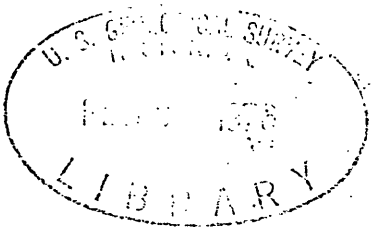

References cited

Pomeroy, J. S., 1975a, Bedrock geologic map of the East Brookfield quadrangle, south-central Massachusetts: U. S. Geol. Survey Open-File Rept. 530, 12 p.

_____ 1975b, Surficial geologic map of the East Brookfield quadrangle, south-central Massachusetts: U. S. Geol. Survey Open-File Rept. 531, 7 p.

The map and accompanying table are mainly intended as a guide for the planner. However, the product will be of use to other people dealing directly or indirectly with the physical characteristics of the terrain in this portion of central Massachusetts. The proximity of the Massachusetts Turnpike and the Sturbridge Interchange and the quadrangle location itself along the Worcester-Springfield corridor are conducive to some degree of moderate growth in the long-range future.

Statements in the table are generalized and should not be construed as being necessarily directly applicable to specific parcels of land. Individual on-site investigations are required to determine pertinent information regarding certain areas. This statement is particularly pertinent to categories such as "depth to bedrock" since subsurface information (well logs, etc.) is very sparse.

The map was compiled based on the bedrock and surficial geologic mapping which was conducted from 1973 to 1975 in cooperation with the Massachusetts Department of Public Works. Observations at over 3000 field locations coordinated with an interpretation of low altitude (large-scale) aerial photographs form the basis of the map. A close examination of the Massachusetts Turnpike cuts and the recently constructed State Route 49 leading from Spencer to Sturbridge was helpful in estimating till thickness in adjacent areas.

Detailed information regarding the bedrock and surficial deposits are available (Pomeroy, 1975a and b). This map is best utilized in conjunction with the preceding maps.

Map showing physical characteristics of the land surface in the East Brookfield quadrangle, south-central Massachusetts

Unit	Class 1	Class 2	Class 3	Class 4
Topographic form	rugged, hilly with steep slopes common; occasional cliffs. Hills commonly oriented N to NNE	moderate to steep slopes, rarely flat surfaces, hilly; in part, drumlin topography (rounded oval to elliptically-shaped hills with smooth tops and slopes) Hills commonly oriented N to NNW, a few are oriented to NNE	hilly (hummocky) with minor relief including glacial landforms such as kames, eskers, and kettles to broad flat areas including glacial landforms such as delta topset and lake beds	lowlands, mostly swamps
Earth materials	metamorphic rocks (gneisses, schists), scant igneous rock, and thin till	silty to clayey cobbly till to less common sandy, cobbly till; silty till is more widespread than clayey till	sand, gravel, minor silt and clay	muck, peat, minor silt and sand
Depth to bedrock	0-15' (rarely over 15')	15'-80' (average range), some drumlins have 100' + till thickness	40'-150' (average); near contact boundary thickness is considerably thinner	variable depending upon thickness of glacial material beneath swamp

Unit	Class 1	Class 2	Class 3	Class 4
Potential sources of construction materials	fair to good for crushed aggregate and rip-rap for most gneisses, poor for sulfidic schist and thin till	generally not suitable, some sandy till has substituted for stratified sand	sand and gravel excellent as aggregate source if not too tainted with rust-colored constituents	none
Foundation conditions	excellent (gneiss) to fair (sulfidic schists); generally favorable in thin till	generally favorable, drainage provisions needed around houses and buildings	excellent to good in sand and gravel, fair to poor in clay and silt	poor
Excavation conditions	very difficult, requires blasting and heavy machinery in rock; less difficult in thin till	variable, moderately difficult in highly compacted till and bouldery till; less difficult in silty to sandy till	generally easy, requires hand tools and light machinery in most places	feasible only if area can be drained first
Drainage conditions	poor to good; surface runoff generally high	internally poor to fair, seepages common on hillsides	well-drained generally except in low-lying areas or/and adjacent to swamps. Gravelly and sandy soils are droughty due to excessive drainage.	poor; saturated with water during most of year

Unit	Class 1	Class 2	Class 3	Class 4
Ground water source	generally small and restricted to crevices in bedrock; thin till would yield little water; restricted to domestic use	yields small water supplies to wells; restricted to domestic use	excellent potential where sand and gravel predominate; presence of iron sulfide-rich material could seriously affect water quality. Water supply source for East Brookfield and Spencer	probably abundant if underlain by sand and gravel, minimal if underlain by bedrock or till
Present land use	forested; limited to scant agricultural and developed land	general farming and orchards; also forested	populated areas, gravel pits, forests, some agriculture	natural state

Unit	Class 1	Class 2	Class 3	Class 4
Slope stability	excellent to good in most bedrock areas; however, intensely rusty weathering sulfidic schist is susceptible to weathering along foliation planes and joint surfaces and rockfalls may result. Furthermore, water saturated biotite-rich horizons are locally susceptible to slaking which promotes slope instability. Thin till unlikely to show major instability problems	dependent upon shear strength and cohesiveness of till material; oversteepened slopes along Podunk Pike (State Hgy. 49) show minor mass movement	excellent to fair on natural slopes; slope movement can occur locally in finer-grained sediments (clay) as along northwest and northeast shoreline of Quacumquasit Pond	stable due to topographic setting

Unit	Class 1	Class 2	Class 3	Class 4
Geologic constraints on sanitary landfill placement	generally poor sites because of excavation problems and pollution risk along fractures in bedrock at surface and beneath thin till	probably favorable in most cases especially where over 30' thick. Best on relatively flat upland areas. Relative impermeability of most till would retard movement of pollutants. Detailed site evaluation necessary before selection is made.	generally unfavorable in sand and gravel deposits due to permeability, contamination to acquifers	totally unsatisfactory

Unit	Class 1	Class 2	Class 3	Class 4
Geologic constraints on septic tank placement	generally unsuitable	conditions in most silty till areas would be such that earth material would be relatively impermeable to septic effluent. Formation of sewage springs or swamps in vicinity of or downhill from installation could result. However, sandy till might be suitable. Detailed site evaluation necessary before selection is made.	permeability of earth material would be conducive to efficient operation of septic tank. However, great care would have to be taken to safeguard groundwater from contamination	totally unsatisfactory