Results of Specific-Capacity Tests in Kings and Queens Counties, New York, 1919-82

By Anthony Chu

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CONVERSION FACTORS, ABBREVIATIONS AND VERTICAL DATUM

Multiply	By	To Obtain
	Length	
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
	Area	
square mile (mi^2)	2.59	square kilometer
	Flow	
gallons per minute (gal/min)	3.7854	liters per minute
million gallons per day (Mgal/d)	0.04381	cubic meter per second
inch per year (in/yr)	25.40	millimeter per year
	Hydraulic conductivity	
feet per day (ft/d)	0.3048	meters per day
	Transmissivity	
square foot per day (ft^2/d)	0.0929	square meter per day
	Specific capacity	
gallons per minute per foot [(gal/min)/ft]	0.2070	liters per second per meter

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Results of Specific-Capacity Tests in Kings and Queens Counties, New York, 1919-82

By ANTHONY CHU

Abstract

Results of specific-capacity tests from wells in Kings and Queens Counties were compiled for use in developing a ground-water flow model of western Long Island and are presented here. The specific-capacity data represent public-supply wells in Kings and Queens from 1919 through 1982 and are tabulated by county, well number, and date of test. These records include specific-capacity value, pumping rate, maximum drawdown, depth to water prior to pumping, and screened interval.

INTRODUCTION

Kings and Queens Counties, on western Long Island, N.Y. (fig. 1), obtain nearly all water (about 700 Mgal/d; Buxton and Shernoff, 1995) from an upstate reservoir system operated by the City of New York. The possibility that this source will be inadequate during future droughts or other emergencies has prompted consideration of the underlying aquifer system in Kings and Queens Counties as a supplemental source. The aquifers beneath the two counties were pumped extensively through the mid-1940's, when overpumping caused significant drawdowns, and saltwater encroachment necessitated the shutdown of many wells in several areas. All public-supply pumping was stopped in Kings County (Brooklyn) in 1947 to prevent further saltwater encroachment, and several wells were shut down in western Queens County in 1974 for the same reason.

Pumpage for public and industrial water supply during 1904-47 averaged more than 120 Mgal/d (Buxton and others, 1981), and drawdowns in the aquifer system in Kings County in 1936 extended to as much as 35 ft below sea level. Within 3 years after the cessation of pumping in Kings County in 1947, water levels in the water-table aquifer had recovered to within 8 ft of predevelopment levels (Lusczynski, 1952) and have been near predevelopment levels since 1974. Even though a major cone of depression remained in eastern Queens County through the late 1980's, water levels there did not decline as far as they had in Kings County (Buxton and others, 1981). A major difficulty associated with the water-level recovery is that many of the structures and subways that were constructed when water levels were drawn down, particularly in central and east-central Kings County (fig. 1), are now flooded and require constant dewatering.

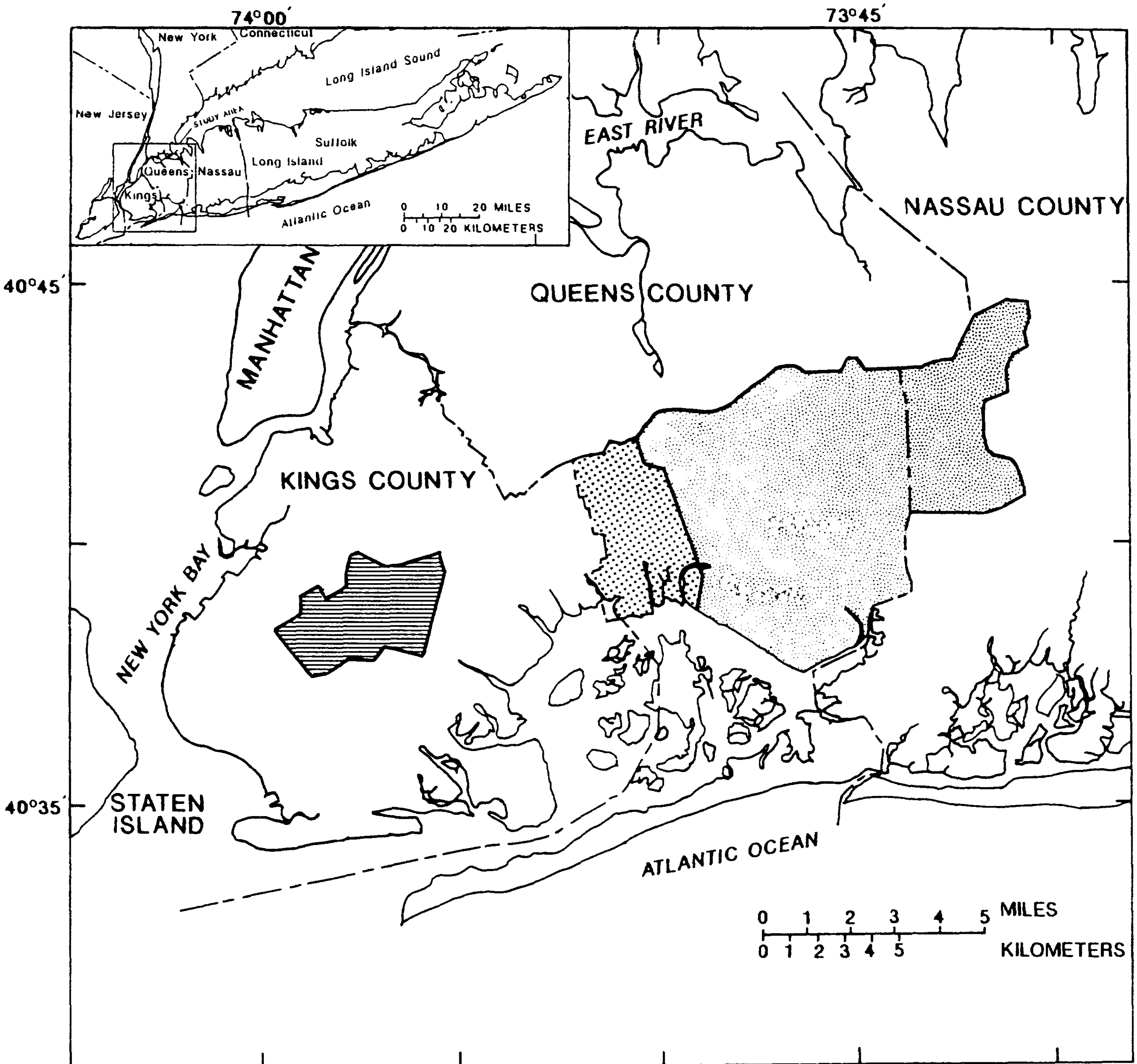
Because the aquifer system has largely recovered from the effects of early pumping, the question has arisen as to whether the system could safely be used as a supplemental water supply under a monitored pumping regime to augment the reservoir supply during water shortages. The major concerns are (1) the extent to which intermittent pumping would induce saltwater encroachment, and (2) whether the pumping would create sufficient flow gradients to induce the migration of contaminants (such as volatile organic compounds and nitrates) from surface sources to depths that provide potable water. The feasibility of using the Kings-Queens aquifer system for water supply will depend on hydraulic characteristics of the aquifers and the chemical quality of the pumped water.

In 1992, the U.S. Geological Survey (USGS), in cooperation with the New York City Department of Environmental Protection, began a 4-year study to develop a ground-water-flow model that can simulate a range of pumping scenarios and indicate what effects they would have on ground-water levels and flow patterns. The results would enable water managers to select optimum rates and locations for pumping to minimize saltwater encroachment and contaminant migration.

Objectives of Study

The principal goals of the study were to:

(1) Define the ground-water quality in the Kings-Queens aquifer system, with emphasis on contami-



Base from U.S.G.S. 1:24000 series: Jamaica, Brooklyn, Central Park, Mount Vernon, Yonkers, Coney Island, Flushing, The Narrows, and Far Rockaway.

EXPLANATION

- Flatbush pumping center franchise area.
- Woodhaven pumping center franchise area.
- Jamaica pumping center franchise area.

Figure 1. Location and pertinent features of study area, Long Island, N.Y. (Modified from Chu and Stumm, 1995, fig. 2.)

nation from volatile organic compounds (VOC's), bacteria, and saltwater.

(2) Establish a hydrologic data-collection network in Kings and Queens Counties to obtain data for use in model calibration and future monitoring of water levels and water quality.

(3) Develop a numerical ground-water-flow model to predict the effects of present and proposed water-supply pumping and dewatering operations on ground-water levels and flow patterns through numerical simulation.

The work entailed four phases:

(1) Reconnaissance of 106 wells that were sampled in Kings, Queens, and Nassau Counties in 1983 (Buxton and Shernoff, 1995). (Only 87 of these 106 wells were available for resampling; the others had either been destroyed, had clogged screens, or were inaccessible).

(2) Sampling the remaining wells for water quality to locate areas with high concentrations of contaminants.

(3) Installing 15 wells in three aquifers to provide hydrogeologic information, particularly on the location of the saltwater interface (Chu and Stumm, 1995), and to augment the water-level network.

(4) Creating a Geographic Information System (GIS) database for use in the development of the ground-water-flow model. The data files consist of well information that includes screen depth, aquifer, water levels, water chemistry, hydrogeologic framework of each aquifer and confining unit, pumpage, and specific capacity.

This investigation entailed collecting and compiling specific-capacity data from USGS records and from previous studies (Leggette & Brashears, 1944; Roberts and Jaster, 1947).

Purpose and Scope

This report presents the specific-capacity data used to calculate hydraulic conductivities for the model. The data pertain to wells screened in the upper glacial, Jameco, Magothy, and Lloyd aquifers in Kings and Queens Counties. The report also briefly describes the physical and hydrogeologic characteristics of the study area and explains the methods used to select aquifer-test records. Results of specific-capacity tests in Kings and Queens during 1919-82 are given in table 1 (at end of report). The table is arranged by county, well number, and date.

STUDY AREA

The study area encompasses Kings and Queens Counties in the western part of Long Island and has a total area of about 189 mi^2 (fig. 1). This area is underlain by four major aquifers—the upper glacial, Magothy, Jameco, and Lloyd (fig. 2).

Physical Setting

The study area is bounded on the south by the Atlantic Ocean, on the east by Nassau County, and on the north and west by the East River and New York Bay (fig. 1); it includes bays, lagoons, islands, and barrier beaches along the southern shore. Precipitation, the sole source of naturally occurring freshwater on Long Island, ranges from 40 to 50 in/yr (Miller and Frederick, 1969). Altitudes range from 360 ft above sea level on morainal deposits, to sea level at the coast. Many streams, and much of the low-lying swamp and marsh areas, were filled in as the area became urbanized.

Aquifer Characteristics

The principal aquifers in the study area are the upper glacial (water table), Jameco, Magothy, and Lloyd. This section briefly describes their geologic and hydraulic characteristics and cites the main references.

Upper Glacial (Water-Table) Aquifer

Pleistocene glaciation covered Long Island with a mantle of till, outwash, and glaciolacustrine deposits that form the upper glacial aquifer (fig. 2). Till, a poorly sorted mixture of clay, sand, gravel, and boulders, forms the moraines along northern Long Island and is poorly permeable. Outwash overlies the central and southern part of Long Island and consists of fine to coarse sands and gravels that are moderately to highly permeable. Glaciolacustrine deposits of clay, silt, sand, and gravel are found in central and eastern Long Island, and marine clay deposits are found along the southern shore of Long Island. These deposits are poorly permeable but contain thin local lenses of sand and gravel that are moderately permeable.

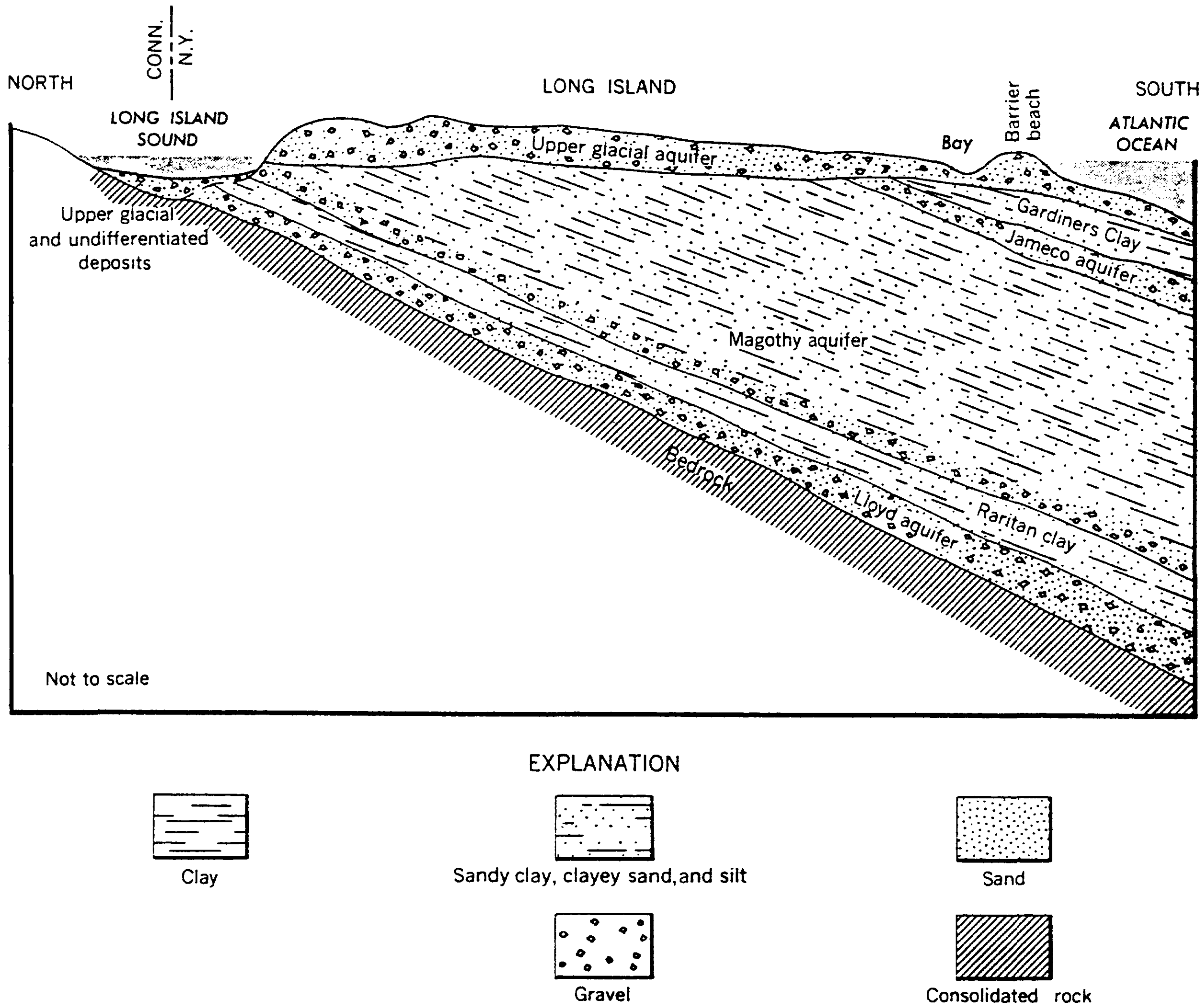


Figure 2. Generalized cross section showing relative positions of aquifers, Long Island, N.Y. (From Franke and McClymonds, 1972, fig. 8.)

The average horizontal hydraulic conductivity of the Pleistocene deposits ranges from 75 ft/d for till to 230 ft/d for outwash (Buxton and Modica, 1992). The average transmissivity is 24,100 ft^2/d in Kings County and 16,100 ft^2/d in Queens County (McClymonds and Franke, 1972). The upper glacial aquifer is in hydraulic contact with the Magothy everywhere except along most of the southern shore, where the Gardiners Clay restricts vertical flow to underlying aquifers.

Jameco Aquifer

The Jameco aquifer, a southern-shore glacial stream deposit (fig. 2), lies unconformably beneath the Gardiners Clay in Kings and Queens Counties. The Jameco aquifer consists of coarse to fine sand and gravel and is moderately to highly permeable. The average horizontal hydraulic conductivity has been estimated to be 267 ft/d (Soren, 1971). The average transmissivity is 16,100 ft^2/d in Kings County and 13,400 ft^2/d in Queens County (McClymonds and Franke, 1972).

Magothy Aquifer

The Magothy aquifer, of Cretaceous age extends throughout most of Long Island. It lies unconformably beneath the Pleistocene deposits, mostly the

Jameco aquifer, in the southern half of the study area, but is absent throughout most of Kings County. The Magothy consists of alternating beds of clay, silt, sand, and gravel. The average horizontal hydraulic conductivity of the Magothy aquifer has been estimated to be 50 ft/d (Franke and Cohen, 1972). The average transmissivity of this aquifer, where present in Kings County is 11,400 ft^2/d and is 10,700 ft^2/d in Queens County (McClymonds and Franke, 1972). The Magothy is underlain unconformably by the Raritan confining unit (hereinafter called the Raritan clay), which restricts vertical flow.

Lloyd Aquifer

The Lloyd aquifer of the Late Cretaceous-aged Raritan Formation lies conformably beneath the Raritan clay and unconformably upon bedrock throughout most of Long Island. The Lloyd consists of fine to coarse sand and gravel and is poorly to moderately permeable. The average horizontal hydraulic conductivity has been estimated to be 40 ft/d (Franke and Cohen, 1972). The average transmissivity is 4,700 ft^2/d in Kings County and 8,000 ft^2/d in Queens County (McClymonds and Franke, 1972).

METHODS OF DATA COMPILATION

Well-construction, test-duration, and pumping-rate criteria were set to standardize the specific-capacity data (table 1). Compilation procedures consisted of (1) review of previous studies, and (2) establishing criteria for selection of specific-capacity data.

Published Sources

Leggette and others (1937, 1938) compiled a record of wells in Kings and Queens Counties; specific-capacity tests were listed as part of the hydrogeologic data included in these bulletins. Updated compilations were published by Leggette and Brashears (1944), and Roberts and Jaster (1947) for Kings and Queens Counties, respectively.

Criteria for Selection of Specific-Capacity Tests

The historical specific-capacity-test results that were used in the development of the ground-water-flow model represent tests that met or exceeded minimum pumping-duration and yield criteria and well-construction requirements. Specific-capacity tests that ran 8 hours or more with a minimum discharge of 500 gal/min were considered an adequate stress on the aquifer. In addition, a minimum screened interval of 15 ft and a minimum casing diameter of 8 in. were arbitrarily chosen as standards for tests selected for use in determining hydraulic conductivity values for the model. Where a specific-capacity test did not meet the set criteria, the deficient value is listed in the remarks column of table 1.

RESULTS OF SPECIFIC-CAPACITY TESTS

Results of 162 specific-capacity tests conducted at 121 public-supply wells in Kings and Queens Counties for 1919-82 (table 1) include date of test, specific capacity, maximum pumping rate, depth to water (static and pumping), maximum drawdown, and screen elevation.

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Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82
[(gal/min)/ft, gallons per minute per foot; gal/min, gallons per minute; Q, pumping rate of well, in gallons per minute; in., inches; --, data not available; *, Woodhaven well]

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet)		Maximum drawdown (feet)	Screen elevation (feet below top of well casing)		Remarks
				Static	Pumping		Top	Bottom	
A. KINGS COUNTY									
K501	7-20-20	84	1,260	41.0	56.0	15.0	63	103	Higher Q than in second test
K501	3-7-28	93	1,060	47.8	59.2	11.4	63	103	Lower Q than in first test
K502	10-6-21	56	1,300	20.8	44.0	23.2	54	96	Lower Q than in second test
K502	3-28-28	72	1,500	21.0	41.8	20.8	54	96	Higher Q than in first test
K503	4-1-22	50	1,000	57.0	77.0	20.0	57	105	Lower specific capacity than in second test
K503	2-28-28	83	1,000	57.0	69.0	12.0	57	105	Higher specific capacity than in first test
K504	10-17-22	108	1,300	28.0	40.0	12.0	65	108	
K505	6-24-23	44	1,550	21.0	56.0	35.0	48	92	
K506	6-1-23	55	1,000	24.0	42.0	18.0	52	95	Lower Q than in second test
K506	7-12-28	65	1,050	34.8	51.0	16.2	52	95	Higher Q than in first test
K507	1-1-25	68	1,161	31.0	48.0	17.0	48	92	
K507	7-7-28	71	1,020	35.1	49.5	14.4	48	92	
K508	1-6-24	76	1,250	48.5	65.0	16.5	73	116	Higher Q than in second test
K508	7-7-28	88	1,000	54.3	65.6	11.3	73	116	Lower Q than in first test
K509	6-30-24	54	1,300	22.0	46.0	24.0	53	97	
K510	8-14-24	65	1,100	60.0	77.0	17.0	68	111	Higher Q than in second test
K510	8-20-28	120	1,020	63.3	71.8	8.5	68	111	Lower Q than in first test
K511	3-28-25	62	1,050	23.0	40.0	17.0	53	92	Lower Q than in second test (steam station)
K511	3-20-28	100	1,450	16.0	30.5	14.5	53	92	Higher Q than in first test (steam station)
K512	5-29-25	66	1,185	45.0	63.0	18.0	58	101	Higher Q than in second test
K512	8-7-28	70	1,065	50.8	66.0	15.2	58	101	Lower Q than in first test
K513	7-7-28	64	1,020	52.8	68.5	15.7	55	92	Higher Q than in second test
K513	11-14-35	70	1,000	50.0	64.2	14.2	55	92	Lower Q than in first test
K514	3-16-26	94	1,272	26.5	40.0	13.5	48	90	Higher Q than in second test
K514	7-7-28	57	940	28.0	44.4	16.4	48	90	Lower Q than in first test
K515	7-19-26	28	1,116	19.0	58.7	39.7	206	341	Two screens (206-216, 302-341 feet)
K516	4-30-26	119	830	38.5	45.5	7.0	58	101	Lower Q than in second test
K516	8-19-26	130	1,000	42.3	50.0	7.7	58	101	Higher Q than in first test

Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82--continued

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet) Static	Depth to water (feet) Pumping	Maximum drawdown (feet)	Screen elevation (feet below top of well casing) Top	Screen elevation (feet below top of well casing) Bottom	Remarks
K517	1-29-27	64	900	81.0	95.0	14.0	247	290	Higher Q than in second test
K517	8-13-27	60	800	72.9	86.2	13.3	247	290	Lower Q than in first test
K518	2-1-27	13	867	15.3	81.7	66.4	300	315	Screen less than 15 feet; actual screen length is 14.7 ft
K518	3-20-28	14	850	13.8	74.5	60.7	300	315	Screen less than 15 feet; actual screen length is 14.7 ft
K519	5-19-29	106	1,800	32.0	49.0	17.0	196	239	Higher Q than in second test
K519	4-8-32	119	1,333	45.7	56.9	11.2	196	239	Lower Q than in first test
K520	12-10-29	133	1,800	45.5	59.0	13.5	253	295	Lower Q than in second test
K520	3-10-32	137	1,900	51.4	65.2	13.8	253	295	Higher Q than in first test
K521	10-20-29	123	2,400	35.5	55.0	19.5	370	418	Higher Q than in second test
K521	3-22-32	140	2,150	36.2	51.5	15.3	370	418	Lower Q than in first test
K522	9-6-30	176	2,200	55.0	67.5	12.5	194	293	Two screens (194-244, 273-293 feet)
K522	3-23-32	174	1,900	58.2	69.1	10.9	194	293	Two screens (194-244, 273-293 feet)
K523	4-7-30	172	2,000	46.8	58.4	11.6	202	268	Lower Q than in second test
K523	5-6-32	157	2,055	51.2	64.3	13.1	202	268	Higher Q than in first test
K524	12-05-30	122	2,200	48.6	66.6	18.0	227	287	
K525	4-6-31	184	2,200	47.1	58.6	11.5	260	300	Higher Q than in second test
K525	4-9-32	225	1,180	48.4	53.7	5.3	260	300	Lower Q than in first test
K526	3-19-31	98	2,200	95.0	117.4	22.4	303	358	
K527	5-31-34	38	870	61.3	84.3	23.0	83	134	
K527	--	37	600	61.3	77.3	16.0	83	134	
K528	--	86	2,180	77.0	102.3	25.3	253	303	Higher Q than in second test
K528	--	91	1,540	77.0	94.0	17.0	253	303	Lower Q than in first test
K529	--	36	893	69.0	93.9	24.9	100	145	First test
K529	--	36	600	69.0	85.7	16.7	100	145	Second test
K 530	--	107	1,500	43.0	57.0	14.0	95	145	First test
K530	--	107	1,900	43.0	60.8	17.8	95	145	Second test
K531	12-30-36	118	2,255	103.0	122.0	19.0	300	360	
K1329	9-25-39	33	700	68.5	89.5	21.0	122	162	Test assumed to last 8 hours
K1331	12-28-42	88	790	69.0	78.0	9.0	105	145	
K1508	12-28-45	38	740	45.4	64.8	19.4	76	121	Specific-capacity test was only 6 hours
K1517	5-25-46	31	610	8.2	28.2	20.0	41	83	

Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82--continued

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet)		Maximum drawdown (feet)	Screen elevation (feet below top of well casing)		Remarks
				Static	Pumping		Top	Bottom	
B. QUEENS COUNTY									
Q 301	7-28-19	31	1,322	45	87	42	58	102	
Q 302	1-20-21	81	1,215	31	46	15	43	92	
Q 303	4-24-22	56	1,300	12	35	23	48	92	
Q 304	3-13-23	30	1,000	3	36	33	43	80	
Q 305	7-31-23	55	1,200	24	46	22	43	87	
Q 306	9-25-23	40	1,240	7	38	31	38	68	
Q 307	8-25-23	36	1,200	30.3	64.0	33.7	53	97	
Q 308	9-10-23	75	1,200	48	64	16	62	102	
Q 310	8-20-24	37	1,200	15.8	49.0	33.2	58	101	Deepened 11-19-88 to 170 feet
Q 311	9-22-24	63	1,200	25	44	19	202	260	
Q 312	3-9-25	28	1,200	6.5	50.0	43.5	216	276	
Q 313	4-6-25	109	1,200	58.0	69.0	11.0	63	106	
Q 314	7-2-25	58	1,022	32.0	49.5	17.5	244	304	
Q 317	6-6-29	35	1,300	60	97	37	487	555	Two screens; screened 490-550 feet as of 3-29-55
Q 319	5-14-30	22	551	98	123	25	120	140	New screen 11-14-52—129-144 feet
Q 321	9-24-31	37	860	105	128	23	130	145	New 12-in. screen 8-8-84—286-335 feet
Q 322	6-16-31	25	960	67	105	38	106	126	
Q 322	2-3-32	26	1,020	71	110	39	106	126	
Q 323	8-2-33	52	1,250	29	53	24	74	98	
Q 324	8-16-34	38	800	26	47	21	45	65	
Q 354*	3-24-25	113	1.555	34.0	47.7	13.7	58	101	
Q 354*	--	127	1,650	48	61	13	58	101	Specific-capacity test was only 4.5 hours
Q 355*	2-15-26	139	1,386	39	49	10	68	113	
Q 557	9-15-26	30	1,020	38.0	72.4	34.4	166	196	
Q 558	5-31-30	50	1,200	27	51	24	125	155	
Q 559	7-22-26	56	1,250	15.6	38.0	22.4	174	213	Abandoned June 1952
Q 560	12-5-25	61	1,242	10.0	30.4	20.4	44	73	New 18-16 in. liner In 1934
Q 561	12-5-25	70	1,204	9.3	26.6	17.3	56	85	New 18-16 in. liner In 1934
Q 562	8-14-35	49	1,825	43	80	37	499	589	New screen 1972—530-600 feet
Q 563	10-7-30	8	517	30.5	98.0	67.5	111	131	Specific capacity was questionable

Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82--continued

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet)		Maximum drawdown (feet)	Screen elevation (feet below top of well casing)		Remarks
				Static	Pumping		Top	Bottom	
Q 564	6-16-31	48	1,150	38	62	24	241	282	
Q 564	1-25-44	37	1,050	41	69	28	241	291	Specific-capacity test was too short
Q 565	7-10-28	26	1,086	50.0	91.8	41.8	482	547	Two screens
Q 565	6-16-44	26	1,025	82	121	39	482	547	Two screens; (see replacement Q 3069)
Q 566	6-6-29	8	600	54	134	80	262	281	Diameter reduces to 10 inches
Q 567	6-18-30	22	1,050	121	169	48	544	621	Two screens/diameter reduces to 8 inches
Q 567	5-3-46	20	1,000	140	189	49	538	618	Diameter reduces to 8 inches
Q 568	3-13-33	44	1,225	29	57	28	301	362	Q 569-571 at steam station #2 until 1934
Q 568	2-19-47	60	1,100	34.0	52.3	18.3	301	362	Q-569
Q 1058	6-23-39	46	1,100	16	40	24	40	60	Well at steam station #2 prior to 1935?
Q1071	1-29-40	29	2,210	--	75	75	771	836	Flowing well
Q1378*	4-20-45	178	1,610	38	47	9	77	189	Two screens at 77-121 and 169-189 feet
Q1379*	8-27-45	132	1,450	78.5	89.5	11.0	108	192	Two screens at 108-132 and 156-192 feet
Q 1450	3-29-48	19	1,194	31	95	64	95	115	Q 1309 test well at steam station #1
Q 1476*	7-7-48	43	1,080	27.8	53.2	25.4	102	138	Specific-capacity test was only 7 hours
Q 1476*	2-26-71	31	656	35.0	56.3	21.3	102	138	Specific-capacity test was only 1.5 hours
Q 1484*	7-10-48	33	914	48.3	75.9	27.6	96	144	
Q 1493*	5-27-67	31	737	53.3	77.0	23.7	93	134	
Q 1528*	11-2-49	58	810	72	86	14	105	175	Two screens at 105-135 and 155-175 feet
Q 1528*	6-19-67	58	810	69.5	83.5	14.0	105	175	Two screens at 105-135 and 155-175 feet
Q 1534	5-2-50	53	1,280	40	64	24	78	98	Q 1535—abandoned in 1950
Q 1600	12-19-50	17	1,150	68	134	66	270	290	
Q 1629	4-3-50	16	1,150	40	111	71	236	276	
Q 1747	1-24-51	23	1,155	165	216	51	235	260	
Q 1811	7-2-52	33	1,020	42	73	31	95	115	Deepened in 1968
Q 1811	4-30-68	49	1,176	57	81	24	118	138	Specific-capacity test after being deepened in 1968
Q 1815	7-7-52	17	1,200	33	102	69	240	280	
Q 1839	2-22-52	23	844	23	59	36	65	85	
Q 1840	3-19-52	36	1,245	40	75	35	85	105	
Q 1843	4-14-52	34	990	29	58	29	65	85	

Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82--continued

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet)		Maximum drawdown (feet)	Screen elevation (feet below top of well casing)		Remarks
				Static	Pumping		Top	Bottom	
Q 1957	7-13-53	48	1,600	36	69	33	230	285	Specific-capacity test was only 2 hours
Q 1958	7-30-53	31	1,600	25	76	51	380	432	Specific-capacity test was only 6 hours
Q 1997	1-27-54	47	1,400	37	67	30	82	112	
Q 2000	2-25-53	81	1,455	48	66	18	81	102	Specific-capacity test was only 1 hour
Q 2001	3-16-54	36	1,200	97	130	33	167	207	Specific-capacity test was only 3 hours
Q 2006	3-4-54	46	1,200	68	94	26	100	120	
Q 2026	10-21-54	28	1,250	22	67	45	397	431	Specific-capacity test was only 4 hours
Q 2027	5-13-54	38	1,284	29	63	34	65	85	
Q 2028	5-25-54	28	1,421	30	81	51	245	285	
Q 2028	5-13-69	27	1,400	46	97	51	245	285	Specific-capacity test was only 3 hours
Q 2137	5-3-55	31	1,000	115	147	32	210	250	
Q 2138	2-1-55	52	1,470	61	89	28	103	123	
Q 2188	1-5-56	24	1,135	53	101	48	214	254	
Q 2189	5-18-56	24	1,350	47	103	56	106	126	
Q 2243	3-4-57	48	1,400	28	57	29	86	106	Specific-capacity test was only 4 hours
Q 2275	12-20-57	38	1,400	36	73	37	85	105	
Q 2276	12-18-57	35	1,400	35	75	40	305	345	
Q 2299	11-20-58	50	1,400	44	72	28	100	120	
Q 2300	11-17-58	48	1,400	44	73	29	240	280	
Q 2321	10-19-60	73	1,454	51	71	20	110	130	
Q 2332	3-11-60	19	1,245	70	136	66	212	242	
Q 2332	7-6-60	19	1,210	57.7	123.0	65.3	212	242	
Q 2343	12-22-60	31	1,471	51	99	48	190	230	
Q 2362	7-17-62	32	895	60	88	28	220	287	Three screens; test was only 6.5 hours
Q 2363	7-16-62	15	943	41	102	61	120	130	Short screen (only 10 feet)
Q 2373	7-18-62	27	1,001	54.5	91.0	36.5	143	158	Short screen (only 10 feet)
Q 2374	9-26-61	12	1,392	62.0	178.5	116.5	219	254	
Q 2374	7-19-62	12	1,001	46	133	87	219	254	
Q 2408	4-24-63	23	1,266	61	117	56	126	146	
Q 2409	3-11-63	18	1,266	63	133	70	216	256	

Table 1. Results of specific-capacity tests in Kings and Queens Counties, N.Y., 1919-82--continued

Well number	Date	Specific capacity [(gal/min)/ft]	Maximum pumping rate (gal/min)	Depth to water (feet)		Maximum drawdown (feet)	Screen elevation (feet below top of well casing)		Remarks
				Static	Pumping		Top	Bottom	
Q 2432	11-2-64	45	1,529	57	91	34	240	280	Higher Q than in second test
Q 2432	7-1-65	40	1,250	56	87	31	240	280	Lower Q than in first test
Q 2435	12-4-64	27	1,543	149	206	57	310	350	Higher Q than in second test
Q 2435	8-11-65	26	1,200	144	191	47	310	350	Lower Q than in first test
Q 2442	10-29-65	45	1,200	38.5	65.0	26.5	93	103	Short screen (only 10 feet)
Q 2442	2-1-65	43	302	44	51	7	93	103	Short screen (only 10 feet)/ low Q rate
Q 2443	1-25-65	28	310	47	58	11	320	360	Lower Q than in second test
Q 2443	11-19-65	25	1,225	39	88	49	320	360	
Q 2955	12-12-67	27	1,525	17.3	73.1	55.8	405	445	Lower Q than in second test
Q 2955	1-9-67	28	1,753	19	82	63	405	445	Higher Q than in first test
Q 3014	7-14-71	11	1,001	116	204	88	269	319	Higher Q than in second test
Q 3014	12-18-72	12	845	107	178	71	269	319	Specific-capacity test was 7.5 hours
Q 3156	10-7-82	68	1,534	40.0	62.5	22.5	250	300	Test assumed to last 8 hours