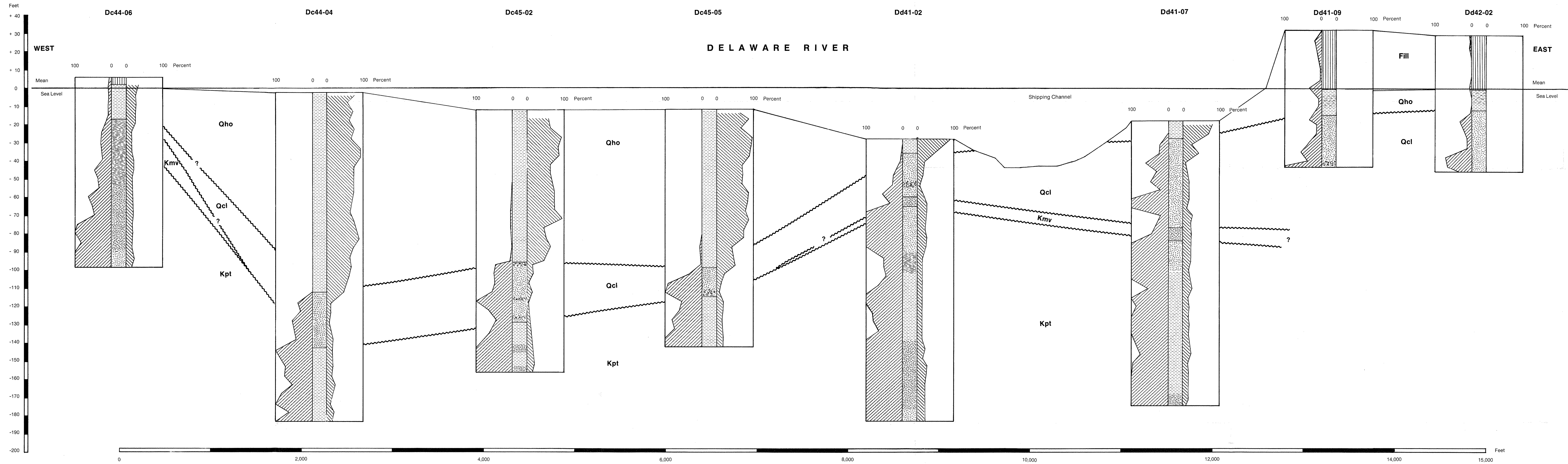
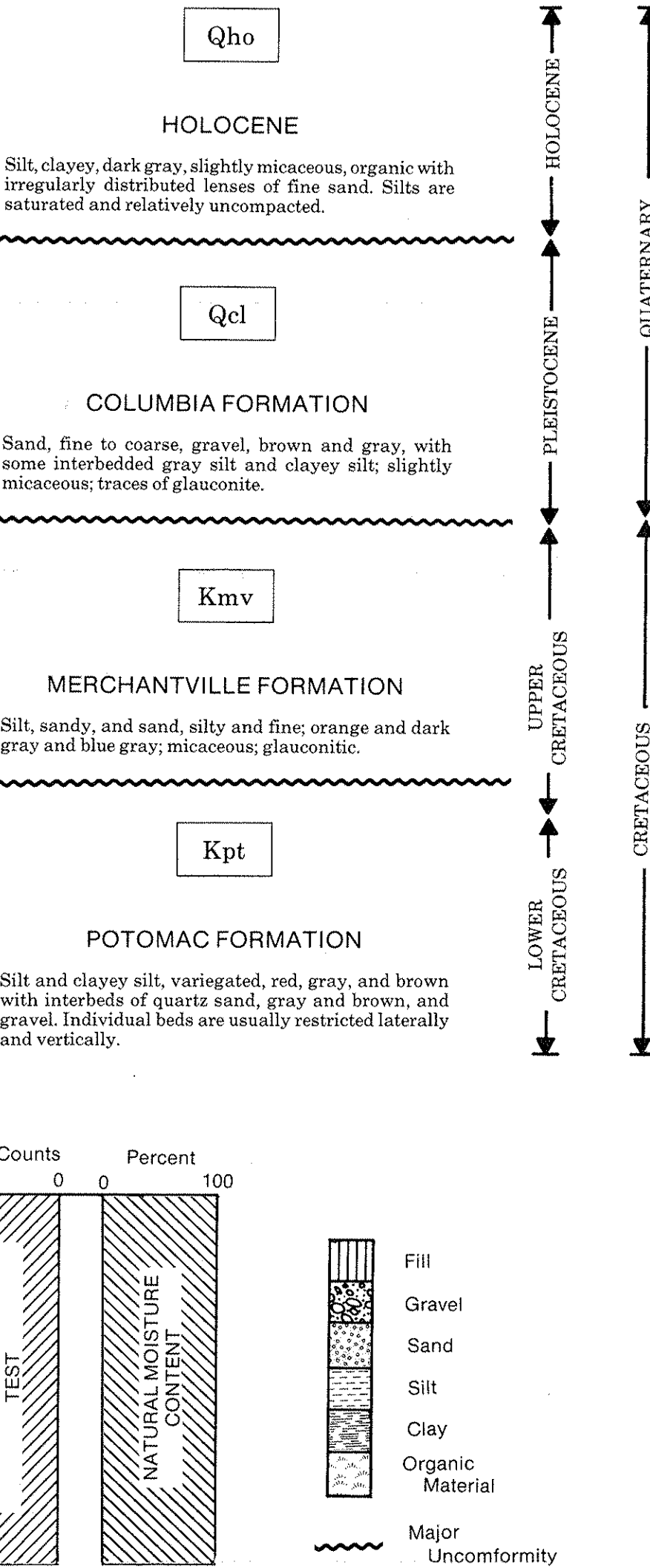




KEY TO CROSS SECTION



DISCUSSION

Test borings made in preparation for the construction of a power line across the 2.5 miles wide Delaware River provided an opportunity to investigate the geology beneath the river which is otherwise inaccessible. The information is of value to studies of ground-water development near the River and for other engineering works as well as understanding the geologic history of a major feature of the State.

Sediments penetrated by the eight borings, which are up to 182 feet deep, from youngest to oldest, include Holocene age silts, Potomac age sands and gravels (Columbia Formation), Upper Cretaceous silt (Merchantville Formation), and nonmarine Upper and Lower Cretaceous silts, clays, and sands (Esopus Formation). The ancestral Delaware River channel, which was cut into Cretaceous age sediments of the Esopus Formation during the Pleistocene Epoch, extends to a depth of at least 141 feet below present sea level. The present designed shipping channel lies approximately 7,000 feet east of the ancestral channel.

The youngest sediments (Holocene) beneath the Delaware River are dark gray clayey silts. Organic matter and thin lenses of fine sand and sandy silt are irregularly distributed throughout the section. The silts contain large amounts of water and are uncompacted. The thickest section of silt penetrated was encountered from 3 to 112 feet in borehole Dc44-06. The silt thin rapidly westward and more gradually to the east to southward. Following down-cutting of the river channel during the Pleistocene, the Esopus transgression drowned the channel resulting in the deposition of these fine-grained sediments.

Brown and gray sands and gravels locally containing interbedded silts and clayey silts unconformably underlie the Holocene sediments. The sands and gravels have not yet been precisely dated. However, on the basis of gross lithology and relationship to overlying and underlying units, Jordan and Groat (1962, p. 9) concluded that these sediments were probably deposited during the waning phase of the Wisconsin and are thus, part of the Columbia Formation. Some of the sands are slightly micaceous. Traces of glauconite derived from older sediments occur throughout the Columbia section. The thickness of the sands and gravels ranges from 0 to 49 feet and in boring Dd41-09, they are found as deep as 145 feet.

The contact between the sands and gravels and the overlying silts is abrupt and characterized by both a sharp increase in moisture content and a sharp increase in standard penetration resistance (blow counts). The Columbia Formation sediments are compacted, whereas the Holocene silts are relatively uncompacted.

The Merchantville Formation (Upper Cretaceous), which is bounded unconformably above by the Columbia Formation and below by the Potomac Formation, was encountered in three borings (Dc44-06, Dd41-02, and Dd41-07) at progressively greater depths from west to east. It appears to have been completely eroded in the central portion of the ancestral Delaware River valley. The Merchantville is weathered to an orange color in outcrop, and occurs in the subsurface as dark gray to dark blue, micaceous, sandy silt and silty fine sand.

The oldest sediments encountered in the borings are composed of multicolored clayey silts, sands, silts, clays, silty sand, and some gravel. These sediments are part of the Potomac Formation, and are usually very compact, hard (more than 150 blow counts/foot), and have relatively low natural moisture contents (generally less than 50%).

SELECTED REFERENCES

Jordan, R. R., and Groat, J. J., 1962. Some observations on the sediments of the Delaware River south of Wilmington. Delaware Geological Survey Report of Investigations No. 6, 12 p.

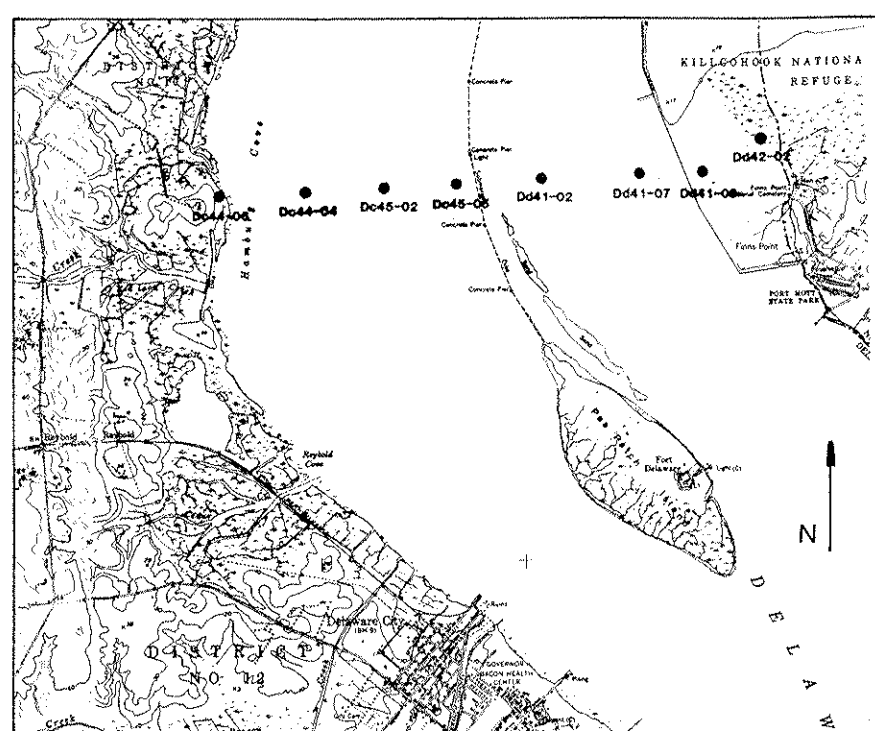
Pickett, T. E., 1970. Geology of the Chesapeake and Delaware Canal Area, Delaware. Delaware Geological Survey Map No. 1.

ACKNOWLEDGMENTS

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GEOLOGIC CROSS-SECTION OF DELAWARE RIVER
RED LION CREEK TO KILLCOHOOK NATIONAL WILDLIFE REFUGE

by
John H. Talley
1985



Location of Cross-Section