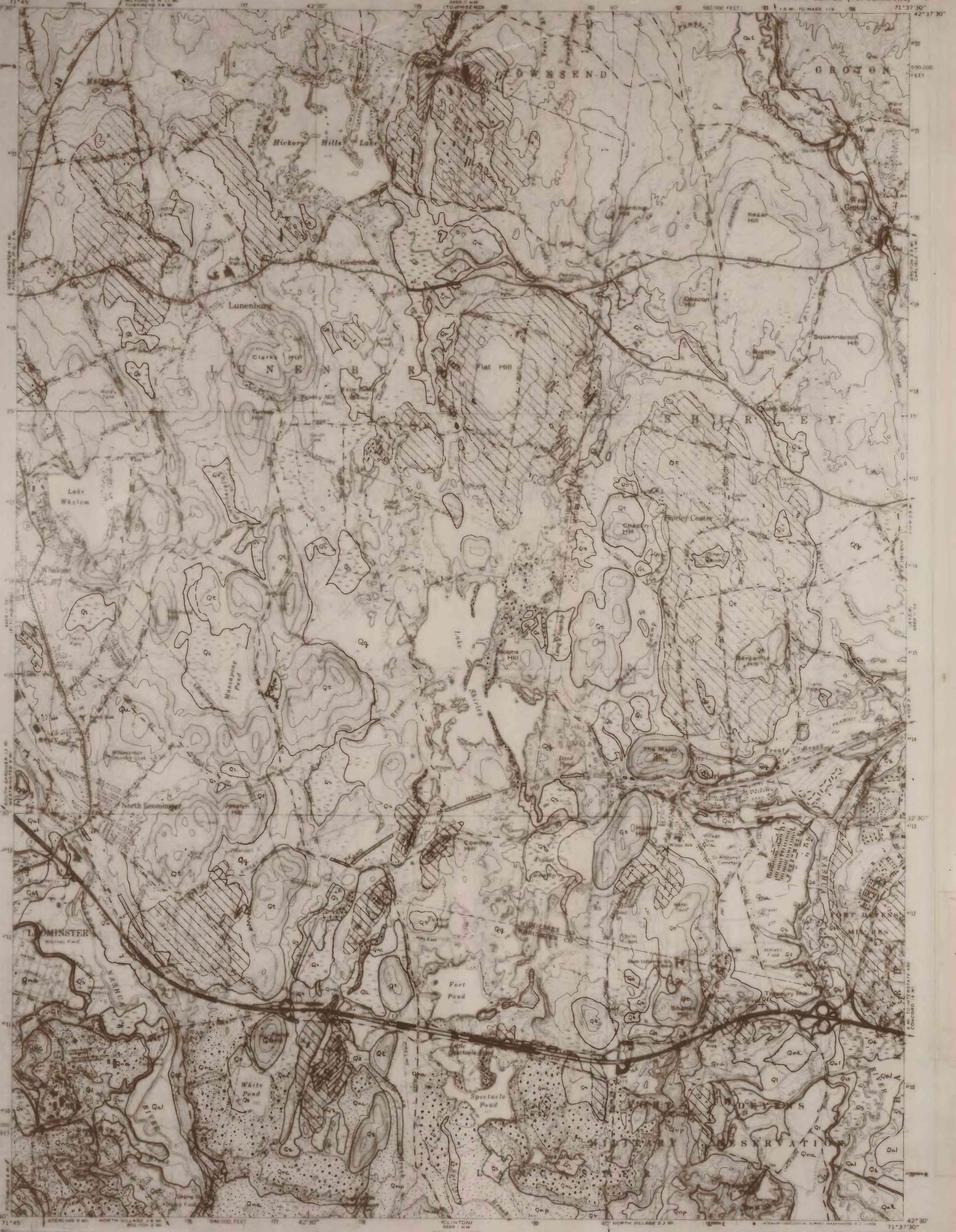
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

SHIRLEY QUADRANGLE
MASSACHUSETTS
7.5 MINUTE SERIES (TOPOGRAPHIC)



Base map by U.S. Geological Survey, 1965.
10,000-foot grid based on Massachusetts coordinate system, mainland zone.
1000-meter Universal Transverse Mercator grid ties, zone 19.

Geology mapped in 1973 by W. D. Schneider, R. W. Allmendinger, E. L. Bendetto, S. L. Russell, and P. C. Weigel under the direction of E. L. Bendetto.

SCALE 1:24000

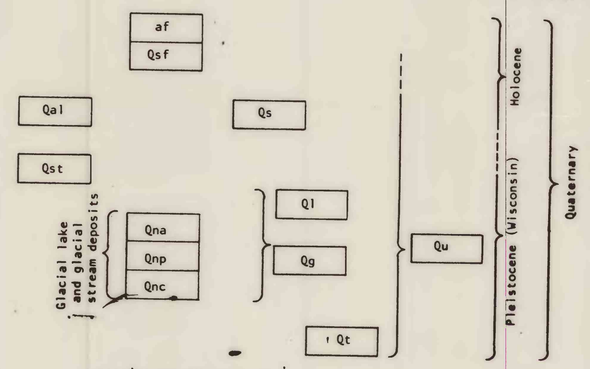
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

INTERIM SURFICIAL GEOLOGIC MAP OF THE SHIRLEY QUADRANGLE, MASSACHUSETTS

By

R.W. Allmendinger and W.D. Schneider

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

af, sf — Artificial fill

Sanitary land fill

Qal — ALLUVIUM - Light-gray fine sand and silt with minor gravel, in flood plains along present streams and rivers. Extent of alluvium indicates areas of potential flooding

Qs — SWAMP DEPOSITS - Muck, peat, silt and sand

Qst — STREAM-TERRACE DEPOSITS - Sand with local gravel generally on terraces cut into former glacial-lake deposits. Formed in part during late glacial time. Mostly less than 10 ft. thick

Qna, Qnp, Qnc — GLACIAL LAKE NASHUA DEPOSITS
Coarse gravel and sand in kame deltas and associated fluvial sediments, and sand with minor amounts of silt in lake-bottom sediments. Deposited in or graded to successively lower levels of glacial Lake Nashua. Deposits laid down in contract with or beyond adjacent ice. Most topset or fluvial beds of deltas range from pebble to cobble gravel and overlie forset beds of sand to pebbly sand. Lake Nashua deposits probably average about 30 ft. thick. Qna, Ayer stage; Qnp, Pin Hill stage; and Qnc, Clinton stage are deposits laid down in lake waters controlled by successively lowered spillways to the east near Ayer and south near Clinton

Ql — GLACIAL LAKE BOTTOM DEPOSITS - Clay, silt, and fine sand.

Qg — UNCORRELATED GLACIAL-LAKE AND STREAM DEPOSITS - Sand and gravel not assigned chronologic position

Qt — TILL - Light- to dark-gray, nonsorted to poorly sorted, noncompact mixture of silt, sand, pebbles, cobbles, and boulders; contains minor amounts of clay-sized particles and some gravel

Qu — UNDIFFERENTIATED DEPOSITS

28 — DIRECTION and dip of delta foreset beds

Melt-water channel

Pebble gravel
Mixed sand and gravel
Predominantly sand
Stippling density shows relative proportion of materials

BEDROCK EXPOSURES

Outcrops

Areas of abundant outcrops; generally spaced too closely to map separately

Areas where cover over bedrock is generally 3 m or less

Planimetry of quarries, 7/15/75

Selected References

Jahns, R. H., 1953, Surficial geology of the Ayer quadrangle, Massachusetts: U. S. Geol. Survey Geol. Quad. Map, GQ-21.
Koteff, Carl, 1966, Surficial geologic map of the Clinton quadrangle, Massachusetts: U. S. Geol. Survey Geol. Quad. Map, GQ-567.
Koteff, Carl and Volckmann, R. P., 1973, Surficial geologic map of the Pepperell quadrangle, Middlesex County, Massachusetts and Hillsborough County, New Hampshire: U. S. Geol. Survey Geol. Quad. Map, GQ-1118.

EXPLANATION FOR THE INTERIM SURFICIAL GEOLOGIC MAP OF THE SHIRLEY QUADRANGLE, MASSACHUSETTS

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