their electrical conductivity, it has been possible to delineate the promising areas for well-drilling and the development of aquifers.

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Interpretation of Resistivity Curves

Line A-1.

Location: 0.2 mi. N.W. of W. Bridge Street, Morrisville, Pa.,
on Snipe's farm. P_1 -N.42°E. Altitude - 75'.

Electrical depth profile:

- 0 - 5' loam, soil, some sand and gravel.
- 5' - 37' sand and gravel.
- 37' - 68' clay, sand and gravel.
- 68' - 160' bedrock.

Line A-2.

Location: Along W. edge of Morrisville, Pa. airport. 895' N. of
road at S.W. corner of field. P_1 -N.10°W. Altitude - 20'.

Electrical depth profile:

- 0 - 10' topsoil, some sand and gravel.
- 10' - 20' sand and gravel.
- 20' - 168' clay, some sand and gravel.
- 168' - 500' bedrock.

Line B-1.

Location: 0.8 mi. W. of Penna. R.R. on Fallsington Penn Valley
Road, thence 0.25 mi. N.E. P_1 -N.26°E. Altitude - 45'.

Electrical depth profile:

- 0 - 6' topsoil, sand, gravel.
- 6' - 24' sand and gravel.
- 24' - 107' clay, sand and gravel.
- 107' - 500' bedrock.

Line B-2.

Location: N.W. of Turkey Hill along E. side of private railroad. P_1 -N.4⁰E. Altitude - 25'.

Electrical depth profile:

- 0 - 4' topsoil, some sand and gravel.
- 4' - 17' sand and gravel.
- 17' - 112' clay, sand and gravel.
- 112' - 500' bedrock, probably weathered.

Line B-3.

Location: 2.7 mi. N. of Tullytown, Pa. on Slickville Road, thence 0.17 mi. E. P_1 -N.6⁰E. Altitude - 20'.

Electrical depth profile:

- 0 - 4.5' topsoil, some sand and clay.
- 4.5' - 32' sand and gravel.
- 32' - 115' clay, some sand and gravel.
- 115' - 500' bedrock, probably weathered.

Line B-4.

Location: 3.8 mi. E. of Tullytown, Pa., thence 760' N. in open field. P_1 -N.3⁰W. Altitude - 20'.

Electrical depth profile:

- 0 - 8.25' sandy topsoil.
- 8.25' - 34' sand and gravel.
- 34' - 210' clay, some sand and gravel.
- 210' - 500' bedrock, probably weathered.

Line B-5.

Location: 4.1 mi. E. of Tullytown, Pa., thence 0.35 mi. S.

P_1 -N.10°W. Altitude - 15'.

Electrical depth profile:

- 0 - 9.5' sandy topsoil.
- 9.5' - 14' clay, little sand and gravel.
- 14' - 38' sand and gravel, some clay.
- 38' - 238' clay, some sand and gravel.
- 238' - 500' bedrock, somewhat weathered.

Line C-1.

Location: 0.2 mi. E. of Fallsington Road intersection with road along-side Airways Beacon 71A, thence about 0.2 mi. N. in a field. P_1 -N.3°W. Altitude - 35'.

Electrical depth profile:

- 0 - 3' sandy topsoil.
- 3' - 11' sand and gravel.
- 11' - 140' bedrock, somewhat weathered.

Line C-2.

Location: 0.4 mi. S. of intersection of road along-side Airways Beacon 71A and Highway 13, thence 0.1 mi. W. in open field.

P_1 -N.6°W. Altitude - 35'.

Electrical depth profile:

- 0 - 8.25' coarse sandy soil.
- 8.25' - 44' sand and gravel, very clean.
- 44' - 133' clay, little sand and gravel.
- 133' - 400' bedrock.

Line C-3.

Location: 0.85 mi. N. of Tullytown Slickville Road along road just W. of King Farms Office; E. side of road. P_1 -N.3°E. Altitude - 20'.

Electrical depth profile:

0 - 31' topsoil, coarse gravelly.
 31' - 202' clay, some sand and gravel.
 202' - 600' bedrock, probably weathered.

Line C-4.

Location: 0.55 mi. E. of railroad at King Farms Office, thence N. 0.1 mi. Just E. of Slickville. P_1 -N.16°W. Altitude - 15'.

Electrical depth profile:

0 - 26' sandy topsoil, sand, gravel.
 26' - 92' clay, little sand and gravel.
 92' - 300' bedrock, weathered.

Rock indication here is not good; possibility that it may be much deeper.

Line C-5.

Location: 0.6 mi. S. of first road E. of Slickville, Pa., thence 0.2 mi. E. P_1 -N.85°E. Altitude - 15'.

Electrical depth profile:

0 - 5.75' sandy topsoil.
 5.75' - 38' sand and gravel.
 38' - 180' clay.
 180' - 600' bedrock, weathered.

Line C-6.

Location: 3.8 mi. E. of Tullytown, Pa., then 1 mi. S. and
0.3 mi. W. on N. side of road. P_1 -N.87°E. Altitude - 10'.

Electrical depth profile:

- 0 - 3.5' topsoil, some clay.
- 3.5' - 21' sand and gravel.
- 21' - - - clay, some sand and gravel.

Bedrock depth is not definite but appears to be > 300'
and may be as much as 500'. It is shallower on P-2 than
on P-1 end of line.

Line D-1.

Location: N. of Tullytown, Pa. along Fallsington Road 1.1 mi.
N. of Cooper Mill Road, thence 0.51 mi. W. of Fallsington Road.

P_1 -N.83°E. Altitude - 35'.

Electrical depth profile:

- 0 - 4.5' sandy topsoil.
- 4.5' - 17' sand and gravel.
- 17' - - - sand and gravel with clay.

Bedrock appears to be either deep, near 200', or else
weathered so that it has the characteristics of sand,
gravel and clay layer.

Line D-1A.

Location: N. of Tullytown, Pa. on Fallsington Road 0.15 mi. N.
of junction with Cooper Mill Road. P_1 -N.8°E. Altitude - 35'.

Electrical depth profile:

- 0 - 2.5' sandy topsoil.
- 2.5' - 10' sand and gravel, very clean.
- 10' - 250' sand and gravel with clay.

No indication of rock.

Line D-2.

Location: 0.45 mi. E. of intersection of Fallsington and Cooper Mill Roads, along Cooper Mill road, thence 0.1 mi. N. in open meadow. P_1 -N.11°E. Altitude - 25'.

Electrical depth profile:

- 0 - 4.5' sandy topsoil with gravel.
- 4.5' - 18' sand and gravel, exceptionally clean.
- 18 - 200' clay with sand and gravel.

Line D-2A.

Location: N.E. of Tullytown, Pa. along road to Slickville, Pa. 0.9 mi., thence 0.1 mi. N. P_1 -N.69°E. Altitude - 15'.

Electrical depth profile:

- 0 - 6' coarse gravelly soil.
- 6' - 24' sand and gravel.
- 24' - 200' sand and gravel with clay.

No bedrock indication.

Line D-3.

Location: 1.15 mi. N.E. of Tullytown, Pa. along Slickville Road, thence 0.2 mi. N. and 0.07 mi. N.E. P_1 -N.30°E. Altitude - 20'.

Electrical depth profile:

- 0 - 7' gravelly topsoil.
- 7' - 22' sand and gravel.
- 22' - 172' clay with sand and gravel.
- 172' - 200' bedrock.

Because of limited space observations were not extended far enough to obtain a satisfactory bedrock indication.

Line D-3A.

Location: 0.05 mi. W. of bridge across Scotts Creek, thence
0.2 mi. S.W. in open field. P_1 -N.23°E. Altitude - 15'.

Electrical depth profile:

0 - 6' sandy topsoil.
6' - 11.8' clay with sand and gravel.
11.8' - 22' sand and gravel.
22' - $\dot{=}$ 225' sand, gravel and clay.
 $\dot{=}$ 225' - 300' bedrock, probably weathered.

Observations not extended far enough to obtain a satisfactory
depth to bedrock; limited space

Line D-4.

Location: At edge of field along E. side of Pennsbury Road
0.95 mi. S. of intersection with Tullytown - Slickville Road.
 P_1 -N.7°W. Altitude - 15'.

Electrical depth profile:

0 - 6' topsoil, some clay.
6' - 24' sand, gravel, clay.
24' - 68' clay.
68' - 300' bedrock, weathered.

Line D-5.

Location: 0.98 mi. S. of Slickville, Pa. along Louderback Road, E. side. $P_1-N.3^{\circ}W.$ Altitude - 10'.

Electrical depth profile:

- 0 - 10' sandy soil cover.
- 10' - 26' sand, gravel.
- 26' - 208' clay, little sand or gravel.
- 208' - 450' bedrock, weathered.

Line E-1.

Location: 0.1 mi. S. of intersection of Cooper Mill Road with Tullytown - Oxford Valley Road along E. side of Tullytown - Oxford Valley Road. $P_1-N.32^{\circ}W.$ Altitude - 30'.

Electrical depth profile:

- 0 - 15' sandy soil cover.
- 15' - 20' sand and gravel.
- 20' - 102' clay.
- 102' - 200' bedrock.

Line E-2.

Location: N. of Tullytown, Pa. 0.8 mi. along Fallsington Road, thence 0.1 mi. W. in field along old road. $P_1-N.27^{\circ}W.$ Altitude - 25'.

Electrical depth profile:

- 0 - 5.5' topsoil, some clay.
- 5.5' - 27' sand and gravel.
- 27' - 96' clay, some sand and gravel.
- 96' - 200' bedrock.

Line E-3.

Location: Based on bearings: Patterson Parchment Paper Co.
stack S.55°W.; abandoned powder mill stack S.72°W. P₁-N.32°E.
Altitude - 20'.

Electrical depth profile:

- 0 - 5.5' sandy topsoil.
- 5.5' - 24' sand and gravel.
- 24' - 165' clay, some sand and gravel.
- 165' - 350' bedrock.

Line E-4.

Location: S.E. of Tullytown, Pa. toward Scotts Creek on
unnamed road in King Farms; 25' S. from ~~E~~ of dirt road and
650' E. of Scotts Creek. P₁-N.86°E. Altitude - 15'.

Electrical depth profile:

- 0 - 4.25' sandy topsoil.
- 4.25' - 25' sand and gravel.
- 25' - 128' clay with some sand and gravel.
- 128' - 325' rock, weathered.

Rock may be deeper than this and the material interpreted
as rock could be gravel or weathered rock.

Line F-1.

Location: 0.4 mi. S. of Mill Creek Road on Hanes Road, thence
290' N.E. from center of road in a pasture. P_1 -N.65°E.

Altitude - 30'.

Electrical depth profile:

- 0 - 2.6' topsoil.
- 2.6' - 10.5' sand and gravel.
- 10.5' - 48' sand and gravel, some clay.
- 48' - 164' bedrock.
- 164' - 200' bedrock of lower resistivity (? kind).

Line F-2.

Location: 0.32 mi. E. of Hanes Road along S. side of Penna.
Canal, thence N.33°W. 0.12 mi. and N. of Patterson Paper Co.

P_1 -S.35°E. Altitude - 25'.

Electrical depth profile:

- 0 - 4.25' sandy clay soil.
- 4.25' - 21' sand and gravel.
- 21' - 112' clay, some sand and gravel.
- 112' - 300' bedrock.

Line F-3.

Location: Based on bearings, see map. About 750' to Delaware River. P -N.50°E. Altitude - 10'.
1

Electrical depth profile:

- 0 - 6' sandy soil, some rocks and boulders.
- 6' - 24' sand and gravel.
- 24' - 39' clay, sand, and gravel.
- 39' - 200' sand, gravel, some clay.

No bedrock indication certain. However, layer at 39'-200' may be extremely weathered rock.

Line G-1.

Location: About 150' S.E. of S.E. end of plane factory runway fill; 1,400' S.W. of Emilie Road along Penna. Canal, then 100' S.W. P -N.58°E. Altitude - 25'.
1

Electrical depth profile:

- 0 - 4' soil with rock projecting through.
- 4' - 16' sand and gravel, clean.
- 16' - 107' clay, some sand and gravel.
- 107' - 280' bedrock.

Line H-1.

Location: 0.2 mi. S.E. of intersection Cooper Mill Road with Highway No. 101, thence 0.05 mi. W. in open field. P $-N.4^{\circ}W.$
1

Altitude - 30'.

Electrical depth profile:

- 0 - 8.5' topsoil with some gravel.
- 8.5' - 17' sand and gravel, some clay.
- 17' - 92' clay, some sand and gravel.
- 92' - 325' bedrock.

Line H-2.

Location: 0.15 mi. N.W. of intersection Beaver Dam Road and Green Lane along Green Lane, thence 280' W. in open field.

P $-N.27\frac{1}{2}^{\circ}W.$ Altitude - 30'.
1

Electrical depth profile:

- 0 - 11' topsoil with some sand and gravel.
- 11' - 22' sand and gravel, some clay.
- 22' - 93' clay, some sand and gravel.
- 93' - 325' bedrock.

A low resistivity layer appears on the curve below 250' but is not interpreted because of lack of observations.

Line I-1.

Location: 0.6 mi. N.W. of P.R.R. overpass along Beaver Dam Road, Highway No. 102, thence 0.12 mi. N.W. in a field.

P - N.13°E. Altitude - 30'.

Electrical depth profile:

- 0 - 2.5' topsoil, some clay.
- 2.5' - 18' sand and gravel, very clean.
- 18' - 192' clay with some sand and gravel.
- 192' - 400' bedrock.

A deeply weathered zone may overlie the bedrock here. P₁ is also deeper than P₂ by approximately 40'.

Line J-1.

Location: 0.9 mi. N.W. of P.R.R. overpass along Bristol-Newportville Road, thence 0.2 mi. N. of road in a field.

P₁ - N.26°E. Altitude - 30'.

Electrical depth profile:

- 0 - 6' topsoil, some sand and gravel.
- 6' - 24' sand and gravel, little clay.
- 24' - 122' clay, with some sand and gravel.
- 122' - 400' bedrock.

P₂ is deeper than P₁ by $\frac{1}{2}$ 20'.

Line K-1.

Location: Along Highway No. 13, 0.52 mi. E. of Philco plant in Croydon, Pa., thence 0.1 mi. N. in an open field about 250' S. of creek. P_1 -N.71°E. Altitude - 20'.

Electrical depth profile:

- 0 - 30' topsoil, some clay, sand and gravel.
- 30' - 53' clay, little sand and gravel.
- 53' - 300' bedrock.

Line K-2.

Location: 0.8 mi. S.W. of intersection of State Road E. of Croydon with dirt road, along dirt road, thence 40' E. in open field. P_1 -N.37°E. Altitude - 25'.

Electrical depth profile:

- 0 - 7.5' topsoil, some sand and gravel.
- 7.5 - 30' sand and gravel, some clay.
- 30' - 118' clay.
- 118' - 300' bedrock.

Driller's Logs

Near resistivity line A2

Ducks County well 112, Borough of Morrisville, Pa.

Grid location: 1964, 4 yards north, 835, 5 yards east; about 1,000

yards N.42° E. of station A2. Altitude: about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	18	3	topsoil:
15	6	12	sand, gravel and boulders.
28	-7	13	sand and dry gravel.
35	-14	7	sand and gravel, water.
42	-21	7	gravel and boulders.
61	-40	19	white clay.
72	-51	11	fine white sand.
75	-54	3	white sand.
79	-58	4	white sand and a little gravel.
82	-61	3	white sand and gravel.
98	-77	16	white sand.
105	-84	7	coarse white sand.
112	-91	7	coarse white sand and gravel.
117	-96	5	yellow sand and gravel.
--	--	--	clay.

Bucks County well 111, Borough of Morrisville, Pa.

Grid location: 1964, 8 yards north, 835, 3 yards east; about 1,000 yards N.20° E. of station A2. Altitude: about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	18	3	clay and boulders.
15	6	12	dry sand, gravel and boulders.
37	-16	22	gravel and sand.
47	-26	10	sand and gravel, some clay.
53	-32	6	hard red clay.
61	-40	8	soft white clay and sand.
62	-41	1	gravel.
68	-47	6	white clay and sand.
72	-51	4	gravel.
77	-56	5	white clay and sand.
84	-63	7	hard white clay.
133	-112	49	hard yellow clay.
135	-114	2	blue clay.
136.5	-115.5	1.5	rock.
146.5	-125.5	10	sand.

Bucks County well 110, Borough of Morrisville, Pa.

Grid location: 1965, 4 yards north, 835, 1 yards east; about 1,600 yards N.5° E. of station A2. Altitude: about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
2	18	2	topsoil.
28	- 8	26	boulders, gravel, and sand.
30	-10	2	hardpan.
38	-18	8	gravel, coarse sand.
40	-20	2	yellow muddy sand.
50	-30	10	decomposed mica rock.
52	-32	2	gray sand and gravel.
74	-54	22	rocks, quartz.

Bucks County well 118, Pennsylvania Maritime Academy,
Morrisville R.D., Penna.

Grid location: 1961, 2 yards north, 839, 3 yards east; about 1,750 yards N.37° E. of station B4. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
11	4	11	loam.
34	-19	23	coarse gravel.
44	-29	10	water-bearing sand and gravel.
45	-30	1	white clay.
51	-36	6	yellow sand and gravel.
61.5	-46.5	10.5	dirty yellow sand, in water.

Near resistivity line F2
Bucks County well 40, Patterson Parchment Paper Company

Grid location: 1957, 3 yards north, 830, 3 yards east; about 670
yards S.53°E. of station F2. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	12	3	topsoil and yellow clay.
8	7	5	brown sand and gravel.
20	- 5	12	gravel and boulders.
22	- 7	2	dark gray sand and hard clay.
28	-13	6	boulders and gravel.
35	-20	7	yellow clay.
39	-24	4	white and blue clay mixed.
55	-40	16	red clay.
90	-75	35	gray sandy clay.
92	-77	2	rock.

Near resistivity line F3
Bucks County well 36, Patterson Parchment Paper Company

Grid location: 1957, 1 yards north, 830, 2 yards east; 850 yards
N.74°W. of station F3. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	12	3	topsoil.
13	2	10	sand and gravel.
29½	14½	16½	boulders, gravel, and yellow clay.

Near resistivity line F3
Bucks County well 36, Patterson Parchment Company (Cont'd)

Bottom Depth	Bottom Elevation	Thickness	Description
48	-33	18½	yellow sandy clay.
67	-52	19	sand, gravel, and clay.
69	-54	2	loose sand, gravel, and clay.
72	-57	3	hard packed sand and gravel.
74	-59	2	hard black sand.
76	-61	2	hard gray sand and blue clay.
78	-63	2	rock.

Bucks County well 37, Patterson Parchment Company

Grid location: 1957, 0 yards north, 830, 4 yards east; 700 yards

N.72°W. of station F3. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
5	10	5	topsoil and yellow clay.
14	1	9	sand and gravel.
38	-23	24	gravel, sand, and boulders.
42	-27	4	blue clay.
45	-30	3	yellow and blue clay mixed.
52	-37	7	yellow sandy clay.
73½	-58½	21½	red sandy clay.
87	-72	13½	gray sandy clay.
109	-94	22	gray sand and streaks of clay.
113	-98	4	white clay.
115	-100	2	rock, very hard.

Bucks County well 38, Patterson Parchment Paper Company

Grid location: 1956, 9 yards north, 830, 0 yards east; 1,000 yards
S. 85° W. of station F3. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	12	3	topsoil and yellow clay.
19 $\frac{3}{4}$	- 4 $\frac{3}{4}$	16 $\frac{3}{4}$	coarse gravel.
28	-13	8 $\frac{1}{2}$	yellow clay.
38	-23	10	brown sandy clay.
79	-64	41	gray sandy clay.
83	-68	4	rock.

Bucks County well 39, Patterson Parchment Paper Company

Grid location: 1956, 8 yards north, 830, 1 yards east; 900 yards
S. 86° W. of station F3. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
6	9	6	topsoil and yellow clay.
31	-16	25	gravel and boulders.
33	-18	2	yellow clay.
80	-65	47	gray sandy clay.
82	-67	2	rock.

Near resistivity line G1
Bucks County well 14, Bristol Water Company

Grid location: 1956, 5 yards north, 829, 7 yards east; 1,250 yards
S.82°E. of station G1. Altitude: about 18' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
2	16	2	fill.
3	15	1	topsoil.
14	4	11	sand and gravel.
24	- 6	10	coarse sand and gravel.
--	--	--	clay.

Bucks County well 15, Bristol Water Company

Grid location: 1956, 5 yards north, 829, 6 yards east; 1,175 yards
S.80°E. of station G1. Altitude: about 19' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
4	15	4	topsoil.
6	13	2	mud.
11	8	5	sand and gravel.
22	- 3	11	coarse sand and gravel.
25	- 6	3	very coarse sand and gravel.
27	- 8	2	small gravel.
--	--	--	clay.

Bucks County well 16, Bristol Water Company

Grid location: 1956, 6 yards north, 829, 5 yards east; 1,125 yards

S. 88° E. of station G1. Altitude: about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
1	19	1	fill.
5	15	4	sandy topsoil.
7	13	2	gray clay.
16	4	9	muddy yellow sand.
20	0	4	very coarse gravel and sand.
25	- 5	5	coarse sand and gravel.
--	--	--	clay.

Near resistivity line 11
Bucks County well 6, Bristol Water Company

Grid location: 1953, 6 yards north, 825, 6 yards east; 1,250 yards

S. 8° W. of station 11. Altitude: about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
11	9	11	brown gravel, 2", fine sand.
27	- 7	16	coarse gravel, cobblestones, and coarse brown sand.
45	-25	3	coarse sand and gravel, brown.
47	-27	2	brown sand and gravel, fine.
48	-28	1	coarse white sand.
50	-30	2	coarse sand and gravel.

Near resistivity line I1
Bucks County well 6, Bristol Water Company (Cont'd)

Bottom Depth	Bottom Elevation	Thickness	Description
52	-32	2	coarse clean sand.
54	-34	2	brown dirty sand, coarse.
56	-36	2	fine dirty sand, dark brown.
60	-40	4	fine sand and gravel with clay.
64	-44	4	very coarse sand and gravel, clay.
70	-50	6	clay.

Bucks County well 7, Bristol Water Company

Grid location: 1953, 7 yards north, 825, 6 yards east; 950 yards
S. 14° W. of station I1. Altitude: about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
9	12	9	brown sand and gravel, 2", cobblestones.
23	- 2	14	coarse brown gravel and cobblestones.
32	-11	9	coarse sand and gravel, clay.
52	-31	20	brown coarse water sand.
54	-33	2	coarse white sand.
56	-35	2	dirty white fine sand and clay.
59	-38	3	white gravel and clay.
65	-44	6	yellow and white clay.

Bucks County well 9, Bristol Water Company

Grid location: 1953, 5 yards north, 825, 7 yards east; 1,050 yards

S.4°W. of Station 11. Altitude: about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
9	11	9	brown 2" gravel and fine sand.
21	- 1	12	brown, very coarse sand and gravel.
30	-10	9	brown sandy clay.
35	-15	5	dark brown, coarse sand and gravel.
46	-26	11	brown and white, coarse sand and gravel.
52	-32	6	yellowish white, very fine sand and clay.
57	-37	5	yellowish white sand and gravel with clay.
64	-44	7	white clay.

Bucks County well 12, Bristol Water Company

Grid location: 1953, 6 yards north, 825, 9 yards east; 950 yards

S.9°E. of Station 11. Altitude: about 24' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
17	7	17	loam, gravel, and boulders.
38	-14	21	coarse gravel and sand.
45	-21	7	coarse, brown sand and gravel.
50	-26	5	coarse, brown sand and very coarse gravel.
58	-34	8	gray clay.
74	-50	16	fine, gray sand and clay.

Near resistivity line K2
Bucks County well 57, Croydon, Pa.

Location: 1950, 7 yards north, 823, 2 yards east; 1,650 yards

N. of station K2. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
5	10	5	loam.
22	- 7	17	large gravel and loam.
31	-16	9	gravel, water.
41	-26	10	soft rock.

Bucks County well 17, Bristol, Pa.

Grid location: 1952, 5 yards north, 826, 3 yards east; 2,260 yards

N.76°E. from station K2. Altitude: about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
6	9	6	fill.
10	5	4	clay and mud
26	-11	16	bar sand and gravel.
34	-19	8	sand and gravel.
46	-31	12	clay.
63	-48	17	brown sand.
67	-52	4	sand and clay.
71	-56	4	hardpan - white crystalline rock.
73	-58	2	sand and gravel of white crystalline rock.
81	-66	8	clay.
85	-70	4	gray mica.

Bucks County well 18, Bristol, Pa.

Grid location: 1952, 7 yards north, 826, 8 yards east. Altitude:
about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
10	11	10	fill.
23	- 2	13	small gravel and sand.
38	-17	15	fine sand and clay.
40	-19	2	fine sand and clay.
55	-34	15	fine sand and clay.
57	-36	2	fine gray sand.
60	-39	3	fine yellow sand.
67	-46	7	coarse yellow sand.
69	-48	2	coarse yellow sand.
70	-49	1	fine sand and clay.

Bucks County well 26, Rohm and Haas

Grid location: 1952, 8 yards north, 825, 6 yards east; 1,800 yards
N.63°E. of station K2. Altitude: about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
21	0	21	sand and boulders.
38	-17	17	fine brown sand.
57	-36	19	coarse gray sand.
65	-44	8	coarse brown sand.

Bucks County well 26, Rohm and Haas (Cont'd)

Bottom Depth	Bottom Elevation	Thickness	Description
66	-45	1	hardpan.
68	-47	2	coarse brown sand.
69	-48	1	hardpan.
85	-64	16	coarse brown sand and gravel.
--	--	--	hardpan.

Bucks County well 27, Rohm and Haas

Grid location: 1952, 5 yards north, 825, 9 yards east; 1,800 yards

N.76°E. of station K2. Altitude: about 21' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
4	17	4	soil.
56	-35	52	sand and boulders.
74	-53	18	coarse sand and boulders.
75	-54	1	clay.
92	-71	17	sand, coarse gravel, streaks of clay.
98	-77	6	clay and gravel.

Bucks County well 28, Rohm and Haas

Grid location: 1952, 2 yards north, 825, 6 yards east; 1,600 yards

N. 83° E. of station K2. Altitude: about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
5	15	5	topsoil
35	-15	30	brown sand and boulders.
45	-25	10	gray sand.
69	-49	24	white sand.
83	-63	14	sandy blue clay.
96	-76	13	white sand.
103	-83	7	black sand.
109	-89	6	white sand.
--	--	--	black mica clay.

Bucks County well 29, Rohm and Haas

Grid location: 1952, 2 yards north, 825, 4 yards east; 1,370 yards

N. 83° E. of station K2. Altitude: about 18' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
13	5	13	sand, gravel, boulders, and fill.
17	1	4	yellow and brown sand and gravel.
20	- 2	3	brown, yellow, and white clay.
25	- 7	5	streaks of clay with sand and gravel.
35	-17	10	brown and yellow sand and gravel, streaks of iron oxide.

Bucks County well 29, Rohm and Haas (Cont'd)

Bottom Depth	Bottom Elevation	Thickness	Description
44	-26	9	brown, yellow, white, and red medium sand.
54	-36	10	fine gray sand, streaks brown clay.
57	-39	3	tough white and yellow clay.
60	-42	3	brown coarse sand and gravel.
62	-44	2	white coarse sand and gravel.
72	-54	10	white tough clay changing to mica rock.

Bucks County well 30, Rohm and Haas

Grid location: 1952, 4 yards north, 825, 5 yards east. Altitude:
about 19' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
3	16	3	sand fill.
7	12	4	tough clay.
18	1	11	sand, gravel, boulders.
40	-21	22	sand and gravel.
48	-29	8	red and yellow clay, tough.
65	-46	17	yellow sand.
--	--	--	clay and gravel.

Bucks County well 31, Rohm and Haas

Grid location: 1952, 1 yards north, 826, 4 yards east. Altitude:
about 20' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
5	15	5	silt.
51	-31	46	sand, gravel, boulders.
53	-33	2	clay.
56	-36	3	muddy sand.

Bucks County well 32, Rohm and Haas

Grid location: 1952, 1 yards north, 825, 8 yards east. Altitude;
about 15' above mean sea level.

Bottom Depth	Bottom Elevation	Thickness	Description
4	11	4	topsoil.
12	3	8	white sand and gravel.
28	-13	16	boulders, gravel, dirty white sand.
38	-23	10	brown coarse sand and gravel.
44	-29	6	yellow coarse sand.
56	-41	12	yellow coarse sand, streaks of white clay.

1.

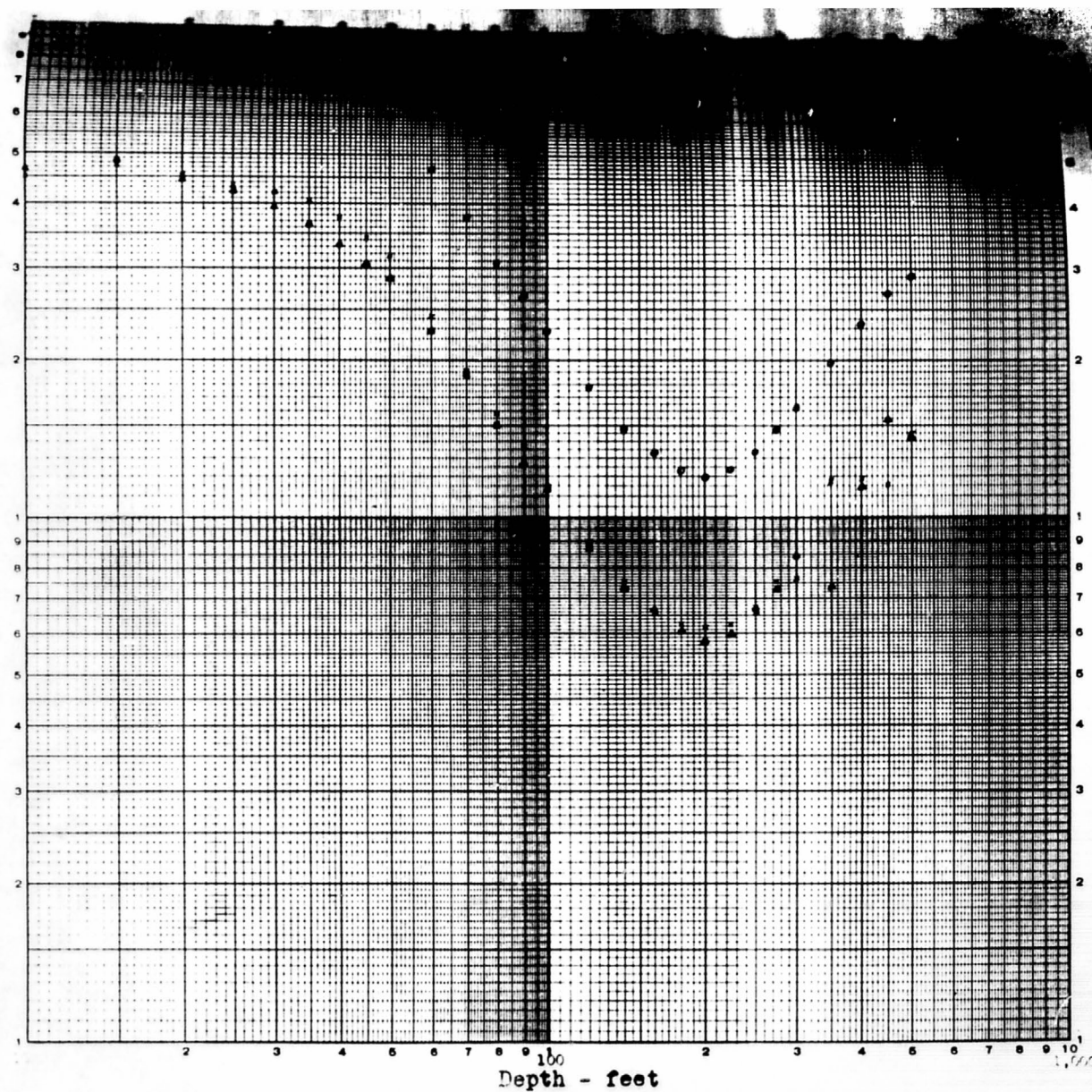


Location:

Bearing:

P₁-N. 42°E.

Apparent Resistivity - ohm cms



Line A-2 (1-1)
Bristol, Pa.
1/21/7

Location:

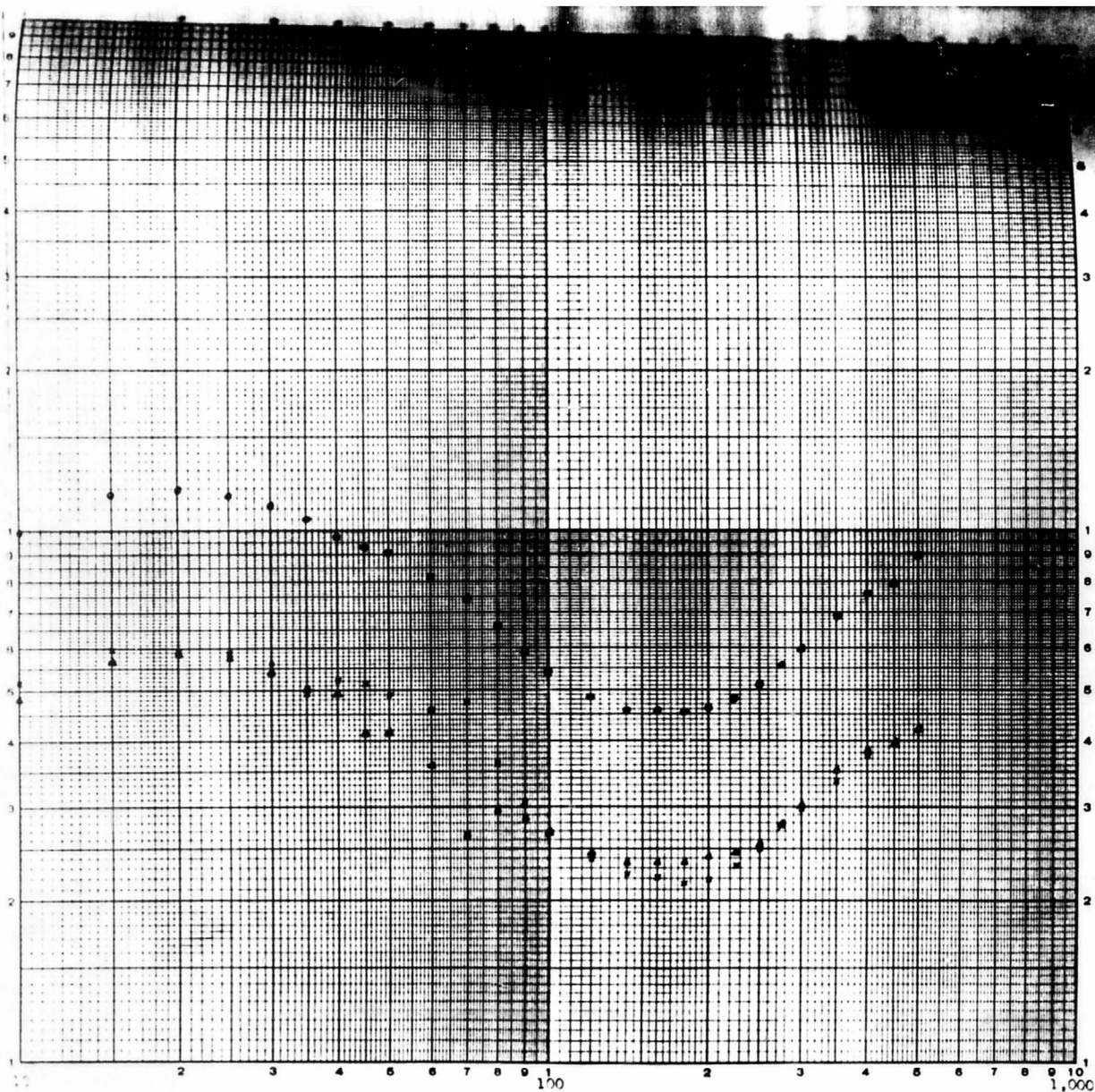
Along W. edge of Morrisville
Airport 896' N. of R. 1st S.W.
corner of field.

Bearing:

E1-N.10°W.

Apparent Resistivity - ohm cms

10,000



Depth - feet

Line B-1 (G-7)
Bristol, Pa.
1/2/47

Location:

0. mi. W. of P.R.M. on R.R. Sta.
Penn. Valley Rd. thence S. 1 mi. N.E.

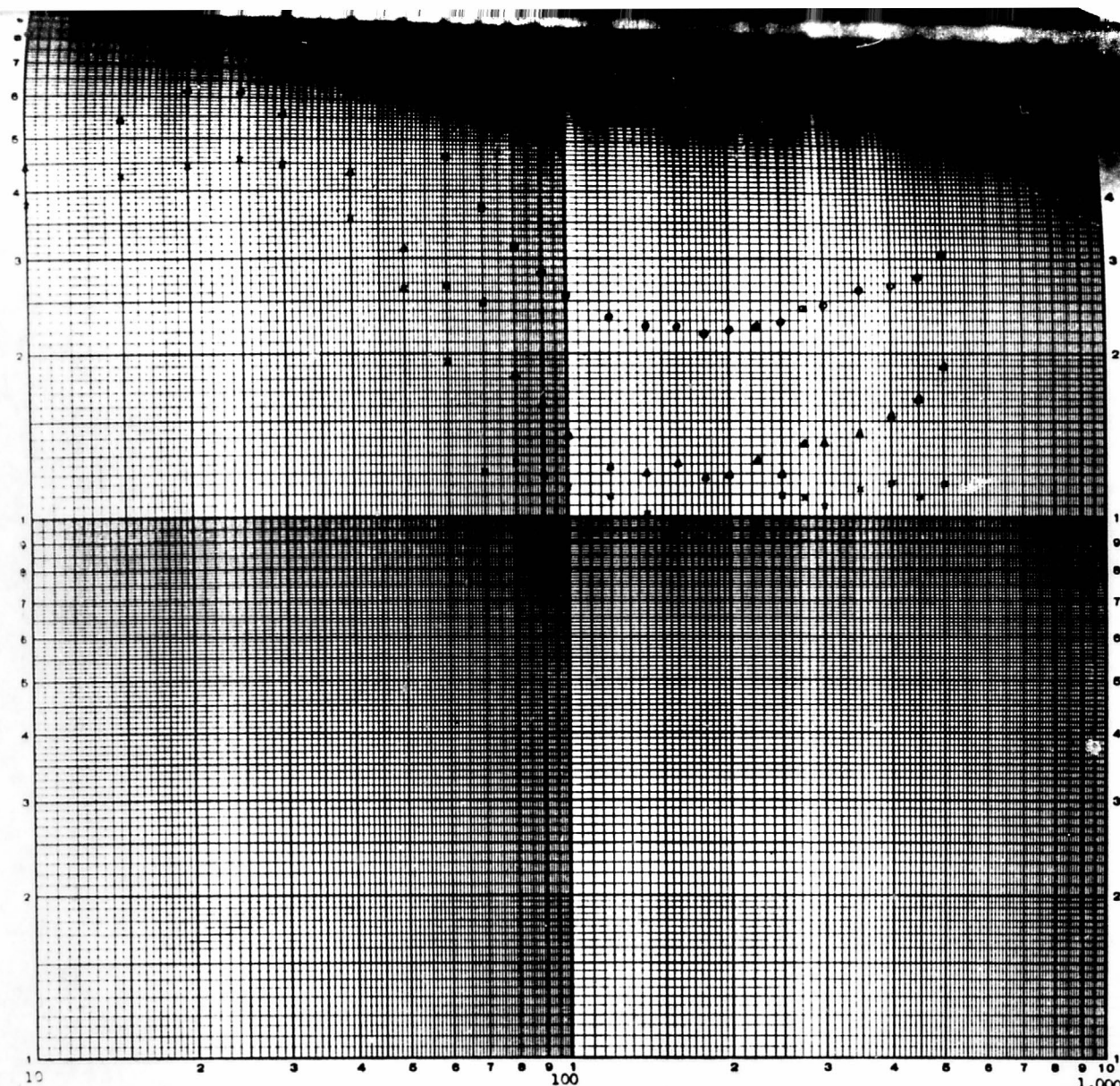
Bearings:

P1-N. 66° E.

Apparent Resistivity - ohm cms

10,000

1,000



Depth - feet

Line B-2 (G-1)
Bristol, Pa.
5/6/47

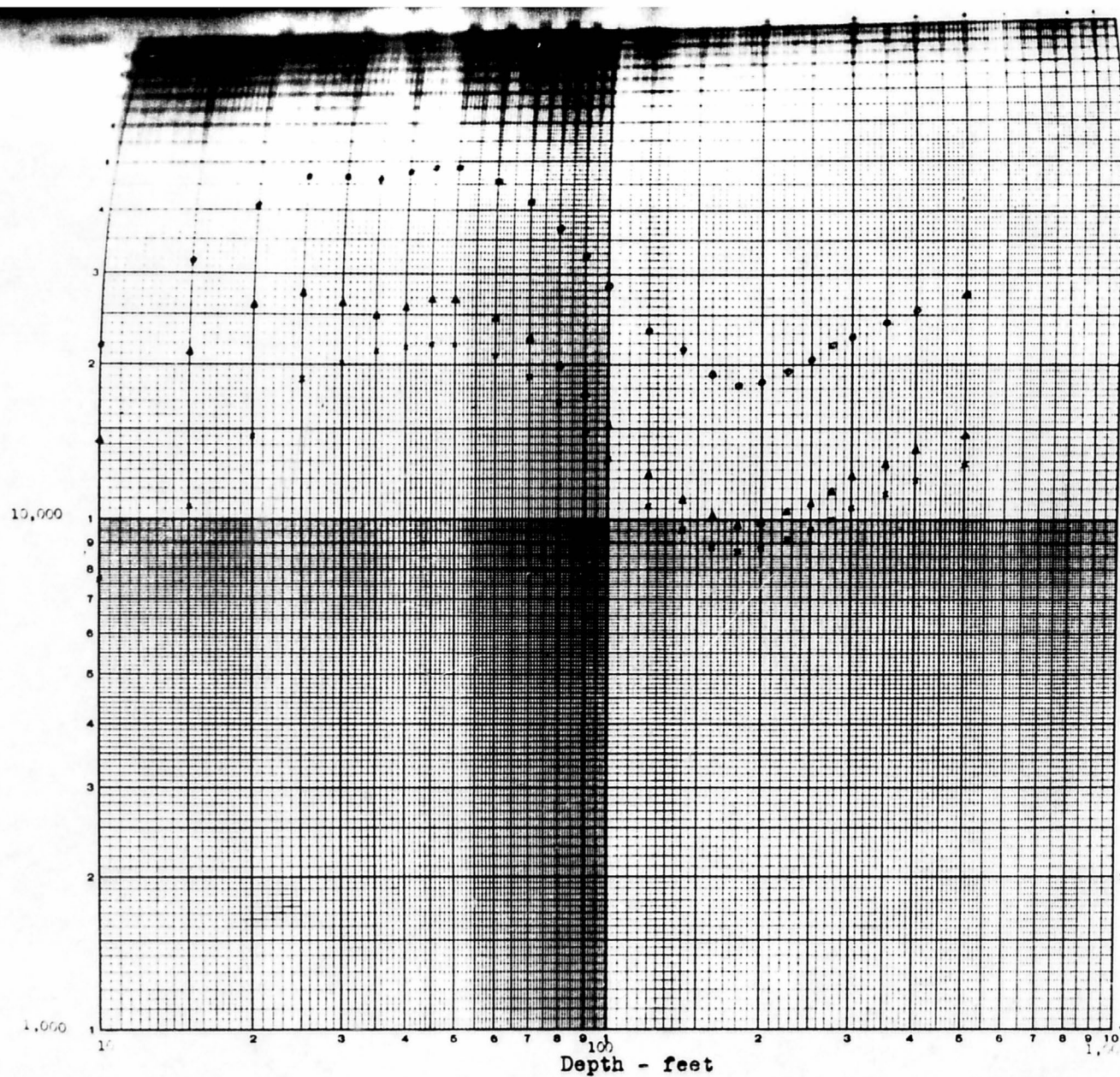
Location:

N.W. of Turkey Hill along E. side of
private railroad and about 1/2 mi. S.
of Chapel Rd.

Bearing:

P1-N.40°E.

Apparent Resistivity - Ohm cm



Line No. (1-)
 Resist. No.
 11107

Location:

6.1 mi. N. of Dollywood, Knoxville
 Re. No. 1.1 mi. E. to center of line.

Depth:

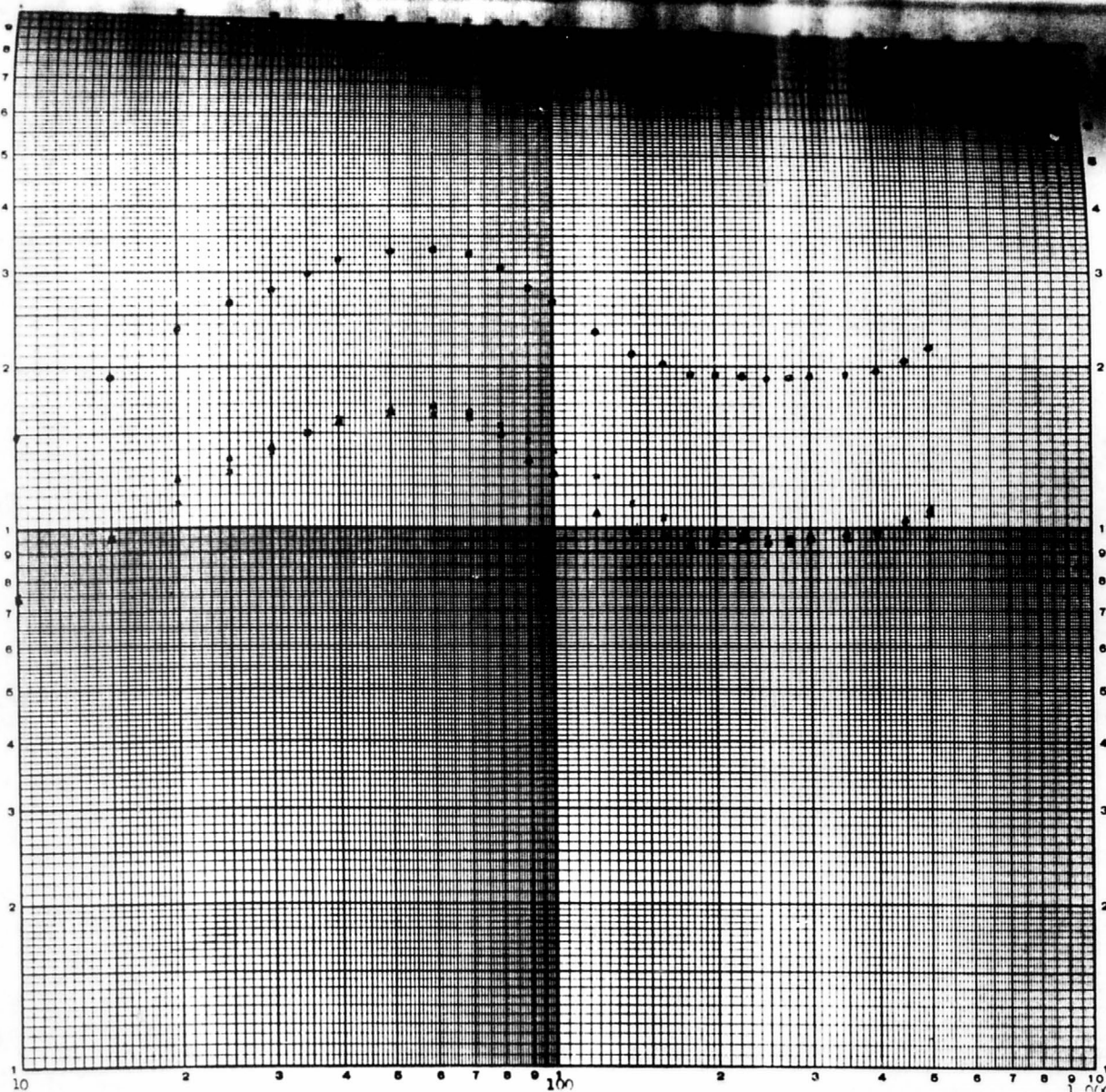
$r_1 = 0.02$

Apparent Resistivity - ohm cms

100,000

10,000

1,000



Depth - feet

Line 2- (2-)
Bridg. Pl. No.
1/1/7

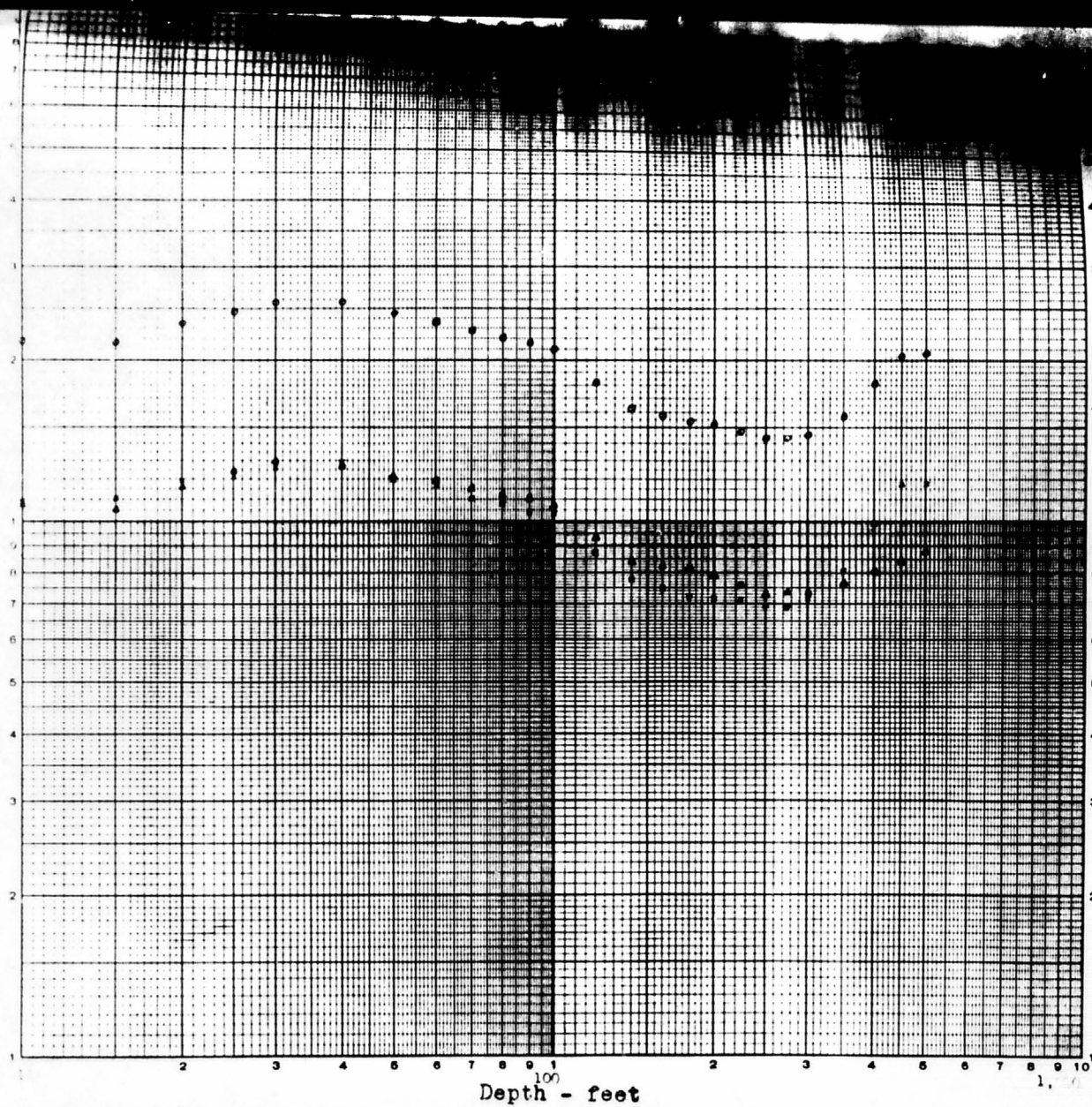
Location:

1.5 mi. E. of Polk, Iowa
74° N. in an orchard.

Section:

P₁-N. 20 W.

Apparent Resistivity - ohm cm



Location:

1.1 mi. E. of Dilworth, N.C. 28041
0.5 mi. S.

1.1 mi. S.

1.1 mi. S.

1.1 mi. S.

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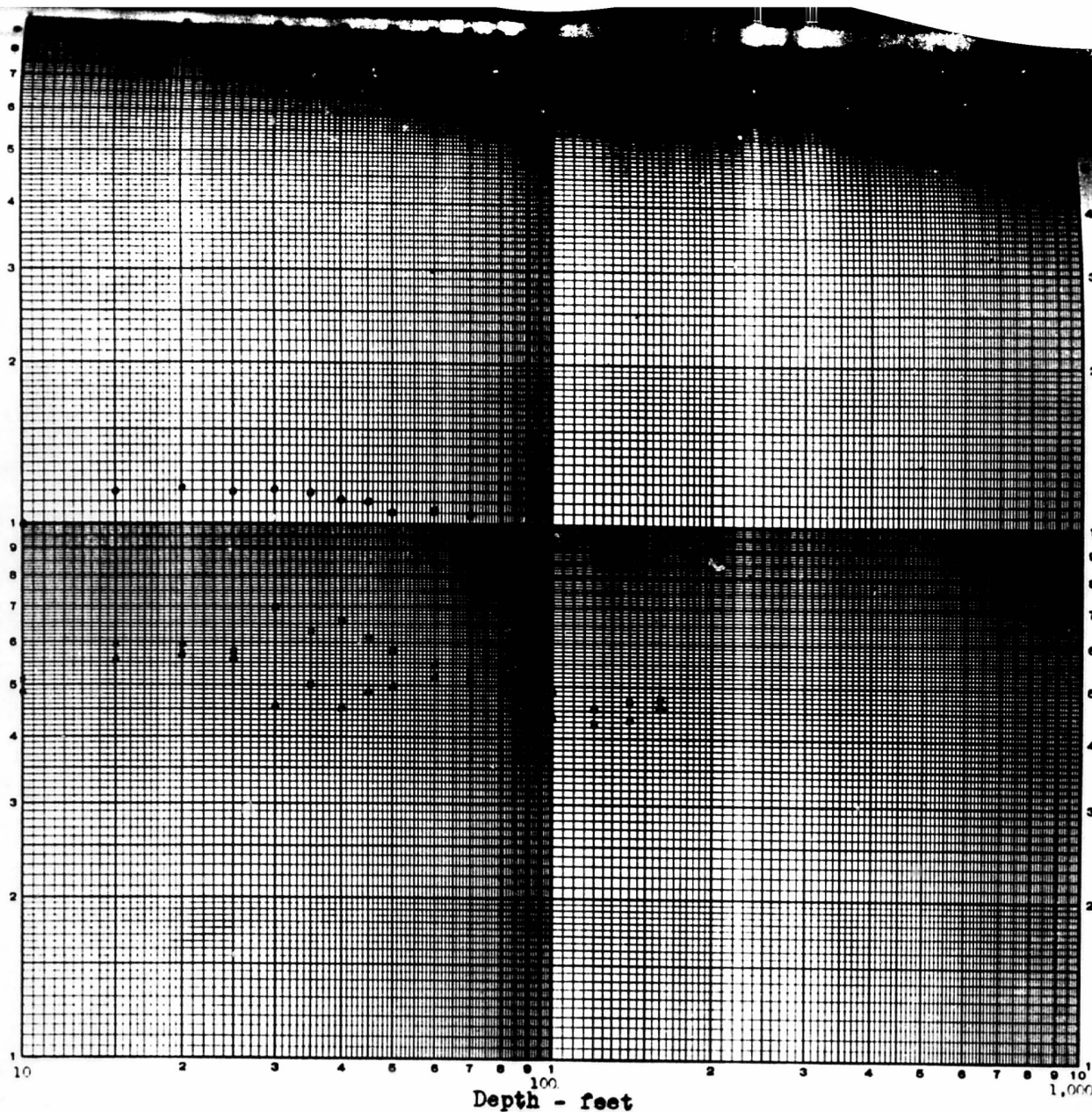
1.1 mi. S.

1.1 mi. S.

Apparent Resistivity - ohm cms

10,000

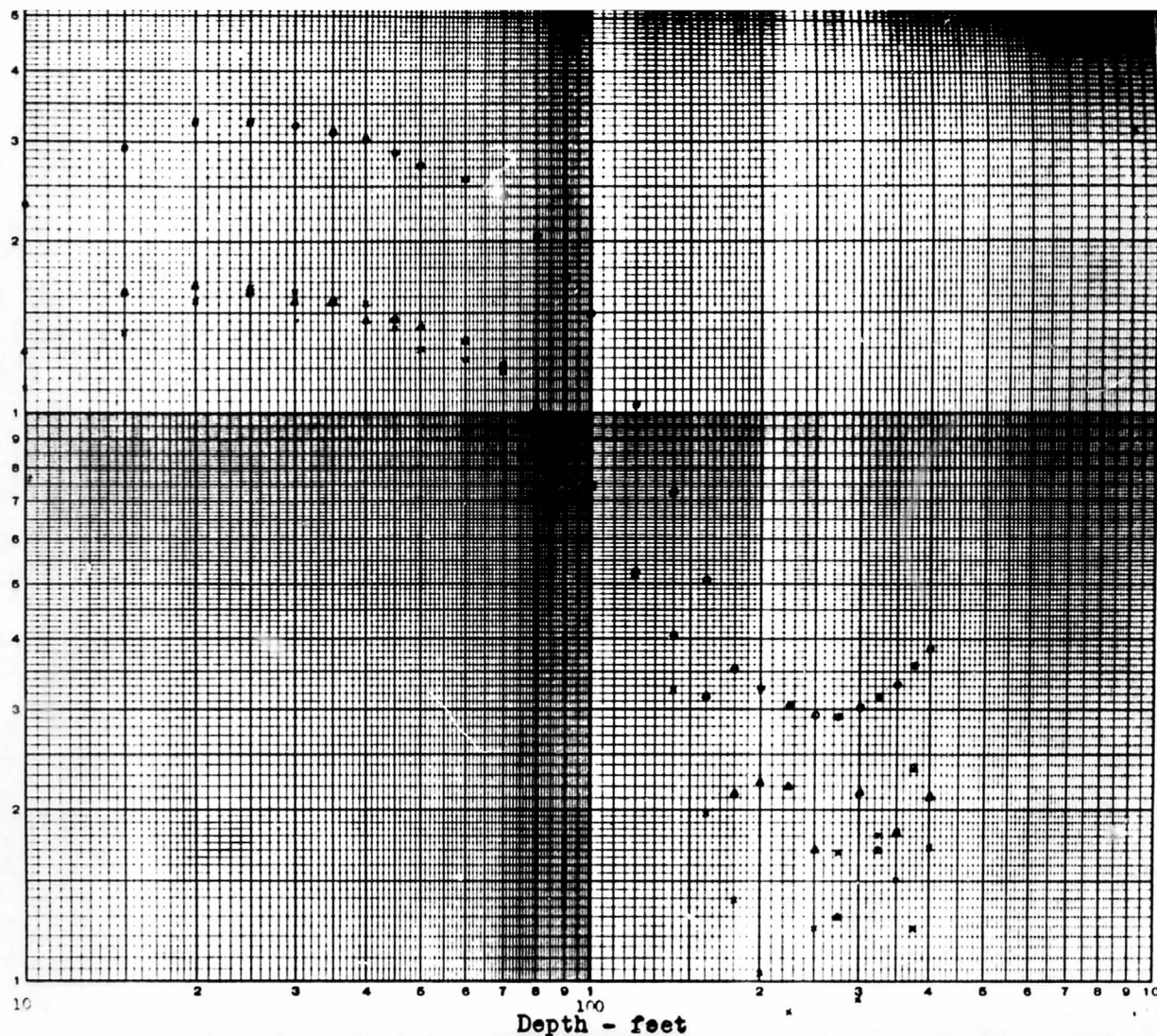
10,000



Apparent Resistivity - ohm cms.

100,000

10,000



Depth - feet

Line 2- (C-1)
Bristol, Va.
1/1/51

Location:

0.5 mi. S. of ...
road along side A ...
11A & Highway 13. ...
W. in open field.

Remarks:

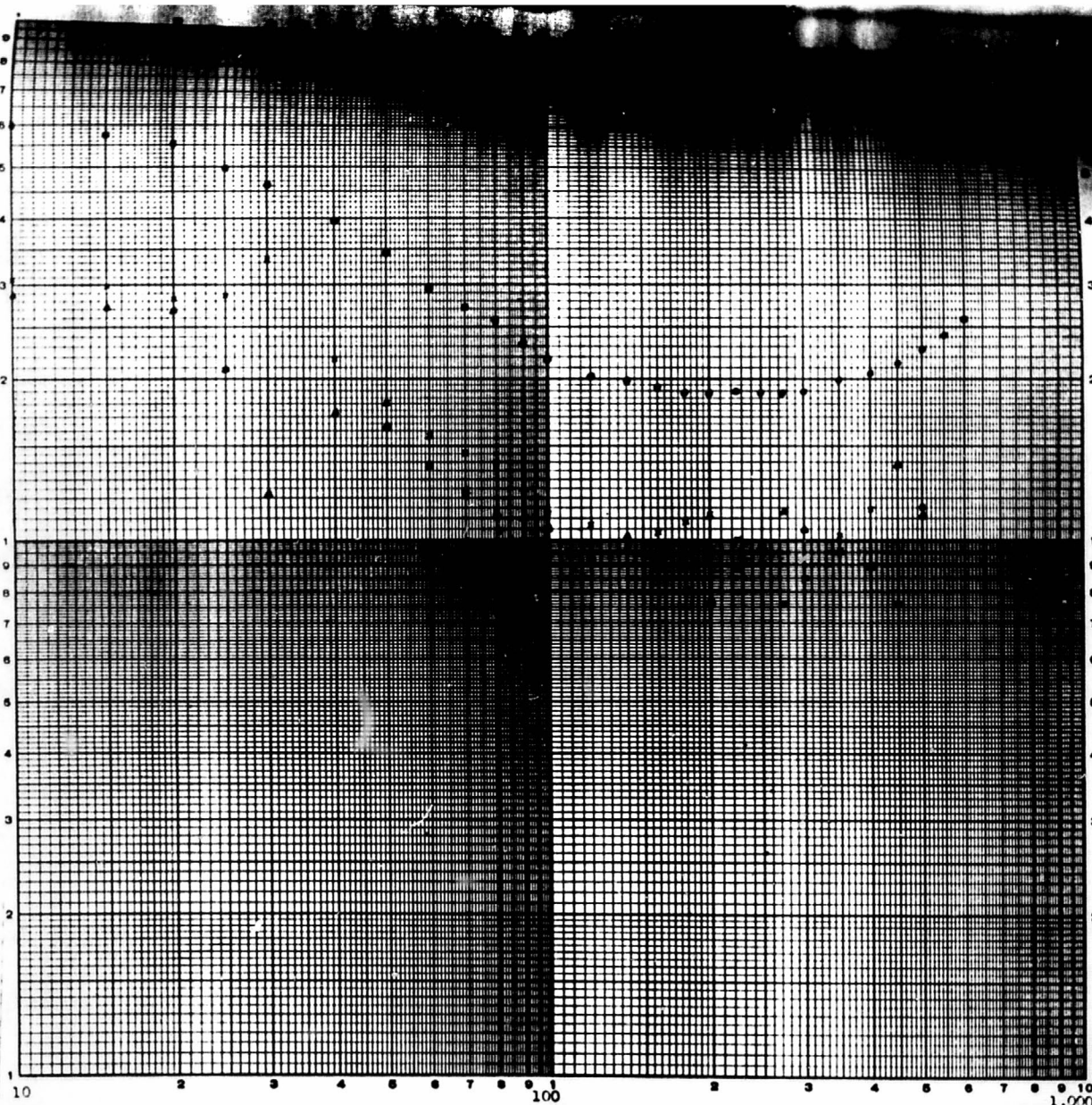
P₁-N. 60W.

Apparent Resistivity - ohm cms

100,000

10,000

1,000



Depth - feet

Line C-1 (G)
Bristol, Pa.
4/1/57

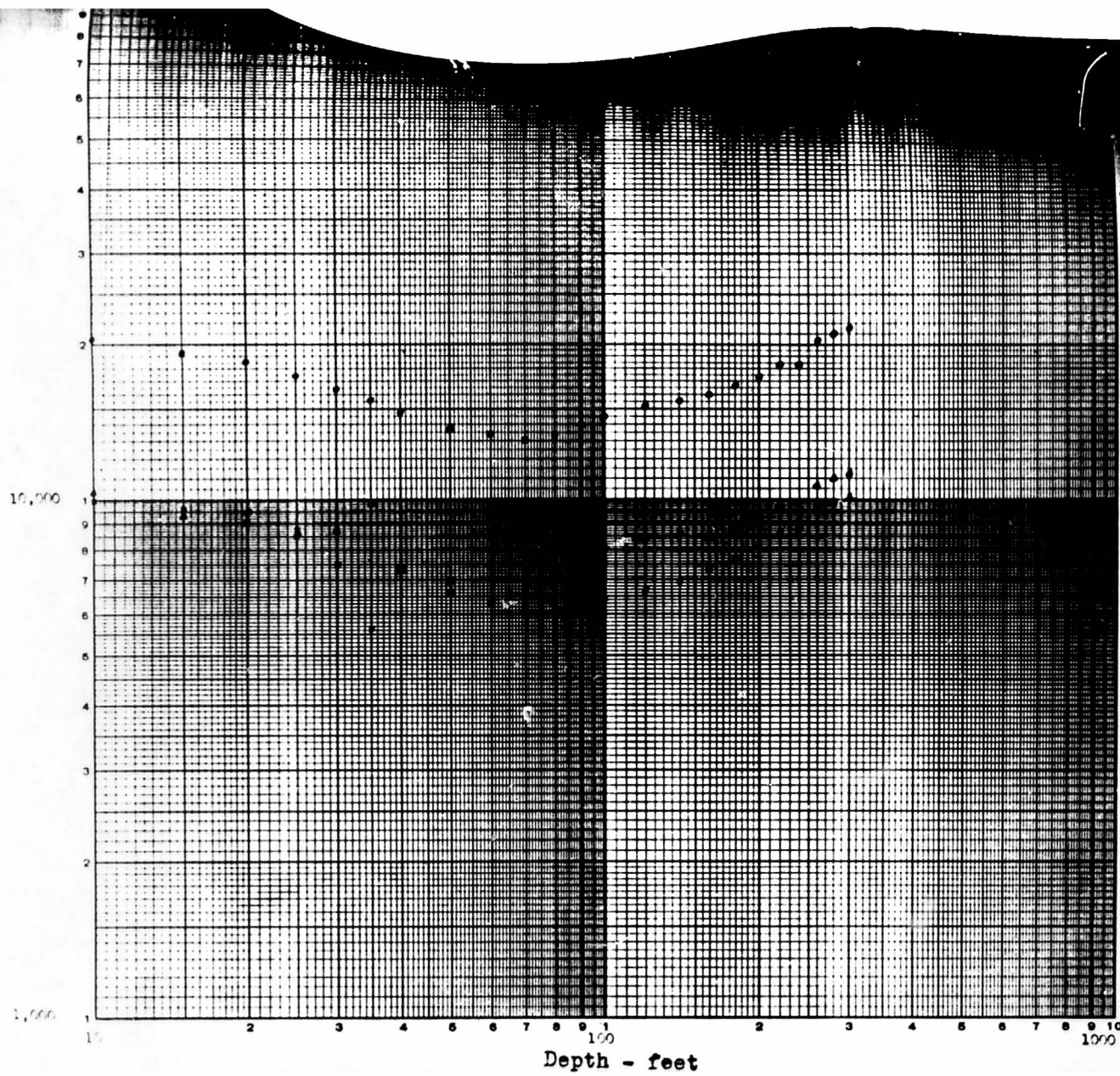
Location:

0.5 mi. N. of Tullytown-Sixville
Rd. along road just N. of Farm House
of ice at W. side of Rd.

Bearing:

P1-N. 3° E.

Apparent Resistivity - ohm cms



Line C-4 (G-2)
Bristol, Pa.
5/5/47

Location :

0.55 mi. E. of railroad at King's
farms office, thence N. 0.1 mi. (Just
east of Slickville)

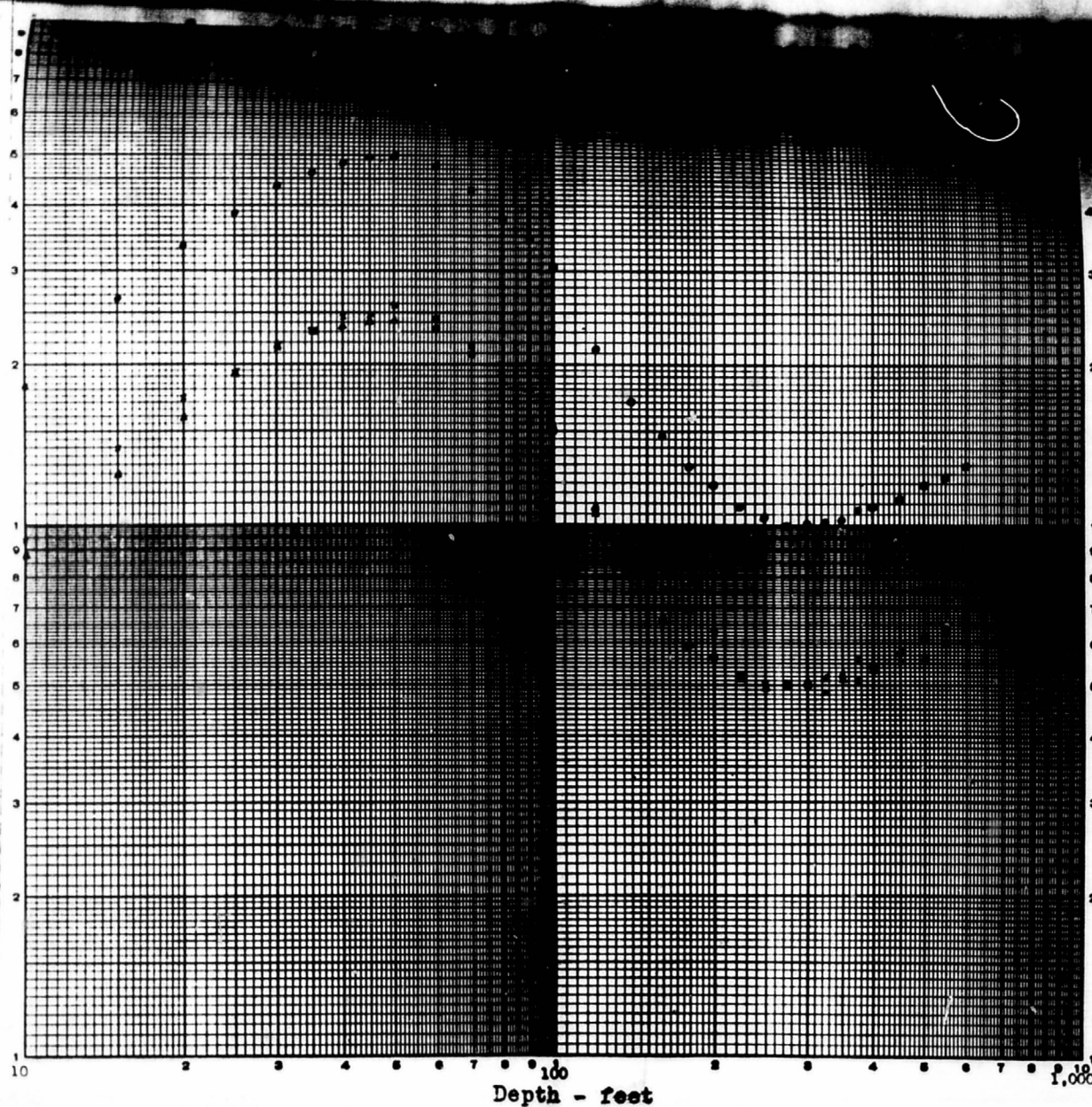
Bearing:

● P₁-N.16°W.

Apparent Resistivity - ohm cms

10,000

1,000



Line C-1 (G-2)
Bristol, Pa.
5/6/47

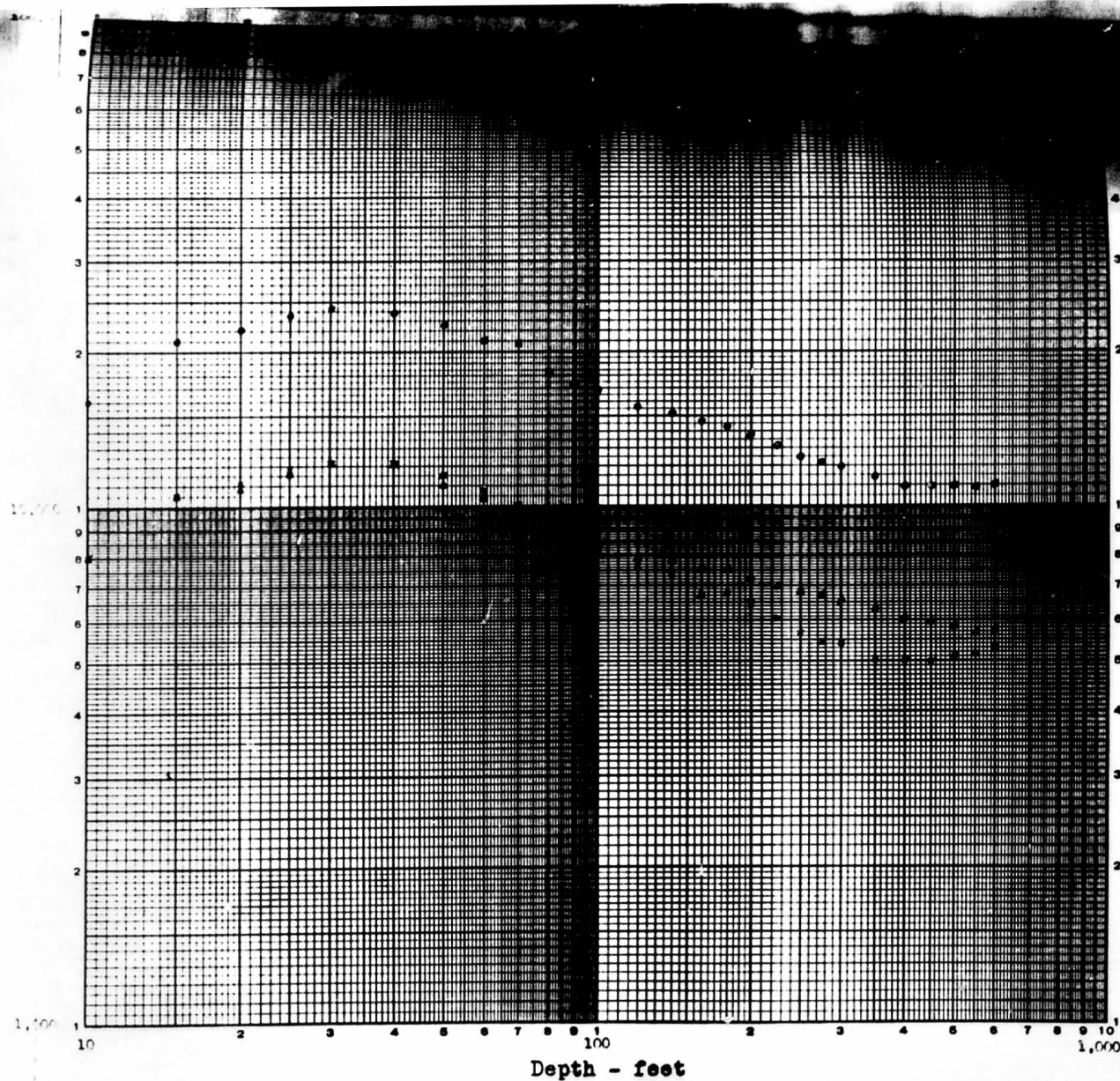
Location:

0.6 mi. S. of first Rd. E. of
Slickville thence 0.2 mi. W.

Bearing:

P₁-N. 75° E.

Apparent Resistivity - ohm cms



Line C-5 (C-2)
Bristol, Pa.
7/2/57

Location:

1.8 mi. E. of Tullytown, thence
1 mi. S. then 0.3 mi. W. on N. side
of Rd.

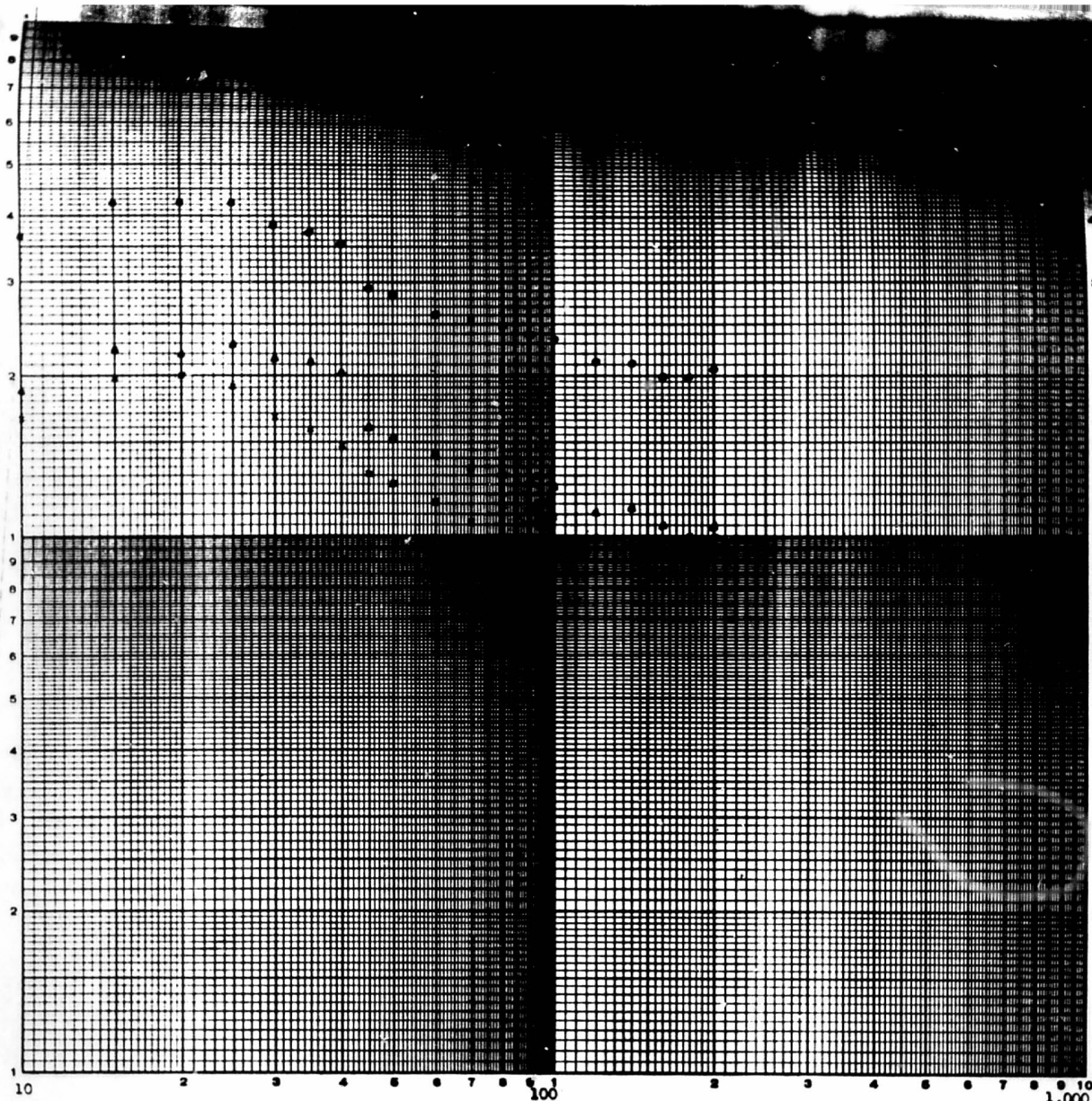
Bearing:

P₁-N. 87° E.

Apparent Resistivity - ohm cms

10,000

1,000



Depth - feet

Line D-1 (G-2)
Bristol, Pa.
4/29/47

Location:

W. of Tullytown along Fallsington
Rd. thence 0.51 mi. W. of Falls-
ington Rd.

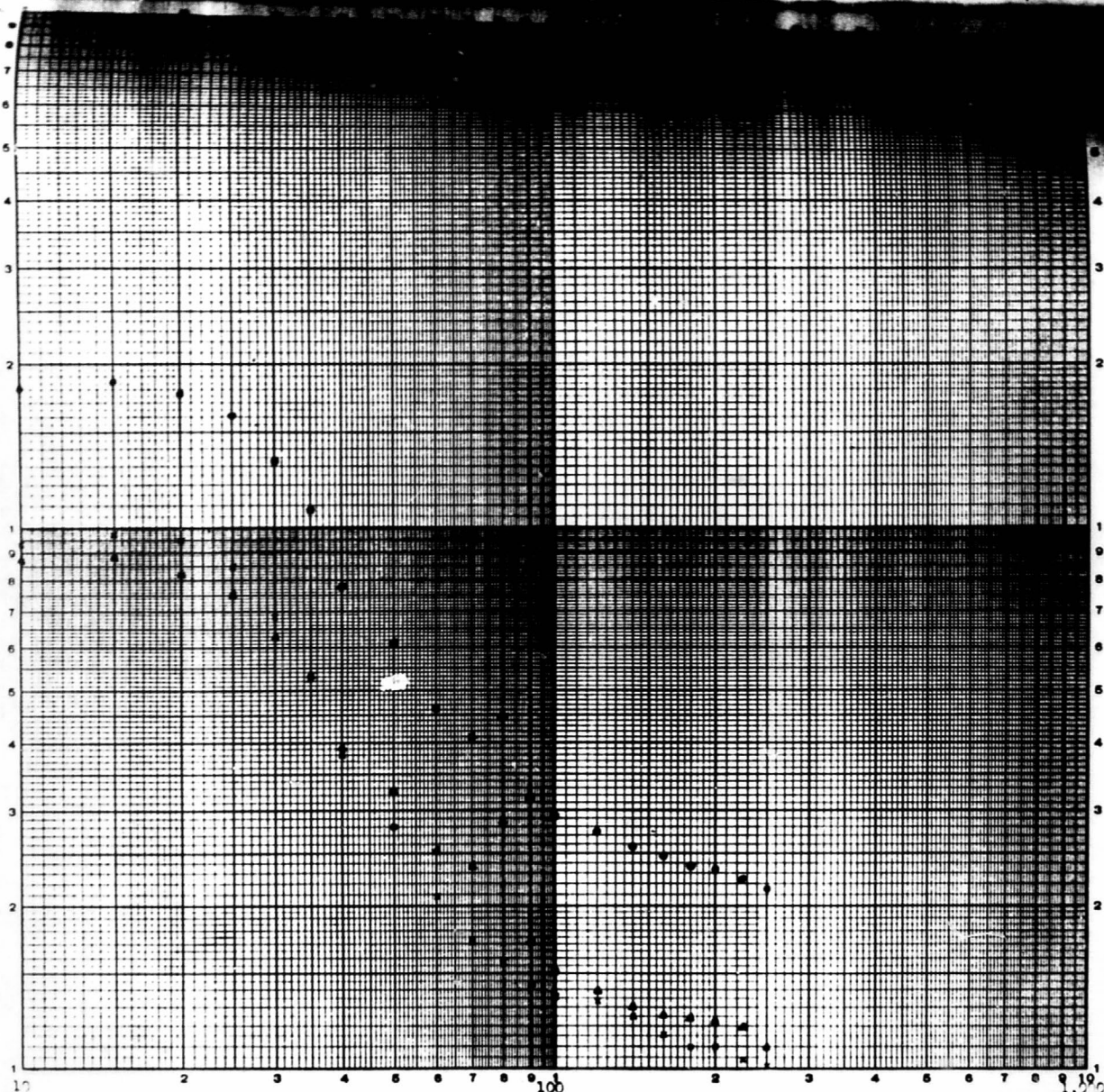
Bearing:

P₁-N. 83° E.

Apparent Resistivity - OHM CM

100,000

1,000



Depth - feet

Line D-1A (G-P)
Bristol, Pa.
4/29/47

Location:

N. of Tullytown on Falls Church Rd.
0.15 mi. N. of Jct. with Center Hill
Rd.

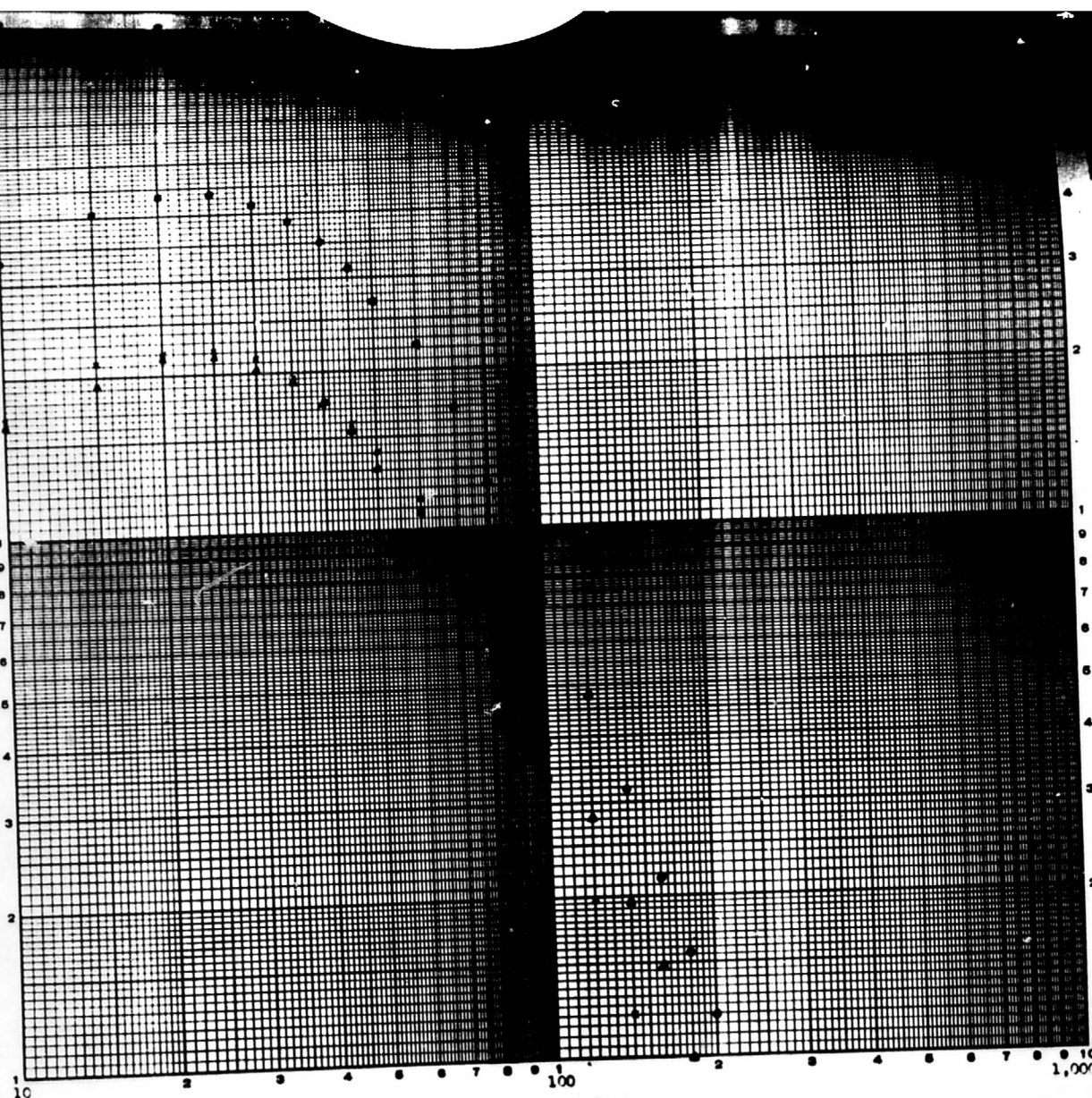
Bearing:

P₁-N. 80° E.

Apparent Resistivity - ohm cms

10,000

10,000



Depth - feet ..

Line D-2(1-6)
Bristol, Pa.
4/29/47

Location:

0.45 mi. E. of intersection of
Pallastington Rd. with Cooper Mill
Rd. along Cooper Mill Rd. thence
0.1 mi. N. in open meadow.

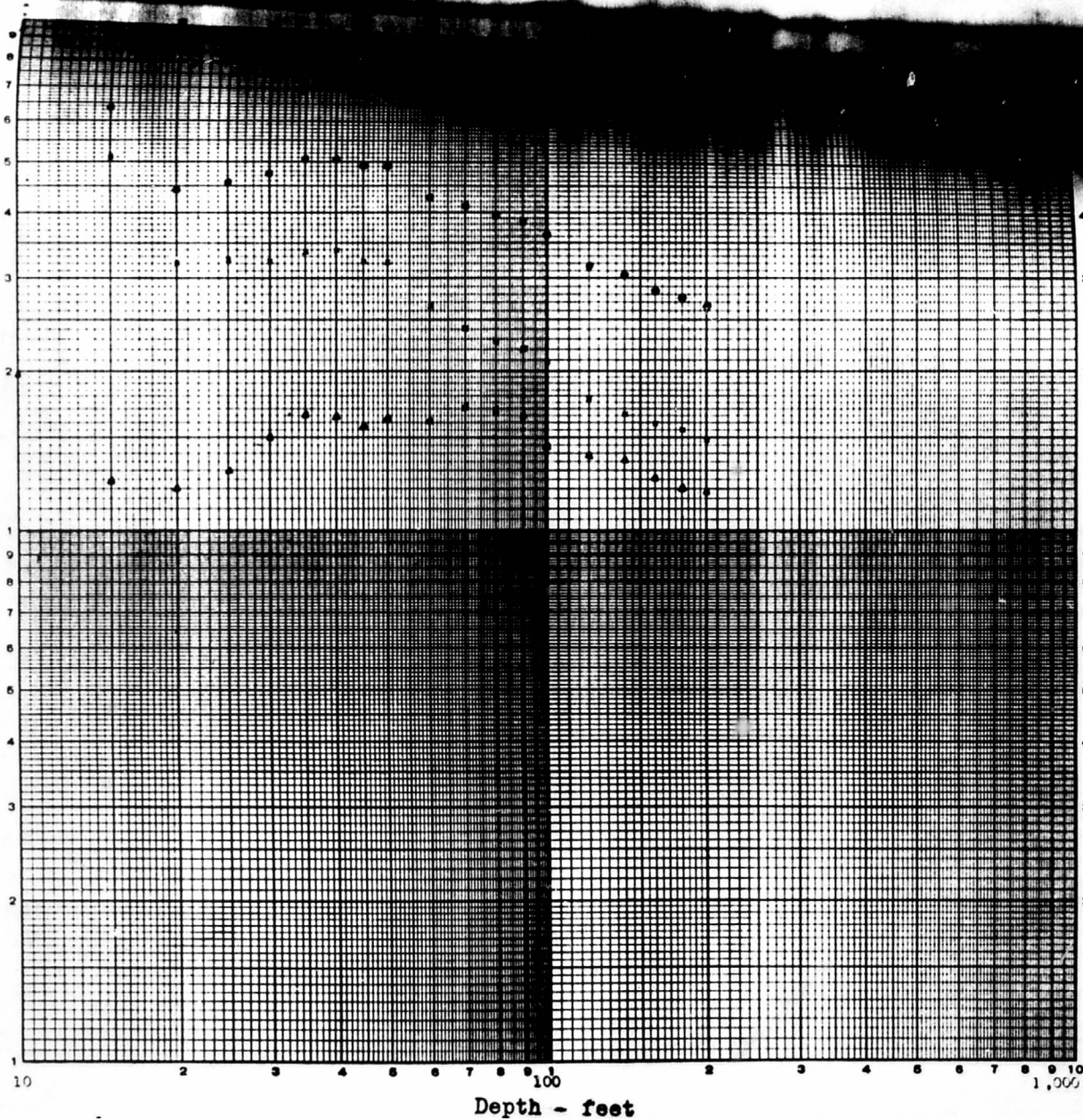
Bearing:

P₁-N.11°E.

Apparent Resistivity - Ohm. Cms

10,000

1,000



Line D-A (7-1)
Bristol, Pa.
1947

Location:

N.E. of Tullytown, Pa.
Slackville, Pa., near the N.

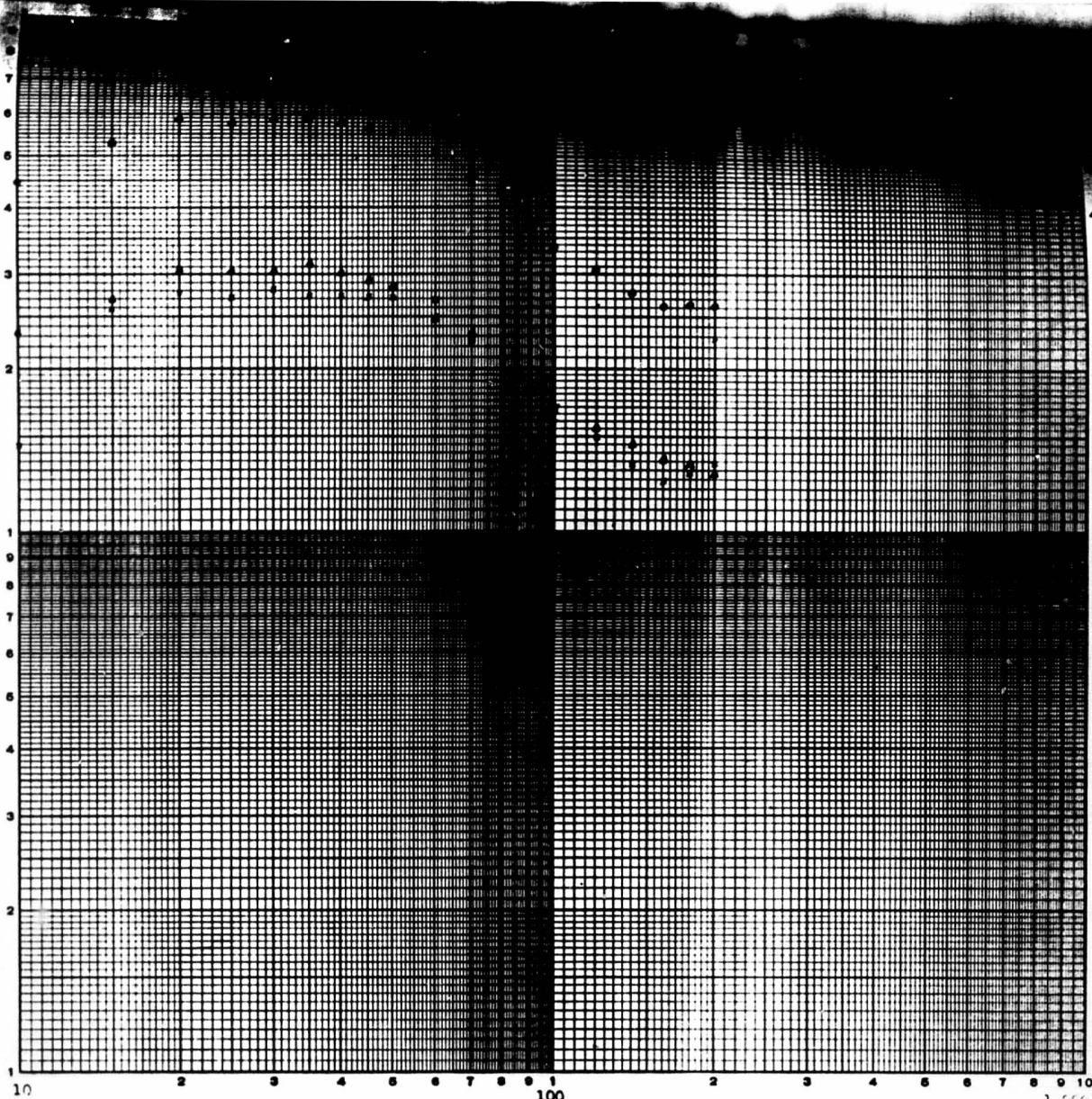
Bearing:

P₁-N. 60° E.

Apparent Resistivity - ohm cms

10,000

1,000



Depth - feet

Line D-3 (2-1)
Bristol, Pa.
4/30/47

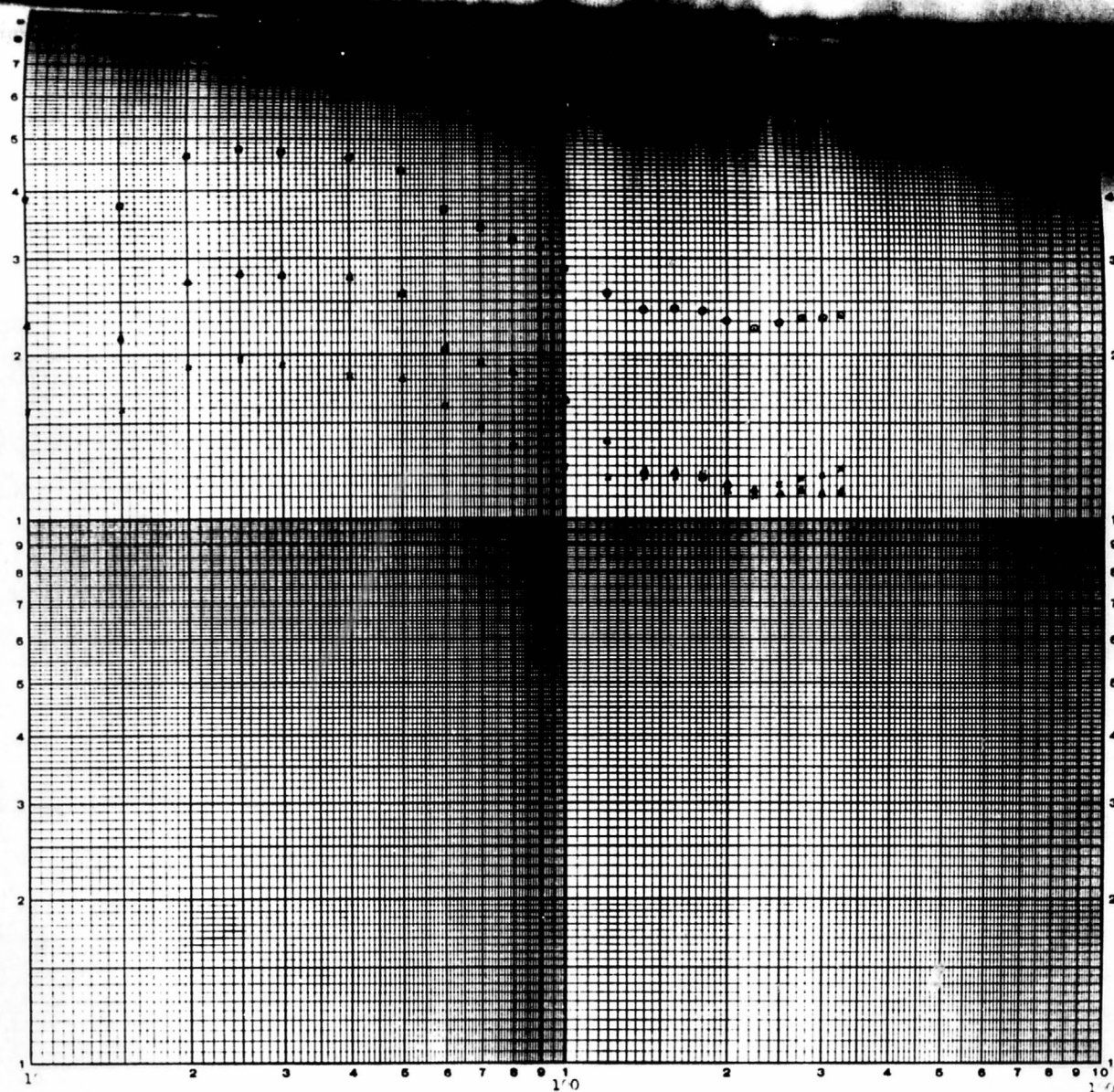
Location:

1.15 mi. N.E. of Pottstown on
road to Slickville, then
W. then 0.07 mi. N.E.

Bearing:

P₁-N.30°E.

Apparent Resistivity - ohm cms



Depth - feet

Line D-PA (5-7)
Bristol, Pa.
1/10/47

Location:

0.05 mi. W. of bridge across Spot
creek, thence 0.2 mi. S. W. to open
field.

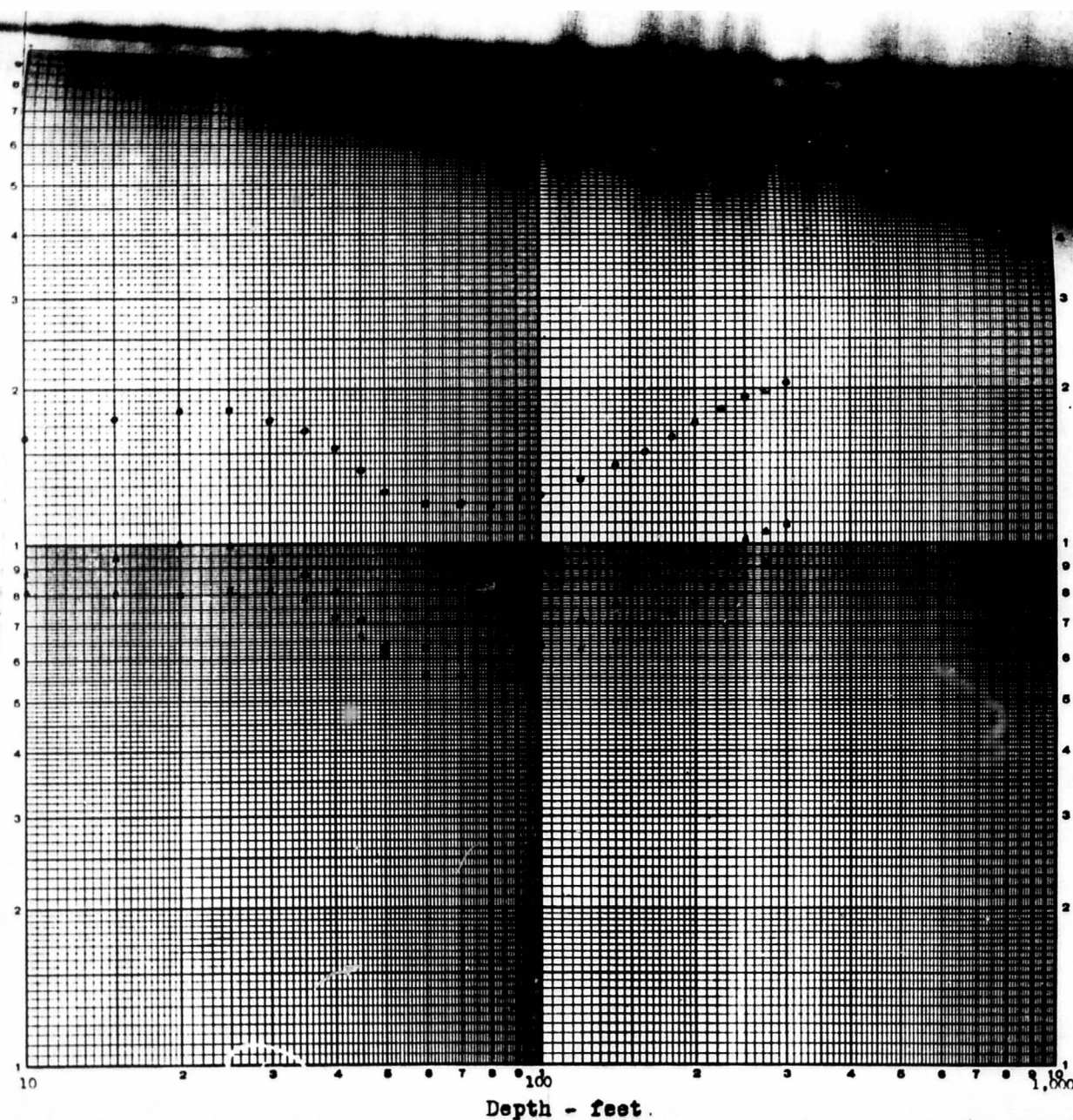
Bearing:

P₁-N. 83° E.

Apparent Resistivity - ohm cms

10,000

1,000



Line D-4 (G-P)
Bristol, Pa.
7/1/47

Location:

At edge of field along E. side
of Pennsbury Rd. S. of inter-
section with Tullytown-Slipville Rd.

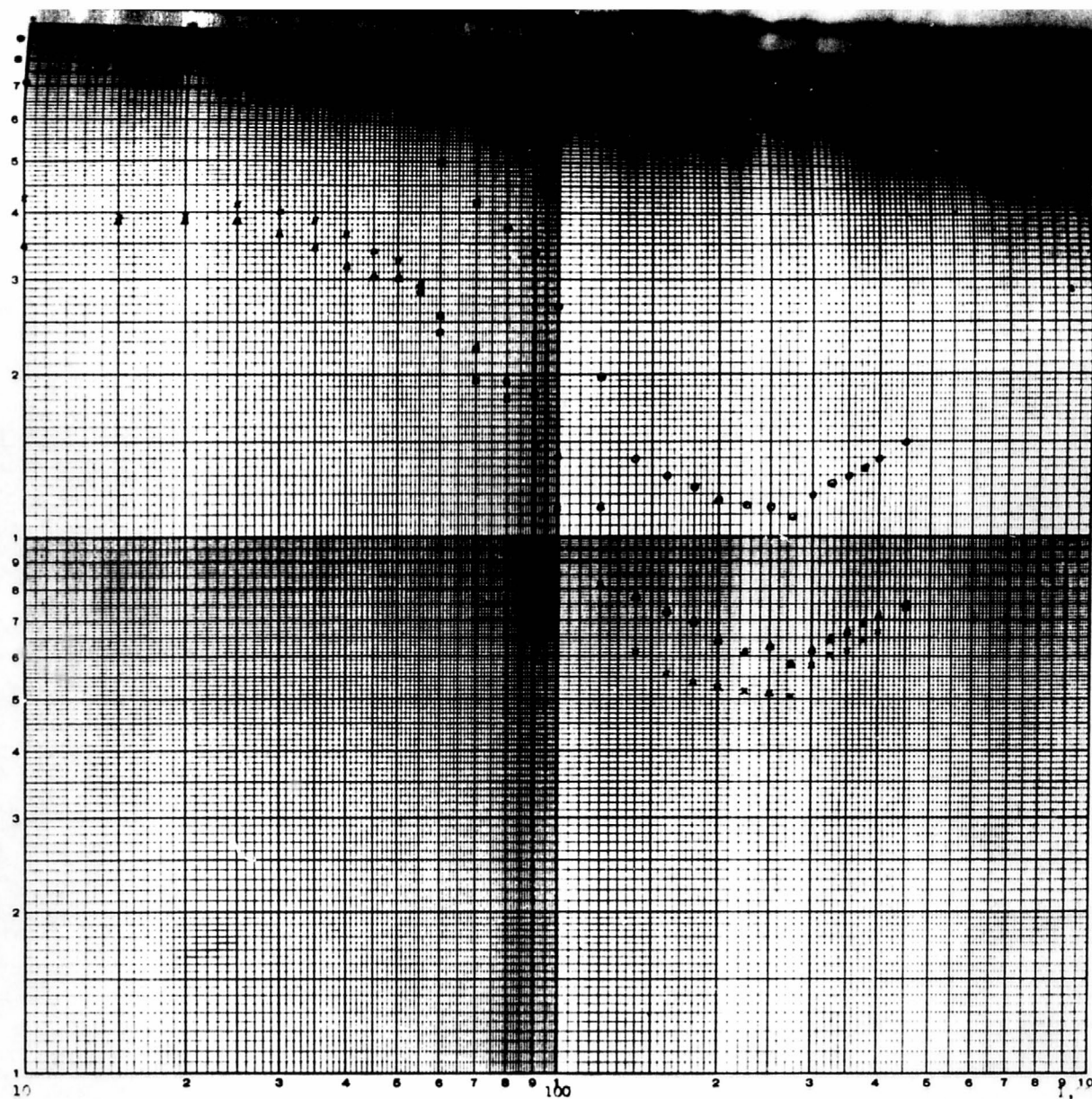
Bearing:

P₁-N. 7° W.

Apparent Resistivity - ohm cms

10

1.00



Depth - feet

Line D-1 (D-1)
3rd 101, R.
/1/17

Location:

0.48 mi. S. of Slidell, La.,
along Louisiana R. 101, R.
of 101.

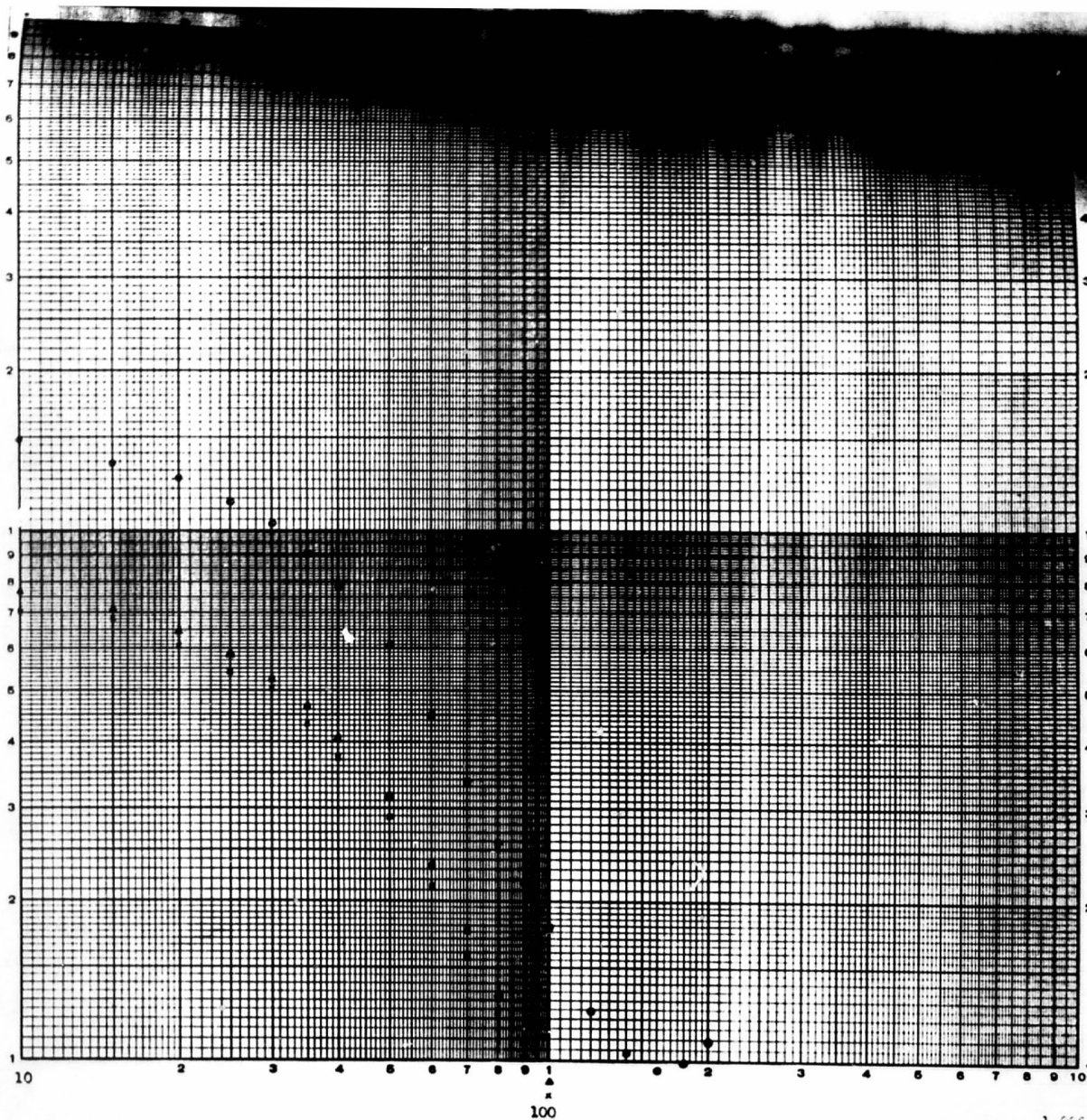
Year:

1951, or.

Apparent Resistivity - ohm cms

100,000

10,000



Depth - feet

Line E-1 (1-1)
 100 ft. log.
 1/1/57

Location:

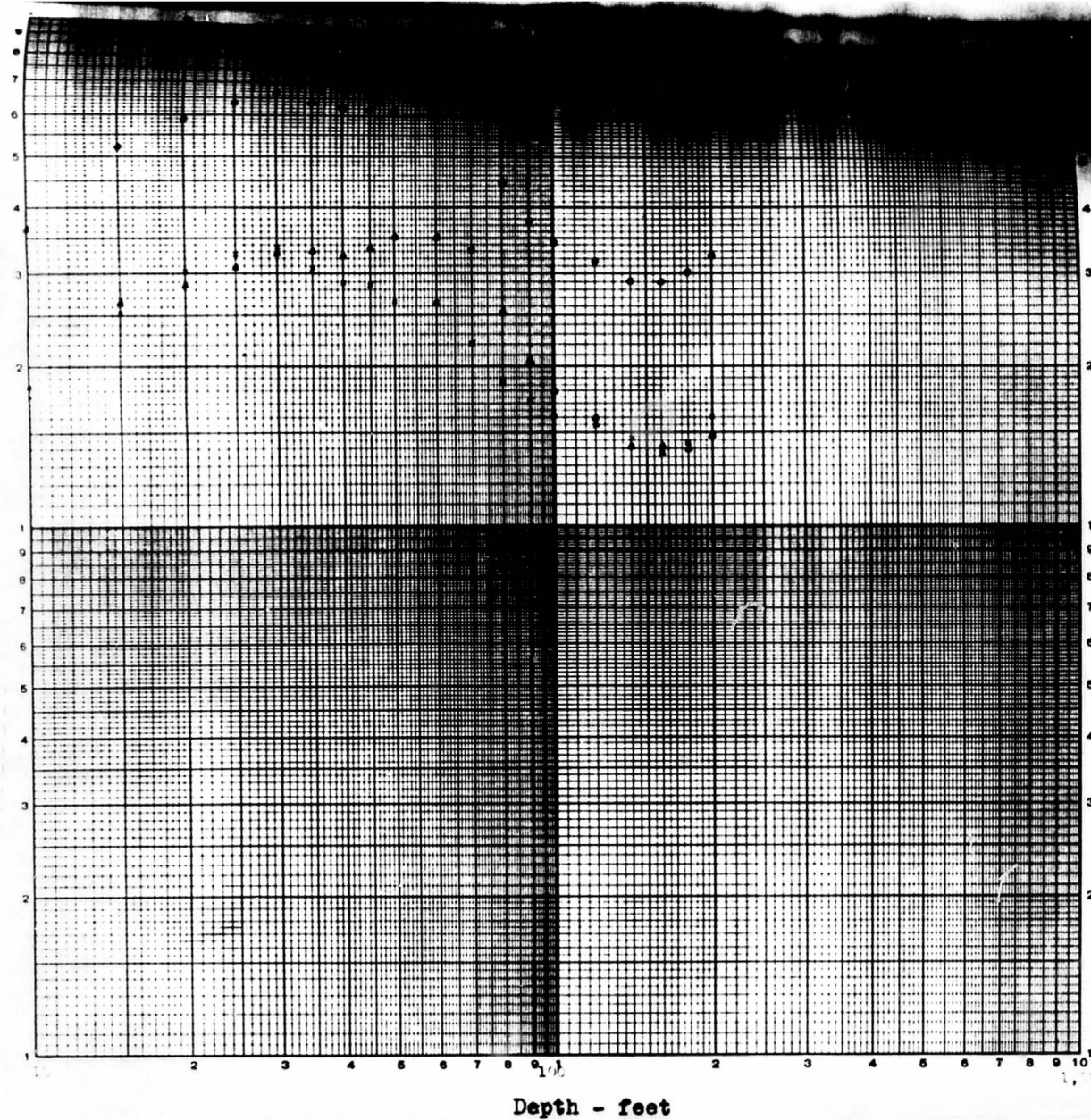
U.S. S. of ...
 Co. Mill No. ...
 Oxford Valley N. ...
 Talbot Co. - Oxford ...

Remarks:

P₁-N.Y. ...

1,000

Apparent Resistivity - Ohm CMS



Line 3-2 (1-)
Bristol, Pa.
11/17

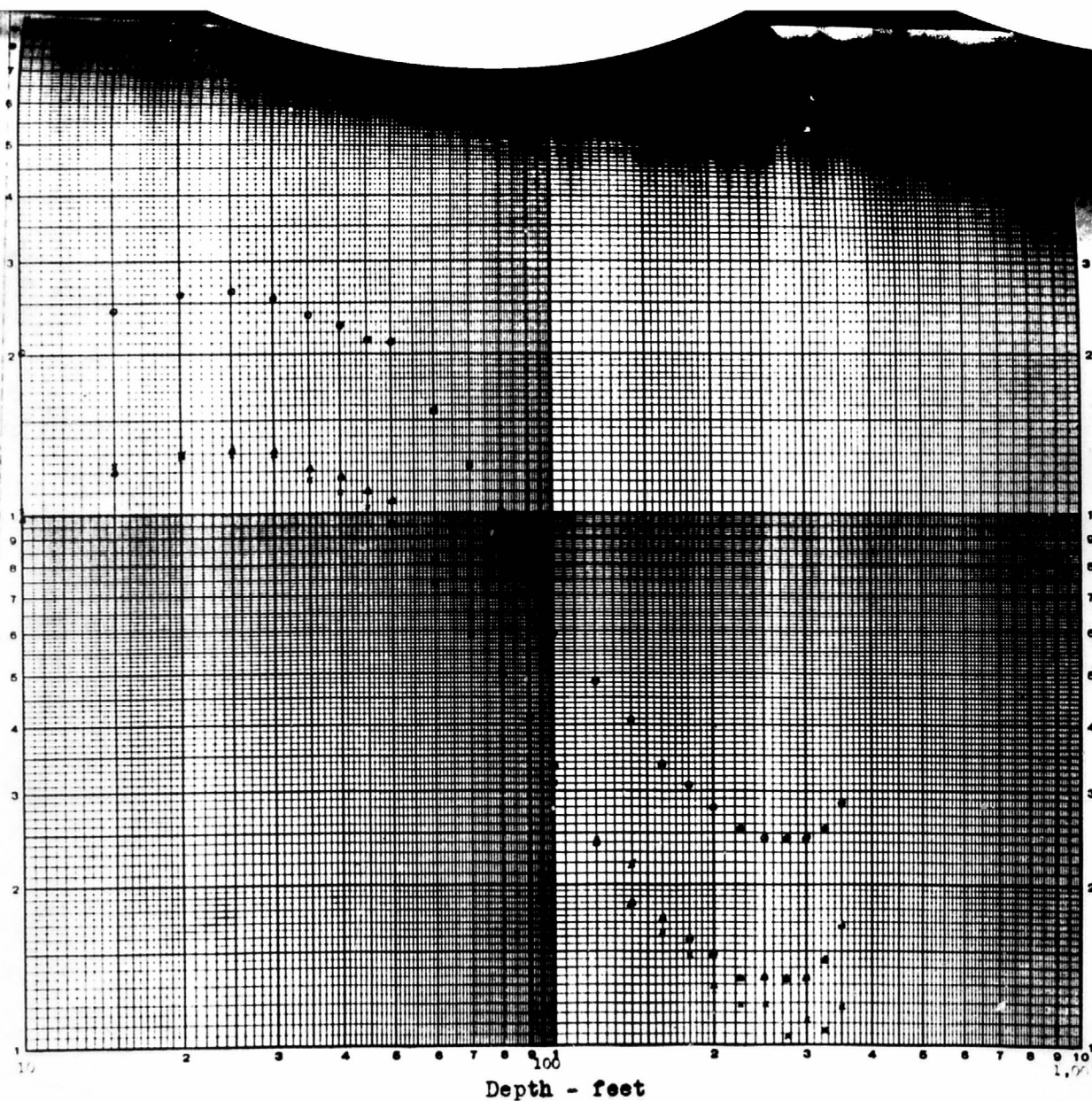
Location:

N. of City of ...
Pottsville, Pa.
W. of ...

Section:

N.-N. 10° W.

Apparent Resistivity - Ohm cms



Line 2-3 (1-1)
Bristol, Pa.
1/1/47

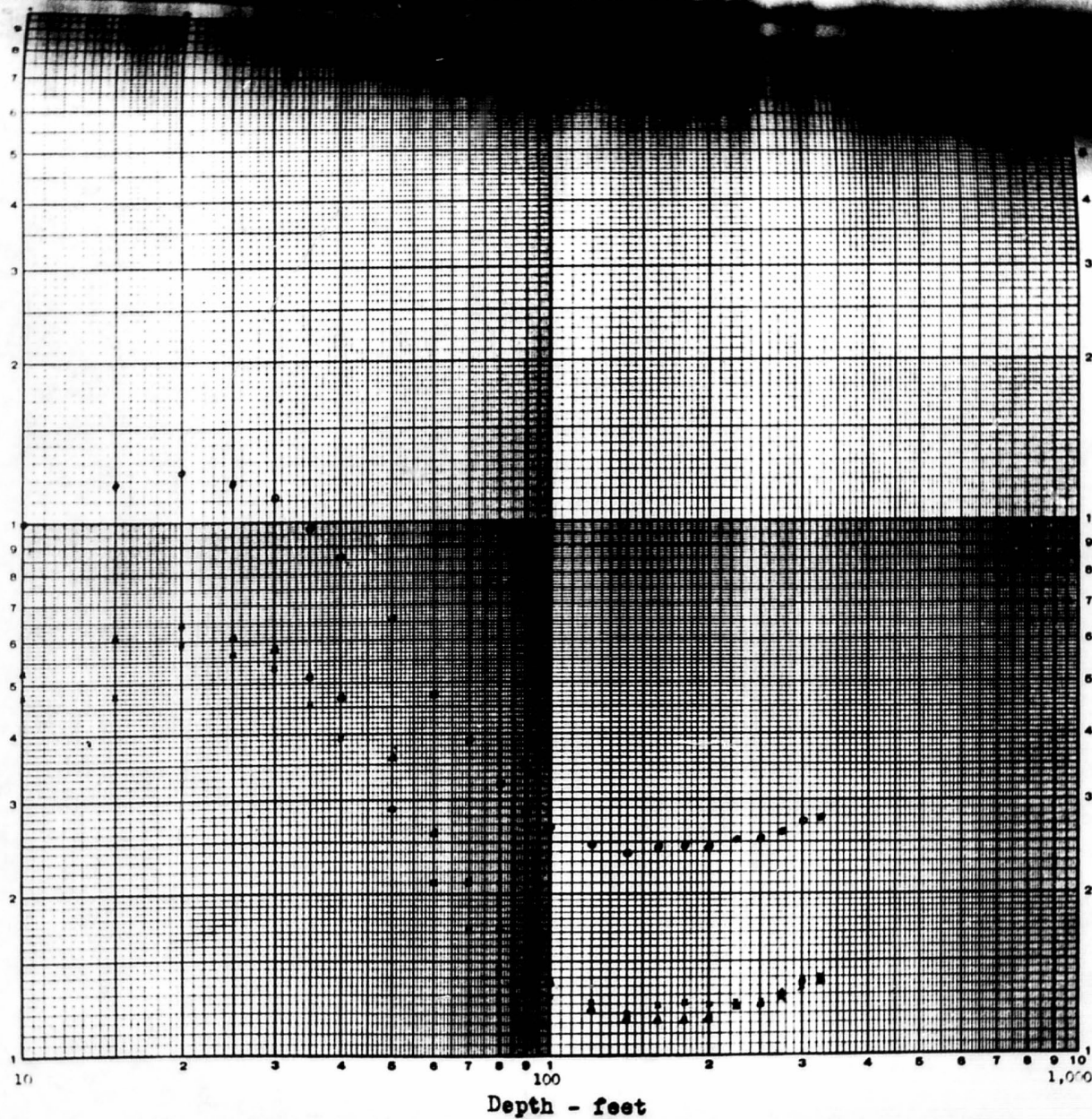
Location:

Based on apparent resistivity
Perry, R. L. & S. L. 1947
Apparent Resistivity (Ohm cms)

Depth (feet)

1-1000

• Apparent Resistivity - ohm cms



Line W- (P-)
Bristol, Pa.
4/24/7

Location:

S.E. of Tullytown town, Pa. on
on unnamed road in K. P. (See
map) P. S. (see map) road and
road and S. of Scotts Creek.

Bearing:

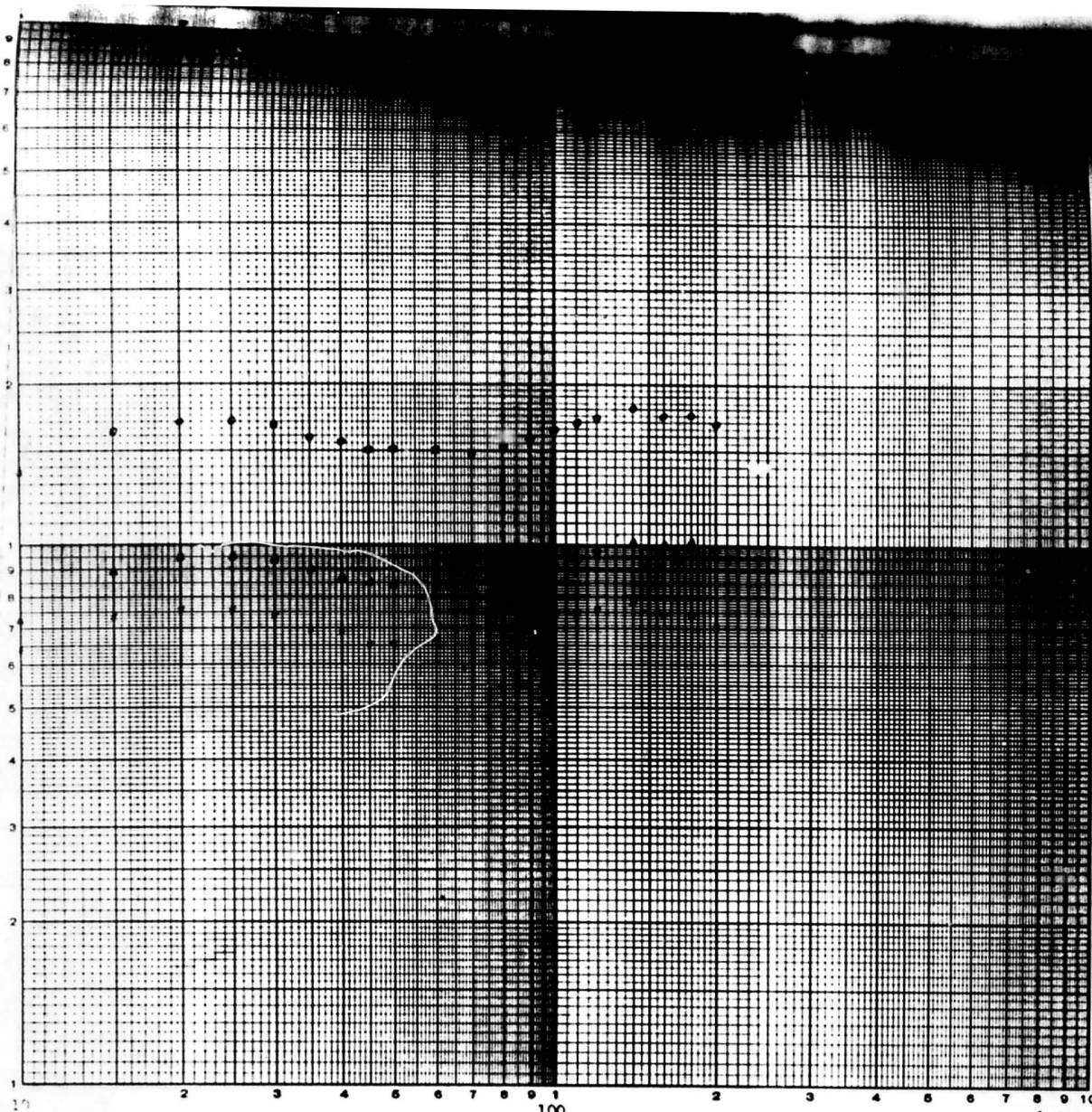
P₁ - N. 85° E.

Apparent Resistivity - ohm cm

1,000,000

10,000

1



Depth - feet

Line P-1 (7-2)
Bristol, Pa.
4/22/47

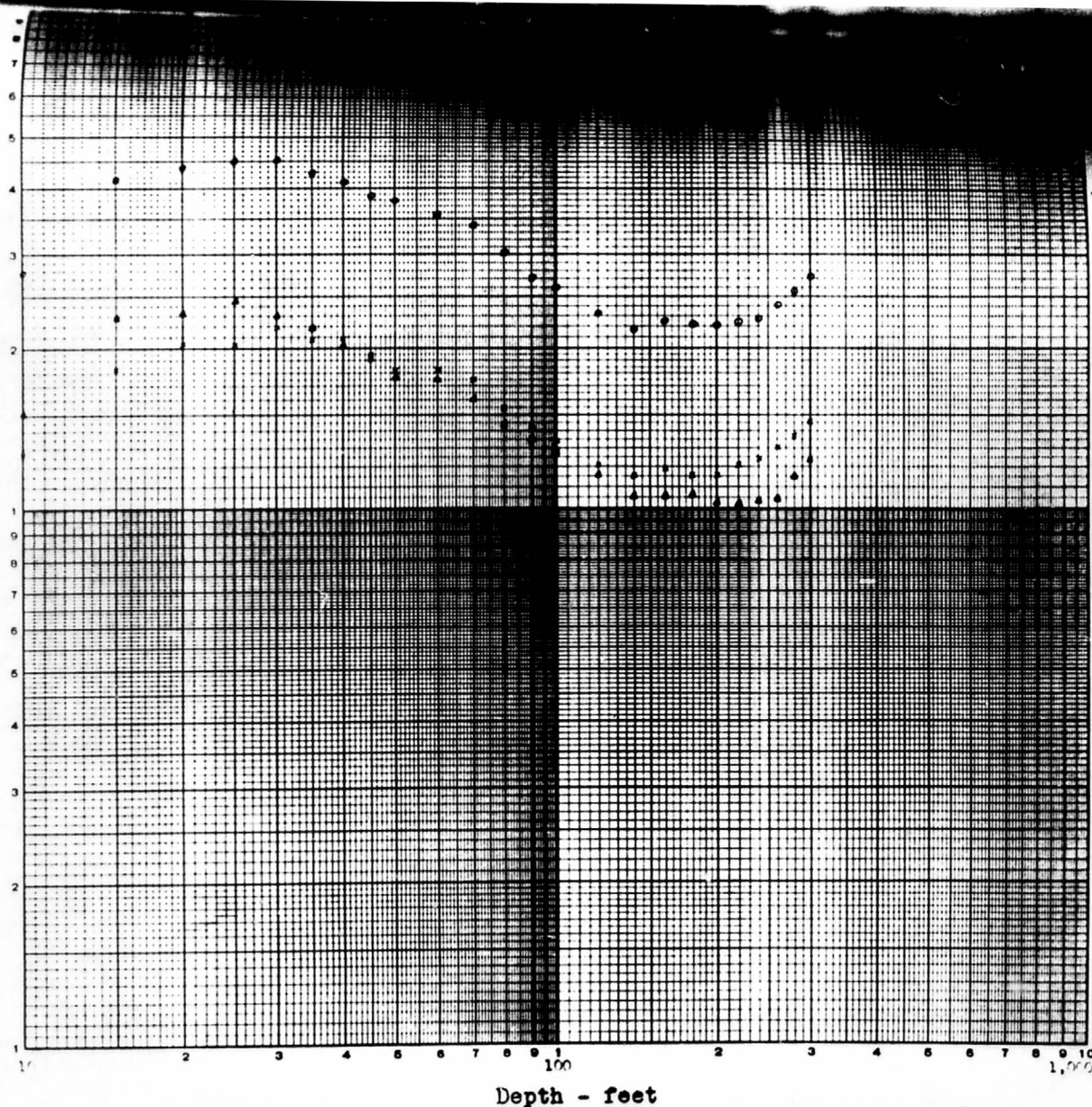
Location:

0.5 mi. S. of Mill Creek W., on Hones
Rd., thence 290° NE center of P. to a
pasture. About 1/2 mi. NE of P.

Bearings:

P1-W. 65° E.

Apparent Resistivity - Ohm cm



Line P-2 (1-1)
Bristol, Pa.
1/1/57

Location:

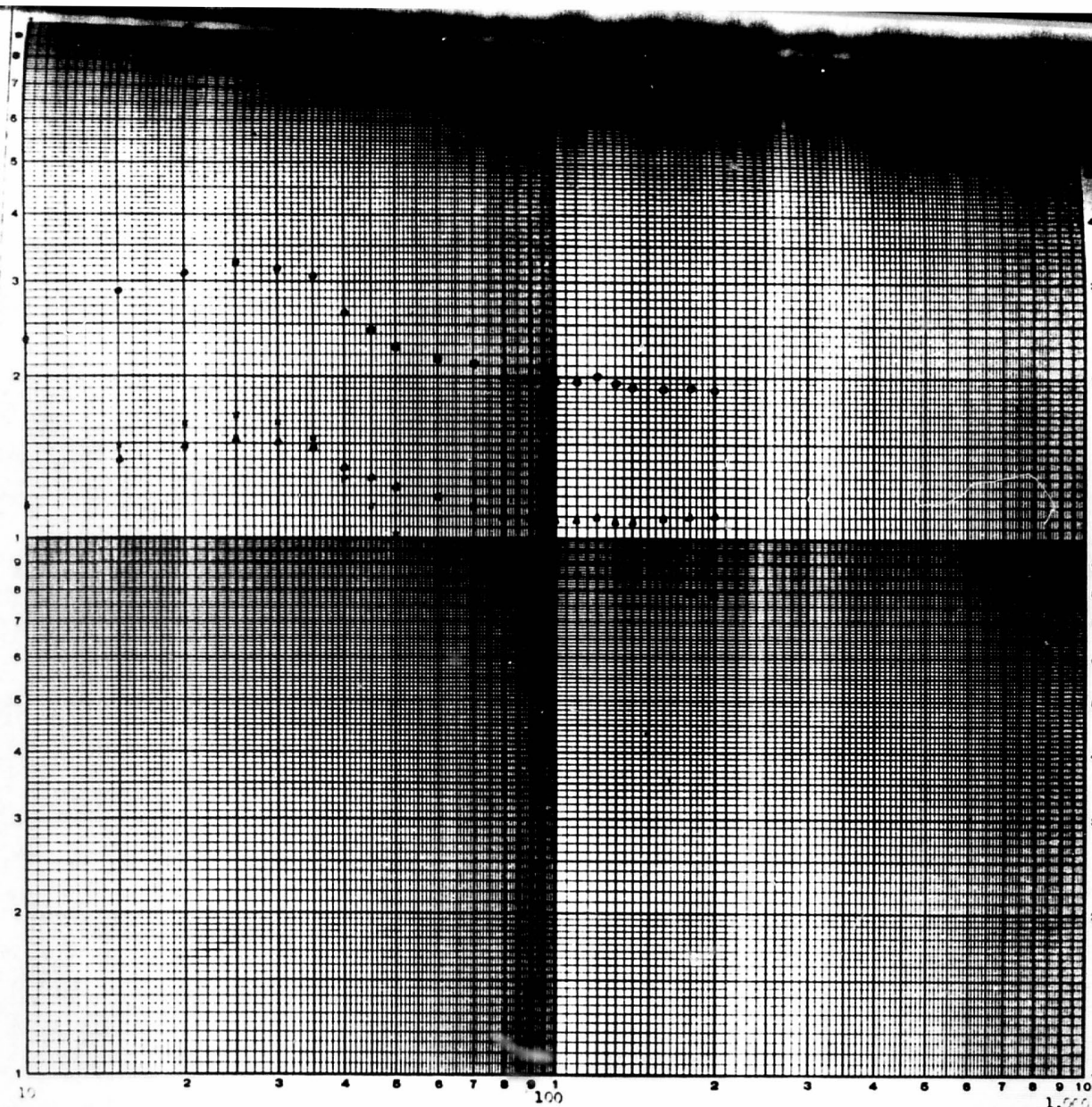
0.5 mi. E. of Honesdale, Pa.
side of Route 28
0.1 mi. N. of Honesdale, Pa.
Co.

Scale:

P-S-1000.

Apparent Resistivity - ohm cms

10,000



Depth - feet

Line W-3 (2-)
Bristol, Pa.
4/23/47

Location by Bearings:

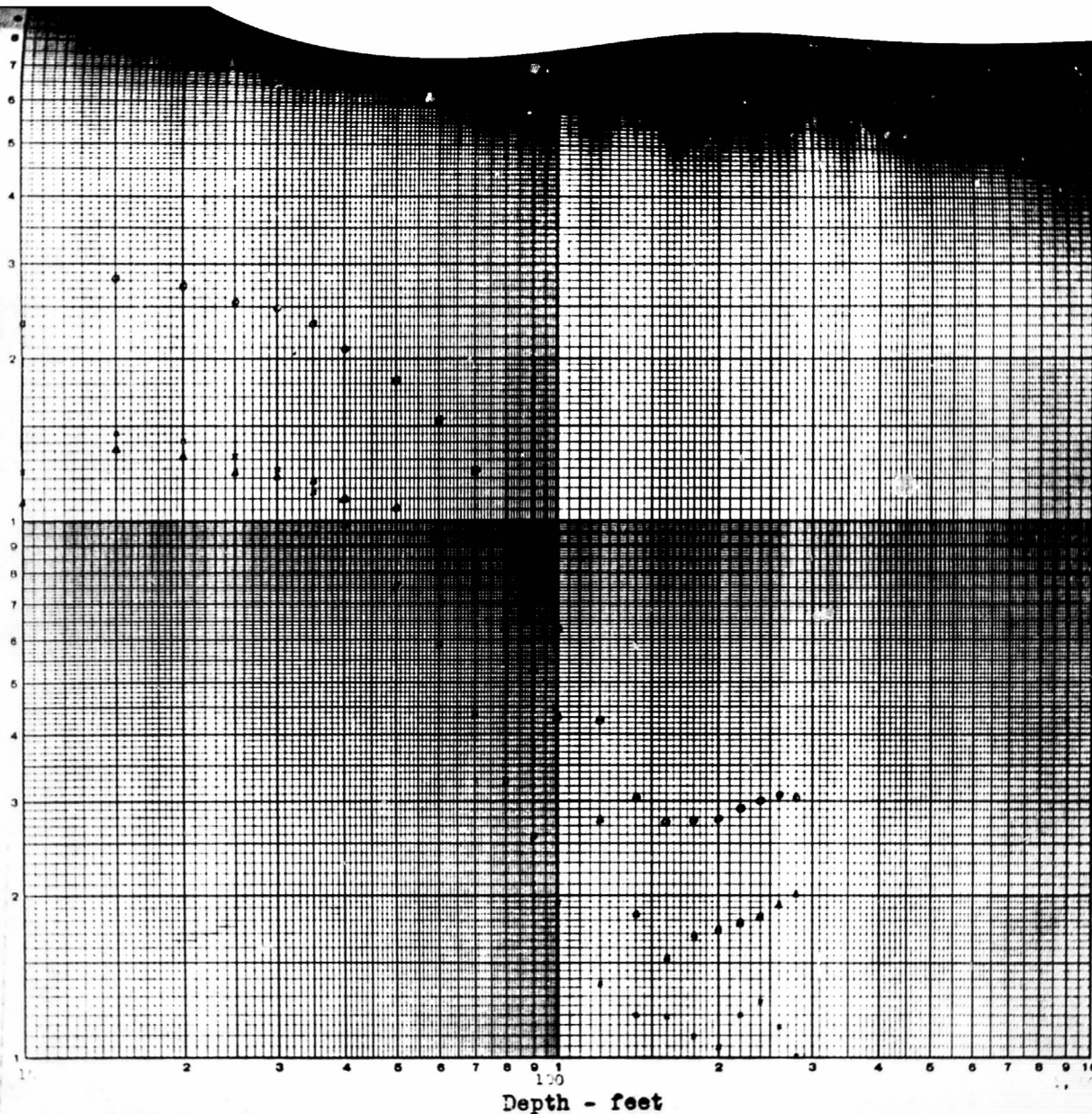
To Bristol Water Tower - S. 1 1/2° E.
To Patterson Farm Road - S. 1° E.
To Powder Plant Road - N. 1° E.
To Del. River S. 60° E.
About 750' to River.

Bearings:

P1-N. 50° E.

Apparent Resistivity - ohm cms

100,000



L. 100 (100)
Bul. 101, R.
100

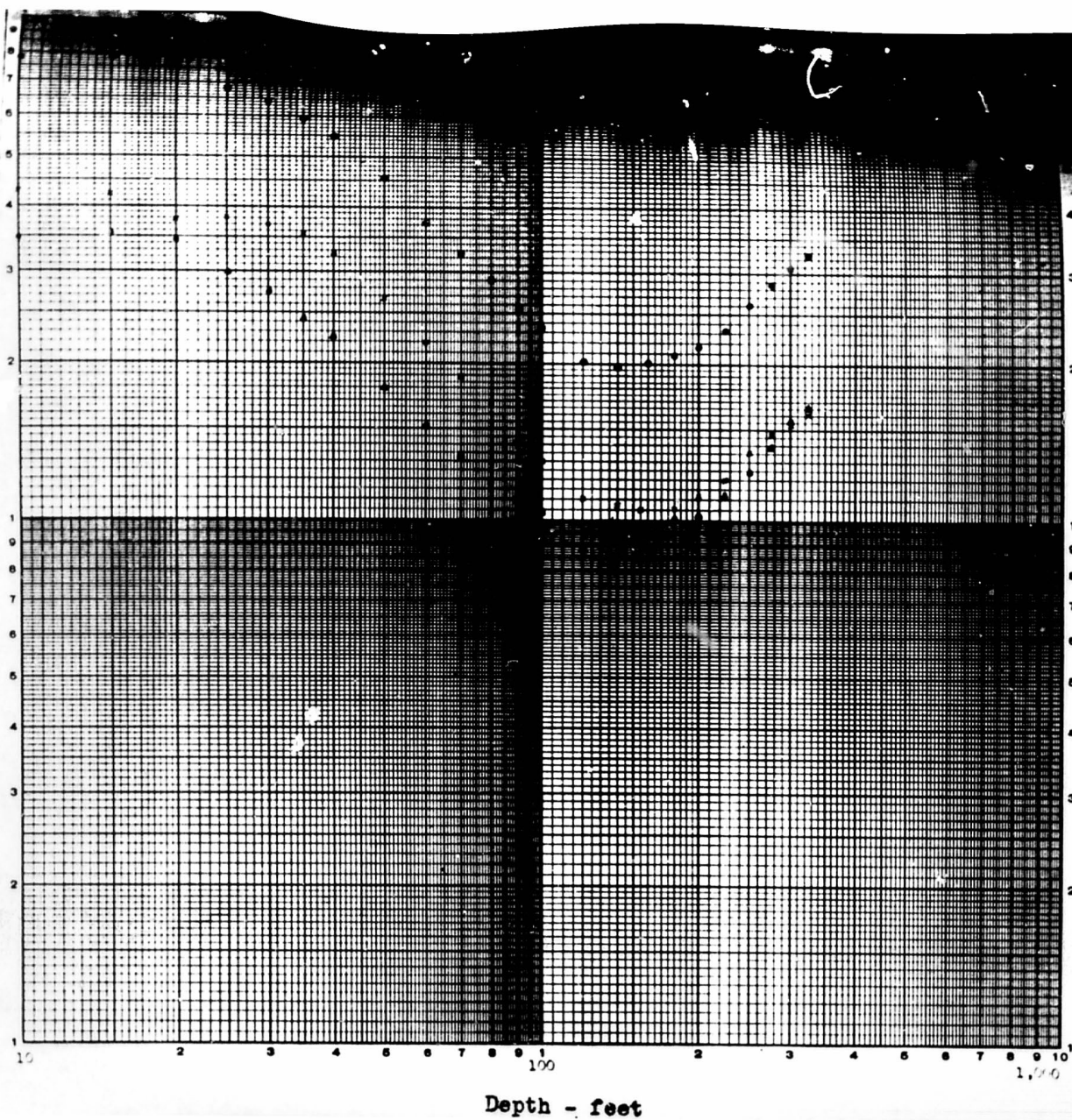
Location:

About 100' S.E. of S.E. corner of plot
Western boundary of plot
Rd. along line. " " " " " "
100' SW corner of plot.

Scale:

100' = 1" = 100'

Apparent Resistivity - ohm cms



L. H. 1 (1-)
Bristol, Pa.
4/2/77

Location:

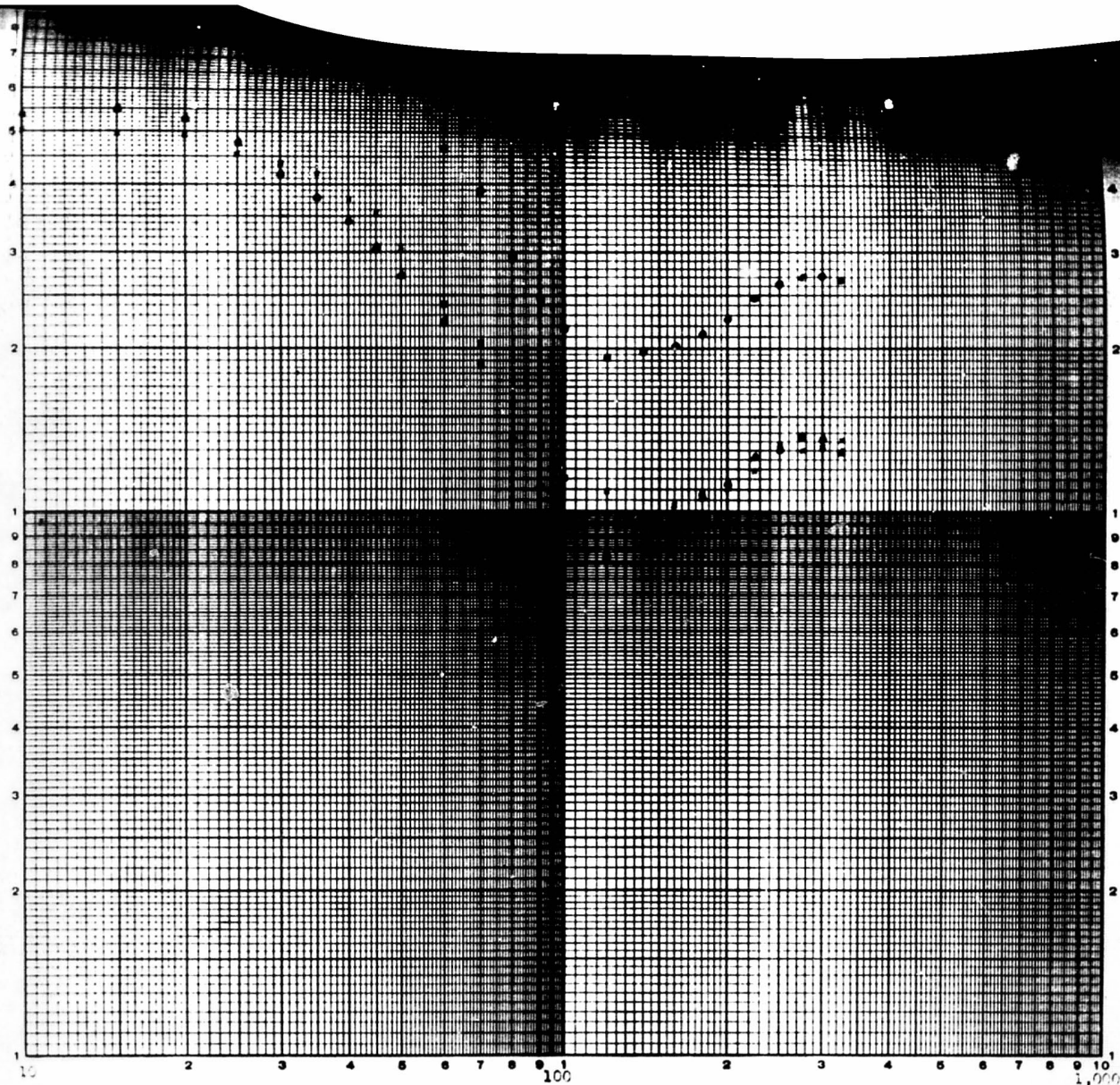
0.2 mi. SE. of intersection Cooper
Mill Road with Highway 101
thence 0.05 mi. W. in open field.

Bearing:

P1-N. 30° W.

Depth - feet

10.



Depth - feet

Line H-2 (7-1)
Bristol, Pr.
4/24/7

Location:

0.15 mi. NW. of intersection of
Beaver Dam Road and Green Lane
along Green Lane thence 280' W.
in an open field.

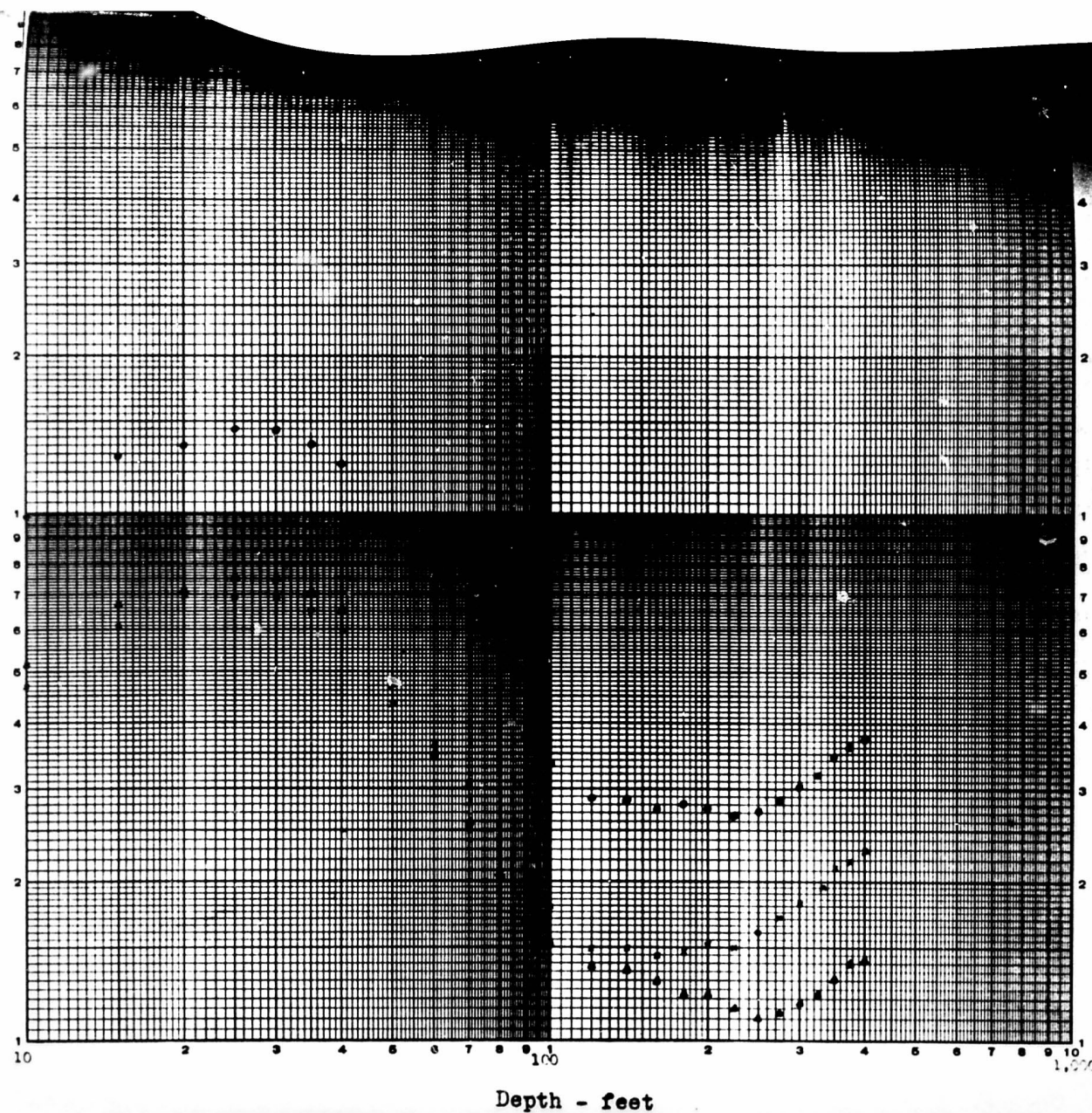
Batteries:

7 P1-N.2 1/200.

Apparent Resistivity - ohm cms

100,000

10,000



Line I-1 (100)
Bristol, Pa.
4/10/67

Location:

0.5 mi. N.W. of P.R.R. crossing
along Beaver Dam Rd. (Rwy 100)
thence 0.1 mi. N.E. to Beaver
Dam Rd. in a field.

Bearing:

K1-B.1003.

Apparent resistivity - ohm cms

1,000,000

100,000

10,000

10

2

3

4

5

6

7

8

9

100

2

3

4

5

6

7

8

9

10

1,000

Depth - feet

Current & State of N. H.
Logarithmic scale
and units

Line J-1 (2-)
Bristol, R.I.
1/1/1

Location:

0.9 mi. N. of R.N.H.
Bristol-Newport R.
N. of R-N Rd. 1 to 2 miles

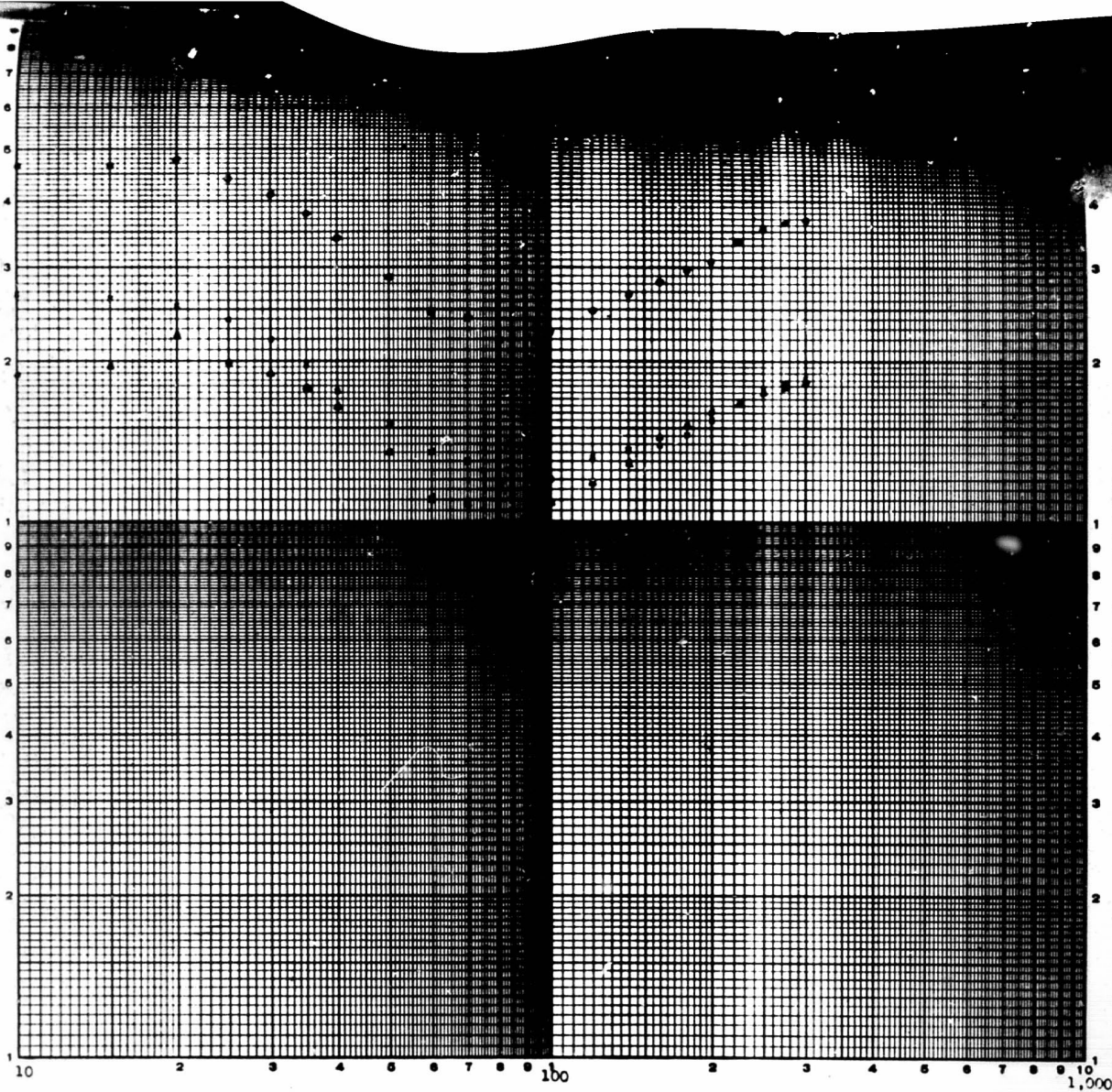
Bearing:

E₁-N. 60°E.

Apparent Resistivity - ohm-cm

10,000

1,000



Depth - feet

Line K-1 (C-1)
Bristol, Pa.
4/25/47

Location:

Along Hiway 13, 0.52 mi. E. of
Philco Plant in Croydon, about 0.1
mi. W. in open field about 250' from
creek.

Centerline on Hiway 13 to creek 0.8

Centerline on Hiway 13 to Croydon 7

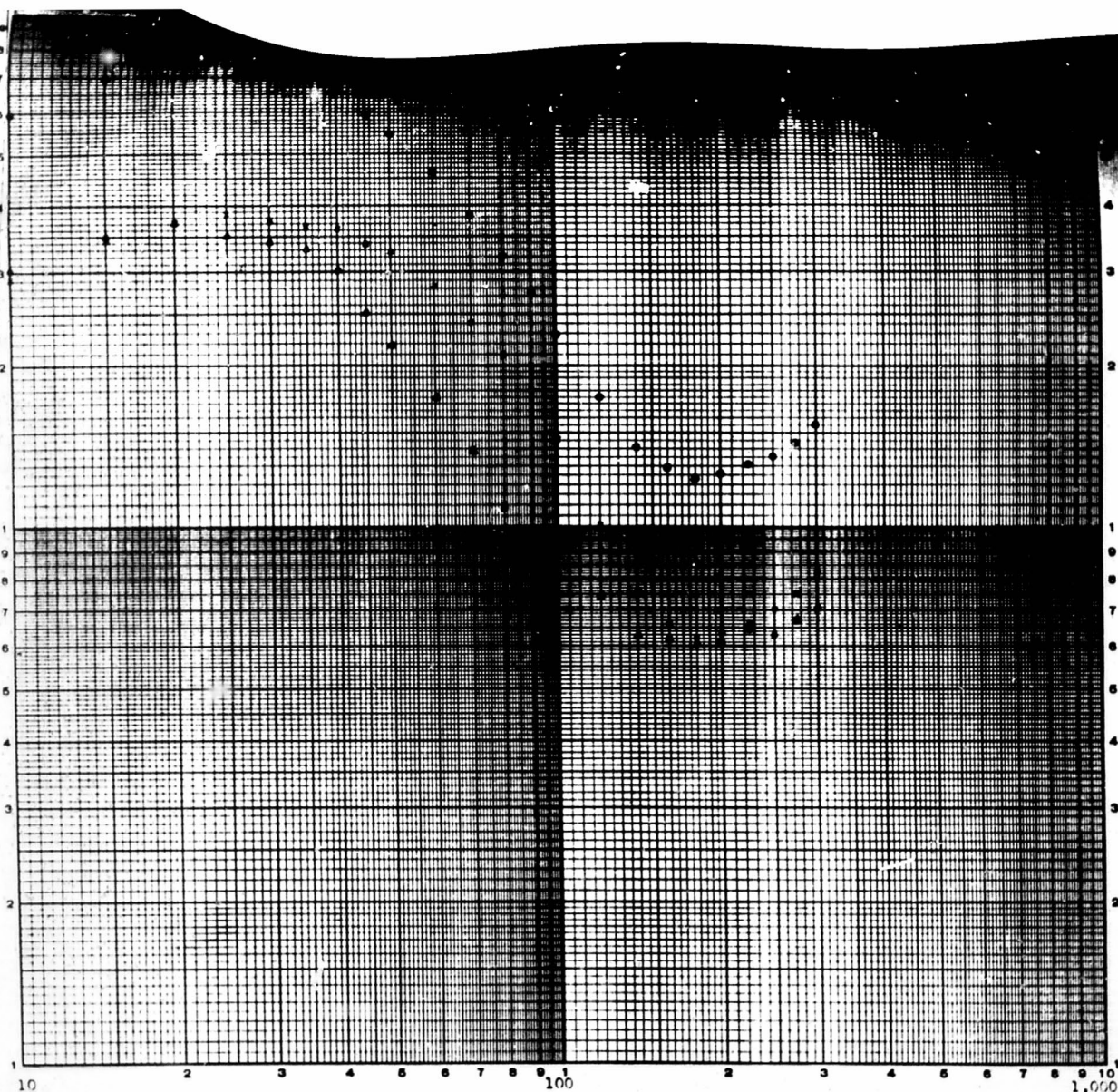
Bearing:

P1-N. 71° E. of Airways Beacon from
centerline S. 41° E.

Apparent Resistivity - ohm cms

10,000

1,000



Depth - feet

Line K-2 (G-2)
Bristol, Pa.
4/28/47

Location:

0.8 mi. S.W. of intersection of
State road E. of Croydon with dirt
road along dirt road. Thence 40' E.
in open field.

Bearing:

P₁-N.37°E.