INTRODUCTION

The population of the 132-square-mile area of the Croton River basin that lies in Putnam County, N.Y., is growing rapidly. Ground water is the primary source of public and domestic supplies within the basin, and water managers need information on the location, thickness, and potential well yield of the stratified-deposit aquifers to develop this resource.

In 1986, the U.S. Geological Survey, in cooperation with the Putnam County Department of Health, reviewed and compiled all available well information and aerial photographs to plot (1) the locations of the wells and springs currently on file with the U.S. Geological Survey, and (2) the thickness and potential well yield of the stratified deposits. These deposits consist either of glacial sand and gravel that lie primarily in glacially enlarged valleys, or of recent accumulations of clay, sand, and organic material on flood plains and within local depressions.

Purpose and Scope

This map shows the locations of all wells and springs in the area that are currently on file in the U.S. Geological Survey's computerized data base; both bedrock wells and wells that tap till or stratified material are included. Also shown are the locations and depths of the wells, the reported depth to bedrock and yield, and the yield of all springs.

Plate 2 shows the thickness of the stratified deposits as determined from logs of wells that were drilled through it; plate 3 shows the amount of water that a stratified deposit may be expected to yield to a new well. These estimates are based on the reported yields of the compiled wells.

The well and spring data were obtained from records on file with the U.S. Geological Survey in Albany, N.Y., and from well records supplied by the Putnam County Department of Health. Data on stratified deposits were obtained from (1) a report on the ground-water resources of Putnam County (Grossman, 1957), (2) U.S. Soil Conservation Service soils maps (Duckery, W. E., Soil Conservation Service, written commun., 1986), and (3) an unpublished map on file with the U.S. Geological Survey in Albany (Kantrowitz, I. H., 1969, U.S. Geological Survey, written commun., 1969).

METHODS

The deposit boundaries were first defined from soils maps prepared by the U.S. Soil Conservation Service from aerial photographs. Those soils that were interpreted as having developed from glacial outwash are mapped as stratified deposits. Areas of alluvium and organic soils are included because they commonly overlie significant sand and gravel deposits. Many of the small accumulations of organic muck, particulary in upland areas, probably overlie till and (or) bedrock and are not a significant source of water to wells. Well logs were used to refine the boundaries and to identify a few previously unknown deposits where stratified drift is overlain by till.

WELL AND SPRING DATA

The latitude and longitude of the wells and springs were taken from 7½-minute maps plotted by the Putnam County Department of Health and from 15-minute field maps of well and spring data plotted by the U.S. Geological Survey. Not all inventoried wells are plotted; if multiple wells occupy the same location, only the one whose logs were used to determine the thickness of the stratified deposits (pl. 2) and whose reported yield was used to estimate the potential yield (pl. 3) is shown.

Only 15 percent of the 670 inventoried wells tap surficial material; these contribute 15 percent of the total reported well yield of the basin. Many were dug before 1920 and either lack a pumping test or have estimated yields of less than 1 gallon per minute. (See table 1.)

Of the wells with reported yields, 91 percent yield less than 30 gallons per minute and together represent 63 percent of the total production. Fifty-six percent of the wells with reported yields obtain less than 10 gallons per minute; they account for 19 percent of the basin's total production. (See table 2.)

Only 27 (4 percent) of the 670 inventoried wells tap stratified deposits. This, and the fact that the yields of 67 percent of the wells that tap surficial deposits are unreported, greatly limits the ability to estimate the size and potential yield of the aquifers in this part of the county.

Other information, such as well logs and production data, is available from the U.S. Geological Survey's computerized ground-water data base. Data are available on request from the U.S. Geological Survey office in Albany, N.Y.

Table 1.--Number of wells that tap surficial material and total yield to wells in Croton River basin in Putnam County, N.Y., by yield range.

Yield range (gal/min)	Well data: Number of wells	Well data: Percentage of total wells	Yield data: Total (gal/min)	Yield data: Percentage total of yield
Unreported	66	66.7	--	--
0 - 9	10	10.1	44	4.2
10 - 19	11	11.1	113	10.6
20 - 29	1	1.0	85	8.0
30 - 39	2	2.0	60	5.6
40 - 49	3	3.0	136	12.9
>50	3	3.0	620	58.7
Total	99		Total 1,057	

Table 2.--Number of wells and total yield to wells in Croton River basin in Putnam County, N.Y., by yield range.

Yield range (gal/min)	Well data: Number of wells	Well data: Percentage of total wells	Yield data: Total (gal/min)	Yield data: Percentage total of yield
Unreported	145	21.7	--	--
0 - 9	296	44.1	1,405	21.5
10 - 19	130	19.4	1,592	24.4
20 - 29	55	8.2	1,194	18.3
30 - 39	23	3.4	718	11.0
40 - 49	8	1.2	336	5.2
50 - 59	7	1.1	350	5.4
60 - 69	2	0.3	120	1.8
70 - 79	1	0.1	70	1.1
80 - 89	1	0.1	80	1.2
90 - 99	0	0.0	0	0.0
> 100	2	0.3	660	10.1
Total	670		Total 6,525	

REFERENCE CITED

Grossman, I. G., 1957, The ground-water resources of Putnam County, New York: New York State Water and Power Control Commission Bulletin GW-37, 78 p.

P12 / P38 / 10 — **WELL OR TEST HOLE**--Open circle denotes well or test hole that taps either till or stratified deposit; solid circle denotes well or test hole that penetrates bedrock

P12 — First line is local identification number, letter denotes source of data as explained below

P — U.S. Geological Survey well log for Putnam County
PA — Putnam County well record for Patterson Township
C — Putnam County well record for Carmel Township
K — Putnam County well record for Kent Township
S — Putnam County well record for Southeast Township

1 — Second line is depth to bedrock, in feet; NA = data not available

21 — Third line is depth of well, in feet; NA = data not available

10 — Last line is report well yield, in gallons per minute; NA = data not available

●P5SP — SPRING

P — U.S. Geological Survey spring record

5 — Local identification number

SP — Spring

1 — Reported yield, in gallons per minute; NA = data not available

BASIN BOUNDARY

Base from New York State Department of Transportation, Brewster, 1973; Croton Falls, 1982; Hopewell Junction, 1973; Lake Carmel, 1973; Mohegan Lake, 1982; Pawling, 1973; Peach Lake, 1982; Poughquag, 1973; and Oscawana Lake, 1973; 1:24,000 scale

CONTOUR INTERVAL 10 AND 20 FEET
DATUM IS MEAN SEA LEVEL

Copies of this map can be purchased from: U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225

THICKNESS AND POTENTIAL WELL YIELD OF THE STRATIFIED DEPOSITS IN THE CROTON RIVER BASIN, PUTNAM COUNTY, NEW YORK

By
Don J. Irwin

Plate 1. Location of Wells and Springs