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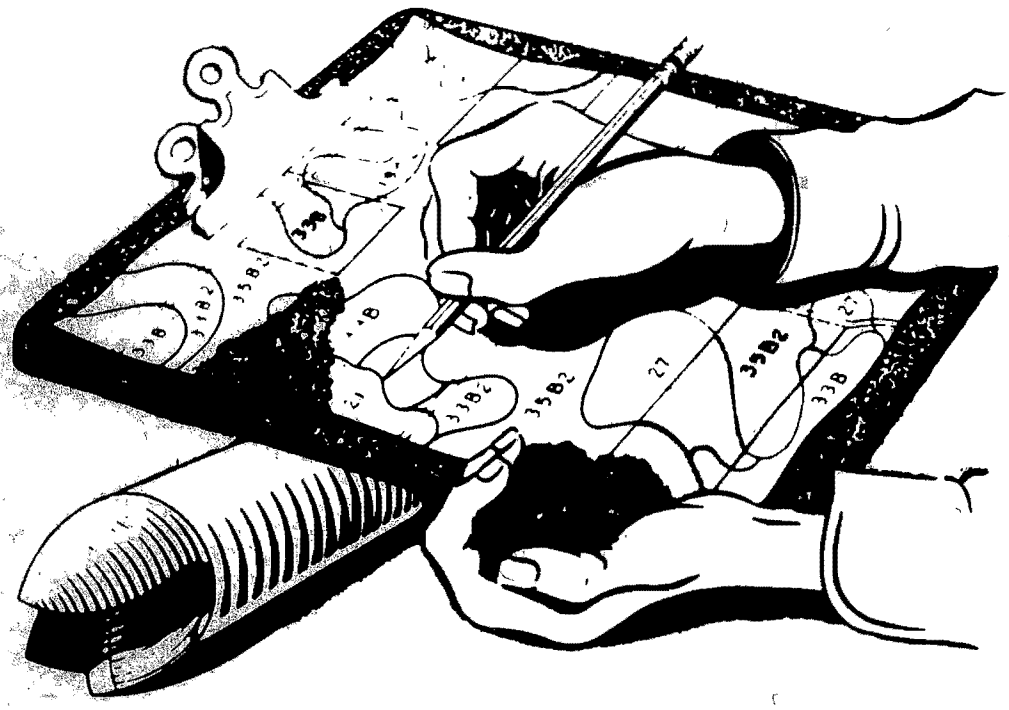
SOIL SURVEY REPORT

NAVAL ORDNANCE STATION

Indian Head and Stump Neck, Charles County, MD



October 1990

SOIL SURVEY REPORT

Naval Ordnance Station
Indian Head and Stump Neck, Charles Co., MD

Maps, text and interpretations prepared by the
USDA-Soil Conservation Service

in cooperation with the
United States Department of the Navy

October 1990

FOREWORD

This soil survey report contains information that can be used in land-planning programs on the Naval Ordnance Station in Charles County. It contains predictions of soil behavior for selected land uses. The report also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information is available at the local office of the Soil Conservation Service.

Philip H. Christensen
State Conservationist
Soil Conservation Service

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This report is an advance copy and is subject to change and/or revision.

SOIL SURVEY OF THE NAVAL ORDNANCE STATION INDIAN HEAD AND STUMP NECK CHARLES COUNTY, MARYLAND

by George P. Demas, James E. Brewer,
and the Maryland State Office Staff

INTRODUCTION

The Naval Ordnance Station, Indian Head, Maryland is located in the northwestern corner of Charles County. The station has a total land area of 3525 acres. Water nearly surrounds the base, with only the eastern boundary being bordered by land. The three water bodies around the station are Chicamuxen Creek, Mattawoman Creek, and the Potomac River.

Although the main land use on the base is for production of military materials, a portion of the station is utilized for recreational, residential and natural resource purposes.

The main highway entering the station is Md. Route 210. It runs from the Washington Beltway directly to the main gate of the facility. A U.S. Government railroad, originally set up during World War I, enters south of Route 210 and has numerous spurs which run throughout the station. These rail lines are no longer active.

Indian Head, Maryland was originally charted in 1710 as the Pamunkey Indian Lands. The high banks of the peninsula and expansive view made this location an excellent look-out post. The Indians used this site as a signal hill in times of crisis. In 1775 the area was recommended for the placement of a military battery to prevent foreign entry of ships during the American Revolution. Only a beacon was placed to warn of incoming ships. In the War of 1812 the peninsula, then known as Indian Point, was used as a military battery against warships. Only one recorded engagement occurred during this war. In 1835 the area became known as Indian Head-lands. During the Civil War, it was once again set up as a battery for Union troops to guard against an invasion from the south. In 1865, the name was changed to Indian Head. In 1890, the Naval Bureau of Ordnance was moved from Annapolis, Maryland to Indian Head. Production and testing of Naval ordnance occurred there until 1918 when testing of long range guns was moved from the Naval Powder Factory to Dahlgren, Virginia. Then, in 1923, Stump Neck was added to the Naval Powder

Factory as a testing facility. The name was later changed to the Naval Ordnance Station.

This survey serves as an updated version to a soil survey of the Naval Ordnance Station (Indian Head and Stump Neck) published in 1971 and later included in the Soil Survey of Charles County published in 1974.

HOW THIS SURVEY WAS MADE

Fieldwork for this survey was performed during July and August of 1990. The text and maps were prepared during September 1990.

This survey was made to provide information about the soils at the Naval Ordnance Station located in Indian Head, Maryland. The information includes soil maps, soil interpretation tables, soil descriptions, and an explanation of the tables. A soil scientist observed the steepness, shape, and length of slopes, the pattern of drainage, the native plants, and the kinds of geologic materials. He dug many holes to study the soil profile, which is the sequence of layers, or horizons, in a soil. The soil profile extends from the soil surface down to unconsolidated material from which the soil formed. This material is normally absent of any roots or other living organisms and has not been altered by biological activity.

The soils in the survey area occur in an orderly pattern that is related to geology, landform, relief, climate, and the native vegetation. Each kind of soil is associated with a particular landform or segment of the landscape. By observing the soils and relating them to their landscape position, a soil scientist develops a model of how the soils formed. Since the soil scientist can observe only a limited number of holes, this model enables them to predict with considerable accuracy the kind of soil at a specific location on the landscape.

The soil scientist recorded the characteristics of the soil profiles that they studied. Features such as soil color, texture, gravel content, acidity, and organic matter content enable the soil scientist to distinguish one kind of soil from another. Comparisons were made among the profiles studied and with profiles from nearby counties and from places more

distant. The soils were classified and named according to nationwide, uniform procedures. The soil series and soil phase are the categories of soil classification most used in a local survey such as the one presented here.

Soils that have almost alike profiles make up a soil series. Except for different textures in the surface layer, all the soils in one series have major horizons that are similar in thickness, texture, and other characteristics. All the soil series in the United States with the same name are essentially alike in those characteristics that affect their behavior in an undisturbed condition. For example, the Beltsville series mapped here would be very similar to the Beltsville series mapped in St. Mary's county.

Soils of one series can differ in texture of the surface layer and in slope, or some other characteristic that affects the use of the soils by man. On the basis of such a difference, the soil series is divided into soil phases. Beltsville silt loam, 2 to 5 percent slopes is an example of a soil phase. After a guide for classifying and naming the soils has been worked out, the soil scientist drew the boundaries of the individual soils on aerial photographs. The areas shown on the soil map are called mapunits. In most situations, the map unit is almost equivalent to the soil phase.

Some map units are made up of two or more soils of different series. One kind of such a map unit is called a complex. An example of this kind of map unit is Keyport-Urban land complex.

Although the maps and their components are important, the soil scientist must also relate each soil to how it will behave under different conditions or use. As data is collected and tested for the key soils in a survey area, the soil scientist consults with engineers, biologists and others to ensure that the predictions of each soil's suitability or limitations for a specific use are accurate. Thus, the interpretations that finally evolved reflect the most up-to-date knowledge of the soils and their behavior under current methods of use and management.

HOW TO USE THIS INTERIM REPORT

This interim report contains information that can be applied in managing farms, ranches, and woodlands; help in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of this area are shown on the detailed maps at the back of this special report. On each map sheet soil areas are outlined and are identified by symbols. All areas marked with the same symbol in this survey area are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Using Interpretation Tables to Find Soil Information

All soil interpretations in this special report are in tabular form. To find the desired soil interpretation, first refer to the appropriate table that addresses the intended use. Second, use the numerically arranged map symbol and soil name to locate the soil interpretation. Say, for example, you are interested in finding out the Unified Classification of the surface layer in an area mapped as BeA (Beltsville silt loam, 0 to 2 percent slopes). First, you would go to the ENGINEERING INDEX PROPERTIES TABLE. Second, you would find soil symbol BeA and read that it has a classification of ML, ML-CL. An explanation of all table column headings may be found in the text of this report.

KINDS OF INTERPRETATIONS AND INFORMATION IN THIS REPORT

Before using the information listed in the interpretation tables read and become familiar with the explanations of the interpretation tables given in the section, "USE AND EXPLANATION OF SOIL INTERPRETATION TABLES."

The tables are the key source of information in this special report. The soils are rated as to their suitability as resource material, as to their degree of limitations for several selected uses, such as dwellings, septic tank filter

fields, etc., and for recreation. The major features affecting the soil for these uses are also shown. Other information and interpretations given are the capability, soil loss factors, and potential yields for the soil, wildlife suitability, and woodland suitability.

PREPARING INTERPRETIVE MAPS FROM THE SOIL MAPS

Individual maps showing the relative limitations of soils for many specific purposes can be developed by using the soil map and the interpretations. Ratings can be shown visually by coloring soil maps or transparent overlays according to the traffic-light color connotations to point up the limitations for a particular use. A map or overlay can be made in this manner for septic tank filter fields, dwellings, or for any of the uses for which the soils are rated. For example, soil areas that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, those with a severe limitation colored red, and those with a very severe limitation colored brown or purple to contrast with the traffic light colors. Once the interpretive map is complete, the patterns of the soil limitations are readily apparent. The user can quickly select areas that have potential for a particular type of development and at the same time identify the areas of severe limitations.

USE AND EXPLANATION OF SOIL INTERPRETATION TABLES

Introduction

The interpretation tables should be used only with soil surveys of medium or detailed intensity, that have been prepared according to standard procedures of the National Cooperative Soil Survey. It is not intended that they be used with "Land-Type Surveys", low intensity surveys, or general soil maps. The interpretations are for soils in their natural state and not for disturbed areas that are altered by cut or fill operations, or by drainage.

The soil interpretations will not eliminate the need for on-site sampling, testing, and study of specific sites for design and construction of engineering works and various uses. The interpretation tables should be used primarily to plan more detailed field investigations to determine the conditions of the soil at the proposed site for the intended use.

When the interpretation tables are used in connection with delineated soil areas on soil maps, the information pertains to the dominant soil for which the soil is named. Other soils, too small an area to map out, may occur within the soil map area. The interpretations ordinarily do not apply to the included soils. More detailed studies are required if small, specific sites are to be developed or used within a given soil area. For example, a soil map bearing the name Mattapex also can include small, unmappable areas of other soil such as Keyport and Beltsville. The interpretations apply only to the Mattapex part of the delineated soil area and not to the entire soil area.

TABLE A: ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Explanation and Discussion of Items

This table shows, in numerical order, all of the soil map units in the survey area with their corresponding acreage. Also shown is the percentage that each map unit occupies in the survey area.

TABLE B: WOODLAND MANAGEMENT AND PRODUCTIVITY

Introduction

In this table the soils are evaluated for their suitability for woodland. Each soil is given a woodland ordination symbol. The soils are evaluated for woodland management problems, and the potential productivity of important trees is estimated. Trees to plant are also given.

Ordination Symbol--The ordination symbol serves to group soils that are suited to about the same kinds of trees and that have about the same potential productivity.

Each woodland ordination symbol is identified by a 2-part symbol. The first part of the symbol indicates the potential productivity of the soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest. The second part of the symbol, a letter, indicates the important soil property that imposes a moderate or severe hazard or limitation in managing the soils for wood

production. The letter X shows that the main limitation is stoniness or rockiness; W shows that excessive water in or on the soil is the chief limitation; T shows that toxic substances in the soil are the chief limitation; D shows that the rooting depth is restricted; C shows that clay in the upper part of the soil is a limitation; S shows the soils are sandy; F shows that the soils have large amounts of coarse fragments; R shows the soils have slopes; and A shows the soils have no significant restrictions or limitations for woodland use or management. If a soil has more than one limitation, the priority is as follows: W and S.

Management problems evaluated are (1) erosion hazard, (2) equipment limitations, (3) seedling mortality, (4) windthrow hazard, and (5) plant competition.

(1) Erosion hazard measures the risk of soil losses in well-managed woodland. Erosion hazard is slight if expected soil loss is small, moderate if some measures to control erosion are needed in logging and construction, and severe if intensive treatment or special equipment and methods are needed to prevent excessive soil losses.

(2) Equipment limitations ratings reflect the soil conditions that restrict the use of equipment normally used in woodland management or harvesting. Slight ratings indicate equipment use is not limited to kind or time of year. A rating of moderate indicates a seasonal limitation or need for modification in methods of equipment. Severe limitations indicate the need for specialized equipment or operations.

(3) Seedling mortality ratings indicate the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock and proper planting are assumed. A slight rating indicates expected mortality is less than 25 percent. Moderate rating indicates a 25 to 50 percent loss; and severe indicates over 50 percent loss of seedling.

(4) Windthrow hazard ratings reflect the danger of trees being blown over by wind. A rating of slight indicates that normally there are no trees blown down by the wind, a rating of moderate that some trees are expected to blow down during periods of excessive soil wetness and high wind, and a rating of severe that many trees are expected

to blow down during periods of soil wetness with moderate or high winds.

(5) Plant competition refers to the invasion or growth of undesirable species on different kinds of soil when openings are made in the canopy. A rating of slight indicates that competition will not prevent adequate natural regeneration and early growth or interfere with adequate development of planted seedlings, a rating of moderate that competition will delay natural or artificial regeneration, both establishment and growth rate, but will not prevent the eventual development of fully stocked normal stands and a rating of severe that competition will prevent adequate natural or artificial regeneration without intensive site preparation and maintenance treatments such as weeding.

Common Trees--This is a list of some of the commercially important trees which are adapted to the soil. These are the trees which woodland managers will generally favor in intermediate or improvement cuttings.

Site Index--This is the average height of dominant trees at age 50.

Productivity Class represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. It can be converted to board feet by multiplying by a factor of about 71; or to convert cubic feet per acre to cords per acre, divide the cubic feet by 85. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per year at the point where mean annual increment culminates, which is about 568 board feet per acre per year; or about 1.3 cords per acre per year.

Trees to Plant-- This is a list of trees suitable to plant for commercial wood production.

TABLE C: WILDLIFE HABITAT

Introduction

Soils directly influence kinds and amounts of vegetation and amounts of water available, and in this way indirectly influence the kinds of wildlife that can live in an area.

Soil properties that affect the growth of wildlife habitat are: (1) thickness of soil useful to crops, (2) surface texture, (3) available water capacity to a 40-inch depth, (4) wetness, (5) surface stoniness or rockiness, (6) flood hazard, (7) slope, and (8) permeability of the soil to air and water.

In this table, soils are rated for producing eight elements of wildlife habitat and for three groups, or kinds, of wildlife. The ratings indicate relative suitability for various elements. A rating of good means the element or kind of habitat generally is easily created, improved, and maintained. Few or no limitations affect management in this category and satisfactory results are expected when the soil is used for the prescribed purpose.

A rating of fair means the element or kind of habitat can be improved, maintained, or created in most places. Moderate intensity of management and fairly frequent attention may be required for satisfactory results, however.

A rating of poor means the element of wildlife and limitations for the designated use are rather severe. Habitats can be improved, maintained, or created in most places, but management is difficult and requires intensive effort.

A rating of very poor means the elements of wildlife habitat are very severe and that unsatisfactory results are to be expected. It is either impossible or impractical to improve, maintain, or create habitats on soils in this category.

Explanation of Items

Potential for habitat elements--Each soil is rated according to its suitability for producing various kinds of plants and other elements that make up wildlife habitats. The ratings take into account mainly the characteristics of the soils and closely related natural factors of the environment. They do not take into account climate, present use of soils, or present distribution of wildlife and people. For this reason, selection of a site for development as a habitat for wildlife requires inspection at the site.

Grain and seed are annual grain-producing plants such as corn, wheat, and soybeans.

Grass and legumes--Making up the group are domestic grasses and legumes that are established by planting. They provide

food and cover for wildlife. Grasses include fescue, timothy, and bromegrass; legumes include annual lespedeza, clover, and alfalfa.

Wild herbaceous--This group consists of native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Examples of wild herbaceous plants are bluestem, goldenrod, beggar-ticks, quackgrass, and ragweed.

Hardwood trees are nonconiferous trees, shrubs, and woody vines that produce wildlife food in the form of fruits, nuts, buds, catkins, or browse. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical species in this category are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry.

Coniferous plants are cone-bearing trees and shrubs that provide cover and frequently furnish food in the form of browse, seeds, or fruitlike cones. They commonly grow in their natural environment, but they may be planted and managed. Typical plants in this category are pines, spruce, yew, cedar, and hemlock.

Shrubs--This column is not applicable to soils in Maryland and a dash is used to indicate this.

Wetland plants are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples of wetland plants are smartweed, arrowhead, burrweed, pickerel weed, cordgrass, rushes, sedges, and reeds. Submerged and floating aquatics are not included in this category.

Shallow water--This includes impoundments or excavations for controlling water, generally not more than five feet deep, to create habitats that are suitable for waterfowl. Some are designed to be drained, planted, and then flooded; others are permanent impoundments that grow submerged aquatics.

Potential as habitat for--The soils are rated according to their suitability as habitat for (1) openland wildlife, (2) woodland wildlife, and (3) wetland wildlife. These ratings are related to ratings made for elements of habitat. For example, soils rated unsuited for shallow water developments are rated unsuited for wetland wildlife.

(1) Openland wildlife are birds and mammals that normally live in meadows, pastures, and open areas where grasses, herbs, and shrubby plants grow. Quail, doves, meadowlarks, field sparrows, cottontail rabbits, and foxes are typical examples of openland wildlife.

(2) Woodland wildlife are birds and mammals that normally live in wooded areas of hardwood trees, coniferous trees, and shrubs. Thrushes, wild turkeys, deer, squirrels, and raccoons are typical examples of woodland wildlife.

(3) Wetland wildlife are birds and mammals that normally live in wet areas, marshes, and swamps. Ducks, geese, rails, shore birds, and herons are typical examples of wetland wildlife.

Rangeland wildlife is not rated in Maryland since woodland wildlife is rated and is applicable to Maryland conditions and soils.

TABLE D: RECREATIONAL DEVELOPMENT

Soils are rated according to limitations that affect their suitability for camp areas, picnic area, playground, and paths and trails and golf fairways. Not considered in this rating, but important in evaluation of a site are location, accessibility of the areas, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public service lines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding and the season when it occurs are important considerations. Onsite assessment of duration and frequency of flooding is essential in planning recreational facilities.

(a) Camp Areas are tracts of land used intensively for tents, trailers and campers, and the accompanying activities of outdoor living. Camp areas require such site preparation as shaping and leveling, areas for tent and parking area, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The soils are rated on the basis of soil properties that influence the ease of developing camping areas and the performance of the camping area after development. Soil properties that influence trafficability and promote the growth of vegetation after heavy use are important.

Slope, stoniness, and depth to bedrock or cemented pan are the main concerns in development camp areas. For good trafficability, the surface of the picnic areas should absorb rainfall readily, remain firm to heavy foot traffic, and not be dusty when dry. Soil properties that influence trafficability are texture of the surface layer, wetness, permeability and large stones. Slow permeability and clayey surface texture are not as severe a limitation in dry regions of the country, however, silty soils may be more of a problem because they are dusty. Soil properties that influence the growth of plants are depth to bedrock, permeability, and the presence of toxic materials.

(b) Picnic areas are natural or landscape tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking lots. Soils are rated on the basis of properties that influence development costs of shaping sites, trafficability, and growth of vegetation after development.

Slope and stoniness are the main concerns in developing picnic area. For good trafficiability, the surface of picnic areas should absorb rainfall readily, remain firm to heavy foot traffic, and not be dusty when dry. Soil properties that influence trafficability are texture of the surface layer, wetness, permeability, and large stones. Slow permeability and clayey surface texture are not as severe a limitation in dry regions of the country; however, the silty soils may be more of a problem because they are dusty. Soil properties that influence the growth of plants are depth to bedrock, permeability, and the presence of toxic materials.

(c) Playgrounds are areas used intensively for games such as baseball, football, and similar activities. Playgrounds require a nearly level soil that is free of stones and that can withstand heavy foot traffic and still maintain adequate vegetation. Soils are rated on the basis of properties that influence cost of shaping, trafficability, and growth of vegetation.

(d) Paths and Trails are used for walking, horseback riding, and other uses and require little or no cutting or

filling. The soils are rated on the properties that influence trafficability and erodibility.

These are stoniness, wetness, texture of the surface layer, slope, flooding, erodibility, and in dry regions, dustiness.

(e) Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tree or greens is not considered in rating the soils.

TABLE E1 and TABLE E2: ENGINEERING INDEX PROPERTIES

Introduction

This table gives estimates of the engineering classification and of the range of index properties for major layers of each soil in the survey area. Although the soils bearing the same name are similar between counties and states, the physical and chemical properties of these soils may vary somewhat from one county to another and one state to another; however, the properties of the soil at any location should fall within the range of the estimates given for the soil series on the interpretation table. For some soils, some of the physical and chemical properties are based on test data; in others, these are best estimates based on test data on similar soils.

Explanation of Items

(TABLE E1)

Depth (In.)--The depth in inches of the major soil horizons that have similar properties are given in this column.

USDA Texture--The USDA texture is based on the relative amounts of sand, silt, and clay in a soil, giving rise to textural classes such as sand, sandy loam, loam, clay loam, and clay. (USDA Handbook No. 18, SOIL SURVEY MANUAL)

Unified Classification--In the Unified System, soils are classified according to particle size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-

grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as PT. Soils on the borderline between two classes are designated by symbols for both classes; for example, SP-SM.

AASHTO Classification--The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. The A-1, A-2, and A-7 groups can be further divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6.

(TABLE E2)

Fraction Greater than 3 inches (Pct.)--Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage of Material Less than 3 inches Passing Sieve No.--The measured or estimated percentages of materials passing the numbers 4, 10, 40, and 200 sieves are given for each major horizon. The percent passing the 200 sieve approximates the amount of silt and clay, but does include some very fine sand. A range is listed because of variability for a given soil.

Liquid Limit and Plasticity Index--These indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range for moisture content within which a soil material is plastic.

TABLE F: PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

This table shows estimates of some characteristics and features that affect soil behavior. These estimates are given for major layers of each soil in the survey area.

Explanation of Items

Clay (Pct.)--The measured or estimated percentages of a mineral soil separate consisting of particles less than 0.002 millimeter in diameter. A range is given because of the variability for a given soil.

Moist Bulk Density--The mass (weight) of a unit volume of moist soil. This volume includes both soil and pores. Soils that are loose and porous will have low bulk densities and those that are more compact will have high values. A range is listed because of the variability for a given soil.

Permeability (In./Hr.)--That quality of a soil that enables it to transmit water or air. Values listed are estimates of the range in rate and time it takes for downward movement of water in the major soil layers when saturated, but allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and drainage observations of the water movement through soils. On a given soil, percolation through the surface layer varies according to land use and management as well as with initial moisture content. The permeability is shown in inches per hour. For example, in a soil that has a permeability rate of 6.0 inches per hour in 3 hours free water would move downward a distance of (3 x 6") 18 inches.

Available Water Capacity (In./In.)--The ability of soils to hold water for use by most plants. The available water capacity is given in inches per inch of soil for major horizons. The water retention of the soil is related to the particle size, organic matter content, and to the arrangement and size of soil pores. Fine-texture soils tend to have higher water retention due to small pores than do sandy soils with large pores. Estimates of the available water capacity for soils with normally high water tables may appear meaningless until one considers the possibility of artificial drainage or the natural lowering of the water table during dry seasons. Soils of the same series vary from place to place. Therefore, values can deviate considerably from those listed. It is commonly defined as the difference between field capacity (1/3 atmosphere for loamy and clayey materials or

1/10 atmosphere for sand) and the wilting percentage (15 atmospheres) times bulk density times the thickness in inches of the soil. The formula for AWC is:

$$AWC(in/in) = \frac{1/3 \text{ (or } 1/10) \text{ bar \%} - 15 \text{ bar \%} \times \text{bulk density, moist}}{100}$$

For example, in a soil that has an available water capacity of 0.10 in/in of soil, there would be 0.1 inch of water available for plant growth for each inch of soil, and in 24 inches of soil (0.1 x 24") 2.4 inches available.

Soil Reaction--The degree of acidity or alkalinity of a soil. It is expressed in pH - the logarithm of the reciprocal of the H-ion concentration. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Salinity (mmhos/cm)--The salinity is expressed in terms of the electrical conductivity of a saturation extract in millimhos per centimeter at 25 degrees centigrade. The following shows the response of plants associated with different ranges for electrical conductivity of saturation extracts of soils.

Electrical Conductivity of Saturation Extract mmhos/cm at 25 C	Plant Response
0-2	Salinity effects usually negligible
2-4	Yield of very salt-sensitive crops may be restricted

4-8	Yield of salt-sensitive crops restricted
8-16	Only salt-tolerant crops yield satisfactory
16	Only a few very salt-tolerant crops yield satisfactory

If salinity is zero or no problem for growing crops, a dash is shown on the interpretation sheet. Except for areas of tidal marsh or tidal swamp along the coasts, salinity is of little to no importance in most Maryland soils.

Shrink-Swell Potential--The relative change in volume to be expected of soil material with changes in moisture content; that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Erosion Factors, (K and T)--A soil erodibility factor (K) and the soil-loss tolerance (T) are used in an equation that predicts the amount of soil loss resulting from rainfall erosion of cropland. The soil erodibility factor "K" is measure of the rate at which a soil will erode. Values are expressed as tons of soil loss per acre per unit of R (rainfall factor) from continuous fallow (three years or more) on a 9 percent slope, 73 feet long. Thus, the K factor reflects the rate that soil erodes when other factors affecting erosion are constant. Soil properties that influence erodibility by water are: those that affect infiltration rate, movement of water through the soil, and water storage capacity; and those that resist dispersion, splashing, abrasion, and transporting forces from rainfall and runoff. Some of the soil properties that are most important are texture and organic matter of the surface layer, size and stability of structural aggregates in the surface layer, permeability of the subsoil, and depth to slowly permeable layers.

The soil-loss tolerance "T" sometimes called permissible soil loss, is the maximum rate of soil erosion that will permit a high level of crop productivity to be sustained economically

and indefinitely. These tes are expressed in tons of soil loss per acre per year. Rates of 1 through 5 tons are used in the south, depending upon soil depth and prior erosion.

Wind Erodibility Groups--Soils that are subject to wind erosion are grouped into 8 groups according to their susceptibility to soil blowing. Sandy soils are most susceptible to soil blowing, especially during dry periods when wind velocities are high. Organic soils are normally wet, but they are also subject to soil blowing when drained and cultivated if the soil surface is left bare during extreme dry periods and wind velocities are high.

Organic Matter (Pct.)--The measurement of estimated percentage of the organic fraction of the soil that includes plant and animal residues at various stages of decomposition, cell and tissues of soil organisms, and substances synthesized by the soil population. It is commonly determined as the amount of organic material contained in a soil sample passed through a 2-millimeter sieve. Estimates of organic matter are given only for the surface layer.

TABLE G: WATER FEATURES

This table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Explanation of Items

Hydrologic Groups--Soils are grouped into four hydrologic soil groups, A through D. These groups are used mostly in watershed planning to estimate runoff from rainfall. Soil properties were considered that influence the minimum rate of infiltration obtained for a bare soil after prolonged wetting. These properties are: depth to seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a layer or layers that slow or impede water movement.

Dual hydrologic groups are given for wet soils rated D in their natural condition that can be adequately drained. It is considered that drainage is feasible and practical and that drainage improves the hydrologic group by at least two classes (from D to A or B). The first letter applies to the drained condition.

Hydrologic Group A--(Low runoff potential) Soils that have high infiltration

rates even when thoroughly wetted and a high rate of water transmission.

Hydrologic Group B--(Moderately low runoff potential). Soils that have moderate infiltration rates when thoroughly wetted and a moderate rate of water transmission.

Hydrologic Group C--(Moderately high runoff potential) Soils that have slow infiltration rates when thoroughly wetted and a slow rate of water transmission.

Hydrologic Group D--(High runoff potential) Soils having very slow infiltration rates when thoroughly wetted and a very slow rate of water transmission.

Flooding--Flooding is defined as temporary covering of soil surface by water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or combinations of these. Shallow water standing during or shortly following a rain is excluded from the definition of flooding. Marshes and swamps are excluded from the definition of flooding because water is more than a temporary covering.

Flooding hazard may be expressed by one of three general flood frequency classes - none, rare, or common. Duration and time of year that the flooding occurs is given for those soils with common flood hazards. Not considered here, but nevertheless important, are velocity and depth of flood waters. The classes of flooding are defined as follows:

None — No reasonable possibility of flooding.

Rare — Flooding unlikely but possible under unusual weather conditions. No evidence of recent water deposited sediments on surface or within the pedon. Pedogenic horizons have developed within most soils. Flooding probability is so low that it imposes no more than slight or moderate soil limitation ratings for soil uses except those with high per-acre

investments, such as residential developments.

Common	Flooding is likely under usual weather conditions. Most pedons show evidence of recent water deposited sediments or scouring. The probability of recurring floods is great enough to impose severe limitations on many uses of soils, such as sanitary facilities and community development. Restrictions on farming may be slight to severe depending on duration and season of flooding.

Where a finer breakdown of common flooding is made, the following classes under common flooding are used:

Occasional	Less often than once in 2 years on the average. Most pedons show evidence of past deposition or scouring. The probability of floods is not great enough to interfere seriously with farming operations although some crop damage is likely.
Frequent	More often than once in 2 years on the average. The pedon shows evidence of yearly deposition or scouring. In addition, debris or other recent flood water marks are easily observable on the ground, on trees, fences, or bridges. The probability of floods is great enough to restrict the choice of crops, cause severe crop damage, or prevent the production of crops.

Duration refers to the length of time that the soils are flooded. Only duration classes for common frequency classes are given. These classes are as follows:

Very brief	Less than 2 days. Soils have sufficient surface drainage so that flood waters run off, and damage, if any, to crops results mainly from scouring or sedimentation.
Brief	2 to 7 days. Relatively permeable soils on level or depressional landscapes or soils with restricted permeability on

nearly level landscapes. Most cultivated crops are severely affected by flooding; most pasture plants and tree species are slightly or moderately affected.

Long	7 days to 1 month. Soils on nearly level or depressional landscapes with restricted surface drainage or restricted permeability, or both. Only water tolerant plants can survive.
Very Long	More than 1 month. Soils on nearly level or depressional landscapes with highly restricted surface drainage and restricted permeability. Only water tolerant plants survive.

The time of year that flooding normally occurs is expressed in months, for example, December-May.

The economic and social consequences of improper land use of flood prone areas are serious. Problems begin when structures are located in flood prone areas. The initial development encourages additional construction and the installation of streets and utilities. The capacity of the floodway may be reduced by these kinds of developments increasing the flood hazard. When flooding occurs, losses are not borne only by the property owner but by the community as well. The public is usually called upon to bear the cost of flood fighting, rehabilitation, and flood protection.

Dwellings, commercial buildings, and other high cost developments that are easily damaged by floods shouldn't be located on flood prone soils. Sanitary facilities such as septic tank filter fields, sewage lagoons, and sanitary landfills built on flood prone soils present a health hazard. Roads and streets built on flood prone soils are likely to be closed during floods and may require extensive maintenance or restoration after floods.

In agricultural areas the consequences of flooding are much less expensive, but nevertheless, may present a hazard to the production of crops. The frequency, duration, and time of year the flooding occurs influences whether trees, pasture, or crops can be grown.

Trees and pastures can withstand more flooding than crops. Certain short season crops, however, can be grown successfully if the growing season is relatively flood free.

High Water Table--A high water table is defined as a zone of saturation at the highest average depth during the wettest season. It persists in the soil for more than a few days and occurs within 80 inches of the soil surface.

Most water tables occur within the soil and are measured from the surface of the soil down to the free-water level. In swamps and marshes, however, the water table is above the surface of the soil much of the time and water table is measured from the surface of the water down to the soil surface.

Soils that have seasonal high water tables are classified according to depth to the water table, kind of water table, and time of year that the water table is highest.

The depth of the high water table from the soil surface is given in feet or half feet. The range in depth reflects the year-to-year variation in average highest depth. Depth to water table within the soil is recorded with the small number first, e.g., 2-3. Water table above the soil surface is recorded with a +, e.g., +2; if the water table varies such that the average highest depth can be above or below the surface, it is recorded as follows: +1-.5, with the first number indicating 1 foot above the soil surface, and the second number 1/2 foot below the soil surface. Where a water table is below 6 feet or exists for less than one month, 6.0 is shown under depth.

Three kinds of seasonal high water tables are recognized within the soil; apparent, perched, and artesian.

Apparent Water Table is the level at which water stands in a dug unlined borehole. It is influenced by the hydrostatic pressure of soil water and by pressure at greater depths penetrated by the borehole, water relations across impermeable layers, and other factors; in the absence of evidence that would permit greater specificity, therefore, the term apparent water table is used for the level at which water stands in an

uncased borehole after adequate time of adjustment in the surrounding soil.

Perched Water Table — is one that exists in the soil above an unsaturated zone. A water table may be inferred to be perched on the basis of general knowledge To prove that a water table is perched, it is necessary to observe the water level in cased wells placed above, in, and below the less permeable layer. If the water in the well above the less permeable layer is consistently higher than the other two, the water table is perched.

Artesian Water Table — is one that esists under hydrostatic head beneath an impermeable layer. When this impermeable layer is penetrated by a cased borehole, the water rises. The final level of the water in the cased borehole may then be characterized as an artesian water table.

Areas with water tables above the surface of the soil much of the time are characterized as marsh or swamp - marsh having herbaceous vegetation and swamps having woody vegetation.

The months that the water table normally persists at the average highest depth range is shown, for example, December through April.

A seasonal high water table is an important criterion in a number of engineering and biological uses of soils. Its depth and duration influences the use of soils for septic tank absorption fields, shallow excavations, sanitary landfills, dwellings, and local roads and streets, and ease of excavation for roadfill and topsoil.

The water table also influences the growth of crops - a water table that is near the surface during the growing season is detrimental to most plants. Growing plants, however, tend to lower the water table through transpiration. A change in land

use may drastically change the wetness of an area. For example, a change from trees to soybeans changes the transpiration rate and may cause a wetter soil condition. Changing land use from cropland, pasture, or forest to urban areas with streets and houses covering a much larger area not only decreases the transpiration by vegetation but also causes increased runoff. A wetter soil may result.

EXPLANATION OF LIMITATIONS AND RESTRICTIVE FEATURES USED IN RATING SOILS FOR TABLES H,I,J, and K.

Rating Soils for Selected Uses

Soils are rated for the uses expected to be important or potentially important to users of soil survey information. Ratings for proposed uses are given in terms of limitations and restrictive features, suitability and restrictive features, or only restrictive features. Only the most restrictive features are listed, therefore, a soil rated severe gives those soil features that cause the soil to be rated severe. There may be other features that need to be treated to overcome soil limitations for a specific purpose. The definition of the ratings are as follows:

Limitation Ratings

Soils are rated in their "natural" state, that is, no modification of the soil site or material is made. Only the most restrictive features are listed.

Slight is the rating given soils that have properties favorable for the use. The degree of limitation is minor and can be overcome easily. Good performance and low maintenance can be expected.

Moderate is the rating given soils that have properties moderately favorable for the use. This degree of limitation can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance of the structure or other planned use is somewhat less desirable than for soils rated slight. Some soils rated moderate require treatment such as artificial drainage, control of runoff to reduce erosion, extended septic tank absorption fields, extra excavation, or some modification of certain features through manipulation of the soil. For these soils, modification is needed for those construction plans generally used for soils of slight limitation. Modification

may include specially designed foundations, extra reinforcement of structures, sump pumps, and the like.

Severe is the rating given soils that have one or more properties unfavorable for the rated use, such as steep slopes, bedrock near the surface, flooding, high shrink-swell potential, a seasonal high water table, or low strength. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance. Some of these soils, however, can be improved by reducing or removing the soil feature that limits use, but in most situations, it is difficult and costly to alter the soil or to design a structure so as to compensate for a severe degree of limitation.

THE INTERPRETATIONS WILL NOT ELIMINATE THE NEED FOR ON-SITE STUDY, TESTING AND PLANNING OF SPECIFIC SITES FOR THE DESIGN AND CONSTRUCTION FOR SPECIFIC USES. The interpretations can be used as a guide to planning more detailed investigations and for avoiding undesirable sites for an intended use. By using the soil map and interpretations, it is possible to select sites that have the least limitations for an intended use.

Many soils that have a high water table have severe limitations in their natural condition. These same soils, when drained artificially, may only have a slight limitation. Modern equipment and knowledge make it possible to overcome most of the limitations of soils for many urban and recreational uses. The degree of the limitation and the location of the soil will determine the practicability of developing the soil for the intended use. No consideration was given in these interpretations to the size and shape of soil areas, nor to the pattern they form with other soils on the landscape. For example, some very desirable soil areas are too small in size or too irregular in shape, or their concurrence with less desirable soils forms a pattern too complex to be utilized for the intended use. Although not considered in the interpretations, these items should influence the final selection of a site.

In rating soils for nonfarm uses, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most degrees of limitations. Most of these practices, however, are costly. The owner must be willing to live with a few limitations, providing the use does not violate community codes or regulations. The final decision in selecting a site

for a particular use is a personal one and generally involves weighing the costs for site preparation and maintenance.

Suitability Ratings

Soils are rated in their "natural" state, that is, no modification of the soil site or materials is made. A rating of good means the soils have properties favorable for the use. Good performance and low maintenance can be expected.

A rating of fair means the soil is moderately favorable for the use. One or more soil properties make these soils less desirable than those rated good.

A rating of poor means the soil has one or more properties unfavorable for the use. Overcoming the unfavorable property requires special design, extra maintenance, or costly alteration.

The limitations or restrictive features and the features affecting a particular use are shown on the tables through the use of "Key Phrases." A list of the key phrases with explanation or definition follows:

KEY PHRASE	EXPLANATION
AREA RECLAIM	Borrow areas are difficult to reclaim, and revegetation and erosion control on these areas are extremely difficult.
CEMENTED PAN	Cemented pan too close to surface.
CUTBANKS CAVE	Walls of cuts are not stable. The soil sloughs easily.
DEEP TO WATER	Deep to permanent water table during dry season.
DEPTH TO ROCK	Bedrock is so near the surface that it affects specified use of the soil.
DROUGHT	Soil holds too little water for plants during dry periods.
DUST	Soil particles detach easily and cause dust.
ERODES EASILY	Water erodes soil easily.
EXCESS FINES	The soil contains too much silt and clay for use as gravel or sand in construction.
EXCESS HUMUS	Too much organic matter.
EXCESS LIME	The amount of carbonates in the soil is so high that it restricts the

	growth of most plants.
EXCESS SALT	The amount of soluble salt in the soil is so high that it restricts the growth of most plants.
FAST INTAKE	Water infiltrates rapidly into the soil.
FAVORABLE*	Features of the soil are favorable for the intended use.
FLOODS	Soil flooded by moving water from stream overflow, runoff, or high tides.
FRAGILE	Soil easily damaged by use of disturbance.
HARD TO PACK	Difficult to compact.
LARGE STONES	Rock fragments greater than 3 inches across affect the specified use.
LOW STRENGTH	The soil has inadequate strength to support loads.
NO WATER	Too deep to ground water.
PERCS SLOWLY	Water moves through the soil slowly, affecting the specified use.
PIPING	The soil is susceptible to the formation of tunnels or pipelike cavities by moving water.
PONDING	Soil in closed depressions inundated by standing water that is removed only by percolation or evapotranspiration.
ROOTING DEPTHS	A layer that greatly restricts the downward rooting of plants that occurs at a shallow depth.
SALTY WATER	Water too salty for livestock consumption.
SEEPAGE	Water moves through the soil so quickly that it affects the specified use.
SHRINK-SWELL	The soil expands on wetting and shrinks on drying, which may cause damage to roads, dams, building foundations, or other structures.
SLIPPAGE	Soil mass is susceptible to movement downslope when loaded, excavated or wet.
SLOPE	Slope too great.
SLOW INTAKE	Water infiltrates slowly into the soil.
SLOW REFILL	Ponds fill slowly because the permeability of the soil is

	restricted.
SMALL STONES	Rock fragments that are 3 inches or less across may affect the specified use.
SOIL BLOWING	Soil easily moved and deposited by wind.
SUBSIDES	Settlement of organic soils or of soils containing semifluid layers.
THIN LAYER	Suitable soil material is not thick enough for use as borrow material or topsoil.
TOO ACID	The soil is so acid that growth of plants is restricted.
TOO CLAYEY	Soil slippery and sticky when wet and slow to dry.
TOO SANDY	Soil soft and loose; droughty and low in fertility.
WETNESS	Soil wet during period of use.

*Used only under "features affecting" in Water Management where other entries were not appropriate.

TABLE H: SANITARY FACILITIES 1/

The nature of the soil is important in selecting sites for septic tank absorption fields, sewage lagoons, and sanitary landfills, and in identifying limiting soil properties and site features to be considered in planning, design, and installation of these facilities.

Soil limitations ratings of slight, moderate, or severe are given for septic tank absorption fields, sewage lagoons and trench and area type sanitary landfills. Soil suitability ratings of good, fair, and poor are given for daily cover for landfill.

(a) Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. The centerline depth of the tile is assumed to be at a depth of 24 inches. Only the soil between depths of 24 and 72 inches is considered in making the ratings. The soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction of the system, and those that may affect public health.

Properties and features that affect the absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and a shallow depth to bedrock, ice, or cemented pan interfere with installations. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas. Also soil erosion and soil slippage are hazards where absorption fields are installed in sloping soils.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, and as a result ground water supplies in the area may be contaminated.

Percolation tests are used by some regulatory agencies to evaluate the soil's suitability for septic tank absorption fields. These tests should be performed during the season when the water table is highest and the soil is at minimum absorptive capacity. The percolation rates do not correspond to the permeability rates because they are measured by different methods. Experience indicates that soils having percolation rates (1) faster than 43 minutes per inch function satisfactorily, (2) between 45 and 60 minutes per inch have moderate limitations, and (3) slower than 60 minutes per inch have severe limitations (USDHEW 1969).

In many of the soils that have moderate or severe limitations for septic tank absorption fields, it may be possible to install special systems that lower the seasonal water table or to increase the size of the absorption fields so that satisfactory performance is achieved (Bouma, 1974). However, such considerations are not considered in this report.

1/Ratings based on NATIONAL SOILS HANDBOOK, Part II, Section 403, 3-78.

(b) <u>Sewage lagoons</u> are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor surrounded by cut slopes or embankments of compacted, relatively impervious soil material. Aerobic lagoons generally are designed so that depth of the sewage is 2 to 5 feet. Relatively impervious soil for the lagoon floor and sides is desirable to minimize seepage and contamination of local ground water.

Soil permeability is a critical property in evaluating a soil for sewage lagoons. Most porous soils will eventually seal when being used as a sewage lagoon, however, until they do, the hazard of pollution is great and it is difficult to maintain the constant water depth required for proper operation. Soils with a permeability exceeding 2 inches per hour are generally too porous for proper operation of sewage lagoons and may cause contamination of shallow wells. Fractured bedrock within 40 inches may create a pollution hazard. Bedrock and cemented pans create construction problems.

The slope limits are based on the specification that the effluent be 2 to 5 feet deep. If shallower than this, weeds grow, if deeper, it is more difficult to maintain an aerobic environment. Slope must be gentle enough and the soil material thick enough over bedrock or cemented pan to make smoothing for uniformity of lagoon depth practical.

If floodwater overtops the lagoon, it interferes with the functioning of the lagoon and carries away polluting sewage before sufficient decomposition has taken place. Ordinarily, therefore, soils susceptible to flooding have a severe limitation for sewage lagoons. If, however, flood waters are slow flooding and are rarely if ever more than 5 feet deep--not deep enough to overtop the lagoon embankment--the limitation rating is not severe because of susceptibility to flooding.

Soil containing large amounts of organic matter are unsuitable for the floor of the lagoon. The organic matter promotes anaerobic rather than aerobic environment and is detrimental to the proper functioning of the lagoon.

Depth to water table is important if it influences the water level in the lagoon. If it does, then a pollution hazard also exists. Depth to water table is disregarded if the lagoon floor has slowly permeable soil material at least 4 feet thick. Soils that contain rock fragments are undesirable sites because the fragments interfere with the manipulation and compaction needed to prepare the lagoon floor.

(c) <u>Sanitary landfill (trench)</u> is a method of disposing of solid waste by placing refuse in successive layers in an

excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil that is excavated from the trench. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill.

Ratings are based on properties to a depth normally observed during soil mapping. However, because trenches may be as deep as 15 feet or more, geologic investigations are needed to determine the potential for pollution of ground water as well as examination of stratification, rock formations, and geologic conditions that might lead to the conducting of leachates to aquifers, wells, water courses, and other water sources. The presence of hard nonripple bedrock, creviced bedrock, or highly permeable strata in or immediately underlying the proposed trench bottom is undesirable from the standpoints of excavation and potential pollution of underground water.

Properties that influence risk of pollution, ease of excavation, trafficability, and revegetation are major considerations. Soils that flood or have a water table within the depth of excavation present a potential pollution hazard and cause difficulty in excavating.

Soil slope is an important consideration because it affects the work involved in road construction, the performance of the roads and the control of surface water around the landfill. Soil slope may also cause difficulty in construction of the trenches where the trench bottoms must be kept level and oriented to follow the contour.

Soil slippage may be a problem on certain sloping soils.

The ease with which the trench is dug and with which a soil can be used as daily and final cover is based largely on texture and consistence of the soil. The texture and consistence of a soil determines the degrees of workability of the soil both when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and to place in a uniformly thick cover over a layer of refuse.

The uppermost part of the final cover should be soil material that is favorable for the growth of plants. It should not contain excess sodium or salt and should not

be too acid. In comparison with other horizons, the A horizon in most soils has the best workability and highest content of organic matter. Thus, for a trench-type landfill operation it may be desirable to stockpile the surface layer for use in final blanketing of the fill.

(d) Sanitary landfill (area) is a method of disposing of solid waste by placing refuse in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil that is imported from a source away from the site. A final cover of soil at least 2 feet thick is placed over the landfill when it is completed. Properties that influence trafficability and risk of pollution are the only considerations for area sanitary landfills.

Flooding is a serious problem because of the risk of washouts and pollution downstream and the difficulty of moving trucks in and out of flooded areas.

Permeability of the soil is an important consideration. If permeability is too rapid, or if fractured bedrock or fractured cemented pan are close to the surface, the risk of the leachate contaminating water supplies is great. A high water table may also transmit pollutants to water supplies and is likely to restrict truck movement during the wet parts of the year.

Slope is a consideration because of the extra grading required to maintain roads on sloping soils. Furthermore, leachate may flow along the soil surface on sloping soils and cause difficult seepage problems in completed fills.

Soil slippage may be a problem on certain sloping soils.

(e) Daily cover for landfill is the soil material that is applied daily to compacted solid waste in an area type sanitary landfill. The cover material is obtained offsite, transported, and spread on the area. The required soil characteristics relative to both daily and final cover material are nearly enough alike for one rating to serve.

Suitability of a soil for use as cover is based on properties that reflect workability, ease of digging, and moving and spreading the material over the refuse daily

during both wet and dry periods. Soils that are loamy or silty and free of stones are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soil must be thick enough over bedrock, cemented pan or water table so that material can be removed efficiently and yet leave a borrow area that can be revegetated. Some damage to the borrow area is expected, but if revegetation and erosion could be serious problems, then the soil is rated severe.

Slope affects the ease of excavation and moving of the cover material. Slope also may affect the final configuration of the borrow area and hence runoff, erosion, and reclamation.

In addition to these features, the soils selected for daily cover of landfill should be suitable for growing plants. They should not contain significant amounts of substances toxic to plants such as a high content of sodium or salts.

TABLE I: BUILDING SITE DEVELOPMENT

Soil properties influence development of building sites, including the selection of the site, the design of the structure, construction, and after construction, performance, and maintenance.

Soil limitation ratings of slight, moderate, and severe are given for shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

(a) Shallow excavations are trenches or holes dug in the soil to a maximum depth of 5 or 6 feet. They are used for pipelines, sewerlines, telephone and power transmission lines, basements, open ditches, grave sites, and the like. The excavations are most commonly made by trenching machines or backhoes.

The ratings are based on the soil properties that influence ease of digging and the resistance to sloughing. Depth and hardness of bedrock or cemented pan, the bulk density of the soil and the amount of large stones influences the ease of digging, filling, and compacting. Depth to the seasonal high water table and

flooding may restrict the time that the excavations can be made. Slope influences the ease of using digging machines. Soil texture and depth to water table influence the resistance to sloughing. Soil slippage may be a problem on certain sloping soils.

(b) Dwellings without basements are single-family houses of three stories or less without basements. The foundation is assumed to be spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet.

The ratings are based on properties affecting soil strength and settlement under a load, and those that affect excavation and construction costs. The properties affecting soil strength and settlement are presence of a high water table and flooding, and the shrink-swell behavior and compressibility of the soils. Compressibility is inferred from the Unified classification. Properties influencing the ease and amount of excavation are flooding, high water table, slope, depth to bedrock or cemented pan, and the amount of coarse fragments. Soil slippage may be a problem on certain sloping soils.

(c) Dwellings with basements are single-family houses of three stories or less with basements. The foundation is assumed to be spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings are based on properties affecting soil strength and settlement under load and those that affect excavation and construction costs. The properties affecting soil strength and settlement are the presence of a high water table and flooding, and the shrink-swell behavior and compressibility of the soil. Compressibility is inferred from the Unified classification. Properties influencing the ease and amount of excavation are flooding, high water table, slope, depth to bedrock or cemented pan, and the amount of coarse fragments. Soil slippage may be a problem on certain sloping soils.

(d) Small commercial buildings are less than 3 stories without basements. The foundation is assumed to be spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet.

The ratings are based on properties affecting soil strength and the settlement under a load and those that affect excavation and construction costs. The properties affecting soil strength and settlement are presence of a high water table and flooding, and the shrink-swell behavior and compressibility of the soil. Compressibility is inferred from the Unified classification. Properties influencing the ease and amount of excavation are flooding, high water table, slope, depth to bedrock or cemented pan, and the amount of rock fragments. Soil slippage may be a problem on certain sloping soils.

(e) Local Roads and Streets--Limitation ratings are given for the use of soils for construction of improved local roads and streets that have all-weather surfacing--commonly of asphalt or concrete--and that are expected to carry automobile traffic all year. The roads and streets consist of (1) the underlying local soil material, whether cut or fill, that is called "the subgrade," (2) the base material, lime-stabilized soil, soil-cement stabilized soil, gravel or crushed road, and (3) the actual road surface or street pavement that is either flexible (asphalt), rigid (concrete), or gravel with binder in it. These roads and streets are graded to shed water and conventional drainage measures are provided. With probable exception of the hard surface, the roads and streets are built mainly from the soil at hand.

The properties that affect local roads and streets are those that influence the ease of excavation and grading, and traffic supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or cemented pan, depth to water table, flooding, the amount of large stones, and slope. The properties that affect traffic supporting capacity are soil strength as inferred from ASSHTO group index and the Unified classification, shrink-swell behavior, potential frost action, and depth to high water table. Soil slippage may be a problem on certain sloping soils.

(f) Lawns and Landscaping--The soils are rated for their use in establishing and maintaining turf for lawns, and ornamental trees and shrubs for residential type landscaping. The ratings are based on the use of soil material at the location with some land smoothing. Irrigation may or may not be needed and is not a criteria for rating.

The properties considered are those that affect plant growth and trafficability after establishing vegetation. The propeties that affect plant growth are the content of salt, sodium and sulfidic materials, soil reaction, depth to water table, depth to bedrock or cemented pan, and the available water capacity of the upper 40 inches of soil. The properties that affect trafficability after vegetation is established are flooding, wetness, slope, stoniness, and the amount of clay, sand or organic matter in the surface layer.

TABLE J: CONSTRUCTION MATERIALS

Suitability ratings of good, fair, or poor are given for soils used as a source of roadfill and topsoil. Ratings of probable and improbable are given for sand and gravel.

A rating of probable means that on the basis of the available evidence, the source material is likely to occur in or below the soil. A rating of improbable means that the source material is unlikely to occur within or below the soil. This rating does not consider the quality of the source material because quality depends on how the source material will be used.

(a) Roadfill--Roadfill consists of soil material that is excavated from its original position and used in road embankments elsewhere. The evaluations for roadfill are for low embankments generally less than 6 feet and are less exacting in design than high embankments such as used in superhighways. The rating is given for the whole soil, from the surface to a depth of about 5 feet, based on the assumption that soil horizons will be mixed in loading, dumping, and spreading. Soils are rated as to the amount of material available for excavation, the ease of excavation, and how well the material performs after it is in place.

Soil properties that affect the amount of material available for excavation are thickness of suitable material above bedrock or other material that is not as suitable. The percent of coarse fraction greater than 3 inches, depth to high water table and slope are properties that influence the ease of excavation. How well the soil performs in place is indicated by AASHTO classification and group index and the shrink-swell potential. Some damage to the borrow area is expected,

but if revegetation and erosion control could become serious problems, then the soil is rated severe.

(b) Sand--Sand as a construction material is usually defined as the size of particles ranging from 0.74 mm (sieve #200) to 4.76 mm (sieve #4) in diameter. Sand is used in great quantities in many kinds of construction. Specifications for each purpose vary widely. The intent of this rating is to show only the probability of finding material in suitable quantity. The suitability of the sand for specific purposes is not evaluated.

The properties used to evaluate the soils as a probable source for sand are the grain size as indicated by the Unified Soil Classification, the thickness of the sand layer, and the amount of rock fragments in the soil material.

If the lowest layer of the soil contains sand, the soil is rated as a probable source regardless of thickness. The assumption is that the sand layer below the depth of observation exceeds the minimum thickness.

(c) Gravel--Gravel as a construction material is defined as the size of particles ranging from 4.76 mm (sieve #4) to 76 mm (3 inches) in diameter. Gravel is used in great quantities in many kinds of construction. Specifications for each purpose vary widely. The intent of this rating is to show only the probability of finding material in suitable quantity. The suitability of the gravel for specific purposes is not evaluated.

The properties used to evaluate the soil as a probable source for gravel are grain size as indicated by the Unified Soil Classification, the thickness of the gravel layer and the amount of rock fragments in the soil material. If the lowest layer of the soil contains gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the gravel layer below the depth of observation exceeds the minimum thickness.

(d) Topsoil--The term "topsoil" has several meanings, but as used here, the term describes soil material used to cover an area so as to improve soil conditions for establishment and maintenance of adapted vegetation.

Generally, the organic rich upper part of the soil is most desirable, however, material excavated from deeper layers is also used. In this rating, the upper 40 inches of soil material is evaluated for its use as topsoil. In the borrow area, the material below 40 inches is evaluated for its suitability to grow vegetation after the upper 40 inches is removed.

The soil properties that are used to rate the soil as topsoil are those that influence plant growth, those that influence the ease of excavation, loading, and spreading; and those which influence the reclamation of the borrow area.

The physical and chemical soil properties that influence plant growth are the presence of toxic substances, soil reaction, and those properties which are inferred from the soil texture such as available water capacity and fertility. The properties that influence the ease of excavation, loading, and spreading are the amounts of rock fragments, slope, depth to the water table, soil texture, and thickness of suitable material. The properties that influence the reclamation of the borrow area are slope, depth to water table, amount of rock fragments, depth to rock, and the presence of toxic material.

TABLE K: WATER MANAGEMENT

Interpretations of soils for water management are given as limitations for pond reservoir areas, embankments, dikes and levees, and excavated ponds (aquifer-fed), and as restrictive features that affect drainage, irrigation, terraces and diversions, and grass waterways. If there are no restrictive features the soil is shown as "favorable."

(a) Pond Reservoir Area is the area that holds water behind a dam or embankment. Soils best suited to this use have a low seepage potential which is determined by permeability and depth to fractured or permeable bedrock, cemented pan, or other permeable material. The soil is rated on its properties in the upper 60 inches as a natural barrier against seepage into deeper layers without regard to cutoff trenches or other features that may be installed under the pond embankment. Excessive slopes will seriously reduce the storage capacity of the reservoir area.

(b) Embankments, dikes, and levees are raised structures of soil material constructed to impound water or protect land against overflow. They are generally less than 20 feet high, constructed of "homogenous" soil material (without a core zone) and compacted to medium density. Embankments having zoned construction (core and shell) are not considered.

Ratings are made for soil as source material for embankment fills. The rating is given for whole soil, from the surface to a depth of about 5 feet, based on the assumption that soil horizons will be mixed in loading, dumping, and spreading. The ratings do not indicate the suitability of the natural soil for supporting the embankment. Soil properties to depths greater than the embankment height will have an effect on the embankment performance and safety. Generally, deeper onsite geologic investigations must be made to determine these important properties. Low density silts and clays in the supporting foundations usually have excess settlement and low strength.

Embankments, dikes, and levees require soil material that is resistant to seepage, piping, and erosion, and that has favorable compaction characteristics. Organic soils are not suitable because of high compression, low strength, and unpredictable permeability. When compacting with tamping rollers (sheepsfoot) or pneumatic rollers, stones over 6 inches in size must be removed, causing restrictions for stony soils. If a water table is present, the depth of usable material and the trafficability are affected.

The content of sodium and salts affects the capability for growing vegetation on embankment surfaces. These properties may also indicate dispersive soils that are highly erosive and susceptible to piping.

(c) Excavated Ponds (aquifer-fed)--An aquifer-fed excavated pond is a body of water created by excavating a pit or dugout into a ground water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface.

The soil properties that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, and quality of water as determined by inference

from the salinity of the soil. Large stones are also considered because of their effect on ease of excavation.

(d) Drainage is the process of removing excess surface and subsurface water from agricultural land. How easily and effectively a soil is drained depends on the depth of the water table or ponding, soil permeability, depth to bedrock or cemented pan, flooding, subsidence of organic layers, and slope. The productivity of the soil after drainage is dependent on presence of toxic substances in the root zone, such as salts, sodium, sulfur, or extreme acidity.

Properties that affect grading, excavation, and stability of trench or ditch bands are depth to bedrock or cemented pan, large stones, slope and stability against caving.

Availability of drainage outlets is a feature that must be considered in design, but is not considered in this report.

(e) Irrigation is the controlled application of water to supplement rainfall for supporting plant growth. Soil features are listed that affect design, layout, construction, management or performance of an irrigation system. Those features important in design and management of most irrigation systems are wetness or ponding and the need for drainage, flooding, available water capacity, intake rate, permeability, susceptibility to wind or water erosion, and slope. Soil features that influence construction are large stones and depth to bedrock or cemented pan. The features that affect performance of the system are rooting depth, amount of salts or sodium, and soil acidity.

(f) Terraces and Diversions are embankments or a combination of an embankment and channel constructed across a slope to control erosion by diverting or storing runoff instead of permitting it to flow uninterrupted down the slope. Soil features are listed that affect the construction of terraces and diversions and that may cause problems after construction of terraces and diversions. Soil features that influence construction are slope, large stones, depth to bedrock or cemented pan, and wetness. Soil features that may cause problems after construction are restricted rooting depth, high susceptibility to wind or water erosion, and restricted permeability to water and air.

(g) Grassed waterways are natural or constructed channels, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water to outlets at a nonerosive velocity. Soil features are listed that affect the construction of grassed waterways and the growth and maintenance of grass after construction. Soil features that influence the construction of grassed waterways are large stones, wetness, slope, and depth to bedrock or cemented pan. The soil features affecting the growth of grass after construction are susceptibility to wind or water erosion, available water capacity, rooting depth, presence of toxic substances such as salts or sodium and the permeability of water and air.

TABLE L: CLASSIFICATION OF THE SOILS

The classification of all the different kinds of soil that occur on the Naval Ordnance Station are listed along with their taxonomic placement at the family or higher taxonomic class level.

TABLE M: CAPABILITY CLASSES AND SUBCLASSES

Explanation of Items:

Class--The land capability classes are listed.
Total Acreage--The total acreage of each land capability class are listed.
Major Management Concerns (Subclass)--The number of acres of each land capability class is listed according to the major management concerns (subclass). The letter e shows that the main limitation is risk of erosion unless close growing plant cover is maintained; w shows that water in or on the soil surface interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and s shows that the soil is limited mainly because it is shallow, droughty, or stony.

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

TABLE A

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Map Unit Name	Acres	Percent
BeA	BELTSVILLE SILT LOAM, 0 TO 2 PERCENT SLOPES	156	4.4
BeB	BELTSVILLE SILT LOAM, 2 TO 5 PERCENT SLOPES	869	24.6
BeC	BELTSVILLE SILT LOAM, 5 TO 10 PERCENT SLOPES	112	3.2
BmB	BELTSVILLE-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES	118	3.4
Bs	BIBB SANDY LOAM	35	1.0
CrD	CROOM GRAVELLY SANDY LOAM, 10 TO 15 PERCENT SLOPES	368	10.4
CrE	CROOM GRAVELLY SANDY LOAM, 15 TO 25 PERCENT SLOPES	208	5.9
CrF	CROOM GRAVELLY SANDY LOAM, 25 TO 40 PERCENT SLOPES	96	2.7
FmA	FORT MOTT LOAMY SAND, 0 TO 2 PERCENT SLOPES	130	3.7
FmB	FORT MOTT LOAMY SAND, 2 TO 5 PERCENT SLOPES	63	1.8
HbB	HAMBROOK SANDY LOAM, 2 TO 5 PERCENT SLOPES	29	0.8
InA	INGLESIDE LOAMY SAND, 0 TO 2 PERCENT SLOPES	37	1.1
InB	INGLESIDE LOAMY SAND, 2 TO 5 PERCENT SLOPES	16	0.5
Ke	KENTUCK MUCKY SILT LOAM	54	1.5
KpA	KEYPORT SILT LOAM, 0 TO 2 PERCENT SLOPES	103	2.9
KpB	KEYPORT SILT LOAM, 2 TO 5 PERCENT SLOPES	70	2.0
KrB	KEYPORT-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES	137	3.9
Ks	KLEJ LOAMY SAND	85	2.4
MkA	MATAPEAKE SILT LOAM, WET SUBSTRATUM, 0 TO 2 PERCENT SLOPES	20	0.6
MkB	MATAPEAKE SILT LOAM, WET SUBSTRATUM, 2 TO 5 PERCENT SLOPES	13	0.4
MkC	MATAPEAKE SILT LOAM, WET SUBSTRATUM, 5 TO 10 PERCENT SLOPES	75	2.1
MmB	MATAPEAKE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	37	1.1
MpA	MATTAPEX FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES	21	0.6
MpB	MATTAPEX FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	53	1.5
MuB	MATTAPEX-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES	24	0.7
Pk	PUCKUM MUCKY PEAT	124	3.5
RcA	RUNCLINT LOAMY SAND, 0 TO 2 PERCENT SLOPES	192	5.5
RcB	RUNCLINT LOAMY SAND, 2 TO 5 PERCENT SLOPES	53	1.5
Ua	UDORTHENTS	77	2.2
WoA	WOODSTOWN SANDY LOAM, 0 TO 2 PERCENT SLOPES	57	1.6
WoB	WOODSTOWN SANDY LOAM, 2 TO 5 PERCENT SLOPES	93	2.6
	TOTAL	3525	100.0

(0.0 percent is less than 0.1 percent)

TABLE B.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
BeA, BeB, BeC Beltsville	4W	Slight	Moderate	Moderate	Moderate	Moderate	Black oak	70	4	Virginia pine, loblolly pine.
							Virginia pine	70	8	
							Loblolly pine	70	6	
							White oak	---	--	
							Pin oak	---	--	
							Sweetgum	---	--	
							Red maple	---	--	
BmB**:										
Beltsville	4W	Slight	Moderate	Moderate	Moderate	Moderate	Black oak	70	4	Virginia pine, loblolly pine.
							Virginia pine	70	8	
							Loblolly pine	70	6	
							White oak	---	--	
							Pin oak	---	--	
							Sweetgum	---	--	
							Red maple	---	--	
Urban land.										
Bs Bibb	9W	Slight	Severe	Severe	Moderate	Severe	Loblolly pine	90	9	Eastern cottonwood, loblolly pine, sweetgum, yellow poplar.
							Sweetgum	90	7	
							Water oak	90	6	
							Blackgum	---	--	
							Yellow poplar	---	--	
							Atlantic white cedar	---	--	
CrD Croom	3D	Slight	Slight	Moderate	Moderate	--------	White oak	60	3	Loblolly pine, Virginia pine.
							Virginia pine	60	6	
CrE, CrF Croom	3D	Moderate	Moderate	Moderate	Moderate	--------	White oak	60	3	Loblolly pine, Virginia pine.
							Virginia pine	60	6	

See footnote at end of table.

TABLE B.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
FmA, FmB Fort Mott	3A	Slight	Moderate	Slight	Slight	Slight	Shortleaf pine	---	--	Virginia pine.
							Pitch pine	---	--	
							Virginia pine	---	--	
							Black oak	---	--	
							White oak	---	--	
HbB Hambrook	8A	Slight	Slight	Slight	Slight	Slight	Virginia pine	70	8	Virginia pine, loblolly pine.
							Black oak	65	3	
							White oak	70	4	
							Scarlet oak	70	4	
InA, InB Ingleside	8S	Slight	Slight	Moderate	Slight	Slight	Virginia pine	70	8	
							Black oak	65	3	
							White oak	70	4	
							Scarlet oak	70	4	
Ke Kentuck	3W	Slight	Severe	Severe	Severe	Severe	Red maple	50	2	Sweetgum.
							Sweetgum	50	4	
							Willow oak	50	2	
							Swamp chestnut oak	60	2	
							Water oak	50	2	
KpA, KpB Keyport	6A	Slight	Moderate	Slight	Slight	Moderate	Yellow poplar	90	6	Yellow poplar, northern red oak.
							Northern red oak	80	4	
							American beech	80	6	
KrB**:										
Keyport	6A	Slight	Moderate	Slight	Slight	Moderate	Yellow poplar	90	6	Yellow poplar, northern red oak.
							Northern red oak	80	4	
							American beech	80	6	
Urban land.										
Ks Klej	8S	Slight	Moderate	Slight	Slight	-------	Loblolly pine	80	8	Virginia pine, eastern white pine, loblolly pine, sweetgum.
							Sweetgum	80	6	
							White oak	70	4	
							Virginia pine	70	8	

See footnote at end of table.

TABLE B.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
MkA, MkB, MkC Matapeake	4A	Slight	Slight	Slight	Slight	Moderate	Southern red oak	75	4	Loblolly pine.
							White oak	75	4	
							Loblolly pine	83	8	
							Red maple	60	3	
MmB**:										
Matapeake	4A	Slight	Slight	Slight	Slight	Moderate	Southern red oak	75	4	Loblolly pine.
							White oak	75	4	
							Loblolly pine	83	8	
							Red maple	60	3	
Urban land.										
MpA, MpB Mattapex	4A	Slight	Slight	Moderate	Slight	Moderate	White oak	70	4	Loblolly pine, eastern white pine, yellow poplar.
							Northern red oak	70	4	
							Loblolly pine	81	8	
							Sweetgum	80	6	
							Virginia pine	70	8	
MuB**:										
Mattapex	4A	Slight	Slight	Moderate	Slight	Moderate	White oak	70	4	Loblolly pine, eastern white pine, yellow poplar.
							Northern red oak	70	4	
							Loblolly pine	81	8	
							Sweetgum	80	6	
							Virginia pine	70	8	
Urban land.										
Pk Puckum	2W	Slight	Severe	Severe	Severe	Severe	Red maple	50	2	
							Blackgum	60	6	
							Sweetgum	60	4	
							Swamp chestnut oak	60	--	
							Water oak	60	3	
							Northern whitecedar	60	6	

See footnote at end of table.

TABLE B.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
RcA, RcB---------- Runclint	7S	Slight	Slight	Moderate	Slight	Slight	Virginia pine-------	60	6	
							Loblolly pine-------	70	6	
							White oak----------	55	3	
							Black oak----------	70	4	
							Northern red oak----	70	4	
Ua---------- Udorthents	3W	Slight	Moderate	Moderate	Slight	Severe	Sweetgum----------	40	3	Loblolly pine.
							Red maple----------	40	3	
							Willow oak----------	50	2	
							Loblolly pine-------	50	4	
WoA, WoB---------- Woodstown	4A	Slight	Slight	Slight	Slight	Moderate	White oak----------	80	4	Loblolly pine, yellow poplar, eastern white pine.
							Yellow poplar-------	90	6	
							Loblolly pine-------	85	8	
							Sweetgum----------	90	7	
							Northern red oak----	---	--	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE C.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements								Potential as habitat for—			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
BeA, BeB Beltsville	Good	Good	Good	Good	Poor	---	Poor	Poor	Good	Good	Poor	---
BeC Beltsville	Fair	Good	Good	Good	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.	---
BmB*:												
Beltsville	Good	Good	Good	Good	Poor	---	Poor	Poor	Good	Good	Poor	---
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Bs Bibb	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
CrD Croom	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
CrE Croom	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
CrF Croom	Very poor.	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
FmA, FmB Fort Mott	Poor	Fair	Fair	Poor	Poor	---	Poor	Very poor.	Fair	Poor	Very poor.	---
HbB Hambrook	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
InA, InB Ingleside	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Ke Kentuck	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Fair	Good	---
KpA, KpB Keyport	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
KrB*:												
Keyport	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Ks Klej	Fair	Fair	Good	Fair	Fair	---	Poor	Poor	Fair	Fair	Poor	---
MkA, MkB Matapeake	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
MkC Matapeake	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
MmB*:												
Matapeake	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---

See footnote at end of table.

TABLE C.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
MmB*:												
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
MpA Mattapex	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
MpB Mattapex	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
MuB*:												
Mattapex	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Pk Puckum	Very poor.	Very poor.	Poor	Poor	Poor	---	Good	Good	Very poor.	Poor	Good	---
RcA, RcB Runclint	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Ua Udorthents	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Poor	Fair	Fair	---
WoA Woodstown	Fair	Good	Good	Good	Poor	---	Poor	Poor	Good	Good	Poor	---
WoB Woodstown	Fair	Good	Good	Good	Poor	---	Poor	Very poor.	Good	Good	Very poor.	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE D.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BeA, BeB: Beltsville	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
BeC: Beltsville	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness.
BmB*:					
Beltsville	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
Urban land	Variable	Variable	Variable	Variable	Variable.
Bs: Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding, too sandy.	Severe: wetness.	Severe: wetness, flooding.
CrD: Croom	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope.
CrE: Croom	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: erodes easily.	Severe: slope.
CrF: Croom	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: slope.
FmA: Fort Mott	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
FmB: Fort Mott	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
HbB: Hambrook	Slight	Slight	Moderate: small stones.	Slight	Slight.
InA: Ingleside	Slight	Slight	Slight	Slight	Moderate: droughty.
InB: Ingleside	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Ke: Kentuck	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
KpA, KpB: Keyport	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
KrB*:					
Keyport	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
Urban land	Variable	Variable	Variable	Variable	Variable.

See footnote at end of table.

TABLE D.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ks Klej	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
MkA Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
MkB, MkC Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
MmB*:					
Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
Urban land	Variable	Variable	Variable	Variable	Variable.
MpA Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
MpB Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
MuB*:					
Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Urban land	Variable	Variable	Variable	Variable	Variable.
Pk Puckum	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
RcA, RcB Runclint	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
Ua Udorthents					Severe: wetness.
WoA Woodstown	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness.	Moderate: wetness.	Moderate: wetness, droughty.
WoB Woodstown	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness, droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

ENGINEERING INDEX PROPERTIES
TABLE E 1

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	USDA Texture	Classification Unified	Classification AASHTO
BeA	BELTSVILLE	0-14	SIL	ML CL-ML	A-4
		14-25	SICL SIL	CL ML	A-4 A-6
		25-50	SICL SIL L	CL CL-ML	A-6 A-4
		50-72	GR-SL SL CL	SM ML CL	A-2 A-4 A-6
BeB	BELTSVILLE	0-14	SIL	ML CL-ML	A-4
		14-25	SICL SIL	CL ML	A-4 A-6
		25-50	SICL SIL L	CL CL-ML	A-6 A-4
		50-72	GR-SL SL CL	SM ML CL	A-2 A-4 A-6
BeC	BELTSVILLE	0-14	SIL	ML CL-ML	A-4
		14-25	SICL SIL	CL ML	A-4 A-6
		25-50	SICL SIL L	CL CL-ML	A-6 A-4
		50-72	GR-SL SL CL	SM ML CL	A-2 A-4 A-6
BmB	BELTSVILLE	0-14	SIL	ML CL-ML	A-4
		14-25	SICL SIL	CL ML	A-4 A-6
		25-50	SICL SIL L	CL CL-ML	A-6 A-4
		50-72	GR-SL SL CL	SM ML CL	A-2 A-4 A-6
	URBAN LAND	0- 6	VAR		
Bs	BIBB	0-12	SL	SM SC-SM ML CL-ML	A-2 A-4
		12-60	SL L SIL	SM SC-SM ML CL-ML	A-2 A-4
CrD	CROOM	0-12	GR-SL	SM ML CL GM	A-1 A-2 A-4 A-6
		12-28	GRV-SCL GRV-SL GRV-L	GP-GM GP-GC GC GM	A-1 A-2-4 A-2-6
		28-48	GRV-LS GRV-SL GRV-SCL	GW GM GC GP	A-1 A-2-4 A-2-6
		48-99	GRV-S GRV-SL GRV-LS	GW SM GM SP	A-1 A-2 A-3 A-4
CrE	CROOM	0-12	GR-SL	SM ML CL GM	A-1 A-2 A-4 A-6
		12-28	GRV-SCL GRV-SL GRV-L	GP-GM GP-GC GC GM	A-1 A-2-4 A-2-6
		28-48	GRV-LS GRV-SL GRV-SCL	GW GM GC GP	A-1 A-2-4 A-2-6
		48-99	GRV-S GRV-SL GRV-LS	GW SM GM SP	A-1 A-2 A-3 A-4
CrF	CROOM	0-12	GR-SL	SM ML CL GM	A-1 A-2 A-4 A-6
		12-28	GRV-SCL GRV-SL GRV-L	GP-GM GP-GC GC GM	A-1 A-2-4 A-2-6
		28-48	GRV-LS GRV-SL GRV-SCL	GW GM GC GP	A-1 A-2-4 A-2-6
		48-99	GRV-S GRV-SL GRV-LS	GW SM GM SP	A-1 A-2 A-3 A-4
FmA	FORT MOTT	0-30	LS	SM SP-SM	A-2
		30-49	SL SCL	SM SC SC-SM	A-2 A-4 A-6
		49-60	SR- S LS	SM SP SP-SM SC	A-1 A-2 A-3
FmB	FORT MOTT	0-30	LS	SM SP-SM	A-2
		30-49	SL SCL	SM SC SC-SM	A-2 A-4 A-6
		49-60	SR- S LS	SM SP SP-SM SC	A-1 A-2 A-3
HbB	HAMBROOK	0-10	SL	SM ML CL	A-2 A-4
		10-14	L SL	SM ML CL	A-2 A-4
		14-28	SCL SL L	SC-SM CL ML	A-2 A-4 A-6
		28-65	LS S	SC SM SP-SM	A-1 A-2
		65-72	SR- FSL SICL	SC-SM CL CL-ML	A-4 A-6
InA	INGLESIDE	0-10	LS	SM SP-SM	A-2 A-1
		10-43	SL SCL	SM SC SC-SM	A-2 A-4
		43-56	LS S LFS	SC SM SP-SM	A-2 A-1

ENGINEERING INDEX PROPERTIES
TABLE E 1

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	USDA Texture	Classification Unified	Classification AASHTO
		56-72	SR- FSL SICL	SC-SM CL-ML CL	A-4 A-6
InB	INGLESIDE	0-10	LS	SM SP-SM	A-2 A-1
		10-43	SL SCL	SM SC SC-SM	A-2 A-4
		43-56	LS S LFS	SC SM SP-SM	A-2 A-1
		56-72	SR- FSL SICL	SC-SM CL-ML CL	A-4 A-6
Ke	KENTUCK	0-13	MK-SIL	CL OL	A-4
		13-24	SIL	CL CL-ML	A-4 A-6
		24-45	SIL SICL	CL	A-6
		45-56	SL FSL	SC-SM	A-4 A-2
		56-70	FS LS S	SM SP-SM	A-2 A-1 A-3
KpA	KEYPORT	0-10	SIL	ML CL SC SM	A-4 A-2-4 A-6 A-2-6
		10-60	SICL CL C	ML CL MH CH	A-6 A-7-6
KpB	KEYPORT	0-10	SIL	ML CL SC SM	A-4 A-2-4 A-6 A-2-6
		10-60	SICL CL C	ML CL MH CH	A-6 A-7-6
KrB	KEYPORT	0-10	SIL	ML CL SC SM	A-4 A-2-4 A-6 A-2-6
		10-60	SICL CL C	ML CL MH CH	A-6 A-7-6
	URBAN LAND	0- 6	VAR		
Ks	KLEJ	0-39	LS	SM	A-2 A-4
		39-47	S FS	SP-SM SM	A-1 A-2
		47-60	COS S	SM SP SP-SM	A-1-B A-2-4 A-3
MkA	MATAPEAKE	0- 7	SIL	SM CL ML	A-4
		7-13	SIL	CL ML	A-4
		13-38	SIL SICL	CL CL-ML	A-4 A-6
		38-46	SL L FSL	SM CL ML	A-2 A-4
		46-72	LS S LFS	SC SM SP-SM	A-1 A-2
MkB	MATAPEAKE	0- 7	SIL	SM CL ML	A-4
		7-13	SIL	CL ML	A-4
		13-38	SIL SICL	CL CL-ML	A-4 A-6
		38-46	SL L FSL	SM CL ML	A-2 A-4
		46-72	LS S LFS	SC SM SP-SM	A-1 A-2
MkC	MATAPEAKE	0- 7	SIL	SM CL ML	A-4
		7-13	SIL	CL ML	A-4
		13-38	SIL SICL	CL CL-ML	A-4 A-6
		38-46	SL L FSL	SM CL ML	A-2 A-4
		46-72	LS S LFS	SC SM SP-SM	A-1 A-2
MmB	MATAPEAKE	0- 7	SIL	SM CL ML	A-4
		7-13	SIL	CL ML	A-4
		13-38	SIL SICL	CL CL-ML	A-4 A-6
		38-46	SL L FSL	SM CL ML	A-2 A-4
		46-72	LS S LFS	SC SM SP-SM	A-1 A-2
	URBAN LAND	0- 6	VAR		
MpA	MATTAPEX	0-15	FSL	SM SC-SM ML	A-4 A-2
		15-36	SICL SIL	CL CL-ML	A-4 A-6 A-7
		36-60	FSL L LS	SM SC CL ML	A-2 A-4 A-6
		60-65	S LS	SM SC	A-2

ENGINEERING INDEX PROPERTIES
TABLE E 1

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	USDA Texture	Classification: Unified	Classification: AASHTO
MpB	MATTAPEX	0-15	FSL	SM SC-SM ML	A-4 A-2
		15-36	SICL SIL	CL CL-ML	A-4 A-6 A-7
		36-60	FSL L LS	SM SC CL ML	A-2 A-4 A-6
		60-65	S LS	SM SC	A-2
MuB	MATTAPEX	0-15	FSL	SM SC-SM ML	A-4 A-2
		15-36	SICL SIL	CL CL-ML	A-4 A-6 A-7
		36-60	FSL L LS	SM SC CL ML	A-2 A-4 A-6
		60-65	S LS	SM SC	A-2
	URBAN LAND	0- 6	VAR		
Pk	PUCKUM	0- 4	MPT	PT	A-8
		4-80	MUCK MPT	PT	A-8
RcA	RUNCLINT	0-22	LS	SP-SM SM	A-2 A-3
		22-40	S LS	SP-SM SM	A-2 A-3
		40-59	S LS GR-S	SP-SM SP	A-1 A-2 A-3
		59-72	SR- S SCL	SP-SM SC-SM CL-ML	A-2 A-3 A-4
RcB	RUNCLINT	0-22	LS	SP-SM SM	A-2 A-3
		22-40	S LS	SP-SM SM	A-2 A-3
		40-59	S LS GR-S	SP-SM SP	A-1 A-2 A-3
		59-72	SR- S SCL	SP-SM SC-SM CL-ML	A-2 A-3 A-4
Ua	UDORTHENTS	0-72	SR- S L	SM ML SP-SM	A-1 A-2 A-4
WoA	WOODSTOWN	0-11	SL	SM CL-ML SC-SM	A-2 A-4
		11-29	SCL L SL	SM CL-ML ML CL	A-2 A-4 A-6
		29-70	SR- GR-S SL	SM SP-SM SC-SM	A-1 A-2 A-3 A-2-4
WoB	WOODSTOWN	0-11	SL	SM CL-ML SC-SM	A-2 A-4
		11-29	SCL L SL	SM CL-ML ML CL	A-2 A-4 A-6
		29-70	SR- GR-S SL	SM SP-SM SC-SM	A-1 A-2 A-3 A-2-4

ENGINEERING INDEX PROPERTIES
TABLE E 2

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Fragments >3 Inches (pct)	Percent passing - sieve number 4	10	40	200	Liquid limit (pct)	Plasticity Index
BeA	BELTSVILLE	0-14	0- 0	85-100	80-100	70-100	50- 90	22-26	3- 7
		14-25	0- 0	85-100	80-100	70-100	55- 95	29-32	9-12
		25-50	0- 0	85-100	80-100	70-100	50- 95	29-34	9-14
		50-72	0- 0	60-100	50-100	30-100	15- 90	18-34	3-16
BeB	BELTSVILLE	0-14	0- 0	85-100	80-100	70-100	50- 90	22-26	3- 7
		14-25	0- 0	85-100	80-100	70-100	55- 95	29-32	9-12
		25-50	0- 0	85-100	80-100	70-100	50- 95	29-34	9-14
		50-72	0- 0	60-100	50-100	30-100	15- 90	18-34	3-16
BeC	BELTSVILLE	0-14	0- 0	85-100	80-100	70-100	50- 90	22-26	3- 7
		14-25	0- 0	85-100	80-100	70-100	55- 95	29-32	9-12
		25-50	0- 0	85-100	80-100	70-100	50- 95	29-34	9-14
		50-72	0- 0	60-100	50-100	30-100	15- 90	18-34	3-16
BmB	BELTSVILLE	0-14	0- 0	85-100	80-100	70-100	50- 90	22-26	3- 7
		14-25	0- 0	85-100	80-100	70-100	55- 95	29-32	9-12
		25-50	0- 0	85-100	80-100	70-100	50- 95	29-34	9-14
		50-72	0- 0	60-100	50-100	30-100	15- 90	18-34	3-16
	URBAN LAND	0- 6	-	-	-	-	-	-	-
Bs	BIBB	0-12	0- 5	95-100	90-100	60- 90	30- 60	15-25	0- 7
		12-60	0-10	60-100	50-100	40-100	30- 90	15-30	0- 7
CrD	CROOM	0-12	0- 0	60- 85	50- 75	30- 70	15- 55	15-33	2-16
		12-28	0- 0	40- 80	30- 55	20- 50	10- 30	8-36	2-16
		28-48	0- 0	40- 80	30- 55	15- 50	2- 30	15-36	0-16
		48-99	0- 0	40- 80	30- 55	15- 40	2- 20	15-30	0-12
CrE	CROOM	0-12	0- 0	60- 85	50- 75	30- 70	15- 55	15-33	2-16
		12-28	0- 0	40- 80	30- 55	20- 50	10- 30	8-36	2-16
		28-48	0- 0	40- 80	30- 55	15- 50	2- 30	15-36	0-16
		48-99	0- 0	40- 80	30- 55	15- 40	2- 20	15-30	0-12
CrF	CROOM	0-12	0- 0	60- 85	50- 75	30- 70	15- 55	15-33	2-16
		12-28	0- 0	40- 80	30- 55	20- 50	10- 30	8-36	2-16
		28-48	0- 0	40- 80	30- 55	15- 50	2- 30	15-36	0-16
		48-99	0- 0	40- 80	30- 55	15- 40	2- 20	15-30	0-12
FmA	FORT MOTT	0-30	0- 0	90-100	85-100	50- 90	10- 25	-	0- 0
		30-49	0- 0	90-100	80-100	50- 90	25- 45	15-35	0-15
		49-60	0- 0	90-100	75-100	40- 80	5- 35	15-40	0-12
FmB	FORT MOTT	0-30	0- 0	90-100	85-100	50- 90	10- 25	-	0- 0
		30-49	0- 0	90-100	80-100	50- 90	25- 45	15-35	0-15
		49-60	0- 0	90-100	75-100	40- 80	5- 35	15-40	0-12
HbB	HAMBROOK	0-10	0- 0	90-100	75-100	50- 95	25- 50	10-30	5-10
		10-14	0- 0	90-100	75-100	40- 90	20- 40	10-30	0-10
		14-28	0- 0	90-100	75-100	50- 95	30- 75	20-35	5-15
		28-65	0- 0	80-100	55-100	20- 70	5- 30	15-20	0- 5
		65-72	0- 0	85-100	80-100	70- 90	40- 85	10-30	5-10
InA	INGLESIDE	0-10	0- 0	90-100	90-100	40- 75	10- 35	15-15	0- 5

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TABLE E 2

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Fragments >3 Inches (pct)	Percent passing - sieve number 4	10	40	200	Liquid limit (pct)	Plasticity Index
		10-43	0- 0	90-100	55-100	50- 90	20- 40	10-25	0-10
		43-56	0- 0	80-100	75-100	20- 70	5- 30	15-20	0- 5
		56-72	0- 0	85-100	80-100	70- 90	40- 85	10-30	5-10
InB	INGLESIDE	0-10	0- 0	90-100	90-100	40- 75	10- 35	15-15	0- 5
		10-43	0- 0	90-100	55-100	50- 90	20- 40	10-25	0-10
		43-56	0- 0	80-100	75-100	20- 70	5- 30	15-20	0- 5
		56-72	0- 0	85-100	80-100	70- 90	40- 85	10-30	5-10
Ke	KENTUCK	0-13	0- 0	100-100	100-100	90-100	75- 90	30-40	5-10
		13-24	0- 0	100-100	100-100	90-100	75- 90	25-40	5-15
		24-45	0- 0	100-100	100-100	90-100	75- 95	35-45	15-20
		45-56	0- 0	100-100	100-100	60- 85	30- 50	15-25	5-10
		56-70	0- 0	100-100	100-100	50- 80	10- 35	15-20	0- 5
KpA	KEYPORT	0-10	0- 0	95-100	95-100	80-100	30- 55	20-30	3-12
		10-60	0- 0	95-100	95-100	85-100	70- 95	35-60	15-35
KpB	KEYPORT	0-10	0- 0	95-100	95-100	80-100	30- 55	20-30	3-12
		10-60	0- 0	95-100	95-100	85-100	70- 95	35-60	15-35
KrB	KEYPORT	0-10	0- 0	95-100	95-100	80-100	30- 55	20-30	3-12
		10-60	0- 0	95-100	95-100	85-100	70- 95	35-60	15-35
	URBAN LAND	0- 6	-	-	-	-	-	-	-
Ks	KLEJ	0-39	0- 0	100-100	95-100	50- 95	15- 45	15-20	0- 0
		39-47	0- 0	90-100	75-100	40- 80	5- 35	15-20	0- 0
		47-60	0- 0	98-100	95-100	35- 70	0- 15	-	0- 0
MkA	MATAPEAKE	0- 7	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		7-13	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		13-38	0- 0	100-100	100-100	80-100	60- 90	25-35	10-15
		38-46	0- 0	90-100	75-100	50- 95	25- 50	10-30	5-10
		46-72	0- 0	90-100	75-100	20- 70	5- 30	15-20	0- 5
MkB	MATAPEAKE	0- 7	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		7-13	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		13-38	0- 0	100-100	100-100	80-100	60- 90	25-35	10-15
		38-46	0- 0	90-100	75-100	50- 95	25- 50	10-30	5-10
		46-72	0- 0	90-100	75-100	20- 70	5- 30	15-20	0- 5
MkC	MATAPEAKE	0- 7	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		7-13	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		13-38	0- 0	100-100	100-100	80-100	60- 90	25-35	10-15
		38-46	0- 0	90-100	75-100	50- 95	25- 50	10-30	5-10
		46-72	0- 0	90-100	75-100	20- 70	5- 30	15-20	0- 5
MmB	MATAPEAKE	0- 7	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		7-13	0- 0	100-100	100-100	80-100	45- 80	20-35	5-10
		13-38	0- 0	100-100	100-100	80-100	60- 90	25-35	10-15
		38-46	0- 0	90-100	75-100	50- 95	25- 50	10-30	5-10
		46-72	0- 0	90-100	75-100	20- 70	5- 30	15-20	0- 5
	URBAN LAND	0- 6	-	-	-	-	-	-	-

ENGINEERING INDEX PROPERTIES
TABLE E 2

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Fragments >3 Inches (pct)	Percent passing - sieve number 4	10	40	200	Liquid limit (pct)	Plasticity Index
MpA	MATTAPEX	0-15	0- 0	95-100	90-100	80-100	30- 65	15-30	0-10
		15-36	0- 0	100-100	100-100	90-100	85- 95	24-45	7-21
		36-60	0- 0	95-100	90-100	45- 95	15- 75	15-40	0-18
		60-65	0- 0	95-100	90-100	43- 85	15- 40	15-10	0- 0
MpB	MATTAPEX	0-15	0- 0	95-100	90-100	80-100	30- 65	15-30	0-10
		15-36	0- 0	100-100	100-100	90-100	85- 95	24-45	7-21
		36-60	0- 0	95-100	90-100	45- 95	15- 75	15-40	0-18
		60-65	0- 0	95-100	90-100	43- 85	15- 40	15-10	0- 0
MuB	MATTAPEX	0-15	0- 0	95-100	90-100	80-100	30- 65	15-30	0-10
		15-36	0- 0	100-100	100-100	90-100	85- 95	24-45	7-21
		36-60	0- 0	95-100	90-100	45- 95	15- 75	15-40	0-18
		60-65	0- 0	95-100	90-100	43- 85	15- 40	15-10	0- 0
	URBAN LAND	0- 6	-	-	-	-	-	-	-
Pk	PUCKUM	0- 4	0- 0	-	-	-	-	-	-
		4-80	0- 0	-	-	-	-	-	-
RcA	RUNCLINT	0-22	0- 0	90-100	85-100	50- 90	5- 15	-	0- 0
		22-40	0- 0	90-100	85-100	50- 90	5- 15	-	0- 0
		40-59	0- 0	55-100	45-100	20- 80	5- 15	-	0- 0
		59-72	0- 0	90-100	80-100	50- 90	5- 40	15-30	0-10
RcB	RUNCLINT	0-22	0- 0	90-100	85-100	50- 90	5- 15	-	0- 0
		22-40	0- 0	90-100	85-100	50- 90	5- 15	-	0- 0
		40-59	0- 0	55-100	45-100	20- 80	5- 15	-	0- 0
		59-72	0- 0	90-100	80-100	50- 90	5- 40	15-30	0-10
Ua	UDORTHENTS	0-72	0- 0	90-100	90-100	60- 95	5- 60	15-30	0-15
WoA	WOODSTOWN	0-11	0- 0	90-100	80-100	60- 95	30- 75	15-28	0- 7
		11-29	0- 0	90-100	70-100	45- 90	25- 60	15-32	0-20
		29-70	0- 0	80-100	70- 95	35- 55	5- 25	15-26	0- 6
WoB	WOODSTOWN	0-11	0- 0	90-100	80-100	60- 95	30- 75	15-28	0- 7
		11-29	0- 0	90-100	70-100	45- 90	25- 60	15-32	0-20
		29-70	0- 0	80-100	70- 95	35- 55	5- 25	15-26	0- 6

PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS
TABLE F

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Clay (pct)	Moist Blk Density (g/cm3)	Permeability (In/hr)	Available water cap (In/in)	Soil React (ph)	Salinity (mmhos/cm)	Shrink Swell Pot.	Erosion Factor K	Erosion Factor T	Wind Erod. Group	Organic Matter (pct)
BeA	BELTSVILLE	0-14	7-20	1.20-1.40	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43	3		1.0- 3.0
		14-25	20-30	1.30-1.50	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43			0.0- 0.0
		25-50	20-30	1.60-1.90	0.00- 0.20	0.05-0.10	3.6-5.5	-	LOW	.32			0.0- 0.0
		50-72	20-35	1.30-1.50	0.20- 6.00	0.08-0.18	3.6-5.5	-	LOW	.37			0.0- 0.0
BeB	BELTSVILLE	0-14	7-20	1.20-1.40	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43	3		1.0- 3.0
		14-25	20-30	1.30-1.50	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43			0.0- 0.0
		25-50	20-30	1.60-1.90	0.00- 0.20	0.05-0.10	3.6-5.5	-	LOW	.32			0.0- 0.0
		50-72	20-35	1.30-1.50	0.20- 6.00	0.08-0.18	3.6-5.5	-	LOW	.37			0.0- 0.0
BeC	BELTSVILLE	0-14	7-20	1.20-1.40	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43	3		1.0- 3.0
		14-25	20-30	1.30-1.50	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43			0.0- 0.0
		25-50	20-30	1.60-1.90	0.00- 0.20	0.05-0.10	3.6-5.5	-	LOW	.32			0.0- 0.0
		50-72	20-35	1.30-1.50	0.20- 6.00	0.08-0.18	3.6-5.5	-	LOW	.37			0.0- 0.0
BmB	BELTSVILLE	0-14	7-20	1.20-1.40	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43	3		1.0- 3.0
		14-25	20-30	1.30-1.50	0.60- 2.00	0.18-0.21	3.6-5.5	-	LOW	.43			0.0- 0.0
		25-50	20-30	1.60-1.90	0.00- 0.20	0.05-0.10	3.6-5.5	-	LOW	.32			0.0- 0.0
		50-72	20-35	1.30-1.50	0.20- 6.00	0.08-0.18	3.6-5.5	-	LOW	.37			0.0- 0.0
	URBAN LAND	0- 6	-	0.00-0.00	0.00- 0.00	0.00-0.00	0.0-0.0	-					0.0- 0.0
Bs	BIBB	0-12	2-18	1.25-1.55	0.60- 2.00	0.12-0.18	4.5-5.5	-	LOW	.20	5	3	0.5- 2.0
		12-60	2-18	1.30-1.60	0.60- 2.00	0.12-0.20	4.5-5.5	-	LOW	.37			0.0- 0.0
CrD	CROOM	0-12	10-23	1.20-1.40	0.60- 2.00	0.10-0.18	4.5-6.0	-	LOW	.43	4		1.0- 3.0
		12-28	10-35	1.30-1.50	0.20- 2.00	0.05-0.10	4.5-6.0	-	LOW	.17			0.0- 0.0
		28-48	5-30	1.30-1.50	0.60-20.00	0.04-0.07	4.5-6.0	-	LOW	.17			0.0- 0.0
		48-99	5-20	1.30-1.50	0.60-20.00	0.03-0.13	4.5-6.0	-	LOW	.17			0.0- 0.0
CrE	CROOM	0-12	10-23	1.20-1.40	0.60- 2.00	0.10-0.18	4.5-6.0	-	LOW	.43	4		1.0- 3.0
		12-28	10-35	1.30-1.50	0.20- 2.00	0.05-0.10	4.5-6.0	-	LOW	.17			0.0- 0.0
		28-48	5-30	1.30-1.50	0.60-20.00	0.04-0.07	4.5-6.0	-	LOW	.17			0.0- 0.0
		48-99	5-20	1.30-1.50	0.60-20.00	0.03-0.13	4.5-6.0	-	LOW	.17			0.0- 0.0
CrF	CROOM	0-12	10-23	1.20-1.40	0.60- 2.00	0.10-0.18	4.5-6.0	-	LOW	.43	4		1.0- 3.0
		12-28	10-35	1.30-1.50	0.20- 2.00	0.05-0.10	4.5-6.0	-	LOW	.17			0.0- 0.0
		28-48	5-30	1.30-1.50	0.60-20.00	0.04-0.07	4.5-6.0	-	LOW	.17			0.0- 0.0
		48-99	5-20	1.30-1.50	0.60-20.00	0.03-0.13	4.5-6.0	-	LOW	.17			0.0- 0.0
FmA	FORT MOTT	0-30	5-10	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.20	4	2	1.0- 2.0
		30-49	10-30	1.25-1.80	0.60- 6.00	0.12-0.16	3.6-5.5	-	LOW	.32			0.0- 0.0
		49-60	5-15	1.30-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.17			0.0- 0.0
FmB	FORT MOTT	0-30	5-10	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.20	4	2	1.0- 2.0
		30-49	10-30	1.25-1.80	0.60- 6.00	0.12-0.16	3.6-5.5	-	LOW	.32			0.0- 0.0
		49-60	5-15	1.30-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.17			0.0- 0.0
HbB	HAMBROOK	0-10	12-18	1.30-1.60	0.60- 6.00	0.12-0.20	3.6-5.5	-	LOW	.28	4	5	0.0- 3.0
		10-14	10-18	1.45-1.65	0.60- 6.00	0.10-0.16	3.6-5.5	-	LOW	.24			0.5- 0.5
		14-28	18-27	1.35-1.70	0.60- 2.00	0.14-0.22	3.6-5.5	-	LOW	.37			0.5- 0.5
		28-65	3- 8	1.40-1.70	2.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.24			0.5- 0.5
		65-72	15-30	1.50-1.70	0.06- 0.60	0.12-0.24	3.6-5.5	-	LOW	.49			0.5- 0.5
InA	INGLESIDE	0-10	3- 8	1.30-1.70	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.20	4	2	0.5- 2.0
		10-43	8-25	1.45-1.65	2.00- 6.00	0.10-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5
		43-56	3- 8	1.40-1.70	2.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.5- 0.5
		56-72	15-30	1.50-1.70	0.06- 0.60	0.12-0.24	3.6-5.5	-	LOW	.49			0.5- 0.5

PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

TABLE F

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Clay (pct)	Moist Blk Density (g/cm3)	Permeability (In/hr)	Available water cap (In/in)	Soil React (ph)	Salinity (mmhos/cm)	Shrink Swell Pot.	Erosion Factor K	Erosion Factor T	Wind Erod. Group	Organ Matte (pct)
InB	INGLESIDE	0-10	3- 8	1.30-1.70	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.20	4	2	0.5- 2
		10-43	8-25	1.45-1.65	2.00- 6.00	0.10-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5
		43-56	3- 8	1.40-1.70	2.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.5- 0.5
		56-72	15-30	1.50-1.70	0.06- 0.60	0.12-0.24	3.6-5.5	-	LOW	.49			0.5- 0
Ke	KENTUCK	0-13	14-18	1.20-1.50	0.60- 2.00	0.20-0.25	3.6-5.5	0 - 4	LOW	.24	5	5	3.0-15
		13-24	14-20	1.40-1.70	0.60- 2.00	0.15-0.21	3.6-5.5	0 - 4	LOW	.43			0.5- 1.0
		24-45	24-34	1.40-1.70	0.06- 0.60	0.15-0.21	3.6-5.5	-	LOW	.43			0.5- 0
		45-56	10-15	1.65-1.80	2.00- 6.00	0.11-0.15	3.6-5.5	-	LOW	.24			0.5- 0
		56-70	3- 8	1.65-1.80	6.00-20.00	0.05-0.11	3.6-5.5	-	LOW	.15			0.5- 0.5
KpA	KEYPORT	0-10	10-25	1.20-1.60	0.20- 2.00	0.16-0.22	3.6-5.5	-	LOW	.43	3	5	1.0- 5.0
		10-60	30-50	1.35-1.60	0.00- 0.20	0.13-0.17	4.5-5.5	-	MODER	.32			0.0- 0
KpB	KEYPORT	0-10	10-25	1.20-1.60	0.20- 2.00	0.16-0.22	3.6-5.5	-	LOW	.43	3	5	1.0- 5.0
		10-60	30-50	1.35-1.60	0.00- 0.20	0.13-0.17	4.5-5.5	-	MODER	.32			0.0- 0.0
KrB	KEYPORT	0-10	10-25	1.20-1.60	0.20- 2.00	0.16-0.22	3.6-5.5	-	LOW	.43	3	5	1.0- 5
		10-60	30-50	1.35-1.60	0.00- 0.20	0.13-0.17	4.5-5.5	-	MODER	.32			0.0- 0
	URBAN LAND	0- 6	-	0.00-0.00	0.00- 0.00	0.00-0.00	0.0-0.0	-					0.0- 0.0
Ks	KLEJ	0-39	2-12	1.00-1.40	6.00-20.00	0.06-0.11	3.6-5.0	-	LOW	.17	5		1.0- 3
		39-47	2-10	1.30-1.50	6.00-20.00	0.06-0.08	3.6-5.0	-	LOW	.17			0.0- 0
		47-60	0- 5	1.40-1.60	6.00-20.00	0.04-0.05	3.6-5.0	-	LOW	.10			0.0- 0.0
MkA	MATAPEAKE	0- 7	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	4.5-7.3	-	LOW	.43	5	5	1.0- 2.0
		7-13	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	3.6-6.0	-	LOW	.49			0.0- 0
		13-38	18-30	1.40-1.70	0.20- 2.00	0.18-0.24	3.6-5.5	-	LOW	.49			0.0- 0
		38-46	10-22	1.65-1.80	0.60- 6.00	0.12-0.20	3.6-5.5	-	LOW	.28			0.0- 0.0
		46-72	3-10	1.65-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.0- 0
MkB	MATAPEAKE	0- 7	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	4.5-7.3	-	LOW	.43	5	5	1.0- 2
		7-13	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	3.6-6.0	-	LOW	.49			0.0- 0.0
		13-38	18-30	1.40-1.70	0.20- 2.00	0.18-0.24	3.6-5.5	-	LOW	.49			0.0- 0
		38-46	10-22	1.65-1.80	0.60- 6.00	0.12-0.20	3.6-5.5	-	LOW	.28			0.0- 0
		46-72	3-10	1.65-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.0- 0.0
MkC	MATAPEAKE	0- 7	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	4.5-7.3	-	LOW	.43	5	5	1.0- 2.0
		7-13	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	3.6-6.0	-	LOW	.49			0.0- 0
		13-38	18-30	1.40-1.70	0.20- 2.00	0.18-0.24	3.6-5.5	-	LOW	.49			0.0- 0
		38-46	10-22	1.65-1.80	0.60- 6.00	0.12-0.20	3.6-5.5	-	LOW	.28			0.0- 0.0
		46-72	3-10	1.65-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.0- 0
MmB	MATAPEAKE	0- 7	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	4.5-7.3	-	LOW	.43	5	5	1.0- 2
		7-13	10-18	1.20-1.50	0.60- 2.00	0.16-0.24	3.6-6.0	-	LOW	.49			0.0- 0.0
		13-38	18-30	1.40-1.70	0.20- 2.00	0.18-0.24	3.6-5.5	-	LOW	.49			0.0- 0
		38-46	10-22	1.65-1.80	0.60- 6.00	0.12-0.20	3.6-5.5	-	LOW	.28			0.0- 0
		46-72	3-10	1.65-1.80	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.15			0.0- 0.0
	URBAN LAND	0- 6	-	0.00-0.00	0.00- 0.00	0.00-0.00	0.0-0.0	-					0.0- 0.0
MpA	MATTAPEX	0-15	10-18	1.10-1.45	0.60- 2.00	0.13-0.20	3.6-5.5	-	LOW	.37	4	3	0.5- 3
		15-36	18-30	1.25-1.45	0.20- 2.00	0.18-0.22	3.6-5.5	-	LOW	.43			0.5- 0.5
		36-60	8-15	1.45-1.65	0.60- 6.00	0.14-0.18	3.6-5.5	-	LOW	.28			0.5- 0.5
		60-65	3- 8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	-	LOW	.17			0.5- 0
MpB	MATTAPEX	0-15	10-18	1.10-1.45	0.60- 2.00	0.13-0.20	3.6-5.5	-	LOW	.37	4	3	0.5- 3
		15-36	18-30	1.25-1.45	0.20- 2.00	0.18-0.22	3.6-5.5	-	LOW	.43			0.5- 0.5

PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

TABLE F

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map Symbol	Soil Name	Depth (In)	Clay (pct)	Moist Blk Density (g/cm3)	Permeability (In/hr)	Available water cap (In/in)	Soil React (ph)	Salinity (mmhos/cm)	Shrink Swell Pot.	Erosion Factor K	Erosion Factor T	Wind Erod. Group	Organic Matter (pct)
		36-60	8-15	1.45-1.65	0.60- 6.00	0.14-0.18	3.6-5.5	-	LOW	.28			0.5- 0.5
		60-65	3- 8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	-	LOW	.17			0.5- 0.5
MuB	MATTAPEX	0-15	10-18	1.10-1.45	0.60- 2.00	0.13-0.20	3.6-5.5	-	LOW	.37	4	3	0.5- 3.0
		15-36	18-30	1.25-1.45	0.20- 2.00	0.18-0.22	3.6-5.5	-	LOW	.43			0.5- 0.5
		36-60	8-15	1.45-1.65	0.60- 6.00	0.14-0.18	3.6-5.5	-	LOW	.28			0.5- 0.5
		60-65	3- 8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	-	LOW	.17			0.5- 0.5
	URBAN LAND	0- 6	-	0.00-0.00	0.00- 0.00	0.00-0.00	0.0-0.0	-					0.0- 0.0
Pk	PUCKUM	0- 4	-	0.10-0.50	2.00- 6.00	0.35-0.45	3.6-5.5	0- 4	LOW	.02	1	8	45.0-90.0
		4-80	-	0.10-0.50	2.00- 6.00	0.35-0.45	3.6-5.5	0- 4	LOW	.02			30.0-75.0
RcA	RUNCLINT	0-22	4-10	1.50-1.75	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.17	5	2	0.5- 3.0
		22-40	1- 8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	-	LOW	.10			0.5- 0.5
		40-59	1- 8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	-	LOW	.05			0.5- 0.5
		59-72	1-25	1.40-1.70	0.60- 2.00	0.02-0.15	3.6-5.5	-	LOW	.20			0.5- 0.5
RcB	RUNCLINT	0-22	4-10	1.50-1.75	6.00-20.00	0.05-0.10	3.6-5.5	-	LOW	.17	5	2	0.5- 3.0
		22-40	1- 8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	-	LOW	.10			0.5- 0.5
		40-59	1- 8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	-	LOW	.05			0.5- 0.5
		59-72	1-25	1.40-1.70	0.60- 2.00	0.02-0.15	3.6-5.5	-	LOW	.20			0.5- 0.5
Ua	UDORTHENTS	0-72	3-20	1.55-1.80	2.00-20.00	0.05-0.20	3.6-5.5	-	LOW	.15			0.5- 0.5
WoA	WOODSTOWN	0-11	5-18	1.00-1.40	0.60- 6.00	0.08-0.16	3.6-5.5	-	LOW	.24	4	3	1.0- 2.0
		11-29	18-30	1.35-1.70	0.20- 6.00	0.06-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5
		29-70	5-20	1.35-1.65	0.60- 6.00	0.06-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5
WoB	WOODSTOWN	0-11	5-18	1.00-1.40	0.60- 6.00	0.08-0.16	3.6-5.5	-	LOW	.24	4	3	1.0- 2.0
		11-29	18-30	1.35-1.70	0.20- 6.00	0.06-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5
		29-70	5-20	1.35-1.65	0.60- 6.00	0.06-0.16	3.6-5.5	-	LOW	.28			0.5- 0.5

WATER FEATURES
TABLE G

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol and soil name		Hydrologic group	Flooding Freq	Duration	Months	High water table Depth	Kind	Months
						(Ft)		
BeA	BELTSVILLE	C	NONE		-	1.5- 2.5	PERCH	NOV-APR
BeB	BELTSVILLE	C	NONE		-	1.5- 2.5	PERCH	NOV-APR
BeC	BELTSVILLE	C	NONE		-	1.5- 2.5	PERCH	NOV-APR
BmB	BELTSVILLE	C	NONE		-	1.5- 2.5	PERCH	NOV-APR
	URBAN LAND		NONE		-	2.0- 2.0		-
Bs	BIBB	D	FREQ	LONG	DEC-MAY	0.5- 1.5	APPAR	DEC-APR
CrD	CROOM	C	NONE		-	6.0- 6.0		-
CrE	CROOM	C	NONE		-	6.0- 6.0		-
C[illegible]	CROOM	C	NONE		-	6.0- 6.0		-
FmA	FORT MOTT	A	NONE		-	6.0- 6.0		-
FmB	FORT MOTT	A	NONE		-	6.0- 6.0		-
HbB	HAMBROOK	B	NONE		-	4.0- 6.0	PERCH	JAN-MAY
InA	INGLESIDE	B	NONE		-	4.0- 6.0	APPAR	JAN-MAY
InB	INGLESIDE	B	NONE		-	4.0- 6.0	APPAR	JAN-MAY
Ke	KENTUCK	B/D	FREQ		JAN-DEC	-	APPAR	-
KpA	KEYPORT	C	NONE		-	1.5- 4.0	PERCH	NOV-MAY
KpB	KEYPORT	C	NONE		-	1.5- 4.0	PERCH	NOV-MAY
KrB	KEYPORT	C	NONE		-	1.5- 4.0	PERCH	NOV-MAY
	URBAN LAND		NONE		-	2.0- 2.0		-
Ks	KLEJ	B	NONE		-	1.5- 2.0	APPAR	DEC-APR
MkA	MATAPEAKE	B	NONE		-	4.0- 6.0	APPAR	JAN-APR
MkB	MATAPEAKE	B	NONE		-	4.0- 6.0	APPAR	JAN-APR
MkC	MATAPEAKE	B	NONE		-	4.0- 6.0	APPAR	JAN-APR
MmB	MATAPEAKE	B	NONE		-	4.0- 6.0	APPAR	JAN-APR
	URBAN LAND		NONE		-	2.0- 2.0		-
MpA	MATTAPEX	C	NONE		-	1.5- 3.0	APPAR	JAN-APR
MpB	MATTAPEX	C	NONE		-	1.5- 3.0	APPAR	JAN-APR
MuB	MATTAPEX	C	NONE		-	1.5- 3.0	APPAR	JAN-APR
	URBAN LAND		NONE		-	2.0- 2.0		-
Pk	PUCKUM	D	FREQ		JAN-DEC	-	APPAR	-
RcA	RUNCLINT	A	NONE		-	4.0- 6.0	APPAR	JAN-MAY
RcB	RUNCLINT	A	NONE		-	4.0- 6.0	APPAR	JAN-MAY
Ua	UDORTHENTS	A/D	NONE		-	0- 3.0	APPAR	NOV-MAY
WoA	WOODSTOWN	C	NONE		-	1.5- 3.5	APPAR	JAN-APR
WoB	WOODSTOWN	C	NONE		-	1.5- 3.5	APPAR	JAN-APR

SANITARY FACILITIES REPORT
TABLE H

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name	Septic Tank Absorption Fields	Sewage Lagoons	Sanitary Landfill (Trench)	Sanitary Landfill (Area)	Daily Cover for Landfill
BeA BELTSVILLE	SEVERE Wetness Percs Slowly	SEVERE Seepage	SEVERE Seepage Wetness	MODERATE Wetness	FAIR Too Clayey Wetness
BeB BELTSVILLE	SEVERE Wetness Percs Slowly	SEVERE Seepage	SEVERE Seepage Wetness	MODERATE Wetness	FAIR Too Clayey Wetness
BeC BELTSVILLE	SEVERE Wetness Percs Slowly	SEVERE Seepage Slope	SEVERE Seepage Wetness	MODERATE Wetness	FAIR Too Clayey Wetness
BmB BELTSVILLE	SEVERE Wetness Percs Slowly	SEVERE Seepage	SEVERE Seepage Wetness	MODERATE Wetness	FAIR Too Clayey Wetness
URBAN LAND	Variable	Variable	Variable	Variable	Variable
Bs BIBB	SEVERE Flooding Wetness	SEVERE Flooding Wetness	SEVERE Flooding Wetness	SEVERE Flooding Wetness	POOR Wetness
CrD CROOM	SEVERE Percs Slowly Poor Filter	SEVERE Seepage Slope	SEVERE Seepage Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy Small Stones
CrE CROOM	SEVERE Percs Slowly Poor Filter Slope	SEVERE Seepage Slope	SEVERE Seepage Slope Too Sandy	SEVERE Seepage Slope	POOR Seepage Too Sandy Small Stones
CrF CROOM	SEVERE Percs Slowly Poor Filter Slope	SEVERE Seepage Slope	SEVERE Seepage Slope Too Sandy	SEVERE Seepage Slope	POOR Seepage Too Sandy Small Stones
FmA FORT MOTT	SEVERE Poor Filter	SEVERE Seepage	SEVERE Seepage	SEVERE Seepage	POOR Seepage
FmB FORT MOTT	SEVERE Poor Filter	SEVERE Seepage	SEVERE Seepage	SEVERE Seepage	POOR Seepage
HbB HAMBROOK	SEVERE Poor Filter	SEVERE Seepage	SEVERE Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy

SANITARY FACILITIES REPORT

TABLE H

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name	Septic Tank Absorption Fields	Sewage Lagoons	Sanitary Landfill (Trench)	Sanitary Landfill (Area)	Daily Cover for Landfill
InA INGLESIDE	SEVERE Percs Slowly	SEVERE Seepage	SEVERE Wetness	SEVERE Seepage	POOR Thin Layer
InB INGLESIDE	SEVERE Percs Slowly	SEVERE Seepage	SEVERE Wetness	SEVERE Seepage	POOR Thin Layer
Ke KENTUCK	SEVERE Ponding Percs Slowly	SEVERE Seepage Ponding	SEVERE Seepage Ponding	SEVERE Ponding	POOR Ponding
KpA KEYPORT	SEVERE Wetness Percs Slowly	SEVERE Wetness	SEVERE Wetness Too Clayey	MODERATE Wetness	POOR Too Clayey Hard To Pack
KpB KEYPORT	SEVERE Wetness Percs Slowly	SEVERE Wetness	SEVERE Wetness Too Clayey	MODERATE Wetness	POOR Too Clayey Hard To Pack
KrB KEYPORT	SEVERE Wetness Percs Slowly	SEVERE Wetness	SEVERE Wetness Too Clayey	MODERATE Wetness	POOR Too Clayey Hard To Pack
URBAN LAND	Variable	Variable	Variable	Variable	Variable
Ks KLEJ	SEVERE Wetness Poor Filter	SEVERE Seepage Wetness	SEVERE Wetness	SEVERE Seepage Wetness	POOR Seepage
MkA MATAPEAKE	SEVERE Percs Slowly	SEVERE Seepage	SEVERE Seepage Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy
MkB MATAPEAKE	SEVERE Percs Slowly	SEVERE Seepage	SEVERE Seepage Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy
MkC MATAPEAKE	SEVERE Percs Slowly	SEVERE Seepage Slope	SEVERE Seepage Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy
MmB MATAPEAKE	SEVERE Percs Slowly	SEVERE Seepage	SEVERE Seepage Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy
URBAN LAND	Variable	Variable	Variable	Variable	Variable

SANITARY FACILITIES REPORT
TABLE H

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Septic Tank Absorption Fields	Sewage Lagoons	Sanitary Landfill (Trench)	Sanitary Landfill (Area)	Daily Cover for Landfill
MpA	MATTAPEX	SEVERE Wetness Percs Slowly	SEVERE Seepage Wetness	SEVERE Seepage Wetness	SEVERE Seepage Wetness	FAIR Too Sandy Wetness
MpB	MATTAPEX	SEVERE Wetness Percs Slowly	SEVERE Seepage Wetness	SEVERE Seepage Wetness	SEVERE Seepage Wetness	FAIR Too Sandy Wetness
MuB	MATTAPEX	SEVERE Wetness Percs Slowly	SEVERE Seepage Wetness	SEVERE Seepage Wetness	SEVERE Seepage Wetness	FAIR Too Sandy Wetness
	URBAN LAND	Variable	Variable	Variable	Variable	Variable
Pk	PUCKUM	SEVERE Flooding Ponding	SEVERE Seepage Flooding Excess Humus	SEVERE Flooding Seepage Ponding	SEVERE Flooding Seepage Ponding	POOR Ponding Excess Humus
RcA	RUNCLINT	SEVERE Poor Filter	SEVERE Seepage	SEVERE Wetness Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy Small Stones
RcB	RUNCLINT	SEVERE Poor Filter	SEVERE Seepage	SEVERE Wetness Too Sandy	SEVERE Seepage	POOR Seepage Too Sandy Small Stones
Ua	UDORTHENTS	SEVERE Wetness Poor Filter	SEVERE Seepage Wetness	SEVERE Seepage Wetness Too Sandy	SEVERE Seepage Wetness	POOR Seepage Too Sandy Wetness
WoA	WOODSTOWN	SEVERE Wetness Percs Slowly	SEVERE Seepage Wetness	SEVERE Seepage Wetness	SEVERE Seepage Wetness	POOR Seepage Too Sandy
WoB	WOODSTOWN	SEVERE Wetness Percs Slowly	SEVERE Seepage Wetness	SEVERE Seepage Wetness	SEVERE Seepage Wetness	POOR Seepage Too Sandy

BUILDING SITE DEVELOPMENT REPORT
TABLE I
Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Shallow Excavations	Dwellings Without Basements	Dwellings With Basements	Small Commercial Buildings	Local Streets and Roads	Lawns, Landscaping, and Golf Fairways
BeA	BELTSVILLE	SEVERE Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Frost Action	MODERATE Wetness
BeB	BELTSVILLE	SEVERE Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Frost Action	MODERATE Wetness
BeC	BELTSVILLE	SEVERE Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness Slope	SEVERE Frost Action	MODERATE Wetness
BmB	BELTSVILLE	SEVERE Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Frost Action	MODERATE Wetness
	URBAN LAND	Variable	Variable	Variable	Variable	Variable	Variable
Bs	BIBB	SEVERE Wetness Cutbanks Cave	SEVERE Flooding Wetness	SEVERE Flooding Wetness	SEVERE Flooding Wetness	SEVERE Wetness Flooding	SEVERE Wetness Flooding
CrD	CROOM	SEVERE Cutbanks Cave	MODERATE Slope	MODERATE Slope	SEVERE Slope	MODERATE Slope Frost Action	MODERATE Small Stones Slope
CrE	CROOM	SEVERE Cutbanks Cave Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope
CrF	CROOM	SEVERE Cutbanks Cave Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope	SEVERE Slope
FmA	FORT MOTT	SEVERE Cutbanks Cave	SLIGHT	SLIGHT	SLIGHT	MODERATE Frost Action	MODERATE Droughty
FmB	FORT MOTT	SEVERE Cutbanks Cave	SLIGHT	SLIGHT	SLIGHT	MODERATE Frost Action	MODERATE Droughty
HbB	HAMBROOK	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	MODERATE Frost Action	SLIGHT

BUILDING SITE DEVELOPMENT REPORT
TABLE I

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Shallow Excavations	Dwellings Without Basements	Dwellings With Basements	Small Commercial Buildings	Local Streets and Roads	Lawns, Landscaping, and Golf Fairways
InA	INGLESIDE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	SLIGHT	MODERATE Droughty
InB	INGLESIDE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	SLIGHT	MODERATE Droughty
Ke	KENTUCK	SEVERE Cutbanks Cave Ponding	SEVERE Ponding	SEVERE Ponding	SEVERE Ponding	SEVERE Low Strength Ponding	SEVERE Ponding
KpA	KEYPORT	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Low Strength Frost Action	MODERATE Wetness
KpB	KEYPORT	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Low Strength Frost Action	MODERATE Wetness
KrB	KEYPORT	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Wetness	MODERATE Wetness Shrink-swell	SEVERE Low Strength Frost Action	MODERATE Wetness
	URBAN LAND	Variable	Variable	Variable	Variable	Variable	Variable
Ks	KLEJ	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	MODERATE Wetness Frost Action	MODERATE Wetness Droughty
MkA	MATAPEAKE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	MODERATE Low Strength	SLIGHT
MkB	MATAPEAKE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	MODERATE Low Strength	SLIGHT
MkC	MATAPEAKE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	MODERATE Slope	MODERATE Low Strength	SLIGHT
MmB	MATAPEAKE	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	MODERATE Slope	MODERATE Low Strength	SLIGHT
	URBAN LAND	Variable	Variable	Variable	Variable	Variable	Variable

BUILDING SITE DEVELOPMENT REPORT
TABLE I
Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name	Shallow Excavations	Dwellings Without Basements	Dwellings With Basements	Small Commercial Buildings	Local Streets and Roads	Lawns, Landscaping, and Golf Fairways
MpA MATTAPEX	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Low Strength	MODERATE Wetness
MpB MATTAPEX	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Low Strength	MODERATE Wetness
MuB MATTAPEX	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	SEVERE Low Strength	MODERATE Wetness
URBAN LAND	Variable	Variable	Variable	Variable	Variable	Variable
Pk PUCKUM	SEVERE Excess Humus Ponding	SEVERE Subsides Flooding Ponding	SEVERE Subsides Flooding Ponding	SEVERE Subsides Flooding Ponding	SEVERE Subsides Ponding Flooding	SEVERE Ponding Flooding Excess Humus
RcA RUNCLINT	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	SLIGHT	SEVERE Droughty
RcB RUNCLINT	SEVERE Cutbanks Cave	SLIGHT	MODERATE Wetness	SLIGHT	SLIGHT	SEVERE Droughty
Ua UDORTHENTS	SEVERE Cutbanks Cave Wetness	SEVERE Wetness	SEVERE Wetness	SEVERE Wetness	SEVERE Wetness	SEVERE Wetness
WoA WOODSTOWN	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	MODERATE Wetness Frost Action	MODERATE Wetness Droughty
WoB WOODSTOWN	SEVERE Cutbanks Cave Wetness	MODERATE Wetness	SEVERE Wetness	MODERATE Wetness	MODERATE Wetness Frost Action	MODERATE Wetness Droughty

CONSTRUCTION MATERIALS REPORT
TABLE J
Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Roadfill	Sand	Gravel	Topsoil
BeA	BELTSVILLE	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Area Reclaim Too Clayey Small Stones
BeB	BELTSVILLE	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Area Reclaim Too Clayey Small Stones
BeC	BELTSVILLE	FAIR Wetness	IMPROBABLE Excess Fines	PROBABLE	FAIR Area Reclaim Too Clayey Small Stones
BmB	BELTSVILLE	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Area Reclaim Too Clayey Small Stones
	URBAN LAND	Variable	Variable	Variable	Variable
Bs	BIBB	POOR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Wetness Small Stones
CrD	CROOM	GOOD	PROBABLE	PROBABLE	POOR Small Stones Area Reclaim
CrE	CROOM	FAIR Slope	PROBABLE	PROBABLE	POOR Small Stones Area Reclaim Slope
CrF	CROOM	POOR Slope	PROBABLE	PROBABLE	POOR Small Stones Area Reclaim Slope
FmA	FORT MOTT	GOOD	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Sandy Small Stones
FmB	FORT MOTT	GOOD	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Sandy Small Stones
HbB	HAMBROOK	GOOD	PROBABLE	IMPROBABLE Too Sandy	POOR Small Stones
InA	INGLESIDE	GOOD	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Small Stones

CONSTRUCTION MATERIALS REPORT
TABLE J

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Roadfill	Sand	Gravel	Topsoil
InB	INGLESIDE	GOOD	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Small Stones
Ke	KENTUCK	POOR Wetness	PROBABLE	IMPROBABLE Too Sandy	POOR Wetness
KpA	KEYPORT	POOR Low Strength	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Thin Layer Too Clayey
KpB	KEYPORT	POOR Low Strength	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Thin Layer Too Clayey
KrB	KEYPORT	POOR Low Strength	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	POOR Thin Layer Too Clayey
	URBAN LAND	Variable	Variable	Variable	Variable
Ks	KLEJ	FAIR Wetness	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Sandy Small Stones
MkA	MATAPEAKE	GOOD	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Clayey Thin Layer
MkB	MATAPEAKE	GOOD	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Clayey Thin Layer
MkC	MATAPEAKE	GOOD	PROBABLE	PROBABLE	FAIR Too Clayey Thin Layer
MmB	MATAPEAKE	GOOD	PROBABLE	IMPROBABLE Too Sandy	FAIR Too Clayey Thin Layer
	URBAN LAND	Variable	Variable	Variable	Variable
MpA	MATTAPEX	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Too Clayey

CONSTRUCTION MATERIALS REPORT
TABLE J

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Roadfill	Sand	Gravel	Topsoil
MpB	MATTAPEX	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Too Clayey
MuB	MATTAPEX	FAIR Wetness	IMPROBABLE Excess Fines	IMPROBABLE Excess Fines	FAIR Too Clayey
	URBAN LAND	Variable	Variable	Variable	Variable
Pk	PUCKUM	POOR Wetness	IMPROBABLE Excess Humus	IMPROBABLE Excess Humus	POOR Excess Humus Wetness
RcA	RUNCLINT	GOOD	PROBABLE	IMPROBABLE Thin Layer	POOR Area Reclaim
RcB	RUNCLINT	GOOD	PROBABLE	IMPROBABLE Thin Layer	POOR Area Reclaim
Ua	UDORTHENTS	POOR Wetness	PROBABLE	IMPROBABLE Too Sandy	POOR Too Sandy Wetness
WoA	WOODSTOWN	FAIR Wetness	PROBABLE	IMPROBABLE Too Sandy	POOR Small Stones
WoB	WOODSTOWN	FAIR Wetness	PROBABLE	IMPROBABLE Too Sandy	POOR Small Stones

WATER MANAGEMENT REPORT
TABLE K

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Limitations for: Pond Reservoir Area	Embankments, Dikes and Levees	Excavated Ponds--Aquifier Fed	Features affecting: Drainage	Irrigation	Terraces and Diversions	Grassed Waterways
BeA	BELTSVILLE	SLIGHT	SEVERE Piping	SEVERE No Water	LIMITATION Percs Slowly Frost Action	LIMITATION Wetness Percs Slowly	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Rooting Depth
BeB	BELTSVILLE	SEVERE Seepage	SEVERE Piping	SEVERE No Water	LIMITATION Percs Slowly Frost Action Slope	LIMITATION Slope Wetness Percs Slowly	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Rooting Depth
BeC	BELTSVILLE	SEVERE Seepage	SEVERE Piping	SEVERE No Water	LIMITATION Percs Slowly Frost Action Slope	LIMITATION Slope Wetness Percs Slowly	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Rooting Depth
BmB	BELTSVILLE	SEVERE Seepage	SEVERE Piping	SEVERE No Water	LIMITATION Percs Slowly Frost Action	LIMITATION Wetness Percs Slowly	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Rooting Depth
	URBAN LAND	Variable	Variable	Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable
Bs	BIBB	MODERATE Seepage	SEVERE Piping Wetness	MODERATE Slow Refill	LIMITATION Flooding	LIMITATION Wetness Flooding	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Wetness
CrD	CROOM	SEVERE Seepage Slope	SEVERE Seepage	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Droughty Slope Erodes Easily	LIMITATION Slope Erodes Easily Too Sandy	LIMITATION Slope Erodes Easily Droughty
CrE	CROOM	SEVERE Seepage Slope	SEVERE Seepage	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Droughty Slope Erodes Easily	LIMITATION Slope Erodes Easily Too Sandy	LIMITATION Slope Erodes Easily Droughty
CrF	CROOM	SEVERE Seepage Slope	SEVERE Seepage	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Droughty Slope Erodes Easily	LIMITATION Slope Erodes Easily Too Sandy	LIMITATION Slope Erodes Easily Droughty
FmA	FORT MOTT	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Droughty Fast Intake Soil Blowing	LIMITATION Too Sandy Soil Blowing	LIMITATION Droughty
FmB	FORT MOTT	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Droughty Fast Intake Soil Blowing	LIMITATION Too Sandy Soil Blowing	LIMITATION Droughty
HbB	HAMBROOK	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	FAVORABLE	LIMITATION Erodes Easily Too Sandy	LIMITATION Erodes Easily

WATER MANAGEMENT REPORT
TABLE K

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Limitations for: Pond Reservoir Area	Embankments, Dikes and Levees	Excavated Ponds--Aquifer Fed	Features affecting: Drainage	Irrigation	Terraces and Diversions	Grassed Waterways
InA	INGLESIDE	SEVERE Seepage	SEVERE Piping	SEVERE Slow Refill Cutbanks Cave	LIMITATION Deep To Water	LIMITATION Droughty Soil Blowing	LIMITATION Soil Blowing	LIMITATION Droughty
InB	INGLESIDE	SEVERE Seepage	SEVERE Piping	SEVERE Slow Refill Cutbanks Cave	LIMITATION Deep To Water	LIMITATION Slope Droughty Soil Blowing	LIMITATION Soil Blowing	LIMITATION Droughty
Ke	KENTUCK	SLIGHT	SEVERE Ponding	SEVERE Slow Refill Cutbanks Cave	LIMITATION Ponding Percs Slowly	LIMITATION Ponding Percs Slowly	LIMITATION Erodes Easily Ponding Percs Slowly	LIMITATION Wetness Erodes Easily Percs Slowly
KpA	KEYPORT	SLIGHT	MODERATE Piping Wetness	SEVERE No Water	LIMITATION Percs Slowly Frost Action	LIMITATION Wetness Erodes Easily	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Percs Slowly
KpB	KEYPORT	MODERATE Slope	MODERATE Piping Wetness	SEVERE No Water	LIMITATION Percs Slowly Frost Action Slope	LIMITATION Wetness Percs Slowly Slope	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Percs Slowly
KrB	KEYPORT	SLIGHT	MODERATE Piping Wetness	SEVERE No Water	LIMITATION Percs Slowly Frost Action	LIMITATION Wetness Erodes Easily	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily Percs Slowly
	URBAN LAND	Variable	Variable	Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable
Ks	KLEJ	SEVERE Seepage	SEVERE Seepage Piping Wetness	SEVERE Cutbanks Cave	LIMITATION Cutbanks Cave	LIMITATION Wetness Droughty Fast Intake	LIMITATION Wetness Too Sandy	LIMITATION Droughty
MkA	MATAPEAKE	SLIGHT	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Erodes Easily	LIMITATION Erodes Easily Too Sandy	LIMITATION Erodes Easily
MkB	MATAPEAKE	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Slope Erodes Easily	LIMITATION Erodes Easily Too Sandy	LIMITATION Erodes Easily
MkC	MATAPEAKE	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Slope Erodes Easily	LIMITATION Erodes Easily Too Sandy	LIMITATION Erodes Easily
MmB	MATAPEAKE	SEVERE Seepage	SEVERE Seepage Piping	SEVERE No Water	LIMITATION Deep To Water	LIMITATION Slope Erodes Easily	LIMITATION Erodes Easily Too Sandy	LIMITATION Erodes Easily

WATER MANAGEMENT REPORT

TABLE K

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Map symbol, soil name		Limitations for: Pond Reservoir Area	Embankments, Dikes and Levees	Excavated Ponds--Aquifer Fed	Features affecting: Drainage	Irrigation	Terraces and Diversions	Grassed Waterways
	URBAN LAND	Variable	Variable	Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable
MpA	MATTAPEX	SLIGHT	SEVERE Seepage Piping Wetness	SEVERE Slow Refill Cutbanks Cave	LIMITATION Cutbanks Cave	LIMITATION Wetness Soil Blowing	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily
MpB	MATTAPEX	SLIGHT	SEVERE Seepage Piping Wetness	SEVERE Slow Refill Cutbanks Cave	LIMITATION Slope Cutbanks Cave	LIMITATION Slope Wetness Soil Blowing	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily
MuB	MATTAPEX	SEVERE Seepage	SEVERE Seepage Piping Wetness	SEVERE Slow Refill Cutbanks Cave	LIMITATION Cutbanks Cave	LIMITATION Wetness Soil Blowing	LIMITATION Erodes Easily Wetness	LIMITATION Erodes Easily
	URBAN LAND	Variable	Variable	Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable	LIMITATION Variable
Pk	PUCKUM	SEVERE Seepage	SEVERE Excess Humus Ponding	SLIGHT	LIMITATION Ponding Flooding Subsides	LIMITATION Ponding Flooding	LIMITATION Ponding	LIMITATION Wetness
RcA	RUNCLINT	SEVERE Seepage	SEVERE Seepage Piping	SEVERE Cutbanks Cave	LIMITATION Deep To Water	LIMITATION Droughty Fast Intake Soil Blowing	LIMITATION Too Sandy Soil Blowing	LIMITATION Droughty Rooting Depth
RcB	RUNCLINT	SEVERE Seepage	SEVERE Seepage Piping	SEVERE Cutbanks Cave	LIMITATION Deep To Water	LIMITATION Droughty Fast Intake Soil Blowing	LIMITATION Too Sandy Soil Blowing	LIMITATION Droughty Rooting Depth
Ua	UDORTHENTS	SEVERE Seepage	SEVERE Seepage Piping Wetness	SEVERE Cutbanks Cave	LIMITATION Slope Cutbanks Cave	LIMITATION Slope Wetness Droughty	LIMITATION Wetness Too Sandy	LIMITATION Wetness Droughty
WoA	WOODSTOWN	SEVERE Seepage	SEVERE Seepage Piping Wetness	SEVERE Slow Refill Cutbanks Cave	LIMITATION Cutbanks Cave	LIMITATION Wetness Droughty	LIMITATION Wetness Too Sandy	LIMITATION Droughty
WoB	WOODSTOWN	SEVERE Seepage	SEVERE Seepage Piping Wetness	SEVERE Slow Refill Cutbanks Cave	LIMITATION Slope Cutbanks Cave	LIMITATION Slope Wetness Droughty	LIMITATION Wetness Too Sandy	LIMITATION Droughty

CLASSIFICATION OF THE SOIL
TABLE L

Survey Area- NAVAL ORDNANCE STATION CHARLES COUNTY, MARYLAND

Soil Name	Family or higher taxonomic class
BELTSVILLE	TYPIC FRAGIUDULTS, FINE-LOAMY, MIXED, MESIC
BIBB	TYPIC FLUVAQUENTS, COARSE-LOAMY, SILICEOUS, ACID, THERMIC
CROOM	TYPIC HAPLUDULTS, LOAMY-SKELETAL, MIXED, MESIC
FORT MOTT	ARENIC HAPLUDULTS, LOAMY, SILICEOUS, MESIC
HAMBROOK	TYPIC HAPLUDULTS, FINE-LOAMY, SILICEOUS, MESIC
INGLESIDE	TYPIC HAPLUDULTS, COARSE-LOAMY, SILICEOUS, MESIC
KENTUCK	TYPIC UMBRAQUULTS, FINE-SILTY, MIXED, MESIC
KEYPORT	AQUIC HAPLUDULTS, CLAYEY, MIXED, MESIC
KLEJ	AQUIC QUARTZIPSAMMENTS, MESIC, COATED
MATAPEAKE	TYPIC HAPLUDULTS, FINE-LOAMY, MIXED, MESIC
MATTAPEX	AQUIC HAPLUDULTS, FINE-LOAMY, MIXED, MESIC
PUCKUM	TYPIC MEDISAPRISTS, DYSIC, MESIC
RUNCLINT	TYPIC QUARTZIPSAMMENTS, MESIC, COATED
WOODSTOWN	AQUIC HAPLUDULTS, FINE-LOAMY, MIXED, MESIC

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

TABLE M.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	57	---	---	---	---
II	1,679	1,249	430	---	---
III	833	555	85	193	---
IV	507	208	54	245	---
V	112	---	112	---	---
VI	96	96	---	---	---
VII	---	---	---	---	---
VIII	241	---	124	117	---

MAP UNIT DESCRIPTIONS

BeA -- Beltsville silt loam, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of moderately well drained. It is on smooth uplands of the coastal plain. It formed in a thin silty mantle overlying loamy and gravelly alluvial deposits. These soils have a distinct hard pan that restricts water movement and root growth.

The typical depth, sequence, and composition of this soil are as follows:

Surface layer:

Surface to 3 inches, dark brown silt loam.

Subsurface layer:

3 to 10 inches, light olive brown silt loam.

Subsoil:

10 to 19 inches, yellowish brown silt loam.
19 to 28 inches, yellowish brown silt loam with light yellowish brown mottles.
28 to 50 inches, yellowish brown firm silt loam with gray mottles and yellowish red mottles.

Substratum:

50 to 65 inches, yellowish brown very fine sandy loam with gray mottles.
65 to 72 inches, yellowish brown loam.

In some areas there are similar soils with 10 to 20 percent gravel in the substratum. These areas make up 15 percent of the unit.

Dissimilar soils included in mapping are small intermingled areas of Keyport and Mattapex soils in similar landscape positions; and Matapeake soils at slightly higher

landscape positions. These areas make up 15 percent of the unit.

The potential productivity for loblolly pine on this soil is moderately high. The seasonal high water table is the main limitation for timber production. Conventional methods of timber harvest are generally suitable, but the use of heavy equipment will compact the soil when wet.

There are no severe limitations for pond reservoir areas.

The main limitations for urban uses are the seasonal high water table, very slow permeability, and potential frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed will help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitation of potential frost action. Due to the seasonal high water table and very slow permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil well suited to upland wildlife habitat. It is well suited for food plot crop production.

BeB -- Beltsville silt loam, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of moderately well drained. It is on smooth uplands of the coastal plain. It formed in a thin silty mantle overlying loamy and gravelly alluvial deposits. These soils have a distinct hard pan that restricts water movement and root growth.

The typical depth, sequence, and composition of this soil are as follows:

Surface layer:

Surface to 3 inches, dark brown silt loam.

Subsurface layer:

3 to 8 inches, light olive brown silt loam.

Subsoil:

8 to 22 inches, yellowish brown silt loam.
22 to 30 inches, yellowish brown silt loam with pale brown mottles.
30 to 46 inches, yellowish brown firm silt loam with gray mottles and yellowish red mottles.

Substratum:
46 to 62 inches, yellowish brown very fine sandy loam with gray mottles.
62 to 72 inches, yellowish brown sandy loam.

In some areas there are similar soils with 10 to 20 percent gravel in the substratum. These areas make up 15 percent of the unit.

Dissimilar soils included in mapping are small areas of Croom soils along the edge of steep side slopes; Keyport and Mattapex soils in similar landscape positions; and Matapeake soils at slightly higher landscape positions. These areas make up 20 percent of the unit.

The potential productivity for loblolly pine on this soil is moderately high. The seasonal high water table is the main limitation for timber production. Conventional methods of timber harvest are generally suitable, but the use of heavy equipment will compact the soil when wet.

The main limitations for water management is seepage. The selection of better suited soils will help overcome this limitation.

The main limitations for urban uses are the seasonal high water table, very slow permeability, and frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed will help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help

overcome the limitation of potential frost action. Due to the seasonal high water table and very slow permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil is well suited for upland wildlife habitat. It is well suited for food plot crop production.

BeC -- Beltsville silt loam, 5 to 10 percent slopes. This soil is very deep, moderately sloping, and has a natural soil drainage class of moderately well drained. It is on uplands of the coastal plain. It formed in a thin silty mantle overlying loamy and gravelly alluvial and marine deposits. These soils have a distinct hard pan that restricts water movement and root growth.

The typical depth, sequence, and composition of this soil are as follows:

Surface layer:

Surface to 3 inches, dark brown silt loam.

Subsurface layer:

3 to 8 inches, light olive brown silt loam.

Subsoil:

8 to 17 inches, yellowish brown silt loam.
17 to 24 inches, yellowish brown silt loam with pale brown mottles.
24 to 40 inches, yellowish brown firm silt loam with gray mottles and yellowish red mottles.

Substratum:

40 to 65 inches, yellowish brown very fine sandy loam with gray mottles.
65 to 72 inches, light yellowish brown gravelly sandy loam.

In some areas there are similar soils with 0 to 15 percent gravel in the substratum. These areas make up 20 percent of the unit.

Dissimilar soils included in mapping are small areas of Croom soils along the edge of steep side slopes; Keyport and Mattapex soils in similar landscape positions; and Matapeake soils at slightly higher landscape positions. These areas make up 15 percent of the unit.

The potential productivity for loblolly pine on this soil is moderately high. The seasonal high water table is the main limitation for timber production. Conventional methods of timber harvest are generally suitable, but the use of heavy equipment will compact the soil when wet. Management practices that reduce the risk of erosion are essential during harvest and site preparation activities.

The limitations for water management are seepage in pond reservoir areas and slope. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are the seasonal high water table, very slow permeability, slope, and seepage. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Planning structures to conform to the contour will help overcome the limitation of slope. Drainage and a raised bed will help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitation of potential frost action. Due to the seasonal high water table, very slow permeability, and slope onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil is well suited to upland wildlife habitat. It is moderately well suited to food plot crop production.

BmB -- Beltsville-Urban land complex, 0 to 5 percent slopes. This unit consists of very deep, nearly level to gently sloping soils of the Beltsville series and areas paved over or otherwise covered by impervious materials. The Beltsville

soil has a natural drainage class of moderately well drained. This unit is on uplands of the coastal plain. Beltsville soils and Urban land occur together in such an intricate pattern that it is not practical to separate them at the scale of mapping.

About 50 percent of this unit is relatively undisturbed Beltsville soil and 30 percent Urban land. The typical sequence, depth, and composition of the layers of the Beltsville soil are as follows:

Surface layer:

Surface to 3 inches, dark brown silt loam.

Subsurface layer:

3 to 10 inches, light olive brown silt loam.

Subsoil:

10 to 19 inches, yellowish brown silt loam.
19 to 28 inches, yellowish brown silt loam with light gray mottles.
28 to 50 inches, yellowish brown firm silt loam with gray mottles and yellowish red mottles.

Substratum:

50 to 65 inches, yellowish brown very fine sandy loam with gray mottles.
65 to 72 inches, yellowish brown loam.

In some areas there are similar soils that have 10 to 20 percent gravel in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Keyport, Mattapex, and Udorthents soils. These areas make up 20 percent of the unit.

The potential productivity for loblolly pine on this soil is moderately high. The seasonal high water table is the main limitation for timber production.

The main limitations for water management is slope. The selection of better suited soils will help overcome this limitation.

The main limitations for urban uses are the seasonal high water table, very slow permeability, and frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed will help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitation of potential frost action. Due to the seasonal high water table and very slow permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil complex is not suited for upland wildlife habitat. It is not suited for food plot crop production.

Bs -- Bibb sandy loam. This soil is very deep, nearly level, and has a natural soil drainage class of poorly drained. It is on thin drainageways on the coastal plain. It formed in sandy alluvial material deposited within floodplains.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

0 to 8 inches, dark grayish brown sandy loam.

Subsurface layer:

8 to 16 inches, light brownish gray sandy loam with yellowish brown mottles.

Substratum:

16 to 38 inches, grayish brown sandy loam with yellowish brown mottles.
38 to 72 inches, gray stratified gravelly sandy loam and loam with light yellowish brown mottles.

In some areas there are similar soils with 5 to 15 percent gravels in the surface layer. These areas make up 10 percent of the unit.

Dissimilar soils included in mapping are Klej and Woodstown soils at slightly higher elevations, and Kentuck soils near the mouth of drainages. These included soils make up 25 percent of the unit.

Due to the high water table and flooding this soil has severe limitations for all woodland, cropland, and urban uses. Selection of better suited soils will help overcome these limitations.

The main limitations for water management are seepage, and sloughing and piping of embankments. Digging ponds deep enough into the water table will help maintain a sufficient water level in the pond during dry periods. Selection of better suited soils will help overcome the limitations of sloughing and piping of embankments.

This soil is well suited for wetland wildlife habitat. It is not suited for food plot crop production.

CrD-- Croom gravelly sandy loam, 10 to 15 percent slopes. This soil is very deep, moderately steep, and has a natural soil drainage class of well drained. It is on upland side slopes of the coastal plain. It formed in gravelly alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 2 inches, dark brown gravelly sandy loam.

Subsurface layer:

2 to 17 inches, brownish yellow gravelly sandy loam.

Subsoil:

17 to 26 inches, strong brown gravelly sandy loam.
26 to 30 inches, strong brown very gravelly sandy loam.

Substratum:

30 to 72 inches, strong brown firm extremely gravelly sandy loam.

In some areas there are similar soils with fine sandy loam surfaces. These areas make up 25 percent of the unit.

Dissimilar soils included in mapping are small areas of Beltsville and Matapeake soils on the shoulders of slopes; and very thin alluvial areas of Bibb soils within drainage cuts, often with an active stream. These areas make up 15 percent of the unit.

The potential productivity for loblolly pine is moderate on this soil. Windthrow hazard is moderate due to the firm gravel layer below 20 inches.

The limitations for water management are seepage in pond reservoir areas and slope. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are sloughing of excavation walls, slow permeability, seepage, and slope. Shallow excavation walls need shoring to prevent sloughing. To prevent contamination of water supplies and seepage down slope, all onside sanitary facilities need special design, including use of trenches shallow enough to be in the root zone and tile lines along the contour of the slope. Planning structures to conform to the contour will help overcome the limitation of slope.

This soil is moderately suited for upland wildlife habitat. It is moderately well suited for food plot crop production.

CrE-- Croom gravelly sandy loam, 15 to 25 percent slopes. This soil is very deep, steep, and has a natural soil drainage class of well drained. It is on upland side slopes of the coastal plain. It formed in gravelly alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 2 inches, dark brown gravelly sandy loam.

Subsurface layer:

2 to 12 inches, brownish yellow gravelly sandy loam.

Subsoil:

12 to 20 inches, strong brown gravelly sandy loam.
20 to 42 inches, strong brown very gravelly sandy loam.

Substratum:

42 to 72 inches, strong brown firm gravelly sandy loam.

In some areas there are similar soils with gravelly loam surfaces. These areas make up 10 percent of the unit.

Dissimilar soils included in mapping are small areas of Beltsville and Matapeake soils on the shoulders of slopes; and very thin alluvial areas of Bibb soils within drainage cuts, often with an active stream. These areas make up 15 percent of the unit.

The potential productivity for loblolly pine is moderate on this soil. Windthrow hazard is moderate due to the firm gravel layer below 20 inches. The steep slopes cause poor trafficability for equipment. Management practices that reduce the risk of erosion are essential during harvest and site preparation activities.

The limitations for water management are seepage in pond reservoir areas and slope. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are sloughing of excavation walls, slow permeability, seepage, and slope. Shallow excavation walls need shoring to prevent sloughing. To prevent contamination of water supplies and seepage down slope, all onside sanitary facilities need special design,

including use of trenches shallow enough to be in the root zone and tile lines along the contour of the slope. Planning structures to conform to the contour will help overcome the limitation of slope. Land shaping and grading will help overcome the slope limitation. Practices which reduce the risk of erosion should be utilized during any grading activities.

This soil is moderately suited for upland wildlife habitat. It is poorly suited for food plot crop production.

CrF -- Croom gravelly sandy loam, 25 to 40 percent slopes. This soil is very deep, very steep, and has a natural drainage class of well drained. It is on upland side slopes of the coastal plain. It formed in gravelly alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 2 inches, dark brown gravelly sandy loam.

Subsurface layer:

2 to 17 inches, brownish yellow gravelly sandy loam.

Subsoil:

17 to 26 inches, strong brown gravelly sandy loam with very pale brown mottles.
26 to 30 inches strong brown gravelly sandy loam.

Substratum:

30 to 72 inches, strong brown firm gravelly sandy loam.

In some areas there are similar soils with very gravelly sandy loam surfaces. These areas make up 20 percent of the unit.

Dissimilar soils included in mapping are small areas of Beltsville and Matapeake soils on the shoulders of slopes; and

very thin alluvial areas of Bibb soils within drainage cuts, often with an active stream. These areas make up 15 percent of the unit.

The potential productivity for loblolly pine is low to moderate on this soil. Windthrow hazard is moderate due to the firm gravel layer below 20 inches. The steep slopes cause poor trafficability for equipment. Management practices that reduce the risk of erosion are essential during harvest and site preparation activities.

The limitations for water management are seepage in pond reservoir areas and slope. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are sloughing of excavation walls, slow permeability, seepage, and slope. These soils are not suited to urban uses. Selection of better suited soils will help overcome these limitations.

This soil is poorly suited for upland wildlife habitat. It is not suited for food plot crop production.

FmA -- Fort Mott loamy sand, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of well drained. It is on broad uplands and old alluvial terraces of the coastal plain. It developed in thick sandy deposits overlying loamy or gravelly materials.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 4 inches, dark brown loamy sand.

Subsurface layer:

4 to 22 inches, yellowish brown sand.

Subsoil:

22 to 30 inches, yellowish brown loamy sand with dark yellowish brown layers of sandy loam.
30 to 41 inches, strong brown sandy loam.

41 to 47 inches, light brownish gray and yellowish brown loam.
47 to 62 inches, reddish yellow sandy clay loam.

Substratum:

62 to 72 inches, strong brown sandy loam.

In some areas there are similar soils that have 10 to 30 percent gravel in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Runclint soils; and Ingleside and Woodstown soils in lower landscape positions. Also included are small areas on Stump and Bullitt Necks with a water table between 48 and 72 inches. These included areas make up 20 percent of the unit.

The potential productivity for loblolly pine is moderately high on this soil. Seedling survival is limited by moisture stress. The rate of seedling mortality can be reduced by planting seedlings in early spring, allowing them to obtain sufficient water from spring rains. The loose sand in places causes poor trafficability for equipment.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are sloughing of excavation walls, droughtiness, rapid permeability, and seepage in the substratum. Shallow excavation walls need shoring to prevent sloughing. Food plots and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies, all onside sanitary facilities need special design, including use of trenches shallow enough to be in the root zone.

This soil is moderately suited for upland wildlife habitat. It is moderately suited for food plot crop production.

FmB -- Fort Mott loamy sand, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of well drained. It is on broad uplands and

old alluvial terraces of the coastal plain. It developed in thick sandy deposits overlying loamy or gravelly materials.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 4 inches, dark brown loamy sand.

Subsurface layer:

4 to 23 inches, yellowish brown sand.

Subsoil:

23 to 40 inches, yellowish brown loamy sand.
40 to 54 inches, yellowish brown sandy loam.

Substratum:

54 to 72 inches, yellowish brown stratified sandy loam and loamy sand.

In some areas there are similar soils that have 10 to 30 percent gravel in the substratum. These areas make up 15 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Runclint soils; and Ingleside and Woodstown soils in lower landscape positions. These included areas make up 20 percent of the unit.

The potential productivity for loblolly pine is moderately high on this soil. Seedling survival is limited by moisture stress. The rate of seedling mortality can be reduced by planting seedlings in early spring, allowing them to obtain sufficient water from spring rains. The loose sand in places causes poor trafficability for equipment.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are sloughing of excavation walls, droughtiness, rapid permeability, and seepage in the substratum. Shallow excavation walls need shoring to prevent sloughing. Food plots and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies and seepage points down slope, all onside sanitary facilities need special design, including use of trenches shallow enough to be in the root zone and tile lines along the contour of the slope.

This soil is moderately suited for upland wildlife habitat. It is moderately suited for food plot crop production.

HbB -- Hambrook sandy loam, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of well drained. It is on old alluvial terraces of the coastal plain.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 6 inches, dark brown sandy loam.

Subsurface layer:

6 to 10 inches, brown fine sandy loam.

Subsoil:

10 to 22 inches, yellowish brown loam.
22 to 47 inches, light olive brown loam with pale brown mottles.

Substratum:

47 to 49 inches, grayish brown loam with strong brown and light yellowish brown mottles.
49 to 72 inches, grayish brown firm very gravelly sandy loam.

Small areas of similar soils have a loamy sand surface. These areas make up 10 percent of the unit.

Included with this soil in mapping are intermingled areas of Fort Mott, Ingleside, and Runclint soils; and Woodstown soils at lower landscape positions. These soils make up 25 percent of the unit.

The potential productivity for loblolly pine is high. This soil has few limitations that effect the management of woodland.

The limitations for water management are seepage in pond reservoir areas and seepage and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses include sloughing of excavation walls, permeability, seepage, and the seasonal high water table. Shallow excavations will need shoring to prevent sloughing. To prevent contamination of water supplies and seepage points downslope, all sanitary facilities need special design, including the use trenches shallow enough to be in the root zone and tile lines along the contour of the slope. Enlarging the absorption fields and installing drainage around the field helps to overcome the effects of the high water table. Structures with basements need sealed foundations and foundation drains to help prevent wet basements.

This soil is well suited for upland wildlife habitat. It is very well suited for food plot crop production.

InA -- Ingleside loamy sand, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of well drained. It is on old alluvial terraces dominantly below 40 feet in elevation. It formed in unconsolidated sandy alluvial deposits.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 3 inches, dark brown loamy sand.

Subsurface layer:

3 to 7 inches, brownish yellow loamy sand.

Subsoil:

7 to 32 inches yellowish brown sandy loam.

Substratum:

32 to 41 inches, strong brown loamy sand.
41 to 49 inches, light brownish gray loam with yellowish brown and pale brown mottles.
49 to 72 inches, light brownish gray sandy clay loam with strong brown and light yellowish brown mottles.

Small areas of similar soils have a sandy loam surface. These areas make up 10 percent of the unit.

Included with this soil in mapping are intermingled areas of Fort Mott, Hambrook, and Runclint soils; and Woodstown soils at lower landscape positions. These soils make up 25 percent of the unit.

The potential productivity for loblolly pine is high. This soil has few limitations that effect the management of woodland.
The sandy surface texture limit seedling survival due to possible moisture stress. Planting early enough in the spring to take advantage of spring rains will help overcome this limitation.

The limitations for water management are seepage in pond reservoir areas and seepage and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses include sloughing of excavation walls, droughtiness, permeability, and the seasonal high water table. Shallow excavations will need shoring to prevent sloughing. Food plots and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies and seepage points downslope, all sanitary facilities need special design, including the use trenches shallow enough to be in the root zone and tile lines along the

contour of the slope. Enlarging the absorption fields and installing drainage around the field helps to overcome the effects of the high water table. Structures with basements need sealed foundations and foundation drains to help prevent wet basements.

This soil is well suited for upland wildlife habitat. It is very well suited for food plot crop production.

InB -- Ingleside loamy sand, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of well drained. It is on old alluvial terraces dominantly below 40 feet in elevation. It formed in unconsolidated sandy alluvial deposits.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 3 inches, dark brown loamy sand.

Subsurface layer:

3 to 9 inches, brownish yellow loamy sand.

Subsoil:

9 to 29 inches yellowish brown sandy loam.

Substratum:

29 to 38 inches, strong brown loamy sand.
38 to 49 inches, yellowish brown sandy loam
49 to 72 inches, light brownish gray loam with strong brown and light yellowish brown mottles.

Small areas of similar soils have a sandy loam surface. These areas make up 10 percent of the unit.

Included with this soil in mapping are intermingled areas of Fort Mott, Hambrook, and Runclint soils; and Woodstown

soils at lower landscape positions. These soils make up 25 percent of the unit.

The potential productivity for loblolly pine is high. This soil has few limitations that effect the management of woodland. The sandy surface texture limit seedling survival due to possible moisture stress. Planting early enough in the spring to take advantage of spring rains will help overcome this limitation.

The limitations for water management are seepage in pond reservoir areas and seepage and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses include sloughing of excavation walls, droughtiness, permeability, and the seasonal high water table. Shallow excavations will need shoring to prevent sloughing. Food plots and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies and seepage points downslope, all sanitary facilities need special design, including the use trenches shallow enough to be in the root zone and tile lines along the contour of the slope. Enlarging the absorption fields and installing drainage around the field helps to overcome the effects of the high water table. Structures with basements need sealed foundations and foundation drains to help prevent wet basements.

This soil is well suited for upland wildlife habitat. It is very well suited to food plot crop production.

Ke -- Kentuck mucky silt loam. This soil is very deep, nearly level, and has a natural soil drainage class of very poorly drained. It is found in freshwater tidal areas. It formed in organic materials overlying silty alluvial deposits. The present vegetation is dominantly sweetgum, water oak, blackgum, spice bush, and three square.

The typical depth, sequence, and composition of the layers of this soil are as follows:

Surface Layer:

Surface to 12 inches, dark brown mucky silt loam.

Subsurface Layer:

12 to 20 inches, yellowish brown silt loam with gray mottles.

Subsoil:

20 to 32 inches, light yellowish brown silty clay loam with gray mottles.
32 to 44 inches, gray clay loam with strong brown mottles.

Substratum:

44 to 65 inches, gray sandy clay loam with dark yellowish brown mottles.

In some areas are similar soils that have a mucky peat surface textures. These areas make up 10 percent of the unit.

Dissimilar soils included in mapping are Puckum soils adjacent to marshes and intermingled areas of soils with greater than 8 inches of organic materials at the surface. These soils make up 15 percent of the unit.

The main limitation for water management is ponding. Selection of better suited soils for embankment materials will help overcome this limitation.

This soil has severe limitations for all woodland, cropland, and urban uses. Selection of better suited soils will overcome these limitations.

This soil is well suited for wetland wildlife habitat. It is not suited for food plot crop production.

KpA -- Keyport silt loam, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of moderately well drained. It is on low-lying uplands

of the coastal plain. It formed in a thick mantle of silts high in clay.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 1 inch, dark brown silt loam.

Subsurface layer:

1 to 8 inches, light yellowish brown silt loam with yellowish brown mottles.
8 to 18 inches, olive yellow silt loam with pale brown mottles.

Subsoil:

18 to 24 inches, light brownish gray silt loam with dark yellowish brown and light yellowish brown mottles.
24 to 47 inches, grayish brown silty clay loam with strong brown mottles.

Substratum:

47 to 60 inches, strong brown silty clay loam with light gray mottles.
60 to 72 inches, light gray sandy clay loam with strong brown mottles.

In some areas there are similar soils that have a fine sandy loam surface texture. There are also areas with 10 to 30 percent gravels in the substratum. These included areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Beltsville and Mattapex soils; Matapeake soils at higher landscape positions; and soils that have gray mottling directly under the surface layer with a water table between 10 and 20 inches at lower landscape positions on Stump Neck. These included soils make up 25 percent of the unit.

The potential productivity is moderate for loblolly Pine on this soil. Due to the seasonal high water table, equipment limitations are a management concern. The use of heavy

equipment during January through May could expose the subsoil which is sticky and slippery when wet. Unless road drainage is provided, harvest or planting operations will be delayed until drier periods. Conventional methods of harvesting timber generally are suitable, but the use of heavy equipment will compact the soil.

The soil is well suited to pond reservoir areas. Ponds should be dug deep enough into the water table to maintain a sufficient water level in the pond during dry periods. Only surface, subsurface and subsoil material should be used for embankments.

The main limitations for urban uses are the seasonal high water table, the permeability, low strength, and the potential frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitation of potential frost action. Due to the seasonal high water table and low permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil is well suited for upland wildlife habitat. It is moderately well suited for food plot crop production.

KpB -- Keyport silt loam, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of moderately well drained. It is on low-lying uplands of the coastal plain. It formed in a thick mantle of silts high in clay.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 1 inch, dark brown silt loam.

Subsurface layer:

1 to 9 inches, light yellowish brown silt loam.
9 to 15 inches, olive yellow silt loam with pale brown mottles.

Subsoil:

15 to 25 inches, light yellowish brown silt loam with dark yellowish brown and pale brown mottles.
25 to 52 inches, grayish brown silty clay loam with strong brown mottles.

Substratum:

52 to 65 inches, strong brown silty clay loam with light gray mottles.
65 to 72 inches, light gray sandy loam with strong brown mottles.

In some areas there are similar soils that have a fine sandy loam surface texture. There are also areas with 10 to 30 percent gravels in the substratum. These included areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Beltsville and Mattapex soils; Matapeake soils at higher landscape positions; and soils with gray mottling directly under the surface layer with a water table between 10 and 20 inches on Stump Neck at lower landscape positions. These included soils make up 15 percent of the unit.

The potential productivity is moderate for loblolly pine on this soil. Due to the seasonal high water table, equipment limitations are a management concern. The use of heavy equipment during January through May could expose the subsoil which is sticky and slippery when wet. Unless road drainage is provided, harvest or planting operations will be delayed until drier periods. Conventional methods of harvesting timber generally are suitable, but the use of heavy equipment will compact the soil.

The soil is well suited to pond reservoir areas. Ponds should be dug deep enough into the water table to maintain a sufficient water level in the pond during dry periods. Only

surface, subsurface and subsoil material should be used for embankments.

The main limitations for urban uses are the seasonal high water table, the permeability, low strength, and the potential frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitations of low strength and potential frost action. Due to the seasonal high water table and low permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil is well suited for upland wildlife habitat. It is moderately well suited for food plot crop production.

KrB -- Keyport-Urban land complex, 0 to 5 percent slopes. This unit consists of very deep, nearly level to gently sloping soils of the Keyport series and areas paved over or otherwise covered with impervious materials during urbanization. The Keyport soil has a natural soil drainage class of moderately well drained. This unit is on low-lying uplands of the coastal plain. Keyport soils and Urban land occur together in such an intricate pattern that it is not practical to separate them at the scale of mapping.

About 50 percent of this unit is relatively undisturbed Keyport soil and 30 percent Urban land. The typical sequence, depth, and composition of the layers of the Keyport soil are as follows:

Surface layer:

Surface to 1 inch, dark brown silt loam.

Subsurface layer:

1 to 8 inches, light yellowish brown silt loam with yellowish brown mottles.

8 to 13 inches, olive yellow silt loam with light brownish gray mottles.

Subsoil:

13 to 20 inches, light brownish gray silt loam with dark yellowish brown and light yellowish brown mottles.
20 to 47 inches, grayish brown silty clay loam with strong brown mottles.

Substratum:

47 to 60 inches, strong brown silty clay loam with light gray mottles.
60 to 72 inches, light gray sandy clay loam with strong brown mottles.

In some areas there are similar soils that have a fine sandy loam surface texture. There are also areas with 10 to 30 percent gravels in the substratum. These included areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Beltsville, Mattapex, and Udorthents soils. These included soils make up 20 percent of the unit.

The potential productivity is moderate for Loblolly Pine on this soil. Due to the seasonal high water table, equipment limitations are a management concern.

The soil is well suited to pond reservoir areas. Ponds should be dug deep enough into the water table to maintain a sufficient water level in the pond during dry periods. Only surface, subsurface and subsoil material should be used for embankments.

The main limitations for urban uses are the seasonal high water table, the permeability, low strength, and the potential frost action. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert water from the structures will help overcome the limitations for structures with basements. Drainage and a raised bed help overcome the limitations of a high water table for local roads and streets. Coarse grained suborder and base materials will help overcome the limitations of low strength and potential frost action. Due to the seasonal high water table and low

permeability, onside sanitary facilities need special design which could include sandy backfield for trenches, enlarged and raised absorption fields, and drainage systems around the facility.

This soil complex is not suited for upland wildlife habitat. It is not suited for food plot crop production.

Ks -- Klej loamy sand. This soil is very deep, nearly level, and has a natural soil drainage class of somewhat poorly drained. It is on thin drainageways on the coastal plain. It formed in sandy alluvial material deposited within floodplains.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

0 to 8 inches, dark grayish brown loamy sand.

Subsurface layer:

8 to 16 inches, light yellowish brown loamy sand with yellowish brown mottles.

Subsoil:

16 to 24 inches, grayish brown loamy sand with yellowish brown mottles.
24 to 41 inches, grayish brown sand with yellowish brown mottles.

Substratum:

41 to 72 inches, light gray stratified sand and sandy loam with light yellowish brown mottles.

In some areas there are similar soils with 5 to 15 percent gravels throughout the soil profile. These areas make up 10 percent of the unit.

Dissimilar soils included in mapping are Bibb soils at the same elevation, and Woodstown soils at slightly higher elevations. These included soils make up 25 percent of the unit.

The potential productivity is moderately high for loblolly pine. The seasonal high water table limits the use of equipment and causes a high rate of seedling mortality. Unless drainage is provided, harvesting and planting operations will be delayed until drier periods. Bedding the soil prior to planting helps reduce seedling mortality. Windthrow is common when the soil is excessively wet and winds are strong. Conventional methods of harvest are generally suitable, but the use of heavy equipment will compact the soil if it is wet.

The main limitations for water management are seepage, and sloughing and piping of embankments. Digging ponds deep enough into the water table will help maintain a sufficient water level in the pond during dry periods. Selection of better suited soils will help overcome the limitations of sloughing and piping of embankments.

The main limitations for urban uses are the seasonal high water table, rapid permeability, and sloughing. Drainage around elevated footings and land shaping to divert water from the structure will help overcome the limitations for structures without basements. Better suited soils should be selected for structures with basements. Shallow excavation walls will need shoring to prevent sloughing. Due to the seasonal high water table and rapid permeability, onside sanitary facilities need special design which could include enlarged and raised absorption fields, and drainage systems around the facility.

This soil is moderately suited for wetland wildlife habitat. It is poorly suited for food plot crop production.

MkA -- Matapeake silt loam, wet substratum, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of well drained. It is on upland flats of the coastal plain. It formed in a thin silt mantle overlying loamy and gravelly alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface:

Surface to 2 inches, dark brown silt loam.

Subsurface layer:

2 to 8 inches, brownish yellow silt loam.

Subsoil:

8 to 22 inches, yellowish brown silty clay loam.
22 to 40 inches, yellowish brown very fine sandy loam with pale brown mottles.

Substratum:

40 to 47 inches, brownish yellow very fine sandy loam with grayish brown and strong brown mottles.
47 to 72 inches, brownish yellow loam with grayish brown mottles.

In some areas there are similar soils with 5 to 15 percent gravels in the substratum. These soils make up 10 percent of the unit.

Dissimilar soils included in mapping are the Beltsville, Keyport, and Mattapex soils at slightly lower landscape positions; and Matapeake soils with no water table at slightly higher landscape positions. These soils make up 20 percent of the unit.

Potential productivity for loblolly pine is high on this soil. This soil is well suited to woodland use.

The limitations for water management are sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, permeability, and low strength. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert runoff away from the structure will help overcome the limitations for structures. Structures with basements need sealed foundations

and foundation drains to overcome the limitation of the high water table. Coarse grained suborder and base materials for the raised bed will help overcome the limitations due to low strength. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is very well suited for food plot crop production.

MkB -- Matapeake silt loam, wet substratum, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of well drained. It is on upland flats of the coastal plain.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface:

Surface to 2 inches, dark brown silt loam.

Subsurface layer:

2 to 8 inches, brownish yellow silt loam.

Subsoil:

8 to 28 inches, yellowish brown silty clay loam.
28 to 39 inches, yellowish brown very fine sandy loam with pale brown mottles.

Substratum:

39 to 49 inches, brownish yellow very fine sandy loam with pale brown and strong brown mottles.
49 to 72 inches, brownish yellow loam with grayish brown mottles.

In some areas there are similar soils with 5 to 15 percent gravels in the substratum. These soils make up 10 percent of the unit.

Dissimilar soils included in mapping are the Beltsville, Keyport, and Mattapex soils at slightly lower landscape positions; and Matapeake soils with no water table at slightly higher landscape positions. These soils make up 20 percent of the unit.

Potential productivity for loblolly pine is high on this soil. This soil is well suited to woodland use.

The limitations for water management are sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, permeability, and low strength. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert runoff away from the structure will help overcome the limitations for structures. Structures with basements need sealed foundations and foundation drains to overcome the limitation of the high water table. Coarse grained suborder and base materials for the raised bed will help overcome the limitations due to low strength. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is well suited for food plot crop production.

MkC -- Matapeake silt loam, wet substratum, 5 to 10 percent slopes. This soil is very deep, strongly sloping, and has a natural soil drainage class of well drained. It is on upland flats of the coastal plain. It formed in a thin mantle of silts overlying loamy and gravelly alluvial deposits.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface:

Surface to 3 inches, dark brown silt loam.

Subsurface layer:

3 to 7 inches, brownish yellow silt loam.

Subsoil:

7 to 24 inches, yellowish brown silty clay loam.
24 to 43 inches, yellowish brown sandy loam with pale brown mottles.

Substratum:

43 to 51 inches, brownish yellow gravelly sandy loam with grayish brown and strong brown mottles.
51 to 72 inches, brownish yellow gravelly loam with grayish brown mottles.

In some areas there are similar soils with 0 to 10 percent gravels in the substratum, and 5 to 10 percent gravels at the surface. These soils make up 10 percent of the unit.

Dissimilar soils included in mapping are the Croom soils along steep side slopes on Stump Neck; and Matapeake soils with no water table at slightly higher landscape positions. These soils make up 20 percent of the unit.

Potential productivity for loblolly pine is high on this soil. This soil is well suited to woodland use. Management practices that reduce the risk of erosion are essential during harvest and site preparation activities.

The limitations for water management are seepage in pond reservoir areas, slope, and sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, slope, sloughing of excavation walls, permeability, and low strength. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert runoff away from the structure will help overcome the limitations for structures. Structures with basements need sealed foundations and foundation drains to overcome the limitation of the high water table. Planning structures to conform to the contour will help overcome the limitation of slope. Shallow excavations need shoring to prevent sloughing. Drainage and a raised bed will help overcome the limitation

for local roads and streets. Coarse grained suborder and base materials for the raised bed will help overcome the limitations due to low strength. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and tiles lines along the contour of the slope.

This soil is moderately well suited for upland wildlife habitat. It is moderately suited for food plot crop production.

MmB -- Matapeake-Urban land complex, 0 to 8 percent slopes. This unit consists of very deep, nearly level to gently sloping soils of the Matapeake series and areas paved over or otherwise covered by impervious materials during urbanization. The Matapeake soil has a natural drainage class of well drained. The slope is dominantly 0 to 5 percent, but ranges to 8 percent in some areas. This unit is on uplands of the coastal plain. Matapeake soils and Urban land occur together in such an intricate pattern that it is not practical to separate them at the scale of mapping.

About 50 percent of this unit is relatively undisturbed Matapeake soil and 30 percent Urban land. The typical sequence, depth, and composition of the layers of the Matapeake soil are as follows:

Surface:

Surface to 2 inches, dark brown silt loam.

Subsurface layer:

2 to 8 inches, brownish yellow silt loam.

Subsoil:

8 to 22 inches, yellowish brown silty clay loam.
22 to 40 inches, yellowish brown very fine sandy loam with pale brown mottles.

Substratum:

40 to 47 inches, brownish yellow very fine sandy loam with grayish brown and strong brown mottles.

47 to 72 inches, brownish yellow loam with grayish brown mottles.

In some areas there are similar soils with 5 to 15 percent gravels in the substratum. These soils make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of the Beltsville, Keyport, Mattapex and Udorthents soils. These soils make up 20 percent of the unit.

Potential productivity for loblolly pine is high on this soil. This soil is well suited to woodland use.

The limitations for water management are sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, permeability, and low strength. Drainage around elevated footings, sandy backfield under structures, and land shaping to divert runoff away from the structure will help overcome the limitations for structures. Structures with basements need sealed foundations and foundation drains to overcome the limitation of the high water table. Coarse grained suborder and base materials for the raised bed will help overcome the limitations due to low strength. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil complex is not suited for upland wildlife habitat. It is not suited for food plot crop production.

MpA-- Mattapex fine sandy loam, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of moderately well drained. It is on lowland flats and along the edges of rivers and creeks. They developed in a thin mantle of silts overlying sandy materials.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 10 inches, dark brown fine sandy loam.

Subsurface layer:

10 to 14 inches, yellowish brown fine sandy loam.

Subsoil:

14 to 18 inches, strong brown fine sandy loam with light yellowish brown mottles.
18 to 33 inches, yellowish brown silt loam with strong brown and dark gray mottles.
33 to 48 inches, light brownish gray silty clay loam with yellowish brown mottles.

Substratum:
48 to 62 inches, pale brown silty clay with pinkish gray mottles.
62 to 72 inches, yellowish brown silty clay loam with light gray mottles.

In some areas along steep sideslopes are similar soils with 5 to 10 percent gravel in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are Keyport soils on lower landscape positions, intermingled areas of Beltsville soils, and Matapeake soils on slightly higher landscape positions. Also included are Fort Mott and Woodstown soils in areas where thicker sands were deposited, and small areas of Urban land on Indian Head. These included soils make up 20 percent of the unit.

The potential productivity for Loblolly pine on this soil is high. The seasonal high water table is the only limitation. Conventional methods of harvesting timber generally are suitable, but the use of heavy equipment compacts the soil if it is wet.

There are no severe limitations for water management on this soil.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, the permeability of the subsoil, low strength, and the potential frost action. Drainage around elevated footings if an outlet is available, sandy backfield under dwellings, and land shaping so that surface water moves away from dwellings will help to overcome the high water table as a limitation for dwellings without basements. Shallow excavation walls will need shoring to prevent sloughing. The selection of better suited soils can overcome these limitations for dwellings with basements. Drainage and a raised bed for the roadway construction, help to overcome the high water table as a limitation for local roads and streets. Coarse grained suborder and base materials for the raised bed help to overcome the limitation of potential frost action. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is well suited for food plot crop production.

MP -- Mattapex fine sandy loam, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of moderately well drained. It is on lowland flats and along the edges of rivers and creeks. It developed in a thin mantle of silts overlying sandy or gravelly alluvial materials.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 8 inches, dark brown fine sandy loam.

Subsurface layer:

8 to 13 inches, yellowish brown fine sandy loam.

Subsoil:

13 to 24 inches, strong brown silt loam with light yellowish brown mottles.
24 to 35 inches, yellowish brown silt loam with strong brown and dark gray mottles.
35 to 48 inches, light brownish gray silty clay loam with yellowish brown mottles.

Substratum:

48 to 58 inches, pale brown silty clay with pinkish gray mottles.
58 to 72 inches, yellowish brown fine sandy loam with light gray mottles.

In some areas along steep side slopes there are similar soils with 5 to 10 percent gravel in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are Keyport soils in slightly lower landscape positions, intermingled areas of Beltsville soils, and Matapeake soils on slightly higher landscape positions. Also included are Fort Mott and Woodstown soils in areas where a thicker overburden of sand was deposited; and small areas of Urban land on Indian Head. These included soils make up 20 percent of the unit.

The potential productivity for loblolly pine on this soil is high. The seasonal high water table is the only limitation. Conventional methods of harvesting timber generally are suitable, but the use of heavy equipment compacts the soil if it is wet.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, low strength, and the permeability of the subsoil. Drainage around elevated footings if an outlet is available, sandy backfield under dwellings, and land shaping so that surface water moves away from dwellings will help to overcome the high water table as a limitation for dwellings without basements. Shallow excavation walls will need shoring to prevent sloughing. The

selection of better suited soils can overcome the limitations for dwellings with basements. Drainage and a raised bed for the roadway construction, help to overcome the high water table as a limitation for local roads and streets. Coarse grained suborder and base materials for the raised bed help to overcome the limitation of low strength. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is well suited for food plot crop production.

MuB -- Mattapex-Urban land complex, 0 to 5 percent slopes. This unit consists of very deep, nearly level to gently sloping soils of the Mattapex series and areas paved over or otherwise covered by impervious materials during urbanization. The Mattapex soil has a natural soil drainage class of moderately well drained. This unit is on uplands of the coastal plain. Mattapex soils and Urban land occur together in such an intricate pattern that it is not practical to separate them at the scale of mapping.

About 50 percent of this unit is relatively undisturbed Mattapex soil and 25 percent Urban land. The typical sequence, depth, and composition of the layers of the Mattapex soil are as follows:

Surface layer:

Surface to 10 inches, dark brown fine sandy loam.

Subsurface layer:

10 to 14 inches, yellowish brown fine sandy loam.

Subsoil:

14 to 22 inches, strong brown fine sandy loam with light yellowish brown mottles.
22 to 33 inches, yellowish brown silt loam with strong brown and dark gray mottles.

33 to 48 inches, light brownish gray silty clay loam with yellowish brown mottles.

Substratum:

48 to 62 inches, pale brown silty clay with pinkish gray mottles.
62 to 72 inches, yellowish brown silty clay loam with light gray mottles.

In some areas there are similar soils with 5 to 10 percent gravel in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are the intermingled areas of Beltsville, Keyport, and Udorthents soils. These included soils make up 25 percent of the unit.

The potential productivity for loblolly pine on this soil is high. The seasonal high water table is the only limitation. Conventional methods of harvesting timber generally are suitable, but the use of heavy equipment compacts the soil if it is wet.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. The selection of better suited soils can overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, and the permeability of the subsoil. Drainage around elevated footings if an outlet is available, sandy backfield under dwellings, and land shaping so that surface water moves away from dwellings will help to overcome the high water table as a limitation for dwellings without basements. Shallow excavation walls will need shoring to prevent sloughing. The selection of better suited soils can overcome the limitations for dwellings with basements. Drainage and a raised bed for the roadway construction, help to overcome the high water table as a limitation for local roads and streets. To overcome the high water table and moderately slow permeability, septic tank absorption fields and other onside sanitary facilities need special design, including sandy backfield for the trenches, enlarged and raised absorption fields, and a drainage system around the facility.

This soil complex is not suited for upland wildlife habitat. It is not suited for food plot crop production.

Pk -- Puckum mucky peat. This soil is very deep, nearly level, and has a natural soil drainage class of very poorly drained. It is on freshwater tidal marshes. It formed in thick deposits of organic materials. Presnt vegetation is dominantly tear thumb, cattails, arrow arum, marsh hibiscuc, wild rice, and water hemp.

The typical depth, sequence, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 10 inches, dark reddish brown mucky peat.

Subsurface layer:

10 to 48 inches, black muck.

Substratum:

48 to 65 inches, dark brown muck.

In some areas are similar soils with dominantly mucky peat textures in the subsurface layer. These soils make up 20 percent of the unit.

Dissimilar soils included in mapping are soils with less than 51 inches of organic materials on Thoroughfare Island and the tip of Bullit Neck, and Kentuck soils in the thin marsh areas on the Indian Head mainland. These soils make up 25 percent of the unit.

The high water table, very low strength, and very high organic matter content severely limits this soil for woodland and urban uses. Selection of better suited soils will help overcome these limitations.

This soil is well suited for wetland wildlife habitat. It is not suited for food plot crop production.

RcA -- Runclint loamy sand, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of excessively drained. It is on broad uplands and old alluvial terraces of the coastal plain. It formed in thick sandy alluvial deposits.

The typical sequence, depth, and composition of the layers of the soil are as follows:

Surface layer:

Surface to 10 inches, dark yellowish brown loamy sand.

Subsurface layer:

10 to 18 inches, yellowish brown loamy sand.

Subsoil:

18 to 32 inches, yellowish brown loamy sand.
32 to 42 inches, strong brown loamy sand.
42 to 48 inches, light yellowish brown loamy sand with light yellowish brown mottles.

Substratum:

48 to 66 inches, pale olive brown sand with light olive brown mottles.
66 to 72 inches, yellowish brown sandy loam with light brownish gray mottles.

In some areas similar soils have a sand surface texture. Also included are similar soils with 10 to 20 percent gravel in the substratum. These areas make up 10 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Fort Mott soils; Klej soils at slightly lower landscape positions; and Ingleside soils at slightly higher

elevations and along ridge tops. These included soils make up 25 percent of the unit.

The potential productivity for loblolly pine is moderately high on this soil. Seedling survival is limited by moisture stress. The rate of seedling mortality can be reduced by planting seedlings in early spring, allowing them to obtain sufficient moisture from spring rains. Once established, the seasonal high water table supplies water to the trees in an otherwise extremely droughty soil. Only drought-tolerant species should be planted. These would include Virginia pine, loblolly pine and shortleaf pine. The loose sand in places causes poor trafficability for equipment.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. Selection of better suited soils will help to overcome these limitations.

The limitations for urban uses include sloughing of excavation walls, droughtiness, rapid permeability, and seepage in the substratum. Shallow excavation walls will need shoring to prevent sloughing. Garden and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies, all onside sanitary facilities need special design, including use of trenches shallow enough to be in the root zone. Dwellings with basements need sealed foundations and foundation drains to help prevent wet basements. The land should also be shaped to divert runoff away from the dwelling.

This soil is poorly suited for upland wildlife habitat. It is poorly suited for food plot crop production.

RcB --- Runclint loamy sand, 2 to 5 percent slopes. This soil is very deep, gently sloping, and has a natural soil drainage class of excessively drained. It is on broad uplands, and old alluvial terraces. It formed in thick deposits of sandy alluvial deposits.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface Layer:

Surface to 8 inches, dark yellowish brown loamy sand.

Subsurface layer:

8 to 16 inches, yellowish brown loamy sand.

Subsoil:

16 to 43 inches, yellowish brown loamy sand.
43 to 47 inches, light yellowish brown loamy sand with yellowish brown mottles.

Substratum:

47 to 60 inches, pale olive brown sand with light olive brown mottles.
60 to 72 inches, yellowish brown fine sandy loam with light brownish gray mottles.

In some areas similar soils have a sand surface texture. Also included are similar soils with 10 to 20 percent gravels in the substratum. These areas make up 5 percent of the unit.

Dissimilar soils included in mapping are intermingled areas of Fort Mott soils; Klej soils at slightly lower landscape positions; and Ingleside soils at slightly higher elevations and along ridge tops. These included soils make up 20 percent of the unit.

The potential productivity for loblolly pine is moderately high on this soil. Seedling survival is limited by moisture stress. The rate of seedling mortality can be reduced by planting seedlings in early spring, allowing them to obtain sufficient moisture from spring rains. Once established, the seasonal high water table supplies water to the trees in an otherwise extremely droughty soil. Only drought-tolerant species should be planted. These would include Virginia pine, Loblolly pine and Shortleaf pine. The loose sand in places causes poor trafficability for equipment.

The limitations for water management are seepage in pond reservoir areas and sloughing and piping of embankments. Selection of better suited soils will help to overcome these limitations.

The limitations for urban uses include sloughing of excavation walls, droughtiness, rapid permeability, and seepage in the substratum. Shallow excavation walls will need shoring to prevent sloughing. Garden and landscape plants need irrigation to overcome droughtiness. To prevent contamination of water supplies and seepage at points down slope, all onside sanitary facilities need special design, including use of trenches shallow enough to be in the root zone and tile lines along the contour of the slope. Dwellings with basements need sealed foundations and foundation drains to help prevent wet basements. The land should also be shaped to divert runoff away from the dwelling.

This soil is poorly suited for upland wildlife habitat. It is poorly suited for food plot crop production.

Ua -- Udorthents. This unit consists of nearly level to moderately sloping loamy and gravelly soil material that has been moved, graded, cut, filled in or otherwise disturbed by machinery. Most of these areas have either been reshaped, leveled, and filled; or consist of cuts and excavations that extend into the underlying geologic material. Slopes range from 0 to 10 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

Surface to 4 inches, dark brown sandy loam.

Subsurface layer:

4 to 12 inches, light yellowish brown sandy loam.

Substratum:

12 to 30 inches, yellowish brown gravelly loam.
30 to 48 inches, light yellowish brown gravelly sandy loam.
48 to 72 inches, yellowish brown sandy loam.

In some areas are similar soils with less than 15 percent gravel throughout the soil profile. These soils make up 30 percent of the unit.

Dissimilar soils included in mapping are small undisturbed areas of Fort Mott and Runclint soils, and soils that have silty substratums. These areas make up 15 percent of the unit.

Most areas of this unit are on borrow pits and filled areas along the Potomac River and Mattawoman Creek where ordnance tests are performed. Some smaller abandoned areas are wooded.

The properties of the soil material are extremely variable. Onside investigations are needed to estimate the potential and limitations of this unit for each specific use.

Because of present land use, this soil is not suited for wildlife habitat. It is not suited for food plot crop production.

WoA -- Woodstown sandy loam, 0 to 2 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of moderately well drained. It is on uplands of the coastal plain. It formed in loamy alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

0 to 2 inches, dark brown sandy loam.

Subsurface layer:

2 to 10 inches, light yellowish brown fine sandy loam.

Subsoil:

10 to 18 inches, yellowish brown sandy clay loam.
18 to 23 inches, yellowish brown loam.
23 to 37 inches, yellowish brown loam with gray mottles.

Substratum:

37 to 40 inches, yellowish brown gravelly sandy loam with gray mottles.
40 to 72 inches, pale brown very gravelly sandy loam with gray mottles.

In some areas there are similar soils with fine sandy loam surfaces. In other areas there are similar soils with less than 15 percent gravels in the substratum. These areas make up 15 percent of the unit.

Dissimilar soils included in mapping are Hambrook soils at slightly higher elevations; soils with clay loam subsoils on Stump Neck; and Klej soils at slightly lower elevations. These included soils make up 25 percent of the unit.

The potential productivity is high for loblolly pine. There are few limitations for timber production.

The limitations for water management are seepage in pond reservoir areas, and sloughing and piping of embankments. Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, and the permeability of the substratum. Drainage around elevated footings if an outlet is available, sandy backfield under dwellings, and land shaping so that surface water moves away from dwellings will help to overcome the high water table as a limitation for dwellings without basements. Shallow excavation walls will need shoring to prevent sloughing. The selection of better suited soils can overcome these limitations for dwellings with basements. Drainage and a raised bed for the roadway construction, help to overcome the high water table as a limitation for local roads and streets. To overcome the high water table and moderately rapid permeability, septic tank absorption fields and other onside sanitary facilities need special design, which could include enlarged and raised absorption fields and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is moderately well suited for food plot crop production.

WoB -- Woodstown sandy loam, 2 to 5 percent slopes. This soil is very deep, nearly level, and has a natural soil drainage class of moderately well drained. It is on uplands of the coastal plain. It formed in loamy alluvial sediments.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:

0 to 2 inches, dark brown sandy loam.

Subsurface layer:

2 to 10 inches, light yellowish brown fine sandy loam.

Subsoil:

10 to 18 inches, yellowish brown sandy clay loam.
18 to 23 inches, yellowish brown loam.
23 to 37 inches, yellowish brown loam with gray mottles.

Substratum:

37 to 40 inches, yellowish brown gravelly sandy loam with gray mottles.
40 to 72 inches, pale brown very gravelly sandy loam with gray mottles.

In some areas there are similar soils with fine sandy loam surfaces. In other areas there are similar soils with less than 15 percent gravels in the substratum. These areas make up 15 percent of the unit.

Dissimilar soils included in mapping are Hambrook soils at slightly higher elevations; soils with a clay loam subsoil on Stump Neck; and Klej soils at slightly lower elevations. These included soils make up 25 percent of the unit.

The potential productivity is high for loblolly pine. There are few limitations for timber production.

The limitations for water management are seepage in pond reservoir areas, and sloughing and piping of embankments.

Selection of better suited soils will help overcome these limitations.

The main limitations for urban uses are the seasonal high water table, sloughing of excavation walls, and the permeability of the substratum. Drainage around elevated footings if an outlet is available, sandy backfield under dwellings, and land shaping so that surface water moves away from dwellings will help to overcome the high water table as a limitation for dwellings without basements. Shallow excavation walls will need shoring to prevent sloughing. The selection of better suited soils can overcome these limitations for dwellings with basements. Drainage and a raised bed for the roadway construction, help to overcome the high water table as a limitation for local roads and streets. To overcome the high water table and moderately rapid permeability, septic tank absorption fields and other onside sanitary facilities need special design, which could include enlarged and raised absorption fields and a drainage system around the facility.

This soil is well suited for upland wildlife habitat. It is moderately well suited for food plot crop production.

SOIL IDENTIFICATION LEGEND

Naval Ordnance Station, Charles Co., Maryland

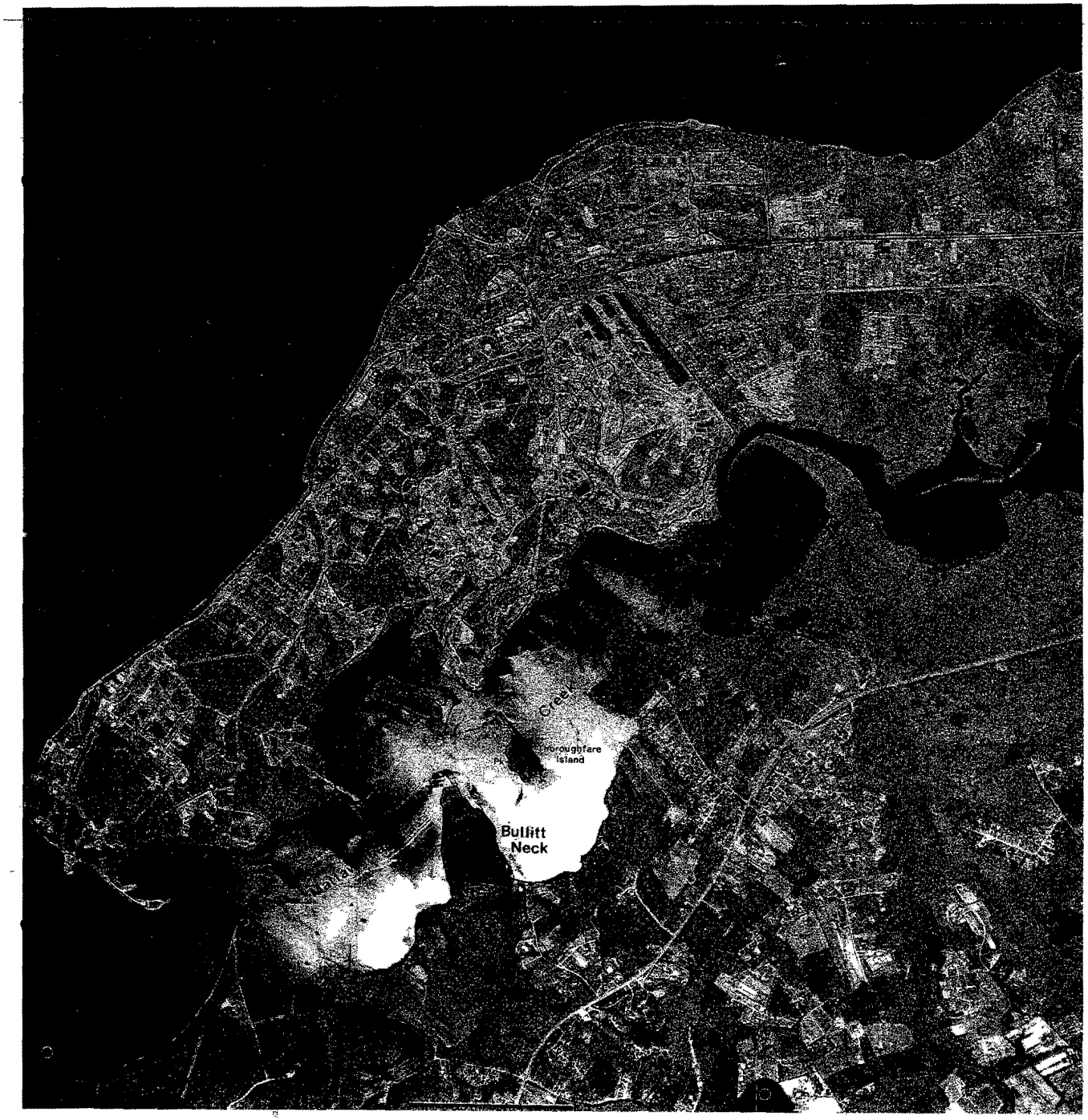
Soil Symbol	Soil Map Unit Name	Published Old Symbol
BeA	Beltsville silt loam, 0 to 2 percent slopes	BeB2
BeB	Beltsville silt loam, 2 to 5 percent slopes	BeB2
BeC	Beltsville silt loam, 5 to 10 percent slopes	BeC, BeC3
BmB	Beltsville-Urban Land complex, 0 to 5 percent slopes	MlF, BeB2
Bs	Bibb sandy loam	Bo
CrD	Croom gravelly sandy loam, 10 to 15 percent slopes	SgC3, SgD2 KeD
CrE	Croom gravelly sandy loam, 15 to 25 percent slopes	SgD2, SgD3 NoE, ClE
CrF	Croom gravelly sandy loam, 25 to 40 percent slopes	SgE, ClE SgF
FmA	Fort Mott loamy sand, 0 to 2 percent slopes	SsB, GaA NoA, MwA
FmB	Fort Mott loamy sand, 2 to 5 percent slopes	RdB2, GaB NoA, NoB
HbB	Hambrook sandy loam, 2 to 5 percent slopes	SsB
InA	Ingleside loamy sand, 0 to 2 percent slopes	SsB
InB	Ingleside loamy sand, 2 to 5 percent slopes	SsC2
Ke	Kentuck mucky silt loam	Tm
KpA	Keyport silt loam, 0 to 2 percent slopes	KeA, KeB

SOIL IDENTIFICATION LEGEND (cont.)

Soil Symbol	Soil Map Unit Name	Published Old Symbol
KpB	Keyport silt loam, 2 to 5 percent slopes	KeB, KeC
KrB	Keyport-Urban land complex, 0 to 5 percent slopes	MlF, Md KeB
Ks	Klej loamy sand	Ot, GaA
MkA	Matapeake silt loam, wet substratum, 0 to 2 percent slopes	MaB
MkB	Matapeake silt loam, wet substratum, 2 to 5 percent slopes	MaB
MkC	Matapeake silt loam, wet substratum, 5 to 10 percent slopes	MaC3, MaD2 KeC, KeD, KcB3
MmB	Matapeake-Urban Land complex, 0 to 8 percent slopes	Md, MaB
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes	MpA
MpB	Mattapex fine sandy loam, 2 to 5 percent slopes	MpA, KeA
MuB	Mattapex-Urban Land complex, 0 to 5 percent slopes	Md, MpA
Pk	Puckum mucky peat	Tm
RcA	Runclint loamy sand, 0 to 2 percent slopes	MwA, EsA
RcB	Runclint loamy sand, 2 to 5 percent slopes	GaA, GaB MwB, NoB
Ua	Udorthents	McB, Dumps B.P.
WoA	Woodstown sandy loam, 0 to 2 percent slopes	SsB
WoB	Woodstown sandy loam, 2 to 5 percent slopes	SsB

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

DESCRIPTION	SYMBOL
CULTURAL FEATURES	
ROAD EMBLEMS & DESIGNATIONS	
State	52
WATER FEATURES	
Perennial	water W
SPECIAL SYMBOLS FOR SOIL SURVEY	
ESCARPMENTS	
Other than bedrock (points down slope)	
SHORT STEEP SLOPE	
Gravelly spot	
Dumps and other similar non soil areas	



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
COOPERATING WITH
STATE AGRICULTURAL EXPERIMENT STATION

APPROX. SCALE 1"=2000'

USDA-SCS-FORT WORTH TEXAS

SOIL SURVEY FIELD SHEET
CHARLES COUNTY, MARYLAND
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