UNITED STATES GEOLOGICAL SURVEY

BULLETIN NO. 8 PLATE B
CONNECTICUT WATER RESOURCES COMMISSION

EXPLANATION

DRAINAGE DIVIDE

STRATIFIED DRIFT DEPOSITS

Stratified sand, gravel, silt, and (rarely) clay. The most important source of ground water in the Quinebaug basin and the source of most of the "dry-weather" streamflow.

COARSE-GRAINED DEPOSITS

Predominantly coarse-grained deposits. These deposits are heterogeneous; grain size of individual layers ranges from cobble-boulder gravel to silt; some layers are well-sorted, and include clean sand and rare openwork gravel, but other layers are poorly sorted and include dense, silty sand and gravel. The deposits have a range in average permeability of 200 to 4,000 gpd per sq ft from place to place and in places would yield 100 to 1,000 gpm to developed, large-diameter, properly screened wells. Permeability of individual layers ranges from about 20 to at least 20,000 gpd per sq ft.

FINE-GRAINED DEPOSITS

Predominantly fine-grained deposits. Commonly these deposits have a bottom unit of silt or silt and clay grading upward into very fine and fine sand. The fine-grained materials are capped almost everywhere by 5 to 25 feet of pebbly medium to coarse sand. The fine-grained materials probably originated as lake-bottom deposits and the coarse material in the capping layer as stream or delta deposits. Where present-day streams cross the fine-grained materials the relatively coarse alluvium forms the capping layer.

The relatively coarse-grained capping layer has a range in average permeability of 500 to 4,000 gpd per sq ft. It is largely above the water table in most terraces, but where saturated (as in local depressions, floodplains of large streams, or near some dam) the deposits may yield 100 gpm to shallow wells.

The fine-grained layers have a range in average permeability of 50 to 500 gpd per sq ft. The permeability of some individual layers, however, may be as low as 1 gpd per sq ft. Successful construction of drilled screened wells or driven wells is difficult or impossible in most places, and even some dug wells may pump sand.

COARSE-GRAINED DEPOSITS UNDERLYING FINE-GRAINED DEPOSITS

Areas where the fine-grained deposits are known or inferred to be underlain by coarse-grained deposits. These coarse-grained deposits are probably buried equivalents of the exposed deposits mapped as coarse-grained deposits. These buried coarse-grained deposits appear to be widespread, but it is difficult to map them accurately from available subsurface data. For this reason, test drilling should proceed to bedrock, as coarse-grained deposits may underlie fine-grained deposits at places not indicated on the map for lack of data. They are an important aquifer, though they are relatively thin and the overlying fine-grained deposits may limit recharge.

AREAS WHERE STRATIFIED DRIFT HAS NOT BEEN SUBDIVIDED ACCORDING TO GRAIN SIZE

TILL DEPOSITS

Till deposits are composed predominantly of till, commonly referred to as "hardpan", a nonsorted, nonstratified mixture of clay, silt, sand, gravel, and boulders. Thin lenses of stratified sand, silt, or gravel are interbedded with till locally. Till itself has a range in permeability from 0.2 to about 30 gpd per sq ft, although average permeability of till containing stratified lenses can be higher. Till deposits at a majority of sites would yield 200 gpd to large-diameter dug wells as long as the water table remains atleast 2 feet above the bottom of the well.

Areas where till deposits are generally 40 feet or more thick. These areas were mapped from interpretation of relatively few well records, the absence of known bedrock outcrops within the areas, and from their topographic form; hence, the mapped extent of many areas is subject to considerable change as more data become available, and some small areas undoubtedly exist that were overlooked in this study.

Areas where a layer of coarse-grained stratified drift occurs between thick till and bedrock. Most of these areas are within east-west-trending bedrock valleys. The stratified drift consists of gravel or sand which may have been deposited by meltwater as the ice sheet advanced. Yields of domestic wells tapping the stratified drift below till are about half as large as the yields of domestic wells tapping stratified drift where it is at the surface.

BEDROCK

Bedrock is not shown on the map but underlies the whole area. Bedrock consists of a variety of crystalline rock types whose water-yielding properties are similar. Nonfractured bedrock has a range in permeability of 0.00002 to 0.0004 gpd per sq ft, but the net permeability of the nonfractured and fractured bedrock averages about 4 gpd per sq ft. Yields of individual wells should exceed 3 gpm at a large majority of sites.

CONTACT

(Shown only between areas of stratified drift and till deposits)

SATURATED-THICKNESS LINE

Shows saturated thickness of stratified drift; interval varies. The water table as defined by lakes and streams on the topographic map and by measured or estimated late-summer water levels in a few wells provided part of the control for placement of the contours: in determining its saturated thickness the base of the stratified drift was assumed to be 5 ft above the bedrock surface, except where lithologic logs indicated otherwise.

Geology by Allan D. Randall, Robert L. Melvin, and Charles E. Shaw, assisted by I. G. Grossman, R. Vitali, and D. Underhill. Norwich Quadrangle after Hanshaw and Snyder (1962). Oneco Quadrangle modified after Johnson (1960). Voluntown Quadrangle in part after Feininger (in press). Till-stratified drift contact in Rhode Island from Hansen (1962) and unpublished maps by R. Goldsmith.

BASE BY BRANCH OF TECNICAL ILLUSTRATIONS, U.S. GEOLOGICAL SURVEY

SCALE 1:48000

2 MILES

CONTOUR INTERVAL 10 FEET

Datum is mean sea level

GEOHYDROLOGIC MAP OF THE QUINEBAUG RIVER BASIN, CONNECTICUT