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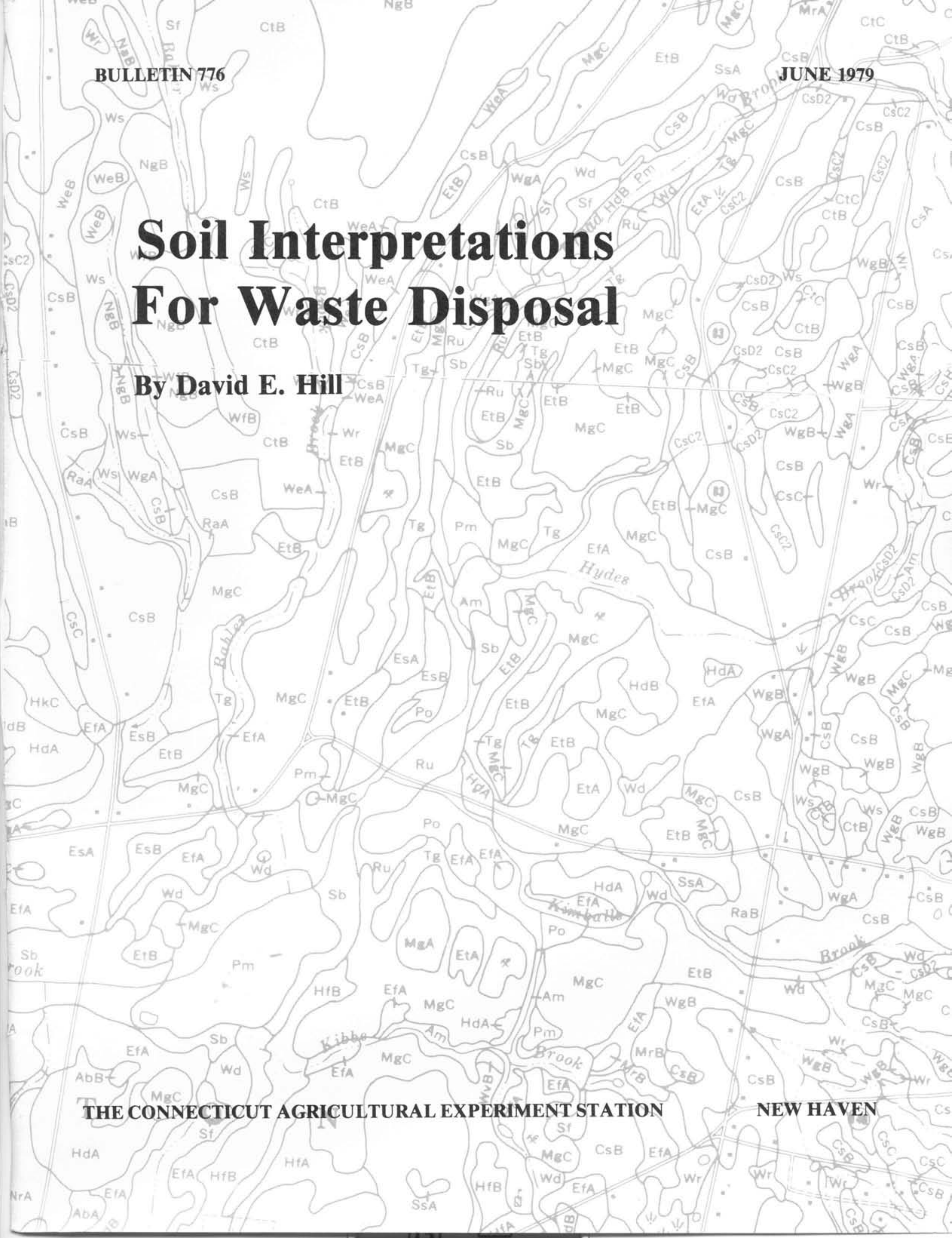

Soil Interpretations For Waste Disposal

By David E. Hill

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION NEW HAVEN

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Throughout Connecticut's history, we have disposed most of our wastes by simply dumping them on the soil. Septic systems have replaced privies and sanitary landfills have replaced dumps, but soil is still the final resting place for most of our wastes. Tertiary sewage treatment plants and elaborate resource recycling proposals are now the byword. However, most wastes will continue to find their way to the soil.

Wastes disposed on soil create conditions ranging from unslightly and malodorous dumps to the unseen but potentially hazardous accumulation in the soil of chemicals of varying toxicity that may enter surface and groundwaters.

One of the most obvious impacts of waste disposal in lakes and streams in Connecticut and in Long Island Sound, which laps its southern shores, is enrichment in phosphorus and nitrogen, elements that nourish algae and weeds. Man's activities have increased the concentration of phosphorus several-fold in some of our lakes during the past third of a century (Norvell and Frink, 1975) with concomitant increases in algae and decreases in clarity. Chemicals and pathogens hazardous to health have generally not been a problem in our surface drinking water supplies in Connecticut. However, new knowledge of what may be hazardous, coupled with the almost certain increase in man's activities in the watersheds of our reservoirs, may dictate elaborate and expensive treatments to insure our continued good health.

Less is known about hazardous materials in groundwater. However, our record of good public health is reassuring. Unlike a lake, the recharge area of a groundwater aquifer is not easily defined. Hence, the concentration and movement of pollutants is less readily determined. Nitrate nitrogen is known to exceed the potable water standard of 10 ppm in some farm wells in Connecticut (Frink, 1973) and in some municipal wells tapping aquifers in the Connecticut and Housatonic River Valleys. This situation is not unique to Connecticut; throughout the country many public water supplies exceed the standard. Although incidents of nitrate poisoning from public water supplies are extremely rare, there is general agreement that the limit should not be raised (National Acad. Sci., 1972).

Another class of chemicals receiving increasing attention are chlorinated hydrocarbons and similar compounds that are often toxic and degrade slowly in the environment. These are exemplified by DDT, which is now banned for most uses. However, recent reports of toxic concentrations of PCBs (polychlorinated biphenyls) in fish and sediment of the Housatonic River remind us that we still have much to learn.

Despite gaps in our knowledge of the safety and efficacy of disposal of wastes in soil, the lack of alternatives forces us to decide which soils are best suited to the task. Research during the 18 years since our first publication on interpretation of soils for urban uses (Hill and Shearin, 1960) has given us considerable information on this important topic. Accordingly, we shall examine the many soils identified in Connecticut by the ongoing National Cooperative Soil Survey and evaluate their limitations and potentials for the disposal of solid and liquid wastes.

SOIL LIMITATIONS AND POTENTIALS

Limitations

The concept of rating soils according to their limitations for various uses was developed in the 1960s by the National Cooperative Soil Survey. The ratings **slight, moderate,** and **severe** are based on such internal characteristics as texture, structure, drainage, permeability, and depth to bedrock; and such external characteristics as surface stoniness, rockiness, slope, and flood hazard. The system identifies the limiting feature of a soil that is to be used for a specific purpose and the degree to which that limitation will affect its use if uncorrected. The more severe the limitations, the more complex the engineering design and the higher the cost of overcoming the limitation. However, rating soils by their limitations does not identify specific corrective measures, estimate their relative cost, or judge their effectiveness in overcoming the limitations. The interpretative ratings for soil limitations are defined as follows:

Slight. The few limitations are easily overcome by engineering design. The expense of correction is usually below the average cost of preparing the site for the intended use.

Moderate. The limitations require more intensive on-site observation and testing to determine proper design. Moderate limitations can be corrected at average to above average costs of preparing the site for the intended use.

Severe. This rating indicates that the use of the soil is seriously limited by one or more factors. Intensive testing of the site is necessary to develop design features to overcome the limitations. Preparing the site for the intended use would be costly, and in some cases may be prohibitive.

Potentials

The concept of rating soils according to their potentials is intended to convey to the user the kinds of management practices that can be employed to overcome the limitations identified with each kind of soil. It also provides the relative cost of specific practices and the degree to which these practices have been successful by past experience. Rating soils by their limitations alone has caused some misunderstandings in their interpretation. A rating of "severe" for septic tank drainfields has, at times, been interpreted to mean that the soil should not be used for drainfields. However, the "severe" rating only implies that the limitations imposed by nature are formidable, that proper design must be based on intensive on-site testing and that these tests,

Table 1. Management practices associated with overcoming soil limitations.

SEPTIC TANKS

- Serial distribution of tile lines.
- Increase square feet of leaching system if percolation test rate is faster than 5 min/in and silt + clay content exceeds 30%. Square feet determined by percolation test x factor of 1.2.
- Avoid construction when soils are excessively wet.
- Percolation testing and deep pit observation when seasonal water tables and soil moisture are near maximum.
- Addition of suitable fill material. Compaction or natural stabilization.
- Curtain drain or other interceptor drains to cut off lateral flow of groundwater over compact till.
- Maximum size leaching system and/or graded sand filter system or mound system.
- Extensive land shaping and/or stone removal.
- Drainage system to lower water table.
- Flood control structures.
- Sewage collection as alternative system of choice if area is underlain by a major aquifer.
- Control of housing density.
- Least suitable for use.

SANITARY LAND FILL

- Stone removal.
- Surface water runoff control measures.
- Determination if underlying stratified materials are a potential aquifer.
- Groundwater control measures.
- Addition of compacted fill to provide required base over bedrock or water table.
- Land shaping.
- Area fill as alternative for trench fill.
- Comparative isolation from domestic wells.
- Flood control measures.
- Creation of impermeable base with collection and treatment of leachate.
- Least suitable for use.

WASTE WATER DISPOSAL — TERTIARY TREATMENT

- Modification of spacing for irrigation equipment.
- Determination if underlying stratified materials are a potential aquifer.
- Surface water runoff control structures.
- Application rates reduced to less than 2 in/wk. May require additional storage capacity for treated effluent or additional acres for disposal.
- Least suitable for use.

design, and installation may add considerable cost to development. In some cases these costs may prove to be impractical.

Thus, the concept of soil potential ratings is intended to provide the broadest amount of information to soil survey users, landowners, developers, design engineers, and those charged with regulating land use in the public interest. Soil potential is a positive approach that allows the user to compare corrective designs as well as positive alternative uses for the soils of Connecticut.

In developing potential ratings, the limitations that a soil imposes upon a specific use must first be identified. For example, a seasonal high water table that rises to within 18" below a septic tank drainfield is a specific limitation. Bedrock at shallow depths not only limits the installation of a septic tank drainfield but the thin soil layer above the bedrock limits proper renovation of the effluent. To overcome these limitations, specific management practices are available (i.e., land drainage, addition of fill, installation of sewers). Some corrective measures cost more than others and the results may not meet with expectations. Therefore, we have rated soil potentials as *high, medium, low and very low.* The ratings are broadly defined as follows:

High potential. Few limitations exist and costs of overcoming them are a fraction of the average costs of site preparation. Once the corrective practices have been employed, performance is usually satisfactory according to local experience. Continuing limitations are rare, and environmental quality is maintained.

Medium potential. Individual limitations are more severe or more numerous. Costs of practices to overcome the limitations are average to 10-fold above average. The performance of the soil usually will be improved but continuing limitations may require additional modification of design or other practices. If the practices are successful, environmental quality may be maintained or it may be slightly lowered by continuing limitations.

Low potential. Limitations may be severe, requiring intensive and expensive management practices. Performance of the soil may be significantly below acceptable standards if limitations are not overcome. Costs of management practices may be up to 100-fold above average. Continuing limitations may reduce environmental quality, even after corrective management practices have been employed.

Very low potential. Limitations are very severe and performance of the soil may be much below acceptable standards even after management practices have been employed. The costs of corrective measures may be greater than 100-fold above average costs and may be economically unsound. Continuing limitations are common and may seriously affect the maintenance of environmental quality. In many cases the decrease in environmental quality may be judged to be locally unacceptable.

The most common practices used in overcoming soil limitations are listed in Table 1 and are ranked according to increasing costs. Their relative position in the list for each use may vary among counties and regions within the state. Some practices imply regulatory action and their relative costs are not easily predicted. Regulatory practices were placed in the list according to the anticipated severity of impact upon the user. For example, controlling housing density to prevent pollution of a proven underlying aquifer is a more severe regulatory action than the restriction of percolation tests in certain soils to the normally wet spring months. These practices are listed in abbreviated form in the footnotes of Table 3. Reference may be made back to pertinent statements about limitations and potentials discussed for septic tank drainfields, sanitary landfills, and disposal of sewage treatment plant effluent in the sections which follow.

On-site Sewage Disposal Systems

About 40% of Connecticut's population relies on septic tanks with drainfields to dispose of liquid household wastes. The drainfields, which dispose of liquid wastes from the septic tank, may consist of trenches, beds, pits or galleries. Each has specific advantages and disadvantages. The choice of method is usually determined by the characteristics of the soil and landscape. Specific details may be obtained from publications of the Connecticut Department of Health (1970) and of the U.S. Public Health Service (1967).

Many soils have properties that limit the use of septic systems. However, engineering designs based on soil observation and testing, proper installation, adequate maintenance, and conservative use are important and can result in a system that functions properly for many years, even several decades.

Each soil in the state is rated in Table 3 according to the limitations imposed on construction and performance of septic systems. Potential ratings reflect the kinds of management practices needed to overcome the limitations and reflect their relative costs and performance. Measures of performance, the half-life of systems and rate of early failure, are based on a study of 2,845 septic systems in Glastonbury, a town in Hartford County that has many soils found in the state (Hill and Frink, 1974). The half-life is the number of years before 50% of the systems will be expected to fail. Our studies show that the half-life ranges from 38 years in soils developed on compact, slowly permeable glacial till to 23 years in soils developed on friable glacial till with moderate to moderately rapid permeability. We have arbitrarily set a standard of performance of 25 years.

Systems installed in soils that fall below that standard can be identified and improved designs can be suggested to increase their longevity. The other measure of performance is the occurrance of early failures; i.e., those systems failing within 5 years of installation. The class limits have been arbitrarily set at less than 5%, 5-10%, and greater than 10%. This measure also provides important information because most early failures have been traced to timing of the percolation test (Hill, 1976). Early failures can be reduced substantially by observing soil features and obtaining data when water tables are high, rather than when water tables are low during the summer months. The wet soils of early spring have conservative percolation rates, and result in design of larger systems. High water tables also may be observed in spring and their control can become part of the design of the system. Performance of systems by soil groups are presented in Table 2. These data have been used to suggest corrective measures and enable a better estimation of soil potential.

The limiting factors for septic tank installation and performance include slow permeability, high water table (apparent or perched), excessive slope, excessive stoniness, shallow soil over bedrock, flooding, and smearing of infiltrative surfaces during excavation. Many of these limitations can be overcome by corrective measures. Following the discussion of each limitation, management practices are listed from Table 1 and their relative cost indexed as follows: (X) Low, (10X) Medium, (100X) High.

Slow permeability (Percs slowly)[1] is usually associated with soils developed in compact glacial till, such as those of the Paxton, Woodbridge, Wethersfield and Ludlow series, and in silty lacustrine deposits such as the Buxton and Berlin series. Slow permeability results in slow flow rates observed in percolation tests. To compensate for slow permeability, large leaching fields are designed to handle the daily flow of effluent. Another limitation of soils on compact till and silty lacustrine deposits is the presence of perched water flowing laterally over compact layers. This feature is prominent in the moderately well-drained Woodbridge, Ludlow, Buxton and Berlin soils. Perched water may occur for weeks, even months, on lower topographic positions on the landscape.

Septic systems can fail because the leaching field is "drowned" with perched water. It is, therefore, important that percolation tests and deep observation holes, required by all towns, be made when water tables are highest and moisture contents are greatest. Perched water most often occurs late in winter and throughout the spring. Testing and observation at this time will detect perched water and its control can be designed in advance. Curtain drains and other water interceptor structures are often used, although their use is impractical if suitable outlets are not available. Curtain drains are sometimes ineffective on lower topographic positions where laterial flow of water over the compact till is complex. Other design modifications for systems installed in soils formed on slowly permeable compact till include graded sand filters and mound systems (Bouma, 1972) where effluent is pumped into a mound of suitably permeable soil that lies above the natural grade. These systems are seldom used in Connecticut but have gained acceptance in several mid-western states where conventional systems cannot be installed.

Studies in Connecticut (Hill and Frink, 1974) have shown that septic systems installed in soils with compact till have greater longevities than in soils with friable till and stratified sand and gravel. They are greatest because the systems are made large to compensate for slow permeability. However, despite their greater longevity, they have an early failure rate that exceeds 10% within 5 years. Early failure is caused by observation of fast percolation rates during dry summer months, which leads to design of too small a system. Testing in spring when soils are naturally wet will result in design of larger systems. Early failure is also caused by "drowning" of the leaching field by perched water. This often occurs because the systems were tested and observed in summer months when the perched water was absent and the tester apparently failed to observe the tell-tale mottled colors of soil above the slowly permeable layer that indicates prolonged water saturation above the compact zone.

Management practices:

- Percolation testing and deep pit observation when seasonal water tables and soil moisture are near maximum or observation of soil mottling as an indicator of wetness (X).
- Curtain drain or other interceptor drains to cut off lateral flow of groundwater over hardpan (10X).
- Maximum size of leaching area and/or graded sand filter system or mound system (10X).
- Sewage collection and treatment (100X).

High water table (wetness) is a limitation that may cause early failure of systems if not detected during deep pit observation. The maximum height and seasonal fluctuation of the water table is dependent upon distribution of annual rainfall and is often controlled by topographic position. Water tables may fluctuate greatly under moderately well drained soils, less under poorly drained soils, and very little under very poorly drained soils. Fluctuation is also a function of soil texture and size of the watershed above the point of observation. Rates of fluctuation are usually greater in stratified sands and gravels where discharge rates to rivers and streams are greater than in glacial tills where discharge rates are slower.

Perched water tables may be found in areas of com-

1 Keywords used in Table 3

pact till where water flow is impeded by slowly permeable layers, which cause water to flow laterally over the surface of the compact layer. The rate of flow is dependent upon slope. Movement is slower in nearly level areas and more rapid in steeper slopes where water moves along preferred subsurface channels over the compact layer. Perched water tables usually disappear during summer months but they persist longer in lower topographic positions than in upper slopes.

High water tables can sometimes be lowered by regional drainage if suitable outlets can be found. Perched water tables are generally controlled by curtain drains or diversion ditches which intercept the water moving laterally. Perched water is sometimes difficult to control on lower slopes where the slowly permeable compact layers are usually deeper below the surface. The appropriate design to control water table depth is determined after on-site evaluation.

Management practices:

- Percolation testing and deep pit observations when water tables and soil moisture are near maximum or observation of soil mottling as an indicator of wetness (X).
- Regional drainage system to lower water table (10X).
- Curtain drain or other interceptor drains to cut off lateral flow of ground water over compact layers (10X).
- Addition of suitable fill material with mechanical compaction or natural stabilization (10X).

Excessive slope (Slope) is another limitation because septic tank drainfields are easiest to install at level grades. If natural surface gradients are steep, part of the system must be buried deeply. In soils underlain by slowly permeable compact till, effluent moving laterally over the till can erupt on steep surfaces downslope from the drainfield.

On moderate slopes, design of the drainfield may include several tile drains placed in series each parallel to the contours of the slope. On steeply sloping soils, installation of the drainfield may require extensive land shaping to produce nearly level areas where the system can be installed.

Management practices:

- Serial distribution of tile lines (X).
- Extensive land shaping and/or stone removal (10X).

Excessive stoniness (Large stones) is a limitation if the stones hinder excavation of the leaching field. Excavation may require the use of heavy equipment which contributes toward compaction of infiltrative surfaces. The location of the leaching field may have to be changed to avoid large boulders, thus reducing potential reserve space for expansion of drainfields in case of failure. In the installation of trench systems, the trench may have to snake around boulders that are too large to move. Although installation may be more difficult it has not been shown that the systems operate less effectively in stony areas. When backfilling trenches or beds, larger stones have been known to break pipes, and rip the tarpaper that covers the gravel or crushed stone that fills the trench. This allows soil from above to fill the voids in the crushed stone, reduces the storage capacity of the trench or bed, and seals infiltrative surfaces.

Table 2. Performance of septic tank drainfields in various Connecticut soil groups.

Soil Group	Half-life, yrs	Failure rate within 5 years, %
Stratified sand and gravel	>25	<5
Friable glacial till	<25	5-10
Compact glacial till	>25	>10
Shallow to bedrock	>25	5
Poorly and very poorly drained soils	25	5-10

Management practice:

- Extensive land shaping and/or stone removal (10X).

Bedrock at shallow depths (Depth to rock) is one of the most restricting limitations encountered. State regulations (Conn. Dept. Health, 1970) require that the base of leaching systems be more than 4 feet above bedrock. Shallow soils have only 20 inches of unconsolidated till above bedrock. In several of the soil complexes (i.e., Branford-Holyoke silt loams, Charlton-Hollis fine sandy loams, Cheshire-Holyoke complex) there is usually sufficient area with satisfactory depth for a leaching system but intensive deep pit observation is necessary. In areas without deep pockets of soil, the addition of several feet of fill is required. In areas where shallow soils predominate, many towns permit only sparse development by requiring large lots.

The studies of septic tank longevity in Connecticut indicate that the half-life of all systems installed in areas of shallow soil-deep soil complexes is above the average of 27 years. Presumably most of the systems have been installed in pockets of deeper soil.

Management practices:

- Addition of suitable fill material with mechanical compaction or natural stabilization (10X).
- Control of housing density (100X).

Poor filtration (Poor filter) is a limiting factor in very porous sandy and gravelly soils. These soils are low in clay which provides increased surface area for chemical exchange of cations and adsorption of phosphorus. They permit rapid percolation of soluble nitrogen. Concentrations exceeding 10 parts per million nitrate have been found in groundwater within 50 feet of septic systems in very sandy soil (Preul, 1966; Sawhney and Starr, 1978). Adsorption of phosphorus was also found to be less effective in sandy soils than loamy soils (Sawhney and Hill, 1975; Sawhney and Starr, 1977). The probability of groundwater contamination by chemicals, bacteria, and viruses increases as the proportion of non-capillary pores increases in the soil and as the thickness of the unsaturated zone of soil beneath a septic system decreases. Contaminants may move far if the base of the leaching system is accidently inundated by a rising water table.

Management practices:

- Sewage collection as alternative system of choice if area is underlain by a major aquifer (100X).
- Control of housing density (100X).

Flooding (Floods) is a limiting factor associated with soils of floodplains. Flooding over septic systems saturates the soil and impairs normal discharge of effluent through the surrounding soil. Flooding may also cause effluent to rise to the surface and contaminate the flood waters with disease organisms. Installation of septic systems in flood-prone areas should be avoided unless the areas are protected by flood control structures.

Management practices:

- Flood control structures such as dams and dikes (100X).

Smearing (Smears) of infiltrative surfaces in septic tank drainfields is a limitation associated with loamy and silty soil textures. Soils from glacial till containing appreciable silt and some clay and terrace soils mantled by silty deposits are more prone to smearing than sandy terrace soils containing little silt and clay. Smearing occurs during excavation of the leaching system and is more pronounced when the moisture content of the loamy or silty soils is high.

Studies of septic tank longevity in Connecticut revealed that systems installed in soils developed in friable glacial till had half-lives of 23 years, 4 years less than the average of all soils. Percolation testing on most of these soils yielded fast percolation rates that required the minimum leaching field area. Similarly, percolation rates were predominately fast in soils developed on stratified sand and gravel. However, the half-lives of the systems installed in the soils on stratified sand and gravel were 4 years longer than systems in friable glacial till. The most obvious difference between the two soils is particle and pore size distribution. Particle sizes in stratified sand and gravel are more or less uniform, but in glacial till soils, sand, silt and clay are usually mixed and are more prone to smearing during execution. It was also found that systems installed in 1955 are conspicuous (Hill and Frink, 1974). This year is well remembered for the storms in August and October which deluged Southern New England with 22 inches of rain above normal. The soils were saturated for prolonged periods in the fall; the septic systems installed during this time had the highest failure rate of any group of systems installed since 1944. We concluded that high soil moisture contents in loamy and silty soils favor smearing during excavation and lessen the longevity of the systems.

Two options are available to compensate for smearing. Construction of leaching systems may be delayed until soil moisture contents are low. If delay of excavation is not feasible, the other alternative is to design a larger system to compensate for the smearing process even if percolation rates are fast and indicate that a minimum of leaching area is required. In soils that list smearing as a limitation, if leaching fields are increased by a factor of 1.2, adequate compensation for the smearing process will be obtained. This factor is best applied to soils with percolation test rates faster than 5 minutes/inch and if contents of silt plus clay exceed 30%. If percolation rates are slower than 5 minutes/inch, the limitation of slower permeability will have already required a larger system and thus have compensated for the limitation of smearing.

Management practices:

- Increase area of leaching system if percolation test rate is faster than 5 minutes/inch and if contents of silt plus clay exceeds 30% (X).
- Avoid construction when soils are excessively wet (X).

Sanitary Landfills

Approximately 110 towns in Connecticut use landfills for the disposal of garbage, trash, demolition materials, and the remains of incineration. According to a recent study by the U.S. Geological Survey (unpublished data), 14 of the 205 solid waste disposal areas examined by the Department of Environmental Protection have caused contamination of the groundwater. Numerous large industries also have landfills for the disposal of their solid wastes. Of 335 disposal sites for industrial wastes, the U.S. Geological Survey reports that 23 have contaminated the groundwater with metals and organic chemicals. Contamination of groundwater arises from formation of leachate produced by rainfall percolating through the layers of compacted garbage and trash, which removes the soluble products of bacterial decomposition and chemical alteration. The leachate reaches the water table beneath the landfill and moves as a plume of contamination at varying speeds. Sometimes the contaminated groundwater moves toward points of groundwater discharge in swamps, rivers, streams, and ponds. In some landfills, however, the groundwater does not rely upon percolating rainfall for its charge of pollutants. Contaminated groundwater is also produced if the water table rises above the base of the landfill, inundates the trash and garbage, and removes soluble products. All landfills in Connecticut produce contaminated leachate, although efforts have been made in recent years to contain the leachate, minimize its production or provide suitable treatment. At many sites, leachate erupts from the surface on or near the landfill.

Two types of landfills are used in Connecticut. The most prevalent is the area fill in which the existing land surface serves as the base and the refuse is deposited in layers above the surface. Many sites are located in former sand and gravel pits and others are in wetlands. The trench fill is usually used in upland areas where trenches are dug and backfilled with layers of refuse. The material excavated from the trench is used for daily cover. As the trenches become full the trench fill becomes an area fill as the refuse is piled above the original ground surface to reduce infiltration of rainfall as the landfill settles during decomposition.

Locating a landfill site is difficult for most towns largely for aesthetic reasons. Consequently, many landfill sites are environmentally unsound. Plans have been proposed in Connecticut to replace many landfills with regional sites and resource recovery facilities.

Soil is an integral part of landfill operations. In trench fills, it serves as a host for the entombed waste and reacts with the leachate as it percolates away from the disposal site. The physical and chemical properties of the soil surrounding the landfill control the speed at which leachate travels. It may be altered chemically or by microorganisms that convert nutrients to less soluble compounds. Soil also serves as daily cover material to provide suitable all-weather surfaces for vehicles, prevents blowing of debris, discourages vermin, and allows escape of combustible gases produced by anaerobic decomposition. Later, as a site is abandoned, the final soil cover retards percolation of rainfall that produces leachate and provides a suitable medium for the vegetation that stabilizes the site. Thus, soil information is vital to the establishment of an environmentally secure site and throughout its daily operations until abandonment.

Site Selection

Soils information must be used together with geological and hydrological information (Hill and Thomas, 1972) in the selection of new sites for landfills. Soils information is less useful alone because trenches often penetrate beyond the 4- to 5-foot depth investigated in a soil survey. Beyond this depth, hydrological and geological surveys are useful. Despite limitations of soil survey information, there are characteristics which provide excellent clues to problems at greater depths. For example, in an upland soil, a zone of mottled colors above 3 feet indicates a seasonal water table that saturates the soil for prolonged periods. The water table is probably perched over a slowly permeable layer. The restricting layer retards downward flow of water and forces it to flow laterally. If such a site were to be used for a trench fill, the water must be intercepted before it seeps into the landfill and produces a large volume of leachate.

State regulations prohibit deposition of refuse or its leachings in a manner that contributes to pollution or contamination of ground or surface water on neighboring properties. Refuse cannot be deposited within 50 feet of the high water mark of a watercourse or on land where it may be carried into an adjacent watercourse unless protective measures are provided.

Although there is evidence that many landfills are environmentally unsound (Miller, DeLuca, and Tessier, 1974), the most favorable characteristics of sites and soil include:

- A host material that is unconsolidated and slowly to moderately permeable to retard movement of leachate and provide maximum attenuation of potential pollutants.
- Bedrock and a seasonally high water table should be 4 feet or more below the base of the landfill.
- The site should have natural control of surface water runoff.
- Slopes should not exceed 15% to avoid oversteepening of the working face.
- Adequate amounts of suitable daily cover material should be available to avoid excessive transportation costs.
- Sites should be avoided over a proven or potential groundwater supply, a known groundwater recharge area, fault zones, or highly fractured bedrock.

A site satisfying all favorable criteria would be found only occasionally. Hill and Thomas (1972) found 10% of an 8 square mile area in the Connecticut Valley had soil and topography favorable for landfill. However, even some of this land was unsuitable because of nearby residential development. The remaining 90% of the area had one or more limitations for site selection and daily maintenance. In Connecticut most soils are rated severe because of the dominance of combinations of limitations that require special site preparation and engineering design to reduce leachate pollution of groundwater.

We shall briefly discuss soil limitations that include shallow bedrock, seasonal high water tables, permeability, excessive slopes, stoniness, and flooding. The management practices required to overcome these limitations are listed at the end of each limitation and rated according to relative cost. The costs of site preparation for a sanitary landfill may be much higher than the costs for preparing a site for a septic tank drainfield; hence, a rating of (X) for sanitary landfill does not have the same relative cost as a rating of (X) for septic tank drainfields.

Bedrock at shallow depths (Depth to rock) is a serious limitation for trench fills because adequate storage depths are not available. Thus, shallow soils and their mapping complexes are virtually prohibited from trench fills. Area fills, which begin at the land surface and work upwards, are alternatives. It is highly probable, however, that additional fill will be required before trash and garbage can be deposited. It is also highly probable that cover will have to be transported to the site at additional expense.

Interpretations of geological information by the Connecticut Geology Soil Task Force (Hill and Thomas, 1972) and those produced in the Connecticut Valley Urban Area Project by the U.S. Geological Survey extend predictions of bedrock to 10 feet. A comparison of maps that show bedrock within 10 feet of the surface to soil survey overlays, indicates that 50% of the areas of friable glacial till soils of the Cheshire, Watchaug, Charlton and Sutton series are underlain by bedrock at depths less than 10 feet and are limiting to trench fill operations. Where slopes exceed 15%, the probability of bedrock at depths of less than 10 feet rises to 60% for the same soils.

In Paxton, Woodbridge, Wethersfield and Ludlow soils on compact glacial till, bedrock within 10 feet of the surface seldom exceeds 20% of the area. Thus, the probability of striking bedrock in the excavation is low because the compact tills that cover the bedrock are usually several tens of feet of unconsolidated compact material.

The occurrence of bedrock at depths less than 10 feet is 1% or less in terrace soils underlain by sand and gravel deposits and on floodplains.

Management practices:

- Addition of compacted fill to provide suitable base over bedrock (10X).
- Area fill as an alternative to trench fill (10X).

High water tables (Wetness) are limiting to sanitary landfills, especially the trench type. During periods of groundwater recharge, rising water tables may seep into the compacted trash and garbage and remove soluble products of decomposition. Contaminated waters may move quickly by saturated flow if regional water table gradients are steep. Lateral seepage over compact slowly permeable layers may be controlled before it reaches the landfill by interceptor drains if suitable outlets can be provided. In areas where the regional water table is high, as under ancient glacial terraces and modern flood plains, the soils may be more difficult to drain.

A seasonally high water table can be anticipated in soils that display well-developed mottling within 3 feet of the surface. These include the drainage classes of moderately well-drained, poorly-drained, and very poorly-drained soils. In these drainage classes, water tables usually persist within 3 feet of the surface for at least 3 months of the year. All soils with these drainage classes will probably require groundwater control in preparation of sites for landfills.

The depth to water tables under well-drained soils is more difficult to predict because seasonal fluctuations are often great. If groundwater gradients are steep, as in many upland areas, groundwater flow and discharge to streams may be rapid. Relatively flat groundwater gradients of flow in valleys and near the shores of Long Island Sound may create water tables that fluctuate little. In shoreline areas, especially those underlain by stratified sand and gravel deposits that dip beneath Long Island Sound, groundwater gradients are nearly flat and even well-drained soils have water tables within 10 feet of the surface. In a study area in the coastal town of Madison, south of I-95, 80% of the areas with well-drained soils have a water table within 6 feet of the surface in the spring (unpublished data). Thus, groundwater may interfere with trench fills in some areas with well-drained soils.

Management practices:

- Groundwater control measures; interceptor drains or regional drainage (10X).
- Area fill as an alternative to trench fill (10X).

Permeability (Seepage) (Percs slowly) of the material surrounding a landfill controls the rate of movement of pollutant-laden leachate from the landfill. In stratified sand and gravel, leachate may percolate rapidly to the water table and then to swamps, streams, lakes, and ponds. In sandy soils with little clay and low exchange capacity, attenuation of soluble chemical ions by cation exchange and precipitation is poor, especially if the movement is by saturated flow. But even in coarse textured soil attenuation can be significant if leachate moves under unsaturated flow before it reaches the water table. Attenuation increases in soils containing appreciable clay with high exchange capacity and if permeability is sufficient to accept the volume of leachate produced in the landfill. Ideally, the most suitable soil is one that can readily adsorb all the leachate produced in the landfill and attenuate the pollutants by cation exchange, precipitation, and biological utilization. Soils with high permeability rates and most prone to seepage are those on stratified sand and gravel terraces and friable glacial till.

Rapid permeability may permit pollutants to seep to the water table below, degrading water quality. If the underlying groundwater is a known or potential high-yielding aquifier, protection of the groundwater by impervious liners may be necessary. If collection and treatment of the leachate are desirable, the slowly permeable compact tills and lacustrine silt and clay deposits provide the most suitable "natural liners" for the landfill.

However, permeability may be very slow in compact glacial tills and lacustrine silt and clay deposits and leachate may break out on the surface of the landfill or adjacent areas. Lateral movement of water over hardpan can be controlled by interceptor drains to prevent it from reaching garbage and trash.

Management practices:

Rapid permeability:

- Determine if underlying stratified materials are a potential aquifer (X).
- Comparative isolation from domestic wells especially downslope from the landfill site (10X).
- Creation of impermeable base with collection and treatment of leachate (100X).

Very slow permeability:

- Interceptor drains to cut off lateral flow of groundwater over the compact layer.

Slope (Slope) limitations have been assigned soils that exceed 15%. There are often inclusions of steeper and flatter slopes than the range defined for a mapping unit. Steep slopes limit trench-type landfills in three ways: they decrease the volume of storage space available, often permit seepage of leachate downslope from the landfill, and require control of surface runoff from upslope. Alternatively, steep land may be used for area fills; however, the working face often becomes too steep for safe operation of compaction vehicles, requiring land shaping to reduce slopes to safe working grades. It is also more difficult to establish access roads on slopes and to maintain them during the winter months.

Management practices:

- Surface water runoff control (X).
- Land shaping to reduce slope gradients (10X).
- Area fill as an alternative for trench fill (10X).

Excessive stones (Large stones) become limiting because they reduce the usable volume of daily or final cover. Most vehicles used to compact refuse are not limited by occasional stones. Vehicle movement can be impaired if numerous stones jut from the working surface of the landfill. Large boulders usually must be stockpiled or buried adjacent to the landfill, a more costly operation. If the glacial till has too many boulders for a trench fill, an area fill may serve as an alternative.

Management practices:

- Stone removal (X).
- Area fill as alternative for trench fill (10X).

Stream and tidal flooding (Floods) is a limitation near streams and tidal estuaries. Soils of floodplains are recognized by their lack of distinct profile development because of recent deposition of alluvium. The soil survey only identifies the depositional areas of the floodplain; the U.S. Geological Survey may have records of floods on adjacent areas. Some portions of floodplains flood more frequently than others. Floodplains protected by flood control structures flood less frequently or not at all. Trench fills in flood-prone areas are impractical because water tables are too high and drainage too difficult.

Management practice:

- Flood control measures, including dikes (100X).

Daily cover

The suitability rating of each soil for its use as daily cover is given in Table 3, Column 5. The suitability rating is based upon its engineering characteristics. The total volume available for use, ease of excavation, and transportation costs are also important.

A suitable daily cover is one that provides adequate bearing strength for vehicles over a wide range of moisture contents during all seasons. The suitability classes are *good*, *fair*, and *poor*. Ratings are based upon their estimated engineering classification in the American Association of State Highway and Transportation Officials (AASHTO) system. The sandy and gravelly A-1 and A-2 materials that contain few fines generally provide the best all-weather surfaces. A-3 materials and some A-1 and A-2 materials are of uniform sand size and are stable only under a narrow range of moisture contents. Their limitation has been designated "too sandy." Because these materials pack poorly, vehicles tend to become stuck when the sand is dry. The A-4 materials are somewhat less suitable as daily cover because they contain appreciable fines and become increasingly unstable at higher moisture contents. These materials are often dusty when dry and cannot support vehicles following periods of high rainfall and during spring thaws. Their limitation has been designated "wet unstable." A-6 materials are unstable due to their high silt and clay content which holds abundant water. Their limitation has been designated "excess clay."

Materials that contain many stones are less useful. The usefulness of the material is reduced by the volume of stones that exceed 10″ diameter. This limitation has been designated "stones." Large boulders create obstructions during excavation and are usually left behind. This limitation has been designated "large stones."

Excavation of cover materials is sometimes limited by a small volume of suitable material. This occurs when bedrock or a water table is found at shallow depths and the usable soil above forms only a thin mantle above the bedrock or water table. This limitation has been designated "thin layer".

Excavation for cover material on steep slopes is also limited by increasing the hazards of operating equipment and by increasing the probability of erosion on bare, oversteepened slopes. This limitation has been designated "slope".

Wastewater Disposal- Tertiary Treatment

In Connecticut's cities and densely populated towns domestic sewage is transported via sewer lines to a treatment plant where solids are removed, the liquid effluent is chlorinated to prevent disease, and is discharged into a river or Long Island Sound. A river can dilute the nutrient-rich effluent if the discharge is small in comparison to the volume of flow in the river. The Sound can dilute the effluent if natural currents disperse and flush it seaward. As the volume of effluent increases or as the flow of the river decreases during summer months, dilution becomes less effective. In the Sound dispersal is less effective in the western portion as currents diminish (Long Island Sound Study, 1975). Thus, under these circumstances, greater quantities of nutrients begin to exert their influence on the receiving water.

An effective alternative to dilution of sewage treatment plant effluent is to use soil and plants to filter the effluent and remove its nutrients. The purifying power of soils and plants have been known for some time (EPA, 1973). Studies in Connecticut (Hill, 1972) have shown that some soils are more effective renovators of sewage effluent than others. We shall interpret the potential of soils for reduction of the nutrient load through tertiary treatment.

Each soil is rated in Table 3 according to its limitations for wastewater disposal through spray irrigation systems. Although slow infiltration and overland flow methods of disposal are also employed, spray irrigation has had wider application through the country (EPA, 1973). The rating of each soil is based on the limitations affecting the installation of the system and its operation. The limitations affecting installation are steepness of slope, excessive stoniness, outcrops of bedrock, and flood hazard. The limitations that affect operation are surface ponding and subsurface mounding of water in slowly permeable materials. The potential of each soil is also rated, and corrective measures to overcome the limitations are listed and rated according to cost and effectiveness. All ratings are based upon disposal of 2-inches of effluent per week for 8- to-9 months each year.

Site Selection

Steep slopes (Slope) limit installation if the irrigation pipes are permanently installed underground. Not only are equipment hazards more severe on steep slopes, but soil creep may rupture permanent installations. Portable pipes are more commonly used and are less affected by slope but spacing of laterals may be irregular. Steeply sloping land also requires reduced rates of application to avoid runoff. If runoff is anticipated, diversion ditches and sod waterways may be needed to avoid rapid overland flow and its resultant erosion and diminished renovation capability.

Management practices:

- Surface water runoff control structures (10X).
- Application rates reduced to less than 2 inches/week. Increased storage capacity for treated effluent or additional land for disposal may be required (100X).

Excessive stones (Large stones) and bedrock outcrops (Rock outcrops) limit installation of underground distribution systems and spacing of portable systems. Modification of spacing requirements may result in uneven distribution of effluent and require additional acreage for disposal. Rock fragments within the soil profile also reduce the effective capability for renovation because of reduction in reactive surface area of the soil body. Coarse fragments, 50% by volume, would reduce the effective renovation capacity of a soil by an equivalent amount. Again, greater areas may be necessary. Surface stones may be removed to facilitate installation; but removal of subsurface stones to increase the effective renovation capability is impractical.

Management practices:

- Modification of spacing for irrigation equipment (X).
- Application rates reduced to less than 2 inches/week. Increased storage of treated effluent or additional land for disposal may be required (100X).

Flooding (Floods) limits both installation and operation of irrigation systems. In addition to an obvious potential loss of equipment, operation would have to cease until water tables fall to acceptable levels.

Soils of the floodplains are least suited for wastewater renovation. Floodplain soils may erode, and if the sediments contain abundant nutrients stored during tertiary treatment, they constitute a potential threat to water quality.

Management practice:

- Seek alternative areas for treatment (100X).

Surface ponding (Ponding) limits operation of the system because less effluent can be distributed in an affected area. In addition, pools of effluent standing on the surface may be unsightly, emit odors, and breed mosquitoes. Renovation capability may also be reduced if the effluent passes through poorly aerated soil. Water tables are generally high in ponded areas and nutrients may pass rapidly through the soil by saturated flow to rivers and streams.

Management practice:

- Seek alternative areas for treatment (100X).

Mounding (Mounding) of effluent beneath distribution areas is a limitation commonly associated with soils of low permeability. Effluent percolates slowly in these soils but subsurface lateral flow cannot keep pace with vertical flow and the water table rises in a mound throughout the area of infiltration. If the water table is near the surface and too much effluent is applied, a mound can grow and erupt on the surface. On sloping land underlain by slowly permeable compact soil the mound may rise toward the surface, retard infiltration, and promote surface runoff. Mounding of effluent often develops in silty soils and soil underlain by layers of compact slowly permeable glacial till. The effectiveness of all soils for wastewater renovation are based on application rate of 2 inches per week. Mounding can be reduced by applying less effluent. However, greater storage capacity of effluent will be needed during the winter months or a greater number of acres will be required for wastewater disposal.

Management practice:

- Application rates reduced to less than 2 inches/week. Increased storage capacity for treated effluent or additional land for disposal may be required (100X).

Stratified sand and gravel soils (Potential aquifer) have inherent limitations in their capacity to renovate effluent. High permeability rates and low silt and clay contents with low cation exchange capacity diminishes their effectiveness to renovate effluent for a prolonged period of time. Areas of stratified sand and gravel have great potential for subsurface water supply; thus, it is necessary to determine what the potential supply might be. If the area overlies a high yielding aquifer, an alternative area for disposal may be required.

Management practices:

- Determine if underlying stratified materials are a potential aquifer (X).
- Seek alternative areas for treatment (100X).

Renovation suitability

An important consideration when using soil for tertiary treatment of effluent is its effectivensss in removing dissolved chemical constituents that may become potential pollutants of groundwater. The ability of a soil to renovate wastewater is highly dependent upon its physical and chemical properties, which effect the mechanisms of purification and the depth of soil through which the effluent must pass before reaching bedrock or the underlying water table. The effectiveness is also influenced by the volume of coarse fragments and the slope of the landscape, which governs infiltration rates and runoff.

The renovation suitability of each soil is estimated in column 7, Table 3. Soils capable of removing the greatest quantities of dissolved solutes are those containing appreciable clay and organic matter, which influence ion exchange. During renovation, negatively charged soil particles attract positively charged cations in wastewater and remove them from the effluent with varying degrees of effectiveness. Studies (Hill, 1972) showed that up to 90% of the potassium, 65% of the calcium and magnesium, and 10% of the sodium in wastewater was removed after 2 years of continuous application on Paxton and Cheshire soils, which contained 5-10% clay and at least 5% organic matter. In sandy Merrimac and silty Hadley soils, which contained less than 5% organic matter, removal of the cations is about half as effective. Anions such as $Cl-$, $SO_4=$, and NO_3- are not removed effectively by soil but, in the case of NO_3-, can be removed by a growing crop.

Phosphorus, on the other hand, is removed largely by coprecipitation with iron, aluminum, and silica as an amorphous gel (Sawhney, 1973). These elements are abundant in most acid soils of the Northeast. However, in very sandy soils, phosphorus can penetrate to greater depths after prolonged application than in loamy and silty soils. This limitation is designated "low exchange" in column 7. Some soils with sandy substrata are overlain by finer textured topsoils and subsoils that have more suitable renovation suitability. This limitation has been designated "low exchange, substratum."

Renovation of phosphorus has also been shown to be less effective in soils with a high pH. Thus, soils formed on glacial till or stratified materials rich in limestone have poorer renovation suitability. This limitation has been designated "high pH."

The effective depth of soil that wastewater passes through also influences its suitability for renovation. Shallow soils have limited effective depth over bedrock and high water tables. No standards have been established in Connecticut for a minimum depth to bedrock or seasonal high water table level under a spray irrigation system; however, 3 feet of soil would be needed to adequately filter and remove chemical constituents from wastewater for 10 to 13 years (Hill, 1972) in most soils. This period could be lengthened appreciably if the effluent were sprayed on a growing crop that is removed following harvest (Parizek, et al., 1967).

Soils shallower than 3 feet would renovate effluent less effectively. Initial renovation would be satisfactory; however, in a short time partially renovated water may seep into cracks and crevices in bedrock and drain rapidly to the groundwater. This limitation has been designated "thin layer" in column 7, Table 3. Where seasonal water tables are high, partially renovated wastewater will, in time, be discharged to groundwater. The mechanisms of renovation are thought to be less effective in saturated soil than in unsaturated well-aerated soil. Phosphorus may be more soluble under anaerobic conditions. However, nitrate nitrogen may be reduced by microorganisms to nitrogen gas and returned to the atmosphere. Hence, decisions regarding utilization of poorly-drained soils may depend on the nutrient of greatest concern at the site in question.

Stones in soil diminish the effectiveness of renovation. Stones force all effluent to pass through a smaller volume of soil. Soils containing 30% stones by volume would have about 30% less renovative capacity. This limitation is designated "large stones."

Finally, steep slopes permit greater runoff. Rates of application of effluent would have to be reduced to compensate for high rates of surface runoff. Renovation of wastewater during surface runoff is less effective than in seepage through the soil (Thomas, 1973). This limitation has been designated "high runoff."

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My thanks also to Dr. Charles R. Frink, Chief, Department of Soil and Water, who offered valuable suggestions and contributions to this publication.

Table of Interpretations

All soil mapping units of Connecticut are listed alphabetically in column 1, Table 3. This list is a composite of all mapping units of the state by current names. It includes soils published by the U. S. Department of Agriculture, Soil Conservation Service for Hartford, Tolland, and Litchfield Counties as well as soils in unpublished legends for New Haven, Middlesex, New London, Fairfield, and Windham Counties.

The ratings of limitations and potentials for various uses of the soils are given in columns 2, 3, 4, and 6. Limitations are rated slight, moderate, and severe; potentials are rated high, medium, low, and very low. Soil suitability for daily cover and renovation of effluent from sewage treatment plants are given in columns 5 and 7. Suitability ratings are good, fair, and poor. The limitations that influence the rating of each soil are listed below each rating and the management practices to overcome the limitations are listed as numbers next to the limitations. These numbers are keyed to the list of management practices in the footnotes at the bottom of each page of interpretations.

The specific limitations listed under the soil ratings acquaint the user with the problems that may be found during inspection and testing. If the mapping unit contains other kinds of soils as inclusions, additional limitations may be possible. At the present mapping scale of 1″ = 1320′ or 1:15,840 only the most frequent limitations are listed, as well as the most frequent management practices employed to overcome the limitation.

The soils that comprise the Inland Wetlands (I.W.) and Tidal Wetlands (T.W.) according to current definitions are identified in Table 3. Although various corrective measures may overcome the limitations of these soils, the reader is advised that the use of areas in which these soils occur is regulated by town and state agencies and appropriate permits must be obtained from them.

The soils of some areas are so broadly defined that interpretations are not meaningful. These units are identified as being "Variable."

Some soils with severe limitations and very poor potential have their management practices listed as "least suitable for use" in the footnotes of Table 3. This phrase is assigned to the most difficult soils for the use intended, but it is not intended to mean that the soils are necessarily prohibited from use. It means that one or more management practices must be employed that are of unique design, or whose costs are usually prohibitive.

The reader is advised that the interpretative material should not be used as a substitute for on-site observation and testing. It serves the purpose of acquainting the user with probable limitations and possible solutions to those problems in soils delineated on survey maps.

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks: Leaching fields	Sanitary landfill: Area type	Sanitary landfill: Trench type	Sanitary landfill: Suitability for daily cover	Wastewater disposal-tertiary treatment: Spray irrigation system	Wastewater disposal-tertiary treatment: Renovation suitability
ADRIAN and PALMS (I.W.)						
mucks	Severe / Very low Wetness / 20** Unstable muck / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Unstable muck	Severe / Very low Ponding / 20 Unstable muck / 20	Poor: Water table
AGAWAM						
fine sandy loam						
0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
AMENIA						
silt loam very stony silt loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8	Severe / Medium Wetness / 8	Fair: Wet unstable Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table High pH
8-15% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8 Slope / 1	Severe / Medium Wetness / 8	Severe / Medium Wetness / 8	Fair: Wet unstable Stones Thin layer	Severe / Low Mounding / 19 Slope / 9,19	Poor: Water table High pH
extremely stony silt loam						
3-15% slopes	Severe / Low Percs slowly / 4,12 Wetness / 8 Slope / 1 Large stones / 11	Severe / Medium Wetness / 8	Severe / Low Wetness / 8 Large stones /11,13	Poor: Wet unstable Large stones Thin layer	Severe / Low Mounding / 19 Slope / 9,19 Large stones / 6,19	Poor: Water table High pH Large stones
BEACHES-UDIPSAMMENTS (T.W.)						
complex	Severe / Very low Tide flooding / 20	Severe / Very low Tide flooding / 20	Severe / Very low Tide flooding / 20	Poor: Too sandy	Severe / Very low Tide flooding / 20	Poor: Low exchange
BERNARDSTON						
silt loam very stony silt loam						
3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Good
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Good
extremely stony silt loam						
3-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Large stones / 11 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Mounding / 19	Poor: Large stones
15-25% slopes	Severe / Medium Percs slowly / 4,8,12 Large stones / 11 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Large stones / 11,13 Slope / 9,11,13	Poor: Large stones Slope	Severe / Very low Large stones / 20 Slope / 20 Mounding / 20	Poor: Large stones High runoff
BERLIN						
silt loam						
0-3% slopes 3-8% slopes	Severe / Low Percs slowly / 4,12,16 Wetness / 10	Severe / Medium Wetness / 10 Percs slowly / 8	Severe / Medium Wetness / 10,13	Poor: Excess clay Wet unstable Thin layer	Severe / Very low Mounding / 20	Fair: Water table

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

** Management practices to overcome soil limitations:

1. Serial tile distribution
2. Enlarge leaching area
3. Avoid construction when wet
4. Restricted percolation testing
5. Determine underlying aquifer
6. Modify irrigation spacing
7. Addition of fill
8. Interceptor drains over hardpan
9. Surface runoff control
10. Regional drainage
11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
14. Isolation from domestic wells
15. Flood control
16. Sewage collection
17. Landfill leachate treatment
18. Control housing density
19. Reduce application rate; additional storage
20. Least suitable for use

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks	Sanitary landfill			Wastewater disposal-tertiary treatment	
	Leaching fields	Area type	Trench type	Suitability for daily cover	Spray irrigation system	Renovation suitability
BIDDEFORD (I.W.)						
silt loam	Severe / Very low Wetness / 20 Percs slowly / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer Excess clay	Severe / Very low Ponding / 20	Poor: Water table
BIRCHWOOD						
fine sandy loam 0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Thin layer	Severe / Low Mounding / 19	Poor: Water table
BIRDSALL (I.W.)						
silt loam	Severe / Very low Wetness / 20 Percs slowly / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
BRANFORD						
silt loam 0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5	Fair: Substratum, low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5 Slope / 9,19	Fair: Substratum, low exchange
BRANFORD-HOLYOKE						
silt loams 3-15% slopes	Severe / Medium Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Seepage / 20 Depth to rock / 20	Fair: Thin layer	Severe / Very low Depth to rock / 20	Poor: Thin layer
BRIDGEHAMPTON						
silt loam silt loam, till substratum very stony silt loam, till substratum 0-3% slopes 3-8% slopes	Moderate / High Smears / 2,3	Moderate / Medium Seepage / 5,14	Severe / Low Seepage / 5,14,17	Fair: Wet unstable Stones	Moderate / Medium Potential aquifer / 5	Fair: Substratum, low exchange
extremely stony silt loam, till substratum 3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3	Moderate / Medium Seepage / 5,14	Severe / Low Seepage / 5,14,17 Large Stones / 11,13	Poor: Wet unstable Large Stones	Severe / Very low Potential aquifer / 5 Slope / 9,19 Large stones / 6,19	Poor: Large stones Substratum, low exchange
BRIMFIELD-BROOKFIELD						
extremely stony fine sandy loams 3-15% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer
15-35% slopes	Severe / Very low Depth to rock / 20 Smears / 20 Slope / 20	Severe / Low Seepage / 14,17 Slope / 9,11 Depth to rock / 7	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones Slope	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer High runoff
BRIMFIELD-ROCK OUTCROP						
complex 3-15% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20	Poor: Thin layer Large stones	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer
15-35% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Slope / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Poor: Thin layer Large stones Slope	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High runoff

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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3. Avoid construction when wet
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6. Modify irrigation spacing
7. Addition of fill
8. Interceptor drains over hardpan
9. Surface runoff control
10. Regional drainage
11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
14. Isolation from domestic wells
15. Flood control
16. Sewage collection
17. Landfill leachate treatment
18. Control housing density
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Soil name / Slope	Septic tanks: Leaching fields	Sanitary landfill: Area type	Sanitary landfill: Trench type	Sanitary landfill: Suitability for daily cover	Wastewater disposal-tertiary treatment: Spray irrigation system	Wastewater disposal-tertiary treatment: Renovation suitability
BROADBROOK						
silt loam very stony silt loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Good
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium - Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Good
15-25% slopes	Severe / Medium Percs slowly / 4,8,12 Slope / 1,11 Smears / 3	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Slope / 9,11,13	Poor: Stones Slope	Severe / Low Mounding / 19 Slope / 9,19	Poor: High runoff
BROOKFIELD						
fine sandy loam very stony fine sandy loam						
3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
extremely stony fine sandy loam						
3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Slope / 9,19	Poor: Large stones
15-25% slopes	Severe / Medium Large stones / 11 Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13 Large stones / 11,13	Poor: Slope Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Large stones High runoff
BUXTON						
silt loam						
0-3% slopes 3-8% slopes	Severe / Low Percs slowly / 4,12,16 Wetness / 10	Severe / Medium Wetness / 10 Percs slowly / 8	Severe / Medium Wetness / 10,13 Percs slowly / 8	Poor: Excess clay Wet unstable Thin layer	Severe / Very low Mounding / 20	Fair: Water table
8-15% slopes	Severe / Low Percs slowly / 4,12,16 Wetness / 10 Slope / 1	Severe / Medium Wetness / 10 Percs slowly / 8	Severe / Medium Wetness / 10,13 Percs slowly / 8	Poor: Excess clay Wet unstable Thin layer	Severe / Very low Mounding / 20 Slope / 20	Fair: Water table
15-35% slopes	Severe / Very low Percs slowly / 20 Wetness / 20 Slope / 20	Severe / Low Wetness / 20 Slope / 20	Severe / Low Wetness / 20 Slope / 20	Poor: Excess clay Wet unstable Thin layer	Severe / Very low Mounding / 20 Slope / 20	Poor: Water table High runoff
CANTON						
fine sandy loam very stony fine sandy loam						
3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High runoff
CANTON and CHARLTON						
extremely stony fine sandy loams						
3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Slope / 9,19	Poor: Large stones

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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4. Restricted percolation testing
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9. Surface runoff control
10. Regional drainage
11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
14. Isolation from domestic wells
15. Flood control
16. Sewage collection
17. Landfill leachate treatment
18. Control housing density
19. Reduce application rate; additional storage
20. Least suitable for use

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	Sanitary landfill Trench type	Sanitary landfill Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	Wastewater disposal-tertiary treatment Renovation suitability
CANTON and CHARLTON (continued)						
15-35% slopes	Severe / Medium Large stones / 11 Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,18 Large stones / 11,13	Poor: Slope Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Large stones High runoff
CARLISLE (I.W.)						
muck	Severe / Very low Wetness / 20 Unstable muck / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Unstable muck	Severe / Very low Ponding / 20 Unstable muck / 20	Poor: Water table
CHARLTON						
fine sandy loam very stony fine sandy loam						
3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High runoff
CHARLTON-HOLLIS						
very stony fine sandy loams						
3-15% slopes	Severe / Medium Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Seepage / 20 Depth to rock / 20	Fair: Thin layer Stones	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
15-40% slopes	Severe / Low Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17 Slope / 9 Depth to rock / 7	Severe / Very low Seepage / 20 Depth to rock / 20	Poor: Thin layer Slope Stones	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
CHESHIRE						
fine sandy loam very stony fine sandy loam						
0-3% slopes 3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High runoff
extremely stony fine sandy loam						
3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Slope / 9,19	Poor: Large stones
15-35% slopes	Severe / Medium Large stones / 11 Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13 Large stones / 11,13	Poor: Slope Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Large stones High runoff
CHESHIRE-HOLYOKE						
complex						
3-15% slopes	Severe / Medium Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Seepage / 20 Depth to rock / 20	Fair: Thin layer	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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13. Area fill perferred
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15. Flood control
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19. Reduce application rate; additional storage
20. Least suitable for use

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	Sanitary landfill Trench type	Sanitary landfill Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	Wastewater disposal-tertiary treatment Renovation suitability
CHESHIRE-HOLYOKE (continued)						
15-40% slopes	Severe / Low Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17 Slope / 9 Depth to rock / 7	Severe / Very low Seepage / 20 Depth to rock / 20	Poor: Thin layer Slope	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
COPAKE						
loam 0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange High pH
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange High pH
DEERFIELD						
loamy fine sand	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low Mounding / 19 Potential aquifer / 5	Poor: Low exchange Water table
DUMPS	Severe / Very low Unstable / 20	—	—	—	Severe / Very low Unstable / 20	Poor: Variable material
ELLINGTON						
fine sandy loam 0-5% slopes	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low* Mounding / 19 Potential aquifer / 5	Poor: Low exchange Water table
ELMWOOD						
fine sandy loam 0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12,16 Wetness / 10	Severe / Medium Wetness / 10 Percs slowly / 8	Severe / Medium Wetness / 10,13 Percs slowly / 8	Poor: Excess clay Thin layer	Severe / Low Mounding / 20	Poor: Water table
ENFIELD						
silt loam 0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5	Fair Substratum, low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5 Slope / 9,19	Fair: Substratum, low exchange
FARMINGTON-NELLIS						
complex 3-15% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer High pH
15-35% slopes	Severe / Very low Depth to rock / 20 Smears / 20 Slope / 20	Severe / Low Seepage / 4,17 Slope / 9,11 Depth to rock / 7	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones Slope	Severe / Very low Large stones / 20 Slope / 20	Poor: thin layer High runoff High pH
FARMINGTON-ROCK OUTCROP						
complex 3-15% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20	Poor: Thin layer Large stones	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High pH

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifer is of low yield and does not constitute a major source of groundwater supply.

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FARMINGTON-ROCK OUTCROP (continued)						
15-35% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Slope / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Poor: Thin layer Large stones Slope	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High runoff High pH
FREDON (I.W.)						
silt loam	Severe / Low Wetness / 4,7,10	Severe / Medium Wetness / 10 Seepage / 14	Severe / Very low Wetness / 20 Seepage / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
GEORGIA						
silt loam very stony silt loam 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Thin layer Stones	Severe / Low Mounding / 19	Poor: Water table High pH
8-15% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8 Slope / 1	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Thin layer Stones	Severe / Low Mounding / 19 Slope / 9,19	Poor: Water table High pH
GLOUCESTER						
sandy loam very stony sandy loam 3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High runoff
extremely stony sandy loam 3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Slope / 9,19	Poor: Large stones
15-35% slopes	Severe / Medium Large stones / 11 Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13 Large stones / 11,13	Poor: Slope Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Large stones High runoff
GRANBY (I.W.)						
loamy fine sand	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
GROTON						
gravelly sandy loam 0-3% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange High pH
3-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange High pH
HADLEY (I.W.)						
silt loam	Severe / Low Floods / 15 Smears / 2,3	Severe / Low Floods / 15 Seepage / 14	Severe / Low Floods / 15 Seepage / 14	Fair: Thin layer Wet unstable	Severe / Very low Floods / 20	Poor: Low exchange
HAMLIN (I.W.)						
silt loam	Severe / Low Floods / 15 Smears / 2,3	Severe / Low Floods / 15 Seepage / 14	Severe / Low Floods / 15 Seepage / 14	Fair: Thin layer Wet unstable	Severe / Very low Floods / 20	Poor: Low exchange

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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Soil name / Slope	Septic tanks: Leaching fields	Sanitary landfill: Area type	Sanitary landfill: Trench type	Sanitary landfill: Suitability for daily cover	Wastewater disposal-tertiary treatment: Spray irrigation system	Wastewater disposal-tertiary treatment: Renovation suitability
HARTFORD sandy loam						
0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
HAVEN silt loam						
0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5	Fair: Substratum, low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Fair: Solum Good: Substratum	Severe / Low* Potential aquifer / 5 Slope / 9,19	Fair: Substratum, low exchange
HERO loam						
0-3% slopes 3-8% slopes	Severe / Low Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low Mounding / 19 Potential aquifer / 5	Poor: Low exchange Water table
HINCKLEY gravelly sandy loam						
0-3% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange
3-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
HINCKLEY and MANCHESTER gravelly sandy loams						
15-45% slopes	Severe / Low* Poor filter / 16,18 Slope / 1,11	Severe / Low Seepage / 5,14,17 Slope / 9	Severe / Low Seepage / 5,14,17 Slope / 9,11	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange High runoff
HOLLIS-CHARLTON extremely stony fine sandy loams						
3-15% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer
15-40% slopes	Severe / Very low Depth to rock / 20 Smears / 20 Slope / 20	Severe / Low Seepage / 14,17 Slope / 9,11 Depth to rock / 7	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones Slope	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer High runoff
HOLLIS-ROCK OUTCROP complex						
3-15% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20	Poor: Thin layer Large stones	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High runoff
15-40% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Poor: Thin layer Large stones Slope	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High runoff
HOLYOKE-CHESHIRE complex						
3-15% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3 Slope / 1,11	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer

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Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	 Trench type	 Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	 Renovation suitability
HOLYOKE-CHESHIRE (continued)						
15-35% slopes	Severe / Very low Depth to rock / 20 Smears / 20 Slope / 20	Severe / Low Seepage / 14,17 Slope / 9,11 Depth to rock / 7	Severe / Very low Depth to rock / 20 Seepage / 20 Large stones / 20	Poor: Thin layer Large stones Slope	Severe / Very low Large stones / 20 Slope / 20	Poor: Thin layer High runoff
HOLYOKE-ROCK OUTCROP complex						
3-15% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20	Poor: Thin layer Large stones	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer
15-40% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Seepage / 20 Slope / 20 Depth to rock / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Poor: Thin layer Large stones Slope	Severe / Very low Slope / 20 Depth to rock / 20	Poor: Thin layer High runoff
KENDAIA (I.W.)						
silt loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table High pH
KENDAIA and LYONS (I.W.) extremely stony silt loams	Severe / Very low Wetness / 20 Percs slowly / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Ponding / 20 Large stones / 20	Poor: Water table High pH
LEICESTER (I.W.)						
fine sandy loam	Severe / Low Wetness / 4,7,10	Severe / Medium Wetness / 10 Seepage / 14	Severe / Very low Wetness / 20 Seepage / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
LIMERICK						
silt loam	Severe / Low Floods / 15 Wetness / 4,7,10	Severe / Low Floods / 15 Wetness / 7,10	Severe / Very low Floods / 20 Wetness / 20	Poor: Thin layer Floods	Severe / Very low Ponding / 20 Floods / 20	Poor: Water table
LUDLOW silt loam very stony silt loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Wet unstable Thin layer	Severe / Low Mounding / 19	Poor: Water table
8-15% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8 Slope / 1	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Wet unstable Thin layer	Severe / Low Mounding / 19 Slope / 9,19	Poor: Water table
extremely stony silt loam						
3-15% slopes	Severe / Low Percs slowly / 4,12 Wetness / 8 Slope / 1 Large stones / 11	Severe / Medium Wetness / 8,10	Severe / Low Wetness / 8,13 Large stones / 11,13	Poor: Wet unstable Large stones Thin layer	Severe / Low Mounding / 19 Slope / 9,19 Large stones / 6,19	Poor: Water table Large stones
LYONS (I.W.)						
silt loam	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table High pH
MANCHESTER gravelly sandy loam						
0-3% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange
3-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange

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11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
14. Isolation from domestic wells
15. Flood control
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18. Control housing density
19. Reduce application rate; additional storage
20. Least suitable for use

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks	Sanitary landfill			Wastewater disposal-tertiary treatment	
	Leaching fields	Area type	Trench type	Suitability for daily cover	Spray irrigation system	Renovation suitability
MELROSE						
sandy loam 0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 3,4,12	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Poor: Excess clay-substratum Wet unstable Thin layer	Severe / Low Mounding / 19	Poor: Solum, low exchange
15-35% slopes	Severe / Very low Percs slowly / 20 Slope / 20	Severe / Very low Percs slowly / 20 Slope / 20	Severe / Very low Percs slowly / 20 Slope / 20	Poor: Excess clay-substratum Wet unstable Thin layer	Severe / Very low Mounding / 20 Slope / 20	Poor: Solum, low exchange High runoff
MENLO (I.W.)						
silt loam	Severe / Very low Wetness / 20 Percs slowly / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
MERRIMAC						
sandy loam 0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5	Poor: Low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Good	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
MONTAUK						
fine sandy loam very stony fine sandy loam 3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Good
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Good
extremely stony fine sandy loam 3-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Large stones / 11 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Mounding / 19	Poor: Large stones
15-35% slopes	Severe / Medium Percs slowly / 4,8,12 Large stones / 11 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Large stones / 11,13 Slope / 9,11,13	Poor: Large stones Slope	Severe / Very low Large stones / 20 Slope / 20 Mounding / 20	Poor: Large stones High runoff
MONTAUK-ROCK OUTCROP						
complex 3-15% slopes	Severe / Medium Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Seepage / 20 Depth to rock / 20	Poor: Thin layer Large stones	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
NARRAGANSETT						
silt loam very stony silt loam 0-3% slopes 3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Good
8-15% slopes	Moderate / High Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Good
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High runoff

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	 Trench type	 Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	 Renovation suitability
NARRAGANSETT (continued)						
extremely stony silt loam						
3-15% slopes	Severe / Medium Large stones / 11 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Slope / 9,19	Poor: Large stones
15-35% slopes	Severe / Medium Large stones / 11 Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13 Large stones / 11,13	Poor: Slope Large stones	Severe / Very low Large stones / 20 Slope / 20	Poor: Large stones High runoff
NARRAGANSETT-HOLLIS						
complex						
3-15% slopes	Severe / Medium Depth to rock / 7 Poor filter / 16,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20	Fair: Thin layer	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
NELLIS						
fine sandy loam very stony fine sandy loam						
0-3% slopes 3-8% slopes	Moderate / High Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Slight / High	Poor High pH
8-15% slopes	Moderate / High Smears / 2,3 Slope /	Severe / Low Seepage / 14,17	Severe / Low Seepage / 14,17	Good to fair: Stones	Moderate / Medium Slope / 9,19	Poor High pH
15-25% slopes	Severe / Medium Slope / 1,11 Smears / 2,3	Severe / Low Seepage / 14,17 Slope / 9	Severe / Low Seepage / 14,17 Slope / 9,11,13	Poor: Slope Stones	Severe / Low Slope / 9,19	Poor: High pH High runoff
NINIGRET						
fine sandy loam						
0-5% slopes	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low* Mounding / 19 Potential aquifer / 5	Poor: Low exchange
ONDAWA (I.W.)						
sandy loam	Severe / Low Floods / 15 Poor filter / 16,18	Severe / Low Floods / 15 Seepage / 14	Severe / Low Floods / 15 Seepage / 14	Poor: Thin layer Too sandy	Severe / Very low Floods / 20	Poor: Low exchange
PAWCATUCK (T.W.)						
mucky peat	Severe / Very low Tide flooding / 20 Unstable muck / 20	Severe / Very low Tide flooding / 20 Unstable muck / 20	Severe / Very low Tide flooding / 20 Unstable muck / 20	Poor: Thin layer Unstable muck	Severe / Very low Tide flooding / 20 Unstable muck / 20	Poor: Tide flooding Water table
PAXTON						
fine sandy loam very stony fine sandy loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Good
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Good
15-25% slopes	Severe / Medium Percs slowly / 4,8,12 Slope / 1,11 Smears / 3	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Slope / 9,11,13	Poor: Stones Slope	Severe / Low Mounding / 19 Slope / 9,19	Poor: High runoff

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

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Soil name Slope	Septic tanks: Leaching fields	Sanitary landfill: Area type	Sanitary landfill: Trench type	Sanitary landfill: Suitability for daily cover	Wastewater disposal-tertiary treatment: Spray irrigation system	Wastewater disposal-tertiary treatment: Renovation suitability
PAXTON and BROADBROOK						
extremely stony soils						
0-3% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Large stones / 11	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Mounding / 19	Poor: Large stones
3-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Large stones / 11 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Mounding / 19 Slope / 9,19	Poor: Large stones
15-35% slopes	Severe / Medium Percs slowly / 4,8,12 Large stones / 11 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Large stones / 11,13 Slope / 9,11,13	Poor: Large stones Slope	Severe / Very low Large stones / 20 Slope / 20 Mounding / 20	Poor: Large stones High runoff
PENWOOD						
loamy sand						
0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Poor: Too sandy	Severe / Low* Potential aquifer / 5	Poor: Low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Poor: Too sandy	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
PIPESTONE (I.W.)						
loamy fine sand	Severe / Low Wetness / 4,7,10	Severe / Medium Wetness / 10 Seepage / 14	Severe / Very low Wetness / 20 Seepage / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
PITS						
gravel	Severe / Very low Poor filter / 20 Wetness / 20	Severe / Low Seepage / 5,14,17 Wetness / 10	Severe / Low Seepage / 5,14,17 Wetness / 10	Poor: Too sandy	Severe / Very low Potential aquifer / 20 Wetness / 20	Poor: Low exchange
POOTATUCK (I.W.)						
fine sandy loam	Severe / Low Floods / 15 Wetness / 4,10	Severe / Low Floods / 15 Wetness / 10 Seepage / 5,14,17	Severe / Very low Floods / 20 Wetness / 20 Seepage / 20	Fair: Thin layer	Severe / Very low Floods / 20	Poor: Water table Low exchange
POOTATUCK VARIANT (I.W.)						
silt loam	Severe / Low Floods / 15 Wetness / 4,10	Severe / Low Floods / 15 Wetness / 10 Seepage / 5,14,17	Severe / Very low Floods / 20 Wetness / 20 Seepage / 20	Fair: Thin layer	Severe / Very low Floods / 20	Poor: Water table Substratum, low exchange
POQUONOCK						
sandy loam						
3-8% slopes	Severe / Medium Percs slowly / 3,4,12	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good	Severe / Low Mounding / 19	Poor: Low exchange
8-15% slopes	Severe / Medium Percs slowly / 3,4,12 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good	Severe / Low Mounding / 19 Slope / 9,19	Poor: Low exchange
QUARRIES	Severe / Very low No soil / 20	Severe / Very low Bedrock / 20	Severe / Very low Bedrock / 20	Poor: No soil	Severe / Very low No soil / 20	Poor: No soil

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Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	Sanitary landfill Trench type	Sanitary landfill Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	Wastewater disposal-tertiary treatment Renovation suitability
RAINBOW						
silt loam very stony silt loam 0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Wet unstable Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table
RAYNHAM (I.W.)						
silt loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
RAYPOL (I.W.)						
silt loam	Severe / Low Wetness / 4,7,10	Severe / Medium Wetness / 10 Seepage / 14	Severe / Very low Wetness / 20 Seepage / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
RIDGEBURY (I.W.)						
fine sandy loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
RIDGEBURY, LEICESTER and WHITMAN						
extremely stony fine sandy loams	Severe / Very low Wetness / 20 Percs slowly / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Ponding / 20 Large stones / 20	Poor: Water table
RIPPOWAM (I.W.)						
fine sandy loam	Severe / Low Floods / 15 Wetness / 4,7,10	Severe / Low Floods / 15 Wetness / 7,10	Severe / Very low Wetness / 20 Floods / 20	Poor: Thin layer Floods	Severe / Very low Ponding / 20 Floods / 20	Poor: Water table
RIPPOWAM VARIANT (I.W.)						
silt loam	Severe / Low Floods / 15 Wetness / 4,7,10	Severe / Low Floods / 15 Wetness / 7,10	Severe / Very low Wetness / 20 Floods / 20	Poor: Thin layer Floods	Severe / Very low Ponding / 20 Floods / 20	Poor: Water table
RIVERWASH (I.W.)						
	Severe / Very low Wetness / 20 Floods / 20	Severe / Very low Wetness / 20 Floods / 20	Severe / Very low Wetness / 20 Floods / 20	Poor: Thin layer	Severe / Very low Floods / 20	Poor: Water table
ROCK OUTCROP-HOLLIS **ROCK OUTCROP-HOLYOKE**						
complex 0-45% slopes	Severe / Very low Depth to rock / 20 Slope / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Severe / Very low Depth to rock / 20 Seepage / 20 Slope / 20	Poor: Thin layer Large stones	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer
SACO (I.W.)						
silt loam	Severe / Very low Floods / 20 Wetness / 20	Severe / Very low Floods / 20 Wetness / 20	Severe / Very low Floods / 20 Wetness / 20	Poor: Thin layer	Severe / Very low Floods / 20	Poor: Water table
SCANTIC (I.W.)						
silt loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer Excess clay	Severe / Very low Ponding / 20	Poor: Water table
SCARBORO (I.W.)						
mucky loamy fine sand	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table

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Soil name Slope	Leaching fields	Area type	Trench type	Suitability for daily cover	Spray irrigation system	Renovation suitability
SCIO						
silt loam 0-3% slopes 3-8% slopes	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low* Mounding / 19 Potential aquifer / 5	Poor: Water table Low exchange
STOCKBRIDGE						
loam very stony loam 0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Poor: High pH
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Poor: High pH
15-35% slopes	Severe / Medium Percs slowly / 4,8,12 Slope / 1,11 Smears / 3	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Slope / 9,11,13	Poor: Stones Slope	Severe / Low Mounding / 19 Slope / 9,19	Poor: High pH High runoff
SUDBURY						
sandy loam 0-5% slopes	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low* Mounding / 19 Potential aquifer / 5	Poor: Low exchange Water table
SUNCOOK (I.W.)						
loamy sand	Severe / Low Floods / 15 Poor filter / 16,18	Severe / Low Floods / 15 Seepage / 14	Severe / Low Floods / 15 Seepage / 14	Poor: Thin layer Too sandy	Severe / Very low Floods / 20	Poor: Low exchange
SUTTON						
fine sandy loam very stony fine sandy loam 0-3% slopes 3-8% slopes	Severe / Medium Wetness / 4,10 Smears / 2,3	Severe / Medium Wetness / 10 Seepage / 14	Severe / Medium Wetness / 10,13 Seepage / 14	Fair: Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table
extremely stony fine sandy loam 0-3% slopes	Severe / Medium Wetness / 4,10 Smears / 2,3 Large stones / 11	Severe / Medium Wetness / 10 Seepage / 14	Severe / Low Wetness / 10 Large stones / 11,13 Seepage / 14	Poor: Large stones Thin layer	Severe / Low Mounding / 19 Large stones / 6,19	Poor: Water table Large stones
3-15% slopes	Severe / Medium Wetness / 4,10 Smears / 2,3 Large stones / 11 Slope / 1	Severe / Medium Wetness / 10 Seepage / 14	Severe / Medium Wetness / 10 Seepage / 14 Large stones / 11,13	Poor: Large stones Thin layer	Severe / Low Mounding / 19 Large stones / 6,19 Slope / 9.19	Poor: Water table Large stones
SWANTON (I.W.)						
fine sandy loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer Excess clay	Severe / Very low Ponding / 20	Poor: Water table
TEEL (I.W.)						
silt loam	Severe / Low Floods / 15 Wetness / 4,10	Severe / Medium Floods / 15 Wetness / 10	Severe / Very low Floods / 20 Wetness / 20	Fair: Wet unstable Thin layer	Severe / Very low Floods / 20	Poor: Water table High pH
TISBURY						
silt loam 0-3% slopes 3-8% slopes	Severe / Low* Wetness / 4,10 Poor filter / 16,18	Severe / Low Wetness / 10 Seepage / 5,14,17	Severe / Low Wetness / 10,13 Seepage / 5,14,17	Fair: Thin layer	Severe / Low* Mounding / 19 Potential aquifer / 5	Poor: Water table Low exchange

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7. Addition of fill
8. Interceptor drains over hardpan
9. Surface runoff control
10. Regional drainage
11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
14. Isolation from domestic wells
15. Flood control
16. Sewage collection
17. Landfill leachate treatment
18. Control housing density
19. Reduce application rate; additional storage
20. Least suitable for use

Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	Sanitary landfill Trench type	Sanitary landfill Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	Wastewater disposal-tertiary treatment Renovation suitability
UDORTHENTS-URBAN LAND						
complex	Variable	Variable	Variable	Variable	Variable	Variable
UNADILLA						
silt loam						
0-3% slopes 3-8% slopes	Moderate / Medium* Percs slowly / 4,12 Smears / 2,3	Moderate / Medium Seepage / 5,14	Severe / Low Seepage / 5,14,17	Fair: Wet unstable	Moderate / Medium* Potential aquifer / 5	Fair: Substratum, low exchange
8-15% slopes	Moderate / Medium* Percs slowly / 4,12 Smears / 2,3 Slope / 1	Moderate / Medium Seepage / 5,14	Severe / Low Seepage / 5,14,17	Fair: Wet unstable	Moderate / Medium* Potential aquifer / 5 Slope / 9,19	Fair: Substratum, low exchange
URBAN LAND	Variable	—	—	—	Variable	Variable
WALPOLE (I.W.)						
sandy loam	Severe / Low Wetness / 4,7,10	Severe / Medium Wetness / 10 Seepage / 14	Severe / Very low Wetness / 20 Seepage / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
WAPPING						
silt loam very stony silt loam						
0-3% slopes 3-8% slopes	Severe / Medium Wetness / 4,10 Smears / 2,3	Severe / Medium Wetness / 10 Seepage / 14	Severe / Medium Wetness / 10,13 Seepage / 14	Fair: Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table
WATCHAUG						
fine sandy loam very stony fine sandy loam						
0-3% slopes 3-8% slopes	Severe / Medium Wetness / 4,10 Smears / 2,3	Severe / Medium Wetness / 10 Seepage / 14	Severe / Medium Wetness / 10,13 Seepage / 14	Fair: Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table
WESTBROOK (T.W.)						
mucky peat	Severe / Very low Tide flooding / 20 Unstable muck / 20	Severe / Very low Tide flooding / 20 Unstable muck / 20	Severe / Very low Tide flooding / 20 Unstable muck / 20	Poor: Unstable muck Floods	Severe / Very low Tide flooding / 20 Unstable muck / 20	Poor: Tide flooding Water table
WETHERSFIELD						
loam very stony loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19	Good
8-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8	Good to fair: Stones	Severe / Low Mounding / 19 Slope / 9,19	Good
15-25% slopes	Severe / Medium Percs slowly / 4,8,12 Slope / 1,11 Smears / 3	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Slope / 9,11,13	Poor: Stones Slope	Severe / Low Mounding / 19 Slope / 9,19	Poor: High runoff
extremely stony loam						
3-15% slopes	Severe / Medium Percs slowly / 4,8,12 Smears / 3 Large stones / 11 Slope / 1	Severe / Medium Percs slowly / 8	Severe / Medium Percs slowly / 8 Large stones / 11,13	Poor: Large stones	Severe / Low Large stones / 6,19 Mounding / 19	Poor: Large stones
15-35% slopes	Severe / Medium Percs slowly / 4,8,12 Large stones / 11 Smears / 3 Slope / 1	Severe / Medium Percs slowly / 8 Slope / 9	Severe / Medium Percs slowly / 8 Large stones / 11,13 Slope / 9,11,13	Poor: Large stones Slope	Severe / Very low Large stones / 20 Slope / 20 Mounding / 20	Poor: Large stones High runoff

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

** Management practices to overcome soil limitations:

1. Serial tile distribution
2. Enlarge leaching area
3. Avoid construction when wet
4. Restricted percolation testing
5. Determine underlying aquifer
6. Modify irrigation spacing
7. Addition of fill
8. Interceptor drains over hardpan
9. Surface runoff control
10. Regional drainage
11. Land shaping and/or stone removal
12. Large field, sand filter, or mound system
13. Area fill perferred
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Table 3. Limitations / Potentials of Soils for Waste Disposal

Soil name Slope	Septic tanks Leaching fields	Sanitary landfill Area type	 Trench type	 Suitability for daily cover	Wastewater disposal-tertiary treatment Spray irrigation system	 Renovation suitability
WHATELY (I.W.)						
loam	Severe / Very low Percs slowly / 20 Wetness / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20	Poor: Thin layer Excess clay	Severe / Very low Ponding / 20	Poor: Water table
WILBRAHAM (I.W.)						
silt loam very stony silt loam	Severe / Low Wetness / 4,7,10 Percs slowly / 8,12	Severe / Medium Wetness / 10	Severe / Very low Wetness / 20	Poor: Thin layer	Severe / Very low Ponding / 20	Poor: Water table
WILBRAHAM and MENLO (I.W.)						
extremely stony silt loams	Severe / Very low Wetness / 20 Percs slowly / 20 Large stones / 20	Severe / Very low Wetness / 20	Severe / Very low Wetness / 20 Large stones / 20	Poor: Thin layer Large stones	Severe / Very low Ponding / 20 Large stones / 20	Poor: Water table
WINDSOR						
loamy sand						
0-3% slopes 3-8% slopes	Severe / Low* Poor filter / 16,18	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Poor: Too sandy	Severe / Low* Potential aquifer / 5	Poor: Low exchange
8-15% slopes	Severe / Low* Poor filter / 16,18 Slope / 1	Severe / Low Seepage / 5,14,17	Severe / Low Seepage / 5,14,17	Poor: Too sandy	Severe / Low* Potential aquifer / 5 Slope / 9,19	Poor: Low exchange
WINOOSKI (I.W.)						
silt loam	Severe / Low Floods / 15 Wetness / 4,10	Severe / Medium Floods / 15 Wetness / 10	Severe / Very low Floods / 20 Wetness / 20	Fair: Wet unstable Thin layer	Severe / Very low Floods / 20	Poor: Water table
WOODBRIDGE						
fine sandy loam very stony fine sandy loam						
0-3% slopes 3-8% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Stones Thin layer	Severe / Low Mounding / 19	Poor: Water table
8-15% slopes	Severe / Medium Percs slowly / 4,12 Wetness / 8 Slope / 1	Severe / Medium Wetness / 8,10	Severe / Medium Wetness / 8,13	Fair: Stones Thin layer	Severe / Low Mounding / 19 slope / 9,19	Poor: Water table
extremely stony fine sandy loam						
0-3% slopes	Severe / Low Percs slowly / 4,12 Wetness / 8 Large stones / 11	Severe / Medium Wetness / 8,10	Severe / Low Wetness / 8,13 Large stones / 11,13	Poor: Large stones Thin layer	Severe / Low Mounding / 19 Large stones / 6,19	Poor: Water table Large stones
3-15% slopes	Severe / Low Percs slowly / 4,12 Wetness / 8 Large stones / 11 Slope / 1	Severe / Medium Wetness / 8,10	Severe / Low Wetness / 8,13 Large stones / 11,13	Poor: Large stones Thin layer	Severe / Low Mounding / 19 Large stones / 6,19 Slope / 9,19	Poor: Water table Large stones
YALESVILLE						
fine sandy loam						
3-8% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20	Fair: Thin layer	Severe / Very low Depth to rock / 20	Poor: Thin layer
8-15% slopes	Severe / Low Depth to rock / 7,18 Smears / 2,3 Slope / 1	Severe / Low Seepage / 14,17	Severe / Very low Depth to rock / 20 Seepage / 20	Fair: Thin layer	Severe / Very low Depth to rock / 20 Slope / 20	Poor: Thin layer

* Poor renovation potential and filtration capacity of sandy substrata. Pollution hazards increase as (1) maximum high water table becomes closer to base of leaching system, (2) substrata contains increasing amount of gravel and (3) density of septic tanks per acre increases. These soils may be associated with high yielding groundwater aquifers. Potential rating upgraded to Fair or Good if underlying aquifier is of low yield and does not constitute a major source of groundwater supply.

** Management practices to overcome soil limitations:

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13. Area fill perferred
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15. Flood control
16. Sewage collection
17. Landfill leachate treatment
18. Control housing density
19. Reduce application rate; additional storage
20. Least suitable for use

Appendix A

The Connecticut Cooperative Soil Survey initiated a detailed soil survey in 1948. During the intervening 30 years, the concepts of soil classification changed as new knowledge was gained about the properties of soils. These changes necessitate reevaluation of the ranges of properties that are used to define each soil series. During reevaluation, ranges may either be broadened to create one series where two existed or narrowed to create two series where only one existed. Thus, the published soil surveys of Hartford (1962), Tolland (1966) and Litchfield (1970) Counties contain some series names that are now obsolete. New series names have been added. Some series names have also been combined as complexes in recent years and some slope units have been combined with others because their areal extent is only a few acres out of Connecticut's 3.1 million acres. For the convenience of readers in Hartford, Tolland, and Litchfield Counties whose reports have been published and for New Haven, and Middlesex Counties whose unpublished soils legends have been submitted for publication, we list the original legends and note the changes to conform to the present unified legend. This unified state soils legend was prepared in May 1978.

Hartford County, CT

Acton fine sandy loam, 0-3% slopes
See Sutton fine sandy loam, 0-3% slopes
Acton fine sandy loam, 3-8% slopes
See Sutton fine sandy loam, 3-8% slopes
Acton stony fine sandy loam, 3-8% slopes
See Sutton very stony fine sandy loam, 3-8% slopes
Agawam very fine sandy loam, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Agawam very fine sandy loam, 3-8% slopes
See Agawam fine sandy loam, 3-8% slopes
Agawam very fine sandy loam, 8-15% slopes
See Agawam fine sandy loam, 8-15% slopes
Agawam very fine sandy loam, overflow, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Alluvial land
See Rippowam fine sandy loam
Belgrade silt loam, 0-3% slopes
See Scio silt loam, 0-3% slopes
Belgrade silt loam, 3-8% slopes
See Scio silt loam, 3-8% slopes
Belgrade silt loam, reddish variant, 0-3% slopes
See Scio silt loam, 0-3% slopes
Belgrade silt loam, reddish variant, 3-8% slopes
See Scio silt loam, 3-8% slopes
Berlin silt loam, 8-15% slopes
See Berlin silt loam, 3-8% slopes
Bermudian sandy loam, 0-3% slopes
See Ondawa sandy loam
Bermudian silt loam, 0-3% slopes
See Pootatuck Variant silt loam
Biddeford silt loam, 0-3% slopes
See Biddeford silt loam
Biddeford silt loam, reddish variant, 0-3% slopes
See Biddeford silt loam
Bowmansville silt loam, 0-3% slopes
See Rippowam Variant silt loam
Broadbrook silt loam, 3-8% slopes, eroded
See Broadbrook silt loam, 3-8% slopes
Broadbrook silt loam, 8-15% slopes, eroded
See Broadbrook silt loam, 8-15% slopes
Broadbrook stony silt loam, 0-3% slopes
See Broadbrook very stony silt loam, 3-8% slopes
Broadbrook stony silt loam, 3-8% slopes
See Broadbrook very stony silt loam, 3-8% slopes
Broadbrook stony silt loam, 8-15% slopes
See Broadbrook very stony silt loam, 8-15% slopes
Broadbrook stony silt loam, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Brookfield stony fine sandy loam, 3-8% slopes
See Brookfield very stony fine sandy loam, 3-8% slopes
Brookfield stony fine sandy loam, 8-15% slopes
See Brookfield very stony fine sandy loam, 8-15% slopes
Charlton fine sandy loam, 0-3% slopes
See Charlton fine sandy loam, 3-8% slopes
Charlton stony fine sandy loam, 3-8% slopes
See Charlton very stony fine sandy loam, 3-8% slopes
Charlton stony fine sandy loam, 8-15% slopes
See Charlton very stony fine sandy loam, 8-15% slopes
Charlton stony fine sandy loam, 15-25% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Charlton very stony fine sandy loam, 3-15% slopes
See Canton and Charlton extremely stony fine sandy loams, 3-15% slopes
Charlton very stony fine sandy loam, 15-35% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Cheshire fine sandy loam, 3-8% slopes, eroded
See Cheshire fine sandy loam, 3-8% slopes
Cheshire fine sandy loam, 8-15% slopes, eroded
See Cheshire fine sandy loam, 8-15% slopes
Cheshire fine sandy loam, 15-25% slopes, eroded
See Cheshire fine sandy loam, 15-25% slopes
Cheshire stony fine sandy loam, 3-8% slopes
See Cheshire very stony fine sandy loam, 3-8% slopes
Cheshire stony fine sandy loam, 8-15% slopes
See Cheshire very stony fine sandy loam, 8-15% slopes
Cheshire stony fine sandy loam, 15-25% slopes
See Cheshire extremely stony fine sandy loam, 15-35% slopes
Cheshire very stony fine sandy loam, 3-15% slopes
See Cheshire extremely stony fine sandy loam, 3-15% slopes
Cheshire very stony fine sandy loam, 15-35% slopes
See Cheshire extremely stony fine sandy loam, 15-35% slopes
Ellington fine sandy loam, 0-3% slopes
See Ellington fine sandy loam, 0-5% slopes
Elmwood loamy sand, 0-3% slopes
See Elmwood fine sandy loam, 0-3% slopes
Elmwood sandy loam, 0-3% slopes
See Elmwood fine sandy loam, 0-3% slopes

Elmwood sandy loam, 3-8% slopes
See Elmwood fine sandy loam, 3-8% slopes
Elmwood very fine sandy loam, 0-3% slopes
See Elmwood fine sandy loam, 0-3% slopes
Elmwood very fine sandy loam, 3-8% slopes
See Elmwood fine sandy loam, 3-8% slopes
Enfield silt loam, 0-3% slopes, eroded
See Haven silt loam, 0-3% slopes
Enfield silt loam, 3-8% slopes, eroded
See Haven silt loam, 3-8% slopes
Enfield silt loam, 8-15% slopes, eroded
See Haven silt loam, 8-15% slopes
Enfield silt loam, overflow, 0-3% slopes
See Enfield silt loam, 0-3% slopes
Gloucester fine sandy loam, 0-3% slopes
See Canton fine sandy loam, 3-8% slopes
Gloucester fine sandy loam, 3-8% slopes
See Canton fine sandy loam, 3-8% slopes
Gloucester fine sandy loam, 8-15% slopes
See Canton fine sandy loam, 8-15% slopes
Gloucester fine sandy loam, 15-25% slopes
See Canton fine sandy loam, 15-25% slopes
Gloucester stony fine sandy loam, 3-8% slopes
See Canton very stony fine sandy loam, 3-8% slopes
Gloucester stony fine sandy loam, 8-15% slopes
See Canton very stony fine sandy loam, 8-15% slopes
Gloucester stony fine sandy loam, 15-25% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Gloucester and Brookfield very stony fine sandy loams, 3-15% slopes
See Canton and Charlton extremely stony fine sandy loams, 3-15% slopes
Gloucester and Brookfield very stony fine sandy loams, 15-35% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Hadley silt loam, 0-3% slopes
See Hadley silt loam
Hartford fine sandy loam, 0-3% slopes
See Hartford sandy loam, 0-3% slopes
Hartford fine sandy loam, 3-8% slopes
See Hartford sandy loam, 3-8% slopes
Hinckley loamy sand, 3-15% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Hollis rocky loam, 3-15% slopes
See Charlton-Hollis very stony fine sandy loams, 3-15% slopes
Hollis rocky loam, 15-35% slopes
See Charlton-Hollis very stony fine sandy loams, 15-40% slopes
Hollis very rocky loam, 3-15% slopes
See Hollis-Charlton extremely stony fine sandy loams, 3-15% slopes
Hollis very rocky loam, 15-35% slopes
See Hollis-Charlton extremely stony fine sandy loams, 15-40% slopes
Holyoke rocky silt loam, 3-15% slopes
See Cheshire-Holyoke complex, 3-15% slopes
Holyoke rocky silt loam, 15-35% slopes
See Cheshire-Holyoke complex, 15-40% slopes
Holyoke very rocky silt loam, 3-15% slopes
See Holyoke-Cheshire complex, 3-15% slopes
Holyoke very rocky loam, 15-35% slopes
See Holyoke-Cheshire complex, 15-35% slopes
Leicester loam, 0-3% slopes
See Leicester fine sandy loam
Leicester stony loam, 0-3% slopes
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Leicester, Whitman and Ridgebury very stony soils, 0-5% slopes
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Limerick silt loam, 0-3% slopes
See Limerick silt loam
Ludlow loam, 0-3% slopes
See Ludlow silt loam, 0-3% slopes
Ludlow loam, 3-8% slopes
See Ludlow silt loam, 3-8% slopes
Ludlow stony loam, 3-8% slopes
See Ludlow very stony silt loam, 3-8% slopes
Ludlow and Watchaug very stony soils, 3-15% slopes
See Ludlow extremely stony silt loam, 3-15% slopes
Made land
See Udorthents-Urban land complex
Manchester gravelly loam, 0-3% slopes
See Manchester gravelly sandy loam, 0-3% slopes
Manchester gravelly loam, 3-15% slopes
See Manchester gravelly sandy loam, 3-15% slopes
Manchester loamy sand, 3-15% slopes
See Manchester gravelly sandy loam, 3-15% slopes
Melrose very fine sandy loam, 0-3% slopes
See Melrose sandy loam, 0-3% slopes
Melrose very fine sandy loam, 3-8% slopes
See Melrose sandy loam, 3-8% slopes
Menlo stony silt loam, 0-3% slopes
See Wilbraham and Menlo extremely stony silt loams
Merrimac fine sandy loam, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Merrimac fine sandy loam, 3-8% slopes
See Agawam fine sandy loam, 3-8% slopes
Merrimac fine sandy loam, 8-15% slopes
See Agawam fine sandy loam, 8-15% slopes
Merrimac fine sandy loam, overflow, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Narragansett silt loam, 3-8% slopes, eroded
See Narragansett silt loam, 3-8% slopes
Narragansett silt loam, 8-15% slopes, eroded
See Narragansett silt loam, 8-15% slopes
Narragansett stony silt loam, 3-8% slopes
See Narragansett very stony silt loam, 3-8% slopes
Narragansett stony silt loam, 8-15% slopes
See Narragansett very stony silt loam, 8-15% slopes
Narragansett stony silt loam, 15-25% slopes
See Narragansett extremely stony silt loam, 15-35% slopes
Narragansett and Broadbrook very stony silt loams, 3-15% slopes
See Narragansett extremely stony silt loam, 3-15% slopes
Narragansett and Broadbrook very stony soils, 15-35% slopes
See Narragansett extremely stony silt loam, 15-35% slopes
Ninigret fine sandy loam, 0-3% slopes
See Ninigret fine sandy loam, 0-5% slopes
Ninigret fine sandy loam, 3-8% slopes
See Ninigret fine sandy loam, 0-5% slopes
Ninigret very fine sandy loam, 0-3% slopes
See Ninigret fine sandy loam, 0-5% slopes
Ninigret very fine sandy loam, 3-8% slopes
See Ninigret fine sandy loam, 0-5% slopes
Ondawa sandy loam, 0-3% slopes
See Ondawa sandy loam
Paxton fine sandy loam, reddish substratum, 3-8% slopes
See Paxton fine sandy loam, 3-8% slopes
Paxton fine sandy loam, reddish substratum, 8-15% slopes
See Paxton fine sandy loam, 8-15% slopes
Paxton fine sandy loam, reddish substratum, 15-25% slopes
See Paxton fine sandy loam, 15-25% slopes
Paxton loam, 3-8% slopes
See Paxton fine sandy loam, 3-8% slopes

Paxton loam, 8-15% slopes
See Paxton fine sandy loam, 8-15% slopes
Paxton loam, 15-25% slopes, eroded
See Paxton fine sandy loam, 15-25% slopes
Paxton stony fine sandy loam, reddish substratum, 3-8% slopes
See Paxton very stony fine sandy loam, 3-8% slopes
Paxton stony fine sandy loam, reddish substratum, 8-15% slopes
See Paxton very stony fine sandy loam, 8-15% slopes
Paxton stony fine sandy loam, reddish substratum, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Paxton stony loam, 3-8% slopes
See Paxton very stony fine sandy loam, 3-8% slopes
Paxton stony loam, 8-15% slopes
See Paxton very stony fine sandy loam, 8-15% slopes
Paxton stony loam, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Paxton very stony loam, 3-15% slopes
See Paxton and Broadbrook extremely stony soils, 3-15% slopes
Paxton very stony loam, 15-35% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Peats and Mucks
See Carlisle muck
Peats and Mucks, shallow
See Adrian and Palms mucks
Podunk sandy loam, 0-3% slopes
See Pootatuck fine sandy loam
Poquonock loamy sand, 3-8% slopes
See Poquonock sandy loam, 3-8% slopes
Poquonock loamy sand, 8-15% slopes
See Poquonock sandy loam, 8-15% slopes
Rainbow stony silt loam, 0-3% slopes
See Rainbow very stony silt loam, 0-3% slopes
Rainbow stony silt loam, 3-8% slopes
See Rainbow very stony silt loam, 3-8% slopes
Ridgebury loam, 0-3% slopes
See Ridgebury fine sandy loam
Rocky land, Hollis materials, 3-15% slopes
See Rock outcrop-Hollis complex, 0-45% slopes
Rocky land, Hollis materials, 15-35% slopes
See Rock outcrop-Hollis complex, 0-45% slopes
Rocky land, Holyoke materials, 3-15% slopes
See Rock outcrop-Holyoke complex, 0-45% slopes
Rocky land, Holyoke materials, 15-35% slopes
See Rock outcrop-Holyoke complex, 0-45% slopes
Rowland silt loam, 0-3% slopes
See Pootatuck Variant silt loam
Rumney sandy loam, 0-3% slopes
See Rippowam fine sandy loam
Saco sandy loam, 0-3% slopes
See Saco silt loam
Saco silt loam, 0-3% slopes
See Saco silt loam
Scantic silt loam, 0-3% slopes
See Scantic silt loam
Scantic silt loam, reddish variant, 0-3% slopes
See Scantic silt loam
Scarboro loam, 0-3% slopes
See Scarboro mucky loamy fine sand
Sudbury fine sandy loam, 0-3% slopes
See Sudbury sandy loam, 0-5% slopes
Suncook loamy sand, 0-3% slopes
See Suncook loamy sand
Sunderland rocky fine sandy loam, 3-15% slopes
See Cheshire-Holyoke complex, 3-15% slopes
Sunderland rocky fine sandy loam, 15-35% slopes
See Holyoke-Cheshire complex, 15-35% slopes
Sutton loam, 0-3% slopes
See Sutton fine sandy loam, 0-3% slopes
Sutton loam, 3-8% slopes
See Sutton fine sandy loam, 3-8% slopes
Sutton stony loam, 0-3% slopes
See Sutton very stony fine sandy loam, 0-3% slopes
Sutton stony loam, 3-8% slopes
See Sutton very stony fine sandy loam, 3-8% slopes
Sutton and Acton very stony loams, 3-15% slopes
See Sutton extremely stony fine sandy loam, 3-15% slopes
Swanton sandy loam, 0-3% slopes
See Swanton fine sandy loam
Swanton very fine sandy loam, 0-3% slopes
See Swanton fine sandy loam
Terrace escarpments, clay
See Buxton silt loam, 15-35% slopes
Terrace escarpments, sand and clay
See Melrose sandy loam, 15-35% slopes
Terrace escarpments, sand and gravel
See Hinckley and Manchester gravelly sandy loams, 15-45% slopes
Wallington silt loam, 0-3% slopes
See Raynham silt loam
Wallington silt loam, reddish variant, 0-3% slopes
See Raynham silt loam
Walpole loam, 0-3% slopes
See Raypol silt loam
Walpole sandy loam, 0-3% slopes
See Walpole sandy loam
Wapping stony silt loam, 0-3% slopes
See Wapping very stony silt loam, 0-3% slopes
Wapping stony silt loam, 3-8% slopes
See Wapping very stony silt loam, 3-8% slopes
Watchaug loam, 0-3% slopes
See Watchaug fine sandy loam, 0-3% slopes
Watchaug loam, 3-8% slopes
See Watchaug fine sandy loam, 3-8% slopes
Watchaug stony loam, 0-3% slopes
See Watchaug very stony fine sandy loam, 3-8% slopes
Watchaug stony loam, 3-8% slopes
See Watchaug very stony fine sandy loam, 3-8% slopes
Wethersfield loam, 3-8% slopes, eroded
See Wethersfield loam, 3-8% slopes
Wethersfield loam, 8-15% slopes, eroded
See Wethersfield loam, 8-15% slopes
Wethersfield loam, 15-25% slopes, severely eroded
See Wethersfield loam, 15-25% slopes
Wethersfield stony loam, 3-8% slopes
See Wethersfield very stony loam, 3-8% slopes
Wethersfield stony loam, 8-15% slopes
See Wethersfield very stony loam, 8-15% slopes
Wethersfield stony loam, 15-25% slopes
See Wethersfield extremely stony loam, 15-35% slopes
Wethersfield very stony loam, 3-15% slopes
See Wethersfield extremely stony loam, 3-15% slopes
Wethersfield very stony loam, 15-35% slopes
See Wethersfield extremely stony loam, 15-35% slopes
Whately loam, 0-3% slopes
See Whately loam
Whitman stony loam, 0-3% slopes
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Wilbraham silt loam 0-3% slopes
See Wilbraham silt loam
Wilbraham stony silt loam, 0-3% slopes
See Wilbraham very stony silt loam
Wilbraham and Menlo very stony silt loams, 0-3% slopes
See Wilbraham and Menlo extremely stony silt loams
Windsor loamy coarse sand, 0-3% slopes
See Windsor loamy sand, 0-3% slopes
Windsor loamy coarse sand, 3-8% slopes
See Windsor loamy sand, 3-8% slopes

Windsor loamy coarse sand, 8-15% slopes
See Windsor loamy sand, 8-15% slopes
Windsor loamy fine sand, 0-3% slopes
See Windsor loamy sand, 0-3% slopes
Windsor loamy fine sand, 3-8% slopes
See Windsor loamy sand, 3-8% slopes
Windsor loamy fine sand, 8-15% slopes
See Windsor loamy sand, 8-15% slopes
Winooski silt loam, 0-3% slopes
See Winooski silt loam
Woodbridge loam, 0-3% slopes
See Woodbridge fine sandy loam, 0-3% slopes
Woodbridge loam, 3-8% slopes
See Woodbridge fine sandy loam, 3-8% slopes
Woodbridge loam, reddish substratum, 0-3% slopes
See Woodbridge fine sandy loam, 0-3% slopes
Woodbridge loam, reddish substratum, 3-8% slopes
See Woodbridge fine sandy loam, 3-8% slopes
Woodbridge stony loam, 0-3% slopes
See Woodbridge very stony fine sandy loam, 0-3% slopes
Woodbridge stony loam, 3-8% slopes
See Woodbridge very stony fine sandy loam, 3-8% slopes
Woodbridge stony loam, reddish substratum, 3-8% slopes
See Woodbridge very stony fine sandy loam, 3-8% slopes
Woodbridge very stony soils, 3-15% slopes
See Woodbridge extremely stony fine sandy loam, 3-15% slopes
Mines and pits
See Pits, gravel

Litchfield County, CT

Alluvial land
See Rippowam fine sandy loam
Amenia stony silt loam, 3-8% slopes
See Amenia very stony silt loam, 3-8% slopes
Amenia stony silt loam, 8-15% slopes
See Amenia very stony silt loam, 8-15% slopes
Amenia very stony silt loam, 3-15% slopes
See Amenia extremely stony silt loam, 3-15% slopes
Au Gres loamy fine sand
See Pipestone loamy fine sand
Belgrade silt loam, 0-3% slopes
See Scio silt loam, 0-3% slopes
Belgrade silt loam, 3-8% slopes
See Scio silt loam, 3-8% slopes
Bernardston stony silt loam, 3-8% slopes
See Bernardston very stony silt loam, 3-8% slopes
Bernardston stony silt loam, 8-15% slopes
See Bernardston very stony silt loam, 8-15% slopes
Bernardston very stony silt loam, 3-15% slopes
See Bernardston extremely stony silt loam, 3-15% slopes
Bernardston very stony silt loam, 15-25% slopes
See Bernardston extremely stony silt loam, 15-25% slopes
Borrow and fill land, coarse material
See Udorthents-Urban land complex
Borrow and fill land, loamy material
See Udorthents-Urban land complex
Branford loam, 3-8% slopes
See Branford silt loam, 3-8% slopes
Branford loam, 8-15% slopes
See Branford silt loam, 8-15% slopes
Charlton fine sandy loam, 0-3% slopes
See Charlton fine sandy loam, 3-8% slopes
Charlton fine sandy loam, 3-8% slopes, eroded
See Charlton fine sandy loam, 3-8% slopes
Charlton fine sandy loam, 8-15% slopes, eroded
See Charlton fine sandy loam, 8-15% slopes
Charlton fine sandy loam, 25-35% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Charlton stony fine sandy loam, 3-8% slopes
See Charlton very stony fine sandy loam, 3-8% slopes
Charlton stony fine sandy loam, 8-15% slopes
See Charlton very stony fine sandy loam, 8-15% slopes
Charlton stony fine sandy loam, 15-25% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Charlton very stony fine sandy loam, 3-15% slopes
See Canton and Charlton extremely stony fine sandy loams, 3-15% slopes
Charlton very stony fine sandy loam, 15-35% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Deerfield loamy fine sand, 0-3% slopes
See Deerfield loamy fine sand
Dover stony fine sandy loam, 3-8% slopes
See Nellis very stony fine sandy loam, 3-8% slopes
Dover stony fine sandy loam, 8-15% slopes
See Nellis very stony fine sandy loam, 8-15% slopes
Eel silt loam
See Teel silt loam
Farmington very rocky silt loam, 3-15% slopes
See Farmington-Nellis complex, 3-15% slopes
Farmington very rocky silt loam, 15-35% slopes
See Farmington-Nellis complex, 15-35% slopes
Farmington extremely rocky silt loam, 3-15% slopes
See Farmington-Rock outcrop complex, 3-15% slopes
Farmington extremely rocky silt loam, 15-35% slopes
See Farmington-Rock outcrop complex, 15-35% slopes
Genesee silt loam
See Hamlin silt loam
Gloucester stony sandy loam, 3-8% slopes
See Gloucester very stony sandy loam, 3-8% slopes
Gloucester stony sandy loam, 8-15% slopes
See Gloucester very stony sandy loam, 8-15% slopes
Gloucester stony sandy loam, 15-25% slopes
See Gloucester extremely stony sandy loam, 15-35% slopes
Gloucester very stony sandy loam, 3-15% slopes
See Gloucester extremely stony sandy loam, 3-15% slopes
Gloucester very stony sandy loam, 15-35% slopes
See Gloucester extremely stony sandy loam, 15-35% slopes
Hartland silt loam, 0-3% slopes
See Unadilla silt loam, 0-3% slopes
Hartland silt loam, 3-8% slopes
See Unadilla silt loam, 3-8% slopes
Hartland silt loam, 8-15% slopes
See Unadilla silt loam, 8-15% slopes
Hinckley gravelly loamy sand, 0-3% slopes
See Hinckley gravelly sandy loam, 0-3% slopes
Hinckley gravelly loamy sand, 3-15% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Hollis rocky fine sandy loam, 3-15% slopes
See Charlton-Hollis very stony fine sandy loams, 3-15% slopes
Hollis very rocky fine sandy loam, 3-15% slopes
See Hollis-Charlton extremely stony fine sandy loams, 3-15% slopes
Hollis very rocky fine sandy loam, 15-35% slopes
See Hollis-Charlton extremely stony fine sandy loams, 15-35% slopes
Hollis extremely rocky fine sandy loam, 3-15% slopes
See Hollis-Rock outcrop complex, 3-15% slopes

Hollis extremely rocky fine sandy loam, 15-35% slopes
See Hollis-Rock outcrop complex, 15-40% slopes
Holyoke very rocky silt loam, 3-15% slopes
See Holyoke-Cheshire complex, 3-15% slopes
Holyoke extremely rocky silt loam, 15-35% slopes
See Holyoke-Rock outcrop complex, 15-40% slopes
Kendaia-Lyons very stony silt loams
See Kendaia and Lyons extremely stony silt loams
Leicester stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Leicester, Ridgebury and Whitman very stony fine sandy loams
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Made land
See Dumps
Muck, shallow
See Adrian and Palms mucks
Ondawa fine sandy loam
See Ondawa sandy loam
Paxton fine sandy loam, 3-8% slopes, eroded
See Paxton fine sandy loam, 3-8% slopes
Paxton fine sandy loam, 8-15% slopes, eroded
See Paxton fine sandy loam, 8-15% slopes
Paxton fine sandy loam, 15-25% slopes, eroded
See Paxton fine sandy loam, 15-25% slopes
Paxton fine sandy loam, 25-35% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Paxton stony fine sandy loam, 3-8% slopes
See Paxton very stony fine sandy loam, 3-8% slopes
Paxton stony fine sandy loam, 8-15% slopes
See Paxton very stony fine sandy loam, 8-15% slopes
Paxton stony fine sandy loam, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Paxton very stony fine sandy loam, 0-3% slopes
See Paxton and Broadbrook extremely stony soils, 0-3% slopes
Paxton very stony fine sandy loam, 3-15% slopes
See Paxton and Broadbrook extremely stony soils, 3-15% slopes
Paxton very stony fine sandy loam, 15-35% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Peat and Muck
See Carlisle muck
Podunk fine sandy loam
See Pootatuck fine sandy loam
Ridgebury stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Rock land
See Rock outcrop-Hollis complex, 0-40% slopes
Rumney fine sandy loam
See Rippowam fine sandy loam
Scarboro loamy fine sand
See Scarboro mucky loamy fine sand
Shapleigh very rocky sandy loam, 3-15% slopes
See Hollis-Charlton extremely stony fine sandy loams, 3-15% slopes
Shapleigh very rocky sandy loam, 15-35% slopes
See Hollis-Rock outcrop complex, 15-40% slopes
Shapleigh extremely rocky sandy loam, 3-15% slopes
See Hollis-Rock outcrop complex, 3-15% slopes
Shapleigh extremely rocky sandy loam, 15-35% slopes
See Hollis-Rock outcrop complex, 15-40% slopes
Stockbridge loam, 3-8% slopes, eroded
See Stockbridge loam, 3-8% slopes
Stockbridge loam, 8-15% slopes, eroded
See Stockbridge loam, 8-15% slopes
Stockbridge loam, 15-25% slopes, eroded
See Stockbridge loam, 15-35% slopes
Stockbridge stony loam, 3-8% slopes
See Stockbridge very stony loam, 3-8% slopes
Stockbridge stony loam, 8-15% slopes
See Stockbridge very stony loam, 8-15% slopes
Stockbridge stony loam, 15-25% slopes
See Stockbridge very stony loam, 15-35% slopes
Stockbridge very stony loam, 3-15% slopes
See Stockbridge very stony loam, 8-15% slopes
Suncook loamy fine sand
See Suncock loamy sand
Sutton stony fine sandy loam, 0-3% slopes
See Sutton very stony fine sandy loam, 0-3% slopes
Sutton stony fine sandy loam, 3-8% slopes
See Sutton very stony fine sandy loam, 3-8% slopes
Sutton very stony fine sandy loam, 0-3% slopes
See Sutton extremely stony fine sandy loam, 0-3% slopes
Sutton very stony fine sandy loam, 3-15% slopes
See Sutton extremely stony fine sandy loam, 3-15% slopes
Terrace escarpments
See Hinckley and Manchester gravelly sandy loams, 15-45% slopes
Tisbury and Sudbury soils, 0-3% slopes
See Tisbury silt loam, 0-3% slopes
Tisbury and Sudbury soils, 3-8% slopes
See Tisbury silt loam, 3-8% slopes
Walpole and Raynham soils
See Walpole sandy loam
Wareham loamy fine sand, nonacid variant
See Walpole sandy loam
Whitman stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Windsor loamy fine sand, 0-3% slopes
See Windsor loamy sand, 0-3% slopes
Windsor loamy fine sand, 3-8% slopes
See Windsor loamy sand, 3-8% slopes
Windsor loamy fine sand, 8-15% slopes
See Windsor loamy sand, 8-15% slopes
Woodbridge stony fine sandy loam, 0-3% slopes
See Woodbridge very stony fine sandy loam, 0-3% slopes
Woodbridge stony fine sandy loam, 3-8% slopes
See Woodbridge very stony fine sandy loam, 3-8% slopes
Woodbridge stony fine sandy loam, 8-15% slopes
See Woodbridge very stony fine sandy loam, 8-15% slopes
Woodbridge very stony fine sandy loam, 0-3% slopes
See Woodbridge extremely stony fine sandy loam, 0-3% slopes
Woodbridge very stony fine sandy loam, 3-15% slopes
See Woodbridge extremely stony fine sandy loam, 3-15% slopes

Middlesex County, CT

Adrian muck
See Adrian and Palms mucks
Berlin silt loam, 0-5% slopes
See Berlin silt loam, 0-3% slopes

Canton and Charlton fine sandy loams, 3-8% slopes
See Canton fine sandy loam, 3-8% slopes
Canton and Charlton very stony fine sandy loams, 3-8% slopes
See Canton very stony fine sandy loam, 3-8% slopes
Canton and Charlton very stony fine sandy loams, 8-15% slopes
See Canton very stony fine sandy loam, 8-15% slopes
Cheshire silt loam, 3-8% slopes
See Cheshire fine sandy loam, 3-8% slopes
Cheshire silt loam, 8-15% slopes
See Cheshire fine sandy loam, 8-15% slopes
Cheshire-Holyoke very stony silt loams, 3-15% slopes
See Cheshire-Holyoke complex, 3-15% slopes
Hinckley and Manchester soils, 15-45% slopes
See Hinckley and Manchester gravelly sandy loams, 15-45% slopes
Holyoke-Cheshire very stony silt loams, 15-35% slopes
See Holyoke-Cheshire complex, 15-35% slopes
Leicester, Ridgebury, and Whitman extremely stony fine sandy loams
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Merrimac sandy loam, 3-10% slopes
See Merrimac sandy loam, 3-8% slopes
Paxton and Montauk fine sandy loams, 3-8% slopes
See Paxton fine sandy loam, 3-8% slopes
Paxton and Montauk fine sandy loams, 8-15% slopes
See Paxton fine sandy loam, 8-15% slopes
Paxton and Montauk fine sandy loams, 15-25% slopes
See Paxton fine sandy loam, 15-25% slopes
Paxton and Montauk very stony fine sandy loams, 3-8% slopes
See Paxton very stony fine sandy loam, 3-8% slopes
Paxton and Montauk very stony fine sandy loams, 8-15% slopes
See Paxton very stony fine sandy loam, 8-15% slopes
Paxton and Montauk extremely stony fine sandy loams, 3-15% slopes
See Paxton and Broadbrook extremely stony soils, 3-15% slopes
Paxton and Montauk extremely stony fine sandy loams, 15-35% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Podunk fine sandy loam
See Pootatuck fine sandy loam
Rumney fine sandy loam
See Rippowam fine sandy loam
Rumney Variant silt loam
See Rippowam Variant silt loam
Wethersfield loam, 15-35% slopes
See Wethersfield loam, 15-25% slopes
Wilbraham extremely stony silt loam
See Wilbraham and Menlo extremely stony silt loams

New Haven County, CT

Beaches
See Beaches-Udipsamments complex
Charlton extremely stony fine sandy loam, 3-15% slopes
See Canton and Charlton extremely stony fine sandy loams, 3-15% slopes
Charlton extremely stony fine sandy loam, 15-35% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Charlton-Hollis fine sandy loams, 3-15% slopes
See Charlton-Hollis very stony fine sandy loams, 3-15% slopes
Ellington silt loam
See Ellington fine sandy loam, 0-5% slopes
Hinckley gravelly sandy loam, 3-8% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Hinckley gravelly sandy loam, 8-15% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Hinckley and Manchester soils, 15-35% slopes
See Hinckley and Mancester gravelly sandy loams, 15-45% slopes
Hollis-Charlton fine sandy loams, 15-35% slopes
See Hollis-Charlton extremely stony fine sandy loams, 15-40% slopes
Hollis-Rock outcrop complex, 15-35% slopes
See Hollis-Rock outcrop complex, 15-40% slopes
Holyoke silt loam, rocky, 3-15% slopes
See Holyoke-Cheshire complex, 3-15% slopes
Holyoke-Rock outcrop complex, 15-35% slopes
See Holyoke-Rock outcrop complex, 15-40% slopes
Manchester gravelly sandy loam, 3-8% slopes
See Manchester gravelly sandy loam, 3-15% slopes
Manchester gravelly sandy loam, 8-15% slopes
See Manchester gravelly sandy loam, 3-15% slopes
Ninigret fine sandy loam
See Ninigret fine sandy loam, 0-5% slopes
Paxton extremely stony fine sandy loam, 3-15% slopes
See Paxton and Broadbrook extremely stony soils, 3-15% slopes
Paxton extremely stony fine sandy loam, 15-35% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Podunk fine sandy loam
See Pootatuck fine sandv loam
Podunk Variant silt loam
See Pootatuck Variant silt loam
Rumney fine sandy loam
See Rippowam fine sandy loam
Rumney Variant silt loam
See Rippowam Variant silt loam
Scarboro muck
See Scarboro mucky loamy fine sand
Scio silt loam
See Scio silt loam, 0-3% slopes
Udorthents, smoothed
See Udorthents-Urban land complex

Tolland County, CT

Agawam sandy loam, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Agawam sandy loam, 3-8% slopes
See Agawam fine sandy loam, 3-8% slopes
Alluvial land
See Rumney fine sandy loam
Birchwood sandy loam, 0-3% slopes
See Birchwood fine sandy loam, 0-3% slopes

Birchwood sandy loam, 3-8% slopes
See Birchwood fine sandy loam, 3-8% slopes
Borrow and fill land, coarse materials
See Udorthents-Urban land complex
Borrow and fill land, loamy materials
See Udorthents-Urban land complex
Brimfield very rocky fine sandy loam, 3-15% slopes
See Brimfield-Brookfield extremely stony fine sandy loams, 3-15% slopes
Brimfield very rocky fine sandy loam, 15-25% slopes
See Brimfield-Brookfield extremely stony fine sandy loams, 15-35% slopes
Brimfield extremely rocky fine sandy loam, 3-15% slopes
See Brimfield-Rock outcrop complex, 3-15% slopes
Brimfield extremely rocky fine sandy loam, 15-25% slopes
See Brimfield-Rock outcrop complex, 15-35% slopes
Broadbrook stony silt loam, 3-8% slopes
See Broadbrook very stony silt loam, 3-8% slopes
Brookfield stony fine sandy loam, 3-15% slopes
See Brookfield very stony fine sandy loam, 8-15% slopes
Brookfield very stony fine sandy loam, 3-15% slopes
See Brookfield extremely stony fine sandy loam, 3-15% slopes
Brookfield very stony fine sandy loam, 15-25% slopes
See Brookfield extremely stony fine sandy loam, 15-25% slopes
Charlton stony fine sandy loam, 3-8% slopes
See Charlton very stony fine sandy loam, 3-8% slopes
Charlton stony fine sandy loam, 8-15% slopes
See Charlton very stony fine sandy loam, 8-15% slopes
Charlton stony fine sandy loam, 15-25% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Charlton very stony fine sandy loam, 3-15% slopes
See Canton and Charlton extremely stony fine sandy loams, 3-15% slopes
Charlton very stony fine sandy loam, 15-25% slopes
See Canton and Charlton extremely stony fine sandy loams, 15-35% slopes
Cheshire fine sandy loam, 8-15% slopes, eroded
See Cheshire fine sandy loam, 8-15% slopes
Cheshire fine sandy loam, 15-25% slopes, eroded
See Cheshire fine sandy loam, 15-25% slopes
Cheshire stony fine sandy loam, 3-8% slopes
See Cheshire very stony fine sandy loam, 3-8% slopes
Cheshire stony fine sandy loam, 8-15% slopes
See Cheshire very stony fine sandy loam, 8-15% slopes
Ellington fine sandy loam, 0-3% slopes
See Ellington fine sandy loam, 0-5% slopes
Enfield silt loam, shallow, 0-3% slopes
See Haven silt loam, 0-3% slopes
Enfield silt loam, shallow, 3-8% slopes
See Haven silt loam, 3-8% slopes
Gloucester stony sandy loam, 3-8% slopes
See Gloucester very stony sandy loam, 3-8% slopes
Gloucester stony sandy loam, 8-15% slopes
See Gloucester very stony sandy loam, 8-15% slopes
Gloucester and Charlton very stony soils, 3-15% slopes
See Gloucester extremely stony sandy loam, 3-15% slopes
Gloucester and Charlton very stony soils, 15-35% slopes
See Gloucester extremely stony sandy loam, 15-35% slopes
Hartford fine sandy loam, 0-3% slopes
See Hartford sandy loam, 0-3% slopes
Hartford fine sandy loam, 3-8% slopes
See Hartford sandy loam, 3-8% slopes
Hinckley gravelly loamy sand, 3-15% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Hollis rocky fine sandy loam, 3-15% slopes
See Charlton-Hollis very stony fine sandy loams, 3-15% slopes
Hollis very rocky fine sandy loam, 3-15% slopes
See Hollis-Charlton extremely stony fine sandy loams, 3-15% slopes
Hollis very rocky fine sandy loam, 15-35% slopes
See Hollis-Charlton extremely stony fine sandy loams, 15-40% slopes
Hollis extremely rocky fine sandy loam, 3-15% slopes
See Hollis-Rock outcrop complex, 3-15% slopes
Hollis extremely rocky fine sandy loam, 15-35% slopes
See Hollis-Rock outcrop complex, 15-40% slopes
Jaffrey gravelly sandy loam and loamy sand, 3-15% slopes
See Hinckley gravelly sandy loam, 3-15% slopes
Leicester stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Leicester-Ridgebury-Whitman very stony complex
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Made land
See Dumps
Manchester gravelly loamy sand, 3-15% slopes
See Manchester gravelly sandy loam, 3-15% slopes
Merrimac fine sandy loam, 0-3% slopes
See Agawam fine sandy loam, 0-3% slopes
Merrimac fine sandy loam, 3-8% slopes
See Agawam fine sandy loam, 3-8% slopes
Narragansett stony silt loam, 3-8% slopes
See Narragansett very stony silt loam, 3-8% slopes
Narragansett stony silt loam, 8-15% slopes
See Narragansett very stony silt loam, 8-15% slopes
Ninigret sandy loam, 0-3% slopes
See Ninigret fine sandy loam, 0-5% slopes
Ninigret sandy loam, 3-8% slopes
See Ninigret fine sandy loam, 0-5% slopes
Paxton stony fine sandy loam, 3-8% slopes
See Paxton very stony fine sandy loam, 3-8% slopes
Paxton stony fine sandy loam, 8-15% slopes
See Paxton very stony fine sandy loam, 8-15% slopes
Paxton stony fine sandy loam, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Paxton very stony fine sandy loam, 3-15% slopes
See Paxton and Broadbrook extremely stony soils, 3-15% slopes
Paxton very stony fine sandy loam, 15-25% slopes
See Paxton and Broadbrook extremely stony soils, 15-35% slopes
Peat and Muck
See Carlisle muck
Peat and Muck, shallow
See Adrian and Palms mucks
Podunk fine sandy loam
See Pootatuck fine sandy loam
Poquonock sandy loam, 0-3% slopes
See Poquonock sandy loam, 3-8% slopes
Rainbow stony silt loam, 0-6% slopes
See Rainbow very stony silt loam, 0-3% slopes
Ridgebury stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Rock land
See Rock outcrop-Hollis complex, 0-45% slopes
Rumney fine sandy loam
See Rippowam fine sandy loam
Saco fine sandy loam
See Saco silt loam
Scarboro fine sandy loam
See Scarboro mucky loamy fine sand
Sudbury fine sandy loam, 0-6% slopes
See Sudbury sandy loam, 0-5% slopes
Sutton stony fine sandy loam, 0-3% slopes
See Sutton very stony fine sandy loam, 0-3% slopes

Sutton stony fine sandy loam, 3-8% slopes
See Sutton very stony fine sandy loam, 3-8% slopes
Sutton very stony fine sandy loam, 0-3% slopes
See Sutton extremely stony fine sandy loam, 0-3% slopes
Sutton very stony fine sandy loam, 3-15% slopes
See Sutton extremely stony fine sandy loam, 3-15% slopes
Terrace escarpments
See Hinckley and Manchester gravelly sandy loam, 15-45% slopes
Wapping stony silt loam, 3-8% slopes
See Wapping very stony silt loam, 3-8% slopes
Whitman stony fine sandy loam
See Ridgebury, Leicester and Whitman extremely stony fine sandy loams
Wilbraham stony silt loam
See Wilbraham very stony silt loam
Winooski and Hadley silt loams
See Winooski silt loam
Woodbridge stony fine sandy loam, 0-3% slopes
See Woodbridge very stony fine sandy loam, 0-3% slopes
Woodbridge stony fine sandy loam, 3-8% slopes
See Woodbridge very stony fine sandy loam 3-8% slopes
Woodbridge very stony fine sandy loam, 0-3% slopes
See Woodbridge extremely stony fine sandy loam, 0-3% slopes
Woodbridge very stony fine sandy loam, 3-15% slopes
See Woodbridge extremely stony fine sandy loam, 3-15% slopes