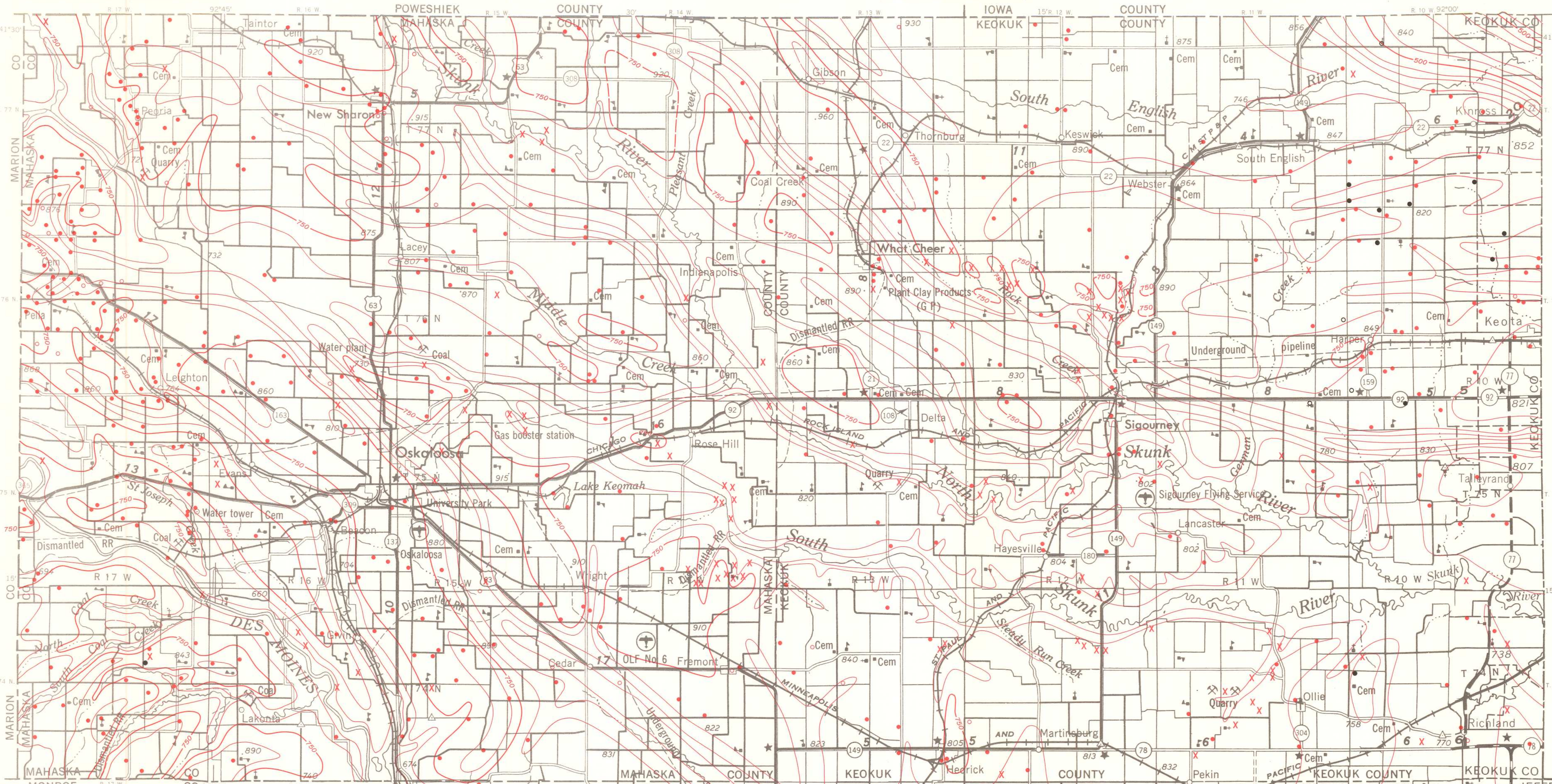
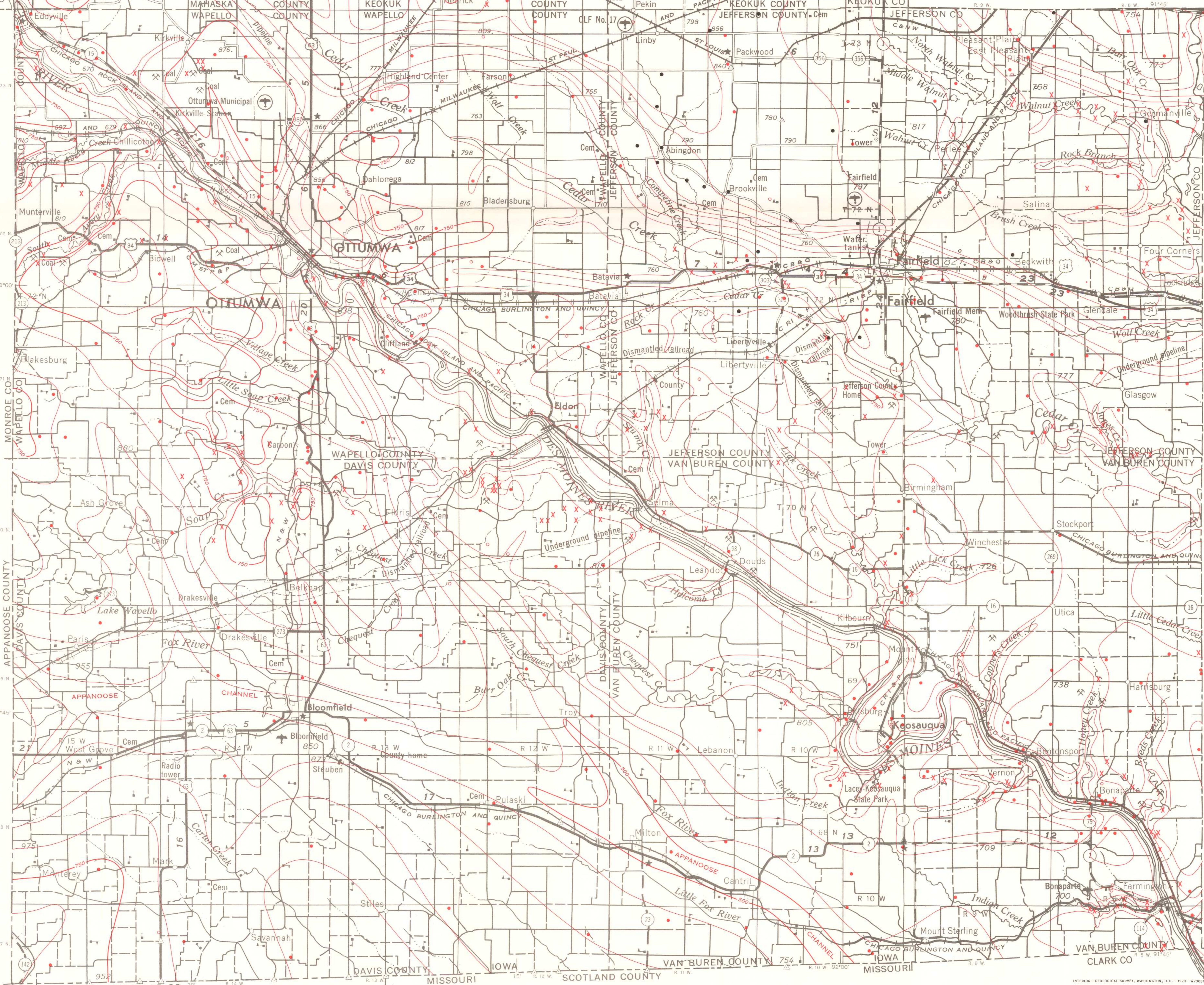
PREPARED IN COOPERATION WITH THE
IOWA GEOLOGICAL SURVEY





EXPLANATION

Log data
Bedrock penetrated

Log data
Bedrock not penetrated

Published data
Bedrock penetrated

Published data
Bedrock not penetrated

Quarry or outcrop

750

Bedrock contours
Show altitude of bedrock surface. Dashed where approximately located. Contour interval is 50 feet. Datum is mean sea level

INTRODUCTION

The bedrock in Iowa is covered nearly everywhere by unconsolidated deposits of glacial drift and alluvium, which range in thickness from less than 1 foot to more than 400 feet, and from less than 1 foot to about 60 feet, respectively. The configuration of the bedrock surface is the result of a complex system of ancient drainage courses which were developed during a long period of preglacial erosion and during shorter, but more intense, periods of interglacial erosion.

BEDROCK TOPOGRAPHY

Primary control for the map is geological log data and information from quarries and outcrops. Published data (Norton, 1912) provide additional control, but they are not as precise as the log data and are used principally in areas where primary control is limited and to support the contouring of major features such as the bedrock channels. Much of the available published data for the area cannot be used because locations are too general to assign land-surface altitudes with reasonable accuracy. More detailed information about the control data is available in the cooperative files of the Iowa Geological Survey and the U.S. Geological Survey, Iowa City, Iowa.

The accuracy of the map is related to the density of control points; the greater number of points there are in a given area, the more exact is the placement of the contours. In several instances dashed contours were used where it seemed reasonable to continue a ridge or valley, but where no control point was available to confirm the contours.

The principal features of the map are the deeply buried bedrock channels along the eastern border and the present-day bedrock-incised stream valleys in the northwestern part of the area. The Udden and Gordon channels are a part of the master drainage line for a network of channels that are cut into the predominantly carbonate bedrock of eastern Iowa (Hershey, 1969). In southeastern Iowa, tributaries to the master channel are characteristically narrow and steep-walled. In contrast, the broad channel with gently-sloping walls in Van Buren and Davis counties is characteristic of channels which are cut into bedrock that is dominantly shale. These features indicate that the bedrock topography reflects both the erosional history of the bedrock surface and the lithology of the underlying rock.

The northwestern part of the map area illustrates a part of the bedrock surface that has been sculptured primarily by present-day streams. These streams have incised the bedrock uplands which consist of shale and sandstone, and have extended their valleys by headward erosion. Generally, the bedrock-incised valleys tend to be narrow and steep walled. Occasionally, the present-day streams occupy valleys that are situated over buried channels and relatively broad valleys have developed.

USES OF MAP

The bedrock map, when used in conjunction with land-surface altitudes, is a vital tool for studying hydrologic, environmental, and geologic problems.

Hydrology. – The map is an aid in locating supplies of ground-water. The areas that are most favorable for the development of ground-water supplies are the buried-bedrock channels and the alluvial valleys of present-day streams. In areas that are underlain by shale the bedrock channels often are the principal source of potable water for private domestic and stock wells and a few small towns. Though not all channels contain sand and gravel aquifers, the larger, more extensive channels in the eastern part of the map area contain aquifers that supply many farm and rural-domestic needs. Recorded yields generally range from 10 to 30 gpm (gallons per minute) but yields as high as 100 gpm have been reported.

The alluvial deposits range in thickness up to about 60 feet and contain sand and gravel aquifers that will yield from 10 to 40 gpm to individual wells. Because few wells have been completed in the alluvium and information is limited, a program of test drilling is recommended, especially when attempting to develop a large supply of water.

The map will help the drilling contractor when planning the construction of a well. By determining the depth to bedrock, the contractor can estimate casing needs and prepare more accurate cost estimates. And, where overburden is particularly thick, the contractor can be better prepared for any problems attendant to drilling this material.

Other uses for the map are in river basin hydrology studies and in determining surface-water and ground-water relationships at selected locations.

Environment. – The bedrock information is particularly valuable to State, regional, and local planners concerned with environmental problems such as the location of landfill sites. The thickness of overburden, which can be determined with the aid of this map, is an important factor to consider for the protection of ground-water supplies from potential contamination.

Geology. – The bedrock map shows the location of bedrock highs, which are of interest to quarry operators and to construction engineers concerned with foundation problems. The map also aids in the interpretation of drainage changes caused by glacial advances and in mapping the areal distribution of consolidated rocks.

ACKNOWLEDGMENTS

Particular recognition is made to the present and past members of the Iowa Geological Survey who, over a period of many years, have collected and analyzed drill-hole samples, determined land-surface altitudes, and compiled other information necessary to the preparation of this map. Further acknowledgment is made to the many well drilling contractors who have voluntarily collected drill cuttings and have provided other well data.

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Base from U.S. Geological Survey 1:250,000
Centerville, and Des Moines, 1954;
Burlington and Davenport, 1958
Roads as of 1969

SCALE 1:125 000

2 0 2 4 6 8 10 MILES

2 0 2 4 6 8 10 KILOMETERS

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BEDROCK TOPOGRAPHY OF SOUTHEAST IOWA

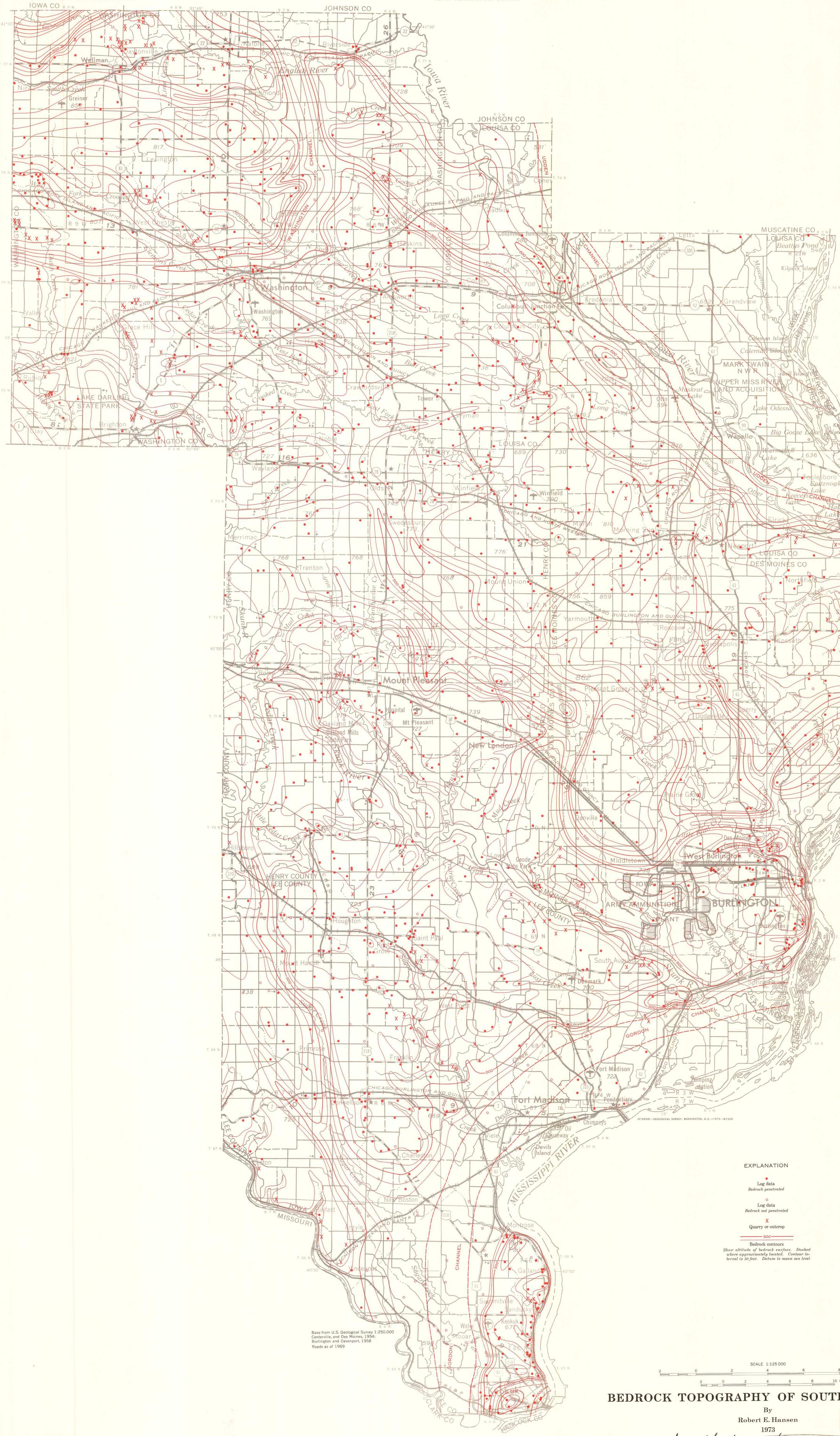
By
Robert E. Hansen
1973

For sale by U.S. Geological Survey, price $1.00 per set

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
IOWA GEOLOGICAL SURVEY

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-808 (SHEET 2 OF 2)



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- X Quarry or outcrop
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