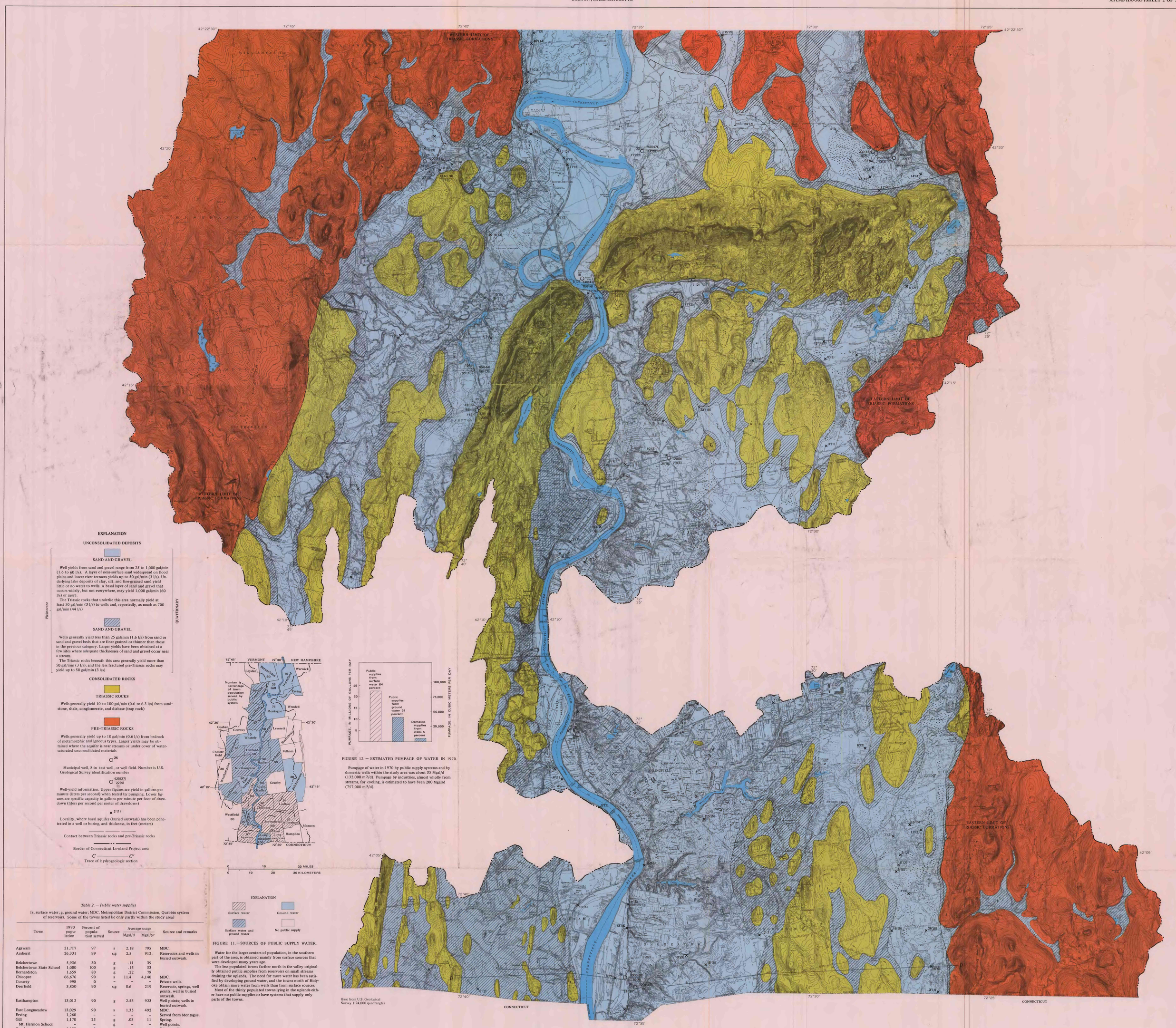
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with
THE MASSACHUSETTS WATER RESOURCES COMMISSION
BOSTON, MASSACHUSETTS

HYDROLOGIC INVESTIGATIONS
ATLAS HA-563 (SHEET 2 OF 2)



EXPLANATION

UNCONSOLIDATED DEPOSITS

SAND AND GRAVEL

Well yields from sand and gravel range from 25 to 1,000 gal/min (1.6 to 60 l/s). A layer of near-surface sand widespread on flood plains and lower river terraces yields up to 50 gal/min (3 l/s). Underlying lake deposits of clay, silt, and fine-grained sand yield little or no water to wells. A basal layer of sand and gravel that occurs widely, but not everywhere, may yield 1,000 gal/min (60 l/s) or more.

The Triassic rocks that underlie this area normally yield at least 50 gal/min (3 l/s) to wells and, reportedly, as much as 700 gal/min (44 l/s)

Pleistocene — QUATERNARY

SAND AND GRAVEL

Wells generally yield less than 25 gal/min (1.6 l/s) from sand or sand and gravel beds that are finer grained or thinner than those in the previous category. Larger yields have been obtained at a few sites where adequate thicknesses of sand and gravel occur near a stream.

The Triassic rocks beneath this area generally yield more than 50 gal/min (3 l/s), and the less fractured pre-Triassic rocks may yield up to 50 gal/min (3 l/s)

CONSOLIDATED ROCKS

TRIASSIC ROCKS

Wells generally yield 10 to 100 gal/min (0.6 to 6.3 l/s) from sandstone, shale, conglomerate, and diabase (trap rock)

PRE-TRIASSIC ROCKS

Wells generally yield up to 10 gal/min (0.6 l/s) from bedrock of metamorphic and igneous types. Larger yields may be obtained where the aquifer is near streams or under cover of water-saturated unconsolidated materials

○25 — Municipal well, 8-in test well, or well field. Number is U.S. Geological Survey identification number

○ 425(27) / 22(4) — Well-yield information. Upper figures are yield in gallons per minute (liters per second) when tested by pumping. Lower figures are specific capacity in gallons per minute per foot of drawdown (liters per second per meter of drawdown)

×3'(1) — Locality, where basal aquifer (buried outwash) has been penetrated in a well or boring, and thickness, in feet (meters)

Contact between Triassic rocks and pre-Triassic rocks

Border of Connecticut Lowland Project area

C — C' Trace of hydrogeologic section

EXPLANATION

Surface water — Ground water

Surface water and ground water — No public supply

FIGURE 11.—SOURCES OF PUBLIC SUPPLY WATER.

Water for the larger centers of population, in the southern part of the area, is obtained mainly from surface sources that were developed many years ago.

The less populated towns farther north in the valley originally obtained public supplies from reservoirs on small streams draining the uplands. The need for more water has been satisfied by developing ground water, and the towns north of Holyoke obtain more water from wells than from surface sources.

Most of the thinly populated towns lying in the uplands either have no public supplies or have systems that supply only parts of the towns.

FIGURE 12.—ESTIMATED PUMPAGE OF WATER IN 1970.

Pumpage of water in 1970 by public supply systems and by domestic wells within the study area was about 35 Mgal/d (132,000 m^3/d). Pumpage by industries, almost wholly from streams, for cooling, is estimated to have been 200 Mgal/d (757,000 m^3/d).

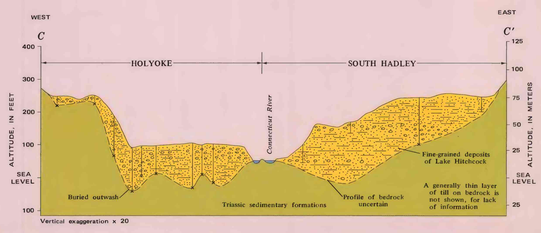
Table 2.—Public water supplies

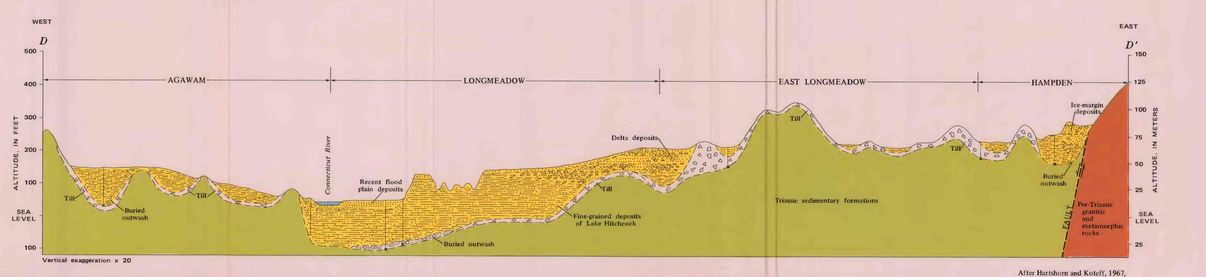
[s, surface water; g, ground water; MDC, Metropolitan District Commission, Quabbin system of reservoirs. Some of the towns listed lie only partly within the study area]

Town	1970 population	Percent of population served	Source	Average usage Mgal/d	Average usage Mgal/yr	Source and remarks
Agawam	21,717	97	s	2.18	795	MDC.
Amherst	26,331	99	s,g	2.5	912.	Reservoirs and wells in buried outwash.
Belchertown	5,936	30	g	.11	39	
Belchertown State School	1,000	100	g	.15	53	
Bernardston	1,659	80	g	.22	79	
Chicopee	66,676	90	s	11.4	4,140	MDC.
Conway	998	0	–	–	–	Private wells.
Deerfield	3,850	90	s,g	0.6	219	Reservoir, springs, well points, well in buried outwash.
Easthampton	13,012	90	g	2.53	923	Well points; wells in buried outwash.
East Longmeadow	13,029	90	s	1.35	492	MDC.
Erving	1,260	–	–	–	–	Served from Montague.
Gill	1,170	25	g	.03	11	Spring.
Mt. Hermon School	–	–	g	–	–	Well points.
Granby	5,473	0	–	–	–	Private wells.
Greenfield	18,116	99	s,g	2.28	831	Reservoirs and wells in buried outwash.
Hadley	3,750	96	s,g	.27	99	Reservoirs and wells in buried outwash.
Hampden	4,572	0	–	–	–	Private wells.
Hatfield	2,825	50	s,g	.21	77	Reservoir and well in buried outwash.
Holyoke	50,112	90	s	–	–	Reservoirs.
Leverett	1,005	0	–	–	–	Private wells.
Longmeadow	15,630	100	s,g	1.68	614	Served from Springfield and well in buried outwash.
Ludlow	17,580	91	s	2.12	775	MDC.
Montague	8,451	75	s,g	.93	338	Ponds and well in buried outwash.
Northampton	29,644	97	s,g	3.69	1,346	Reservoirs and wells in buried outwash.
Northfield	2,631	75	g	–	–	Well in sand and gravel.
Northfield Schools	–	–	s	–	–	Reservoir.
Pelham	937	0	–	–	–	Private wells.
Shutesbury	489	0	–	–	–	Private wells.
South Hadley	17,033	90	s,g	2.13	777	MDC; reservoirs, and well in buried outwash.
Southampton	3,069	40	s,g	.09	33.	Well, and water from Holyoke.
Springfield	163,905	100	s	33.1	12,080	MDC.
Sunderland	2,236	50	s,g	.14	50	Reservoir and well in buried outwash.
Westfield	31,433	85	s,g	.42	152	Reservoir and wells in buried outwash.
Westhampton	793	–	g	–	–	Small supply from a spring.
West Springfield	28,461	90	s,g	3.8	1,389	Wells in buried outwash reservoirs,
Whateley	1,145	10	g	.012	4.4	Wells in pre-Triassic rock.
Wilbraham	11,984	65	s	.75	273	MDC.
Williamsburg	2,342	85	s,g	.15	56	Reservoirs and well in buried outwash.

Base from U.S. Geological Survey 1:24,000 quadrangles

FIGURE 10.—MAP SHOWING AVAILABILITY OF GROUND WATER IN THE SOUTHERN HALF OF THE CONNECTICUT RIVER LOWLANDS.





After Hartshorn and Koteff, 1967, supplemented with data from wells

FIGURE 13.—HYDROGEOLOGIC SECTIONS AT HOLYOKE AND LONGMEADOW.

In the vicinity of Holyoke (section *C*–*C'*) and Longmeadow (section *D*–*D'*) the lowland is underlain by unconsolidated deposits which partly fill a broad trench in Triassic bedrock.

The principal aquifer is buried outwash that occurs widely but not everywhere beneath a blanket of clay, silt, and fine sand.

Smaller amounts of water can be obtained from shallow sand and gravel upon the river flood plain and lower terraces, and also from delta deposits.

The underlying bedrock of Triassic age ordinarily yields at least 50 gal/min (3 l/s) to individual wells and, at places, several times as much.

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

MAP SHOWING AVAILABILITY OF GROUND WATER IN THE CONNECTICUT RIVER LOWLANDS, MASSACHUSETTS SOUTH HALF

By
Eugene H. Walker and William W. Caswell

1977

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