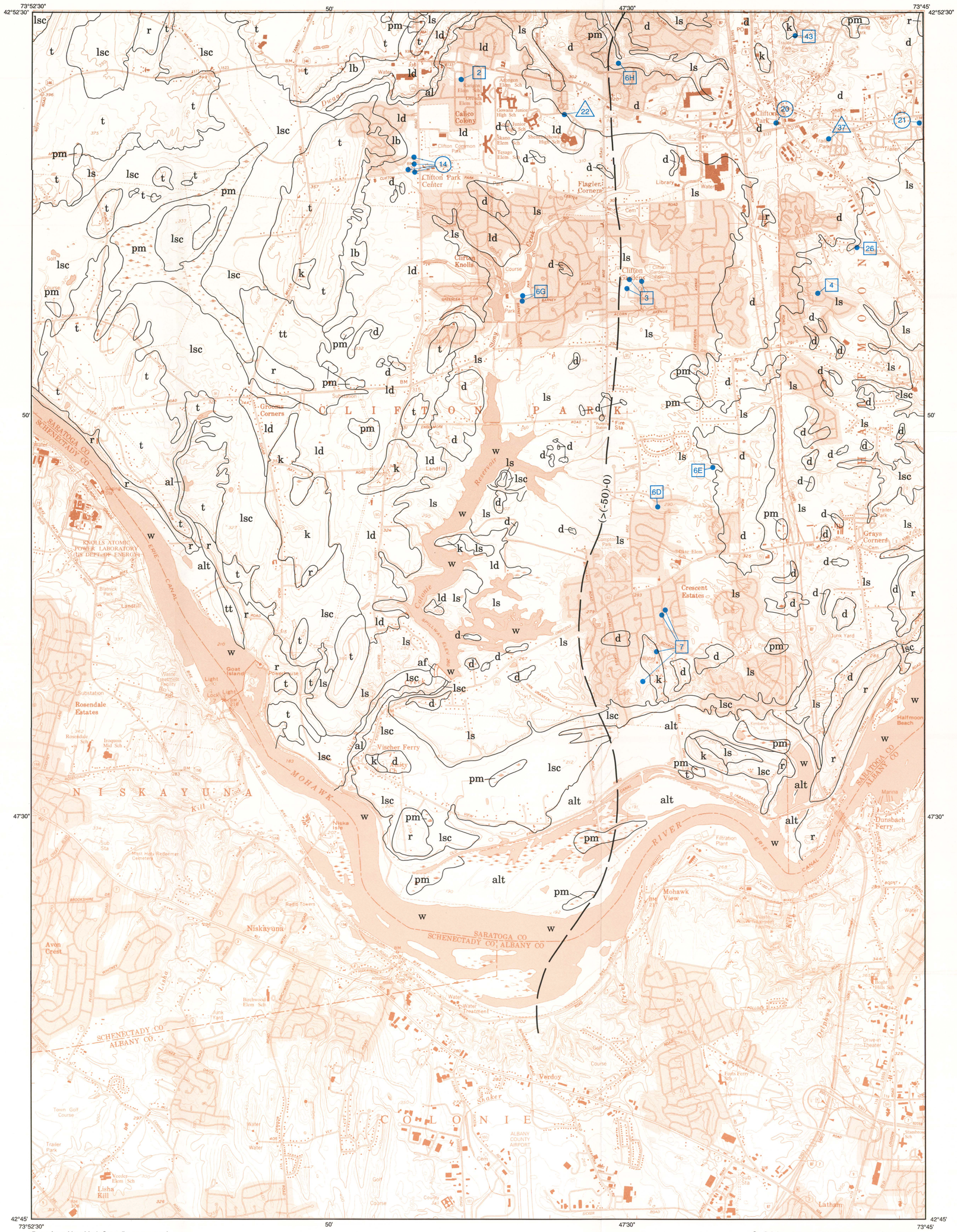
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
SARATOGA COUNTY ENVIRONMENTAL MANAGEMENT COUNCIL

WATER-RESOURCES INVESTIGATIONS REPORT 93-4029
Surficial Geology, Bedrock Channel locations, and Pumpage Facilities—PLATE 7
Paul M. Heisig, 1992, Generalized stratigraphy, surficial geology, types of aquifers, and 1988-89 ground-water pumpage in eastern Saratoga County, New York



Base from New York State Department of Transportation, Niskayuna, N.Y., 1974, 1:24,000

SCALE 1 : 24,000
0 .5 1 MILE
0 .5 1 KILOMETER
CONTOUR INTERVAL 10 FEET
DATUM IS SEA LEVEL

Surficial geology by D.H. Cadwell and R.J. Dineen 1980-88; Bedrock geology by R.J. Dineen, 1957-88, New York State Geological Survey - New York State Museum

EXPLANATION

- YEAR-ROUND PUMPING SITE

Average Pumpage (in gallons per day)

- 37 — 10,000 to less than 20,000. Number within symbol refers to supplier listed in table 3
- 21 — 20,000 to less than 50,000. Number within symbol refers to supplier listed in table 3
- 43 — 50,000 or greater. Number within symbol refers to supplier listed in table 3

—(>(50)-0)— — THALWEG (VALLEY AXIS) OF BURIED BEDROCK CHANNEL —Range of numbers indicates approximate altitude of thalweg, in feet above or below sea level. Order of numbers reflects trend in altitude. Location inferred. <, less than; >, greater than

——— — — CONTACT —between adjacent surface deposits. Approximately located, dashed where inferred

HYDROGEOLOGIC CHARACTERISTICS OF SURFICIAL DEPOSITS

Deposits of High Permeability

	Symbol	Description
HOLOCENE	al	FLOOD-PLAIN ALLUVIUM—recent deposits derived from frequent flooding within a stream valley; generally fine sand and gravel, although sediments commonly reflect the character of the deposits that the stream traverses. Up to 10 ft thick. Alluvium associated with large streams and rivers has potential for water supply through induced infiltration of surface water into the aquifer during pumping periods. Alluvium is generally not a major source of water along small stream valleys, where its thickness or extent is limited.
	alt	ALLUVIAL TERRACE—deposits of fluvial sand and gravel with laterally continuous lenses of silt (flood-plain alluvium) deposited at a level higher than the recent flood plain. Up to 50 ft thick. These deposits are generally permeable but commonly unsaturated.
	d	DUNES—fine to medium sand, well sorted, stratified; generally reworked lacustrine sand and deltaic deposits. Up to 50 ft thick. Permeable but commonly unsaturated.
PLEISTOCENE	k	KAME DEPOSIT—gravel and(or) sand, lateral variability in sorting, coarseness, thickness; deposited adjacent to ice. Includes kames, eskers, kame terraces, kame deltas; up to 100 ft thick. Ice-contact (kame) deposits in preglacial bedrock channels, such as the Colonie channel (Simpson, 1949) overlain by lacustrine silt and clay form a discontinuous, confined aquifer of variable thickness (up to about 100 ft) (Dineen and Hanson, 1983; Reynolds, 1985; Dunn Geoscience, 1981). This type of aquifer represents an important water source for several developments in the Town of Clifton Park (Dunn Geoscience, 1981; Reynolds, 1985). Well yields as high as 800 gal/min have been reported (Dunn Geoscience, 1981), although most supply wells that tap the confined aquifer yield far less as a result of well design, limited aquifer extent and permeability, or interference from other production wells.
	lb	BEACH SAND AND GRAVEL—well-sorted sand and gravel deposited as beaches, associated with large glacial lakes. Limited in areal extent and thickness; generally unsaturated.
	ld	LACUSTRINE DELTA—gravel and sand, stratified, generally well sorted, deposited at former lakeshore. Up to 120 ft thick. Ground water from lacustrine delta and lacustrine sand deposits west of Saratoga Springs supplies several housing tracts and parts of the city of Saratoga Springs and the village of Ballston Spa. The largest withdrawals from these deposits are at the Geyser Crest well field, where the six wells are screened within 60 ft of land surface and where the maximum individual well yield is 600 to 700 gal/min (Dunn Geoscience, 1988). The principal source of water used at a government reactor-research installation at West Milton is a confined aquifer composed of lacustrine deltaic sand. Studies of this aquifer suggest that yields of 800 gal/min can be obtained from a single well (Mack, 1963).
	ls	LACUSTRINE SAND—sand deposits associated with large glacial lakes, generally a nearshore deposit or near a sand source; well sorted, stratified, generally quartz sand; up to 95 ft thick. Hydraulic properties of thin lacustrine sand deposits at the Saratoga National Historical Park (fig. 1) were investigated by Heath and Tannenbaum (1963), who estimated, from aquifer-test data, a horizontal hydraulic conductivity of about 94 ft/d and a storage coefficient of 0.16.

Deposits of Low Permeability

	Symbol	Description
HOLOCENE	pm	SWAMP DEPOSITS—peat, muck, organic silt and sand in poorly drained areas, generally 0 to 20 ft thick. Yields little water.
PLEISTOCENE	lsc	LACUSTRINE SILT AND CLAY—generally a laminated silt and clay deposited in proglacial lakes; maximum thickness is 275 ft in one part of the Colonie bedrock channel (Reynolds, 1985). Typically yields little water. Generally is a confining unit where underlain by permeable deposits (buried-valley aquifers).
	t	TILL—lodgment or ablation till of variable thickness (up to 250 ft) and texture (clay, silty clay, bouldery clay). Can yield small amounts of water to large-diameter (2 ft or greater) dug wells; the water is derived primarily from localized sand lenses within the till.
	tt	THIN TILL—variable mantle of rock debris and till; sporadic bedrock outcrops; up to 10 ft thick. Yields little water.

Other Symbols

af	ARTIFICIAL FILL
r	BEDROCK—predominantly shale, but sandstone, carbonates, and crystalline rock are present in the northwestern part of the study area. Permeability is variable.
w	WATER

SURFICIAL GEOLOGY AND LOCATIONS OF BURIED BEDROCK CHANNELS AND GROUND-WATER PUMPING FACILITIES, SARATOGA COUNTY, NEW YORK

By
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PLATE 7.--NISKAYUNA QUADRANGLE