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# DESIGN CRITERIA OF SEDIMENT DETENTION PONDS FOR CHARACTERISTIC REGIONAL CONDITIONS IN TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

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Robert Harrison Castle Coe III

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## ABSTRACT

Current methods for developing sediment pond design criteria for areas with land-disturbing activities (construction, mining, and agriculture) consist of rule-of-thumb techniques or more complex procedures involving computer analysis. Rule-of-thumb techniques often fail to adequately accommodate specific site conditions and may result in damaging off-site sediment transport. Available computer models accurately address site-specific conditions but require significant input data for satisfactory results. In addition to detailed hydrologic and surface condition information, these inputs include particle size distribution of the eroded soil in the drainage area.

A method which takes into consideration regional rainfall, soil, and slope conditions has been developed to assist designers in the sizing of sediment ponds. The developed method provides for a much more site-specific design to better meet the current best management practice criteria for off-site sediment transport.

The study was undertaken in three steps. First, sixty-five representative Tennessee soils based on SCS Soil Series were selected and evaluated in 6 hydrologic/erosion zones comprising Tennessee. Eroded particle size distributions for these soils were estimated using a computational method developed by G. R. Foster and others. Second, evaluations of the zone and soil conditions were made to estimate required pond sizes utilizing computer modeling software (SEDCAD+). This included an assessment of the trapping efficiency, volume-weighted average discharge, and annual sediment yield with respect to surface area, dead space, detention time and overflow rates using a basic pond geometry

and drainage area with varied slopes. Third, the results were compiled and presented in a format that could be retrievable based on the site information, including: location by county, soil series, and slope. Estimates of flow rates, sediment accumulation, and trapping efficiency are also included in the compiled results.

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## NOMENCLATURE

CP ~ Control practice factor. This is a soil loss factor accounting for cover conditions and conservation practice for use (this research) in the Revised Universal Soil Loss (RUSLE) equation.

dispersed particle size distribution ~ The soil particle size distribution representing the most basic constituent dimensions into which the soil sample will disperse.

eroded particle size distribution ~ The particle size distribution of a soil which includes consideration for the aggregation of particles due to binding by the clay constituent. For this research this distribution is estimated using the computational procedure of Foster and others (1985).

K ~ The erodibility value for a soil series. This value is a measure of the rate of erosion a soil will incur when subjected to rainfall energy (Barfield and others, 1987) for use (this research) in the Revised Universal Soil Loss (RUSLE) equation.

R-factor ~ A measure of rainfall energy, momentum, and intensity (Barfield and others, 1987) for use (this research) in the SEDCAD+ computer model to determine annual sediment accumulation. For this research the R-factor refers to the average annual value.

TE ~ Trapping efficiency. The extent of the total sediment load captured in a detention pond defined (in percent) as:

TE = 100 *((sediment in-sediment out)/sediment in)

tuning ~ The adjustment of the drop inlet and barrel diameters (taken in set combinations) to maximize surcharge in a sediment detention pond design.

VRR ~ The Volume weighted settleable solids Removal Ratio. The extent of the vwss load captured in a detention pond defined (in percent) as:

VRR = 100 *((vwss in-vwss out)/vwss in)

vwss ~ SEDCAD+ (Warner and Schwab, 1992) terminology for volume weighted settleable solids, it is the average sediment concentration per volume of fluid (milliliters/liter) of settleable particles (as determined by a mathematical representation of the Imhoff Cone test) for the peak 24 hour discharge of the event. This is an average value weighted in combination with the hourly flow volumes.

# CHAPTER 1

# INTRODUCTION

Areas subjected to land disturbing activities such as strip mining, agriculture, and construction incur a substantially increased potential for soil erosion and increased runoff rates. The results from such activities include deterioration of water quality, loss of aquatic habitat, property damage, and loss of soil from an area. Good management practices such as the use of mulches, vegetative cover, and phased earth work can provide appreciable reduction in the runoff intensity and the volume of sediment transported from a particular area.

## Objective and Scope

In most cases active or preventative practices alone are not sufficient to prevent adverse downstream impacts. A last defense measure for reducing high discharge rates and keeping soil "on-site" is the sediment detention pond. A common method for sizing sediment detention ponds generally consists of applying rule-of-thumb storage volumes on a watershed area basis. Such an approach does not directly address several major variables that influence the amount of sediment either entering or leaving a given pond. Typically, factors such as variations in soil types, eroded particle size distribution, slope of the drainage area, variations in rainfall, and erosion intensity across a given region are not addressed. Additionally, the broadcast approach of a fixed volume of storage per acre drainage area sets forth no clear criteria with respect to meeting any particular water quality and peak discharge conditions.

The objective of this thesis is to establish a rational basis for volume storage requirements for sediment detention ponds based on regional rainfall and soil conditions for anticipated disturbed site conditions in Tennessee. Three elements are included in the objective. First, an assessment of the regional rainfall, drainage area conditions, and soil conditions which would impact pond performance within the state of Tennessee will be made. Second, a criteria for acceptable pond performance will be established. Third, pond performance evaluation will be executed for the varying conditions to yield an estimate of pond sizes required to meet the established criteria.

# CHAPTER 2

# LITERATURE REVIEW

## Pond Storage Volume, Water Quality, and Peak Flow Criteria

Common sediment pond storage volume criteria in current use ranges from 67.5 cubic yards per acre of drainage area (SCS, 1974A and SCS, 1975) to about 81 cubic yards per acre of drainage area (SCS, 1974B and SCS, 1981). Pond sizing criteria established by ordinance varies regionally and often without specific quantitative design requirements (Whipple and others, 1983). Harrington and Wong (1983) conducted an extensive review and analysis of several extant storm management guidelines within the state of Maryland. Review of this report lead to the conclusions that the peak discharge for disturbed and developed areas should be controlled so as not to exceed the predevelopment peak discharge for both a 2-year and 10-year, SCS Type II, 24-hour storm. Also, a study conducted by Barfield and others (1986) for the state of Maryland, which used the 67.5 cubic yards per acre drainage area criteria at the time of the study, has shown that this rule-of-thumb approach allows considerable impact to off-site sediment discharge for 2-year and 10-year storm events. In the Barfield and others (1986) study, hypothetical drainage areas served by sediment detention ponds were subjected to storms for both predevelopment and disturbed site conditions. The detention ponds were sized two ways: according to the existing 67.5 cubic yards per acre drainage area and according to new criteria based on the 2-year and 10-year storm events. The drainage area site conditions were also varied over the degree of slope and three soil types. The results of the analysis showed that the existing criteria were not sufficient for 2-year and 10-year storm events. This study used the 2-year and 10-year, SCS Type II, 24-hour recurrence storm to determine predevelopment conditions to be utilized as the development criteria comparison.

Instead of using fixed sizing recommendations, a better approach is to approximate predevelopment conditions of water quality and peak discharge (Whipple and others, 1983). Based on this review, reasonable predevelopment conditions to use for sediment concentration and peak discharge criteria to apply to the disturbed conditions are 24-hour 2-year and 10-year recurrence storm events. However, it should be noted that effluent discharges containing a significant portion of non-settleable suspended sediment (fines of particle sizes less than 2 microns) will resist settling under conventional sediment detention pond conditions. In some cases this may present practical limitations in meeting the predevelopment effluent sediment concentration criteria or even make such a goal impossible without extremely large storage volumes (approximating the volume of the runoff) or the addition of chemical flocculants (Ward and others, 1980).

## Pond Geometry and Structure

The function of a sediment detention pond is to receive sediment laden storm runoff from a drainage area and, via the pond storage volume, slow the flow velocity to allow for settling and reduce the peak discharge while still allowing the modified discharge to leave the site. It is not sufficient just to create a prescribed storage volume of indiscriminate shape. The specific pond geometry and outlet structure design both have considerable influence on how efficiently the desired flow and discharge modification is performed.

Ideally, with respect to settling efficiency of particles in a pond, the hydraulic characteristics assume the entire pond volume as the flow field (that is, no short circuits or turbulent perturbations) and the detention time is therefore at a maximum. In practice, inefficiencies, termed collectively as dead space, do exist and have been characterized in laboratory models by Griffin and others (1985). Griffin used triangular ponds with length to width (l/w) ratios ranging from 1/2 to 3/1. In Griffin's analysis it was found that the l/w of 2/1 to 3/1 (3/1 was the largest ratio evaluated) yielded the minimum amount of dead space ranging from 12 to 17 percent. This is in basic agreement with the SCS Maryland (1986) specifications which require a l/w ratio of 2/1.

In practice most sediment ponds are triangular (SCS Maryland 1983 for example) in shape and w is taken as the width at the midpoint of long axis. The hypothetical ponds of this research are rectangular for simplicity, but this makes no difference computationally.

The design depth must also be examined. Based on the overflow rate approach to pond settling, more surface area and less depth (for a given volume) provide the optimum trapping efficiency of a given pond (Barfield and others, 1986). The practical limitations are the economy of the amount of surface area taken and onset of scouring losses at shallower pond depths. For sediment detention ponds of the type postulated in the ensuing research, general guidelines (SCS, 1974A) set the minimum pond depth for small drainage areas at 1.5 ft. Specific analysis of scouring phenomenon is beyond the scope of this research.

Outlet structure design can vary considerably depending on the particular guidelines used. For the design of sediment detention ponds of the size commonly used in disturbed areas, the following items are drawn from the literature as good current practice:

Principal Spillway (barrel and drop inlet): The slightly sloped (about 3 percent) drainage pipe (the barrel) which connects to a vertical pipe serving as the spillway inlet (drop inlet) should be about 2/3 the diameter of the drop inlet. This allows the barrel to flow full and inhibit buoyancy in the pipe. The drop inlet crest is elevated to allow accumulation of water in the pond per design requirements. The principal spillway in conjunction with the emergency spillway (see below) must be able to carry an SCS Type II, 10-year, 24-hour recurrence storm. (SCS, 1974A; SCS, 1983; and Goldman and others, 1986).

Emergency spillway: The emergency spillway crest should be located approximately one foot above the principal spillway crest (SCS, 1974A). It is required by SCS (1974A) and SCS (1986) to carry a 10-year 24-hour storm (operating in conjunction with the principal spillway) while leaving one foot of freeboard above high water. Goldman and others (1986) suggest using a 25-year 24-hour storm with the same elevation recommendations.

## Particle Characteristics

For a given pond geometry, influent sediment, and flow condition the removal efficiency of sediment relative to the effluent is dependent upon the settling velocity of the particles. Assuming a spherical shape, uniform temperature and uniform density for the influent sediment, the diameter (or size) of the particles can control the rate of settling and, therefore, the amount of sediment removed before the fluid leaves the pond (ASCE, 1975). Variation in particle size has significant impact on the settling velocity. For example, a comparison of two pond scenarios with the only change being the average particle size diameter of 0.01 and 0.05 millimeters yields trapping efficiencies of about 34 and 84 percent, respectively (Warner and Schwab, 1992). In practice, the particle sizes do vary for different soil types and, therefore, the size distribution must be considered in detention pond analysis (Barfield and others, 1987). The particle size distribution for a given soil series is generally presented in the dispersed (or primary) particle size condition. In the laboratory this involves the addition of surfactants to the wetted sample and subsequent agitation before sieving and pipetting. The primary particle size distribution represents the most basic constituent dimensions into which the soil sample will disperse (Meyer and Scott, 1982; Meyer and others, 1992).

## Characterization of Eroded Particle Size

Early efforts at characterizing the eroded sediment particle size distribution used dispersion methods for determining the size distribution of eroded sediment samples (Doty and Carter, 1965). Since then, however, it has been accepted that eroded particle size distribution contrasts with the primary grain size distribution since some amount of aggregation (mainly due to the cohesive characteristics of clays) of the primary particles is extant (Meyer and Scott, 1983, Mutchler and McDowell, 1986, Meyer and others, 1986). These altered dimensions can have substantial impact on the prediction of settling time for bodies of sediment laden water. Barfield and others (1986) report estimated trapping efficiencies best for the finer and coarser soils and poorer for the high silt soils.

Qualitatively, Barfield explains, "[t]his results from the greater tendency for clay particles to aggregate in the clay loam soil, and therefore to settle out more easily." Research reviewed with respect to soil particle size distribution includes laboratory analysis, combined laboratory/analytical methods, and computational methods.

## Field Analysis of Eroded Particle Size

In conjunction with the recognition of a difference between the dispersed particle size distribution and the eroded particle size distribution, improved laboratory methods for determining the eroded particle size distribution from field samples have been developed. Alberts and others (1979) reported a comparison of the primary and eroded particle size distribution for a single soil. Meyer and others (1980), utilizing simulated rainfall on croprow sideslopes for analysis of 10 soil types, used laboratory test methods for undispersed grain size distribution. The methods employed were later refined and presented by Meyer and Scott (1983). Meyer and Scott (1983) outline details of pertinent procedures along with a discussion of several potential procedural errors and remarks on the sensitivity of the analysis technique employed. At about the same time, Neibling and others (1983) report findings for improved eroded particle size measurement utilizing 49 samples of Indiana soils. Meyer and others (1992), using the procedures of Meyer and Scott (1983), performed analysis on 21 soils for eroded particle size distributions utilizing low-slope test plots. Such efforts available in the literature involve a limited number of soil samples and do not begin to address the extensive number of identified soil series.

## Laboratory Estimates of Eroded Particle Size

Additionally, there have been efforts to reduce the extent of field sampling required, such as the efforts by Rhoton and others (1982) who have attempted to duplicate eroded particle size in the laboratory. Samples for 17 soils with known field measured eroded particle size distributions were subjected to simulated rainfall in the laboratory and varying agitation times. The trial variation of the agitation time for each soil type and resulting degree of particle aggregation allowed an eventual tailored match of laboratory generated particle size distribution with those of the known field data. The report does not offer any predictive approaches for field sampled eroded particle size distribution, but the method was employed to predict eroded particle size distributions for 21 additional soils in 1987 by Rhoton and Meyer (1987). Improvement in field test methodology has been realized with less time consuming techniques presented by Harmon and others (1989) which is combined with computational predictions of the finer portion of the eroded particle size distribution. Sieve analysis of the sediment sample was still required.

## Computational Estimates of Eroded Particle Size

Young and Onstad (1976) presented the first completely computational approach for prediction of eroded soil particle size composition. The method requires knowledge of the primary sand, silt, and clay distribution, organic matter, and water content. The computational result yields a modified eroded particle size distribution of sand, silt, and clay. This method was developed around Indiana and Minnesota soils which have large portions of kaolinite, illite, and montmorillonite clays. These clays are fairly specific to the Midwest and the method does not appear to be directly applicable to other geographical regions. Also, the Young and Onstad technique yields 3 size categories, whereas most models in current use can accommodate a more detailed particle size distribution.

Another computational method for estimating eroded particle size distribution is presented by Foster and others (1985). The algorithm presented is a modification of the method used by the USDA CREAMS nonpoint source erosion model based on an analysis of 28 soils for which data were available. According to the article abstract:

> *Equations were derived that describe the composition of sediment as a function of the distribution of primary particles in the matrix soil. These equations calculate the fraction of sediment in five particle classes- primary clay, primary silt, small aggregate, large aggregate, and primary sand- and the composition of the aggregate classes. The equations describe sediment at its point of detachment and are designed for use in nonpoint source pollution models that route sediment by particle classes to compute the transport of soil-associated contaminants from field-sized areas.*

Although contaminant transport is not directly applicable, the detachment and transport of sediment is an explicit requirement in the determination of sediment pond size estimates.

Based on research cited by Barfield and others (1986), the reasonable assumption is made that the composition of the original matrix soil is equivalent to that of the detached sediment. This allows the dispersed particle size distribution to be used for the starting point of the estimate computation. The dispersed particle size distributions of sand, silt, and clay are sized, respectively, into greater than 0.063 millimeters, 0.004 to 0.063 millimeters, and less than 0.004 millimeters. The two aggregate size classes generated by the computation are based on the assumption that the cohesive properties of clay will bind the aggregates into larger but less dense agglomerations of the primary composition. The diameter of the three primary (unaggregated) particle size classes are based on particle size distribution of the dispersed matrix soil.

The weight fractions of the five classes are also based on the clay content. The specific values for the particle class diameter and weight fraction are given by a series of equations based on the empirical data derived from observation and analysis of the subject soils. It can be readily seen that, given soil types for which the dispersed particle size distribution in the prescribed sand, silt, and clay categories are known, an algorithm could be conveniently developed to generate an estimated detached particle size distribution for five size classes. The generated size classes apply, however, to the soil "at the point of detachment and not at the edge of the fields." An assumption would therefore need to be made for the research application regarding the degree of eroded sediment size change during transport across the drainage area to the sediment pond.

## Tennessee Soils

Soil series data on particle size distribution, soil erodibility value (K), and location are needed in order to evaluate the effects of soil type on detention pond sizing requirements. SCS "Form 5" information on Tennessee soil series (SCS/Ammons, unpublished), is an extensive listing of all identified soil series of Tennessee. Included in the "Form 5" information are average ranges of dispersed particle size distributions generally given for the A, B, and C soil horizons.

Other sources of particle size distribution information can be found in USDA (1950), SCS (1967), and SCS Soil Surveys for individual Tennessee counties. While some amount of variation in the detail given for particle size distributions exists, observations of duplications of soil series analyses between sources were in reasonable agreement.

Smoot and others (1992) includes a table of 97 soils referred to as "Erodibility values (K) of the B and C horizons for the representative soils of Tennessee." The reference cited for this list, Tennessee SCS (1974), includes the same table and is not directly referenced. This table, referred to as the Tennessee Representative Soils List probably has its origins in a previous University of Tennessee Agricultural Experiment Station Bulletin (Jent and others, 1967) which includes a more comprehensive soil series listing but less extensive information on the erodibilities of the B and C horizons.

The University of Tennessee Agricultural Experiment Station Bulletin 596 (Springer and Elder, 1980) provides an overview of predominant Tennessee soil series. Included in this bulletin are acreages occupied by the predominant soil groups (generally subdivided into about 3 soil series) and a map of Tennessee showing the location of the groups.

## Model of Soil Erosion and Sediment Transport and Deposition

Several generally accepted soil erosion and sediment transport computer models are available for evaluation of transport phenomenon. Fiuzat and others (1992) conducted an evaluation of seven models including SEDCAD+ (Warner and Schwab, 1992). The evaluation did not address verification but did extensively compare capabilities of the models. Of these, SEDCAD+ is of particular interest because it contains a collection of features that make it particularly applicable for both evaluation of soil erosion in a drainage area and the performance of a sediment detention pond receiving such sediment-laden runoff. Review of the SEDCAD+ capabilities consist of input variables, choice of computational models, embedded computations, and the resulting output data.

SEDCAD+ includes input variables for drainage basin site conditions, soil particle size distributions, SCS storm events, storm routing, specific pond design including outlet structure, and pond dead space. Site condition parameters consist of drainage area slope, slope length, area and R-factor. Additionally surface conditions are input for both erosion propensity (Cover Practice (C) and soil erodibility value (K)) and runoff (SCS Curve Number) characteristics. Particle sizes can be input for up to ten diameters with associated weight fractions, but must use a common density. Storm events use the SCS Storm Type hydrograph distributions which can be routed as slow, medium, or fast hydrographs. Pond design input includes volume-area relations and several outlet structure options. Most notable in the outlet structure choices are drop inlet, perforated riser, siphon drainage, and emergency spillways. The elevations and dimensions of these structures are variable within a practical range. The percent dead space feature allows a selected portion of the pond to be held unusable for settling calculations.

The computational methods SEDCAD+ uses are selectable for storm precipitation distribution, time of concentration, erosion, mixing method, and pond sediment accumulation. SCS Type 24-hour storm Distributions (the Type depends on the geographic location which for Tennessee is Type II), the SCS 6-hour Distributions (not geographically dependent), or user input distributions can be used for development of storm hydrographs. Unit hydrographs are developed from these precipitation input data by opting for slow, medium, or fast hydrograph response shapes. The response shapes represent a range of site conditions corresponding with heavily forested drainage areas (slow) to mostly impervious drainage areas (fast). Time of concentration is determined by the SCS Upland Curve Method or supplied by independent calculation. The Upland curve method incorporates the variables of slope, slope length, and land use for an estimate of the time of concentration. One suggested alternate (Warner and Schwab, 1992) is to use the Kirpich method, which does not consider specific land use characteristics. Erosion models include the Revised Universal Soil Loss Equation (RUSLE), the Modified Universal Soil Loss Equation (MUSLE), and the Soil Loss Routine (SLOSS). RUSLE and MUSLE are similar with the main difference being that RUSLE incorporates recently developed factors improving steep slope erosion estimates (Warner and Schwab, 1992). SLOSS is also similar to MUSLE with the primarily difference being that actual slopes and slope lengths are used instead of representative values (Warner and Schwab, 1992). Two mixing methods are available to describe the combining of influent sediment concentrations with the stored concentration in the pond and the resulting effluent concentration over the period of a storm event: the plug flow model and the continuously stirred tank reactor in series (CSTRS) model. Wilson and others (1983) describes a detailed study in which these models were compared with actual sediment samples from test ponds. Although little difference was found in predicted trap efficiency, the CSTRS more accurately described the effluent sediment concentration over the event period. For site conditions that generate significant eroded material, the accumulated volume of sediment over time in detention ponds can be an important consideration. SEDCAD+ addresses this by allowing for arbitrary user input of fixed sediment volume or the utilization of a delivery estimate for a specified time period (Warner and Schwab, 1992). The delivery estimate is based on studies conducted by Warner on Kentucky watersheds (Warner, 1993) and incorporates the annual R-factor, the storm R-factor, and the time period of pond sediment accumulation. (Warner and Schwab, 1992)

Embedded analysis used in SEDCAD+ includes settling characteristics and outlet structure discharge calculations. Settling velocities are determined using Stokes equation. For larger particle sizes (Reynolds Number greater than about 1) Stokes law tends to overestimate the fall velocity (Graf, 1984), but because smaller particle sizes which are well within the Stokes range control pond performance, this should not present a problem for this research application. Outlet structure discharge calculations are, according to Warner and Schwab (1992), based on Brater and King for the drop inlet and broad crested weir (emergency spillway) analysis and refer to an earlier work by Schwab for the siphon flow estimates.

The SEDCAD+ output includes several sediment and hydrologic values associated with the assessed event. The pertinent output information consists of:

Peak flow into (from the drainage area) and out of the pond structure

Peak stage occurring in the pond structure

Tons into (from the drainage area) and out of the pond structure

Trapping efficiency of the pond structure (tons out/tons in times 100)

Volume weighted settleable solids into (from the drainage area) and out of the pond structure. [Note: The settleable solids category is based on the Imhoff Cone Test (Warner and Schwab, 1992)]

Sediment accumulation in the pond structure over a specified time (as described above)

Other values are available from SEDCAD+ output such as: detailed inlet and outlet hydrographs with associated pond stage, arithmetic average sediment influent and effluent, peak sediment influent and effluent, and sedigraphs for the influent and effluent.

# CHAPTER 3

# METHODS

The state of Tennessee was chosen as the spatial scope of this research due to the presence of varied erosion conditions (principally soil and rainfall storm value variations), familiarity with the geography, and the availability of soil data. Consideration of widely varying erosion conditions such as exist in the state would demonstrate whether or not there was a need for refined pond sizing criteria.

Once the scope of the work was determined to encompass the state of Tennessee, development of detention pond sizing criteria was accomplished in six steps. The first step was a determination of specific soils to use for the evaluation. The second step was estimation of the eroded particle size distribution for each soil series. Step three involved the development of geographical Zones with similar rainfall, R-factor, and soil series. Step four was the development of a series of pond geometries to be used in the evaluation. Step five encompassed the drainage area definition, evaluation strategy, fixed variables and computation options, and pond performance acceptance criteria for the evaluation. The final step was the evaluation of pond performance for the varying conditions using the SEDCAD+ (see Chapter 2) model to find pond sizes meeting the described criteria.

## Determination of Soil Series for Evaluation

A reasonable list of Tennessee soils and their likely location was needed. By observation of SCS "Form 5" information on Tennessee soil series (SCS/Ammons, unpublished), a listing of all identified soil series of Tennessee would number in the hundreds. Evaluation of all of these soil series in each probable site location would not be feasible. Tennessee SCS (1974B), as discussed in Chapter 2, includes the Tennessee Representative Soils List which contains 97 soils. This list, however, does not provide the location of these soils within Tennessee. Bulletin 596 (Springer and Elder, 1980) geographically locates the predominate soils series of Tennessee but is a more extensive listing than the Tennessee Representative Soils List, while still not encompassing it.

A list of soil series for evaluation was developed by cross referencing the Bulletin 596 (Springer and Elder, 1980) information with the Tennessee Representative Soils List. If the soil series was included in both it was retained for evaluation. The result was a list of 65 soils for evaluation. Using the Bulletin 596 soil map (Springer and Elder, 1980) for Tennessee, the evaluation soils where further categorized by their presence in a given county. This yielded a table (not shown) which showed the evaluation soils present in each county.

## Eroded Particle Size Distribution

An estimate for the eroded particle size distribution of the selected evaluation soils was needed. Since the literature search revealed eroded particle size distributions for only a few of the evaluation soils, the estimates were developed using the Foster and others

(1985) computational method (referred to herein as the Foster algorithm) described in Chapter 2. The assumption was made that the eroded particle size distribution would remain unchanged during transport from the point of detachment to the exit point of the drainage area. In order to apply the Foster algorithm the dispersed particle size distribution of the subject soil must be known. Furthermore, the percent finer categories of the dispersed particles used for input must match those defined for sand, silt, and clay in the Foster algorithm.

Application of the Foster algorithm to these values yields five grain size classes and two densities. Since the Foster algorithm results are being used for input to the SEDCAD+ model (which allows only one density for the eroded particle size distribution), the diameter of one of the size classes must be converted into an equivalent diameter to provide uniform density for all five size classes. Also, since the SEDCAD+ model uses log linear interpolation of the input grain sizes, the Foster algorithm results were further adjusted by the creation of 5 "dummy" grain size categories which allowed a stepped grain size distribution. This provided a means of narrowly straddling the Foster algorithm output diameter and percent finer values with negligible material recognized in non-Foster algorithm diameters. At this point the estimates for eroded particle size distributions of the evaluation soils were complete and ready for input to SEDCAD+. Details of the procedures for accomplishing this are described below.

Using the sources described in Chapter 2, dispersed particle size distribution data were collected for the B horizon of the evaluation soils with organic matter neglected. Particle sizes greater than 2 millimeters in size were not included in the data collection. The Foster algorithm requires that the percent finer distribution be defined for sand, silt, and clay, respectively, into greater than 0.063 millimeters, 0.004 to 0.063 millimeters, and less than 0.004 millimeters. Since the size classes in the collected data were not always in agreement with the sizes needed for the Foster algorithm, the data were graphed on linear percent finer versus log particle size (millimeter) plots. Percent finer values were then determined graphically for the needed size classes. An example of this graphical method is shown in the Appendix Figure A-1 for Decatur Silt Loam. A summary of the estimated dispersed particle size distributions for the evaluation soils is shown in the Appendix, Table A-1.

The Foster algorithm was then applied to the estimated dispersed particle size distributions for the evaluation soils. This yielded the five particle size classes mentioned, three primary particle sizes and two aggregate size classes. The diameter of the three primary (unaggregated) particle size classes are based on particle sizes of the dispersed matrix soil. The two aggregate diameters are based on the original clay content of the dispersed particle size distribution. The weight fractions of the five classes are also based on the clay content. The specific values for the particle class diameter and weight fraction are given by a series of equations based on the empirical data discussed in Chapter 2. These equations are given below using the notation of the article (except for Ds, Dsi, and Dcl, which are added for clarity):

For the particle class diameters (in millimeters):

Ds = 0.200

Dsi = 0.010

Dcl = 0.002

| | |
|---|---|
| Dsg = 0.03 | Ocl < 0.25 |
| Dsg = 0.2 (Ocl - 0.25) + 0.030 | 0.25 <= Ocl <= 0.60 |
| Dsg = 0.100 (small aggregate upper limit) | Ocl > 0.60 |
| Dlg = 0.300 (large aggregate lower limit) | Ocl <= 0.15 |

| | |
|---|---|
| $Dlg = 2\ Ocl$ | $Ocl > 0.15$ |

Where: Ds = the diameter of the primary sand class in the sediment

Dsi = the diameter of the primary silt class in the sediment

Dcl = the diameter of the primary clay class in the sediment

Dsg = the diameter of the small aggregate class in the sediment

Dlg = the diameter of the large aggregate class in the sediment

Ocl = the weight fraction of clay in the dispersed matrix soil

For the distribution of the particle classes (weight fraction):

| | |
|---|---|
| $Fcl = 0.26\ Ocl$ | |
| $Fsg = 1.8\ Ocl$ | $Ocl < 0.25$ |
| $Fsg = 0.45 - 0.6(Ocl - 0.25)$ | $0.25 <= Ocl <= 0.50$ |
| $Fsg = 0.6\ Ocl$ | $Ocl > 0.50$ |
| $Fsi = Osi - Fsg$ | If Fsi is negative, $Fsg = Osi$ and $Fsi = 0$ |
| $Fsa = Osa(1 - Ocl)^5$ | |
| $Flg = 1 - Fcl - Fsi - Fsg - Fsa$ | If Flg is negative, Fcl, Fsi, Fsg, and Fsa are reduced proportionally to make $Flg = 0$ |

Where: Fcl = the fraction of primary clay class in the sediment

Fsg = the fraction of small aggregate in the sediment

Fsi = the fraction of primary silt in the sediment

Fsa = the fraction of primary sand in the sediment

Flg = the fraction of large aggregate in the sediment

Osi = the fraction of silt in the dispersed matrix soil

Osa = the fraction of sand in the dispersed matrix soil

The computations described above were transferred to a spreadsheet and the evaluation soil's dispersed particle size data were input to generate eroded particle size distributions. The values generated from the Foster algorithm are given in the working form in the Appendix Table A-2. Note that in some cases the fraction of primary silt (Fsi) or the fraction of large aggregate (Flg) can be zero. For the evaluation soils there was always an Flg value but in several cases the Fsi value was zero leaving only four effective size classes. This is discussed further in Chapter 4. Appendix Table A-2 also shows a category labeled Intermediate Small Aggregate Fraction. This value is subjected internally in the spreadsheet to the test described above for Fsi being negative. If Osi-Fsg is negative then the Fsg value is changed for the final Small Aggregate Fraction category in the Table.

The specific gravities for the primary particle classes and the aggregate classes are given as 2.65 and 2.0, respectively. Since SEDCAD+ accepts only one density (input as specific gravity), an equivalent diameter must be determined for one of the classes to make the densities uniform without impacting the fall velocity of the particles. This was done using Stokes law (ASCE, 1975) and postulating two cases having equal velocities and fluid properties. One case has the actual diameter as estimated by the Foster algorithm and the second case has the equivalent diameter. Manipulation of these two equalities yields the relationship:

$$De = Da\ ((Sa-1)/(Se-1))^{0.5}$$

Where De is the equivalent diameter (mm), Da is the Foster algorithm diameter (mm), Sa is the Foster algorithm specific gravity (2.0), and Se is the equivalent specific gravity (2.65). This gives for the conditions in question the conversion:

$$De = 0.778\ Da$$

It should be noted that the large aggregate conversion is somewhat out of the generally accepted Stokes range. For example, a 1 millimeter particle size (most of the large aggregate sizes are smaller than this), this would yield a velocity 4.6 times higher than that given by the empirical curve of ASCE (1975 (Figure 2.2)). This, however, should not affect the subject research application, since particles much finer are extant in the size distributions which will control the overall settling times and pond efficiencies.

In addition to adjusting the diameters of the aggregate classes, the interpolation method used by SEDCAD+ also makes it necessary to force the five associated eroded particle size fractions into narrow bands or steps in the required percent finer format. If this is not done, SEDCAD+ will make log linear interpolations of particle sizes between the percent finer categories (Warner and Schwab, 1992). This is done by having the spreadsheet straddle the adjusted Foster algorithm diameters and fractions by negligible increments, forming five additional artificial "dummy" size categories after each of the "real" grain size categories. An example is shown for Decatur Silt Loam with the Foster algorithm eroded particle size distribution curve (with the aggregate classes adjusted for equivalent diameter) and the stepped eroded particle size distribution curve as prepared for input to SEDCAD+ both shown in the Appendix Figure A-2. Appendix Table A-3 (selected examples and discussion are given in Chapter 4) shows a summary of the evaluation soil series eroded particle size distribution prepared for use in SEDCAD+. The postscript designations 1 and 2 for size classes straddle the adjusted Foster algorithm values. Also included in the table is the soil erodibility value (K) for the "B" horizon and the SCS Hydrologic Soil Group designation (SCS, 1974B).

## Development of Zones

In addition to surface cover conditions, area, and slope of the drainage area (which are addressed in the Criteria section, below), a location specific approach to estimating pond performance requires the soil eroded particle size distribution, precipitation data, and R-factor data. By the procedure described above, the soil series for evaluation and accompanying eroded particle size distributions have been assigned to the counties of Tennessee. Average annual R-factors are available by county from the SCS (1974B). Precipitation values (inches) for the SCS Type II, 2-year and 10-year, 24-hour rainfalls (SCS, 1974B and SCS, 1981) can also be assigned to the counties. By observation it is apparent that model evaluation for the varying conditions of each county would be extensive. Since evaluation soils, R-factors, and the chosen rainfalls often only differ incrementally in adjacent counties, an opportunity exists for simplification of the evaluation process with minimal generalization of the results. The approach taken for simplification was to develop six Zones divided along county lines for Tennessee with each Zone having assigned soil series, a 2-year and 10-year precipitation value, and an annual R-factor. A description of the development and rationale for the Zone determinations follows.

Initially, the 2-year and 10-year, 24-hour rainfall isohyetographs (SCS, 1974B) were modified to follow county divisions and the closest coincident isohyets. These modified isohyets break Tennessee into 3 regions of uniform storm intensities for the 2-year and 10-year conditions. By visual estimate these isohyetal regions apply the highest intensity of the region to all counties within the region which results in overestimate of rainfall for some of the counties. The maps of the Appendix Figures A3 and A4 show the three resulting modified rainfall regions (with precipitation values) overlaid on SCS Type II, 24-hour storm maps for the 2-year and 10-year storms, respectively.

Rainfall distributions through Tennessee have no apparent correlation with the Soil series distributions but do crudely follow the annual R-factor values. Since soil series groups, as expected, tend to regionally cluster, the isohyetal regions were subdivided into regions (called Zones) along county divisions to best accommodate the geographic soil series distributions. This produced a total of six areas, designated Zones 1 through 6, for Tennessee (presented in Chapter 4) to be used for this research. These Zones take the average annual R-factor and include all soil series of the encompassed counties. Appendix Table A-4 shows, by county, the reference precipitations and the reference annual R-factor along with the modified precipitations and the modified annual R-factor used for model evaluation input. A summary of the modified values and discussion of the 6 Zones with their assigned annual R-factors, precipitations, and soil series is given in Chapter 4.

## Pond Geometry Tables Generated

SEDCAD+ has provisions for storing pond dimensions and outlet structures as files. These filed configurations can then be selectively assigned to a set of Zone conditions for the model to process into a pond performance estimate. For consistency it was decided to keep as many elements of the filed pond configurations as possible the same except, of course, the size. This includes general geometric description, emergency spillway, depth, dewatering device, and principal spillway (some exceptions made to the principal spillway dimensions are described in the Fixed Values and Acceptance Criteria section below). A description of the pond geometries and outlet structures developed for the evaluation follows.

A general description of the pond geometry was determined which would apply to all pond sizes. The length to width ratio was chosen to be 2.5 to 1 with an assumed dead space of 15 percent to reduce dead space losses (as discussed in Chapter 2). A rectangular shape (in plan view) was selected with a level bottom. Side slopes are 2 to 1 (run to rise) with the emergency spillway a broad crested weir (Goldman and others, 1986, Barfield and others, 1987). The 20 foot wide emergency spillway is allowed one foot of depth which is adequate to pass a 100-year storm anywhere in Tennessee (well in excess of that recommended in the literature (see Chapter 2)). Freeboard is neglected for the study as it had no bearing on the evaluation results.

Choice of pond depth is not so straightforward. As mentioned in the literature review, trapping efficiency for the same pond volume continues to improve for decreasing depth until scouring occurs. Extremely shallow ponds also require the use of larger portions of the drainage area and complicate control of the discharge rate. The SEDCAD+ model (Warner and Schwab, 1992) does not perform sediment resuspension estimates but does offer some guidelines which were incorporated into the pond depth determination:

> *...[U]sually the crest of the principal spillway will be located at least 2 to 3 feet above the sediment storage level, and/or passive dewatering systems will be used that discharge small flow rates. Such small flow rates will ensure flow net velocities that are low enough, at the sediment storage boundary, to avoid significant sediment resuspension....Also, if the principal spillway is not larger than 24 inches, resuspension will not likely be a problem.*

Based on this, the depth of the design ponds was chosen to be 4.5 feet from the level bottom elevation to the crest of the principal spillway. By other guidelines (Water Resources Administration and others, 1983, Goldman and others, 1986) a distance of 1 foot is recommended from the crest of the principal spillway to the crest of the emergency spillway which makes a total pond depth of 5.5 feet. If a maximum sediment storage of 2.5 feet is allowed (the worst case which the pond will not normally see), a minimum flow depth of 2 feet to the principal spillway will be maintained.

One method of dewatering ponds below the drop inlet crest elevation is by the use of a floating siphon arrangement. The siphon, which is attached to a float, operates by taking in water at a fixed depth below the receding pond surface elevation. It is also usually limited by rigid stops from actual contact with the sediment surface (Schwabb and Warner, 1992). This method of dewatering is considered acceptable practice by Goldman and others (1986) and SCS (1986). In keeping with current acceptable practice a floating siphon arrangement was chosen for the dewatering device, and a drop inlet arrangement was chosen for the principal spillway. The floating siphon was assigned a tube diameter of 3 inches, the tube length was assumed to be 60 feet, and the discharge elevation was taken to be the same as the elevation of the pond bottom.

For the Basic Evaluations (see the Basic Evaluation section below for an explanation of the Basic Evaluation) the drop inlet configuration was assigned fixed dimensions. The basic outlet structure is assumed to be constructed of corrugated metal pipe with a Manning's "n" of 0.024 (Warner and Schwab, 1992). The riser has a diameter of 24 inches and a height of 4.5 feet from the pond bottom. The barrel is 18 inches in diameter, 50 feet long, and laid on a 3 percent slope. The 24/18 inch riser/barrel combination is defined as the standard outlet structure configuration. For the Detailed Evaluations (see the proceeding section for an explanation of the Detailed Evaluations), the riser and barrel diameters were sometimes allowed to vary with all other design details the same. In addition to the standard outlet structure arrangement, the allowable variations of riser and barrel diameter were used in paired dimensions (inches), respectively of 18/12, 16/10, 12/8, 10/6, and 6/4 (Note: the 6/4 riser/barrel combination is probably not practical for field application). Adjusted riser/barrel dimensions are referred to as tuned outlet structures to differentiate them from the standard outlet structures.

Pond volume requirements are generally presented in the literature as a volume storage (cubic yards) per acre of drainage area basis. This convention is maintained herein. A drainage area of five acres was chosen based on anticipated typical site dimensions for land disturbing activities. A pond volume to the crest of the emergency spillway was then given as the storage (in cubic yards) divided by five acres to give a nominal pond size. A selection of ponds was created in the range of 20, 40, 67, 100, 150, and so on by 50 cubic yard per acre increments to 700. A summary of the available pond geometries for the model evaluation is given in Appendix Table A-5. The Table includes stage/volume information for the depth increments.

## Architecture of the Evaluation

At this point eroded particle size distributions, Zone parameters (soil type, rainfall, R-factor), hypothetical drainage area, and pond geometries have been established for the evaluation. Before SEDCAD+ can be applied, the drainage area must be further defined, a strategy for the model evaluation must be developed, values for some additional variables must be determined, and an acceptance criteria of pond performance needs to be established.

## Drainage Area Definition

As mentioned in the Pond Geometry section, a drainage area of five acres was assumed. Further definition of the hypothetical drainage area for the evaluation included a slope length and average slope. The slope length was selected as 1,000 feet. This would imply a corridor-like drainage area often associated with roadway construction projects and other land disturbing activities. No single average slope, however, can begin to encompass expected variations in topography. Four average slopes of 0.01 (referred to as 0), 5, 10, and 20 percent where chosen to represent potential site conditions for disturbed areas. It is recognized that steep slopes such as those averaging 20 percent are not common, but some land disturbing activities such as mining and road construction do create steep slope conditions in localized areas and were, therefore, addressed.

## Pond Performance Evaluation Strategy

Each of the six Zones has a constituent soils set, an assigned rainfall amount for the storm conditions, and a designated R-factor. Since the impact of the Zone parameters is an objective of this research, estimated sediment detention pond sizes need to be determined for the respective Zone soils. The general approach was to undertake the analysis in two parts, the first part called the Basic Evaluation and the second called the Detailed Evaluation.

The Basic Evaluation is comprehensive in scope and addresses estimates on all soil series in each Zone for the variable conditions. To keep the pond size estimates as comparable as possible for the Basic Evaluation, the outlet structure dimensions were kept at the standard configuration described above. Also, for the Basic Evaluation, peak discharge control was not addressed. Pond performance was only assessed against the Efficiency Criteria described in the Acceptance Criteria section below.

The strategy for the Detailed Evaluation was to bracket the estimated sediment detention pond size range for each Zone with assessments against both the Efficiency Criteria and Flow Criteria (see Acceptance Criteria below). The Flow Criteria added the requirement of peak discharge control. The purpose of the Detailed Evaluation was to produce a pond size meeting the two criteria sets and additionally include a spread of pond sizes whose performance is both submarginal and in exceedence to the criteria. For the Detailed Evaluation, three soils were selected for each Zone containing, respectively, the highest undispersed sand, silt, and clay content.

## Variables and Computation Choices

Variables remaining to be considered include those affecting surface conditions, the pond dead space, and the pond sediment accumulation period (pond life before clean-out) is required. Computational choices must be made for the erosion model and pond mixing model.

Surface condition variables include SCS Curve Number, Control Practice factor (CP), hydrograph response shape, and time of concentration. Values must be assumed for both the disturbed and predisturbed conditions. SCS Curve Numbers were taken from the SEDCAD+ documentation (Warner and Schwab, 1992) which were drawn from SCS Technical Release 55. For predisturbed conditions, the Curve Numbers for non-grazed meadow in fair condition were used giving, for Hydrologic Soil Groups A, B, C, and D, respectively, the values 49, 69, 79, and 84. For disturbed conditions, the Curve Numbers for newly graded land were used giving, for Hydrologic Soil Groups A, B, C, and D, respectively, the values 77, 86, 91, and 94. The predisturbed CP factor was assumed to be 0.01, permanent grass (80 percent cover). The disturbed CP factor of 0.1 assumed good conservation practice such as mulching and vegetative cover efforts. The hydrograph is internally developed in SEDCAD+ and, as discussed in Chapter 2, offers three levels of response. The intermediate level (Medium) was utilized for both predisturbed and disturbed site conditions. SEDCAD+ internally calculates the time of concentration for the drainage area using the Upland Curve Method of the SCS (see Chapter 2). Calculation of the time of concentration was determined from the average slope, the slope length and the land use category. Slope and slope length have already been defined while the land use category was taken as 2 (minimum tillage) for predisturbed conditions and as 3 (short grass pasture) for the disturbed conditions. The times of concentration generated by SEDCAD+ based on the described inputs were, for slopes of 0, 5, 10, and 20 percent slopes, respectively, 5.555, 0.2485, 0.175, and 0.124 hours for predisturbed conditions and 3.968, 0.1778, 0.125, and 0.088 hours for the disturbed conditions.

The period of sediment accumulation without clean-out assumed for the detention pond is one year. The SEDCAD+ method of estimating the volume of accumulation is discussed in Chapter 2. The model removes this volume from use (raising the level of the pond bottom) as rainfall storage for performance estimates on settling and discharge rate. This is further addressed in Chapter 4.

The erosion model, dead space, and pond mixing model were chosen per the discussion in Chapter 2. The RUSLE erosion model was chosen on the basis of the steep slopes involved. The value used for dead space was 15 percent. This is in accord with the chosen length to width ratio of 2.5 to 1 as described in the pond geometry section. Also based on the discussion in Chapter 2, the mixing model chosen was CSTRS.

## Acceptance Criteria

Having determined the values necessary for the input information, the output describing pond performance from SEDCAD+ must be weighed against an established criteria. As mentioned in the strategy section above, two sets of acceptance criteria were developed to meet the needs of the Basic and Detailed Evaluations. The Efficiency Criteria were used in both evaluations, while the Flow Criteria were applied only to the Detailed Evaluations.

### Efficiency Criteria

The Efficiency Criteria address pond performance with respect to sediment removal efficiency and basic hydraulic requirements. Included in the Efficiency Criteria are trapping efficiency and volume weighted average settleable solids removal, allowable annual accumulated sediment volume, and allowable emergency spillway usage for the design storms.

As discussed in Chapter 2, the ideal sediment detention pond will approximate predisturbed conditions for sediment effluent. A pond size was assumed to approximate predevelopment rates of sediment effluent when values of 90 percent trapping efficiency or 95 percent removal of volume weighted average settleable solids were achieved. The 90 percent trapping efficiency was based on the observation that the CP factor differed by a factor of 10 between the postulated disturbed and undisturbed conditions. Since the CP factor is linearly linked with the estimated eroded material at a given site, and since this is the most significant difference between disturbed and predisturbed conditions, the 90 percent sediment removal (that is, trapping efficiency) was taken as a reasonable assumption. The 95 percent removal of settleable solids addressed the practical limitation of removing very fine particles in suspension. Settleable solids are by definition those particles which will settle in a reasonable time (see Chapter 2) via the Imhoff Cone Test. The rationale here is that once these particles have been allowed to settle (that is 95 percent of them), any increased pond volume contributes very little to further sediment removal since the remainder are fines which are effectively in suspension.

The maximum allowable annual sediment accumulation in the pond was set at 2.5 feet above the pond bottom. This was based on the reasoning presented in the pond geometry section above (some of the ramifications of this are discussed in Chapter 4). It should be noted that SEDCAD+ volume estimate of annual sediment accumulation is added to the pond bottom and is therefore never made available in fluid storage computations. This is somewhat misleading, in that the pond would be functioning through most of its annual life at somewhat greater depths.

> Note: A remark should be made with respect to the criteria comparison that SEDCAD+ output estimated annual sediment accumulation (which is given in the output in acre-feet) differed by as much as 25 percent between the paired design storms (that is the 2-year and 10-year storms) for a given Zone soil run. Since, as discussed in Chapter 2, the SEDCAD+ (Warner and Schwab, 1992; Warner, 1993) internal computation for this value was originally based on 10-year storm data, the sediment accumulation estimate associated with the 10-year storm was used for criteria comparison and the 2-year storm sediment accumulation estimate ignored.

The allowable emergency spillway usage by the design storms is limited to 0.2 feet. This value more than agrees with recommendations of Goldman and others (1986). The effect on pond size is generally minimal, however, as other criteria usually control pond size since the rapid release of water during emergency spillway usage adversely affects the settling performance.

### Flow Criteria

Three selected soil series (having the highest fraction each of sand, silt, and clay, respectively) for each Zone were subjected to the Efficiency Criteria and the added requirement of meeting predisturbed peak discharge estimates called the Flow Criteria. The peak discharge of the evaluation ponds for disturbed conditions during the Zone design storms (that is, the 2-year and 10-year 24-hour precipitations) was required to be less than 110 percent of the predisturbed peak discharge. This is in basic agreement with the current thinking expressed in the literature (as discussed in Chapter 2).

## Evaluation of Pond Performance for the Zone Conditions Using the SEDCAD+ Model

As mentioned above, the SEDCAD+ computer model was chosen for the data analysis. The evaluation discussed in Chapter 2 was utilized in the model selection process. SEDCAD+ was chosen for this research because it contains a collection of features that make it particularly applicable to the subject research with respect to input variables, choice of computational models, embedded computations, and the resulting output data (see Chapter 2).

With the completion of the steps described above, input data were available for analysis by the chosen model using the established conditions as described. Both the Basic and Detailed Evaluations included trial and error model runs to determine pond sizes in criteria compliance. Both evaluations included essentially the same step process, undertaken repetitively to produce the pond performance data. The main difference in the two evaluation procedures was in the controlling criteria and the extent of the information which was tabulated for the results. The Detailed Evaluations also included assessments of pond sizes not meeting the two criteria. The procedures used for the Basic and Detailed Evaluations are discussed below.

## Basic Evaluation

Working by Zone, a base file was created which included the previously described site conditions, computation options, and variable assumptions. The two design storms and the R-factor associated with the particular Zone were input in addition to the standard outlet structure configuration. The base file used the 0 percent slope drainage area information and the first soil series (eroded particle size data and soil erodibility value (K)) of the Zone. The base file drainage area information could then be revised for a given Zone soil to reflect the four slope conditions to be evaluated.

After a guess was made from the selection of pond sizes, SEDCAD+ was run and the resulting output compared with the Efficiency Criteria. Depending on the results, pond size selection was revised up or down and the model run was repeated to determine the minimum pond size meeting the criteria. The SEDCAD+ run iterations were chosen to assure that pond size determination was approached from the smaller sizes in order to preclude overestimate. This process was repeated with the subject Zone soil for each of the four slope cases (that is 0, 5, 10, and 20 percent slopes). After successful estimates had been determined for the given Zone soil slope cases, a new base file was created by inputting the next Zone soil information. Estimated pond sizes were thus determined for each soil in the Zone for each of the slope cases. After all soils in the Zone had been evaluated, another base file was created by revision of the Zone design storms and R-factor and the entire procedure was repeated.

Application of this approach to the Basic Evaluation generated 572 estimated pond sizes distributed over the applicable six Zones which met the Efficiency Criteria. These data are selectively tabulated and discussed in Chapter 4 and appear complete in the Appendix, Table A-6. Iterations which did not meet the Efficiency Criteria are not included in the reported data. Also, an example of input and output files (for Zone 3 Decatur Silt Loam, 10 percent slope) are included in Appendix Figure A-5.

## Detailed Evaluation

The assigned soils of each Zone were examined via the dispersed particle size distributions to select which ones, respectively, had the highest content of sand, silt, and clay. These eighteen selections, three from each Zone, constituted the Detailed Evaluation soils series. Note that in some instances this results in the same soil series appearing in more than one Zone (see Chapter 4). Working by Zone, one soil at a time, the base files for a selected soil were copied from the Basic Evaluation files for each of the slope cases. These files were modified to reflect predisturbed conditions as described in the Architecture section above. Of course, the predisturbed conditions did not include a sediment detention pond (referred to as a "null structure" in SEDCAD+) while the Zone applicable design storms and R-factor remained unchanged. These files were input to

SEDCAD+ for the four slope cases and the resulting output data were used to define the Flow Criteria.

The interest in the Detailed Evaluation was not only to estimate a pond size meeting the two criteria, but to examine a range of pond performances with respect to pond size. Implementation of this was begun by copying the subject Zone soil series files (that is, those which met the Efficiency Criteria) from the Base evaluation for the four slope cases. Recall that the Base evaluation uses the standard riser/barrel outlet structure. A spread of pond sizes was then identified both above and below the Efficiency Criteria pond size and additional files prepared for input to the model. The output results from this fulfilled the strategy objective of examining pond performance over a range of sizes.

The next step for the Detailed Evaluation was to determine the minimum pond size required to meet both the Efficiency and Flow Criteria. This included in most cases a change (usually but not always an increase) in the pond size and, if necessary, tuning of the riser/barrel dimensions (see Pond Geometry, above) in the outlet structure to maximize surcharge in the pond. Since only the standard riser/barrel dimensions were used in the Basic Evaluations, hydrologic routing through the pond often left some amount of unused volume between the principal spillway and the criteria limited emergency spillway elevation. This volume could be utilized by tuning to aid in the reduction of discharge peaks which was the requirement of the Flow Criteria.

Again, working by Zone on one of the three selected Zone soils at a time, the data for predisturbed condition peak discharge, disturbed sediment retention, and peak discharge were reviewed. Based on this review a guess was made for the minimum pond size and barrel/riser dimensions that would meet both the Efficiency and Flow Criteria. Input files were developed from the guess, and the model was run with the resulting output compared with the mentioned criterion. Depending on the results, pond size was revised up or down and the riser/barrel dimensions tuned for further model iterations. The model run iterations were chosen to assure that minimum pond size determination was approached from the smaller sizes in order to preclude overestimate. This process was repeated for each of the three selected soils (four slope cases) within each of the six Zones.

Application of this approach to the Detailed Evaluation generated 659 estimated pond sizes and associated sets of performance values distributed over the applicable six Zones. These data are selectively tabulated and discussed in Chapter 4 and presented complete in the Appendix, Table A-7. Iterations involving tuning which did not meet the Efficiency and Flow Criteria are not included in the reported data.

# CHAPTER 4

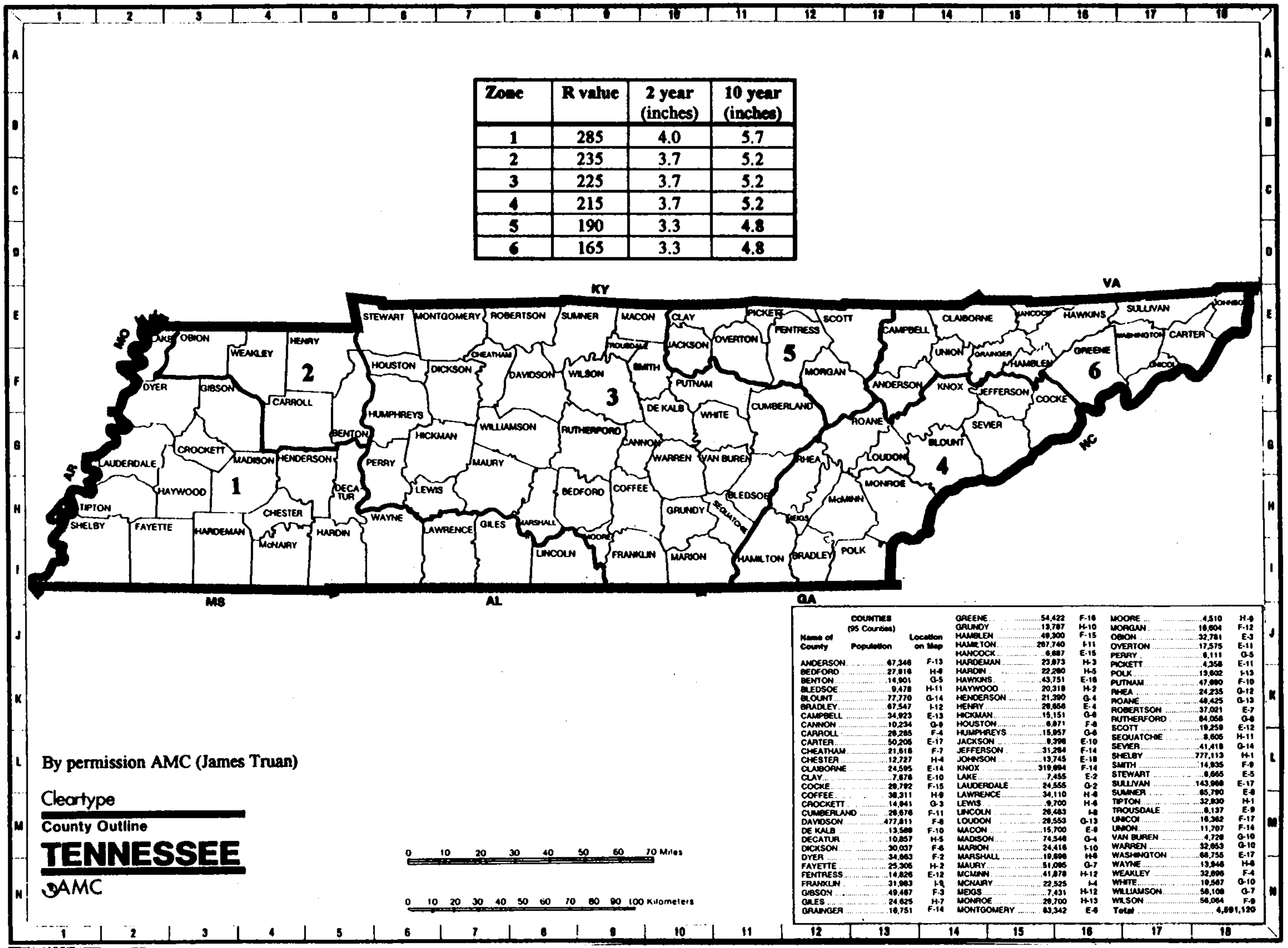
# RESULTS AND DISCUSSION

## Introduction

This research yielded four significant products relating to sediment detention pond performance, including the six Tennessee Zones with similar rainfall, R-factor, and soils; estimated eroded particle size distributions for selected soil series; pond size estimates for each Zone based on sediment removal criteria (the Basic Evaluation); and pond size estimates for each Zone based on both sediment removal and flow control criteria (the Detailed Evaluation). Development of the first two of these information products, the Zone definition and the soil eroded particle size estimates, had to be completed before pond size estimates for each Zone could be undertaken. Points of discussion regarding interpretations, trends, and important observations pertaining to these four elements are given in this chapter with the associated selected data.

## Division of Tennessee Into Zones

The Zone determination results are presented in the form of the Zone boundaries overlaid on a map of Tennessee (Figure 1) and in a summary table (Appendix Table A-4) showing detailed Zone information. Table 1 lists all the evaluation soils, their dispersed particle size distribution, soil information, and geographical distribution by Zone.




| Zone | R value | 2 year (inches) | 10 year (inches) |
|---|---|---|---|
| 1 | 285 | 4.0 | 5.7 |
| 2 | 235 | 3.7 | 5.2 |
| 3 | 225 | 3.7 | 5.2 |
| 4 | 215 | 3.7 | 5.2 |
| 5 | 190 | 3.3 | 4.8 |
| 6 | 165 | 3.3 | 4.8 |

Figure 1. Division of Tennessee into Zones for Rainfall Factor and precipitation.
R value = Rainfall factor; 2 year = SCS Type II, 2-year, 24-hour precipitation (inches); 10-year = SCS Type II, 24-hour precipitation (inches).

Table 1. Dispersed sand, silt, and clay content for subject soil series and Zone groupings.

K= erodibility (see Source note below)

HSG=SCS Hydrologic Soil Group (see Source note below)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2-.063 millimeter | .063-.004 millimeter | <.004 millimeter | | | | | | |
| Soil Series | K/HSG | Sand | Silt | Clay | Zones Present | | | | | |
| | | (Percent) | (Percent) | (Percent) | 1 | 2 | 3 | 4 | 5 | 6 |
| Alcoa Loam | 0.24 / B | 38 | 26 | 36 | | | | x | | |
| Armour Silt Loam | 0.32 / B | 7 | 52 | 41 | x | | x | | | |
| Barfield Silty Clay Loam | 0.24 / D | 15 | 32 | 53 | | | x | | | |
| Baxter [Cherty] Silt Loam | 0.28 / B | 23 | 46 | 31 | | | x | | x | |
| Beason Silt Loam | 0.28 / C | 7 | 46 | 47 | x | | | | | |
| Bodine Cherty Silt Loam | 0.24 / B | 26 | 50 | 24 | x | x | x | x | x | |
| Boswell Fine Sandy Loam | 0.28 / D | 58 | 19 | 23 | x | | | | | |
| Bradyville Silt Loam | 0.20 / C | 14 | 38 | 48 | | | x | | | |
| Brandon Silt Loam | 0.28 / B | 11 | 50 | 39 | | x | x | | | |
| Braxton Silt Loam | 0.24 / C | 16 | 27 | 57 | x | | x | | | |
| Calloway Silt Loam | 0.49 / C | 3 | 73 | 24 | x | x | | | | |
| Capshaw Silt Loam | 0.37 / C | 16 | 40 | 44 | | | x | | | |
| Center Silt Loam | 0.49 / C | 6 | 55 | 39 | x | x | | | | |
| Christian Silt Loam | 0.28 / C | 14 | 43 | 43 | | | x | | x | |
| Crider Silt Loam | 0.32 / B | 8 | 52 | 40 | | | x | | | |
| Cumberland Silt Loam | 0.28 / B | 14 | 49 | 37 | | | x | | | |
| Dandridge Silt Loam | 0.24 / D | 6 | 52 | 42 | | | | x | | x |
| Decatur Silt Loam | 0.28 / B | 15 | 39 | 46 | x | | x | x | x | x |
| Dellrose Cherty Silt Loam | 0.24 / B | 16 | 45 | 39 | x | | x | | x | |
| Dewey Silt Loam | 0.28 / B | 9 | 48 | 43 | | | | x | | x |
| Dickson Silt Loam | 0.43 / B | 24 | 43 | 33 | x | x | x | | x | |
| Dulac Silt Loam | 0.43 / C | 5 | 57 | 38 | x | x | | | | |
| Dunmore Silt Loam | 0.20 / B | 15 | 21 | 64 | | | | x | | x |
| Etowah Silt Loam | 0.28 / B | 39 | 26 | 35 | | | x | x | | x |
| Fullerton Silt Loam | 0.28 / B | 15 | 31 | 54 | | | x | x | x | x |
| Gladeville Flaggy Silt Loam | 0.24 / D | 14 | 42 | 44 | | | x | | | |
| Grenada Silt Loam | 0.32 / C | 4 | 78 | 18 | x | x | | | | |
| Hampshire Silt Loam | 0.28 / C | 22 | 26 | 52 | x | | x | | | |
| Harpeth Silt Loam | 0.32 / B | 10 | 50 | 40 | x | | x | | | |
| Hartsells Loam | 0.28 / B | 53 | 33 | 14 | | | x | x | x | |
| Hayter Silt Loam | 0.28 / B | 45 | 22 | 33 | | | | | | x |
| Holston Loam | 0.28 / B | 27 | 44 | 29 | | | | x | | x |
| Humphreys Cherty [Silt Loam] | 0.24 / B | 23 | 42 | 35 | x | | x | | | |
| Inman Flaggy Silty Clay Loam | 0.24 / C | 12 | 35 | 53 | x | | x | | | |
| Jefferson Loam | 0.28 / B | 34 | 30 | 36 | | | | x | x | x |
| Lax Silt Loam | 0.28 / C | 14 | 48 | 38 | | x | x | | | |
| Lehew Channery Fine Sandy Loa | 0.24 / C | 49 | 31 | 20 | | | | x | | x |
| Lexington Silt Loam | 0.32 / B | 11 | 64 | 25 | x | x | | | | |
| Litz Shaly Silt Loam | 0.24 / C | 20 | 46 | 34 | | | | x | | x |
| Lomond Silt Loam | 0.28 / B | 16 | 44 | 40 | | | x | | | |
| Lonewood Silt Loam | 0.24 / B | 18 | 42 | 40 | | | x | x | x | |
| Loring Silt Loam | 0.37 / C | 1.8 | 72.2 | 26 | x | x | | | | |

Table 1 continued. Dispersed sand, silt , and clay content for subject soil series and Zone groupings.

| Soil Series | K/HSG | 2-.063 millimeter Sand (Percent) | .063-.004 millimeter Silt (Percent) | <.004 millimeters Clay (Percent) | Zones Present 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|
| Maury Silt Loam | 0.32 / B | 11 | 56 | 33 | x | | x | | | |
| Memphis Silt Loam | 0.49 / B | 1 | 72.4 | 26.6 | x | x | | | | |
| Mimosa Silt Loam | 0.20 / C | 4 | 28 | 68 | x | | x | | x | |
| Montevallo Silt Loam | 0.24 / D | 27 | 39 | 34 | | | | x | | x |
| Mountview Silt Loam | 0.37 / B | 13 | 48 | 39 | x | x | x | | x | |
| Needmore Silt Loam | 0.32 / C | 10 | 34 | 56 | | | | x | | x |
| Oktibbeha Clay | 0.20 / D | 13.7 | 26.8 | 59.5 | x | | | | | |
| Paden Silt Loam | 0.32 / C | 5 | 58 | 37 | x | | x | | | |
| Pembroke Silt Loam | 0.28 / B | 8 | 52 | 40 | | | x | | x | |
| Pickwick Silt Loam | 0.32 / B | 9 | 68 | 23 | x | | x | | | |
| Providence Silt Loam | 0.32 / C | 11 | 52 | 37 | x | x | | | | |
| Ramsey Loam | 0.28 / D | 36 | 38 | 26 | x | | x | x | x | x |
| Ruston Fine Sandy Loam | 0.32 / B | 42 | 37 | 21 | x | x | | | | |
| Sequatchie Loam | 0.28 / B | 37 | 33 | 30 | | | x | x | | x |
| Sequoia Silt Loam | 0.32 / C | 5 | 40 | 55 | | | | x | | x |
| Shouns Silt Loam | 0.28 / B | 17 | 53 | 30 | | | | | | x |
| Shubuta Fine Sandy Loam | 0.28 / C | 53 | 31 | 16 | x | x | | | | |
| Statler Loam | 0.28 / B | 23 | 42 | 35 | | | | x | | x |
| Stiversville Loam | 0.32 / B | 47 | 33 | 20 | x | | x | | | |
| Talbott Silt Loam | 0.24 / C | 2 | 23 | 75 | x | | x | x | | x |
| Tellico Loam | 0.32 / B | 28 | 21 | 51 | | | | x | | |
| Wallen Gravelly Loam | 0.28 / B | 42 | 35 | 23 | | | | x | | x |
| Waynesboro Loam | 0.28 / B | 29 | 33 | 38 | x | | x | x | x | x |

Source note: Soil Conservation Service,
Erosion and Sediment Control Handbook for Urban Areas and Construction Sites in Tennessee, 1974

Discussion items regarding the Zones include the rationale and benefits for having Zones of defined rainfall, R-factor, soil series, and the trends exhibited by the assigned Zones.

If the individual counties of Tennessee were used for the research in lieu of the Zones as defined, approximately 5,700 pond conditions (estimating about 15 soil series per county) would need to be analyzed. Such a body of data is not only unwieldy but would contain much redundancy with respect to storm precipitation values, R-factors, and soil types (please see the Appendix Table A-4 for tables showing, by county, the respective precipitations, R-factors, and soils). Use of the Zones for the Basic Evaluation research reduces the analyzed pond conditions to 572.

Observation of Appendix Table A-4 reveals that this substantial simplification of the evaluation effort results, for a given county location, in no loss of assigned soils and relatively small changes in the storm precipitations. The R-factor values for each Zone, however, are the arithmetic average of the constituent counties and in some cases vary from the individual county values as much as about 20 percent (for the worst case; usually less than 10 percent). The impact of modifications of the R-factor on the estimated pond size was considered an acceptable trade-off for the achieved simplification. A review of the Basic Evaluation (see discussion below) for conditions varying approximately 10 percent in R-factor only (by examining results for the same soil in different Zones) showed that the effect on pond size estimates was minimal.

The established Zones can also serve as a valuable tool to future erosion analysis within Tennessee because the hitherto disparate data contained within the Zone definition are of recurring interest to researchers and the information is retrievable along county boundaries. Also, the same approach to Zone determination could be utilized for other states or regions.

Another advantage of the division of Tennessee into Zones is the perspective provided of potential erosion conditions across Tennessee. Viewing the Zone map of Figure 1, the 2-year and 10-year precipitations and average annual R-factor tend to decrease from southwest to northeast. On this basis alone, there is an apparent increased erosion potential in the southwest portion of Tennessee.

It can also be seen by review of the Zone soils in Table 1 that there is also a similar change (with some redundancy) in the assigned constituent soils of the Zones. The soil erodibility values (K) of the western-most (particularly the southwestern Zone 1) soils trend higher than those of the east. The combination of greater precipitations, higher R-factors, and larger soil erodibility values (K) of the western Zones leads to the qualitative conclusion that erosion and therefore sediment detention pond size requirements will be greater in the west. At this point the use of a static rule-of-thumb approach to detention sizing is already suspect. This is further borne out by the eroded particle size distribution estimates of the Zone soils.

## Zone Soils Estimated Eroded Particle Size Distributions

Estimated particle size distributions (resulting from the Foster algorithm) of the evaluation soils are, as mentioned in Chapter 3, in Appendix Table A-2. Complete tables of estimated eroded particle size distributions used in this research are given in Appendix Table A-3. Appendix Table A-3 includes the adjustments (to accommodate SEDCAD+, see Chapter 3) made to the aggregate class diameters to simulate uniform density for the five size categories and the generated dummy size categories. For clarity, Appendix Table A-8 lists the assigned Zones of the estimated soil particle size distributions which are given with the adjusted equivalent diameters. The 5 dummy size categories are not included.

For discussion, the selected examples presented in Table 2 of this section are excerpted from Appendix Table A-8. Included in the tables is information on the undispersed particle size distribution, the soil erodibility values (K), and the SCS Hydrologic Soil Groups associated with the subject soils. The estimate of the eroded particle size for a given soil is, of course, independent of the Zone with which that soil is associated.

However, since the selected soils as assigned to the Zones do demonstrate some noteworthy regional trends, some of the following remarks take into consideration the eroded particle size distribution estimates of the soils as a group within a Zone. In such remarks, reference will be made to Zone soil eroded particle size distribution estimates. Discussion items regarding the eroded particle size distributions include use of the Foster algorithm for this research application and the validity of the estimate results. Discussion regarding the Zone eroded particle size distributions addresses regional trends and usefulness of the data as a resource tool.

## Eroded Particle Size Distribution Estimates

Use of the Foster algorithm for this application worked well with the selected soils and the SEDCAD+ model. A potential problem area was identified, however, which may impact eroded particle size estimates on other soils. As discussed in Chapters 2 and the Chapter 3, two size classes are generated in the estimate, the primary and aggregated, which have different specific gravities (2.65 and about 2.00, respectively). Since the SEDCAD+ model only accommodates one specific gravity for the input particle size distribution, the diameters of the aggregated particles were changed to an equivalent diameter using Stokes law. Input to SEDCAD+ for the particle size distribution, as is common practice, requires that the percent finer categories be presented in order of

Table 2. Discussion examples of eroded particle size distributions of evaluated soil series (diameter adjusted for Aggregate Classes). (Excerpt from Appendix Table A-8).

Note: K= Erodibility Factor
HSG= Hydrologic Soil Group

| Soil Series | K/HSG | Dispersed Particle Size Distribution (Sizes in millimeters) Sand 2-.063 Percent | Silt .063-.004 Percent | Clay <.004 Percent | Eroded Particle Size Class and Diameter of Particles (in millimeters) Large Aggregate Diameter | Primary Sand Diameter | Small Aggregate Diameter | Primary Silt Diameter | Primary Clay Diameter | Large Aggregate Fraction | Prim. Sand Fraction | Small Aggregate Fraction | Prim Silt Fraction | Prim. Clay Fraction | Source (see key) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hartsells Loam | 0.28 / B | 53.0 | 33.0 | 14.0 | 0.23 | 0.2 | 0.023 | 0.01 | 0.002 | 0.384 | 0.249 | 0.252 | 0.078 | 0.036 | 3 |
| Lehew Channery Fine Sandy Loam | 0.24 / C | 49.0 | 31.0 | 20.0 | 0.31 | 0.2 | 0.023 | 0.01 | 0.002 | 0.477 | 0.161 | 0.310 | 0.000 | 0.052 | 2 |
| | | | | | | | | | | | | | | | |
| Alcoa [Silt] Loam | 0.24 / B | 38.0 | 26.0 | 36.0 | 0.56 | 0.2 | 0.041 | 0.01 | 0.002 | 0.606 | 0.041 | 0.260 | 0.000 | 0.094 | 1 |
| Mimosa Silt Loam | 0.20 / C | 4.0 | 28.0 | 68.0 | 1.06 | 0.2 | 0.078 | 0.01 | 0.002 | 0.543 | 0.000 | 0.280 | 0.000 | 0.177 | 1 |
| | | | | | | | | | | | | | | | |
| Boswell Fine Sandy Loam | 0.28 / D | 58.0 | 19.0 | 23.0 | 0.36 | 0.2 | 0.023 | 0.01 | 0.002 | 0.593 | 0.157 | 0.190 | 0.000 | 0.060 | 3 |
| Hartsells Loam | 0.28 / B | 53.0 | 33.0 | 14.0 | 0.23 | 0.2 | 0.023 | 0.01 | 0.002 | 0.384 | 0.249 | 0.252 | 0.078 | 0.036 | 3 |
| Shubuta Fine Sandy Loam | 0.28 / C | 53.0 | 31.0 | 16.0 | 0.25 | 0.2 | 0.023 | 0.01 | 0.002 | 0.427 | 0.222 | 0.288 | 0.022 | 0.042 | 2 |
| | | | | | | | | | | | | | | | |
| Grenada Silt Loam | 0.32 / C | 4.0 | 78.0 | 18.0 | 0.28 | 0.2 | 0.023 | 0.01 | 0.002 | 0.158 | 0.015 | 0.324 | 0.456 | 0.047 | 4 |
| Loring Silt Loam | 0.37 / C | 1.8 | 72.2 | 26.0 | 0.41 | 0.2 | 0.025 | 0.01 | 0.002 | 0.206 | 0.004 | 0.444 | 0.278 | 0.068 | 5 |
| Memphis Silt Loam | 0.49 / B | 1.0 | 72.4 | 26.6 | 0.41 | 0.2 | 0.026 | 0.01 | 0.002 | 0.205 | 0.002 | 0.440 | 0.284 | 0.069 | 6 |
| | | | | | | | | | | | | | | | |
| Dunmore Silt Loam | 0.20 / B | 15.0 | 21.0 | 64.0 | 1.00 | 0.2 | 0.078 | 0.01 | 0.002 | 0.623 | 0.001 | 0.210 | 0.000 | 0.166 | 1 |
| Mimosa Silt Loam | 0.20 / C | 4.0 | 28.0 | 68.0 | 1.06 | 0.2 | 0.078 | 0.01 | 0.002 | 0.543 | 0.000 | 0.280 | 0.000 | 0.177 | 1 |
| Talbott Silt Loam | 0.24 / C | 2.0 | 23.0 | 75.0 | 1.17 | 0.2 | 0.078 | 0.01 | 0.002 | 0.575 | 0.000 | 0.230 | 0.000 | 0.195 | 1 |

Source Key

1 SCS, Soil Survey Investigations Report No. 15: Soil Survey Laboratory Data Descriptions for Some Soils of Tennessee, USDA, 1967
2 SCS Form 5- Soil Particle Size Distribution Data: Courtesy of Dr. Tom Ammons' files (unpublished)
3 USDA, Mechanical Analysis Data, Bureau of Plant Industry, 1950
4 Foster, G.R., Young, R.A. and Neibling, W.H. Sediment composition for nonpoint-source pollution analysis. Trans. ASAE 28:133-139, 1985
5 Harmon, W.C., Meyr, L.D. and Alonso, C.V. A New Method for Evaluating Particle Size Distribution And Aggregated Portion of Eroded Sediment.Trans. ASAE 32(1) :89-96,1989
6 Meyer, L.D., Harmon, W.C. and McDowell, L.L. Sediment sizes eroded from crop row sideslopes. Trans. ASAE 23(4) :891-898, 1980

descending diameters. Given these constraints, it is possible that the adjustment of the diameter of the aggregate class particles could cause an overlap into the smaller adjacent primary particle size diameter. This did not occur for any of the soils evaluated, but as can be seen in Table 2, for Hartsells and Lehew soils such an overlap did almost occur. The undispersed size distributions of the soils at risk for overlapping size categories are those high in sand (about 50 percent). Other research efforts which utilize the described diameter adjustment scheme should be alert to this potential difficulty.

Review of the Alcoa and Mimosa soil series in Table 2 shows the occurrence of null content particle size categories. This is not a peculiarity of this particular application. Examination of the Foster algorithm rules presented in Chapter 3 shows that for certain conditions (high clay combined with low silt fractions), the percent material in the primary sand class and the primary silt goes to zero and is a direct result of the Foster algorithm as presented. The work sheet for generating the estimates, as can be seen in the examples cited for this condition in Appendix Table A-3, generates duplicate percent passing quantities for the adjacent categories. For these cases, the first size category pair is ignored and the second, smaller pair is used for the SEDCAD+ input (see Chapter 3). This causes a reduction in the number of effective size categories (effective size categories refer to the stepped pairs as described in Chapter 3) from 5 to 4 for Alcoa and to 3 in the case of Mimosa.

Overall, estimated eroded particle size distribution results based on the Foster algorithm are in good agreement with the observations of current literature. As described in Chapter 2, certain differences between the dispersed particle size distribution and the eroded particle size distribution are expected. These differences arise primarily from aggregation tendencies of the soil due to the clay content (less than 0.004 millimeters size). Since aggregation by definition increases the sizes of particles present in a given soil (reducing the fraction of fines), the average settling velocity of that soil also increases. This results in a positive influence on pond performance.

However, some amount of the clay remains dispersed which, because of its small diameter, effectively remains in suspension and does not fall within the definition of settleable solids. The fraction of clay that remains unaggregated, therefore, exerts a negative influence on pond performance. The dispersed silt constituent of soils (0.004 to 0.063 millimeters) does not tend to aggregate except by way of attachment to available clay and therefore, when present in high quantities, poses a negative influence on pond performance. The dispersed sand soil constituent (particles greater than 0.063 millimeters), because of the relatively large diameter, will settle rapidly compared to the unaggregated silt and clay. Sand will also aggregate with available clay making even larger particle sizes. The sand fraction of a soil exerts a positive influence on pond performance.

The estimated eroded particle size distribution is derived from interaction (via the Foster algorithm computations) with the dispersed sand, silt, and clay constituents of a given soil. The resulting estimated particle size distribution is, therefore, not attributable to any one dispersed constituent but is, instead, a result of all the constituents taken together. Trends are nonetheless apparent, as can be shown in the review of some specific examples (from Table 2) of selected soils with high dispersed fractions of sand, silt, and clay.

Three soil series high in dispersed sand are Boswell Fine Sandy Loam, Hartsells Loam, and Shubuta Fine Sandy Loam having, respectively, in sand, silt, and clay (percent), the values shown in Table 2. The Boswell soil eroded (aggregated) size distribution estimate results in a sizable fraction (almost 60 percent) in the large aggregate category and no material in the primary silt category. Hartsells and Shubuta have a substantially smaller large aggregate portion at 38 and 43 percent, respectively, even though the dispersed sand is only 5 percent (of the whole distribution) less than that for the Boswell. The difference results from the aggregation influence of the higher content of dispersed clay in the Boswell (23 percent), compared to 14 and 16 percent for the other two.

A revealing comparison can be made by regrouping the five size categories of the eroded sediment estimate into the original three size definitions (this method of presentation was used by Foster and others, 1985) for the primary sand, silt, and clay:

| | **Sand** Dispersed | **Silt** Dispersed | **Clay** Dispersed | **Sand** Aggregated | **Silt** Aggregated | **Clay** Aggregated |
|---|---|---|---|---|---|---|
| **Boswell** (Fraction %) | 58 | 19 | 23 | 75 | 19 | 6 |
| **Hartsells** (Fraction %) | 53 | 33 | 14 | 63 | 33 | 4 |
| **Shubuta** (Fraction %) | 53 | 31 | 16 | 65 | 31 | 4 |

While the average particle size within the aggregated silt group has increased due to the introduction of the small aggregate class (see Table 2), the overall silt fraction has not changed. The portion of larger sand particles has increased substantially, however, while the fraction of fine material (clay) has decreased to about the same for the three soils. The higher clay content of the Boswell soil has contributed to a disproportionately large increase in the aggregated sand category. This results in increased settleability relative to the Hartsells and Shubuta soils.

Estimated eroded particle size distributions of soils series high in dispersed silt exhibit the same pattern of increased particle size (due to clay aggregation) as the high sand soils. The selected examples of Grenada Silt Loam, Loring Silt Loam, and Memphis

Silt Loam from Table 2 are shown in the same regrouped format used for the high sand soils in the summary table below. The general pattern is the same as for the high sand soils previously discussed. Most of the clay present in the dispersed distribution has contributed to aggregation forming a much larger sand category for the eroded distribution. The residual clays of the aggregated distribution are not significantly larger than residual clays of the same category in the high sand examples., However, this is misleading since particles remaining in the clay size category are, from a practical viewpoint, unsettleable. The silt category, without consideration of the average particle size increase observable in Table 2, retains the same proportions. Such high silt content is settleable but not at nearly the same rates as the larger sand particles (see Basic Evaluation discussion below).

| | **Sand** Dispersed | **Silt** Dispersed | **Clay** Dispersed | **Sand** Aggregated | **Silt** Aggregated | **Clay** Aggregated |
|---|---|---|---|---|---|---|
| **Grenada** (Fraction %) | 4 | 78 | 18 | 17 | 78 | 5 |
| **Loring** (Fraction %) | 2 | 72 | 26 | 21 | 72 | 7 |
| **Memphis** (Fraction %) | 1 | 72 | 27 | 21 | 72 | 7 |

Soils of high dispersed clay content display the aggregation propensity more dramatically than high sand and silt soils. The selected examples of Dunmore Silt Loam, Mimosa Silt Loam, and Talbott Silt Loam from Table 2 are shown in the same regrouped format in the summary table below. These high clay content soils have aggregated all of the dispersed silt sized particles into the sand size category. An examination of Table 2 in combination with the above regrouping shows that the small aggregate class diameter has increased into the sand size range, thus eliminating all silt size particles. While over 80

| | **Sand** Dispersed | **Silt** Dispersed | **Clay** Dispersed | **Sand** Aggregated | **Silt** Aggregated | **Clay** Aggregated |
|---|---|---|---|---|---|---|
| **Dunmore** (Fraction %) | 15 | 21 | 64 | 83 | 0 | 17 |
| **Mimosa** (Fraction %) | 4 | 28 | 68 | 82 | 0 | 18 |
| **Talbott** (Fraction %) | 2 | 23 | 75 | 80 | 0 | 20 |

percent of each of the soils is predicted to be in the readily settleable sand category, about 20 percent remains in the low particle velocity clay category. The ramification of this is that rapid settling will occur for the higher fraction sand portion, while much longer time periods (and consequently larger pond sizes) are required to settle even small quantities of the remaining clay. This is discussed further in the Basic Evaluation section below.

## Zone Trends for Eroded Particle Size

From the discussion above of the estimated soil eroded particle size distributions, it is qualitatively apparent that soils (in the dispersed distribution) high in silt and low in clay would yield the slowest settling times and, therefore, require the highest pond volumes for sufficient entrapment. Such soil types are not distributed uniformly across Tennessee, but instead are regionally prejudicial. Although each Zone contains a variety of soil distributions and many soil series are redundant across several Zones, this regional prejudice does appear in the Zone soils.

Below, in Table 3, is a selection from Table 1 showing the evaluation soils (dispersed distribution) having less than or equal to 30 percent clay and greater than or equal to 50 percent silt. Since the Zone numbers are arranged generally from the Southwest to the Northeast, the more frequent occurrence of the high silt/low clay soils in the lower Zone numbers marks the Western portion of Tennessee as potentially the most difficult with respect to the quantity of soil erosion and particle entrapment in ponds. The problems of difficult-to-settle soils in the West are further exacerbated by the higher rainfalls and rainfall energy (R-factor) identified with the region, which ultimately translates into overall larger pond sizes. Conversely, soil and rainfall conditions in the eastern end of Tennessee are generally such that smaller sediment detention ponds are required to meet the same criteria of sediment removal. This is quantitatively borne out in the specifics of the Basic and Detailed Evaluations below.

## Uses of the Estimated Eroded Particle Size Distribution and Zone Information

Without any further analysis (such as the Basic and Detailed Evaluation applications below) the defined Zones and the assigned Zone soil eroded particle size distributions established thus far can serve as a resource for regional erosion studies within Tennessee. This information could be useful in preliminary project planning stages where a general idea of potential soil erosion conditions is needed. Also, in lieu of specific site information regarding eroded particle size distributions and rainfall data, the Zone information can be used as a starting point for pond sizing efforts while incorporating the known specifics (such as drainage area, slope, and cover conditions) of the site conditions. This would be useful for computation of pond size requirements where the intent is to go

Table 3. Dispersed sand, silt, and clay content for subject soil series and Zone groupings having greater than or equal to 50 percent silt and less than or equal to 30 percent clay. (Excerpt from Table 1.)

K= erodibility (see Source note below)

HSG=SCS Hydrologic Soil Group (see Source note below)

| Soil Series | K/HSG | 2-.063 millimeter Sand (Percent) | .063-.004 millimeter Silt (Percent) | <.004 millimeter Clay (Percent) | Zones Present 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bodine Cherty Silt Loam | 0.24 / B | 26 | 50 | 24 | x | x | x | x | x | |
| Grenada Silt Loam | 0.32 / C | 4 | 78 | 18 | x | x | | | | |
| Lexington Silt Loam | 0.32 / B | 11 | 64 | 25 | x | x | | | | |
| Loring Silt Loam | 0.37 / C | 1.8 | 72.2 | 26 | x | x | | | | |
| Memphis Silt Loam | 0.49 / B | 1 | 72.4 | 26.6 | x | x | | | | |
| Pickwick Silt Loam | 0.32 / B | 9 | 68 | 23 | x | | x | | | |
| Shouns Silt Loam | 0.28 / B | 17 | 53 | 30 | | | | | | x |

Source note: Soil Conservation Service, Erosion and Sediment Control Handbook for Urban Areas and Construction Sites in Tennessee, 1974 beyond a rule-of-thumb approach and make a significant effort at meeting predisturbed conditions criteria. Additionally, the eroded particle size distribution estimates can be used on a stand-alone basis directly for soil erosion analysis or to find close dispersed particle size matches among the analyzed soil series for predicting distributions in unevaluated soil series.

## Basic Evaluation Results

Using the approach and methods described in Chapter 3, data were selected for tabulation from the SEDCAD+ output which met the Efficiency Criteria. (Note: Raw SEDCAD+ output examples can be seen in the Appendix Figure A-5.) The Basic Results Table has six subdivisions, each of which presents the information associated with a particular Zone. Within each Zone subdivision (numbers 1-6) are listed the assigned evaluation soil series and soil information including K-value, HSG, and dispersed particle size distribution. For each of the 4 drainage area slopes is given the pond size (cubic yards per acre drainage area) meeting the Efficiency Criteria, the aspect of the Efficiency Criteria which controlled the size, the trapping efficiency (TE) for the 10-year storm, the volume weighted settleable solids removal ratio (VRR, defined below) for the 10-year storm, the annual volume of accumulated sediment (acre feet, 10-year storm basis), and the peak elevation of the pond for the 10-year storm. Only the 10-year storm results values are shown since, as would be expected for the Efficiency Criteria, this controlled the estimated pond size in all cases. Excerpts from the tabular format developed for the Basic Evaluation results are presented in this chapter (Table 4), while the results in their entirety can found in Appendix Table A-6. Discussion items regarding the Basic Evaluation include general trends, soil type influences on pond size requirements, slope effects, annual

Table 4. Three largest and three smallest generated Pond Sizes for each Zone of the Basic Evaluation. (Excerpt from Table A-6).

(See Key to abbreviations at end of Table)

| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | 0 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 5 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 10 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 20 Percent Slope Pond Size | TE/VRR | SedAcc | Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 1 Grouping | | | | | | | | | | | | | | | | | | | | |
| Calloway Silt Loam | 0.49/C | 3 | 73 | 24 | 300 | 80/100 | 0.00 | VRR | 400 | 88/95 | 0.05 | VRR | 450 | 91/97 | 0.13 | VRR | 500 | 91/97 | 0.40 | VRR |
| Grenada Silt Loam | 0.32/C | 4 | 78 | 18 | 350 | 86/100 | 0.00 | VRR | 500 | 92/96 | 0.04 | VRR | 500 | 93/96 | 0.08 | VRR | 500 | 91/95 | 0.26 | TE |
| Loring Silt Loam | 0.37/C | 1.8 | 72.2 | 26 | 300 | 79/100 | 0.00 | VRR | 400 | 89/96 | 0.04 | VRR | 400 | 89/96 | 0.10 | VRR | 450 | 90/96 | 0.30 | VRR |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0.00 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 82/100 | 0.05 | SED | 150 | 83/100 | 0.16 | SED |
| Oktibbeha Clay | 0.20/D | 13.7 | 26.8 | 59.5 | 20 | 58/100 | 0.00 | VRR | 40 | 83/100 | 0.02 | SED | 67 | 85/100 | 0.05 | VRR | 200 | 85/100 | 0.17 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0.00 | VRR | 40 | 79/100 | 0.03 | SED | 67 | 81/100 | 0.06 | SED | 200 | 82/100 | 0.20 | SED |
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 2 Grouping | | | | | | | | | | | | | | | | | | | | |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 67 | 75/100 | 0 | VRR | 100 | 85/95 | 0.02 | VRR | 150 | 88/97 | 0.05 | VRR | 150 | 90/98 | 0.16 | VRR |
| Calloway Silt Loam | 0.49/C | 3 | 73 | 24 | 300 | 82/100 | 0 | VRR | 350 | 88/95 | 0.05 | VRR | 400 | 91/97 | 0.11 | VRR | 400 | 89/96 | 0.36 | VRR |
| Grenada Silt Loam | 0.32/C | 4 | 78 | 18 | 300 | 85/100 | 0 | VRR | 450 | 92/96 | 0.03 | VRR | 450 | 93/97 | 0.07 | VRR | 450 | 91/95 | 0.23 | VRR |
| Loring Silt Loam | 0.37/C | 1.8 | 72.2 | 26 | 250 | 77/100 | 0 | VRR | 350 | 88/96 | 0.04 | VRR | 350 | 89/96 | 0.09 | VRR | 350 | 87/95 | 0.27 | VRR |
| Ruston Fine Sandy Loam | 0.32/B | 42 | 37 | 21 | 67 | 83/100 | 0 | VRR | 100 | 90/96 | 0.03 | VRR | 150 | 92/98 | 0.07 | VRR | 200 | 94/100 | 0.21 | SED |
| Shubuta Fine Sandy Loam | 0.28/C | 53 | 31 | 16 | 67 | 84/100 | 0 | VRR | 100 | 91/96 | 0.03 | VRR | 67 | 92/95 | 0.06 | TE | 200 | 94/99 | 0.20 | SED |
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 3 Grouping | | | | | | | | | | | | | | | | | | | | |
| Dellrose Cherty Silt Loam | 0.24/B | 16 | 45 | 39 | 67 | 64/100 | 0 | VRR | 40 | 81/95 | 0.02 | SED | 67 | 85/97 | 0.05 | SED | 150 | 87/98 | 0.15 | SED |
| Humphreys Cherty [Silt Loam] | 0.24/B | 23 | 42 | 35 | 20 | 67/100 | 0 | VRR | 40 | 85/96 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 150 | 90/100 | 0.15 | SED |
| Maury Silt Loam | 0.32/B | 11 | 56 | 33 | 150 | 72/100 | 0 | VRR | 150 | 84/96 | 0.03 | VRR | 150 | 85/96 | 0.06 | VRR | 200 | 87/97 | 0.20 | SED |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 82/100 | 0.04 | SED | 150 | 83/100 | 0.14 | SED |
| Paden Silt Loam | 0.32/C | 5 | 58 | 37 | 200 | 70/100 | 0 | VRR | 250 | 84/96 | 0.03 | VRR | 250 | 85/96 | 0.07 | VRR | 200 | 84/96 | 0.22 | SED |
| Pickwick Silt Loam | 0.32/B | 9 | 68 | 23 | 200 | 77/100 | 0 | VRR | 300 | 89/96 | 0.03 | VRR | 300 | 89/96 | 0.06 | VRR | 300 | 88/96 | 0.20 | VRR |
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 4 Grouping | | | | | | | | | | | | | | | | | | | | |
| Alcoa Loam | 0.24/B | 38 | 26 | 36 | 20 | 72/100 | 0 | VRR | 40 | 88/98 | 0.02 | SED | 67 | 90/100 | 0.05 | SED | 150 | 91/100 | 0.14 | SED |
| Dandridge Silt Loam | 0.24/D | 6 | 52 | 42 | 150 | 63/100 | 0 | VRR | 200 | 82/95 | 0.02 | VRR | 200 | 82/95 | 0.05 | VRR | 200 | 83/95 | 0.17 | SED |
| Dewey Silt Loam | 0.28/B | 9 | 48 | 43 | 150 | 65/100 | 0 | VRR | 100 | 80/95 | 0.02 | VRR | 67 | 82/96 | 0.05 | SED | 200 | 85/98 | 0.17 | SED |
| Dunmore Silt Loam | 0.20/B | 15 | 21 | 64 | 20 | 53/100 | 0 | VRR | 40 | 82/100 | 0.02 | SED | 67 | 84/100 | 0.04 | SED | 150 | 84/100 | 0.12 | SED |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 100 | 89/95 | 0.03 | VRR | 100 | 91/97 | 0.06 | VRR | 200 | 93/99 | 0.20 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0 | VRR | 40 | 79/100 | 0.02 | SED | 67 | 81/100 | 0.05 | SED | 150 | 81/100 | 0.16 | SED |

Table 4 continued. Three largest and three smallest generated Pond Sizes for each Zone of the Basic Evaluation. (Excerpt from Table A-6).
(See Key to abbreviations at end of Table)

| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | 0 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 5 Percent Slope Pond Size | TE/ VRR | SedAcc | Control | 10 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 20 Percent Slope Pond Size | TE/VRR | SedAcc | Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 5 Grouping | | | | | | | | | | | | | | | | | | | | |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 72/100 | 0 | VRR | 40 | 86/97 | 0.03 | SED | 100 | 90/99 | 0.08 | SED | 250 | 92/100 | 0.24 | SED |
| Jefferson Loam | 0.28/B | 34 | 30 | 36 | 20 | 72/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 90/99 | 0.05 | SED | 150 | 91/100 | 0.16 | SED |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 83/100 | 0.04 | SED | 150 | 83/100 | 0.13 | SED |
| Mountview Silt Loam | 0.37/B | 13 | 48 | 39 | 100 | 66/100 | 0 | VRR | 67 | 80/95 | 0.03 | VRR | 100 | 85/97 | 0.07 | SED | 200 | 88/99 | 0.21 | SED |
| Pembroke Silt Loam | 0.28/B | 8 | 52 | 40 | 150 | 68/100 | 0 | VRR | 100 | 81/95 | 0.02 | VRR | 100 | 82/95 | 0.05 | VRR | 200 | 86/97 | 0.16 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0 | VRR | 40 | 89/100 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 150 | 91/100 | 0.16 | SED |
| | | | | | | | | | | | | | | | | | | | | |
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 6 Grouping | | | | | | | | | | | | | | | | | | | | |
| Dandridge Silt Loam | 0.24/D | 6 | 52 | 42 | 150 | 65/100 | 0 | VRR | 200 | 82/96 | 0.02 | VRR | 200 | 83/95 | 0.04 | VRR | 150 | 82/95 | 0.14 | SED |
| Dunmore Silt Loam | 0.20/B | 15 | 21 | 64 | 20 | 52/100 | 0 | VRR | 20 | 82/100 | 0.01 | VRR | 40 | 83/100 | 0.03 | SED | 100 | 84/100 | 0.10 | SED |
| Montevallo Silt Loam | 0.24/D | 27 | 39 | 34 | 20 | 74/100 | 0 | VRR | 40 | 87/96 | 0.02 | SED | 67 | 91/99 | 0.04 | SED | 150 | 91/100 | 0.14 | SED |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 40 | 90/96 | 0.02 | SED | 100 | 90/97 | 0.05 | VRR | 150 | 91/97 | 0.16 | SED |
| Sequoia Silt Loam | 0.32/C | 5 | 40 | 55 | 67 | 55/100 | 0 | VRR | 40 | 79/96 | 0.02 | SED | 67 | 82/98 | 0.06 | SED | 200 | 84/99 | 0.18 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0 | VRR | 40 | 79/100 | 0.02 | SED | 67 | 81/100 | 0.04 | SED | 150 | 82/100 | 0.13 | SED |

Key to Abbreviations:

K= Soil Erodibility

HSG= SCS Hydrologic Soil Group

Pond Size= Volume in Cubic Yards per Acre Drainage Area

TE= Trapping Efficiency (((Sediment in-Sediment out)/Sediment in)*100)(10 year event)

VRR= Volume weighted settleable Solids Ratio (((vwss in-vwss out)/vwss in)*100)(10 year event)

Note: 0 percent slope VRR shows 100 percent due to lack of resolution at small concentrations

vwss= 24 hour volume weighted settleable solids (Imhoff Cone Test)

SedAcc= annual sediment accumulation in the pond (acre-feet) estimated for the SCS Type II 10year 24 hr. Storm

Control= controlling element for pond size from the Efficiency Criteria (10 year event):

SED= sediment accumulation forces the pond size

VRR= VRR reached 95 percent before TE reached 90 percent

TE= TE reached 90 percent before VRR reached 95 percent

sediment storage volume impact, results of multiple regression modeling (Burns, 1993, unpublished) on the Zone 1 results, the standard outlet structure limitations, and use of the appendix Basic Evaluation tables. Unless otherwise noted, the results discussed refer to the 10-year storm evaluations, since this consistently controlled the pond sizes required to meet the Efficiency Criteria.

## General Trends

The expectation of larger pond size requirements in the western part of Tennessee and smaller pond sizes in the eastern portion is confirmed in the Basic Evaluation results. The Table 4 excerpt from the Basic Evaluation results (Appendix Table A-6) provides a satisfactory overview for discussion of pond performance data realized from the Basic Evaluation. The selected pond size values of Table 4 are those of soil series generating the overall three largest and three smallest pond size requirements for each of the Zones. Pond performance trends exhibited by specific elements of the analysis are discussed in more detail in the ensuing sections, but some general tendencies which accumulatively result from the specific elements and variables should be mentioned as an overview.

With few exceptions (please see Table 4), the controlling criteria were annual sediment accumulation volume and volume weighted settleable solids (vwss) removal. Rarely was a TE of 90 percent reached before 95 percent of the vwss was removed (see Chapter 3, Efficiency Criteria for a discussion of the vwss criterion rationale). In all cases evaluated, sediment accumulation was not a controlling factor for the 0 percent slope condition, since the volume generated was negligible. For 5 and 10 percent slopes, accumulated sediment often controlled the pond size if the soil (such as Talbott) was in the low silt, high clay range. In such cases the pond volume requirement for adequate accumulated sediment storage surpassed the pond volume required to remove the relatively rapidly settling constituents of these kinds of soils. Such soils, as mentioned in the Eroded Particle Size Distribution discussion above, are more predominant in northeastern Tennessee (Zones 4, 5, and 6) and somewhat less so in the midsection of Tennessee (Zone 3). Conversely, Zones 1 and 2 of the western part of Tennessee, which are characterized by slowly settling high silt, low clay soils (such as Grenada) generally require, for the 5 and 10 percent slopes, pond sizes larger than those needed just to meet the sediment accumulation criteria. For the 20 percent slope condition (possibly due to the relatively short drainage area travel time for the 10-year storm) the required Basic pond size was almost exclusively controlled by the volume weighted settleable solids criterion (see Table 4, all Zones).

The Zone conditions of rainfall and R-factor, like the soil settleability, generally decrease from the southwest to the northeast and also act to regionally reduce the required pond size. These overall regional effects are demonstrated in the table below:

| **Zone** | **0% Slope** Average Pond Size (cubic yards/ acre) | **5% Slope** Average Pond Size (cubic yards/ acre) | **10% Slope** Average Pond Size (cubic yards/ acre) | **20% Slope** Average Pond Size (cubic yards/ acre) |
|---|---|---|---|---|
| **1** | 133 | 156 | 174 | 253 |
| **2** | 166 | 196 | 203 | 267 |
| **3** | 79 | 74 | 91 | 199 |
| **4** | 49 | 54 | 83 | 185 |
| **5** | 61 | 50 | 78 | 173 |
| **6** | 46 | 47 | 75 | 152 |

Shown by Zone are the average of all Basic Evaluation pond sizes for each of the slope cases. The mentioned trend is apparent in the table, since the Zone designations numerically increase from southeast to northwest while the average Basic pond size also decreases.

## Soil Type Influences on Pond Size

The influence of soil characteristics of any given soil series on a sediment detention pond size estimate is substantial. Regional and site conditions combine with soil erodibility (K), Hydrologic Soil Group (HSG), and eroded particle size distribution to produce a volume of influent sediment and flow for a storm event. The latter three of these influences are associated directly with characteristics of a given soil series. The effects of K-value, HSG, and eroded particle size distribution on pond size are explored below with the use of the selected Basic results presented in Table 5 (excerpted from Appendix Table A-6).

Soil erodibility value (K) is a measure of the propensity of a given soil to erode. In order to examine K-value effects, Zone 3 soil series Dickson and Humphreys of Table 5 present an extreme example. Review of the data for these soils shows that the HSGs are the same and the dispersed particle size distributions are nearly identical, varying by no more than 2 percent for the clay. The K-value of 0.43 for Dickson, however, is almost double the K-value of Humphreys at 0.23. Except for the anomaly of the 10 percent slope case, the increase in the pond size required to meet the Efficiency Criteria with respect to the two soils is double for the 0 percent slope case and about 2/3 for the 5 and 20 percent slope cases. The inconsistency of the 10 percent case can probably be explained by outlet structure effects described in the section by that name below. However, since K-value variations for all soils evaluated (see Appendix Table A-6) ranged from a minimum of 0.20 to a maximum of 0.49, the example cited is an extreme case. An increase in K, is directly

Table 5. Selected soil variable comparisons from the Basic Evaluations. (excerpted from Appendix Table A-6).

(See Key to abbreviations at end of Table)

| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | 0 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 5 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 10 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 20 Percent Slope Pond Size | TE/VRR | SedAcc | Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 1 Grouping | | | | | | | | | | | | | | | | | | | | |
| Grenada Silt Loam | 0.32/C | 4 | 78 | 18 | 350 | 86/100 | 0.00 | VRR | 500 | 92/96 | 0.04 | VRR | 500 | 93/96 | 0.08 | VRR | 500 | 91/95 | 0.26 | TE |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0.00 | VRR | 40 | 79/100 | 0.03 | SED | 67 | 81/100 | 0.06 | SED | 200 | 82/100 | 0.20 | SED |
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 3 Grouping | | | | | | | | | | | | | | | | | | | | |
| Christian Silt Loam | 0.28/C | 14 | 43 | 43 | 100 | 64/100 | 0.00 | VRR | 40 | 82/97 | 0.03 | VRR | 67 | 84/97 | 0.06 | VRR | 200 | 86/98 | 0.20 | SED |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 60/100 | 0.00 | VRR | 40 | 82/97 | 0.02 | VRR | 67 | 85/98 | 0.06 | SED | 200 | 86/99 | 0.17 | SED |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 72/100 | 0.00 | VRR | 67 | 86/99 | 0.04 | SED | 100 | 90/99 | 0.08 | SED | 250 | 92/100 | 0.27 | SED |
| Gladeville Flaggy Silt Loam | 0.24/D | 14 | 42 | 44 | 100 | 64/100 | 0.00 | VRR | 40 | 81/96 | 0.02 | SED | 67 | 84/97 | 0.06 | SED | 200 | 86/98 | 0.18 | SED |
| Humphreys Cherty [Silt Loam] | 0.24/B | 23 | 42 | 35 | 20 | 67/100 | 0.00 | VRR | 40 | 85/96 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 150 | 90/100 | 0.15 | SED |

Key to Abbreviations:

K= Soil Erodibility

HSG= SCS Hydrologic Soil Group

Pond Size= Volume in Cubic Yards per Acre Drainage Area

TE= Trapping Efficiency (((Sediment in-Sediment out)/Sediment in)*100)(10 year event)

VRR= Volume weighted settleable Solids Ratio (((vwss in-vwss out)/vwss in)*100)(10 year event)

Note: 0 percent slope VRR shows 100 percent due to lack of resolution at small concentrations

vwss= 24 hour volume weighted settleable solids (Imhoff Cone Test)

SedAcc= annual sediment accumulation in the pond (acre-feet) estimated for the SCS Type II 10year 24 hr. Storm

Control= controlling element for pond size from the Efficiency Criteria (10 year event):

SED= sediment accumulation forces the pond size

VRR= VRR reached 95 percent before TE reached 90 percent

TE= TE reached 90 percent before VRR reached 95 percent

proportional to the amount of sediment generated so variations in K-value do play a role in the determination of required pond size.

The SCS Hydrologic Soil Group (HSG) affects the initial abstraction of rainfall and, consequently, the amount of runoff for a given storm event. The SCS designates 4 HSGs, A, B, C, and D. The evaluated soils had HSGs of B, C, and D. The HSG influence on the volume of runoff increases non-linearly in the direction of A to D. The Zone 3 soils of Gladeville, Christian, and Decatur from Table 5 demonstrate HSG effects on pond size. Except for the HSG designation, the cited examples are otherwise similar soils with the K-value varying between 0.24 and 0.28, sand ranging 1 percent, silt ranging 4 percent, and clay ranging 3 percent. Decatur, Christian, and Gladeville have the different HSG designations of B, C, and D, respectively. Notice that these examples represent all evaluated Hydrologic Soil Group designations.

The only variation in pond size requirement among these soils is the large pond needed for Gladeville soil for the 0 percent slope case which is about one third smaller than the B and C HSG examples. Keep in mind that this represents only a one increment step among the available pond sizes for the 0 slope case difference. Since the next pond size had to be chosen even if the smaller size was a near fit, this could easily have been one of the marginal cases. Also, as described in the annual accumulated sediment section below, there were particular resolution problems associated with the low sediment concentration values associated with the 0 slope case. It can be concluded with confidence that, relative to other influences on pond size, the HSG effect is small.

The regional disposition and associated required pond size of the high silt and high clay soils have already been mentioned in the General Trends section above. In order to isolate the effect of particle size distribution on pond size the evaluation results of two Zone 1 soils, Grenada and Talbott, are held for comparison. Grenada, a high silt (78 percent dispersed fraction) soil, and Talbott, a high clay (75 percent dispersed fraction) soil are presented with their respective eroded particle size distributions and Basic pond sizes for the slope cases in Table 5. These soils, being subjected to the same Zone conditions and having the same HSG, offer a close match for comparison of high silt/clay particle size distribution effects with the exception of the unmatched K-values. The K-values of 0.32 for Grenada soil and 0.24 for Talbott soil do not agree as well as preferred, but since the high clay soils consistently have smaller erodibilities (probably due to their cohesive nature and consequent resistance to detachment), this was the closest match available from the evaluated data. Inspection of the table shows a dramatic difference in the required Basic pond sizes for the two soils. The high silt content Grenada requires from 250 to 450 percent larger pond volume than the high clay Talbott soil. Comparison of the trapping efficiencies of the two shows that the Grenada is 9 to 40 percent higher than the TE of the Talbott soil for the pond sizes meeting the Efficiency Criteria. On the other hand, the vwss removal ratio (((vwss in-vwss out)/vwss in)100 = VRR) is larger for the Talbott soil by up to 5 percent.

By examining the estimated eroded particle size distribution for the Grenada soil it can be seen that the clay fraction is small at 4.5 percent. The clay fraction is the major contributor to the suspended solids (that is the sediment constituent not included with the settleable solids). There is also a substantial portion of the soil in the silt and small aggregate sizes (78 percent) which is settleable, but at a slower rate than the large aggregate and sand sizes. This forces a larger pond volume to allow settling time for the smaller but still settleable particles. This also means that, as the aggregated sediment clay size particle content, and therefore the suspended solids, approaches zero, the TE and the VRR become equivalent values. However, since the TE is based on the total sediment load and there is always (in the soils evaluated) some constituent of suspended solids present, the VRR is always higher than the TE. This observation is exemplified by the Grenada soil, as it is one of the few in the analysis which met the TE condition before the VRR condition was met. Therefore, although a relatively larger pond size was required for the Grenada to achieve satisfactory performance, the total sediment removed as reflected in the TE was quite high.

The reverse condition holds for the high clay content Talbott soil. As shown in Table 5, the TEs are substantially smaller than the VRRs. The eroded particle size distribution clay residual is essentially factored out of the VRR, leaving a readily settleable large size fraction (80.5 percent sand sized particles). The result is a small pond size requirement relative to that needed for the Grenada soil, yet the overall sediment removal, the TE, is also smaller. A larger pond will not improve performance since the remaining constituents in their natural state (the addition of flocculants could induce settling) are effectively unsettleable. In fact, most of the soil series having high clay content (see Table 4 or Appendix Table A-6), with the 0 percent slope cases excluded, had their respective pond size forced by the sediment accumulation criterion instead of the removal criterion.

## Slope Effects

The steeper the slope the shorter the travel time will be for routing of runoff to the exit of the drainage area (see chapter 3, SEDCAD+ model). This will increase the runoff peak flow which would in turn lead to the expectation of larger pond size requirements to allow adequate settling times. Review of Table 4, above, shows that the steeper slope cases for a given soil type do generally require larger pond sizes. This is not always the case, however, and the extent of pond size difference seems to vary among soil types depending on the clay and silt fractions present. Based on the discussion in the preceding section the reason is apparent.

Three of the highest silt soils of Zone 1 (the three largest pond size sets) are chosen, for example, from Table 4: Calloway, Grenada, and Loring. Ponds sizes for the range of slopes vary about one third for the Loring soil, somewhat more for the Grenada, and incur a two thirds increase for the Calloway soil. Slope effects are less significant for the high silt soils, since the pond size must initially be large in order to allow settling of the large fraction of fine but settleable particles. This initially larger pond size is better able to retain the higher peak flows of the steeper slopes via surcharge and still allow adequate settling times for sediment removal. As a consequence, the required pond size is less sensitive to the slope increase. High clay soils (the three smaller pond size sets), such as the Zone 1 soils from Table 4 above, of Mimosa, Oktibbeha, and Talbott show considerably more response to variation in slope. The Mimosa soil series pond size increases sevenfold from the 0 percent slope case to the 20 percent slope case, while the Oktibbeha and Talbott pond size requirements increase by an order of magnitude. Since these more aggregated clay soils lack large fractions in the intermediate size range and consequently require a smaller pond size to remove the settleable solids, the volume of accumulated sediment is a significant influence on the required pond size. Since the volume of accumulated sediment is strongly influenced by slope, pond size is quite sensitive to slope increases for the high clay soils. The soil examples chosen represent extremes of particle size distributions and also of the slope induced pond size variations incurred over the range of soils analyzed in the Basic Evaluation.

Note should be made of an anomaly in the results for all Zones for many of the 0 percent slope cases. Review of the Appendix Table A-6 for the 0 percent slopes in comparison to the next slope, 5 percent, often shows a smaller pond size requirement for the 5 percent case. Examples are:

| Zone | Soil | 0 % Slope Pond Size (Cubic Yards per Acre Drainage Area) | 5 % Slope Pond Size (Cubic Yards per Acre Drainage Area) |
|---|---|---|---|
| Zone 1 | Mountview | 150 | 67 |
| Zone 2 | Brandon | 150 | 100 |
| Zone 3 | Cumberland | 100 | 67 |
| Zone 4 | Hartsells | 100 | 40 |
| Zone 5 | Decatur | 67 | 40 |
| Zone 6 | Ramsey | 67 | 40 |

Two reasons can be given for this. First, the volume of sediment generated at the 0 slope is very small relative to the other slope cases. This resulted in very small values (hundredths of a milliliter/liter) of vwss (see the Detailed Evaluation below for typical values of vwss) in comparison to the other slopes. For these small values, the resolution from the SEDCAD+ output is about 10 percent. Conservative determination of a 95 percent VRR criteria condition required that the effluent vwss go to zero, often forcing a larger pond size requirement.

The second reason is also related to the low sediment concentrations generated. Annual accumulated sediment for the 0 percent slope case produced negligible volume in the ponds (see Table 4). The ramification of this is that, unlike the steeper slope cases, no decrease in pond depth occurred. As noted in Chapter 3 the SEDCAD+ model adds the accumulated sediment depth to the pond before making removal calculations. The relatively deeper pond requires more volume in order to allow adequate settling time for material removal. Details on the effects of annual sediment accumulation are discussed in the next section.

## Annual Sediment Accumulation Effects

The annual sediment accumulation volume, as discussed in Chapter 2 for the SEDCAD+ model, is a function of the storm event precipitation, the annual R-factor, the soil erodibility value (K), the drainage area conditions, and the cover conditions. The drainage area and cover conditions are given fixed values in this analysis. However, the R-factor and precipitation values are assigned to each Zone while a K-value is associated with each soil series. The expectation then, would be that the higher rainfall/R Zones of the west and southwest portions of Tennessee would have higher sediment accumulation and conversely the Zones to the east would produce smaller volumes of sediment. The table below, which shows by Zone the average annual sediment accumulation for the 10

| Average Annual Sediment Accumulation (Sediment Accum.) in Acre Feet for the 10 percent slope case for the Zones of the Table 4 Basic Evaluation. | | | | | | |
|---|---|---|---|---|---|---|
| Zone | 1 | 2 | 3 | 4 | 5 | 6 |
| Sediment Accum. | 0.078 | 0.075 | 0.055 | 0.050 | 0.056 | 0.043 |

percent slope for the example soils of Table 4, verifies this. This contributes to the tendency of regional pond size change discussed in the General Trends section above.

In addition to the sediment accumulation effects on the 0 percent slope anomaly and the regional impact discussed above, annual accumulated sediment volumes were observed to have significant effects on the required pond size for the high clay soils. As discussed in the eroded particle size distribution section, the high clay soils generally had pond size controlled by the volume of accumulated sediment criterion.

The rationale for this occurrence will not be repeated here, but a further observation should be made. The fact that sediment will accumulate in a detention pond is a given. More complicated is the determination of what level of accumulated sediment, if any, to use in pond performance calculations. As described in Chapter 3, the method of Warner and Schwabb (1992) was chosen for this research. Since this choice of computation forced the pond size in a significant number of the soil evaluations, it is emphasized here. It is presumed that pond performance is evaluated at the end of pond life (that is the time just before clean-out), at which time particle fall distance is going to be at a minimum due to the reduced depth. At the same time, this is countered by the probable (this would be case sensitive) increase in overflow rates, allowing less time for settling. Quantification of the effects of the accumulated sediment assumption was not addressed in this research.

## Multiple Regression Model for Zone 1

Further investigation of the significance of the discussed variables was made in an unpublished analysis by Burns (1993). A multiple regression model was developed from the Zone 1 results. The analysis showed that for the soils evaluated in the Zone 1 conditions, a two factor regression equation using percent slope and percent silt (dispersed fraction) explained 80 percent of the variability in pond size. In Burns' analysis, it was determined that inclusion of percent sand, percent clay, and K-value only explained an additional 5 percent of the variability. It is suspected that the relative importance of the regression variables would change as the Zone characteristics change over Tennessee since, as discussed above, the presence of accumulated sediment becomes more of a controller for pond size in the higher numbered Zones. This is an area for expanded investigation (see Chapter 5, Conclusions).

## Outlet Structure Limitations

As noted in Chapter 3, the standard outlet structure dimensions were used for the Basic Evaluation. Pond sizes were determined by satisfaction of the Efficiency Criteria under the constraint of its performance using the standard outlet structure. The absence of tuning (see Chapter 3, Detailed Analysis, and the Detailed Analysis discussion section below) impacted the Basic Evaluation results in two ways. First, as peak discharge values were neither controlled nor observed, the pond sizes of the Basic Evaluation should not be used without adjustment if predevelopment discharge is a consideration. Second, the lack of tuning sometimes results in less than full use of the pond volume for the design storms.

This second impact can be observed by examining the peak elevations for the 10-year storm from the Table 4 results. The allowable maximum elevation is 5.7 feet above the zero elevation pond bottom. The principal spillway is located at an elevation of 4.5 feet above the zero elevation bottom. If the peak elevation does not come close to the maximum elevation (say within about 0.5 feet), then a significant portion of the available pond volume between the principal spillway and the emergency spillway crest is not contributing to pond settling performance. This sometimes results in oversizing of ponds that might otherwise meet the Efficiency Criteria with a smaller pond size if the outlet structure where tuned to utilize more of the available pond volume. As can be seen in Table 4, this occurrence is independent whether the soil series being high in clay or silt. Rather, it is dependent on the combination of the inflow hydrograph, the fixed outlet structure, and the pond size increments made available for the evaluation.

## Use of the Basic Evaluation Tables

The Basic Results presented in their entirety in Appendix Table A-6, offers potential as a sediment pond design aid. Utilized as such, the information provided offers substantial improvement over the rule-of-thumb --67 cubic yards storage per acre drainage area-- typically in current use. In the format presented, the user only needs to know the county, soil series, and average slope in order to find an estimated pond volume storage per acre drainage area value. If the cover conditions are similar to those postulated, this should present a conservative estimate of the pond size required to meet the Efficiency Criteria.

Unevaluated soils which have known dispersed particle size distributions can have their pond sizes estimated by locating a close match in Appendix Table A-6. Adjustments to the estimated pond size would need to be made if the cover conditions of the drainage area depart appreciably from those assumed. Also, if an absolute minimum pond size value is needed, it is recommended that hydrograph routing be performed based on the pond volume at the peak elevation of the Appendix Table A-6 value, from which a more precise outlet structure and pond volume can be determined. If peak flow attenuation is to be considered, it is suggested that the information of the Detailed Evaluation below be utilized.

## Detailed Evaluation Results

As described in Chapter 3, the Detailed Evaluation results subjected three soil series, the highest in dispersed sand, silt, and clay, of each Zone to performance evaluation for a range of pond sizes. Over the range of pond sizes evaluated for performance, pond performance is gaged against both the Efficiency and the Flow Criteria. The complete results are given in Appendix Table A-7. Reported data of each evaluation include, by Zone: the pond sizes, the soils evaluated, Hydrologic Soil Group, dispersed particle size distribution, the soil erodibility value (K), designation of the minimum pond size satisfying the Efficiency Criteria (with standard outlet structure), designation of the minimum pond size satisfying the Flow and Efficiency Criteria (with standard outlet structure), designation of the minimum pond size satisfying the Flow and Efficiency Criteria (with tuned outlet structure), TE, vwss discharged, VRR, peak discharge, peak elevation (10-year storm), total tons of sediment discharged, and the outlet structure size if other than standard. These data, except as noted, are included for both the 2-year and 10-year storm events.

In addition to the pond performance evaluations, predisturbed conditions are also evaluated and the same information, where applicable, is given. The Zone 1 and Zone 6 results are repeated as Table 6 (Zone 1) and Table 7 (Zone 6) in this section for discussion. Discussion items in the Basic Evaluation section, above, regarding influences of regional trends, the slope, and soil type on the estimated pond size also apply to the Detailed Evaluation. Additional discussion items revealing information from the Detailed Evaluation include predisturbed and disturbed pond performance comparison, Basic Evaluation and Detailed Evaluation comparison, range of pond size performance, tuned

Table 6. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 1. (excerpted from Appendix Table A-7).

| Zone 1 | Boswell | | Percent Sand, Silt, and Clay: | | | 58,19,23 | Hydrologic Soil Group: | | | D | | Erodibility (K): | | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10) | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 2.21 | 1.32 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 87.94 | 89.63 | 1.90 | 0.91 | 0.1 | 0.0 | 100.00 | 100.00 | 5.5 | all | 10/6 |
| 0 | 67 | 0.00 | 0.00 | 81.87 | 83.45 | 3.60 | 2.41 | 0.1 | 0.1 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 89.95 | 92.34 | 2.15 | 0.53 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | all | std |
| 0 | 20 | 0.02 | 0.01 | 73.70 | 77.58 | 3.60 | 2.42 | 0.1 | 0.1 | 84.62 | 91.67 | 4.8 | | |
| 0 | 40 | 0.01 | 0.00 | 79.34 | 81.68 | 3.60 | 2.42 | 0.1 | 0.1 | 92.31 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 83.33 | 84.50 | 3.60 | 2.40 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 85.50 | 86.88 | 3.49 | 1.91 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 250 | 0.00 | 0.00 | 86.59 | 88.21 | 3.23 | 1.51 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 300 | 0.00 | 0.00 | 87.70 | 89.61 | 2.89 | 1.02 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 500 | 0.00 | 0.00 | 92.02 | 93.69 | 1.35 | 0.36 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 95.45 | 95.37 | 0.53 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 5 | PD | 1.02 | 0.97 | | | 14.68 | 9.00 | 3.1 | 1.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 67 | 0.36 | 0.10 | 90.60 | 92.69 | 19.01 | 12.73 | 3.9 | 1.9 | 96.60 | 99.02 | 5.6 | eff | std |
| 5 | 250 | 0.09 | 0.00 | 93.03 | 94.65 | 15.36 | 6.64 | 2.9 | 1.4 | 99.15 | 100.00 | 5.5 | all | std |
| 5 | 40 | 0.55 | 0.09 | 88.92 | 92.80 | 18.85 | 12.85 | 4.5 | 1.9 | 94.80 | 99.12 | 5.6 | | |
| 5 | 100 | 0.27 | 0.29 | 91.37 | 91.02 | 19.10 | 12.60 | 3.5 | 2.4 | 97.45 | 97.16 | 5.6 | | |
| 5 | 150 | 0.23 | 0.01 | 91.81 | 93.50 | 18.32 | 12.26 | 3.4 | 1.7 | 97.83 | 99.90 | 5.6 | | |
| 5 | 200 | 0.17 | 0.00 | 92.39 | 94.04 | 18.16 | 9.93 | 3.1 | 1.6 | 98.39 | 100.00 | 5.6 | | |
| 5 | 300 | 0.01 | 0.00 | 93.62 | 95.18 | 13.88 | 4.46 | 2.6 | 1.3 | 99.91 | 100.00 | 5.3 | | |
| 5 | 500 | 0.00 | 0.00 | 95.95 | 97.00 | 5.01 | 0.37 | 1.7 | 0.8 | 100.00 | 100.00 | 4.9 | | |
| 5 | 700 | 0.00 | 0.00 | 97.53 | 97.72 | 0.82 | 0.33 | 1.0 | 0.6 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.37 | 2.25 | | | 16.15 | 9.93 | 7.2 | 4.1 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 100 | 0.56 | 0.15 | 92.04 | 93.45 | 21.26 | 14.43 | 7.6 | 4.0 | 97.77 | 99.38 | 5.6 | eff | std |
| 10 | 300 | 0.07 | 0.00 | 93.81 | 95.40 | 17.32 | 6.25 | 5.9 | 2.8 | 99.72 | 100.00 | 5.5 | all | std |
| 10 | 150 | 0.48 | 0.04 | 92.41 | 93.88 | 21.24 | 14.15 | 7.3 | 3.8 | 98.08 | 99.84 | 5.7 | | |
| 10 | 200 | 0.42 | 0.00 | 92.67 | 94.34 | 21.22 | 13.57 | 7.0 | 3.5 | 98.32 | 100.00 | 5.6 | | |
| 10 | 250 | 0.23 | 0.00 | 93.33 | 94.61 | 20.91 | 10.24 | 6.4 | 3.3 | 99.08 | 100.00 | 5.6 | | |
| 10 | 350 | 0.00 | 0.00 | 94.45 | 95.94 | 14.92 | 2.33 | 5.3 | 2.5 | 100.00 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 95.00 | 96.41 | 11.57 | 1.17 | 4.8 | 2.2 | 100.00 | 100.00 | 5.2 | | |
| 10 | 500 | 0.00 | 0.00 | 96.09 | 97.11 | 4.00 | 0.37 | 3.7 | 1.8 | 100.00 | 100.00 | 4.8 | | |
| 10 | 700 | 0.00 | 0.00 | 97.63 | 97.79 | 0.72 | 0.32 | 2.3 | 1.4 | 100.00 | 100.00 | 4.5 | | |
| 20 | PD | 9.32 | 8.04 | | | 18.77 | 11.88 | 24.6 | 14.4 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.24 | 0.00 | 93.77 | 94.55 | 21.23 | 14.04 | 18.9 | 10.6 | 99.68 | 100.00 | 5.6 | eff | std |
| 20 | 350 | 0.00 | 0.00 | 94.41 | 95.63 | 16.19 | 8.09 | 16.9 | 8.5 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 250 | 0.24 | 0.00 | 93.78 | 94.77 | 21.12 | 13.56 | 18.8 | 10.2 | 99.68 | 100.00 | 5.7 | | |
| 20 | 300 | 0.00 | 0.00 | 94.14 | 95.26 | 20.31 | 12.02 | 17.7 | 9.3 | 100.00 | 100.00 | 5.6 | | |
| 20 | 500 | 0.00 | 0.00 | 95.76 | 96.84 | 7.19 | 0.83 | 12.8 | 6.2 | 100.00 | 100.00 | 5.0 | | |
| 20 | 700 | 0.00 | 0.00 | 97.42 | 97.70 | 0.87 | 0.34 | 7.8 | 4.5 | 100.00 | 100.00 | 4.6 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 6 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 1. (excerpted from Appendix Table A-7).

| Zone 1 | Grenada | | Percent Sand, Silt, and Clay: | | | 4,78,18 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10) | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.90 | 1.07 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 84.33 | 89.11 | 1.45 | 0.72 | 0.1 | 0.0 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 350 | 0.00 | 0.00 | 85.52 | 90.73 | 2.16 | 0.51 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 88.18 | 91.85 | 1.74 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.03 | 0.02 | 48.55 | 61.54 | 3.39 | 2.20 | 0.3 | 0.1 | 57.14 | 71.43 | 4.8 | | |
| 0 | 100 | 0.03 | 0.01 | 57.12 | 70.25 | 3.38 | 2.16 | 0.2 | 0.1 | 57.14 | 85.71 | 4.8 | | |
| 0 | 150 | 0.02 | 0.01 | 66.71 | 78.47 | 3.37 | 1.92 | 0.2 | 0.1 | 71.43 | 85.71 | 4.8 | | |
| 0 | 200 | 0.01 | 0.00 | 72.93 | 83.35 | 3.19 | 1.58 | 0.1 | 0.1 | 85.71 | 100.00 | 4.8 | | |
| 0 | 250 | 0.01 | 0.00 | 78.04 | 86.85 | 2.88 | 1.10 | 0.1 | 0.0 | 85.71 | 100.00 | 4.8 | | |
| 0 | 300 | 0.01 | 0.00 | 82.07 | 89.08 | 2.55 | 0.76 | 0.1 | 0.0 | 85.71 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 91.75 | 93.51 | 1.14 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 95.12 | 95.62 | 0.37 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.3 | | |
| 5 | PD | 0.82 | 0.76 | | | 12.94 | 7.44 | 3.0 | 1.6 | | | | | |
| 5 | 450 | 0.40 | 0.00 | 91.03 | 96.24 | 2.52 | 0.37 | 3.9 | 1.0 | 95.62 | 100.00 | 5.1 | all | 12/8 |
| 5 | 500 | 0.37 | 0.00 | 91.90 | 96.60 | 3.22 | 0.36 | 3.6 | 0.9 | 95.95 | 100.00 | 4.8 | eff/all | std |
| 5 | 500 | 0.37 | 0.00 | 91.90 | 96.60 | 3.22 | 0.36 | 3.6 | 0.9 | 95.95 | 100.00 | 4.8 | all | std |
| 5 | 100 | 2.65 | 1.47 | 55.59 | 70.95 | 18.03 | 11.74 | 19.5 | 8.0 | 71.01 | 83.18 | 5.6 | | |
| 5 | 200 | 1.79 | 0.94 | 70.79 | 82.07 | 16.15 | 8.01 | 12.9 | 4.9 | 80.42 | 89.24 | 5.5 | | |
| 5 | 300 | 1.46 | 0.34 | 78.33 | 90.81 | 12.56 | 2.77 | 9.5 | 2.5 | 84.03 | 96.11 | 5.2 | | |
| 5 | 400 | 0.88 | 0.00 | 85.80 | 95.76 | 6.78 | 0.59 | 6.2 | 1.2 | 90.37 | 100.00 | 5.0 | | |
| 5 | 450 | 0.60 | 0.00 | 89.16 | 96.24 | 5.06 | 0.37 | 4.8 | 1.0 | 93.44 | 100.00 | 4.9 | | |
| 5 | 700 | 0.00 | 0.00 | 97.34 | 97.68 | 0.38 | 0.31 | 1.2 | 0.6 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.97 | 1.84 | | | 14.28 | 8.32 | 7.1 | 3.8 | | | | | |
| 10 | 400 | 1.15 | 0.00 | 90.36 | 95.88 | 2.58 | 0.53 | 10.0 | 2.7 | 94.89 | 100.00 | 5.4 | all | 12/8 |
| 10 | 500 | 0.80 | 0.00 | 92.56 | 96.74 | 2.78 | 0.35 | 7.7 | 2.1 | 96.45 | 100.00 | 4.7 | eff/all | std |
| 10 | 500 | 0.80 | 0.00 | 92.56 | 96.74 | 2.78 | 0.35 | 7.7 | 2.1 | 96.45 | 100.00 | 4.7 | all | std |
| 10 | 100 | 4.59 | 2.98 | 66.45 | 75.39 | 20.64 | 13.62 | 34.8 | 16.0 | 79.61 | 86.37 | 5.6 | | |
| 10 | 200 | 4.05 | 2.19 | 71.85 | 82.05 | 20.60 | 12.61 | 29.2 | 11.7 | 82.01 | 89.98 | 5.6 | | |
| 10 | 300 | 3.35 | 0.91 | 79.14 | 90.96 | 14.97 | 2.66 | 21.6 | 5.9 | 85.12 | 95.84 | 5.4 | | |
| 10 | 400 | 2.20 | 0.00 | 86.45 | 95.88 | 8.51 | 0.58 | 14.1 | 2.7 | 90.23 | 100.00 | 5.1 | | |
| 10 | 450 | 1.38 | 0.00 | 89.79 | 96.36 | 4.01 | 0.37 | 10.6 | 2.4 | 93.87 | 100.00 | 4.8 | | |
| 10 | 700 | 0.00 | 0.00 | 97.42 | 97.77 | 0.38 | 0.31 | 2.7 | 1.5 | 100.00 | 100.00 | 4.4 | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.43 | 7.14 | | | 17.06 | 10.26 | 24.7 | 13.6 | | | | | |
| 20 | 450 | 2.58 | 0.00 | 91.50 | 96.01 | 2.57 | 0.93 | 27.9 | 8.2 | 96.21 | 100.00 | 5.3 | all | 12/8 |
| 20 | 500 | 3.70 | 0.00 | 90.59 | 96.00 | 4.12 | 0.38 | 30.8 | 8.2 | 94.56 | 100.00 | 4.8 | eff/all | std |
| 20 | 500 | 3.70 | 0.00 | 90.59 | 96.00 | 4.12 | 0.38 | 30.8 | 8.2 | 94.56 | 100.00 | 4.8 | all | std |
| 20 | 250 | 9.77 | 4.41 | 77.04 | 86.48 | 20.37 | 12.89 | 75.3 | 27.8 | 85.64 | 93.34 | 5.6 | | |
| 20 | 300 | 9.25 | 5.19 | 79.39 | 85.68 | 18.04 | 9.57 | 67.6 | 29.5 | 86.41 | 92.16 | 5.6 | | |
| 20 | 400 | 7.14 | 0.82 | 84.57 | 93.92 | 11.98 | 2.36 | 50.6 | 12.5 | 89.51 | 98.76 | 5.2 | | |
| 20 | 600 | 2.98 | 0.00 | 92.07 | 98.46 | 3.76 | 0.29 | 26.0 | 3.2 | 95.62 | 100.00 | 4.8 | | |
| 20 | 700 | 0.00 | 0.00 | 97.22 | 97.58 | 0.62 | 0.33 | 9.1 | 5.0 | 100.00 | 100.00 | 4.5 | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 6 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 1. (excerpted from Appendix Table A-7).

| Zone 1 | Talbott | | Percent Sand, Silt, and Clay: | | | 2,23,75 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10) | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.90 | 1.07 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 56.66 | 61.83 | 1.45 | 0.72 | 0.2 | 0.1 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 20 | 0.00 | 0.00 | 46.25 | 45.25 | 3.39 | 2.20 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 62.36 | 68.73 | 1.74 | 0.37 | 0.2 | 0.1 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.00 | 0.00 | 47.16 | 47.14 | 3.39 | 2.20 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 48.02 | 48.71 | 3.38 | 2.16 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 51.24 | 54.11 | 3.19 | 1.58 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 250 | 0.00 | 0.00 | 54.05 | 57.78 | 2.20 | 0.95 | 0.2 | 0.1 | 100.00 | 100.00 | 5.5 | | |
| 0 | 300 | 0.00 | 0.00 | 56.26 | 61.78 | 2.55 | 0.76 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 68.77 | 72.69 | 1.14 | 0.34 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 79.21 | 78.70 | 0.37 | 0.30 | 0.1 | 0.1 | 100.00 | 100.00 | 4.3 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.72 | 0.67 | | | 12.94 | 7.44 | 2.3 | 1.2 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.01 | 79.15 | 78.93 | 18.40 | 11.98 | 6.9 | 4.3 | 100.00 | 99.87 | 5.6 | eff | std |
| 5 | 300 | 0.00 | 0.00 | 81.90 | 84.03 | 12.56 | 2.77 | 6.0 | 3.3 | 100.00 | 100.00 | 5.2 | all | std |
| 5 | 67 | 0.00 | 0.00 | 79.32 | 79.44 | 18.45 | 11.86 | 6.8 | 4.2 | 100.00 | 100.00 | 5.6 | | |
| 5 | 100 | 0.00 | 0.00 | 79.55 | 79.44 | 18.06 | 11.78 | 6.7 | 4.2 | 100.00 | 100.00 | 5.6 | | |
| 5 | 200 | 0.00 | 0.00 | 80.49 | 81.79 | 16.16 | 7.94 | 6.4 | 3.7 | 100.00 | 100.00 | 5.5 | | |
| 5 | 400 | 0.00 | 0.00 | 83.93 | 87.08 | 6.78 | 0.59 | 5.3 | 2.7 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 86.29 | 88.77 | 3.22 | 0.36 | 4.5 | 2.3 | 100.00 | 100.00 | 4.8 | | |
| 5 | 700 | 0.00 | 0.00 | 91.19 | 91.10 | 0.38 | 0.31 | 2.9 | 1.8 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.69 | 1.58 | | | 14.88 | 8.32 | 5.3 | 2.9 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 67 | 0.00 | 0.01 | 80.59 | 80.56 | 20.59 | 13.70 | 15.1 | 9.5 | 100.00 | 99.95 | 5.6 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 83.07 | 85.32 | 14.89 | 2.46 | 13.2 | 7.2 | 100.00 | 100.00 | 5.4 | all | std |
| 10 | 100 | 0.00 | 0.00 | 80.83 | 81.32 | 20.65 | 13.63 | 14.9 | 9.1 | 100.00 | 100.00 | 5.6 | | |
| 10 | 200 | 0.00 | 0.00 | 81.76 | 83.17 | 20.56 | 12.11 | 14.2 | 8.2 | 100.00 | 100.00 | 5.6 | | |
| 10 | 400 | 0.00 | 0.00 | 84.93 | 88.12 | 8.51 | 0.50 | 11.7 | 5.8 | 100.00 | 100.00 | 5.1 | | |
| 10 | 500 | 0.00 | 0.00 | 87.16 | 89.54 | 2.78 | 0.35 | 10.0 | 5.1 | 100.00 | 100.00 | 4.7 | | |
| 10 | 700 | 0.00 | 0.00 | 91.63 | 91.68 | 0.38 | 0.31 | 6.5 | 4.1 | 100.00 | 100.00 | 4.4 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 6.16 | 5.92 | | | 17.06 | 10.26 | 18.5 | 10.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.00 | 0.00 | 81.63 | 82.74 | 20.56 | 13.32 | 45.2 | 26.6 | 100.00 | 100.00 | 5.6 | eff | std |
| 20 | 300 | 0.00 | 0.00 | 82.84 | 84.88 | 16.31 | 7.39 | 42.2 | 23.3 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 400 | 0.00 | 0.00 | 84.35 | 87.13 | 10.98 | 1.38 | 38.5 | 19.9 | 100.00 | 100.00 | 5.2 | | |
| 20 | 500 | 0.00 | 0.00 | 86.48 | 89.30 | 3.59 | 0.37 | 33.2 | 16.5 | 100.00 | 100.00 | 4.8 | | |
| 20 | 600 | 0.00 | 0.00 | 88.94 | 90.41 | 1.28 | 0.34 | 27.2 | 14.8 | 100.00 | 100.00 | 4.6 | | |
| 20 | 700 | 0.00 | 0.00 | 91.29 | 91.46 | 0.38 | 0.32 | 21.4 | 13.2 | 100.00 | 100.00 | 4.5 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 7. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 6. (excerpted from Appendix Table A-7).

| Zone 6 | Lehew | | Percent Sand, Silt, and Clay: | | 49,31,20 | Hydrologic Soil Group: | | | C | | Erodibility (K): .24 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10) | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.45 | 0.75 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 89.84 | 91.12 | 1.14 | 0.38 | 0.0 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 67 | 0.00 | 0.00 | 83.75 | 85.77 | 2.75 | 1.70 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 91.98 | 92.98 | 1.12 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 71.59 | 78.38 | 2.76 | 1.71 | 0.1 | 0.0 | 81.82 | 90.00 | 4.7 | | |
| 0 | 40 | 0.01 | 0.00 | 80.32 | 83.55 | 2.76 | 1.71 | 0.1 | 0.0 | 90.91 | 100.00 | 4.7 | | |
| 0 | 100 | 0.00 | 0.00 | 85.48 | 87.05 | 2.75 | 1.58 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 88.17 | 89.79 | 2.36 | 0.71 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 90.73 | 92.10 | 1.61 | 0.36 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 95.06 | 94.92 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 96.45 | 96.48 | 0.34 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 3.6 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.85 | 0.78 | | | 9.99 | 5.30 | 1.7 | 0.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.31 | 0.51 | 91.53 | 88.87 | 14.50 | 9.55 | 2.2 | 1.7 | 96.58 | 94.12 | 5.4 | eff | std |
| 5 | 250 | 0.02 | 0.00 | 94.27 | 96.14 | 10.10 | 1.49 | 1.5 | 0.6 | 99.78 | 100.00 | 5.1 | all | std |
| 5 | 100 | 0.32 | 0.06 | 91.28 | 93.72 | 14.23 | 9.19 | 2.3 | 1.0 | 96.47 | 99.31 | 5.4 | | |
| 5 | 200 | 0.14 | 0.00 | 93.15 | 95.63 | 13.07 | 3.46 | 1.8 | 0.7 | 98.45 | 100.00 | 5.3 | | |
| 5 | 300 | 0.00 | 0.00 | 95.15 | 96.54 | 6.65 | 0.50 | 1.3 | 0.5 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 97.35 | 97.60 | 0.84 | 0.32 | 0.7 | 0.4 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 98.14 | 98.25 | 0.35 | 0.28 | 0.5 | 0.3 | 100.00 | 100.00 | 3.8 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.98 | 1.84 | | | 11.09 | 5.98 | 4.0 | 2.0 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 94.86 | 96.52 | 9.24 | 1.28 | 3.2 | 1.3 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 10 | 100 | 0.81 | 0.58 | 91.46 | 92.27 | 17.01 | 10.98 | 5.3 | 2.9 | 96.27 | 97.25 | 5.5 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 95.25 | 96.85 | 9.10 | 0.38 | 3.0 | 1.2 | 100.00 | 100.00 | 5.1 | all | std |
| 10 | 67 | 1.86 | 0.86 | 86.92 | 90.99 | 17.08 | 11.05 | 8.1 | 3.4 | 91.44 | 95.92 | 5.5 | | |
| 10 | 200 | 0.34 | 0.00 | 93.56 | 95.97 | 14.98 | 4.48 | 4.0 | 1.5 | 98.44 | 100.00 | 5.4 | | |
| 10 | 500 | 0.00 | 0.00 | 97.48 | 97.76 | 0.75 | 0.32 | 1.6 | 0.8 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 98.20 | 98.34 | 0.35 | 0.28 | 1.1 | 0.6 | 100.00 | 100.00 | 3.7 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.12 | 6.78 | | | 13.44 | 7.55 | 14.0 | 7.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.72 | 0.00 | 93.89 | 95.16 | 17.15 | 10.88 | 12.0 | 5.7 | 98.92 | 100.00 | 5.5 | eff | std |
| 20 | 250 | 0.05 | 0.00 | 94.78 | 96.48 | 13.95 | 3.44 | 10.3 | 4.2 | 99.92 | 100.00 | 5.3 | all | std |
| 20 | 200 | 0.59 | 0.00 | 94.10 | 95.91 | 15.48 | 8.76 | 11.6 | 4.8 | 99.11 | 100.00 | 5.5 | | |
| 20 | 300 | 0.00 | 0.00 | 95.31 | 96.88 | 10.26 | 1.17 | 9.2 | 3.7 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 97.42 | 97.76 | 0.80 | 0.33 | 5.1 | 2.6 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 98.17 | 98.36 | 0.35 | 0.28 | 3.6 | 1.9 | 100.00 | 100.00 | 3.7 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 6. (excerpted from Appendix Table A-7).

Zone 6: Shouns | Percent Sand, Silt, and Clay: 17,53,30 | Hydrologic Soil Group: B | Erodibility (K): .28

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.00 | | | 0.95 | 0.41 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 82.77 | 84.69 | 0.77 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 5.1 | all | 6/4 |
| 0 | 100 | 0.00 | 0.00 | 72.94 | 77.79 | 2.37 | 1.14 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 300 | 0.00 | 0.00 | 84.61 | 86.17 | 0.97 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.01 | 0.01 | 55.97 | 61.15 | 2.40 | 1.39 | 0.1 | 0.1 | 88.89 | 87.50 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 69.00 | 74.53 | 2.39 | 1.33 | 0.1 | 0.0 | 88.89 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 79.56 | 82.99 | 1.85 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 90.62 | 90.73 | 0.36 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 4.0 | | |
| 0 | 700 | 0.00 | 0.00 | 93.15 | 93.43 | 0.32 | 0.24 | 0.0 | 0.0 | 100.00 | 100.00 | 3.1 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.81 | 0.70 | | | 6.71 | 2.90 | 1.3 | 0.5 | | | | | |
| 5 | 200 | 0.06 | 0.00 | 90.35 | 93.36 | 6.95 | 0.97 | 2.6 | 1.0 | 99.37 | 100.00 | 5.7 | all | 10/6 |
| 5 | 40 | 0.49 | 0.21 | 82.20 | 87.07 | 13.18 | 8.09 | 4.7 | 1.9 | 94.81 | 97.64 | 5.3 | eff | std |
| 5 | 250 | 0.05 | 0.00 | 90.62 | 94.14 | 5.82 | 0.38 | 2.5 | 0.9 | 99.47 | 100.00 | 4.9 | all | std |
| 5 | 67 | 0.46 | 0.21 | 83.17 | 87.03 | 13.06 | 8.20 | 4.5 | 1.9 | 95.13 | 97.64 | 5.2 | | |
| 5 | 100 | 0.35 | 0.11 | 84.92 | 88.99 | 12.99 | 6.88 | 4.0 | 1.6 | 96.30 | 98.77 | 5.2 | | |
| 5 | 200 | 0.15 | 0.00 | 88.79 | 93.29 | 9.48 | 1.18 | 3.0 | 1.0 | 98.41 | 100.00 | 5.1 | | |
| 5 | 300 | 0.00 | 0.00 | 92.16 | 94.93 | 3.97 | 0.35 | 2.1 | 0.8 | 100.00 | 100.00 | 4.8 | | |
| 5 | 500 | 0.00 | 0.00 | 95.94 | 96.20 | 0.37 | 0.29 | 1.1 | 0.6 | 100.00 | 100.00 | 4.2 | | |
| 5 | 700 | 0.00 | 0.00 | 96.95 | 97.22 | 0.33 | 0.25 | 0.8 | 0.4 | 100.00 | 100.00 | 3.3 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.95 | 1.70 | | | 7.63 | 3.33 | 3.1 | 1.2 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 92.25 | 94.88 | 2.58 | 0.37 | 5.0 | 1.8 | 100.00 | 100.00 | 5.4 | all | 12/8 |
| 10 | 67 | 1.03 | 0.39 | 84.54 | 89.28 | 15.35 | 9.55 | 9.9 | 3.9 | 95.59 | 98.27 | 5.5 | eff | std |
| 10 | 250 | 0.13 | 0.00 | 91.28 | 94.88 | 7.94 | 0.37 | 5.6 | 1.8 | 99.44 | 100.00 | 5.0 | all | std |
| 10 | 100 | 0.92 | 0.60 | 85.62 | 87.72 | 15.19 | 9.59 | 9.2 | 4.4 | 96.06 | 97.33 | 5.3 | | |
| 10 | 200 | 0.34 | 0.00 | 89.62 | 94.12 | 13.08 | 1.20 | 6.6 | 2.1 | 98.54 | 100.00 | 5.5 | | |
| 10 | 300 | 0.00 | 0.00 | 92.78 | 95.27 | 3.06 | 0.35 | 4.6 | 1.7 | 100.00 | 100.00 | 4.8 | | |
| 10 | 500 | 0.00 | 0.00 | 96.15 | 96.57 | 0.37 | 0.29 | 2.5 | 1.2 | 100.00 | 100.00 | 4.2 | | |
| 10 | 700 | 0.00 | 0.00 | 97.11 | 97.47 | 0.32 | 0.25 | 1.8 | 0.9 | 100.00 | 100.00 | 3.3 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.46 | 6.91 | | | 9.85 | 4.66 | 11.1 | 4.8 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 1.62 | 0.00 | 88.08 | 91.95 | 14.75 | 8.89 | 24.1 | 9.2 | 97.72 | 100.00 | 5.4 | eff | std |
| 20 | 250 | 0.85 | 0.00 | 90.47 | 94.93 | 9.35 | 0.99 | 19.3 | 5.8 | 98.80 | 100.00 | 5.1 | all | std |
| 20 | 200 | 1.08 | 0.00 | 89.53 | 93.43 | 13.87 | 3.68 | 21.2 | 7.5 | 98.48 | 100.00 | 5.3 | | |
| 20 | 300 | 0.00 | 0.00 | 92.54 | 95.49 | 5.75 | 0.37 | 15.1 | 5.1 | 100.00 | 100.00 | 4.9 | | |
| 20 | 500 | 0.00 | 0.00 | 96.06 | 96.67 | 0.37 | 0.30 | 8.0 | 3.8 | 100.00 | 100.00 | 4.2 | | |
| 20 | 700 | 0.00 | 0.00 | 97.08 | 97.52 | 0.32 | 0.25 | 5.9 | 2.8 | 100.00 | 100.00 | 3.3 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged) (Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency (((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio (((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass the Criteria noted

Minimum Size Criteria:

no tune= no adjustment in the outlet structure was required

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis for Zone 6. (excerpted from Appendix Table A-7).

| Zone 6 | Talbott | | Percent Sand, Silt, and Clay: | | | 2,23,75 | Hydrologic Soil Group: | | | C | | Erodibility (K): .24 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10) | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.45 | 0.75 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 56.60 | 60.50 | 1.14 | 0.38 | 0.1 | 0.1 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 20 | 0.00 | 0.00 | 45.79 | 45.59 | 2.76 | 1.71 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 62.34 | 66.02 | 1.12 | 0.34 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 100 | 0.00 | 0.00 | 48.26 | 49.48 | 2.75 | 1.58 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 52.41 | 56.51 | 2.36 | 0.71 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 58.63 | 63.33 | 1.61 | 0.36 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 73.24 | 72.69 | 0.38 | 0.30 | 0.1 | 0.1 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 78.79 | 79.04 | 0.34 | 0.27 | 0.1 | 0.0 | 100.00 | 100.00 | 3.6 | | |
| 0 | 67 | 0.00 | 0.00 | 47.09 | 47.36 | 2.75 | 1.70 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.70 | 0.63 | | | 9.99 | 5.30 | 1.7 | 0.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.00 | 79.12 | 78.81 | 14.50 | 9.55 | 5.5 | 3.3 | 100.00 | 100.00 | 5.4 | eff | std |
| 5 | 250 | 0.00 | 0.00 | 81.81 | 84.21 | 10.10 | 1.49 | 4.8 | 2.5 | 100.00 | 100.00 | 5.1 | all | std |
| 5 | 100 | 0.00 | 0.00 | 79.66 | 80.34 | 14.23 | 9.19 | 5.4 | 3.1 | 100.00 | 100.00 | 5.4 | | |
| 5 | 200 | 0.00 | 0.00 | 80.95 | 82.81 | 13.07 | 3.46 | 5.0 | 2.7 | 100.00 | 100.00 | 5.3 | | |
| 5 | 300 | 0.00 | 0.00 | 82.79 | 85.65 | 6.65 | 0.50 | 4.5 | 2.2 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 88.19 | 88.99 | 0.84 | 0.32 | 3.1 | 1.7 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 91.09 | 91.38 | 0.35 | 0.28 | 2.3 | 1.3 | 100.00 | 100.00 | 3.8 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.64 | 1.52 | | | 11.09 | 5.98 | 4.0 | 2.0 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 83.17 | 85.85 | 9.24 | 1.28 | 10.5 | 5.3 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 10 | 67 | 0.01 | 0.00 | 80.50 | 80.73 | 17.08 | 11.05 | 12.1 | 7.2 | 99.95 | 100.00 | 5.5 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 84.01 | 87.08 | 9.10 | 0.38 | 10.0 | 4.8 | 100.00 | 100.00 | 5.1 | all | std |
| 10 | 200 | 0.00 | 0.00 | 82.35 | 84.50 | 14.98 | 4.48 | 11.0 | 5.8 | 100.00 | 100.00 | 5.4 | | |
| 10 | 100 | 0.00 | 0.00 | 81.01 | 81.21 | 17.01 | 10.98 | 11.8 | 7.0 | 100.00 | 100.00 | 5.5 | | |
| 10 | 500 | 0.00 | 0.00 | 89.04 | 89.92 | 0.75 | 0.32 | 6.8 | 3.8 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 91.62 | 92.07 | 0.35 | 0.28 | 5.2 | 3.0 | 100.00 | 100.00 | 3.7 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 6.05 | 5.76 | | | 13.44 | 7.55 | 14.0 | 7.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.00 | 0.00 | 81.55 | 82.90 | 17.15 | 10.88 | 36.3 | 20.2 | 100.00 | 100.00 | 5.5 | eff | std |
| 20 | 250 | 0.00 | 0.00 | 83.08 | 85.63 | 13.95 | 3.44 | 33.3 | 17.0 | 100.00 | 100.00 | 5.3 | all | std |
| 20 | 100 | 0.00 | 0.00 | 80.64 | 82.29 | 17.02 | 10.99 | 38.1 | 21.0 | 100.00 | 100.00 | 5.5 | | |
| 20 | 200 | 0.00 | 0.00 | 82.25 | 84.16 | 15.48 | 8.76 | 34.9 | 18.7 | 100.00 | 100.00 | 5.5 | | |
| 20 | 300 | 0.00 | 0.00 | 83.86 | 86.98 | 10.26 | 1.17 | 31.8 | 15.4 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 88.75 | 90.03 | 0.80 | 0.33 | 22.1 | 11.8 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 91.43 | 92.15 | 0.35 | 0.28 | 16.9 | 9.3 | 100.00 | 100.00 | 3.7 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)

(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency

(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio

(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass

the Criteria noted

Minimum Size Criteria:

no tune= no adjustment in the outlet structure was required

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

outlet structure effects, and use of the Detailed Evaluation Tables. Unless otherwise noted, the results discussed refer to the 10-year storm evaluations, since this consistently controlled the pond performance characteristics.

## Predisturbed/Disturbed Performance Comparison

The Efficiency Criteria conditions of 90 percent TE or 95 percent VRR were by necessity developed prior to the Zone/soil evaluations. The rationale used for formulation of the TE and VRR values (see Chapter 3) was based on a combination of what sediment removal might reasonably be achieved in a conventional sediment detention pond and what sediment removal would approximate predisturbed conditions. The amount of sediment removal reasonably achievable is discussed in the section on the Range of Pond Size Performance below. The sediment removal approximation of predisturbed conditions is best examined by a comparison of the predisturbed and Efficiency Criteria pond size sediment loads for the Tables 6 and 7 soils. Note that the minimum pond size with standard outlet structure designated as meeting the Efficiency Criteria corresponds to the Basic Evaluation pond size.

Comparison of Tables 6 and 7 regarding tons of sediment discharged for the predisturbed and evaluated pond size conditions generally demonstrates that duplication of predisturbed effluent sediment load is not achieved. For this comparison, the 0 percent slope values are ignored because the quantities are too small to assess (see discussion of the 0 percent slope anomaly in Basic Evaluation section). For the Tables 6 and 7 "Tons Out" (10-year storm) values designated as meeting the Efficiency Criteria, it can be seen that the corresponding predisturbed "Tons Out" value is generally higher. This disparity is particularly noticeable for the Zone 1 and Zone 6 high clay Talbott soil. (Reasons for this are discussed in the Basic Evaluation section.) For example, at the 5 percent slope case the 10-year storm effluent sediment load for the pond size meeting the Efficiency Criteria is about 3 times the predisturbed value. On the other hand, the high sand soils of Zone 1 and Zone 6, respectively Boswell and Lehew, for the same case only exceed predisturbed effluent by about one fourth. Table 8 puts this disparity into perspective. In this table, the predisturbed effluent sediment in tons is given for Zones 1 and 6 slope/soil cases (10-year storm), along with the designated Efficiency Criteria and pond sizes. Also included in the table is the influent tons of sediment (derived from the TE and tons of sediment out) and the VRR. When the effluent sediment is viewed relative to the influent tonnage, it is seen that the amount removed represents a substantial improvement.

Addition of the Flow Criteria to the pond size requirement not only replicates predisturbed peak discharge rates but generally provides sediment removals more closely approaching the predisturbed effluent load. This is particularly applicable to the high clay content Talbott soil evaluations of Zones 1 and 6 as seen in Tables 6 and 7, since they require smaller pond sizes to meet the Efficiency Criteria. Such small pond sizes must be enlarged substantially to meet the additional Flow Criteria and, thus, coincidentally provide some additional sediment removal.

The effluent sediment for the minimum pond sizes meeting both the Efficiency and Flow Criteria (10-year storm) are compared to the predisturbed values in Table 9. In this table, the predisturbed effluent in tons is given for Zones 1 and 6 slope/soil cases along with the designated Flow/Efficiency Criteria pond sizes (standard outlet structure) and their corresponding effluent. Also included in the table is the influent tons of sediment derived from the TE and tons of sediment out. It can be seen for the high sand soils (Boswell and Lehew) and the high silt soils (Grenada and Shouns) that effluent values approximate or meet the predisturbed values. The two Zone cases of the Talbott soil, for

Table 8. Comparison of sediment discharge for Efficiency Criteria Ponds and Predisturbed Conditions resulting from the Detailed Analysis. (modified from Appendix Table A-7).

| Zone 1 | Boswell | | Percent Sand, Silt, and Clay: | | 58,19,23 | Hydrologic Soil Group: | D | | Erodibility (K): | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10 | VWSS(10) | TE (10) | VRR (10) | QPeak (10) | Tons(10) | Tons (10) | Min Size | Adjusted |
| Percent | | ml/l in | ml/l out | | | cfs | entering | Disch. | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 2.21 | 0.0 | 0.0 | | |
| 0 | 67 | 0.13 | 0.00 | 81.87 | 100 | 3.60 | 0.6 | 0.1 | eff | std |
| 5 | PD | 1.02 | 1.02 | | | 14.68 | 3.1 | 3.1 | | |
| 5 | 67 | 10.59 | 0.36 | 90.60 | 97 | 19.01 | 41.5 | 3.9 | eff | std |
| 10 | PD | 2.37 | 2.37 | | | 16.15 | 7.2 | 7.2 | | |
| 10 | 100 | 25.11 | 0.56 | 92.04 | 98 | 21.26 | 95.5 | 7.6 | eff | std |
| 20 | PD | 9.32 | 9.32 | | | 18.77 | 24.6 | 24.6 | | |
| 20 | 200 | 75.00 | 0.24 | 93.77 | 100 | 21.23 | 303.4 | 18.9 | eff | std |

| Zone 1 | Grenada | | Percent Sand, Silt, and Clay: | | 4,78,18 | Hydrologic Soil Group: | C | | Erodibility (K): | 0.32 |
|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10 | VWSS(10) | TE (10) | VRR (10) | QPeak (10) | Tons(10) | Tons (10) | Min Size | Adjusted |
| Percent | | ml/l in | ml/l out | | | cfs | entering | Disch. | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.90 | 0.0 | 0.0 | | |
| 0 | 350 | 0.07 | 0.00 | 85.52 | 100 | 2.16 | 0.7 | 0.1 | eff | std |
| 5 | PD | 0.82 | 0.82 | | | 12.94 | 3.0 | 3.0 | | |
| 5 | 500 | 9.14 | 0.37 | 91.90 | 96 | 3.22 | 44.4 | 3.6 | eff/all | std |
| 10 | PD | 1.97 | 1.97 | | | 14.28 | 7.1 | 7.1 | | |
| 10 | 500 | 22.54 | 0.80 | 92.56 | 96 | 2.78 | 103.5 | 7.7 | eff/all | std |
| 20 | PD | 7.43 | 7.43 | | | 17.06 | 24.7 | 24.7 | | |
| 20 | 500 | 68.01 | 3.70 | 90.59 | 95 | 4.12 | 327.3 | 30.8 | eff/all | std |

| Zone 1 | Talbott | | Percent Sand, Silt, and Clay: | | 2,23,75 | Hydrologic Soil Group: | C | | Erodibility (K): | 0.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10 | VWSS(10) | TE (10) | VRR (10) | QPeak (10) | Tons(10) | Tons (10) | Min Size | Adjusted |
| Percent | | ml/l in | ml/l out | | | cfs | entering | Disch. | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.90 | 0.0 | 0.0 | | |
| 0 | 20 | 0.06 | 0.00 | 46.25 | 100 | 3.39 | 0.4 | 0.2 | eff | std |
| 5 | PD | 0.72 | 0.72 | | | 12.94 | 2.3 | 2.3 | | |
| 5 | 40 | 7.74 | 0.00 | 79.15 | 100 | 18.40 | 33.1 | 6.9 | eff | std |
| 10 | PD | 1.69 | 1.69 | | | 14.88 | 5.3 | 5.3 | | |
| 10 | 67 | 18.73 | 0.00 | 80.59 | 100 | 20.59 | 77.8 | 15.1 | eff | std |
| 20 | PD | 6.16 | 6.16 | | | 17.06 | 18.5 | 18.5 | | |
| 20 | 200 | 57.21 | 0.00 | 81.63 | 100 | 20.56 | 246.1 | 45.2 | eff | std |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 8 continued. Comparison of sediment discharge for Efficiency Criteria Ponds and Predisturbed Conditions resulting from the Detailed Analysis. (modified from Appendix Table A-7).

Zone 6 Lehew — Percent Sand, Silt, and Clay: 49,31,20 — Hydrologic Soil Group: C — Erodibility (K): .24

| Slope Percent | Psize | VWSS(10 ml/l in | VWSS(10) ml/l out | TE (10) | VRR (10) | QPeak (10) cfs | Tons(10) entering | Tons (10) Disch. | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.01 | | | 1.45 | 0.0 | 0.0 | | |
| 0 | 67 | 0.11 | 0.00 | 83.75 | 100 | 2.75 | 0.6 | 0.1 | eff | std |
| 5 | PD | 0.85 | 0.85 | | | 9.99 | 1.7 | 1.7 | | |
| 5 | 40 | 9.06 | 0.31 | 91.53 | 97 | 14.50 | 26.0 | 2.2 | eff | std |
| 10 | PD | 1.98 | 1.98 | | | 11.09 | 4.0 | 4.0 | | |
| 10 | 100 | 21.72 | 0.81 | 91.46 | 96 | 17.01 | 62.1 | 5.3 | eff | std |
| 20 | PD | 7.12 | 7.12 | | | 13.44 | 14.0 | 14.0 | | |
| 20 | 150 | 66.67 | 0.72 | 93.89 | 99 | 17.15 | 196.4 | 12.0 | eff | std |

Zone 6 Shouns — Percent Sand, Silt, and Clay: 17,53,30 — Hydrologic Soil Group: B — Erodibility (K): .28

| Slope Percent | Psize | VWSS(10 ml/l in | VWSS(10) ml/l out | TE (10) | VRR (10) | QPeak (10) cfs | Tons(10) entering | Tons (10) Disch. | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.01 | | | 0.95 | 0.0 | 0.0 | | |
| 0 | 100 | 0.09 | 0.00 | 72.94 | 100 | 2.37 | 0.4 | 0.1 | eff | std |
| 5 | PD | 0.81 | 0.81 | | | 6.71 | 1.3 | 1.3 | | |
| 5 | 40 | 9.44 | 0.49 | 82.20 | 95 | 13.18 | 26.4 | 4.7 | eff | std |
| 10 | PD | 1.95 | 1.95 | | | 7.63 | 3.1 | 3.1 | | |
| 10 | 67 | 23.36 | 1.03 | 84.54 | 96 | 15.35 | 64.0 | 9.9 | eff | std |
| 20 | PD | 7.46 | 7.46 | | | 9.85 | 11.1 | 11.1 | | |
| 20 | 150 | 71.05 | 1.62 | 88.08 | 98 | 14.75 | 202.2 | 24.1 | eff | std |

Zone 6 Talbott — Percent Sand, Silt, and Clay: 2,23,75 — Hydrologic Soil Group: C — Erodibility (K): .24

| Slope Percent | Psize | VWSS(10 ml/l in | VWSS(10) ml/l out | TE (10) | VRR (10) | QPeak (10) cfs | Tons(10) entering | Tons (10) Disch. | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 1.45 | 0.0 | 0.0 | | |
| 0 | 20 | 0.06 | 0.00 | 45.79 | 100 | 2.76 | 0.4 | 0.2 | eff | std |
| 5 | PD | 0.70 | 0.70 | | | 9.99 | 1.7 | 1.7 | | |
| 5 | 40 | 7.59 | 0.00 | 79.12 | 100 | 14.50 | 26.3 | 5.5 | eff | std |
| 10 | PD | 1.64 | 1.64 | | | 11.09 | 4.0 | 4.0 | | |
| 10 | 67 | 18.46 | 0.01 | 80.50 | 100 | 17.08 | 62.1 | 12.1 | eff | std |
| 20 | PD | 6.05 | 6.05 | | . | 13.44 | 14.0 | 14.0 | | |
| 20 | 150 | 56.44 | 0.00 | 81.55 | 100 | 17.15 | 196.7 | 36.3 | eff | std |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table 9. Comparison of Efficiency and Flow Criteria pond sizes resulting from the Detailed Analysis. (modified from Appendix Table A-7).

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Zone 1 | Boswell | Percent Sand, Silt, and Clay: | | 58,19,23 | Hydrologic Soil Group: D | | Erodibility (K): 0.28 | |
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 2.21 | | | 0.0 | | | |
| 0 | 67 | 3.60 | 81.87 | 1 | 0.1 | 4.8 | eff | std |
| 0 | 400 | 2.15 | 89.95 | 1 | 0.1 | 4.7 | all | std |
| 5 | PD | 14.68 | | | 3.1 | | | |
| 5 | 67 | 19.01 | 90.60 | 41 | 3.9 | 5.6 | eff | std |
| 5 | 250 | 15.36 | 93.03 | 42 | 2.9 | 5.5 | all | std |
| 10 | PD | 16.15 | | | 7.2 | | | |
| 10 | 100 | 21.26 | 92.04 | 95 | 7.6 | 5.6 | eff | std |
| 10 | 300 | 17.32 | 93.81 | 95 | 5.9 | 5.5 | all | std |
| 20 | PD | 18.77 | | | 24.6 | | | |
| 20 | 200 | 21.23 | 93.77 | 303 | 18.9 | 5.6 | eff | std |
| 20 | 350 | 16.19 | 94.41 | 302 | 16.9 | 5.5 | all | std |
| Zone 1 | Grenada | Percent Sand, Silt, and Clay: | | 4,78,18 | Hydrologic Soil Group: C | | Erodibility (K): .32 | |
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 1.90 | | | 0.0 | | | |
| 0 | 350 | 2.16 | 85.52 | 1 | 0.1 | 4.7 | eff | std |
| 0 | 400 | 1.74 | 88.18 | 1 | 0.1 | 4.6 | all | std |
| 5 | PD | 12.94 | | | 3.0 | | | |
| 5 | 500 | 3.22 | 91.90 | 44 | 3.6 | 4.8 | eff/all | std |
| 5 | 500 | 3.22 | 91.90 | 44 | 3.6 | 4.8 | all | std |
| 10 | PD | 14.28 | | | 7.1 | | | |
| 10 | 500 | 2.78 | 92.56 | 103 | 7.7 | 4.7 | eff/all | std |
| 10 | 500 | 2.78 | 92.56 | 103 | 7.7 | 4.7 | all | std |
| 20 | PD | 17.06 | | | 24.7 | | | |
| 20 | 500 | 4.12 | 90.59 | 327 | 30.8 | 4.8 | eff/all | std |
| 20 | 500 | 4.12 | 90.59 | 327 | 30.8 | 4.8 | all | std |
| Zone 1 | Talbott | Percent Sand, Silt, and Clay: | | 2,23,75 | Hydrologic Soil Group: C | | Erodibility (K): 0.24 | |
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 1.90 | | | 0.0 | | | |
| 0 | 20 | 3.39 | 46.25 | 0 | 0.2 | 4.8 | eff | std |
| 0 | 400 | 1.74 | 62.36 | 1 | 0.2 | 4.6 | all | std |
| 5 | PD | 12.94 | | | 2.3 | | | |
| 5 | 40 | 18.40 | 79.15 | 33 | 6.9 | 5.6 | eff | std |
| 5 | 300 | 12.56 | 81.90 | 33 | 6.0 | 5.2 | all | std |
| 10 | PD | 14.88 | | | 5.3 | | | |
| 10 | 67 | 20.59 | 80.59 | 78 | 15.1 | 5.6 | eff | std |
| 10 | 300 | 14.89 | 83.07 | 78 | 13.2 | 5.4 | all | std |
| 20 | PD | 17.06 | | | 18.5 | | | |
| 20 | 200 | 20.56 | 81.63 | 246 | 45.2 | 5.6 | eff | std |
| 20 | 300 | 16.31 | 82.84 | 246 | 42.2 | 5.5 | all | std |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

(10)= Performance for SCS Type II 24 hour 10 year storm

TE= Trapping Efficiency

(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event (same as tons entering for predisturbed)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass the Criteria noted

Minimum Size Criteria:

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Percent Sand, Silt, and Clay is the dispersed distribution

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18)

Table 9 continued. Comparison of Efficiency and Flow Criteria pond sizes resulting from the Detailed Analysis.

| Zone 6 | Lehew | Percent Sand, Silt, and Clay: | | 49,31,20 | Hydrologic Soil Group: C | | Erodibility (K): .24 | |
|---|---|---|---|---|---|---|---|---|
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 1.45 | | | 0.0 | | | |
| 0 | 67 | 2.75 | 83.75 | 1 | 0.1 | 4.7 | eff | std |
| 0 | 350 | 1.12 | 91.98 | 0 | 0.0 | 4.6 | all | std |
| 5 | PD | 9.99 | | | 1.7 | | | |
| 5 | 40 | 14.50 | 91.53 | 26 | 2.2 | 5.4 | eff | std |
| 5 | 250 | 10.10 | 94.27 | 26 | 1.5 | 5.1 | all | std |
| 10 | PD | 11.09 | | | 4.0 | | | |
| 10 | 100 | 17.01 | 91.46 | 62 | 5.3 | 5.5 | eff | std |
| 10 | 300 | 9.10 | 95.25 | 63 | 3.0 | 5.1 | all | std |
| 20 | PD | 13.44 | | | 14.0 | | | |
| 20 | 150 | 17.15 | 93.89 | 196 | 12.0 | 5.5 | eff | std |
| 20 | 250 | 13.95 | 94.78 | 197 | 10.3 | 5.3 | all | std |
| | | | | | | | | |
| Zone 6 | Shouns | Percent Sand, Silt, and Clay: | | 17,53,30 | Hydrologic Soil Group: B | | Erodibility (K): .28 | |
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 0.95 | | | 0.0 | | | |
| 0 | 100 | 2.37 | 72.94 | 0 | 0.1 | 4.7 | eff | std |
| 0 | 300 | 0.97 | 84.61 | 0 | 0.0 | 4.6 | all | std |
| 5 | PD | 6.71 | | | 1.3 | | | |
| 5 | 40 | 13.18 | 82.20 | 26 | 4.7 | 5.3 | eff | std |
| 5 | 250 | 5.82 | 90.62 | 27 | 2.5 | 4.9 | all | std |
| 10 | PD | 7.63 | | | 3.1 | | | |
| 10 | 67 | 15.35 | 84.54 | 64 | 9.9 | 5.5 | eff | std |
| 10 | 250 | 7.94 | 91.28 | 64 | 5.6 | 5.0 | all | std |
| 20 | PD | 9.85 | | | 11.1 | | | |
| 20 | 150 | 14.75 | 88.08 | 202 | 24.1 | 5.4 | eff | std |
| 20 | 250 | 9.35 | 90.47 | 203 | 19.3 | 5.1 | all | std |
| | | | | | | | | |
| Zone 6 | Talbott | Percent Sand, Silt, and Clay: | | 2,23,75 | Hydrologic Soil Group: C | | Erodibility (K): .24 | |
| Slope Percent | Psize | QPeak (10) cfs | TE (10) | Tons(10) entering | Tons(10) Disch. | Peak Elev.(10) | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 1.45 | | | 0.0 | | | |
| 0 | 20 | 2.76 | 45.79 | 0 | 0.2 | 4.7 | eff | std |
| 0 | 350 | 1.12 | 62.34 | 0 | 0.1 | 4.6 | all | std |
| 5 | PD | 9.99 | | | 1.7 | | | |
| 5 | 40 | 14.50 | 79.12 | 26 | 5.5 | 5.4 | eff | std |
| 5 | 250 | 10.10 | 81.81 | 26 | 4.8 | 5.1 | all | std |
| 10 | PD | 11.09 | | | 4.0 | | | |
| 10 | 67 | 17.08 | 80.50 | 62 | 12.1 | 5.5 | eff | std |
| 10 | 300 | 9.10 | 84.01 | 63 | 10.0 | 5.1 | all | std |
| 20 | PD | 13.44 | | | 14.0 | | | |
| 20 | 150 | 17.15 | 81.55 | 197 | 36.3 | 5.5 | eff | std |
| 20 | 250 | 13.95 | 83.08 | 197 | 33.3 | 5.3 | all | std |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

(10)= Performance for SCS Type II 24 hour 10 year storm

TE= Trapping Efficiency

(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event (same as tons entering for predisturbed)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass

the Criteria noted

Minimum Size Criteria:

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Percent Sand, Silt, and Clay is the dispersed distribution

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18) reasons discussed in the Basic Evaluation, show improvement over the Efficiency Criteria pond size of Table 8 but still depart from the predisturbed effluent target.

## Basic Evaluation and Detailed Evaluation Comparison

The differences between the resulting trapping efficiencies for the Basic and Detailed Evaluation have been discussed in the previous section. The pond size differences resulting from the application of both the Efficiency and Flow Criteria are discussed here for the ponds having the standard outlet structure. Tuned ponds are discussed in the section by that name below.

As seen in Tables 6 and 7, when both the Flow Criteria and Efficiency Criteria are applied, the requirements of peak discharge attenuation force a larger pond size in every case except the high silt content Grenada soil series of Zone 1. The slowly settling Grenada soil required extraordinarily large pond sizes to meet the Efficiency Criteria, thus providing sufficient storage to attenuate peak flow, without increase in pond volume. A comparison is made in Table 10 for the 10-year storm between the pond sizes meeting the Efficiency Criteria (Basic Evaluation) and the pond sizes meeting both the Efficiency and Flow Criteria. The average increase in pond volume required for each Zone/soil class ranges from 4 percent for the Zone 1 Grenada to 737 percent for the Zone 1 Talbott. The high clay Talbott would be expected, as discussed above in the Basic Evaluation section, to have the biggest increase in pond size requirement since the volume required for sediment removal alone was small. The high sand content Zone 1 Lehew and Zone 6 Boswell soil have their Zone/soil average pond size differences of 361 percent and 404 percent, respectively, lying between the high silt and high clay soils. This is probably more due to the intermediate level of aggregation achieved by the silt/clay content combination

Table 10. Percent difference comparison of Efficiency and Flow Criteria pond sizes resulting from the Detailed Analysis. (modified from Appendix Table A-7).

Zone 1
Boswell | Percent Sand, Silt, and Clay: 58,19,23 | HSG: D | Brodibility (K): 0.28

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 67 | eff | std | |
| 0 | 400 | all | std | 597 |
| 5 | 67 | eff | std | |
| 5 | 250 | all | std | 373 |
| 10 | 100 | eff | std | |
| 10 | 300 | all | std | 300 |
| 20 | 200 | eff | std | |
| 20 | 350 | all | std | 175 |

Average difference for group= 361

Zone 6
Lehew | Percent Sand, Silt, and Clay: 49,31,20 | HSG: C | Brodibility (K): .24

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 67 | eff | std | |
| 0 | 350 | all | std | 522 |
| 5 | 40 | eff | std | |
| 5 | 250 | all | std | 625 |
| 10 | 100 | eff | std | |
| 10 | 300 | all | std | 300 |
| 20 | 150 | eff | std | |
| 20 | 250 | all | std | 167 |

Average difference for group= 404

Zone 1
Grenada | Percent Sand, Silt, and Clay: 4,78,18 | HSG: C | Brodibility (K): .32

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 350 | eff | std | |
| 0 | 400 | all | std | 114 |
| 5 | 500 | eff/all | std | |
| 5 | 500 | all | std | 100 |
| 10 | 500 | eff/all | std | |
| 10 | 500 | all | std | 100 |
| 20 | 500 | eff/all | std | |
| 20 | 500 | all | std | 100 |

Average difference for group= 104

Zone 6
Shouns | Percent Sand, Silt, and Clay: 17,53,30 | HSG: B | Brodibility (K): .28

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 100 | eff | std | |
| 0 | 300 | all | std | 300 |
| 5 | 40 | eff | std | |
| 5 | 250 | all | std | 625 |
| 10 | 67 | eff | std | |
| 10 | 250 | all | std | 373 |
| 20 | 150 | eff | std | |
| 20 | 250 | all | std | 167 |

Average difference for group= 366

Zone 1
Talbott | Percent Sand, Silt, and Clay: 2,23,75 | HSG: C | Brodibility (K): 0.24

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 20 | eff | std | |
| 0 | 400 | all | std | 2000 |
| 5 | 40 | eff | std | |
| 5 | 300 | all | std | 750 |
| 10 | 67 | eff | std | |
| 10 | 300 | all | std | 448 |
| 20 | 200 | eff | std | |
| 20 | 300 | all | std | 150 |

Average difference for group= 837

Zone 6
Talbott | Percent Sand, Silt, and Clay: 2,23,75 | HSG: C | Brodibility (K): .24

| Slope Percent | Psize | Min Size Criteria | Adjusted Outlet | Percent Difference |
|---|---|---|---|---|
| 0 | 20 | eff | std | |
| 0 | 350 | all | std | 1750 |
| 5 | 40 | eff | std | |
| 5 | 250 | all | std | 625 |
| 10 | 67 | eff | std | |
| 10 | 300 | all | std | 448 |
| 20 | 150 | eff | std | |
| 20 | 250 | all | std | 167 |

Average difference for group= 747

Key to Abbreviations:
Percent Difference= (all pond size/ eff pond size)* 100
Psize= Cubic yards storage per acre drainage area
HSG= Hydrologic Soil Group (SCS)
Min. Size Criteria= Minimum Pond Size Required to pass the Criteria noted
Minimum Size Criteria:
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met
Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)
Percent Sand, Silt, and Clay is the dispersed distribution

than the large sand fraction present (by the logic presented in the Basic Evaluation section).

General observations of regional and slope effects on the evaluation results should be mentioned. As can be seen in Tables 6 and 7 for the Talbott soil series, the largest volumes for pond sizes meeting both the Efficiency and Flow Criteria requirements occur in Zone 1. Zone 6 pond sizes for the Talbott soil are somewhat smaller (about 17 percent smaller). This is representative of a general trend as the Zone numbers increase across Tennessee from West to East. In discussion of the Basic Evaluation, which does not address peak flow attenuation, this trend was noted. The addition of peak flow attenuation via the Flow Criteria has enhanced this trend. This would be expected, since peak discharge is influenced strongly by precipitation and the difference in rainfall is almost 1 inch (see Figure 1). The second observation is that an increase in pond size is more distinct between slope cases for a given soil (see Table 10) when both Criteria are considered. In the Basic Evaluation, it was mentioned that the annual sediment accumulation criterion of the Efficiency Criteria controlled the pond size for many of the low slope cases. In no case did a pond size meeting the Flow Criteria need to be increased in volume to accommodate annual sediment accumulation. Since the peak discharge increases with slope, it would be expected that the addition of the Flow Criteria would make estimated pond sizes grow with increasing slope.

## Range of Pond Size Performance

Thus far, this Detailed Evaluation discussion has dealt with pond sizes which meet the Flow and/or Efficiency Criteria. The Detailed Evaluation, as seen in Tables 6 and 7, also addresses a range of pond sizes whose performance is inferior and superior to the

Criteria requirements. The range of performance of these pond sizes can be examined in the scatter plots of Figures 2 to 4 of the Zone 1 Detailed Evaluations for the 10-year storm event. The plots are given in pond volume /acre drainage area versus TE. Included in the plotted values are designations for the minimum pond size meeting the Efficiency Criteria with the standard outlet geometry and the minimum pond size meeting the Flow and Efficiency Criteria with the standard outlet geometry. The tuned outlet results, omitted here for clarity, are addressed separately in the section by that name below. The range of pond size values resulting from the standard outlet geometry are discussed here including: change of TE over pond size range and disparities between the 0, 5, 10, and 20 percent slopes results.

The plot points of Figures 2 to 4 generally form a smooth curve of decreasing slope as the pond size increases. This is in agreement with the literature such as Barfield and others (1987) citing Brune's method. The ramification of this characteristic curve is significant to the practical limits of sediment removal. For example, with the Grenada soil on a 5 percent slope, a 25 percent increase in pond volume from 400 cubic yards per acre to 500 cubic yards per acre improves the TE about 6 percent. A further 40 percent increase in pond volume from 500 to 700 cubic yards per acre achieves a TE improvement of still only about 6 percent. This fortifies the use of the 90 percent TE value used in the Efficiency Criteria as a practical limit to how much sediment removal can be reasonably achieved in a conventional sediment detention pond.

The previously discussed differences in the settling characteristics of the high clay soils (Figure 4 for Zone 1 Talbott) and the high silt soil (Figure 3 for the Zone 1 Grenada) are also reflected in the plots. The slope of the Talbott example is less steep and, therefore, yields less sediment removal for increased pond sizes than the Grenada soil. The high clay residuals remain in effective suspension while increased volume (translating

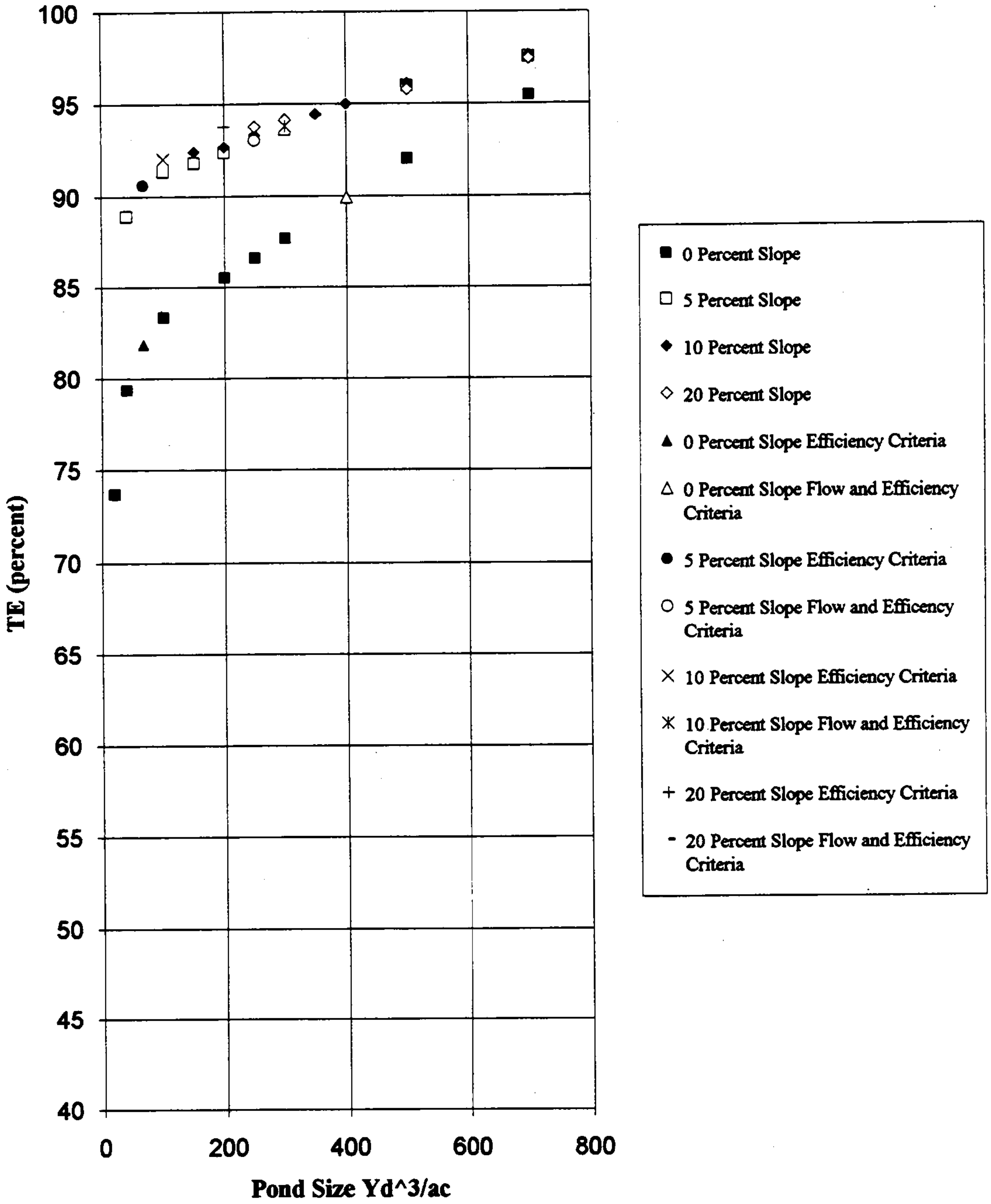



Figure 2. Trapping Efficiency (TE) versus pond size (cubic yards per acre drainage area, (Yd^3/ac)) for Boswell soil (high sand). Zone 1 Detailed Evaluation for 10 year storm using the Standard outlet structure.

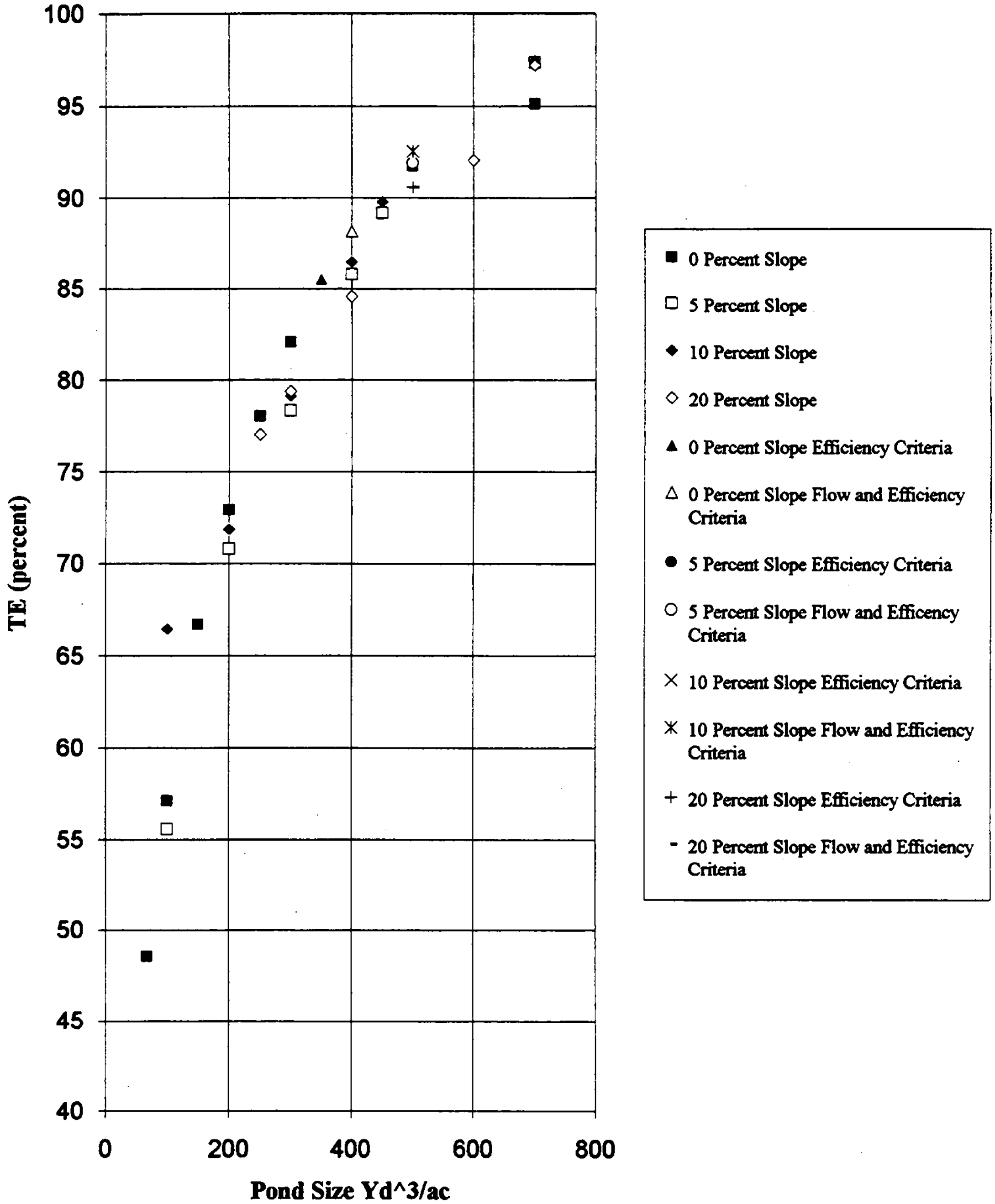



Figure 3. Trapping Efficiency (TE) versus pond size (cubic yards per acre drainage area, (Yd^3/ac)) for Grenada soil (high silt). Zone 1 Detailed Evaluation for 10 year storm using the Standard outlet structure.

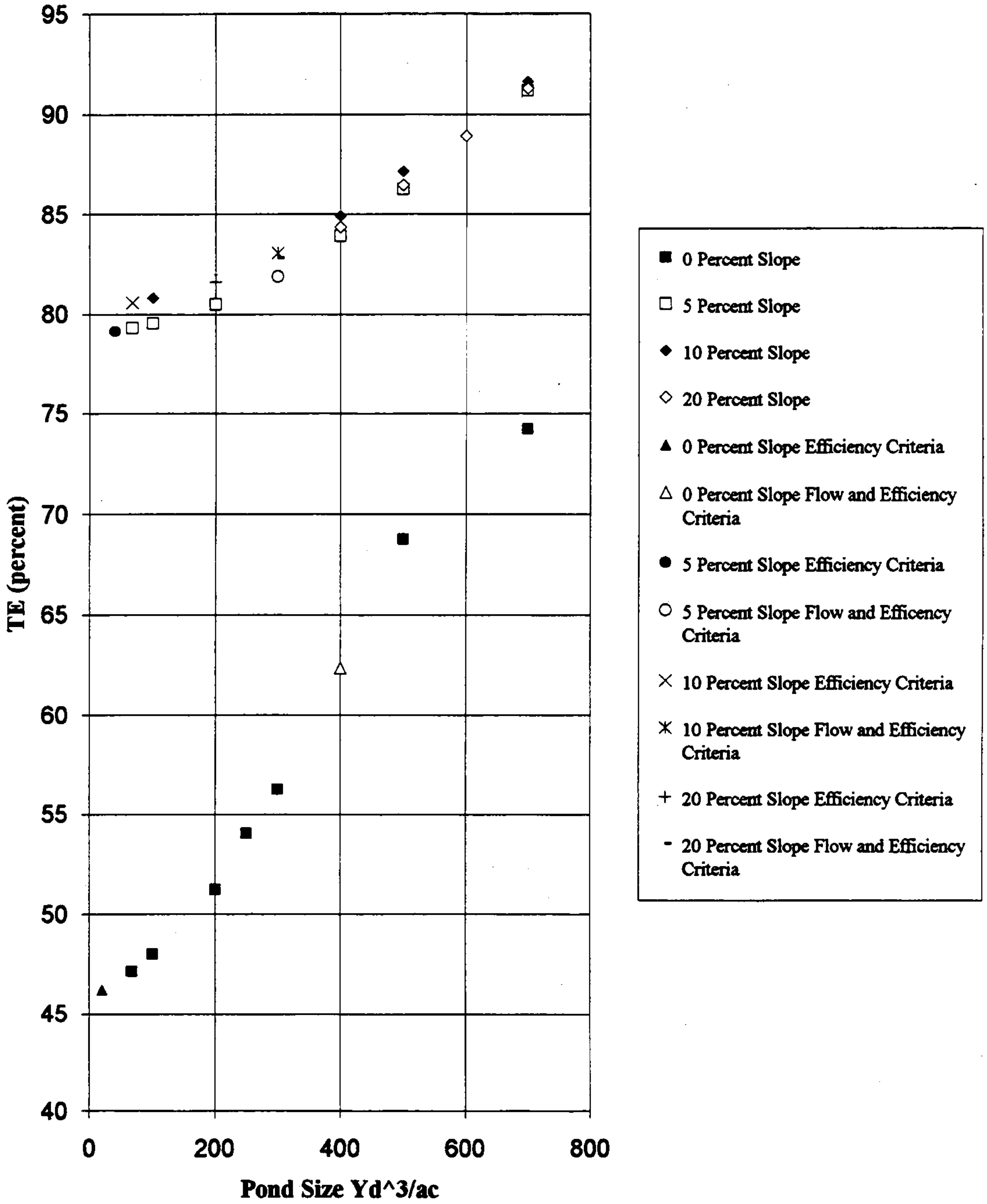



Figure 4. Trapping Efficiency (TE) versus pond size (cubic yards per acre drainage area, (Yd^3/ac)) for Talbott soil (high clay). Zone 1 Detailed Evaluation for 10 year storm using the Standard outlet structure.

into increased detention time) for the high silt soils allows settling to continue. Even with this pronounced difference, both soil types show a significant diminishing return in TE from increased pond size above the approximate 90 percent TE level.

A distinct difference in location of the Figure 2 and 4 plot points (Boswell and Talbott) are observable between the 0 percent slopes compared to 5, 10, and 20 percent slopes while such a difference does not exist for the Figure 3 Grenada soil. Anomalies for the 0 percent slope cases have already been previously mentioned. An additional possible explanation for this difference lies in the fact that the annual accumulated sediment for the steeper slope constitutes a large fraction of the original pond volume for the higher slope cases, while no significant sediment accumulates at the 0 percent slope case. This would reduce the pond depth and decrease the fall distance for the particles in the higher slope cases. With the decreased fall distance, some improvement in TE will be realized. The more quickly settling high sand Boswell and high clay Talbott stand to benefit more from this shallower pond depth occurring with the higher slopes than would apply to the more slowly settling high silt Grenada soil. This could explain why a gap is seen for the Boswell and Talbott soils for the 0 percent slope case, while such is not present for the Grenada soil.

## Tuned Outlet Structure Effects

It is possible to achieve peak flow attenuation and satisfactory sediment removal with the standard outlet structure if the pond size is made big enough. Tuning of the outlet structure, however, can reduce the pond size requirements with about the same pond performance. Tuning, as described in Chapter 3, involves the adjustment (always smaller in this research) of the drop inlet and barrel diameters so as to maximize the surcharge of influent within the pond volume between the riser (drop inlet) crest and the crest of the emergency spillway. Failure to use this available volume negatively impacts both the settling efficiency and peak flow attenuation. Full use of this available volume increases detention time which allows improved sediment removal and reduces the peak discharge. For the Basic Evaluation, size choices for ponds meeting the Efficiency Criteria were under the constraint of its performance using the standard outlet structure only. For the Detailed Evaluation, pond sizes passing both the Efficiency and Flow Criteria were further iterated with tuned outlet structures to use the entire pond storage (with the 10-year storm conditions controlling). The general effects of tuning can be viewed by comparison of pond size values (10-year storm) passing both Criteria using the standard and tuned outlet structures with the TE as shown in Table 11 for Zones 1 and 6. Also included in Table 11 are the associated peak elevation and peak discharge values.

Overall, tuning results in smaller pond sizes for about the same TE and satisfactory criteria peak flow attenuation. The amount of reduction in pond sizes is not consistent. The probable reason for this is that the evaluation process utilized set increments of increasing pond size from the established pond configurations (see Chapter 3). If the standard outlet structure almost met criteria conditions at a smaller pond increment, the next larger pond size required would effectively produce an "oversized pond". The optimum tuned structure dimensions could override this "oversizing" disparity by utilizing the entire available pond volume. The result would be a larger volume difference between the Criteria passing standard and tuned outlet structure evaluations.

Additionally, Table 11 gives (for the 10-year storm) the percent difference between standard and tuned pond sizes values along with the average percent difference for the Zone 1 and 6 examples for the 10-year storm. Also shown on the Table for reference is the pond size meeting the Efficiency Criteria (Basic Evaluation pond size). Between the

| Table 11. Percent difference comparison of tuned and standard outlet structure pond sizes resulting from the Detailed Analysis. (modified from Appendix Table A-7). | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | See Note Below on "no tune" | | | | | | | | | | | | | | |
| Zone 1 | | | | | | | | Zone 6 | | | | | | | |
| Boswell | Percent Sand, Silt, and Clay: | | | 58,19,23 | HSG: D | Brodibility (K): 0.28 | | Lehew | Percent Sand, Silt, and Clay: | | | 49,31,20 | HSG: C | Brodibility (K): .24 | |
| Slope | Psize | Min Size | Adjusted | Percent | | | TB | Slope | Psize | Min Size | Adjusted | Percent | | | TB |
| Percent | | Criteria | Outlet | Difference | | | | Percent | | Criteria | Outlet | Difference | | | |
| 0 | 300 | all | 10/6 | | | | 87.94 | 0 | 250 | all | 6/4 | | | | 89.84 |
| 0 | 400 | all | std | 133 | | | 89.95 | 0 | 350 | all | std | 140 | | | 91.98 |
| 5 | 250 | no tune | std | | Average difference | | 93.03 | 5 | 250 | no tune | std | | Average difference | | 94.27 |
| 5 | 250 | all | std | 100 | for group= | 108 | 93.03 | 5 | 250 | all | std | 100 | for group= | 115 | 94.27 |
| 10 | 300 | no tune | std | | | | 93.81 | 10 | 250 | all | 18/12 | | | | 94.86 |
| 10 | 300 | all | std | 100 | | | 93.81 | 10 | 300 | all | std | 120 | | | 95.25 |
| 20 | 350 | no tune | std | | | | 94.41 | 20 | 250 | no tune | std | | | | 94.78 |
| 20 | 350 | all | std | 100 | | | 94.41 | 20 | 250 | all | std | 100 | | | 94.78 |
| Zone 1 | | | | | | | | Zone 6 | | | | | | | |
| Grenada | Percent Sand, Silt, and Clay: | | | 4,78,18 | HSG: C | Brodibility (K): .32 | | Shouns | Percent Sand, Silt, and Clay: | | | 17,53,30 | HSG: B | Brodibility (K): .28 | |
| Slope | Psize | Min Size | Adjusted | Percent | | | TB | Slope | Psize | Min Size | Adjusted | Percent | | | TB |
| Percent | | Criteria | Outlet | Difference | | | | Percent | | Criteria | Outlet | Difference | | | |
| 0 | 300 | all | 10/6 | | | | 84.33 | 0 | 250 | all | 6/4 | | | | 82.77 |
| 0 | 400 | all | std | 133 | | | 88.18 | 0 | 300 | all | std | 120 | | | 84.61 |
| 5 | 450 | all | 12/8 | | Average difference | | 91.03 | 5 | 200 | all | 10/6 | | Average difference | | 90.35 |
| 5 | 500 | all | std | 111 | for group= | 120 | 91.90 | 5 | 250 | all | std | 125 | for group= | 111 | 90.62 |
| 10 | 400 | all | 12/8 | | | | 90.36 | 10 | 250 | all | 12/8 | | | | 92.25 |
| 10 | 500 | all | std | 125 | | | 92.56 | 10 | 250 | all | std | 100 | | | 91.28 |
| 20 | 450 | all | 12/8 | | | | 91.50 | 20 | 250 | no tune | std | | | | 90.47 |
| 20 | 500 | all | std | 111 | | | 90.59 | 20 | 250 | all | std | 100 | | | 90.47 |
| Zone 1 | | | | | | | | Zone 6 | | | | | | | |
| Talbott | Percent Sand, Silt, and Clay: | | | 2,23,75 | HSG: C | Brodibility (K): 0.24 | | Talbott | Percent Sand, Silt, and Clay: | | | 2,23,75 | HSG: C | Brodibility (K): .24 | |
| Slope | Psize | Min Size | Adjusted | Percent | | | TB | Slope | Psize | Min Size | Adjusted | Percent | | | TB |
| Percent | | Criteria | Outlet | Difference | | | | Percent | | Criteria | Outlet | Difference | | | |
| 0 | 300 | all | 10/6 | | | | 56.66 | 0 | 250 | all | 6/4 | | | | 56.60 |
| 0 | 400 | all | std | 133 | | | 62.36 | 0 | 350 | all | std | 140 | | | 62.34 |
| 5 | 300 | no tune | std | | Average difference | | 81.90 | 5 | 250 | no tune | std | | Average difference | | 81.81 |
| 5 | 300 | all | std | 100 | for group= | 108 | 81.90 | 5 | 250 | all | std | 100 | for group= | 115 | 81.81 |
| 10 | 300 | no tune | std | | | | 83.07 | 10 | 250 | all | 18/12 | | | | 83.17 |
| 10 | 300 | all | std | 100 | | | 83.07 | 10 | 300 | all | std | 120 | | | 84.01 |
| 20 | 300 | no tune | std | | | | 82.84 | 20 | 250 | no tune | std | | | | 83.08 |
| 20 | 300 | all | std | 100 | | | 82.84 | 20 | 250 | all | std | 100 | | | 83.08 |
| Key to Abbreviations: | | | | | | | | | | | | | | | |
| Percent Difference= (all (Standard outlet structure)pond size/ all (Tuned outlet structure) pond size)* 100 | | | | | | | | | | | | | | | |
| Psize= Cubic yards storage per acre drainage area | | | | | | | | | | | | | | | |
| HSG= Hydrologic Soil Group (SCS), Percent Sand, Silt, and Clay is the dispersed distribution | | | | | | | | | | | | | | | |
| TE=100*(sediment in-sediment out)/sediment in | | | | | | | | | | | | | | | |
| Min. Size Criteria= Minimum Pond Size Required to pass the Criteria noted | | | | | | | | | | | | | | | |
| Minimum Size Criteria: | | | | | | | | | | | | | | | |
| eff= Efficiency Criteria Only were met | | | | | | | | | | | | | | | |
| all= both Efficiency and Flow Criteria were met | | | | | | | | | | | | | | | |
| no tune means that the outlet structure was at optimum with the Standard outlet structure--In these cases the percent difference is 0 (the same pond size is used). | | | | | | | | | | | | | | | |
| Adjusted Outlet = the inlet/barrel dimensions in inches if not std | | | | | | | | | | | | | | | |

tuned and standard outlet structures, the average reduction in pond size ranged from 8 percent for the Boswell and Talbott soils in Zone 1 to 20 percent for the Grenada soil also in Zone 1. The average reduction in pond size for Zone 1 and 6 for all slope cases was about 12 percent for Zone 1 and about 15 percent for Zone 6. In rare cases, tuning actually achieved smaller ponds than that required for the Efficiency Criteria alone. This occurred only in the cases of extremely high silt content such as the Grenada soil (for example, 20 percent reduction in pond size from the Grenada evaluation passing the Efficiency Criteria at 20 percent slope) where very large pond sizes were already required for sediment retention. In most cases, as can be seen in the table for the soils other than Grenada, a larger pond was required using either the standard or tuned outlet structure for Flow Criteria requirements in comparison to the Efficiency Criteria pond sizes.

In practice, tuning should be applied to the pond sizing effort in order to maximize the design volume of any pond, either at the recommended Efficiency and Flow Criteria level or at less aggressive (TE and peak flow attenuation criteria) goals.

## Use of the Detailed Evaluation Tables

The Detailed Results, presented complete in Appendix Table A-7, offers potential as a sediment detention pond design aid addressing the concerns of high downstream discharges. The pond sizes of the Table designated as meeting the Efficiency and Flow Criteria fulfill the requirements of current approaches (see Chapter 2) to sediment detention pond design for the conditions evaluated. Utilized as such this information offers improvement over the rule-of-thumb approaches and the Basic Evaluation pond sizing estimates. The range of pond sizes evaluated offers guidance on alternative sizing where less than the Criteria performance is acceptable. As with the Basic Evaluation

Tables, the user only needs to know the county, soil series, and average slope to find an estimated pond volume storage per acre value. It is suggested that the dispersed fraction of silt be used to interpolate, with judgment, between the evaluated soils of the Zone. If the cover conditions are similar to those postulated, this should present a reasonable estimate of the pond size required to meet the desired criteria.

Unevaluated soils which have known dispersed particle size distributions can have their pond sizes estimated in a similar manner. Adjustments to the estimated pond size would need to be made if the cover conditions of the drainage area depart appreciably from those assumed. Plots can be made similar to those of Figures 2 to 4 for the other Zones and used to identify less aggressive criterion sizing needs. One interesting observation from this study can be made with respect to the soils and regions evaluated with the exception of certain high silt soils in West Tennessee (such as Grenada). If a pond having a geometry as described in this research is sized to match for the disturbed condition, the 10-year storm peak discharge of the predisturbed condition, the sediment removal will be close to, or in excedence of, that of the Efficiency Criteria. This observation assumes that disturbed and predisturbed conditions are close to those postulated.

# CHAPTER 5

# CONCLUSIONS AND RECOMMENDATIONS

## Conclusions

The significance of slope, soil type, and regional effects on pond performance have been well established by this research. This information, previously available only in separate references as independent entities, has been articulated as a unit for the range of Tennessee conditions. This should provide an improved source of information for designers and future research efforts. Also included in this approach is the simplification step of the development of Zones into the closest political boundaries corresponding to regional rainfall, R-factor and soil types in an effort to make the information more useful without appreciable loss of accuracy.

The strategy used in the consolidation of the soil erosion related factors including soil conditions with respect to location (R-factor and precipitation conditions), soil erodibility value (K), and settleability (eroded particle size distribution) for pond design development is not specific to Tennessee. The method employed in the development of Zones is also not specific to Tennessee. Implicit in this is that the potential exists for use of the described methodology in other geopolitical regions.

With respect to the specific findings of this research, soil erosion problems in the western Zones of Tennessee are notable in their magnitude. Relative to the rest of Tennessee, the western Zones incur the combined detrimental soil erosion influences of high precipitation, high R-factor, high erodibility, and high silt content soil series. The result is that pond size requirements to adequately remove sediment to desired levels are substantially larger than the sizes currently in use in Tennessee. Moving eastward, the required pond sizes generally are reduced from those of the western Zones. The widely used 67 cubic yard per acre drainage area sizing criteria only remains applicable under moderate slope and soil type conditions. It would be expected that for many land disturbing activities, such as road construction and mining, steeper slope conditions would prevail.

The differences in pond sizes required between high silt and high clay soils range as much as an order of magnitude, with the high clay soils requiring smaller ponds. This results, for the high clay soils, from the aggregation of portions of the clay fraction particles into larger sized constituents. These large sized aggregates of the high clay soils settle more rapidly than the predominant silt fractions of the high silt soils. Such a result is misleading, since lower trapping efficiencies are associated with the high clay soils which possess larger fractions of effectively suspended solids. In other words the practical limit of sediment removal is higher for the high silt soils than for the high clay soils.

If sediment removal criteria does not take into consideration suspended solids, some of the high clay soils would not meet that criteria at any practical pond size. Most of the evaluated soils have clay and silt fractions at intermediate levels, however, and the residual suspended solids for these soils would still compare well with the target predisturbed conditions of the established Criteria. The results of the Detailed Evaluations confirmed that the portions of the Efficiency Criteria addressing TE and settleable solids (established prior to the research) is a good compromise between the desired emulation of predisturbed conditions and that which is reasonably achievable for conventional sediment detention ponds. In cases where the removal of the defined settleable solid portion of the sediment is not sufficient, methods beyond the scope of this research (such as chemical flocculation), would need to be considered.

The findings of this research can be utilized as a source of information and as a guide to sediment detention pond design for improved on-site retention of sediment. Many of the most common soil series of Tennessee are included in the soil types used in the Basic Evaluations, and enough data are supplied on these that a close match or interpolation can be applied to soil series not directly addressed. Detailed Evaluations generally bracket the range of soils in a given Zone but do not address the variety of soils of the Basic Evaluations so more judgment must be used in interpolation of unlisted soils. Interpolation should be supplemented by reference to the Basic Evaluation Tables for close matches.

Starting with this information and the political location (County) within Tennessee, the Basic and/or Detailed Evaluations can be utilized as an informed beginning for the subject specific site sediment detention pond design process. The pond geometry discussions in Chapters 2 and 3 can be used to develop the preferred pond geometry for specific site conditions, while the guidelines discussed at the conclusion of the chapter 4 sections on the Basic and Detailed Evaluations offer suggestions on the pond sizing approach. As noted in Chapter 4, the actual size of the pond would require further consideration if there are significant departures from the basic assumptions of the analysis such as predisturbed conditions, drainage area conditions and whether or not the stated water quality criteria is to be approximated.

## Recommendations

Many temporary sediment detention ponds for land disturbing activities are and should be "eye-balled" into place because of the small drainage area involved or their function is really one of a sediment trap. These ponds do not require a detailed design effort. The recommendations of this section are intended for the situations where the drainage area and risk of off-site sediment transport justify a rational analysis for the design of the sediment detention pond.

Based on this research, the following two specific recommendations are made to the specifiers and designers of sediment detention ponds in disturbed areas. First, the existing fixed volume of pond per unit acre drainage area criteria should be replaced with an applicable criteria such as described for the Efficiency and Flow Criteria of Chapter 3. The second recommendation is that hydrologic or hydraulic routing and consequent tuning of the outlet structure be performed on the pond design.

The following recommendations regarding criteria assume the following qualifications: (a) that current design practice guidelines with respect to the pond geometry (see Chapters 2 and 3) are utilized, (b) that predisturbed conditions should be approximated during the period of the disturbed condition of the subject pond's design application, and (c) that the 2-year and 10-year storms are accepted as design parameters. Accepting these qualifications, the key elements of the Efficiency and Flow Criteria of Chapter 3 should be utilized. Based on this research, these criteria represent the practical limit of sediment removal that is reasonably achievable.

The salient feature of the Efficiency Criteria is sediment removal, which should be based on the smaller pond size achieved with either 90 percent TE or 95 percent settleable solids removal (by the Imhoff Cup test). The other elements of the Efficiency Criteria, annual sediment accumulation depth limit and emergency spillway usage for the 10-year storm, are specific to the postulated pond geometry and are only applicable in principal as particular values would need to be used for each design case. The Flow Criteria states that the peak discharge for the disturbed condition for 2-year and 10-year, SCS Type II storms should not exceed, by 10 percent, the peak discharge of the predisturbed condition for 2-year and 10-year, SCS Type II storms. These criteria should be applied to the design process, which should in turn incorporate consideration of location, drainage area conditions, and soil types.

Tuning, as defined in this research, involves the adjustment of the principal spillway dimensions by reservoir routing so that the pond storage volume between the principal spillway crest and the emergency spillway crest is fully utilized. Tuning is site specific and cannot be reduced to a specific set of outlet structure dimensions, since the surface conditions and drainage area size, shape, and slope are all variables which were static in this analysis and will undoubtedly be at variance with those chosen values in practice. These factors control the runoff volume and the time of concentration and thus will have a direct bearing on both the routing characteristics and the tuning of the principal spillway. Tuning should be based on a 10-year SCS Type II storm (and checked against the 2-year SCS Type II storm) for maximum overall effectiveness and compliance with the above mentioned Criteria recommendations. However, the recommendation of tuning applies whether or not the guidance of the Efficiency and Flow Criteria is embraced. Less aggressive pond performance design criteria can also benefit from the optimum utilization of the full pond volume, which can easily make a 20 percent difference in the pond size required. Since the iterative process required for tuning is quite tedious, it is also suggested that a proven reservoir routing software (see Fiuzat and others, 1992) be used.

# CHAPTER 6

# FURTHER RESEARCH NEEDS

To the author's knowledge, this is the first comprehensive effort at connecting regional geographic and soil conditions to sediment detention pond requirements. In the course of this analysis, several research areas have been identified which offer opportunities and suggest need for further study. These research needs include pond outlet structure design, development of multiple regression analysis for pond size estimates, development of applications from the multiple regression analysis, and field verification studies.

## Outlet Structure Design

The tuning of the outlet structure, as described in the research, involves the reservoir routing of the inflow and outflow hydrographs iteratively using different outlet structure dimensions for a conventional dropped inlet design (with a floating siphon for dewatering). If peak discharge control and maximization of the available pond volume are the only goals of refining the outlet structure dimensions, this is satisfactory. However, full pond volume is only utilized for the design storm (the 10-year storm in this research), and only the peak discharge is controlled. A more satisfactory approach to discharge control is to have the peak discharge emulate that of predisturbed conditions for a variety of potential storms (such as the 2-year and 5-year storms) while simultaneously utilizing as much of the pond volume as possible to increase detention times. It may be possible for the limited application of small pond design on a regional basis to develop an outlet structure design or set of designs which perform their discharge function in such way as to achieve this, such as a staged or progressive discharge scheme.

## Development of Multiple Regression Analysis

Mention was made of the multiple regression equation (Burns, unpublished, 1993) developed for Zone 1. Further development of regression equations for the Zone conditions and their constituent soils would likely show excellent promise for predicting sediment detention pond size requirements. In order to be most effective for estimating pond size, regression equations by Zone would need to include consideration of peak flow attenuation and of varying cover conditions. (Varying cover conditions have not been addressed in this research.) Incorporation of outlet structure dimension variables and varying target trapping efficiencies might also be included in the analysis. Regression analysis of data sets of this research could be utilized in conjunction with new data sets incorporating some arrangement of the additionally recommended variables. The multiple regression equation development would also be greatly enhanced by the incorporation of supporting or modifying field data (see field data section below).

## Development of Applications from the Regression Analysis

Once a satisfactory regression analysis has been performed, the developed equations could be utilized in several ways. The computations could be used directly or in a computer model to generate pond designs based on the minimum necessary required variables identified by the analysis. It is likely that some form of pond design nomograph could be developed along the same lines. Another intriguing possibility is that a soil settleability factor, similar to the soil erodibility value (K), could be developed from the regression analysis for the subject soils of a region (in this case those selected for the Tennessee evaluation in this research). Even if this settleability factor had to be further modified by other factors such as a Zone factor, the result could conceivably be a pond size estimating computation as convenient to use as the Universal Soil Loss Equation.

## Field Verification Studies

The estimated sediment detention pond sizes proposed in this research are based on hypothetical scenarios targeted to simulate typical disturbed site conditions. The estimated eroded particle size distributions are provided by an empirically derived computational method. As such, the data developed from this effort need to be compared with actual performance. There is a need to locate suitable disturbed sites and perform appropriate field testing of pond performance. Such information collected from several adequately documented field locations could verify the methods used in the present research or suggest modifications to be applied. Similarly, there is a need to put in place designs following the guidelines of this research (preferably in a field application as opposed to a laboratory model) and make extensive performance comparisons. The focus of the field data in both cases should be on eroded particle size, dispersed particle size, TE, settleable solids, suspended solids, and assessment of site cover conditions (both predisturbed and disturbed).

# CHAPTER 7

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# APPENDIX

# Appendix Tables

Table A-1. Estimated dispersed particle distributions for selected soil series resulting from evaluations of source data.

Note: K= Erodibility Factor

HSG= Hydrologic Soil Group

| Soil Series | K/HSG | Dispersed Particle Size Distribution (Sizes in millimeters) Sand 2-.063 Percent | Silt .063-.004 Percent | Clay <.004 Percent | Source (see key) |
|---|---|---|---|---|---|
| Alcoa [Silt] Loam | 0.24 / B | 38.0 | 26.0 | 36.0 | 1 |
| Armour Silt Loam | 0.32 / B | 7.0 | 52.0 | 41.0 | 1 |
| Barfield Silty Clay Loam | 0.24 / D | 15.0 | 32.0 | 53.0 | 2 |
| Baxter [Cherty] Silt Loam | 0.28 / B | 23.0 | 46.0 | 31.0 | 1 |
| Beason Silt Loam | 0.28 / C | 7.0 | 46.0 | 47.0 | 1 |
| Bodine Cherty Silt Loam | 0.24 / B | 26.0 | 50.0 | 24.0 | 1 |
| Boswell Fine Sandy Loam | 0.28 / D | 58.0 | 19.0 | 23.0 | 3 |
| Bradyville Silt Loam | 0.20 / C | 14.0 | 38.0 | 48.0 | 2 |
| Brandon Silt Loam | 0.28 / B | 11.0 | 50.0 | 39.0 | 2 |
| Braxton Silt Loam | 0.24 / C | 16.0 | 27.0 | 57.0 | 2 |
| Calloway Silt Loam | 0.49 / C | 3.0 | 73.0 | 24.0 | 3 |
| Capshaw Silt Loam | 0.37 / C | 16.0 | 40.0 | 44.0 | 2 |
| Center Silt Silt Loam | 0.49 / C | 6.0 | 55.0 | 39.0 | 2 |
| Christian Silt Loam | 0.28 / C | 14.0 | 43.0 | 43.0 | 2 |
| Crider Silt Loam | 0.32 / B | 8.0 | 52.0 | 40.0 | 2 |
| Cumberland Silt Loam | 0.28 / B | 14.0 | 49.0 | 37.0 | 3 |
| Dandridge Silt Loam | 0.24 / D | 6.0 | 52.0 | 42.0 | 3 |
| Decatur Silt Loam | 0.28 / B | 15.0 | 39.0 | 46.0 | 3 |
| Dellrose Cherty Silt Loam | 0.24 / B | 16.0 | 45.0 | 39.0 | 1 |
| Dewey Silt Loam | 0.28 / B | 9.0 | 48.0 | 43.0 | 3 |
| Dickson Silt Loam | 0.43 / B | 24.0 | 43.0 | 33.0 | 3 |
| Dulac Silt Loam | 0.43 / C | 5.0 | 57.0 | 38.0 | 1 |
| Dunmore Silt Loam | 0.20 / B | 15.0 | 21.0 | 64.0 | 1 |
| Etowah Silt Loam | 0.28 / B | 39.0 | 26.0 | 35.0 | 1 |
| Fullerton Silt Loam | 0.28 / B | 15.0 | 31.0 | 54.0 | 3 |
| Gladeville Flaggy Silty Clay Loam | 0.24 / D | 14.0 | 42.0 | 44.0 | 2 |
| Grenada Silt Loam | 0.32 / C | 4.0 | 78.0 | 18.0 | 4 |
| Hampshire Silt Loam | 0.28 / C | 22.0 | 26.0 | 52.0 | 2 |
| Harpeth Silt Loam | 0.32 / B | 10.0 | 50.0 | 40.0 | 2 |
| Hartsells Loam | 0.28 / B | 53.0 | 33.0 | 14.0 | 3 |
| Hayter Silt Loam | 0.28 / B | 45.0 | 22.0 | 33.0 | 2 |
| Holston Loam | 0.28 / B | 27.0 | 44.0 | 29.0 | 1 |
| Humphreys Cherty [Silt Loam] | 0.24 / B | 23.0 | 42.0 | 35.0 | 2 |
| Inman Flaggy Silty Clay Loam | 0.24 / C | 12.0 | 35.0 | 53.0 | 2 |
| Jefferson Loam | 0.28 / B | 34.0 | 30.0 | 36.0 | 1 |
| Lax Silt Loam | 0.28 / C | 14.0 | 48.0 | 38.0 | 2 |
| Lehew Channery Fine Sandy Loam | 0.24 / C | 49.0 | 31.0 | 20.0 | 2 |
| Lexington Silt Loam | 0.32 / B | 11.0 | 64.0 | 25.0 | 4 |
| Litz Shaly Silt Loam | 0.24 / C | 20.0 | 46.0 | 34.0 | 2 |
| Lomond Silt Loam | 0.28 / B | 16.0 | 44.0 | 40.0 | 2 |

| Soil Series | K/HSG | Dispersed Particle Size Distribution (Sizes in millimeters) Sand 2-.063 Percent | Silt .063-.004 Percent | Clay <.004 Percent | Source (see key) |
|---|---|---|---|---|---|
| Lonewood Silt Loam | 0.24 / B | 18.0 | 42.0 | 40.0 | 2 |
| Loring Silt Loam | 0.37 / C | 1.8 | 72.2 | 26.0 | 5 |
| Maury Silt Loam | 0.32 / B | 11.0 | 56.0 | 33.0 | 2 |
| Memphis Silt Loam | 0.49 / B | 1.0 | 72.4 | 26.6 | 6 |
| Mimosa Silt Loam | 0.20 / C | 4.0 | 28.0 | 68.0 | 1 |
| Montevallo Silt Loam | 0.24 / D | 27.0 | 39.0 | 34.0 | 2 |
| Mountview Silt Loam | 0.37 / B | 13.0 | 48.0 | 39.0 | 2 |
| Needmore Silt Loam | 0.32 / C | 10.0 | 34.0 | 56.0 | 2 |
| Oktibbeha Clay | 0.20 / D | 13.7 | 26.8 | 59.5 | 7 |
| Paden Silt Loam | 0.32 / C | 5.0 | 58.0 | 37.0 | 1 |
| Pembroke Silt Loam | 0.28 / B | 8.0 | 52.0 | 40.0 | 1 |
| Pickwick Silt Loam | 0.32 / B | 9.0 | 68.0 | 23.0 | 3 |
| Providence Silt Loam | 0.32 / C | 11.0 | 52.0 | 37.0 | 2 |
| Ramsey Loam | 0.28 / D | 36.0 | 38.0 | 26.0 | 2 |
| Ruston Fine Sandy Loam | 0.32 / B | 42.0 | 37.0 | 21.0 | 2 |
| Sequatchie Loam | 0.28 / B | 37.0 | 33.0 | 30.0 | 1 |
| Sequoia Silt Loam | 0.32 / C | 5.0 | 40.0 | 55.0 | 1 |
| Shouns Silt Loam | 0.28 / B | 17.0 | 53.0 | 30.0 | 2 |
| Shubuta Fine Sandy Loam | 0.28 / C | 53.0 | 31.0 | 16.0 | 2 |
| Statler Loam | 0.28 / B | 23.0 | 42.0 | 35.0 | 2 |
| Stiversville Loam | 0.32 / B | 47.0 | 33.0 | 20.0 | 2 |
| Talbott Silt Loam | 0.24 / C | 2.0 | 23.0 | 75.0 | 1 |
| Tellico Loam | 0.32 / B | 28.0 | 21.0 | 51.0 | 1 |
| Wallen Gravelly Loam | 0.28 / B | 42.0 | 35.0 | 23.0 | 2 |
| Waynesboro Loam | 0.28 / B | 29.0 | 33.0 | 38.0 | 1 |

Source Key

1 SCS, Soil Survey Investigations Report No. 15: Soil Survey Laboratory Data Descriptions for Some Soils of Tennessee, USDA, 1967

2 SCS Form 5- Soil Particle Size Distribution Data: Courtesy of Dr. Tom Ammons' files (unpublished)

3 USDA, Mechanical Analysis Data, Bureau of Plant Industry, 1950

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6 Meyer, L.D., Harmon, W.C. and McDowell, L.L. Sediment sizes eroded from crop row sideslopes. Trans. ASAE 23(4) :891-898, 1980

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Table A-2. Application of Foster algorithm for evaluated soil series (working table).

Aggr. = Aggregate; Prim. = primary particle size; Dia. = diameter (millimeters); Intermed. = intermediate; Fract. = weight fraction

Size Class and Diam. of Particles (in millimeters( mm)) Taken from "B" Horizon, (<2mm portion)

| Soil Series | Sand "2-.063" % | Silt ".063-.004" % | Clay "<.004" % | Large Aggr. Dia. | Prim. Sand Dia. | Small Aggr. Dia. | Prim Silt Dia. | Prim. Clay Dia. | Large Aggr. Fract. | Prim. Sand Fract | Intermed. Small Aggr. Fract. | Small Aggr. Fract. | Prim Silt Fract. | Prim. Clay Fract. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alcoa [Silt] Loam | 38.0 | 26.0 | 36.0 | 0.72 | 0.2 | 0.052 | 0.01 | 0.002 | 0.606 | 0.041 | 0.384 | 0.260 | 0.000 | 0.094 |
| Armour Silt Loam | 7.0 | 52.0 | 41.0 | 0.82 | 0.2 | 0.062 | 0.01 | 0.002 | 0.368 | 0.005 | 0.354 | 0.354 | 0.166 | 0.107 |
| Barfield Silty Clay Loam | 15.0 | 32.0 | 53.0 | 1.06 | 0.2 | 0.086 | 0.01 | 0.002 | 0.539 | 0.003 | 0.318 | 0.318 | 0.002 | 0.138 |
| Baxter [Cherty] Silt Loam | 23.0 | 46.0 | 31.0 | 0.62 | 0.2 | 0.042 | 0.01 | 0.002 | 0.423 | 0.036 | 0.414 | 0.414 | 0.046 | 0.081 |
| Beason Silt Loam | 7.0 | 46.0 | 47.0 | 0.94 | 0.2 | 0.074 | 0.01 | 0.002 | 0.415 | 0.003 | 0.318 | 0.318 | 0.142 | 0.122 |
| Bodine Cherty Silt Loam | 26.0 | 50.0 | 24.0 | 0.48 | 0.2 | 0.030 | 0.01 | 0.002 | 0.372 | 0.066 | 0.432 | 0.432 | 0.068 | 0.062 |
| Boswell Fine Sandy Loam | 58.0 | 19.0 | 23.0 | 0.46 | 0.2 | 0.030 | 0.01 | 0.002 | 0.593 | 0.157 | 0.414 | 0.190 | 0.000 | 0.060 |
| Bradyville Silt Loam | 14.0 | 38.0 | 48.0 | 0.96 | 0.2 | 0.076 | 0.01 | 0.002 | 0.490 | 0.005 | 0.312 | 0.312 | 0.068 | 0.125 |
| Brandon Silt Loam | 11.0 | 50.0 | 39.0 | 0.78 | 0.2 | 0.058 | 0.01 | 0.002 | 0.389 | 0.009 | 0.366 | 0.366 | 0.134 | 0.101 |
| Braxton Silt Loam | 16.0 | 27.0 | 57.0 | 1.14 | 0.2 | 0.094 | 0.01 | 0.002 | 0.579 | 0.002 | 0.342 | 0.270 | 0.000 | 0.148 |
| Calloway Silt Loam | 3.0 | 73.0 | 24.0 | 0.48 | 0.2 | 0.030 | 0.01 | 0.002 | 0.200 | 0.008 | 0.432 | 0.432 | 0.298 | 0.062 |
| Capshaw Silt Loam | 16.0 | 40.0 | 44.0 | 0.88 | 0.2 | 0.068 | 0.01 | 0.002 | 0.477 | 0.009 | 0.336 | 0.336 | 0.064 | 0.114 |
| Center Silt Silt Loam | 6.0 | 55.0 | 39.0 | 0.78 | 0.2 | 0.058 | 0.01 | 0.002 | 0.344 | 0.005 | 0.366 | 0.366 | 0.184 | 0.101 |
| Christian Silt Loam | 14.0 | 43.0 | 43.0 | 0.86 | 0.2 | 0.066 | 0.01 | 0.002 | 0.450 | 0.008 | 0.342 | 0.342 | 0.088 | 0.112 |
| Crider Silt Loam | 8.0 | 52.0 | 40.0 | 0.80 | 0.2 | 0.060 | 0.01 | 0.002 | 0.370 | 0.006 | 0.360 | 0.360 | 0.160 | 0.104 |
| Cumberland Silt Loam | 14.0 | 49.0 | 37.0 | 0.74 | 0.2 | 0.054 | 0.01 | 0.002 | 0.400 | 0.014 | 0.378 | 0.378 | 0.112 | 0.096 |
| Dandridge Silt Loam | 6.0 | 52.0 | 42.0 | 0.84 | 0.2 | 0.064 | 0.01 | 0.002 | 0.367 | 0.004 | 0.348 | 0.348 | 0.172 | 0.109 |
| Decatur Silt Loam | 15.0 | 39.0 | 46.0 | 0.92 | 0.2 | 0.072 | 0.01 | 0.002 | 0.484 | 0.007 | 0.324 | 0.324 | 0.066 | 0.120 |
| Dellrose Cherty Silt Loam | 16.0 | 45.0 | 39.0 | 0.78 | 0.2 | 0.058 | 0.01 | 0.002 | 0.435 | 0.014 | 0.366 | 0.366 | 0.084 | 0.101 |
| Dewey Silt Loam | 9.0 | 48.0 | 43.0 | 0.86 | 0.2 | 0.066 | 0.01 | 0.002 | 0.403 | 0.005 | 0.342 | 0.342 | 0.138 | 0.112 |
| Dickson Silt Loam | 24.0 | 43.0 | 33.0 | 0.66 | 0.2 | 0.046 | 0.01 | 0.002 | 0.452 | 0.032 | 0.402 | 0.402 | 0.028 | 0.086 |
| Dulac Silt Loam | 5.0 | 57.0 | 38.0 | 0.76 | 0.2 | 0.056 | 0.01 | 0.002 | 0.327 | 0.005 | 0.372 | 0.372 | 0.198 | 0.099 |
| Dunmore Silt Loam | 15.0 | 21.0 | 64.0 | 1.28 | 0.2 | 0.100 | 0.01 | 0.002 | 0.623 | 0.001 | 0.384 | 0.210 | 0.000 | 0.166 |
| Etowah Silt Loam | 39.0 | 26.0 | 35.0 | 0.70 | 0.2 | 0.050 | 0.01 | 0.002 | 0.604 | 0.045 | 0.390 | 0.260 | 0.000 | 0.091 |
| Fullerton Silt Loam | 15.0 | 31.0 | 54.0 | 1.08 | 0.2 | 0.088 | 0.01 | 0.002 | 0.547 | 0.003 | 0.324 | 0.310 | 0.000 | 0.140 |
| Gladeville Flaggy Silty Clay Loam | 14.0 | 42.0 | 44.0 | 0.88 | 0.2 | 0.068 | 0.01 | 0.002 | 0.458 | 0.008 | 0.336 | 0.336 | 0.084 | 0.114 |
| Grenada Silt Loam | 4.0 | 78.0 | 18.0 | 0.36 | 0.2 | 0.030 | 0.01 | 0.002 | 0.158 | 0.015 | 0.324 | 0.324 | 0.456 | 0.047 |
| Hampshire Silt Loam | 22.0 | 26.0 | 52.0 | 1.04 | 0.2 | 0.084 | 0.01 | 0.002 | 0.599 | 0.006 | 0.312 | 0.260 | 0.000 | 0.135 |
| Harpeth Silt Loam | 10.0 | 50.0 | 40.0 | 0.80 | 0.2 | 0.060 | 0.01 | 0.002 | 0.388 | 0.008 | 0.360 | 0.360 | 0.140 | 0.104 |
| Hartsells Loam | 53.0 | 33.0 | 14.0 | 0.30 | 0.2 | 0.030 | 0.01 | 0.002 | 0.384 | 0.249 | 0.252 | 0.252 | 0.078 | 0.036 |
| Hayter Silt Loam | 45.0 | 22.0 | 33.0 | 0.66 | 0.2 | 0.046 | 0.01 | 0.002 | 0.633 | 0.061 | 0.402 | 0.220 | 0.000 | 0.086 |
| Holston Loam | 27.0 | 44.0 | 29.0 | 0.58 | 0.2 | 0.038 | 0.01 | 0.002 | 0.436 | 0.049 | 0.426 | 0.426 | 0.014 | 0.075 |
| Humphreys Cherty [Silt Loam] | 23.0 | 42.0 | 35.0 | 0.70 | 0.2 | 0.050 | 0.01 | 0.002 | 0.462 | 0.027 | 0.390 | 0.390 | 0.030 | 0.091 |
| Inman Flaggy Silty Clay Loam | 12.0 | 35.0 | 53.0 | 1.06 | 0.2 | 0.086 | 0.01 | 0.002 | 0.509 | 0.003 | 0.318 | 0.318 | 0.032 | 0.138 |
| Jefferson Loam | 34.0 | 30.0 | 36.0 | 0.72 | 0.2 | 0.052 | 0.01 | 0.002 | 0.570 | 0.037 | 0.384 | 0.300 | 0.000 | 0.094 |
| Lax Silt Loam | 14.0 | 48.0 | 38.0 | 0.76 | 0.2 | 0.056 | 0.01 | 0.002 | 0.408 | 0.013 | 0.372 | 0.372 | 0.108 | 0.099 |
| Lehew Channery Fine Sandy Loam | 49.0 | 31.0 | 20.0 | 0.40 | 0.2 | 0.030 | 0.01 | 0.002 | 0.477 | 0.161 | 0.360 | 0.310 | 0.000 | 0.052 |
| Lexington Silt Loam | 11.0 | 64.0 | 25.0 | 0.50 | 0.2 | 0.030 | 0.01 | 0.002 | 0.269 | 0.026 | 0.450 | 0.450 | 0.190 | 0.065 |
| Litz Shaly Silt Loam | 20.0 | 46.0 | 34.0 | 0.68 | 0.2 | 0.048 | 0.01 | 0.002 | 0.427 | 0.025 | 0.396 | 0.396 | 0.064 | 0.088 |

Table A-2 continued. Application of Foster algorithm for evaluated soil series (working table).

| Soil Series | Sand "2-.063" % | Silt ".063-.004" % | Clay "<.004" % | Large Aggr. Dia. | Prim. Sand Dia. | Small Aggr. Dia. | Prim Silt Dia. | Prim. Clay Dia. | Large Aggr. Fract. | Prim. Sand Fract | Intermed. Small Aggr. Fract. | Small Aggr. Fract. | Prim Silt Fract. | Prim. Clay Fract. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Size Class and Diam. of Particles (in mm) Taken from "B" Horizon, (< 2mm portion) | | | | | | | | | | | | | |
| Lomond Silt Loam | 16.0 | 44.0 | 40.0 | 0.80 | 0.2 | 0.060 | 0.01 | 0.002 | 0.444 | 0.012 | 0.360 | 0.360 | 0.080 | 0.104 |
| Lonewood Silt Loam | 18.0 | 42.0 | 40.0 | 0.80 | 0.2 | 0.060 | 0.01 | 0.002 | 0.462 | 0.014 | 0.360 | 0.360 | 0.060 | 0.104 |
| Loring Silt Loam | 1.8 | 72.2 | 26.0 | 0.52 | 0.2 | 0.032 | 0.01 | 0.002 | 0.206 | 0.004 | 0.444 | 0.444 | 0.278 | 0.068 |
| Maury Silt Loam | 11.0 | 56.0 | 33.0 | 0.66 | 0.2 | 0.046 | 0.01 | 0.002 | 0.339 | 0.015 | 0.402 | 0.402 | 0.158 | 0.086 |
| Memphis Silt Loam | 1.0 | 72.4 | 26.6 | 0.53 | 0.2 | 0.033 | 0.01 | 0.002 | 0.205 | 0.002 | 0.440 | 0.440 | 0.284 | 0.069 |
| Mimosa Silt Loam | 4.0 | 28.0 | 68.0 | 1.36 | 0.2 | 0.100 | 0.01 | 0.002 | 0.543 | 0.000 | 0.408 | 0.280 | 0.000 | 0.177 |
| Montevallo Silt Loam | 27.0 | 39.0 | 34.0 | 0.68 | 0.2 | 0.048 | 0.01 | 0.002 | 0.488 | 0.034 | 0.396 | 0.390 | 0.000 | 0.088 |
| Mountview Silt Loam | 13.0 | 48.0 | 39.0 | 0.78 | 0.2 | 0.058 | 0.01 | 0.002 | 0.408 | 0.011 | 0.366 | 0.366 | 0.114 | 0.101 |
| Needmore Silt Loam | 10.0 | 34.0 | 56.0 | 1.12 | 0.2 | 0.092 | 0.01 | 0.002 | 0.513 | 0.002 | 0.336 | 0.336 | 0.004 | 0.146 |
| Oktibbeha Clay | 13.7 | 26.8 | 59.5 | 1.19 | 0.2 | 0.099 | 0.01 | 0.002 | 0.576 | 0.001 | 0.357 | 0.268 | 0.000 | 0.155 |
| Paden Silt Loam | 5.0 | 58.0 | 37.0 | 0.74 | 0.2 | 0.054 | 0.01 | 0.002 | 0.319 | 0.005 | 0.378 | 0.378 | 0.202 | 0.096 |
| Pembroke Silt Loam | 8.0 | 52.0 | 40.0 | 0.80 | 0.2 | 0.060 | 0.01 | 0.002 | 0.370 | 0.006 | 0.360 | 0.360 | 0.160 | 0.104 |
| Pickwick Silt Loam | 9.0 | 68.0 | 23.0 | 0.46 | 0.2 | 0.030 | 0.01 | 0.002 | 0.236 | 0.024 | 0.414 | 0.414 | 0.266 | 0.060 |
| Providence Silt Loam | 11.0 | 52.0 | 37.0 | 0.74 | 0.2 | 0.054 | 0.01 | 0.002 | 0.373 | 0.011 | 0.378 | 0.378 | 0.142 | 0.096 |
| Ramsey Loam | 36.0 | 38.0 | 26.0 | 0.52 | 0.2 | 0.032 | 0.01 | 0.002 | 0.473 | 0.080 | 0.444 | 0.380 | 0.000 | 0.068 |
| Ruston Fine Sandy Loam | 42.0 | 37.0 | 21.0 | 0.42 | 0.2 | 0.030 | 0.01 | 0.002 | 0.446 | 0.129 | 0.378 | 0.370 | 0.000 | 0.055 |
| Sequatchie Loam | 37.0 | 33.0 | 30.0 | 0.60 | 0.2 | 0.040 | 0.01 | 0.002 | 0.530 | 0.062 | 0.420 | 0.330 | 0.000 | 0.078 |
| Sequoia Silt Loam | 5.0 | 40.0 | 55.0 | 1.10 | 0.2 | 0.090 | 0.01 | 0.002 | 0.456 | 0.001 | 0.330 | 0.330 | 0.070 | 0.143 |
| Shouns Silt Loam | 17.0 | 53.0 | 30.0 | 0.60 | 0.2 | 0.040 | 0.01 | 0.002 | 0.363 | 0.029 | 0.420 | 0.420 | 0.110 | 0.078 |
| Shubuta Fine Sandy Loam | 53.0 | 31.0 | 16.0 | 0.32 | 0.2 | 0.030 | 0.01 | 0.002 | 0.427 | 0.222 | 0.288 | 0.288 | 0.022 | 0.042 |
| Statler Loam | 23.0 | 42.0 | 35.0 | 0.70 | 0.2 | 0.050 | 0.01 | 0.002 | 0.462 | 0.027 | 0.390 | 0.390 | 0.030 | 0.091 |
| Stiversville Loam | 47.0 | 33.0 | 20.0 | 0.40 | 0.2 | 0.030 | 0.01 | 0.002 | 0.464 | 0.154 | 0.360 | 0.330 | 0.000 | 0.052 |
| Talbott Silt Loam | 2.0 | 23.0 | 75.0 | 1.50 | 0.2 | 0.100 | 0.01 | 0.002 | 0.575 | 0.000 | 0.450 | 0.230 | 0.000 | 0.195 |
| Tellico Loam | 28.0 | 21.0 | 51.0 | 1.02 | 0.2 | 0.082 | 0.01 | 0.002 | 0.649 | 0.008 | 0.306 | 0.210 | 0.000 | 0.133 |
| Wallen Gravelly Loam | 42.0 | 35.0 | 23.0 | 0.46 | 0.2 | 0.030 | 0.01 | 0.002 | 0.477 | 0.114 | 0.414 | 0.350 | 0.000 | 0.060 |
| Waynesboro Loam | 29.0 | 33.0 | 38.0 | 0.76 | 0.2 | 0.056 | 0.01 | 0.002 | 0.545 | 0.027 | 0.372 | 0.330 | 0.000 | 0.099 |

Table A-3. Adjusted eroded particle size distribution modified for input to the SEDCAD+ model.

HSG=Hydrologic Soil Group
Erod=erodibility (K)
Horiz.=horizon
%Pass= percent passing the given diameter
Dlg1=large aggregate diameter upper value(millimeters)
Dlg2=large aggregate diameter lower value(millimeters)
Dsd1=sand diameter upper value (millimeters)
Dsd2=sand diameter lower value (millimeters)
Dsg1 = small aggregate diameter upper value (millimeters)
Dsg2= small aggregate diameter lower value (millimeters)
Dsi1 = silt diameter upper value (millimeters)
Dsi2= silt diameter lower value (millimeters)
Dcl1 = clay diameter upper value (millimeters)
Dcl2= clay diameter lower value (millimeters)

| Soil Series | Erod., K/ HSG "B" Horiz. | Dlg1 | %Pass | Dlg2 | %Pass | Dsd1 | %Pass | Dsd2 | %Pass | Dsg1 | % Pass | Dsg2 | % Pass | Dsi1 | %Pass | Dsi2 | %Pass | Dcl1 | %Pass | Dcl2 | %Pass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alcoa Loam | 0.24 / B | 0.57 | 100 | 0.55 | 39.4 | 0.21 | 39.3 | 0.19 | 35.4 | 0.042 | 35.3 | 0.040 | 9.4 | 0.011 | 9.3 | 0.009 | 9.4 | 0.003 | 9.3 | 0.0013 | 0 |
| Armour Silt Loam | 0.32 / B | 0.65 | 100 | 0.63 | 63.2 | 0.21 | 63.1 | 0.19 | 62.7 | 0.049 | 62.6 | 0.047 | 27.3 | 0.011 | 27.2 | 0.009 | 10.7 | 0.003 | 10.6 | 0.0013 | 0 |
| Barfield Silty Clay Loam | 0.24 / D | 0.84 | 100 | 0.82 | 46.1 | 0.21 | 46.0 | 0.19 | 45.8 | 0.068 | 45.7 | 0.066 | 14.0 | 0.011 | 13.9 | 0.009 | 13.8 | 0.003 | 13.7 | 0.0013 | 0 |
| Baxter [Cherty] Silt Loam | 0.28 / B | 0.49 | 100 | 0.47 | 57.7 | 0.21 | 57.6 | 0.19 | 54.1 | 0.034 | 54.0 | 0.032 | 12.7 | 0.011 | 12.6 | 0.009 | 8.1 | 0.003 | 8.0 | 0.0013 | 0 |
| Beason Silt Loam | 0.28 / C | 0.74 | 100 | 0.72 | 58.5 | 0.21 | 58.4 | 0.19 | 58.2 | 0.059 | 58.1 | 0.057 | 26.4 | 0.011 | 26.3 | 0.009 | 12.2 | 0.003 | 12.1 | 0.0013 | 0 |
| Bodine Cherty Silt Loam | 0.24 / B | 0.38 | 100 | 0.36 | 62.8 | 0.21 | 62.7 | 0.19 | 56.2 | 0.024 | 56.1 | 0.022 | 13.0 | 0.011 | 12.9 | 0.009 | 6.2 | 0.003 | 6.1 | 0.0013 | 0 |
| Boswell Fine Sandy Loam | 0.28 / D | 0.37 | 100 | 0.35 | 40.7 | 0.21 | 40.6 | 0.19 | 25.0 | 0.024 | 24.9 | 0.022 | 6.0 | 0.011 | 5.9 | 0.009 | 6.0 | 0.003 | 5.9 | 0.0013 | 0 |
| Bradyville Silt Loam | 0.20 / C | 0.76 | 100 | 0.74 | 51.0 | 0.21 | 50.9 | 0.19 | 50.5 | 0.060 | 50.4 | 0.058 | 19.3 | 0.011 | 19.2 | 0.009 | 12.5 | 0.003 | 12.4 | 0.0013 | 0 |
| Brandon Silt Loam | 0.28 / B | 0.62 | 100 | 0.60 | 61.1 | 0.21 | 61.0 | 0.19 | 60.1 | 0.046 | 60.0 | 0.044 | 23.5 | 0.011 | 23.4 | 0.009 | 10.1 | 0.003 | 10.0 | 0.0013 | 0 |
| Braxton Silt Loam | 0.24 / C | 0.90 | 100 | 0.88 | 42.1 | 0.21 | 42.0 | 0.19 | 41.8 | 0.074 | 41.7 | 0.072 | 14.8 | 0.011 | 14.7 | 0.009 | 14.8 | 0.003 | 14.7 | 0.0013 | 0 |
| Calloway Silt Loam | 0.49 / C | 0.38 | 100 | 0.36 | 80.0 | 0.21 | 79.9 | 0.19 | 79.2 | 0.024 | 79.1 | 0.022 | 36.0 | 0.011 | 35.9 | 0.009 | 6.2 | 0.003 | 6.1 | 0.0013 | 0 |
| Capshaw Silt Loam | 0.37 / C | 0.70 | 100 | 0.68 | 52.3 | 0.21 | 52.2 | 0.19 | 51.4 | 0.054 | 51.3 | 0.052 | 17.8 | 0.011 | 17.7 | 0.009 | 11.4 | 0.003 | 11.3 | 0.0013 | 0 |
| Center Silt Loam | 0.49 / C | 0.62 | 100 | 0.60 | 65.6 | 0.21 | 65.5 | 0.19 | 65.1 | 0.046 | 65.0 | 0.044 | 28.5 | 0.011 | 28.4 | 0.009 | 10.1 | 0.003 | 10.0 | 0.0013 | 0 |
| Christian Silt Loam | 0.28 / C | 0.68 | 100 | 0.66 | 55.0 | 0.21 | 54.9 | 0.19 | 54.2 | 0.052 | 54.1 | 0.050 | 20.0 | 0.011 | 19.9 | 0.009 | 11.2 | 0.003 | 11.1 | 0.0013 | 0 |
| Crider Silt Loam | 0.32 / B | 0.63 | 100 | 0.61 | 63.0 | 0.21 | 62.9 | 0.19 | 62.4 | 0.048 | 62.3 | 0.046 | 26.4 | 0.011 | 26.3 | 0.009 | 10.4 | 0.003 | 10.3 | 0.0013 | 0 |
| Cumberland Silt Loam | 0.28 / B | 0.59 | 100 | 0.57 | 60.0 | 0.21 | 59.9 | 0.19 | 58.6 | 0.043 | 58.5 | 0.041 | 20.8 | 0.011 | 20.7 | 0.009 | 9.6 | 0.003 | 9.5 | 0.0013 | 0 |
| Dandridge Silt Loam | 0.24 / D | 0.67 | 100 | 0.65 | 63.3 | 0.21 | 63.2 | 0.19 | 62.9 | 0.051 | 62.8 | 0.049 | 28.1 | 0.011 | 28.0 | 0.009 | 10.9 | 0.003 | 10.8 | 0.0013 | 0 |
| Decatur Silt Loam | 0.28 / B | 0.73 | 100 | 0.71 | 51.6 | 0.21 | 51.5 | 0.19 | 51.0 | 0.057 | 50.9 | 0.055 | 18.6 | 0.011 | 18.5 | 0.009 | 12.0 | 0.003 | 11.9 | 0.0013 | 0 |
| Dellrose Cherty Silt Loam | 0.24 / B | 0.62 | 100 | 0.60 | 56.5 | 0.21 | 56.4 | 0.19 | 55.1 | 0.046 | 55.0 | 0.044 | 18.5 | 0.011 | 18.4 | 0.009 | 10.1 | 0.003 | 10.0 | 0.0013 | 0 |
| Dewey Silt Loam | 0.28 / B | 0.68 | 100 | 0.66 | 59.7 | 0.21 | 59.6 | 0.19 | 59.2 | 0.052 | 59.1 | 0.050 | 25.0 | 0.011 | 24.9 | 0.009 | 11.2 | 0.003 | 11.1 | 0.0013 | 0 |
| Dickson Silt Loam | 0.43 / B | 0.52 | 100 | 0.50 | 54.8 | 0.21 | 54.7 | 0.19 | 51.6 | 0.037 | 51.5 | 0.035 | 11.4 | 0.011 | 11.3 | 0.009 | 8.6 | 0.003 | 8.5 | 0.0013 | 0 |
| Dulac Silt Loam | 0.43 / C | 0.60 | 100 | 0.58 | 67.3 | 0.21 | 67.2 | 0.19 | 66.9 | 0.045 | 66.8 | 0.043 | 29.7 | 0.011 | 29.6 | 0.009 | 9.9 | 0.003 | 9.8 | 0.0013 | 0 |
| Dunmore Silt Loam | 0.20 / B | 1.01 | 100 | 0.99 | 37.7 | 0.21 | 37.6 | 0.19 | 37.6 | 0.079 | 37.5 | 0.077 | 16.6 | 0.011 | 16.5 | 0.009 | 16.6 | 0.003 | 16.5 | 0.0013 | 0 |
| Etowah Silt Loam | 0.28 / B | 0.56 | 100 | 0.54 | 39.6 | 0.21 | 39.5 | 0.19 | 35.1 | 0.040 | 35.0 | 0.038 | 9.1 | 0.011 | 9.0 | 0.009 | 9.1 | 0.003 | 9.0 | 0.0013 | 0 |
| Fullerton Silt Loam | 0.28 / B | 0.85 | 100 | 0.83 | 45.3 | 0.21 | 45.2 | 0.19 | 45.0 | 0.070 | 44.9 | 0.068 | 14.0 | 0.011 | 13.9 | 0.009 | 14.0 | 0.003 | 13.9 | 0.0013 | 0 |
| Gladeville Flaggy Silty Clay Loam | 0.24 / D | 0.70 | 100 | 0.68 | 54.2 | 0.21 | 54.1 | 0.19 | 53.4 | 0.054 | 53.3 | 0.052 | 19.8 | 0.011 | 19.7 | 0.009 | 11.4 | 0.003 | 11.3 | 0.0013 | 0 |
| Grenada Silt Loam | 0.32 / C | 0.29 | 100 | 0.27 | 84.2 | 0.21 | 84.1 | 0.19 | 82.7 | 0.024 | 82.6 | 0.022 | 50.3 | 0.011 | 50.2 | 0.009 | 4.7 | 0.003 | 4.6 | 0.0013 | 0 |
| Hampshire Silt Loam | 0.28 / C | 0.82 | 100 | 0.80 | 40.1 | 0.21 | 40.0 | 0.19 | 39.5 | 0.067 | 39.4 | 0.065 | 13.5 | 0.011 | 13.4 | 0.009 | 13.5 | 0.003 | 13.4 | 0.0013 | 0 |
| Harpeth Silt Loam | 0.32 / B | 0.63 | 100 | 0.61 | 61.2 | 0.21 | 61.1 | 0.19 | 60.4 | 0.048 | 60.3 | 0.046 | 24.4 | 0.011 | 24.3 | 0.009 | 10.4 | 0.003 | 10.3 | 0.0013 | 0 |
| Hartsells Loam | 0.28 / B | 0.24 | 100 | 0.22 | 61.6 | 0.21 | 61.5 | 0.19 | 36.6 | 0.024 | 36.5 | 0.022 | 11.4 | 0.011 | 11.3 | 0.009 | 3.6 | 0.003 | 3.5 | 0.0013 | 0 |
| Hayter Silt Loam | 0.28 / B | 0.52 | 100 | 0.50 | 36.7 | 0.21 | 36.6 | 0.19 | 30.6 | 0.037 | 30.5 | 0.035 | 8.6 | 0.011 | 8.5 | 0.009 | 8.6 | 0.003 | 8.5 | 0.0013 | 0 |
| Holston Loam | 0.28 / B | 0.46 | 100 | 0.44 | 56.4 | 0.21 | 56.3 | 0.19 | 51.5 | 0.031 | 51.4 | 0.029 | 8.9 | 0.011 | 8.8 | 0.009 | 7.5 | 0.003 | 7.4 | 0.0013 | 0 |
| Humphreys Cherty [Silt Loam] | 0.24 / B | 0.56 | 100 | 0.54 | 53.8 | 0.21 | 53.7 | 0.19 | 51.1 | 0.040 | 51.0 | 0.038 | 12.1 | 0.011 | 12.0 | 0.009 | 9.1 | 0.003 | 9.0 | 0.0013 | 0 |
| Inman Flaggy Silty Clay Loam | 0.24 / C | 0.84 | 100 | 0.82 | 49.1 | 0.21 | 49.0 | 0.19 | 48.8 | 0.068 | 48.7 | 0.066 | 17.0 | 0.011 | 16.9 | 0.009 | 13.8 | 0.003 | 13.7 | 0.0013 | 0 |
| Jefferson Loam | 0.28 / B | 0.57 | 100 | 0.55 | 43.0 | 0.21 | 42.9 | 0.19 | 39.4 | 0.042 | 39.3 | 0.040 | 9.4 | 0.011 | 9.3 | 0.009 | 9.4 | 0.003 | 9.3 | 0.0013 | 0 |
| Lax Silt Loam | 0.28 / C | 0.60 | 100 | 0.58 | 59.2 | 0.21 | 59.1 | 0.19 | 57.9 | 0.045 | 57.8 | 0.043 | 20.7 | 0.011 | 20.6 | 0.009 | 9.9 | 0.003 | 9.8 | 0.0013 | 0 |
| Lehew Channery Fine Sandy Loam | 0.24 / C | 0.32 | 100 | 0.30 | 52.3 | 0.21 | 52.2 | 0.19 | 36.2 | 0.024 | 36.1 | 0.022 | 5.2 | 0.011 | 5.1 | 0.009 | 5.2 | 0.003 | 5.1 | 0.0013 | 0 |
| Lexington Silt Loam | 0.32 / B | 0.40 | 100 | 0.38 | 73.1 | 0.21 | 73.0 | 0.19 | 70.5 | 0.024 | 70.4 | 0.022 | 25.5 | 0.011 | 25.4 | 0.009 | 6.5 | 0.003 | 6.4 | 0.0013 | 0 |
| Litz Shaly Silt Loam | 0.24 / C | 0.54 | 100 | 0.52 | 57.3 | 0.21 | 57.2 | 0.19 | 54.8 | 0.038 | 54.7 | 0.036 | 15.2 | 0.011 | 15.1 | 0.009 | 8.8 | 0.003 | 8.7 | 0.0013 | 0 |
| Lomond Silt Loam | 0.28 / B | 0.63 | 100 | 0.61 | 55.6 | 0.21 | 55.5 | 0.19 | 54.4 | 0.048 | 54.3 | 0.046 | 18.4 | 0.011 | 18.3 | 0.009 | 10.4 | 0.003 | 10.3 | 0.0013 | 0 |
| Lonewood Silt Loam | 0.24 / B | 0.63 | 100 | 0.61 | 53.8 | 0.21 | 53.7 | 0.19 | 52.4 | 0.048 | 52.3 | 0.046 | 16.4 | 0.011 | 16.3 | 0.009 | 10.4 | 0.003 | 10.3 | 0.0013 | 0 |
| Loring Silt Loam | 0.37 / C | 0.42 | 100 | 0.40 | 79.4 | 0.21 | 79.3 | 0.19 | 79.0 | 0.026 | 78.9 | 0.024 | 34.6 | 0.011 | 34.5 | 0.009 | 6.8 | 0.003 | 6.7 | 0.0013 | 0 |
| Maury Silt Loam | 0.32 / B | 0.52 | 100 | 0.50 | 66.1 | 0.21 | 66.0 | 0.19 | 64.6 | 0.037 | 64.5 | 0.035 | 24.4 | 0.011 | 24.3 | 0.009 | 8.6 | 0.003 | 8.5 | 0.0013 | 0 |

Table A-3 (continued). Adjusted eroded particle size distribution modified for input to the SBDCAD+ model.

| Soil Series | Brod., K/ HSG "B" Horiz. | Dlg1 | %Pass | Dlg2 | %Pass | Dsd1 | %Pass | Dsd2 | %Pass | Dsg1 | % Pass | Dsg2 | % Pass | Dsi1 | %Pass | Dsi2 | %Pass | Dcl1 | %Pass | Dcl2 | %Pass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Memphis Silt Loam | 0.49 / B | 0.42 | 100 | 0.40 | 79.5 | 0.21 | 79.4 | 0.19 | 79.3 | 0.027 | 79.2 | 0.025 | 35.3 | 0.011 | 35.2 | 0.009 | 6.9 | 0.003 | 6.8 | 0.0013 | 0 |
| Mimosa Silt Loam | 0.20 / C | 1.07 | 100 | 1.05 | 45.7 | 0.21 | 45.6 | 0.19 | 45.7 | 0.079 | 45.6 | 0.077 | 17.7 | 0.011 | 17.6 | 0.009 | 17.7 | 0.003 | 17.6 | 0.0013 | 0 |
| Montevallo Silt Loam | 0.24 / D | 0.54 | 100 | 0.52 | 51.2 | 0.21 | 51.1 | 0.19 | 47.8 | 0.038 | 47.7 | 0.036 | 8.8 | 0.011 | 8.7 | 0.009 | 8.8 | 0.003 | 8.7 | 0.0013 | 0 |
| Mountview Silt Loam | 0.37 / B | 0.62 | 100 | 0.60 | 59.2 | 0.21 | 59.1 | 0.19 | 58.1 | 0.046 | 58.0 | 0.044 | 21.5 | 0.011 | 21.4 | 0.009 | 10.1 | 0.003 | 10.0 | 0.0013 | 0 |
| Needmore Silt Loam | 0.32 / C | 0.88 | 100 | 0.86 | 48.7 | 0.21 | 48.6 | 0.19 | 48.6 | 0.073 | 48.5 | 0.071 | 15.0 | 0.011 | 14.9 | 0.009 | 14.6 | 0.003 | 14.5 | 0.0013 | 0 |
| Oktibbeha Clay | 0.20 / D | 0.94 | 100 | 0.92 | 42.4 | 0.21 | 42.3 | 0.19 | 42.3 | 0.078 | 42.2 | 0.076 | 15.5 | 0.011 | 15.4 | 0.009 | 15.5 | 0.003 | 15.4 | 0.0013 | 0 |
| Paden Silt Loam | 0.32 / C | 0.59 | 100 | 0.57 | 68.1 | 0.21 | 68.0 | 0.19 | 67.6 | 0.043 | 67.5 | 0.041 | 29.8 | 0.011 | 29.7 | 0.009 | 9.6 | 0.003 | 9.5 | 0.0013 | 0 |
| Pembroke Silt Loam | 0.28 / B | 0.63 | 100 | 0.61 | 63.0 | 0.21 | 62.9 | 0.19 | 62.4 | 0.048 | 62.3 | 0.046 | 26.4 | 0.011 | 26.3 | 0.009 | 10.4 | 0.003 | 10.3 | 0.0013 | 0 |
| Pickwick Silt Loam | 0.32 / B | 0.37 | 100 | 0.35 | 76.4 | 0.21 | 76.3 | 0.19 | 74.0 | 0.024 | 73.9 | 0.022 | 32.6 | 0.011 | 32.5 | 0.009 | 6.0 | 0.003 | 5.9 | 0.0013 | 0 |
| Providence Silt Loam | 0.32 / C | 0.59 | 100 | 0.57 | 62.7 | 0.21 | 62.6 | 0.19 | 61.6 | 0.043 | 61.5 | 0.041 | 23.8 | 0.011 | 23.7 | 0.009 | 9.6 | 0.003 | 9.5 | 0.0013 | 0 |
| Ramsey Loam | 0.28 / D | 0.42 | 100 | 0.40 | 52.7 | 0.21 | 52.6 | 0.19 | 44.8 | 0.026 | 44.7 | 0.024 | 6.8 | 0.011 | 6.7 | 0.009 | 6.8 | 0.003 | 6.7 | 0.0013 | 0 |
| Ruston Fine Sandy Loam | 0.32 / B | 0.34 | 100 | 0.32 | 55.4 | 0.21 | 55.3 | 0.19 | 42.5 | 0.024 | 42.4 | 0.022 | 5.5 | 0.011 | 5.4 | 0.009 | 5.5 | 0.003 | 5.4 | 0.0013 | 0 |
| Sequatchie Loam | 0.28 / B | 0.48 | 100 | 0.46 | 47.0 | 0.21 | 46.9 | 0.19 | 40.8 | 0.032 | 40.7 | 0.030 | 7.8 | 0.011 | 7.7 | 0.009 | 7.8 | 0.003 | 7.7 | 0.0013 | 0 |
| Sequoia Silt Loam | 0.32 / C | 0.87 | 100 | 0.85 | 54.4 | 0.21 | 54.3 | 0.19 | 54.3 | 0.071 | 54.2 | 0.069 | 21.3 | 0.011 | 21.2 | 0.009 | 14.3 | 0.003 | 14.2 | 0.0013 | 0 |
| Shouns Silt Loam | 0.28 / B | 0.48 | 100 | 0.46 | 63.7 | 0.21 | 63.6 | 0.19 | 60.8 | 0.032 | 60.7 | 0.030 | 18.8 | 0.011 | 18.7 | 0.009 | 7.8 | 0.003 | 7.7 | 0.0013 | 0 |
| Shubuta Fine Sandy Loam | 0.28 / C | 0.26 | 100 | 0.24 | 57.3 | 0.21 | 57.2 | 0.19 | 35.2 | 0.024 | 35.1 | 0.022 | 6.4 | 0.011 | 6.3 | 0.009 | 4.2 | 0.003 | 4.1 | 0.0013 | 0 |
| Statler Loam | 0.28 / B | 0.56 | 100 | 0.54 | 53.8 | 0.21 | 53.7 | 0.19 | 51.1 | 0.040 | 51.0 | 0.038 | 12.1 | 0.011 | 12.0 | 0.009 | 9.1 | 0.003 | 9.0 | 0.0013 | 0 |
| Stiversville Loam | 0.32 / B | 0.32 | 100 | 0.30 | 53.6 | 0.21 | 53.5 | 0.19 | 38.2 | 0.024 | 38.1 | 0.022 | 5.2 | 0.011 | 5.1 | 0.009 | 5.2 | 0.003 | 5.1 | 0.0013 | 0 |
| Talbott Silt Loam | 0.24 / C | 1.18 | 100 | 1.16 | 42.5 | 0.21 | 42.4 | 0.19 | 42.5 | 0.079 | 42.4 | 0.077 | 19.5 | 0.011 | 19.4 | 0.009 | 19.5 | 0.003 | 19.4 | 0.0013 | 0 |
| Tellico Loam | 0.32 / B | 0.81 | 100 | 0.79 | 35.1 | 0.21 | 35.0 | 0.19 | 34.3 | 0.065 | 34.2 | 0.063 | 13.3 | 0.011 | 13.2 | 0.009 | 13.3 | 0.003 | 13.2 | 0.0013 | 0 |
| Wallen Gravelly Loam | 0.28 / B | 0.37 | 100 | 0.35 | 52.3 | 0.21 | 52.2 | 0.19 | 41.0 | 0.024 | 40.9 | 0.022 | 6.0 | 0.011 | 5.9 | 0.009 | 6.0 | 0.003 | 5.9 | 0.0013 | 0 |
| Waynesboro Loam | 0.28 / B | 0.60 | 100 | 0.58 | 45.5 | 0.21 | 45.4 | 0.19 | 42.9 | 0.045 | 42.8 | 0.043 | 9.9 | 0.011 | 9.8 | 0.009 | 9.9 | 0.003 | 9.8 | 0.0013 | 0 |

**Table A-4. Counties with associated Annual R, 2-year and 10-year, 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**
R = Rainfall Factor (R value) P2 = SCS Type II, 2-year 24-hour precipitation P10 = SCS Type II, 2-year 24-hour precipitation

| County | R; P2, P10[1] (Reference values) | Bulletin 596 Listing[2] | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Anderson | 190; 3.3, 4.8 | H21,23: J11,61 | 6 | Dewey Fullerton Jefferson Lehew Litz Montevallo Ramsey Sequoia Talbott Wallen | 165, 3.3, 4.8 | Anderson |
| Bedford | 230; 3.7, 5.1 | A43: E11, 21, 22: F11, 31 | 3 | Armour Barfield Bodine Capshaw Delrose Gladeville Hampshire Inman Mimosa Stiversville Talbott | 225, 3.7, 5.2 | Bedford |
| Benton | 230; 3.6, 5.1 | A32: C11, 21: D11, 31 | 2 | Bodine Brandon Dickson Dulac Lax Lexington Mountview Providence Ruston Shubuta | 235, 3.7, 5.2 | Benton |
| Bledsoe | 230; 3.6, 5.0 | H11, 21: J32 | 3 | Etowah Hartsells Lonewood Ramsey Sequatchie Waynesboro | 225, 3.7, 5.2 | Bledsoe |
| Blount | 200; 3.4, 5.0 | J11, 31, 51, 52, 71: K11, 22, 42 | 4 | Alcoa Decatur Dewey Dunmore Etowah Fullerton Jefferson Litz Ramsey Sequoia Statler Talbott Tellico Wallen Waynesboro | 215, 3.7, 5.2 | Blount |
| Bradley | 260; 3.6, 5.2 | J12, 52, 62, 71 | 4 | Alcoa Bodine Fullerton Jefferson Litz Ramsey Sequoia Talbott Tellico Wallen | 215, 3.7, 5.2 | Bradley |
| Campbell | 180; 3.2, 4.7 | H21, 23: J11, 51 | 6 | Dewey Etowah Fullerton Jefferson Ramsey Talbott | 165, 3.3, 4.8 | Campbell |
| Cannon | 230; 3.6, 5.0 | D11, 32: E11, 22: F11 | 3 | Barfield Bodine Dellrose Dickson Gladeville Hampshire Inman Mimosa Mountview Stiversville Talbott | 225, 3.7, 5.2 | Cannon |
| Carroll | 210; 3.7, 5.2 | A31, 32: B41: C11, 21 | 2 | Dulac Grenada Lexington Memphis Providence Ruston Shubutta | 235, 3.7, 5.2 | Carroll |
| Carter | 150; 3.0, 4.8 | J21, 41: K12, 21, 31, 41 | 6 | Dandridge Dewey Dunmore Hayter Needmore Shouns | 165, 3.3, 4.8 | Carter |
| Cheatham | 210; 3.5, 5.0 | A43: D11, 21, 32 | 3 | Armour Baxter Bodine Dickson Fullerton Mountview | 225, 3.7, 5.2 | Cheatham |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Chester | 300; 3.8, 5.4 | A32: C11,21 | 1 | Dulac Lexington Providence Ruston Shubuta | 285, 4.0, 5.7 | Chester |
| Claiborne | 150; 3.1, 4.6 | H21, 23: J11, 51, 61 | 6 | Dewey Etowah Fullerton Jefferson Lehew Litz Montevallo Ramsey Sequoia Talbott Wallen | 165, 3.3, 4.8 | Claiborne |
| Clay | 200; 3.3, 4.8 | D13, 21, 42, 51: E11 | 5 | Baxter Bodine Christian Decatur Dellrose Dickson Fullerton Mimosa Mountview Pembroke Waynesboro | 190, 3.3, 4.8 | Clay |
| Cocke | 170; 3.2, 4.9 | J21, 34, 41: K11, 12, 21, 22, 42 | 4 | Dandridge Dewey Dunmore Holston Jefferson Needmore Ramsey Statler Wallen | 215, 3.7, 5.2 | Cocke |
| Coffee | 230; 3.7, 5.1 | A43: D11, 32, 51: E11,21: H11,21 | 3 | Armour Bodine Decatur Dellrose Dickson Hartsells Lonewood Mimosa Mountview Ramsey Waynesboro | 225, 3.7, 5.2 | Coffee |
| Crockett | 270; 3.8, 5.4 | A31: B21, 31, 32 | 1 | Calloway Center Grenada Loring Memphis | 285, 4.0, 5.7 | Crockett |
| Cumberland | 220; 3.4, 4.9 | H11, 21, 22: J32 | 3 | Etowah Hartsells Lonewood Ramsey Sequatchie Waynesboro | 225, 3.7, 5.2 | Cumberland |
| Davidson | 210; 3.5, 5.0 | A43: D11, 21, 32: E11, 21, 22, 31: F11 | 3 | Armour Barfield Baxter Bodine Braxton Dellrose Dickson Fullerton Gladeville Hampshire Harpeth Inman Maury Mimosa Mountview Stiversville Talbott | 225, 3.7, 5.2 | Davidson |
| Decatur | 250; 3.7, 5.3 | A32: C21, 31: D11 | 1 | Bodine Dickson Dulac Paden Pickwick Mountview Shubuta Waynesboro | 285, 4.0, 5.7 | Decatur |
| Dekalb | 220; 3.5, 4.9 | D11, 22, 32: E11, 22: F11 | 3 | Barfield Baxter Bodine Christian Dickson Dellrose Gladeville Hampshire Inman Mimosa Mountview Talbott Stiversville | 225, 3.7, 5.2 | Dekalb |
| Dickson | 220; 3.5, 5.0 | A43: D11, 21, 31, 32 | 3 | Armour Baxter Bodine Brandon Dickson Fullerton Lax Mountview | 225, 3.7, 5.2 | Dickson |
| Dyer | 260; 3.8, 5.4 | A11, 12, 21, 22, 31: B11, 21, 32 | 1 | Calloway Center Grenada Loring Memphis | 285, 4.0, 5.7 | Dyer |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Fayette | 320; 4.0, 5.6 | A31: B21, 41 | 1 | Grenada Lexington Loring Memphis Ruston | 285, 4.0, 5.7 | Fayette |
| Fentress | 200; 3.3, 4.7 | D13, 51: H11, 21, 22 | 5 | Christian Decatur Hartsells Lonewood Mountview Ramsey Waynesboro | 190, 3.3, 4.8 | Fentress |
| Franklin | 250; 3.7, 5.3 | A43: D11, 32, 51: E11: H11, 21 | 3 | Armour Bodine Decatur Dellrose Dickson Hartsells Lonewood Mimosa Mountview Ramsey Waynesboro | 225, 3.7, 5.2 | Franklin |
| Gibson | 250; 3.8, 5.3 | A31: B21, 41 | 1 | Grenada Lexington Loring Memphis Ruston | 285, 4.0, 5.7 | Gibson |
| Giles | 260; 3.8, 5.3 | A43: D11, 32: E11,31 | 1 | Armour Bodine Braxton Dellrose Dickson Harpeth Maury Mimosa Mountview | 285,4.0, 5.7 | Giles |
| Grainger | 170; 3.1, 4.7 | J11, 61, 62 | 6 | Fullerton Dewey Jefferson Lehew Litz Montevallo Ramsey Sequoia Talbott Wallen | 165, 3.3, 4.8 | Grainger |
| Greene | 150; 3.1, 4.8 | J21, 33, 34, 41, 61: K11, 21, 42 | 6 | Dandridge Dewey Dunmore Holston Jefferson Lehew Litz Montevallo Needmore Sequatchie Sequoia Statler Talbott Wallen Waynesboro | 165, 3.3, 4.8 | Greene |
| Grundy | 240; 3.6, 5.1 | D51: H11, 21 | 3 | Decatur Hartsells Lonewood Ramsey Waynesboro | 225, 3.7, 5.2 | Grundy |
| Hamblen | 170; 3.1, 4.8 | J11, 21, 31, 34, 41, 51, 52, 61 | 6 | Dandridge Decatur Dewey Dunmore Etowah Fullerton Holston Lehew Litz Montevallo Needmore Sequoia Talbott Wallen Waynesboro | 165, 3.3, 4.8 | Hamblen |
| Hamilton | 260; 3.6, 5.1 | H11, 21: J12, 51, 52, 62 | 4 | Bodine Etowah Fullerton Hartsells Jefferson Litz Lonewood Ramsey Sequoia Talbott Wallen | 215, 3.7, 5.2 | Hamilton |
| Hancock | 150; 3.0, 4.6 | J11, 51, 61 | 6 | Fullerton Dewey Etowah Lehew Litz Montevallo Sequoia Talbott Wallen | 165, 3.3, 4.8 | Hancock |
| Hardeman | 320; 3.9, 5.5 | A31, 32: B41: C11, 21 | 1 | Dulac Grenada Lexington Memphis Providence Ruston Shubuta | 285, 4.0, 5.7 | Hardeman |
| Hardin | 300; 3.8, 5.4 | A32, 41: C21, 22, 23, 31: D12 | 1 | Bodine Boswell Dulac Oktibbeha Paden Pickwick Shubuta Talbott Waynesboro | 285, 4.0, 5.7 | Hardin |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Hawkins | 150; 3.0, 4.7 | J11, 21, 34, 41, 61, 62 | 6 | Dandridge Dewey Dunmore Fullerton Holston Jefferson Lehew Litz Montevallo Needmore Ramsey Sequoia Talbott Wallen | 165, 3.3, 4.8 | Hawkins |
| Haywood | 300; 3.9, 5.5 | A31: B21, 31 | 1 | Calloway Grenada Lexington Loring Memphis | 285, 4.0, 5.7 | Haywood |
| Henderson | 250; 3.8, 5.3 | A32: C11, 21 | 1 | Dulac Lexington Providence Ruston Shubuta | 285, 4.0, 5.7 | Henderson |
| Henry | 230; 3.6, 5.1 | A31: B31, 41: C11, 21: D31 | 2 | Bodine Brandon CallowayDulac Grenada Lax Lexington Memphis Providence Ruston Shubuta | 235, 3.7, 5.2 | Henry |
| Hickman | 230; 3.6, 5.1 | A43: D11, 21: E11 | 3 | Armour Baxter Bodine Dellrose Dickson Fullerton Mimosa Mountview | 225, 3.7, 5.2 | Hickman |
| Houston | 220; 3.5, 5.0 | A43: D11, 21, 32 | 3 | Armour Baxter Bodine Dickson Fullerton Mountview | 225, 3.7, 5.2 | Houston |
| Humphreys | 230; 3.6, 5.1 | A43: C31: D11, 21, 31 | 3 | Armour Baxter Bodine Brandon Dickson Fullerton Lax Mountview Paden Pickwick Waynesboro | 225, 3.7, 5.2 | Humphreys |
| Jackson | 210; 3.4, 4.8 | D13,22: E11 | 5 | Baxter Bodine Christian Dellrose Dickson Mimosa Mountview | 190, 3.3, 4.8 | Jackson |
| Jefferson | 180; 3.2, 4.8 | J11, 21, 31, 33, 34, 41, 51, 52: K22, 42 | 4 | Dandridge Decatur Dewey Dunmore Etowah Fullerton Holston Jefferson Litz Needmore Sequatchie Sequoia Talbott Wallen Waynesboro | 215, 3.7, 5.2 | Jefferson |
| Johnson | 150; 3.0, 4.8 | K11, 12, 21, 41, 42 | 6 | Dunmore Hayter Jefferson Shouns Statler | 165, 3.3, 4.8 | Johnson |
| Knox | 190; 3.3, 4.8 | J11, 31, 41, 53, 61, 71 | 4 | Alcoa Dandridge Decatur Dewey Dunmore Fullerton Lehew Litz Montevallo Needmore Ramsey Sequoia Statler Talbott Tellico Wallen Waynesboro | 215, 3.7, 5.2 | Knox |
| Lake | 260; 3.7, 5.3 | A11, 13, 21 | 1 | ~ | 285, 4.0, 5.7 | Lake |
| Lauderdale | 280; 3.9, 5.5 | A11, 21, 31: B11, 21 | 1 | Grenada Loring Memphis | 285, 4.0, 5.7 | Lauderdale |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Lawrence | 270; 3.8, 5.3 | A42: D11, 32, 51 | 1 | Bodine Decatur Dickson Humphreys Mountview Waynesboro | 285,4.0, 5.7 | Lawrence |
| Lewis | 250; 3.7, 5.2 | A42: D11, 31, 32 | 3 | Bodine Branden Dickson Humphreys Lax Mountview | 225, 3.7, 5.2 | Lewis |
| Lincoln | 250; 3.7, 5.3 | A43: D32: E11, 21, 22: H21 | 1 | Armour Bodine Dellrose Dickson Hampshire Inman Mimosa Mountview Ramsey Stiversville | 285,4.0, 5.7 | Lincoln |
| Loudon | 210; 3.4, 4.9 | J11, 12, 31, 52, 61, 71 | 4 | Alcoa Bodine Decatur Dewey Dunmore Fullerton Lehew Litz Montevallo Sequoia Talbott Tellico Wallen Waynesboro | 215, 3.7, 5.2 | Loudon |
| McMinn | 230; 3.5, 5.1 | J11, 12, 21, 31, 52, 61, 71: K22 | 4 | Alcoa Bodine Decatur Dewey Dunmore Fullerton Jefferson Lehew Litz Montevallo Ramsey Sequoia Talbott Tellico Wallen Waynesboro | 215, 3.7, 5.2 | McMinn |
| McNairy | 310; 3.9, 5.5 | A32: C11, 21, 22, 31 | 1 | Boswell Dulac Lexington Oktibbeha Paden Pickwick Providence Ruston Shubuta Waynesboro | 285, 4.0, 5.7 | McNairy |
| Macon | 200; 3.3, 4.8 | D13, 21, 32, 41: E11 | 3 | Baxter Bodine Christian Crider Dellrose Dickson Fullerton Mimosa Mountview Pembroke | 225, 3.7, 5.2 | Macon |
| Madison | 260; 3.8, 5.4 | A31, 32: B21, 31, 41: C11, 21 | 1 | Calloway Dulac Grenada Lexington Loring Memphis Providence Ruston Shubuta | 285, 4.0, 5.7 | Madison |
| Marion | 250; 3.7, 5.2 | H11, 12, 21: J32 | 3 | Etowah Hartsells Lonewood Ramsey Sequatchie Waynesboro | 225, 3.7, 5.2 | Marion |
| Marshall | 240; 3.7, 5.2 | A43: E11, 21, 22, 31: F11 | 3 | Armour Barfield Bodine Braxton Dellrose Gladeville Hampshire Harpeth Inman Maury Mimosa Stiversville Talbott | 225, 3.7, 5.2 | Marshall |
| Maury | 240; 3.7, 5.1 | A43: D11: E11, 22, 31: F11 | 3 | Armour Barfield Bodine Braxton Dellrose Dickson Gladeville Hampshire Harpeth Inman Maury Mimosa Mountview Stiversville Talbott | 225, 3.7, 5.2 | Maury |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Meigs | 230; 3.5, 5.0 | J11, 12, 51, 61 | 4 | Bodine Dewey Etowah Fullerton Lehew Litz Montevallo Sequoia Talbott Wallen | 215, 3.7, 5.2 | Meigs |
| Monroe | 220; 3.5, 5.0 | J11, 21, 31, 52, 71: K11, 21, 22 | 4 | Alcoa Decatur Dewey Dunmoore Fullerton Jefferson Litz Ramsey Sequoia Talbott Tellico Wallen Waynesboro | 215, 3.7, 5.2 | Monroe |
| Montgomery | 200; 3.4, 4.9 | A43: D21, 32, 41, 42 | 3 | Armour Baxter Crider Dickson Fullerton Pembroke Mountview | 225, 3.7, 5.2 | Montgomery |
| Moore | 240; 3.7, 5.2 | A43: D11, 32: E11, 21 | 3 | Armour Bodine Dellrose Dickson Mimosa Mountview | 225, 3.7, 5.2 | Moore |
| Morgan | 200; 3.3, 4.8 | H11, 12, 21, 22 | 5 | Hartsells Lonewood Ramsey | 190, 3.3, 4.8 | Morgan |
| Obion | 260; 3.7, 5.2 | A12, 21, 31: B11, 21, 32, 33 | 2 | Calloway Center Grenada Loring Memphis | 235, 3.7, 5.2 | Obion |
| Overton | 210; 3.3, 4.8 | D13, 22, 51: H11, 21, 22 | 5 | Baxter Bodine Christian Decatur Dickson Hartsells Mountview Waynesboro | 190, 3.3, 4.8 | Overton |
| Perry | 250; 3.7, 5.2 | A42: C31: D11, 12 | 3 | Bodine Dickson Humphreys Mountview Paden Pickwick Talbott Waynesboro | 225, 3.7, 5.2 | Perry |
| Pickett | 200; 3.3, 4.7 | D13, 51: H11, 22 | 5 | Christian Decatur Hartsells Lonewood Mountview Ramsey Waynesboro | 190, 3.3, 4.8 | Pickett |
| Polk | 250; 3.6, 5.3 | J31, 52: K11, 21, 22, 32 | 4 | Decatur Dewey Dunmore Jefferson Litz Ramsey Sequoia Talbott Wallen Waynesboro | 215, 3.7, 5.2 | Polk |
| Putnam | 220; 3.6, 4.9 | D11, 22, 32, 51: E11: H11, 21 | 3 | Baxter Bodine Christian Decatur Dellrose Dickson Hartsells Lonewood Mimosa Mountview Ramsey Waynesboro | 225, 3.7, 5.2 | Putnam |
| Rhea | 230; 3.5, 5.0 | H11, 21: J12, 32, 61 | 4 | Bodine DeweyEtowah Fullerton Hartsells Lehew Litz Lonewood Montevallo Ramsey Sequatchie Sequoia Talbott Wallen Waynesboro | 215, 3.7, 5.2 | Rhea |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Roane | 210; 3.4, 4.9 | H21: J11, 12, 51, 61 | 4 | Bodine Dewey Etowah Fullerton Lehew Litz Montevallo Ramsey Sequoia Talbott Wallen | 215, 3.7, 5.2 | Roane |
| Robertson | 200; 3.5, 4.9 | D21, 32, 41, 42 | 3 | Baxter Crider Dickson Fullerton Mountview Pembroke | 225, 3.7, 5.2 | Robertson |
| Rutherford | 230; 3.6, 5.0 | A43: E11, 21, 22: F11, 21, 31 | 3 | Armour Barfield Bodine Bradyville Capshaw Cumberland Dellrose Gladeville Hampshire Inman Lomond Mimosa Stiversville Talbott | 225, 3.7, 5.2 | Rutherford |
| Scott | 180; 3.2, 4.7 | H11, 12, 22, 23 | 5 | Hartsells Jefferson Lonewood Ramsey | 190, 3.3, 4.8 | Scott |
| Sequatchie | 250; 3.6, 5.1 | H11, 21: J32 | 3 | Etowah Hartsells Lonewood Ramsey Sequatchie Waynesboro | 225, 3.7, 5.2 | Sequatchie |
| Sevier | 180; 3.3, 4.9 | J21, 34, 41, 52: K11, 21, 22, 42 | 4 | Dandridge Dewey Dunmore Holston Jefferson Litz Needmore Ramsey Sequoia Statler Talbott Wallen | 215, 3.7, 5.2 | Sevier |
| Shelby | 300; 4.0, 5.7 | A11, 21, 31: B11, 21, 31 | 1 | Calloway Grenada Loring Memphis | 285, 4.0, 5.7 | Shelby |
| Smith | 210; 3.4, 4.9 | E11, 21, 22, 31: F11 | 3 | Armour Barfield Bodine Braxton Dellrose Gladeville Hampshire Harpeth Inman Maury Mimosa Stiversville Talbott | 225, 3.7, 5.2 | Smith |
| Stewart | 210; 3.5, 5.0 | A43: D11, 21, 31, 32 | 3 | Armour Baxter Bodine Brandon Dickson Fullerton Lax Mountview | 225, 3.7, 5.2 | Stewart |
| Sullivan | 140; 3.0, 4.7 | J21, 34, 41, 61: K21 | 6 | Dandridge Dewey Dunmoore Holston Lehew Litz Montevallo Needmore Sequoia Talbott Wallen | 165, 3.3, 4.8 | Sullivan |
| Sumner | 200; 3.4, 4.9 | D11, 21, 32, 41, 42: E11, 21, 31 | 3 | Armour Baxter Bodine Braxton Crider Dellrose Dickson Fullerton Harpeth Maury Mimosa Mountview Pembroke | 225, 3.7, 5.2 | Sumner |
| Tipton | 300; 4.0, 5.6 | A11, 21, 31: B11, 21, 31 | 1 | Calloway Grenada Loring Memphis | 285, 4.0, 5.7 | Tipton |
| Trousdale | 210; 3.4, 4.9 | E11, 21, 31 | 3 | Armour Bodine Braxton Dellrose Harpeth Mimosa Maury | 225, 3.7, 5.2 | Trousdale |

**Table A-4 (continued). Counties with associated Annual R, 2-year and 10-year 24-hour precipitations. Bulletin 596 General Soil Unit listing is given. This is followed by the Zone Designation, Zone Evaluated Soils Listing, Zone R value, and Zone precipitation values used for evaluation in the model.**

| County | R; P2, P10 (Reference values) | Bulletin 596 Listing | Zone | Corresponding Representavie Soils (soils used in the evaluation) | Zone R; P2, P10 (Assigned Values) | County |
|---|---|---|---|---|---|---|
| Unicoi | 150; 3.0, 4.9 | K11, 12, 21, 31 | 6 | ~ | 165, 3.3, 4.8 | Unicoi |
| Union | 170; 3.2, 4.7 | J11,61 | 6 | Dewey Fullerton Lehew Litz Montevallo Sequoia Talbott Wallen | 165, 3.3, 4.8 | Union |
| Van Buren | 230; 3.6, 5.0 | D51: H11, 21 | 3 | Decatur Hartsells Lonewood Ramsey Waynesboro | 225, 3.7, 5.2 | Van Buren |
| Warren | 230; 3.6, 5.0 | D22, 32, 51: H11, 21 | 3 | Baxter Christian Decatur Dickson Hartsells Lonewood Mountview Ramsey Waynesboro | 225, 3.7, 5.2 | Warren |
| Washington | 150; 3.0, 4.8 | J21, 33, 41: K11, 21, 42 | 6 | Dewey Dandridge Dunmore Jefferson Needmore Sequatchie Statler Waynesboro | 165, 3.3, 4.8 | Washington |
| Wayne | 280; 3.8, 5.4 | A41, 42: C21, 23: D11, 12, 32 | 1 | Beason Bodine Dickson Dulac Humphreys Mountview Shubuta Talbott | 285, 4.0, 5.7 | Wayne |
| Weakley | 250; 3.7, 5.2 | A31: B21, 41 | 2 | Grenada Lexington Loring Memphis Ruston | 235, 3.7, 5.2 | Weakley |
| White | 220; 3.5, 4.9 | D22, 51: H11, 21 | 3 | Baxter Christian Decatur Dickson Hartsells Lonewood Mountview Ramsey Waynesboro | 225, 3.7, 5.2 | White |
| Williamson | 230; 3.6, 5.0 | A43: D11, 21: E11, 21, 22, 31: F11 | 3 | Armour Barfield Baxter Bodine Braxton Dellrose Dickson Fullerton Gladeville Hampshire Harpeth Inman Maury Mimosa Mountview Stiversville Talbott | 225, 3.7, 5.2 | Williamson |
| Wilson | 210; 3.5, 4.9 | E21, 22, 31: F11 | 3 | Armour Barfield Braxton Gladeville Hampshire Harpeth Inman Maury Mimosa Stiversville Talbott | 225, 3.7, 5.2 | Wilson |

[1] Source: Erosion and Sediment Control Handbook for Urban Areas and Construction Sites in Tennessee, 1974, U.S. Department of Agriculture Soil Conservation Service.
[2] Source: Tennessee Agricultural Experiment Station Bulletin 596 (Soils of Tennessee), 1980, M.E. Springer and J.A. Elder

Table A-5 . Pond Geometries Used for the Evaluation.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Basic Information: | | Length to Width (A to B) Ratio, approximate: 2.5/1 | | | | | | | |
| | | Rectangular, level bottom sarting at elevation 100 | | | | | | | |
| | | 6.5 foot depth to Top of Berm (Freeboard and Settling ignored) | | | | | | | |
| | | Side Slope: 2 to 1 | | | | | | | |
| | | 20 foot wide emergency spillway | | | | | | | |
| | | 50 foot barrel (18inch diameter), 3 percent slope | | | | | | | |
| | | 4.5 foot high 24 inch diameter riser, perforated below midpoint (1inch diameter) | | | | | | | |
| | | Pond volume/5 Acre watershed (cubic yards/Acre) is based on elevation | | | | | | | |
| | | | at emergency spillway stage 5.5 (V/Ac(yd^3)) | | | | | | |
| | | | | | | | | | |
| | | Length, width (L, W) in feet | | | | | | | |
| | | Ar.= area | | ft=feet | Ac=acres | Acft= acrefeet | | Yd^3=cubic yards | |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P20 | | | 0.0 | 100.0 | | | | 90 | 0.002 |
| | | | 1.0 | 101.0 | 137.3 | 5.1 | 0.003 | 190 | 0.004 |
| | | | 2.0 | 102.0 | 390.7 | 14.5 | 0.009 | 322 | 0.007 |
| | | | 2.5 | 102.5 | 570.8 | 21.1 | 0.013 | 400 | 0.009 |
| Length(A)= | 15 | | 3.0 | 103.0 | 792.0 | 29.3 | 0.018 | 486 | 0.011 |
| Width (B)= | 6 | | 4.0 | 104.0 | 1373.3 | 50.9 | 0.032 | 682 | 0.016 |
| L/W= | 2.5 | | 5.0 | 105.0 | 2166.7 | 80.2 | 0.050 | 910 | 0.021 |
| V/Ac(yd^3)= | 19.65 | | 5.5 | 105.5 | 2652.8 | 98.3 | 0.061 | 1036 | 0.024 |
| | | | 6.0 | 106.0 | 3204.0 | 118.7 | 0.074 | 1170 | 0.027 |
| | | | 6.5 | 106.5 | 3824.2 | 141.6 | 0.088 | 1312 | 0.030 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P40 | | | 0.0 | 100.0 | | | | 360 | 0.008 |
| | | | 1.0 | 101.0 | 449.3 | 16.6 | 0.010 | 544 | 0.012 |
| | | | 2.0 | 102.0 | 1098.7 | 40.7 | 0.025 | 760 | 0.017 |
| | | | 2.5 | 102.5 | 1508.3 | 55.9 | 0.035 | 880 | 0.020 |
| Length(A)= | 30 | | 3.0 | 103.0 | 1980.0 | 73.3 | 0.045 | 1008 | 0.023 |
| Width (B)= | 12 | | 4.0 | 104.0 | 3125.3 | 115.8 | 0.072 | 1288 | 0.030 |
| L/W= | 2.5 | | 5.0 | 105.0 | 4566.7 | 169.1 | 0.105 | 1600 | 0.037 |
| V/Ac(yd^3)= | 40.06 | | 5.5 | 105.5 | 5408.3 | 200.3 | 0.124 | 1768 | 0.041 |
| | | | 6.0 | 106.0 | 6336.0 | 234.7 | 0.145 | 1944 | 0.045 |
| | | | 6.5 | 106.5 | 7353.7 | 272.4 | 0.169 | 2128 | 0.049 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P67 | | | 0.0 | 100.0 | | | | 810.0 | 0.019 |
| | | | 1.0 | 101.0 | 941.3 | 34.9 | 0.022 | 1078.0 | 0.025 |
| | | | 2.0 | 102.0 | 2166.7 | 80.2 | 0.050 | 1378.0 | 0.032 |
| | | | 2.5 | 102.5 | 2895.8 | 107.3 | 0.066 | 1540.0 | 0.035 |
| Length(A)= | 45.0 | | 3.0 | 103.0 | 3708.0 | 137.3 | 0.085 | 1710.0 | 0.039 |
| Width (B)= | 18.0 | | 4.0 | 104.0 | 5597.3 | 207.3 | 0.128 | 2074.0 | 0.048 |
| L/W= | 2.5 | | 5.0 | 105.0 | 7866.7 | 291.4 | 0.181 | 2470.0 | 0.057 |
| V/Ac(yd^3)= | 67.81 | | 5.5 | 105.5 | 9153.8 | 339.0 | 0.210 | 2680.0 | 0.062 |
| | | | 6.0 | 106.0 | 10548.0 | 390.7 | 0.242 | 2898.0 | 0.067 |
| | | | 6.5 | 106.5 | 12053.2 | 446.4 | 0.277 | 3124.0 | 0.072 |

Table A-5, continued. Pond Geometries Used for the Evaluation.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P100 | | | 0.0 | 100.0 | | | | 1380.0 | 0.032 |
| | | | 1.0 | 101.0 | 1551.3 | 57.5 | 0.036 | 1728.0 | 0.040 |
| | | | 2.0 | 102.0 | 3466.7 | 128.4 | 0.080 | 2108.0 | 0.048 |
| | | | 2.5 | 102.5 | 4570.8 | 169.3 | 0.105 | 2310.0 | 0.053 |
| Length(A)= | 60.0 | | 3.0 | 103.0 | 5778.0 | 214.0 | 0.133 | 2520.0 | 0.058 |
| Width (B)= | 23.0 | | 4.0 | 104.0 | 8517.3 | 315.5 | 0.196 | 2964.0 | 0.068 |
| L/W= | 2.6 | | 5.0 | 105.0 | 11716.7 | 434.0 | 0.269 | 3440.0 | 0.079 |
| V/Ac(yd^3)= | 99.99 | | 5.5 | 105.5 | 13498.8 | 500.0 | 0.310 | 3690.0 | 0.085 |
| | | | 6.0 | 106.0 | 15408.0 | 570.7 | 0.354 | 3948.0 | 0.091 |
| | | | 6.5 | 106.5 | 17448.2 | 646.2 | 0.401 | 4214.0 | 0.097 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P150 | | | 0.0 | 100.0 | | | | 2356.0 | 0.054 |
| | | | 1.0 | 101.0 | 2575.3 | 95.4 | 0.059 | 2800.0 | 0.064 |
| | | | 2.0 | 102.0 | 5610.7 | 207.8 | 0.129 | 3276.0 | 0.075 |
| | | | 2.5 | 102.5 | 7310.8 | 270.8 | 0.168 | 3526.0 | 0.081 |
| Length(A)= | 76.0 | | 3.0 | 103.0 | 9138.0 | 338.4 | 0.210 | 3784.0 | 0.087 |
| Width (B)= | 31.0 | | 4.0 | 104.0 | 13189.3 | 488.5 | 0.303 | 4324.0 | 0.099 |
| L/W= | 2.5 | | 5.0 | 105.0 | 17796.7 | 659.1 | 0.409 | 4896.0 | 0.112 |
| V/Ac(yd^3)= | 150.5 | | 5.5 | 105.5 | 20318.8 | 752.5 | 0.466 | 5194.0 | 0.119 |
| | | | 6.0 | 106.0 | 22992.0 | 851.6 | 0.528 | 5500.0 | 0.126 |
| | | | 6.5 | 106.5 | 25820.2 | 956.3 | 0.593 | 5814.0 | 0.133 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P200 | | | 0.0 | 100.0 | | | | 3312.0 | 0.076 |
| | | | 1.0 | 101.0 | 3573.3 | 132.3 | 0.082 | 3840.0 | 0.088 |
| | | | 2.0 | 102.0 | 7690.7 | 284.8 | 0.177 | 4400.0 | 0.101 |
| | | | 2.5 | 102.5 | 9963.3 | 369.0 | 0.229 | 4692.0 | 0.108 |
| Length(A)= | 92.0 | | 3.0 | 103.0 | 12384.0 | 458.7 | 0.284 | 4992.0 | 0.115 |
| Width (B)= | 36.0 | | 4.0 | 104.0 | 17685.3 | 655.0 | 0.406 | 5616.0 | 0.129 |
| L/W= | 2.6 | | 5.0 | 105.0 | 23626.7 | 875.1 | 0.542 | 6272.0 | 0.144 |
| V/Ac(yd^3)= | 198.9 | | 5.5 | 105.5 | 26847.3 | 994.3 | 0.616 | 6612.0 | 0.152 |
| | | | 6.0 | 106.0 | 30240.0 | 1120.0 | 0.694 | 6960.0 | 0.160 |
| | | | 6.5 | 106.5 | 33808.7 | 1252.2 | 0.776 | 7316.0 | 0.168 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P250 | | | 0.0 | 100.0 | | | | 4368.0 | 0.100 |
| | | | 1.0 | 101.0 | 4665.3 | 172.8 | 0.107 | 4968.0 | 0.114 |
| | | | 2.0 | 102.0 | 9946.7 | 368.4 | 0.228 | 5600.0 | 0.129 |
| | | | 2.5 | 102.5 | 12828.3 | 475.1 | 0.294 | 5928.0 | 0.136 |
| Length(A)= | 104.0 | | 3.0 | 103.0 | 15876.0 | 588.0 | 0.364 | 6264.0 | 0.144 |
| Width (B)= | 42.0 | | 4.0 | 104.0 | 22485.3 | 832.8 | 0.516 | 6960.0 | 0.160 |
| L/W= | 2.5 | | 5.0 | 105.0 | 29806.7 | 1104.0 | 0.684 | 7688.0 | 0.176 |
| V/Ac(yd^3)= | 250 | | 5.5 | 105.5 | 33744.3 | 1249.8 | 0.775 | 8064.0 | 0.185 |
| | | | 6.0 | 106.0 | 37872.0 | 1402.7 | 0.869 | 8448.0 | 0.194 |
| | | | 6.5 | 106.5 | 42193.7 | 1562.7 | 0.969 | 8840.0 | 0.203 |

| Table A-5, continued. Pond Geometries Used for the Evaluation. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P300 | | | 0.0 | 100.0 | | | | 5382.0 | 0.124 |
| | | | 1.0 | 101.0 | 5713.3 | 211.6 | 0.131 | 6050.0 | 0.139 |
| | | | 2.0 | 102.0 | 12110.7 | 448.5 | 0.278 | 6750.0 | 0.155 |
| | | | 2.5 | 102.5 | 15575.8 | 576.9 | 0.358 | 7112.0 | 0.163 |
| Length(A)= | 117.0 | | 3.0 | 103.0 | 19224.0 | 712.0 | 0.441 | 7482.0 | 0.172 |
| Width (B)= | 46.0 | | 4.0 | 104.0 | 27085.3 | 1003.2 | 0.622 | 8246.0 | 0.189 |
| L/W= | 2.5 | | 5.0 | 105.0 | 35726.7 | 1323.2 | 0.820 | 9042.0 | 0.208 |
| V/Ac(yd^3)= | 298.9 | | 5.5 | 105.5 | 40349.8 | 1494.4 | 0.926 | 9452.0 | 0.217 |
| | | | 6.0 | 106.0 | 45180.0 | 1673.3 | 1.037 | 9870.0 | 0.227 |
| | | | 6.5 | 106.5 | 50221.2 | 1860.0 | 1.153 | 10296.0 | 0.236 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P350 | | | 0.0 | 100.0 | | | | 6450.0 | 0.148 |
| | | | 1.0 | 101.0 | 6813.3 | 252.3 | 0.156 | 7182.0 | 0.165 |
| | | | 2.0 | 102.0 | 14374.7 | 532.4 | 0.330 | 7946.0 | 0.182 |
| | | | 2.5 | 102.5 | 18445.8 | 683.2 | 0.423 | 8340.0 | 0.191 |
| Length(A)= | 129.0 | | 3.0 | 103.0 | 22716.0 | 841.3 | 0.521 | 8742.0 | 0.201 |
| Width (B)= | 50.0 | | 4.0 | 104.0 | 31869.3 | 1180.3 | 0.732 | 9570.0 | 0.220 |
| L/W= | 2.6 | | 5.0 | 105.0 | 41866.7 | 1550.6 | 0.961 | 10430.0 | 0.239 |
| V/Ac(yd^3)= | 349.6 | | 5.5 | 105.5 | 47191.8 | 1747.8 | 1.083 | 10872.0 | 0.250 |
| | | | 6.0 | 106.0 | 52740.0 | 1953.3 | 1.211 | 11322.0 | 0.260 |
| | | | 6.5 | 106.5 | 58515.2 | 2167.2 | 1.343 | 11780.0 | 0.270 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P400 | | | 0.0 | 100.0 | | | | 7506.0 | 0.172 |
| | | | 1.0 | 101.0 | 7897.3 | 292.5 | 0.181 | 8294.0 | 0.190 |
| | | | 2.0 | 102.0 | 16598.7 | 614.8 | 0.381 | 9114.0 | 0.209 |
| | | | 2.5 | 102.5 | 21260.8 | 787.4 | 0.488 | 9536.0 | 0.219 |
| Length(A)= | 139.0 | | 3.0 | 103.0 | 26136.0 | 968.0 | 0.600 | 9966.0 | 0.229 |
| Width (B)= | 54.0 | | 4.0 | 104.0 | 36541.3 | 1353.4 | 0.839 | 10850.0 | 0.249 |
| L/W= | 2.6 | | 5.0 | 105.0 | 47846.7 | 1772.1 | 1.098 | 11766.0 | 0.270 |
| V/Ac(yd^3)= | 398.9 | | 5.5 | 105.5 | 53846.8 | 1994.3 | 1.236 | 12236.0 | 0.281 |
| | | | 6.0 | 106.0 | 60084.0 | 2225.3 | 1.379 | 12714.0 | 0.292 |
| | | | 6.5 | 106.5 | 66562.2 | 2465.3 | 1.528 | 13200.0 | 0.303 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P450 | | | 0.0 | 100.0 | | | | 8640.0 | 0.198 |
| | | | 1.0 | 101.0 | 9053.3 | 335.3 | 0.208 | 9472.0 | 0.217 |
| | | | 2.0 | 102.0 | 18954.7 | 702.0 | 0.435 | 10336.0 | 0.237 |
| | | | 2.5 | 102.5 | 24233.3 | 897.5 | 0.556 | 10780.0 | 0.247 |
| Length(A)= | 144.0 | | 3.0 | 103.0 | 29736.0 | 1101.3 | 0.683 | 11232.0 | 0.258 |
| Width (B)= | 60.0 | | 4.0 | 104.0 | 41429.3 | 1534.4 | 0.951 | 12160.0 | 0.279 |
| L/W= | 2.4 | | 5.0 | 105.0 | 54066.7 | 2002.5 | 1.241 | 13120.0 | 0.301 |
| V/Ac(yd^3)= | 450 | | 5.5 | 105.5 | 60749.3 | 2250.0 | 1.395 | 13612.0 | 0.312 |
| | | | 6.0 | 106.0 | 67680.0 | 2506.7 | 1.554 | 14112.0 | 0.324 |
| | | | 6.5 | 106.5 | 74862.7 | 2772.7 | 1.719 | 14620.0 | 0.336 |

| Table A-5, continued. Pond Geometries Used for the Evaluation. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P500 | | | 0.0 | 100.0 | | | | 9672.0 | 0.222 |
| | | | 1.0 | 101.0 | 10113.3 | 374.6 | 0.232 | 10560.0 | 0.242 |
| | | | 2.0 | 102.0 | 21130.7 | 782.6 | 0.485 | 11480.0 | 0.264 |
| | | | 2.5 | 102.5 | 26988.3 | 999.6 | 0.620 | 11952.0 | 0.274 |
| Length(A)= | 156.0 | | 3.0 | 103.0 | 33084.0 | 1225.3 | 0.760 | 12432.0 | 0.285 |
| Width (B)= | 62.0 | | 4.0 | 104.0 | 46005.3 | 1703.9 | 1.056 | 13416.0 | 0.308 |
| L/W= | 2.5 | | 5.0 | 105.0 | 59926.7 | 2219.5 | 1.376 | 14432.0 | 0.331 |
| V/Ac(yd^3)= | 498.3 | | 5.5 | 105.5 | 67272.3 | 2491.6 | 1.544 | 14952.0 | 0.343 |
| | | | 6.0 | 106.0 | 74880.0 | 2773.3 | 1.719 | 15480.0 | 0.355 |
| | | | 6.5 | 106.5 | 82753.7 | 3065.0 | 1.900 | 16016.0 | 0.368 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P550 | | | 0.0 | 100.0 | | | | 10824.0 | 0.248 |
| | | | 1.0 | 101.0 | 11289.3 | 418.1 | 0.259 | 11760.0 | 0.270 |
| | | | 2.0 | 102.0 | 23530.7 | 871.5 | 0.540 | 12728.0 | 0.292 |
| | | | 2.5 | 102.5 | 30018.3 | 1111.8 | 0.689 | 13224.0 | 0.304 |
| Length(A)= | 164.0 | | 3.0 | 103.0 | 36756.0 | 1361.3 | 0.844 | 13728.0 | 0.315 |
| Width (B)= | 66.0 | | 4.0 | 104.0 | 50997.3 | 1888.8 | 1.171 | 14760.0 | 0.339 |
| L/W= | 2.5 | | 5.0 | 105.0 | 66286.7 | 2455.1 | 1.522 | 15824.0 | 0.363 |
| V/Ac(yd^3)= | 550.6 | | 5.5 | 105.5 | 74334.3 | 2753.1 | 1.706 | 16368.0 | 0.376 |
| | | | 6.0 | 106.0 | 82656.0 | 3061.3 | 1.898 | 16920.0 | 0.388 |
| | | | 6.5 | 106.5 | 91255.7 | 3379.8 | 2.095 | 17480.0 | 0.401 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P600 | | | 0.0 | 100.0 | | | | 11868.0 | 0.272 |
| | | | 1.0 | 101.0 | 12355.3 | 457.6 | 0.284 | 12848.0 | 0.295 |
| | | | 2.0 | 102.0 | 25706.7 | 952.1 | 0.590 | 13860.0 | 0.318 |
| | | | 2.5 | 102.5 | 32765.8 | 1213.5 | 0.752 | 14378.0 | 0.330 |
| Length(A)= | 172.0 | | 3.0 | 103.0 | 40086.0 | 1484.7 | 0.920 | 14904.0 | 0.342 |
| Width (B)= | 69.0 | | 4.0 | 104.0 | 55525.3 | 2056.5 | 1.275 | 15980.0 | 0.367 |
| L/W= | 2.5 | | 5.0 | 105.0 | 72056.7 | 2668.8 | 1.654 | 17088.0 | 0.392 |
| V/Ac(yd^3)= | 598.1 | | 5.5 | 105.5 | 80741.8 | 2990.4 | 1.854 | 17654.0 | 0.405 |
| | | | 6.0 | 106.0 | 89712.0 | 3322.7 | 2.060 | 18228.0 | 0.418 |
| | | | 6.5 | 106.5 | 98971.2 | 3665.6 | 2.272 | 18810.0 | 0.432 |

| Table A-5, continued. Pond Geometries Used for the Evaluation. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P650 | | | 0.0 | 100.0 | | | | 13032.0 | 0.299 |
| | | | 1.0 | 101.0 | 13543.3 | 501.6 | 0.311 | 14060.0 | 0.323 |
| | | | 2.0 | 102.0 | 28130.7 | 1041.9 | 0.646 | 15120.0 | 0.347 |
| | | | 2.5 | 102.5 | 35825.8 | 1326.9 | 0.822 | 15662.0 | 0.360 |
| Length(A)= | 181.0 | | 3.0 | 103.0 | 43794.0 | 1622.0 | 1.005 | 16212.0 | 0.372 |
| Width (B)= | 72.0 | | 4.0 | 104.0 | 60565.3 | 2243.2 | 1.390 | 17336.0 | 0.398 |
| L/W= | 2.5 | | 5.0 | 105.0 | 78476.7 | 2906.5 | 1.802 | 18492.0 | 0.425 |
| V/Ac(yd^3)= | 650.9 | | 5.5 | 105.5 | 87869.8 | 3254.4 | 2.017 | 19082.0 | 0.438 |
| | | | 6.0 | 106.0 | 97560.0 | 3613.3 | 2.240 | 19680.0 | 0.452 |
| | | | 6.5 | 106.5 | 107551.2 | 3983.4 | 2.469 | 20286.0 | 0.466 |
| | | | | | | | | | |
| Pond Name | | | Stage | Elevation | Volume | Volume | Volume | Surface Ar. | Surface Ar. |
| and information | | | Ft | Ft | Ft^3 | Yd^3 | Acft | Ft^2 | Ac |
| P700 | | | 0.0 | 100.0 | | | | 14089.0 | 0.323 |
| | | | 1.0 | 101.0 | 14626.3 | 541.7 | 0.336 | 15169.0 | 0.348 |
| | | | 2.0 | 102.0 | 30348.7 | 1124.0 | 0.697 | 16281.0 | 0.374 |
| | | | 2.5 | 102.5 | 38630.8 | 1430.8 | 0.887 | 16849.0 | 0.387 |
| Length(A)= | 193.0 | | 3.0 | 103.0 | 47199.0 | 1748.1 | 1.084 | 17425.0 | 0.400 |
| Width (B)= | 73.0 | | 4.0 | 104.0 | 65209.3 | 2415.2 | 1.497 | 18601.0 | 0.427 |
| L/W= | 2.6 | | 5.0 | 105.0 | 84411.7 | 3126.4 | 1.938 | 19809.0 | 0.455 |
| V/Ac(yd^3)= | 699.8 | | 5.5 | 105.5 | 94469.8 | 3498.9 | 2.169 | 20425.0 | 0.469 |
| | | | 6.0 | 106.0 | 104838.0 | 3882.9 | 2.407 | 21049.0 | 0.483 |
| | | | 6.5 | 106.5 | 115520.2 | 4278.5 | 2.652 | 21681.0 | 0.498 |

Table A-6. Pond Sizes for the Basic Evaluations and associated soil characteristics.
(See Key to abbreviations at end of Table)

| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | 0 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 5 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 10 Percent Slope Pond Size | TE/VRR | SedAcc | Control | 20 Percent Slope Pond Size | TE/VRR | SedAcc | Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 1 Grouping | | | | | | | | | | | | | | | | | | | | |
| Armour Silt Loam | 0.32/B | 7 | 52 | 41 | 200 | 68/100 | 0.00 | VRR | 200 | 82/96 | 0.03 | VRR | 200 | 83/96 | 0.07 | VRR | 200 | 84/97 | 0.23 | SED |
| Beason Silt Loam | 0.28/C | 7 | 46 | 47 | 200 | 64/100 | 0.00 | VRR | 150 | 80/95 | 0.03 | VRR | 150 | 81/95 | 0.07 | VRR | 200 | 81/95 | 0.23 | VRR |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 100 | 77/100 | 0.00 | VRR | 150 | 86/95 | 0.02 | VRR | 150 | 87/96 | 0.06 | VRR | 200 | 88/96 | 0.18 | SED |
| Boswell Fine Sandy Loam | 0.28/D | 58 | 19 | 23 | 67 | 82/100 | 0.00 | VRR | 67 | 91/97 | 0.03 | VRR | 100 | 92/98 | 0.08 | SED | 200 | 94/100 | 0.24 | SED |
| Braxton Silt Loam | 0.24/C | 16 | 27 | 57 | 20 | 59/100 | 0.00 | VRR | 40 | 84/100 | 0.03 | SED | 100 | 85/100 | 0.06 | SED | 200 | 86/100 | 0.20 | SED |
| Calloway Silt Loam | 0.49/C | 3 | 73 | 24 | 300 | 80/100 | 0.00 | VRR | 400 | 88/95 | 0.05 | VRR | 450 | 91/97 | 0.13 | VRR | 500 | 91/97 | 0.40 | VRR |
| Center Silt Loam | 0.49/C | 6 | 55 | 39 | 250 | 71/100 | 0.00 | VRR | 250 | 83/95 | 0.05 | VRR | 250 | 84/95 | 0.13 | VRR | 350 | 86/97 | 0.40 | SED |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 60/100 | 0.00 | VRR | 40 | 82/97 | 0.03 | SED | 100 | 85/98 | 0.07 | SED | 200 | 87/99 | 0.21 | SED |
| Dellrose Cherty Silt Loam | 0.24/B | 16 | 45 | 39 | 67 | 63/100 | 0.00 | VRR | 40 | 81/95 | 0.02 | SED | 67 | 85/97 | 0.06 | VRR | 200 | 86/98 | 0.18 | SED |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 71/100 | 0.00 | VRR | 67 | 86/96 | 0.04 | SED | 100 | 90/99 | 0.10 | SED | 300 | 91/100 | 0.32 | SED |
| Dulac Silt Loam | 0.43/C | 5 | 57 | 38 | 250 | 71/100 | 0.00 | VRR | 300 | 85/96 | 0.05 | VRR | 250 | 83/95 | 0.11 | VRR | 300 | 85/97 | 0.35 | SED |
| Grenada Silt Loam | 0.32/C | 4 | 78 | 18 | 350 | 86/100 | 0.00 | VRR | 500 | 92/96 | 0.04 | VRR | 500 | 93/96 | 0.08 | VRR | 500 | 91/95 | 0.26 | TE |
| Hampshire Silt Loam | 0.28/C | 22 | 26 | 52 | 20 | 63/100 | 0.00 | VRR | 40 | 86/100 | 0.03 | SED | 100 | 87/100 | 0.07 | SED | 200 | 87/100 | 0.23 | SED |
| Harpeth Silt Loam | 0.32/B | 10 | 50 | 40 | 150 | 66/100 | 0.00 | VRR | 100 | 81/95 | 0.03 | VRR | 150 | 82/95 | 0.07 | VRR | 200 | 86/97 | 0.23 | SED |
| Humphreys Cherty [Silt Loam] | 0.24/B | 23 | 42 | 35 | 20 | 67/100 | 0.00 | VRR | 40 | 85/96 | 0.02 | SED | 67 | 89/99 | 0.06 | SED | 200 | 90/100 | 0.18 | SED |
| Inman Flaggy Silty Clay Loam | 0.24/C | 12 | 35 | 53 | 20 | 56/100 | 0.00 | VRR | 40 | 83/99 | 0.03 | SED | 67 | 84/99 | 0.06 | VRR | 200 | 86/100 | 0.20 | SED |
| Lexington Silt Loam | 0.32/B | 11 | 64 | 25 | 200 | 77/100 | 0.00 | VRR | 300 | 88/96 | 0.03 | VRR | 300 | 88/96 | 0.07 | VRR | 250 | 86/95 | 0.23 | VRR |
| Loring Silt Loam | 0.37/C | 1.8 | 72.2 | 26 | 300 | 79/100 | 0.00 | VRR | 400 | 89/96 | 0.04 | VRR | 400 | 89/96 | 0.10 | VRR | 450 | 90/96 | 0.30 | VRR |
| Maury Silt Loam | 0.32/B | 11 | 56 | 33 | 150 | 70/100 | 0.00 | VRR | 200 | 85/96 | 0.03 | VRR | 200 | 86/96 | 0.07 | VRR | 200 | 86/97 | 0.23 | SED |
| Memphis Silt Loam | 0.49/B | 1 | 72.4 | 26.6 | 300 | 80/100 | 0.00 | VRR | 350 | 88/96 | 0.05 | VRR | 350 | 89/96 | 0.11 | VRR | 350 | 88/96 | 0.36 | VRR |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0.00 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 82/100 | 0.05 | SED | 150 | 83/100 | 0.16 | SED |
| Mountview Silt Loam | 0.37/B | 13 | 48 | 39 | 150 | 68/100 | 0.00 | VRR | 67 | 82/96 | 0.04 | VRR | 67 | 84/96 | 0.09 | SED | 250 | 87/98 | 0.27 | SED |
| Oktibbeha Clay | 0.20/D | 13.7 | 26.8 | 59.5 | 20 | 58/100 | 0.00 | VRR | 40 | 83/100 | 0.02 | SED | 67 | 85/100 | 0.05 | VRR | 200 | 85/100 | 0.17 | SED |
| Paden Silt Loam | 0.32/C | 5 | 58 | 37 | 250 | 72/100 | 0.00 | VRR | 250 | 83/95 | 0.04 | VRR | 250 | 84/95 | 0.08 | VRR | 250 | 84/95 | 0.26 | SED |
| Pickwick Silt Loam | 0.32/B | 9 | 68 | 23 | 250 | 79/100 | 0.00 | VRR | 350 | 89/96 | 0.03 | VRR | 350 | 90/96 | 0.07 | VRR | 350 | 88/95 | 0.23 | VRR |
| Providence Silt Loam | 0.32/C | 11 | 52 | 37 | 200 | 71/100 | 0.00 | VRR | 150 | 82/95 | 0.04 | VRR | 150 | 83/95 | 0.08 | VRR | 250 | 86/97 | 0.26 | SED |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 79/100 | 0.00 | VRR | 100 | 88/95 | 0.03 | VRR | 100 | 91/97 | 0.08 | SED | 250 | 93/99 | 0.24 | SED |
| Ruston Fine Sandy Loam | 0.32/B | 42 | 37 | 21 | 67 | 82/100 | 0.00 | VRR | 100 | 90/95 | 0.03 | VRR | 100 | 91/97 | 0.07 | SED | 200 | 94/99 | 0.23 | SED |
| Shubuta Fine Sandy Loam | 0.28/C | 53 | 31 | 16 | 67 | 83/100 | 0.00 | VRR | 40 | 91/95 | 0.03 | TE | 100 | 91/96 | 0.07 | SED | 200 | 92/99 | 0.23 | SED |
| Stiversville Loam | 0.32/B | 47 | 33 | 20 | 67 | 83/100 | 0.00 | VRR | 100 | 91/96 | 0.03 | VRR | 100 | 92/97 | 0.07 | SED | 200 | 94/99 | 0.23 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0.00 | VRR | 40 | 79/100 | 0.03 | SED | 67 | 81/100 | 0.06 | SED | 200 | 82/100 | 0.20 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0.00 | VRR | 40 | 88/99 | 0.03 | SED | 100 | 90/100 | 0.07 | SED | 200 | 91/100 | 0.21 | SED |

Table A-6 continued. Pond Sizes for the Basic Evaluations and associated soil characteristics.
(See Key to abbreviations at end of Table)

| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 2 Grouping | | | | | 0 Percent Slope | | | | 5 Percent Slope | | | | 10 Percent Slope | | | | 20 Percent Slope | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 67 | 75/100 | 0 | VRR | 100 | 85/95 | 0.02 | VRR | 150 | 88/97 | 0.05 | VRR | 150 | 90/98 | 0.16 | VRR |
| Brandon Silt Loam | 0.28/B | 11 | 50 | 39 | 150 | 69/100 | 0 | VRR | 100 | 82/95 | 0.02 | VRR | 100 | 83/96 | 0.06 | VRR | 200 | 86/97 | 0.18 | SED |
| Calloway Silt Loam | 0.49/C | 3 | 73 | 24 | 300 | 82/100 | 0 | VRR | 350 | 88/95 | 0.05 | VRR | 400 | 91/97 | 0.11 | VRR | 400 | 89/96 | 0.36 | VRR |
| Center Silt Loam | 0.49/C | 6 | 55 | 39 | 200 | 69/100 | 0 | VRR | 200 | 84/96 | 0.05 | VRR | 250 | 85/97 | 0.11 | VRR | 300 | 85/96 | 0.36 | SED |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 72/100 | 0 | VRR | 67 | 88/99 | 0.04 | SED | 100 | 90/99 | 0.09 | SED | 250 | 92/100 | 0.28 | SED |
| Dulac Silt Loam | 0.43/C | 5 | 57 | 38 | 200 | 69/100 | 0 | VRR | 250 | 84/96 | 0.04 | VRR | 250 | 85/96 | 0.10 | VRR | 300 | 85/96 | 0.31 | SED |
| Grenada Silt Loam | 0.32/C | 4 | 78 | 18 | 300 | 85/100 | 0 | VRR | 450 | 92/96 | 0.03 | VRR | 450 | 93/97 | 0.07 | VRR | 450 | 91/95 | 0.23 | VRR |
| Lax Silt Loam | 0.28/C | 14 | 48 | 38 | 100 | 66/100 | 0 | VRR | 100 | 83/96 | 0.03 | VRR | 67 | 84/97 | 0.06 | VRR | 200 | 87/98 | 0.20 | SED |
| Lexington Silt Loam | 0.32/B | 11 | 64 | 25 | 200 | 79/100 | 0 | VRR | 250 | 87/96 | 0.03 | VRR | 250 | 88/96 | 0.07 | VRR | 250 | 88/96 | 0.21 | VRR |
| Loring Silt Loam | 0.37/C | 1.8 | 72.2 | 26 | 250 | 77/100 | 0 | VRR | 350 | 88/96 | 0.04 | VRR | 350 | 89/96 | 0.09 | VRR | 350 | 87/95 | 0.27 | VRR |
| Memphis Silt Loam | 0.49/B | 1 | 72.4 | 26.6 | 250 | 79/100 | 0 | VRR | 300 | 88/96 | 0.04 | VRR | 300 | 88/96 | 0.10 | VRR | 300 | 87/95 | 0.32 | SED |
| Mountview Silt Loam | 0.37/B | 13 | 48 | 39 | 150 | 70/100 | 0 | VRR | 67 | 82/96 | 0.03 | VRR | 67 | 82/96 | 0.08 | VRR | 250 | 88/99 | 0.24 | SED |
| Providence Silt Loam | 0.32/C | 11 | 52 | 37 | 150 | 69/100 | 0 | VRR | 150 | 83/96 | 0.03 | VRR | 100 | 83/96 | 0.07 | SED | 200 | 86/97 | 0.23 | SED |
| Ruston Fine Sandy Loam | 0.32/B | 42 | 37 | 21 | 67 | 83/100 | 0 | VRR | 100 | 90/96 | 0.03 | VRR | 150 | 92/98 | 0.07 | VRR | 200 | 94/100 | 0.21 | SED |
| Shubuta Fine Sandy Loam | 0.28/C | 53 | 31 | 16 | 67 | 84/100 | 0 | VRR | 100 | 91/96 | 0.03 | VRR | 67 | 92/95 | 0.06 | TE | 200 | 94/99 | 0.20 | SED |

Table A-6 continued. Pond Sizes for the Basic Evaluations and associated soil characteristics.

(See Key to abbreviations at end of Table)

| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 3 Grouping | | | | | 0 Percent Slope | | | | 5 Percent Slope | | | | 10 Percent Slope | | | | 20 Percent Slope | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control |
| Armour Silt Loam | 0.32/B | 7 | 52 | 41 | 150 | 66/100 | 0 | VRR | 150 | 81/95 | 0.03 | VRR | 67 | 81/95 | 0.06 | SED | 200 | 85/97 | 0.20 | SED |
| Barfield Silty Clay Loam | 0.24/D | 15 | 32 | 53 | 20 | 62/100 | 0 | VRR | 40 | 85/100 | 0.02 | SED | 67 | 86/100 | 0.06 | SED | 200 | 87/100 | 0.18 | SED |
| Baxter [Cherty] Silt Loam | 0.28/B | 23 | 46 | 31 | 40 | 71/100 | 0 | VRR | 67 | 87/98 | 0.02 | VRR | 67 | 89/98 | 0.06 | SED | 200 | 90/99 | 0.17 | SED |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 67 | 75/100 | 0 | VRR | 100 | 85/95 | 0.02 | VRR | 150 | 88/97 | 0.05 | VRR | 150 | 90/98 | 0.15 | SED |
| Bradyville Silt Loam | 0.20/C | 14 | 38 | 48 | 40 | 56/100 | 0 | VRR | 67 | 82/98 | 0.02 | VRR | 67 | 84/98 | 0.04 | SED | 150 | 85/98 | 0.14 | SED |
| Brandon Silt Loam | 0.28/B | 11 | 50 | 39 | 150 | 69/100 | 0 | VRR | 67 | 81/95 | 0.02 | VRR | 67 | 83/96 | 0.06 | VRR | 200 | 85/97 | 0.17 | SED |
| Braxton Silt Loam | 0.24/C | 16 | 27 | 57 | 20 | 59/100 | 0 | VRR | 40 | 84/100 | 0.02 | SED | 67 | 85/100 | 0.05 | SED | 200 | 86/100 | 0.17 | SED |
| Capshaw Silt Loam | 0.37/C | 16 | 40 | 44 | 100 | 65/100 | 0 | VRR | 40 | 83/97 | 0.03 | SED | 100 | 86/98 | 0.08 | SED | 250 | 88/99 | 0.26 | SED |
| Christian Silt Loam | 0.28/C | 14 | 43 | 43 | 100 | 64/100 | 0 | VRR | 40 | 82/97 | 0.03 | VRR | 67 | 84/97 | 0.06 | VRR | 200 | 86/98 | 0.20 | SED |
| Crider Silt Loam | 0.32/B | 8 | 52 | 40 | 150 | 67/100 | 0 | VRR | 150 | 82/95 | 0.03 | VRR | 67 | 81/95 | 0.06 | SED | 200 | 85/97 | 0.20 | SED |
| Cumberland Silt Loam | 0.28/B | 14 | 49 | 37 | 100 | 67/100 | 0 | VRR | 67 | 82/96 | 0.02 | VRR | 67 | 85/97 | 0.06 | SED | 200 | 86/97 | 0.17 | SED |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 60/100 | 0 | VRR | 40 | 82/97 | 0.02 | VRR | 67 | 85/98 | 0.06 | SED | 200 | 86/99 | 0.17 | SED |
| Dellrose Cherty Silt Loam | 0.24/B | 16 | 45 | 39 | 67 | 64/100 | 0 | VRR | 40 | 81/95 | 0.02 | SED | 67 | 85/97 | 0.05 | SED | 150 | 87/98 | 0.15 | SED |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 72/100 | 0 | VRR | 67 | 86/99 | 0.04 | SED | 100 | 90/99 | 0.08 | SED | 250 | 92/100 | 0.27 | SED |
| Etowah Silt Loam | 0.28/B | 39 | 26 | 35 | 20 | 73/100 | 0 | VRR | 40 | 89/98 | 0.02 | SED | 67 | 91/100 | 0.06 | SED | 200 | 91/100 | 0.17 | SED |
| Fullerton Silt Loam | 0.28/B | 15 | 31 | 54 | 20 | 60/100 | 0 | VRR | 40 | 89/100 | 0.02 | SED | 67 | 86/100 | 0.06 | SED | 250 | 88/100 | 0.17 | SED |
| Gladeville Flaggy Silt Loam | 0.24/D | 14 | 42 | 44 | 100 | 64/100 | 0 | VRR | 40 | 81/96 | 0.02 | SED | 67 | 84/97 | 0.06 | SED | 200 | 86/98 | 0.18 | SED |
| Hampshire Silt Loam | 0.28/C | 22 | 26 | 52 | 20 | 63/100 | 0 | VRR | 40 | 86/100 | 0.03 | SED | 67 | 87/100 | 0.06 | SED | 200 | 87/100 | 0.20 | SED |
| Harpeth Silt Loam | 0.32/B | 10 | 50 | 40 | 150 | 68/100 | 0 | VRR | 67 | 80/95 | 0.03 | VRR | 67 | 83/96 | 0.06 | SED | 200 | 86/97 | 0.20 | SED |
| Hartsells Loam | 0.28/B | 53 | 33 | 14 | 100 | 84/100 | 0 | VRR | 67 | 88/95 | 0.02 | VRR | 67 | 90/97 | 0.06 | SED | 200 | 92/97 | 0.17 | SED |
| Humphreys Cherty [Silt Loam] | 0.24/B | 23 | 42 | 35 | 20 | 67/100 | 0 | VRR | 40 | 85/96 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 150 | 90/100 | 0.15 | SED |
| Inman Flaggy Silty Clay Loam | 0.24/C | 12 | 35 | 53 | 20 | 56/100 | 0 | VRR | 40 | 83/99 | 0.02 | SED | 67 | 85/99 | 0.05 | SED | 200 | 86/100 | 0.17 | SED |
| Lax Silt Loam | 0.28/C | 14 | 48 | 38 | 100 | 66/100 | 0 | VRR | 40 | 83/96 | 0.03 | SED | 67 | 84/96 | 0.06 | SED | 200 | 87/98 | 0.20 | SED |
| Lomond Silt Loam | 0.28/B | 16 | 44 | 40 | 67 | 64/100 | 0 | VRR | 40 | 82/96 | 0.02 | SED | 67 | 86/98 | 0.06 | SED | 200 | 87/98 | 0.17 | SED |
| Lonewood Silt Loam | 0.24/B | 18 | 42 | 40 | 40 | 65/100 | 0 | VRR | 40 | 83/97 | 0.02 | SED | 67 | 87/98 | 0.05 | SED | 150 | 88/99 | 0.15 | SED |
| Maury Silt Loam | 0.32/B | 11 | 56 | 33 | 150 | 72/100 | 0 | VRR | 150 | 84/96 | 0.03 | VRR | 150 | 85/96 | 0.06 | VRR | 200 | 87/97 | 0.20 | SED |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 82/100 | 0.04 | SED | 150 | 83/100 | 0.14 | SED |
| Mountview Silt Loam | 0.37/B | 13 | 48 | 39 | 150 | 70/100 | 0 | VRR | 40 | 82/96 | 0.03 | SED | 100 | 85/97 | 0.07 | SED | 200 | 87/98 | 0.23 | SED |
| Paden Silt Loam | 0.32/C | 5 | 58 | 37 | 200 | 70/100 | 0 | VRR | 250 | 84/96 | 0.03 | VRR | 250 | 85/96 | 0.07 | VRR | 200 | 84/96 | 0.22 | SED |
| Pembroke Silt Loam | 0.28/B | 8 | 52 | 40 | 150 | 67/100 | 0 | VRR | 150 | 82/95 | 0.02 | VRR | 150 | 83/96 | 0.06 | VRR | 200 | 84/96 | 0.17 | SED |
| Pickwick Silt Loam | 0.32/B | 9 | 68 | 23 | 200 | 77/100 | 0 | VRR | 300 | 89/96 | 0.03 | VRR | 300 | 89/96 | 0.06 | VRR | 300 | 88/96 | 0.20 | VRR |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 100 | 89/96 | 0.03 | VRR | 150 | 91/97 | 0.07 | VRR | 200 | 93/99 | 0.21 | SED |
| Sequatchie Loam | 0.28/B | 37 | 33 | 30 | 20 | 74/100 | 0 | VRR | 40 | 88/96 | 0.02 | SED | 67 | 91/99 | 0.06 | SED | 200 | 92/100 | 0.17 | SED |
| Stiversville Loam | 0.32/B | 47 | 33 | 20 | 67 | 84/100 | 0 | VRR | 40 | 92/95 | 0.03 | VRR | 67 | 92/95 | 0.06 | TE | 200 | 95/100 | 0.20 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0 | VRR | 40 | 79/100 | 0.02 | SED | 67 | 81/100 | 0.05 | SED | 200 | 82/100 | 0.17 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0 | VRR | 40 | 88/99 | 0.02 | SED | 67 | 90/100 | 0.06 | SED | 200 | 91/100 | 0.17 | SED |

Table A-6 continued. Pond Sizes for the Basic Evaluations and associated soil characteristics.

(See Key to abbreviations at end of Table)

| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 4 Grouping | | | | | 0 Percent Slope | | | | 5 Percent Slope | | | | 10 Percent Slope | | | | 20 Percent Slope | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control |
| Alcoa Loam | 0.24/B | 38 | 26 | 36 | 20 | 72/100 | 0 | VRR | 40 | 88/98 | 0.02 | SED | 67 | 90/100 | 0.05 | SED | 150 | 91/100 | 0.14 | SED |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 67 | 75/100 | 0 | VRR | 100 | 85/95 | 0.02 | VRR | 150 | 88/97 | 0.05 | VRR | 150 | 87/96 | 0.14 | SED |
| Dandridge Silt Loam | 0.24/D | 6 | 52 | 42 | 150 | 63/100 | 0 | VRR | 200 | 82/95 | 0.02 | VRR | 200 | 82/95 | 0.05 | VRR | 200 | 83/95 | 0.17 | SED |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 60/100 | 0 | VRR | 40 | 83/98 | 0.02 | SED | 67 | 85/98 | 0.05 | SED | 200 | 87/99 | 0.17 | SED |
| Dewey Silt Loam | 0.28/B | 9 | 48 | 43 | 150 | 65/100 | 0 | VRR | 100 | 80/95 | 0.02 | VRR | 67 | 82/96 | 0.05 | SED | 200 | 85/98 | 0.17 | SED |
| Dunmore Silt Loam | 0.20/B | 15 | 21 | 64 | 20 | 53/100 | 0 | VRR | 40 | 82/100 | 0.02 | SED | 67 | 84/100 | 0.04 | SED | 150 | 84/100 | 0.12 | SED |
| Etowah Silt Loam | 0.28/B | 39 | 26 | 35 | 20 | 73/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 91/100 | 0.05 | SED | 200 | 92/100 | 0.17 | SED |
| Fullerton Silt Loam | 0.28/B | 15 | 31 | 54 | 20 | 60/100 | 0 | VRR | 40 | 85/100 | 0.02 | SED | 67 | 86/100 | 0.05 | SED | 200 | 87/100 | 0.17 | SED |
| Hartsells Loam | 0.28/B | 53 | 33 | 14 | 100 | 84/100 | 0 | VRR | 40 | 88/96 | 0.02 | VRR | 67 | 90/97 | 0.05 | SED | 200 | 93/98 | 0.17 | SED |
| Holston Loam | 0.28/B | 27 | 44 | 29 | 40 | 76/100 | 0 | VRR | 40 | 88/97 | 0.02 | SED | 67 | 90/98 | 0.05 | SED | 200 | 92/100 | 0.17 | SED |
| Jefferson Loam | 0.28/B | 34 | 30 | 36 | 20 | 72/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 91/100 | 0.05 | SED | 200 | 91/100 | 0.17 | SED |
| Lehew Channery Fine Sandy Loam | 0.24/C | 49 | 31 | 20 | 67 | 83/100 | 0 | VRR | 40 | 92/96 | 0.02 | SED | 100 | 91/96 | 0.05 | VRR | 150 | 94/99 | 0.16 | SED |
| Litz Shaly Silt Loam | 0.24/C | 20 | 46 | 34 | 67 | 70/100 | 0 | VRR | 40 | 86/97 | 0.02 | SED | 67 | 87/98 | 0.05 | SED | 150 | 89/99 | 0.16 | SED |
| Lonewood Silt Loam | 0.24/B | 18 | 42 | 40 | 40 | 62/100 | 0 | VRR | 40 | 83/97 | 0.02 | SED | 67 | 86/98 | 0.05 | SED | 150 | 87/99 | 0.14 | SED |
| Montevallo Silt Loam | 0.24/D | 27 | 39 | 34 | 20 | 74/100 | 0 | VRR | 40 | 87/96 | 0.02 | SED | 67 | 91/100 | 0.05 | SED | 200 | 92/100 | 0.17 | SED |
| Needmore Silt Loam | 0.32/C | 10 | 34 | 56 | 20 | 59/100 | 0 | VRR | 40 | 84/100 | 0.03 | SED | 100 | 85/100 | 0.07 | SED | 200 | 86/100 | 0.21 | SED |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 100 | 89/95 | 0.03 | VRR | 100 | 91/97 | 0.06 | VRR | 200 | 93/99 | 0.20 | SED |
| Sequatchie Loam | 0.28/B | 37 | 33 | 30 | 20 | 74/100 | 0 | VRR | 40 | 90/98 | 0.02 | SED | 67 | 91/99 | 0.05 | SED | 200 | 93/100 | 0.17 | SED |
| Sequoia Silt Loam | 0.32/C | 5 | 40 | 55 | 67 | 54/100 | 0 | VRR | 40 | 79/96 | 0.03 | SED | 100 | 81/98 | 0.07 | SED | 200 | 84/99 | 0.21 | SED |
| Statler Loam | 0.28/B | 23 | 42 | 35 | 20 | 67/100 | 0 | VRR | 40 | 88/99 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 200 | 91/100 | 0.17 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0 | VRR | 40 | 79/100 | 0.02 | SED | 67 | 81/100 | 0.05 | SED | 150 | 81/100 | 0.16 | SED |
| Tellico Loam | 0.32/B | 28 | 21 | 51 | 20 | 62/100 | 0 | VRR | 40 | 86/100 | 0.03 | SED | 67 | 87/100 | 0.06 | SED | 200 | 88/100 | 0.19 | SED |
| Wallen Gravelly Loam | 0.28/B | 42 | 35 | 23 | 67 | 82/100 | 0 | VRR | 40 | 91/96 | 0.02 | SED | 100 | 91/96 | 0.05 | VRR | 200 | 94/99 | 0.17 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0 | VRR | 40 | 89/100 | 0.02 | SED | 67 | 90/100 | 0.05 | SED | 200 | 91/100 | 0.17 | SED |

Table A-6 continued. Pond Sizes for the Basic Evaluations and associated soil characteristics.

(See Key to abbreviations at end of Table)

| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 5 Grouping | | | | | 0 Percent Slope | | | | 5 Percent Slope | | | | 10 Percent Slope | | | | 20 Percent Slope | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/ VR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control |
| Baxter [Cherty] Silt Loam | 0.28/B | 23 | 46 | 31 | 40 | 71/100 | 0 | VRR | 40 | 87/98 | 0.02 | SED | 67 | 86/96 | 0.05 | SED | 150 | 91/99 | 0.16 | SED |
| Bodine Cherty Silt Loam | 0.24/B | 26 | 50 | 24 | 67 | 76/100 | 0 | VRR | 100 | 86/96 | 0.02 | VRR | 100 | 87/96 | 0.04 | VRR | 150 | 90/98 | 0.13 | SED |
| Christian Silt Loam | 0.28/C | 14 | 43 | 43 | 100 | 68/100 | 0 | VRR | 40 | 81/92 | 0.02 | SED | 67 | 84/97 | 0.06 | SED | 200 | 87/99 | 0.18 | VRR |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 61/100 | 0 | VRR | 40 | 83/98 | 0.02 | SED | 67 | 84/97 | 0.05 | SED | 150 | 87/99 | 0.16 | SED |
| Dellrose Cherty Silt Loam | 0.24/B | 16 | 45 | 39 | 67 | 65/100 | 0 | VRR | 40 | 84/97 | 0.02 | SED | 67 | 83/96 | 0.04 | SED | 150 | 88/99 | 0.13 | SED |
| Dickson Silt Loam | 0.43/B | 24 | 43 | 33 | 40 | 72/100 | 0 | VRR | 40 | 86/97 | 0.03 | SED | 100 | 90/99 | 0.08 | SED | 250 | 92/100 | 0.24 | SED |
| Fullerton Silt Loam | 0.28/B | 15 | 31 | 54 | 20 | 60/100 | 0 | VRR | 40 | 85/100 | 0.02 | SED | 67 | 86/100 | 0.05 | SED | 200 | 88/100 | 0.16 | SED |
| Hartsells Loam | 0.28/B | 53 | 33 | 14 | 100 | 85/100 | 0 | VRR | 40 | 88/76 | 0.02 | SED | 100 | 90/97 | 0.05 | VRR | 150 | 93/98 | 0.16 | SED |
| Jefferson Loam | 0.28/B | 34 | 30 | 36 | 20 | 72/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 90/99 | 0.05 | SED | 150 | 91/100 | 0.16 | SED |
| Lonewood Silt Loam | 0.24/B | 18 | 42 | 40 | 40 | 63/100 | 0 | VRR | 40 | 85/98 | 0.02 | SED | 67 | 85/97 | 0.04 | VRR | 150 | 88/99 | 0.13 | SED |
| Mimosa Silt Loam | 0.20/C | 4 | 28 | 68 | 20 | 51/100 | 0 | VRR | 40 | 81/100 | 0.02 | SED | 67 | 83/100 | 0.04 | SED | 150 | 83/100 | 0.13 | SED |
| Mountview Silt Loam | 0.37/B | 13 | 48 | 39 | 100 | 66/100 | 0 | VRR | 67 | 80/95 | 0.03 | VRR | 100 | 85/97 | 0.07 | SED | 200 | 88/99 | 0.21 | SED |
| Pembroke Silt Loam | 0.28/B | 8 | 52 | 40 | 150 | 68/100 | 0 | VRR | 100 | 81/95 | 0.02 | VRR | 100 | 82/95 | 0.05 | VRR | 200 | 86/97 | 0.16 | SED |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 40 | 90/96 | 0.03 | VRR | 67 | 90/97 | 0.06 | SED | 200 | 93/100 | 0.19 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0 | VRR | 40 | 89/100 | 0.02 | SED | 67 | 89/99 | 0.05 | SED | 150 | 91/100 | 0.16 | SED |

Table A-6 continued. Pond Sizes for the Basic Evaluations and associated soil characteristics.
(See Key to abbreviations at end of Table)

| Dispersed Sand, Silt, and Clay Content for Subject Soil Series and Zone 6 Grouping | | | | | 0 Percent Slope | | | | 5 Percent Slope | | | | 10 Percent Slope | | | | 20 Percent Slope | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil Series | K/HSG | Sand (2-.063 millimeters) Percent | Silt (.063-.004 millimeters) Percent | Clay (<.004 millimeters) Percent | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control | Pond Size | TE/VRR | SedAcc | Control |
| Dandridge Silt Loam | 0.24/D | 6 | 52 | 42 | 150 | 65/100 | 0 | VRR | 200 | 82/96 | 0.02 | VRR | 200 | 83/95 | 0.04 | VRR | 150 | 82/95 | 0.14 | SED |
| Decatur Silt Loam | 0.28/B | 15 | 39 | 46 | 67 | 61/100 | 0 | VRR | 40 | 83/98 | 0.02 | SED | 67 | 85/98 | 0.04 | SED | 150 | 87/99 | 0.14 | SED |
| Dewey Silt Loam | 0.28/B | 9 | 48 | 43 | 100 | 62/100 | 0 | VRR | 40 | 79/95 | 0.02 | VRR | 67 | 82/96 | 0.04 | VRR | 150 | 85/97 | 0.14 | SED |
| Dunmore Silt Loam | 0.20/B | 15 | 21 | 64 | 20 | 52/100 | 0 | VRR | 20 | 82/100 | 0.01 | VRR | 40 | 83/100 | 0.03 | SED | 100 | 84/100 | 0.10 | SED |
| Etowah Silt Loam | 0.28/B | 39 | 26 | 35 | 20 | 73/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 91/100 | 0.04 | SED | 150 | 92/100 | 0.14 | SED |
| Fullerton Silt Loam | 0.28/B | 15 | 31 | 54 | 20 | 60/100 | 0 | VRR | 40 | 85/100 | 0.02 | SED | 67 | 86/100 | 0.04 | SED | 150 | 87/100 | 0.14 | SED |
| Hayter Silt Loam | 0.28/B | 45 | 22 | 33 | 20 | 74/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 91/100 | 0.04 | SED | 150 | 92/100 | 0.14 | SED |
| Holston Loam | 0.28/B | 27 | 44 | 29 | 20 | 72/100 | 0 | VRR | 40 | 88/97 | 0.02 | SED | 67 | 90/98 | 0.04 | SED | 150 | 92/100 | 0.14 | SED |
| Jefferson Loam | 0.28/B | 34 | 30 | 36 | 20 | 72/100 | 0 | VRR | 40 | 90/100 | 0.02 | SED | 67 | 91/100 | 0.04 | SED | 150 | 91/100 | 0.14 | SED |
| Lehew Channery Fine Sandy Loam | 0.24/C | 49 | 31 | 20 | 67 | 84/100 | 0 | VRR | 40 | 92/97 | 0.02 | SED | 100 | 91/96 | 0.04 | VRR | 150 | 94/99 | 0.13 | SED |
| Litz Shaly Silt Loam | 0.24/C | 20 | 46 | 34 | 67 | 71/100 | 0 | VRR | 40 | 86/97 | 0.02 | SED | 67 | 84/96 | 0.04 | SED | 150 | 89/99 | 0.13 | SED |
| Montevallo Silt Loam | 0.24/D | 27 | 39 | 34 | 20 | 74/100 | 0 | VRR | 40 | 87/96 | 0.02 | SED | 67 | 91/99 | 0.04 | SED | 150 | 91/100 | 0.14 | SED |
| Needmore Silt Loam | 0.32/C | 10 | 34 | 56 | 20 | 59/100 | 0 | VRR | 40 | 84/100 | 0.02 | SED | 67 | 85/100 | 0.06 | SED | 200 | 86/100 | 0.18 | VRR |
| Ramsey Loam | 0.28/D | 36 | 38 | 26 | 67 | 80/100 | 0 | VRR | 40 | 90/96 | 0.02 | SED | 100 | 90/97 | 0.05 | VRR | 150 | 91/97 | 0.16 | SED |
| Sequatchie Loam | 0.28/B | 37 | 33 | 30 | 20 | 75/100 | 0 | VRR | 40 | 90/98 | 0.02 | SED | 67 | 91/99 | 0.04 | SED | 150 | 92/100 | 0.14 | SED |
| Sequoia Silt Loam | 0.32/C | 5 | 40 | 55 | 67 | 55/100 | 0 | VRR | 40 | 79/96 | 0.02 | SED | 67 | 82/98 | 0.06 | SED | 200 | 84/99 | 0.18 | SED |
| Shouns Silt Loam | 0.28/B | 17 | 53 | 30 | 100 | 73/100 | 0 | VRR | 40 | 82/95 | 0.02 | SED | 67 | 85/96 | 0.04 | SED | 150 | 88/98 | 0.14 | SED |
| Statler Loam | 0.28/B | 23 | 42 | 35 | 20 | 68/100 | 0 | VRR | 40 | 88/99 | 0.02 | SED | 67 | 90/99 | 0.04 | SED | 150 | 91/100 | 0.14 | SED |
| Talbott Silt Loam | 0.24/C | 2 | 23 | 75 | 20 | 46/100 | 0 | VRR | 40 | 79/100 | 0.02 | SED | 67 | 81/100 | 0.04 | SED | 150 | 82/100 | 0.13 | SED |
| Wallen Gravelly Loam | 0.28/B | 42 | 35 | 23 | 40 | 79/100 | 0 | VRR | 40 | 91/97 | 0.02 | SED | 67 | 91/97 | 0.04 | SED | 150 | 94/100 | 0.14 | SED |
| Waynesboro Loam | 0.28/B | 29 | 33 | 38 | 20 | 71/100 | 0 | VRR | 40 | 89/100 | 0.02 | SED | 67 | 90/100 | 0.04 | SED | 150 | 91/100 | 0.14 | SED |

Key to Abbreviations:
K= Soil Erodibility
HSG= SCS Hydrologic Soil Group
Pond Size= Volume in Cubic Yards per Acre Drainage Area
TE= Trapping Efficiency (((Sediment in-Sediment out)/Sediment in)*100)(10 year event)
VRR= Volume weighted settleable Solids Ratio (((vwss in-vwss out)/vwss in)*100)(10 year event)
Note: 0 percent slope VRR shows 100 percent due to lack of resolution at small concentrations
vwss= 24 hour volume weighted settleable solids (Imhoff Cone Test)
SedAcc= annual sediment accumulation in the pond (acre-feet) estimated for the SCS Type II 10year 24 hr. Storm
Control= controlling element for pond size from the Efficiency Criteria (10 year event):
SED= sediment accumulation forces the pond size
VRR= VRR reached 95 percent before TE reached 90 percent
TE= TE reached 90 percent before VRR reached 95 percent

Table A-7. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 1 | Boswell | Percent Sand, Silt, and Clay: | | | | 58,19,23 | Hydrologic Soil Group: | | | D | | Erodibility (K): | | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | | | | | | | |
| 0 | PD | 0.01 | 0.01 | | | 2.21 | 1.32 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 87.94 | 89.63 | 1.90 | 0.91 | 0.1 | 0.0 | 100.00 | 100.00 | 5.5 | all | 10/6 |
| 0 | 67 | 0.00 | 0.00 | 81.87 | 83.45 | 3.60 | 2.41 | 0.1 | 0.1 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 89.95 | 92.34 | 2.15 | 0.53 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | all | std |
| 0 | 20 | 0.02 | 0.01 | 73.70 | 77.58 | 3.60 | 2.42 | 0.1 | 0.1 | 84.62 | 91.67 | 4.8 | | |
| 0 | 40 | 0.01 | 0.00 | 79.34 | 81.68 | 3.60 | 2.42 | 0.1 | 0.1 | 92.31 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 83.33 | 84.50 | 3.60 | 2.40 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 85.50 | 86.88 | 3.49 | 1.91 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 250 | 0.00 | 0.00 | 86.59 | 88.21 | 3.23 | 1.51 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 300 | 0.00 | 0.00 | 87.70 | 89.61 | 2.89 | 1.02 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 500 | 0.00 | 0.00 | 92.02 | 93.69 | 1.35 | 0.36 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 95.45 | 95.37 | 0.53 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 5 | PD | 1.02 | 0.97 | | | 14.68 | 9.00 | 3.1 | 1.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 67 | 0.36 | 0.10 | 90.60 | 92.69 | 19.01 | 12.73 | 3.9 | 1.9 | 96.60 | 99.02 | 5.6 | eff | std |
| 5 | 250 | 0.09 | 0.00 | 93.03 | 94.65 | 15.36 | 6.64 | 2.9 | 1.4 | 99.15 | 100.00 | 5.5 | all | std |
| 5 | 40 | 0.55 | 0.09 | 88.92 | 92.80 | 18.85 | 12.85 | 4.5 | 1.9 | 94.80 | 99.12 | 5.6 | | |
| 5 | 100 | 0.27 | 0.29 | 91.37 | 91.02 | 19.10 | 12.60 | 3.5 | 2.4 | 97.45 | 97.16 | 5.6 | | |
| 5 | 150 | 0.23 | 0.01 | 91.81 | 93.50 | 18.32 | 12.26 | 3.4 | 1.7 | 97.83 | 99.90 | 5.6 | | |
| 5 | 200 | 0.17 | 0.00 | 92.39 | 94.04 | 18.16 | 9.93 | 3.1 | 1.6 | 98.39 | 100.00 | 5.6 | | |
| 5 | 300 | 0.01 | 0.00 | 93.62 | 95.18 | 13.88 | 4.46 | 2.6 | 1.3 | 99.91 | 100.00 | 5.3 | | |
| 5 | 500 | 0.00 | 0.00 | 95.95 | 97.00 | 5.01 | 0.37 | 1.7 | 0.8 | 100.00 | 100.00 | 4.9 | | |
| 5 | 700 | 0.00 | 0.00 | 97.53 | 97.72 | 0.82 | 0.33 | 1.0 | 0.6 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.37 | 2.25 | | | 16.15 | 9.93 | 7.2 | 4.1 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 100 | 0.56 | 0.15 | 92.04 | 93.45 | 21.26 | 14.43 | 7.6 | 4.0 | 97.77 | 99.38 | 5.6 | eff | std |
| 10 | 300 | 0.07 | 0.00 | 93.81 | 95.40 | 17.32 | 6.25 | 5.9 | 2.8 | 99.72 | 100.00 | 5.5 | all | std |
| 10 | 150 | 0.48 | 0.04 | 92.41 | 93.88 | 21.24 | 14.15 | 7.3 | 3.8 | 98.08 | 99.84 | 5.7 | | |
| 10 | 200 | 0.42 | 0.00 | 92.67 | 94.34 | 21.22 | 13.57 | 7.0 | 3.5 | 98.32 | 100.00 | 5.6 | | |
| 10 | 250 | 0.23 | 0.00 | 93.33 | 94.61 | 20.91 | 10.24 | 6.4 | 3.3 | 99.08 | 100.00 | 5.6 | | |
| 10 | 350 | 0.00 | 0.00 | 94.45 | 95.94 | 14.92 | 2.33 | 5.3 | 2.5 | 100.00 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 95.00 | 96.41 | 11.57 | 1.17 | 4.8 | 2.2 | 100.00 | 100.00 | 5.2 | | |
| 10 | 500 | 0.00 | 0.00 | 96.09 | 97.11 | 4.00 | 0.37 | 3.7 | 1.8 | 100.00 | 100.00 | 4.8 | | |
| 10 | 700 | 0.00 | 0.00 | 97.63 | 97.79 | 0.72 | 0.32 | 2.3 | 1.4 | 100.00 | 100.00 | 4.5 | | |
| 20 | PD | 9.32 | 8.04 | | | 18.77 | 11.88 | 24.6 | 14.4 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.24 | 0.00 | 93.77 | 94.55 | 21.23 | 14.04 | 18.9 | 10.6 | 99.68 | 100.00 | 5.6 | eff | std |
| 20 | 350 | 0.00 | 0.00 | 94.41 | 95.63 | 16.19 | 8.09 | 16.9 | 8.5 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 250 | 0.24 | 0.00 | 93.78 | 94.77 | 21.12 | 13.56 | 18.8 | 10.2 | 99.68 | 100.00 | 5.7 | | |
| 20 | 300 | 0.00 | 0.00 | 94.14 | 95.26 | 20.31 | 12.02 | 17.7 | 9.3 | 100.00 | 100.00 | 5.6 | | |
| 20 | 500 | 0.00 | 0.00 | 95.76 | 96.84 | 7.19 | 0.83 | 12.8 | 6.2 | 100.00 | 100.00 | 5.0 | | |
| 20 | 700 | 0.00 | 0.00 | 97.42 | 97.70 | 0.87 | 0.34 | 7.8 | 4.5 | 100.00 | 100.00 | 4.6 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 1 | Grenada | Percent Sand, Silt, and Clay: | | | | 4,78,18 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.90 | 1.07 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 84.33 | 89.11 | 1.45 | 0.72 | 0.1 | 0.0 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 350 | 0.00 | 0.00 | 85.52 | 90.73 | 2.16 | 0.51 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 88.18 | 91.85 | 1.74 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.03 | 0.02 | 48.55 | 61.54 | 3.39 | 2.20 | 0.3 | 0.1 | 57.14 | 71.43 | 4.8 | | |
| 0 | 100 | 0.03 | 0.01 | 57.12 | 70.25 | 3.38 | 2.16 | 0.2 | 0.1 | 57.14 | 85.71 | 4.8 | | |
| 0 | 150 | 0.02 | 0.01 | 66.71 | 78.47 | 3.37 | 1.92 | 0.2 | 0.1 | 71.43 | 85.71 | 4.8 | | |
| 0 | 200 | 0.01 | 0.00 | 72.93 | 83.35 | 3.19 | 1.58 | 0.1 | 0.1 | 85.71 | 100.00 | 4.8 | | |
| 0 | 250 | 0.01 | 0.00 | 78.04 | 86.85 | 2.88 | 1.10 | 0.1 | 0.0 | 85.71 | 100.00 | 4.8 | | |
| 0 | 300 | 0.01 | 0.00 | 82.07 | 89.08 | 2.55 | 0.76 | 0.1 | 0.0 | 85.71 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 91.75 | 93.51 | 1.14 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 95.12 | 95.62 | 0.37 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.3 | | |
| 5 | PD | 0.82 | 0.76 | | | 12.94 | 7.44 | 3.0 | 1.6 | | | | | |
| 5 | 450 | 0.40 | 0.00 | 91.03 | 96.24 | 2.52 | 0.37 | 3.9 | 1.0 | 95.62 | 100.00 | 5.1 | all | 12/8 |
| 5 | 500 | 0.37 | 0.00 | 91.90 | 96.60 | 3.22 | 0.36 | 3.6 | 0.9 | 95.95 | 100.00 | 4.8 | eff/all | std |
| 5 | 500 | 0.37 | 0.00 | 91.90 | 96.60 | 3.22 | 0.36 | 3.6 | 0.9 | 95.95 | 100.00 | 4.8 | all | std |
| 5 | 100 | 2.65 | 1.47 | 55.59 | 70.95 | 18.03 | 11.74 | 19.5 | 8.0 | 71.01 | 83.18 | 5.6 | | |
| 5 | 200 | 1.79 | 0.94 | 70.79 | 82.07 | 16.15 | 8.01 | 12.9 | 4.9 | 80.42 | 89.24 | 5.5 | | |
| 5 | 300 | 1.46 | 0.34 | 78.33 | 90.81 | 12.56 | 2.77 | 9.5 | 2.5 | 84.03 | 96.11 | 5.2 | | |
| 5 | 400 | 0.88 | 0.00 | 85.80 | 95.76 | 6.78 | 0.59 | 6.2 | 1.2 | 90.37 | 100.00 | 5.0 | | |
| 5 | 450 | 0.60 | 0.00 | 89.16 | 96.24 | 5.06 | 0.37 | 4.8 | 1.0 | 93.44 | 100.00 | 4.9 | | |
| 5 | 700 | 0.00 | 0.00 | 97.34 | 97.68 | 0.38 | 0.31 | 1.2 | 0.6 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.97 | 1.84 | | | 14.28 | 8.32 | 7.1 | 3.8 | | | | | |
| 10 | 400 | 1.15 | 0.00 | 90.36 | 95.88 | 2.58 | 0.53 | 10.0 | 2.7 | 94.89 | 100.00 | 5.4 | all | 12/8 |
| 10 | 500 | 0.80 | 0.00 | 92.56 | 96.74 | 2.78 | 0.35 | 7.7 | 2.1 | 96.45 | 100.00 | 4.7 | eff/all | std |
| 10 | 500 | 0.80 | 0.00 | 92.56 | 96.74 | 2.78 | 0.35 | 7.7 | 2.1 | 96.45 | 100.00 | 4.7 | all | std |
| 10 | 100 | 4.59 | 2.98 | 66.45 | 75.39 | 20.64 | 13.62 | 34.8 | 16.0 | 79.61 | 86.37 | 5.6 | | |
| 10 | 200 | 4.05 | 2.19 | 71.85 | 82.05 | 20.60 | 12.61 | 29.2 | 11.7 | 82.01 | 89.98 | 5.6 | | |
| 10 | 300 | 3.35 | 0.91 | 79.14 | 90.96 | 14.97 | 2.66 | 21.6 | 5.9 | 85.12 | 95.84 | 5.4 | | |
| 10 | 400 | 2.20 | 0.00 | 86.45 | 95.88 | 8.51 | 0.58 | 14.1 | 2.7 | 90.23 | 100.00 | 5.1 | | |
| 10 | 450 | 1.38 | 0.00 | 89.79 | 96.36 | 4.01 | 0.37 | 10.6 | 2.4 | 93.87 | 100.00 | 4.8 | | |
| 10 | 700 | 0.00 | 0.00 | 97.42 | 97.77 | 0.38 | 0.31 | 2.7 | 1.5 | 100.00 | 100.00 | 4.4 | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.43 | 7.14 | | | 17.06 | 10.26 | 24.7 | 13.6 | | | | | |
| 20 | 450 | 2.58 | 0.00 | 91.50 | 96.01 | 2.57 | 0.93 | 27.9 | 8.2 | 96.21 | 100.00 | 5.3 | all | 12/8 |
| 20 | 500 | 3.70 | 0.00 | 90.59 | 96.00 | 4.12 | 0.38 | 30.8 | 8.2 | 94.56 | 100.00 | 4.8 | eff/all | std |
| 20 | 500 | 3.70 | 0.00 | 90.59 | 96.00 | 4.12 | 0.38 | 30.8 | 8.2 | 94.56 | 100.00 | 4.8 | all | std |
| 20 | 250 | 9.77 | 4.41 | 77.04 | 86.48 | 20.37 | 12.89 | 75.3 | 27.8 | 85.64 | 93.34 | 5.6 | | |
| 20 | 300 | 9.25 | 5.19 | 79.39 | 85.68 | 18.04 | 9.57 | 67.6 | 29.5 | 86.41 | 92.16 | 5.6 | | |
| 20 | 400 | 7.14 | 0.82 | 84.57 | 93.92 | 11.98 | 2.36 | 50.6 | 12.5 | 89.51 | 98.76 | 5.2 | | |
| 20 | 600 | 2.98 | 0.00 | 92.07 | 98.46 | 3.76 | 0.29 | 26.0 | 3.2 | 95.62 | 100.00 | 4.8 | | |
| 20 | 700 | 0.00 | 0.00 | 97.22 | 97.58 | 0.62 | 0.33 | 9.1 | 5.0 | 100.00 | 100.00 | 4.5 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 1 | Talbott | | Percent Sand, Silt, and Clay: | | 2,23,75 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.90 | 1.07 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 56.66 | 61.83 | 1.45 | 0.72 | 0.2 | 0.1 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 20 | 0.00 | 0.00 | 46.25 | 45.25 | 3.39 | 2.20 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 400 | 0.00 | 0.00 | 62.36 | 68.73 | 1.74 | 0.37 | 0.2 | 0.1 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.00 | 0.00 | 47.16 | 47.14 | 3.39 | 2.20 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 48.02 | 48.71 | 3.38 | 2.16 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 51.24 | 54.11 | 3.19 | 1.58 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 250 | 0.00 | 0.00 | 54.05 | 57.78 | 2.20 | 0.95 | 0.2 | 0.1 | 100.00 | 100.00 | 5.5 | | |
| 0 | 300 | 0.00 | 0.00 | 56.26 | 61.78 | 2.55 | 0.76 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 68.77 | 72.69 | 1.14 | 0.34 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 79.21 | 78.70 | 0.37 | 0.30 | 0.1 | 0.1 | 100.00 | 100.00 | 4.3 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.72 | 0.67 | | | 12.94 | 7.44 | 2.3 | 1.2 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.01 | 79.15 | 78.93 | 18.40 | 11.98 | 6.9 | 4.3 | 100.00 | 99.87 | 5.6 | eff | std |
| 5 | 300 | 0.00 | 0.00 | 81.90 | 84.03 | 12.56 | 2.77 | 6.0 | 3.3 | 100.00 | 100.00 | 5.2 | all | std |
| 5 | 67 | 0.00 | 0.00 | 79.32 | 79.44 | 18.45 | 11.86 | 6.8 | 4.2 | 100.00 | 100.00 | 5.6 | | |
| 5 | 100 | 0.00 | 0.00 | 79.55 | 79.44 | 18.06 | 11.78 | 6.7 | 4.2 | 100.00 | 100.00 | 5.6 | | |
| 5 | 200 | 0.00 | 0.00 | 80.49 | 81.79 | 16.16 | 7.94 | 6.4 | 3.7 | 100.00 | 100.00 | 5.5 | | |
| 5 | 400 | 0.00 | 0.00 | 83.93 | 87.08 | 6.78 | 0.59 | 5.3 | 2.7 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 86.29 | 88.77 | 3.22 | 0.36 | 4.5 | 2.3 | 100.00 | 100.00 | 4.8 | | |
| 5 | 700 | 0.00 | 0.00 | 91.19 | 91.10 | 0.38 | 0.31 | 2.9 | 1.8 | 100.00 | 100.00 | 4.5 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.69 | 1.58 | | | 14.88 | 8.32 | 5.3 | 2.9 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 67 | 0.00 | 0.01 | 80.59 | 80.56 | 20.59 | 13.70 | 15.1 | 9.5 | 100.00 | 99.95 | 5.6 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 83.07 | 85.32 | 14.89 | 2.46 | 13.2 | 7.2 | 100.00 | 100.00 | 5.4 | all | std |
| 10 | 100 | 0.00 | 0.00 | 80.83 | 81.32 | 20.65 | 13.63 | 14.9 | 9.1 | 100.00 | 100.00 | 5.6 | | |
| 10 | 200 | 0.00 | 0.00 | 81.76 | 83.17 | 20.56 | 12.11 | 14.2 | 8.2 | 100.00 | 100.00 | 5.6 | | |
| 10 | 400 | 0.00 | 0.00 | 84.93 | 88.12 | 8.51 | 0.50 | 11.7 | 5.8 | 100.00 | 100.00 | 5.1 | | |
| 10 | 500 | 0.00 | 0.00 | 87.16 | 89.54 | 2.78 | 0.35 | 10.0 | 5.1 | 100.00 | 100.00 | 4.7 | | |
| 10 | 700 | 0.00 | 0.00 | 91.63 | 91.68 | 0.38 | 0.31 | 6.5 | 4.1 | 100.00 | 100.00 | 4.4 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 6.16 | 5.92 | | | 17.06 | 10.26 | 18.5 | 10.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.00 | 0.00 | 81.63 | 82.74 | 20.56 | 13.32 | 45.2 | 26.6 | 100.00 | 100.00 | 5.6 | eff | std |
| 20 | 300 | 0.00 | 0.00 | 82.84 | 84.88 | 16.31 | 7.39 | 42.2 | 23.3 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 400 | 0.00 | 0.00 | 84.35 | 87.13 | 10.98 | 1.38 | 38.5 | 19.9 | 100.00 | 100.00 | 5.2 | | |
| 20 | 500 | 0.00 | 0.00 | 86.48 | 89.30 | 3.59 | 0.37 | 33.2 | 16.5 | 100.00 | 100.00 | 4.8 | | |
| 20 | 600 | 0.00 | 0.00 | 88.94 | 90.41 | 1.28 | 0.34 | 27.2 | 14.8 | 100.00 | 100.00 | 4.6 | | |
| 20 | 700 | 0.00 | 0.00 | 91.29 | 91.46 | 0.38 | 0.32 | 21.4 | 13.2 | 100.00 | 100.00 | 4.5 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 2 | Shubuta | | Percent Sand, Silt, and Clay: | | 53,31,16 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.65 | 0.93 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 91.01 | 92.39 | 1.45 | 0.71 | 0.0 | 0.0 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 67 | 0.00 | 0.00 | 83.54 | 86.53 | 3.04 | 1.99 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 93.05 | 94.38 | 1.61 | 0.37 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 69.84 | 76.41 | 3.04 | 1.99 | 0.1 | 0.1 | 83.33 | 91.67 | 4.8 | | |
| 0 | 40 | 0.01 | 0.00 | 79.24 | 83.20 | 3.04 | 1.99 | 0.1 | 0.0 | 91.67 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 86.01 | 88.28 | 3.03 | 1.91 | 0.1 | 0.0 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 89.47 | 91.18 | 2.71 | 1.25 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 91.94 | 93.56 | 2.05 | 0.51 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 95.62 | 95.95 | 0.82 | 0.33 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 97.20 | 97.22 | 0.35 | 0.29 | 0.0 | 0.0 | 100.00 | 100.00 | 3.9 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.99 | 0.92 | | | 11.29 | 6.51 | 2.3 | 1.2 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 100 | 0.42 | 0.12 | 90.90 | 93.21 | 15.54 | 10.85 | 3.1 | 1.5 | 96.00 | 98.81 | 5.5 | eff | std |
| 5 | 250 | 0.11 | 0.00 | 93.91 | 96.34 | 12.09 | 3.31 | 2.1 | 0.8 | 98.95 | 100.00 | 5.2 | all | std |
| 5 | 40 | 1.28 | 0.36 | 86.88 | 91.33 | 16.12 | 10.88 | 4.5 | 1.9 | 87.82 | 96.44 | 5.5 | | |
| 5 | 67 | 0.98 | 0.13 | 85.83 | 92.97 | 15.73 | 10.71 | 4.8 | 1.5 | 90.68 | 98.71 | 5.5 | | |
| 5 | 150 | 0.32 | 0.04 | 91.80 | 94.69 | 15.12 | 9.24 | 2.8 | 1.1 | 96.96 | 99.60 | 5.5 | | |
| 5 | 200 | 0.19 | 0.00 | 92.87 | 95.56 | 14.14 | 5.63 | 2.4 | 1.0 | 98.19 | 100.00 | 5.4 | | |
| 5 | 300 | 0.04 | 0.00 | 94.92 | 96.86 | 9.13 | 1.52 | 1.7 | 0.7 | 99.62 | 100.00 | 5.1 | | |
| 5 | 500 | 0.00 | 0.00 | 97.56 | 97.99 | 1.59 | 0.34 | 0.8 | 0.4 | 100.00 | 100.00 | 4.6 | | |
| 5 | 700 | 0.00 | 0.00 | 98.47 | 98.54 | 0.36 | 0.30 | 0.5 | 0.3 | 100.00 | 100.00 | 4.1 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.31 | 2.17 | | | 12.50 | 7.30 | 5.3 | 2.9 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 67 | 1.38 | 0.21 | 91.81 | 94.28 | 18.64 | 12.63 | 6.6 | 2.9 | 94.51 | 99.14 | 5.6 | eff | std |
| 10 | 300 | 0.15 | 0.00 | 94.97 | 97.10 | 12.20 | 1.53 | 4.1 | 1.5 | 99.40 | 100.00 | 5.2 | all | std |
| 10 | 100 | 0.90 | 0.23 | 91.56 | 93.98 | 18.66 | 12.61 | 6.8 | 3.1 | 96.42 | 99.06 | 5.6 | | |
| 10 | 150 | 0.67 | 0.14 | 92.46 | 94.71 | 18.61 | 12.43 | 6.1 | 2.7 | 97.33 | 99.43 | 5.6 | | |
| 10 | 200 | 0.50 | 0.00 | 93.08 | 95.69 | 18.15 | 9.38 | 5.6 | 2.2 | 98.01 | 100.00 | 5.6 | | |
| 10 | 250 | 0.27 | 0.00 | 94.19 | 96.54 | 14.86 | 4.16 | 4.7 | 1.8 | 98.93 | 100.00 | 5.4 | | |
| 10 | 350 | 0.00 | 0.00 | 95.91 | 97.49 | 8.27 | 0.57 | 3.3 | 1.3 | 100.00 | 100.00 | 5.0 | | |
| 10 | 500 | 0.00 | 0.00 | 97.68 | 98.10 | 1.44 | 0.34 | 1.9 | 1.0 | 100.00 | 100.00 | 4.6 | | |
| 10 | 700 | 0.00 | 0.00 | 98.50 | 98.61 | 0.36 | 0.30 | 1.2 | 0.7 | 100.00 | 100.00 | 4.0 | | |
| 20 | PD | 8.27 | 7.93 | | | 15.04 | 9.09 | 18.6 | 10.4 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.69 | 0.00 | 94.38 | 95.70 | 18.57 | 12.27 | 14.3 | 7.0 | 99.10 | 100.00 | 5.6 | eff | std |
| 20 | 300 | 0.27 | 0.00 | 95.17 | 96.86 | 14.35 | 5.19 | 12.3 | 5.1 | 99.65 | 100.00 | 5.4 | all | std |
| 20 | 350 | 0.00 | 0.00 | 95.70 | 97.35 | 11.04 | 1.96 | 11.0 | 4.3 | 100.00 | 100.00 | 5.2 | | |
| 20 | 400 | 0.00 | 0.00 | 96.39 | 97.60 | 7.08 | 0.76 | 9.2 | 3.9 | 100.00 | 100.00 | 5.0 | | |
| 20 | 500 | 0.00 | 0.00 | 97.49 | 98.03 | 1.94 | 0.36 | 6.4 | 3.2 | 100.00 | 100.00 | 4.7 | | |
| 20 | 700 | 0.00 | 0.00 | 98.45 | 98.55 | 0.36 | 0.31 | 4.0 | 2.3 | 100.00 | 100.00 | 4.1 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 2 | Grenada | Percent Sand, Silt, and Clay: | | 4,78,18 | Hydrologic Soil Group: | | | C | | Erodibility (K): | | 0.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.01 | 0.00 | | | 1.65 | 0.93 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 82.96 | 87.86 | 1.45 | 0.71 | 0.1 | 0.0 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 300 | 0.00 | 0.00 | 84.52 | 89.62 | 2.05 | 0.51 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 87.60 | 90.97 | 1.61 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.05 | 0.04 | 26.38 | 36.28 | 3.04 | 1.99 | 0.3 | 0.2 | 28.57 | 42.86 | 4.8 | | |
| 0 | 67 | 0.03 | 0.02 | 51.81 | 64.45 | 3.04 | 1.99 | 0.2 | 0.1 | 57.14 | 71.43 | 4.8 | | |
| 0 | 150 | 0.02 | 0.01 | 69.94 | 80.66 | 2.96 | 1.64 | 0.1 | 0.1 | 71.43 | 85.71 | 4.8 | | |
| 0 | 250 | 0.01 | 0.00 | 80.77 | 87.82 | 2.40 | 0.76 | 0.1 | 0.0 | 85.71 | 100.00 | 4.7 | | |
| 0 | 400 | 0.00 | 0.00 | 89.82 | 92.02 | 1.18 | 0.35 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 92.62 | 93.67 | 0.82 | 0.33 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 95.24 | 95.75 | 0.35 | 0.29 | 0.0 | 0.0 | 100.00 | 100.00 | 3.9 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.81 | 0.77 | | | 11.29 | 6.51 | 2.6 | 1.4 | | | | | |
| 5 | 400 | 0.45 | 0.00 | 90.65 | 95.92 | 2.51 | 0.37 | 3.6 | 1.0 | 95.02 | 100.00 | 5.1 | all | 12/8 |
| 5 | 450 | 0.33 | 0.00 | 92.14 | 96.36 | 2.68 | 0.35 | 3.1 | 0.9 | 96.35 | 100.00 | 4.7 | eff | std |
| 5 | 450 | 0.33 | 0.00 | 92.14 | 96.36 | 2.68 | 0.35 | 3.1 | 0.9 | 96.35 | 100.00 | 4.7 | all | std |
| 5 | 40 | 3.18 | 2.05 | 51.34 | 62.19 | 16.12 | 10.89 | 19.0 | 9.3 | 64.82 | 76.30 | 5.5 | | |
| 5 | 100 | 2.08 | 1.35 | 64.21 | 72.85 | 15.54 | 10.85 | 14.0 | 6.7 | 76.99 | 84.39 | 5.5 | | |
| 5 | 200 | 1.64 | 0.77 | 73.14 | 84.79 | 14.14 | 5.64 | 10.5 | 3.7 | 81.86 | 91.10 | 5.4 | | |
| 5 | 300 | 1.15 | 0.16 | 81.44 | 93.10 | 9.13 | 1.52 | 7.2 | 1.7 | 87.28 | 98.15 | 5.1 | | |
| 5 | 400 | 0.58 | 0.00 | 89.00 | 95.92 | 4.68 | 0.37 | 4.3 | 1.0 | 93.58 | 100.00 | 4.9 | | |
| 5 | 500 | 0.05 | 0.00 | 94.50 | 96.72 | 1.59 | 0.34 | 2.1 | 0.8 | 99.45 | 100.00 | 4.6 | | |
| 5 | 700 | 0.00 | 0.00 | 97.42 | 97.77 | 0.36 | 0.30 | 1.0 | 0.5 | 100.00 | 100.00 | 4.1 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.94 | 1.80 | | | 12.50 | 7.30 | 6.1 | 3.3 | | | | | |
| 10 | 350 | 0.73 | 0.00 | 91.84 | 95.59 | 2.97 | 0.55 | 7.5 | 2.6 | 96.73 | 100.00 | 5.5 | all | 10/6 |
| 10 | 450 | 0.61 | 0.00 | 92.84 | 96.55 | 2.45 | 0.35 | 6.6 | 2.0 | 97.27 | 100.00 | 4.7 | eff | std |
| 10 | 450 | 0.61 | 0.00 | 92.84 | 96.55 | 2.45 | 0.35 | 6.6 | 2.0 | 97.27 | 100.00 | 4.7 | all | std |
| 10 | 200 | 3.67 | 1.83 | 74.31 | 84.62 | 18.16 | 9.53 | 23.7 | 9.0 | 83.57 | 91.57 | 5.6 | | |
| 10 | 300 | 2.67 | 0.38 | 82.09 | 93.47 | 12.35 | 1.80 | 16.5 | 3.8 | 88.05 | 98.25 | 5.2 | | |
| 10 | 350 | 1.17 | 0.00 | 89.89 | 95.59 | 2.58 | 0.56 | 9.3 | 2.6 | 94.76 | 100.00 | 5.4 | | |
| 10 | 400 | 1.32 | 0.00 | 89.73 | 96.11 | 3.81 | 0.37 | 9.5 | 2.3 | 94.09 | 100.00 | 4.8 | | |
| 10 | 500 | 0.01 | 0.00 | 95.08 | 96.90 | 1.44 | 0.34 | 4.5 | 1.8 | 99.96 | 100.00 | 4.6 | | |
| 10 | 600 | 0.00 | 0.00 | 97.03 | 97.45 | 0.43 | 0.32 | 2.7 | 1.5 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 97.50 | 97.87 | 0.36 | 0.30 | 2.3 | 1.2 | 100.00 | 100.00 | 4.0 | | |
| 20 | PD | 7.36 | 7.06 | | | 15.04 | 9.09 | 21.3 | 11.8 | | | | | |
| 20 | 350 | 3.07 | 0.29 | 90.25 | 94.79 | 6.23 | 1.39 | 28.4 | 9.6 | 95.46 | 99.56 | 5.6 | all | 10/6 |
| 20 | 450 | 3.28 | 0.00 | 91.07 | 96.06 | 3.54 | 0.38 | 26.0 | 7.3 | 95.15 | 100.00 | 4.8 | eff | std |
| 20 | 450 | 3.28 | 0.00 | 91.07 | 96.06 | 3.54 | 0.38 | 26.0 | 7.3 | 95.15 | 100.00 | 4.8 | all | std |
| 20 | 200 | 9.07 | 7.37 | 77.26 | 79.54 | 18.59 | 12.34 | 66.2 | 37.9 | 86.58 | 88.80 | 5.6 | | |
| 20 | 300 | 7.69 | 2.53 | 81.66 | 90.67 | 14.43 | 6.31 | 53.4 | 17.3 | 88.62 | 96.15 | 5.4 | | |
| 20 | 400 | 5.18 | 0.00 | 87.65 | 95.82 | 8.24 | 1.07 | 36.0 | 7.7 | 92.33 | 100.00 | 5.0 | | |
| 20 | 500 | 1.45 | 0.00 | 93.65 | 96.73 | 2.36 | 0.37 | 18.5 | 6.0 | 97.85 | 100.00 | 4.7 | | |
| 20 | 700 | 0.00 | 0.00 | 97.23 | 97.60 | 0.37 | 0.31 | 8.1 | 4.4 | 100.00 | 100.00 | 4.1 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 2 | Brandon | | Percent Sand, Silt, and Clay: | | 11,50,39 | Hydrologic Soil Group: | | | B | | Erodibility (K): | | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.11 | 0.54 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 76.77 | 79.24 | 0.96 | 0.38 | 0.1 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 150 | 0.00 | 0.00 | 68.68 | 73.83 | 2.49 | 1.12 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 81.09 | 83.01 | 1.02 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 45.72 | 49.98 | 2.67 | 1.65 | 0.2 | 0.1 | 71.43 | 85.71 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 59.25 | 65.07 | 2.67 | 1.63 | 0.1 | 0.1 | 85.71 | 100.00 | 4.7 | | |
| 0 | 100 | 0.01 | 0.00 | 63.83 | 69.46 | 2.66 | 1.49 | 0.1 | 0.1 | 85.71 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 72.12 | 76.70 | 2.22 | 0.64 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 78.31 | 81.21 | 1.42 | 0.35 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 400 | 0.00 | 0.00 | 83.49 | 84.57 | 0.84 | 0.32 | 0.1 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 500 | 0.00 | 0.00 | 87.31 | 87.03 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.4 | | |
| 0 | 700 | 0.00 | 0.00 | 90.44 | 90.55 | 0.33 | 0.26 | 0.0 | 0.0 | 100.00 | 100.00 | 3.5 | | |
| 5 | PD | 0.81 | 0.72 | | | 7.85 | 3.84 | 1.5 | 0.7 | | | | | |
| 5 | 250 | 0.00 | 0.00 | 88.60 | 91.63 | 5.81 | 0.91 | 3.4 | 1.5 | 100.00 | 100.00 | 5.6 | all | 10/6 |
| 5 | 100 | 0.42 | 0.23 | 81.69 | 84.77 | 14.09 | 9.15 | 5.5 | 2.7 | 95.35 | 97.32 | 5.4 | eff | std |
| 5 | 250 | 0.13 | 0.00 | 87.04 | 91.55 | 8.16 | 1.12 | 3.9 | 1.5 | 98.56 | 100.00 | 5.0 | all | std |
| 5 | 40 | 0.65 | 0.28 | 76.94 | 83.22 | 14.25 | 9.37 | 6.9 | 3.0 | 92.81 | 96.73 | 5.4 | | |
| 5 | 67 | 0.44 | 0.27 | 80.73 | 83.43 | 14.18 | 9.35 | 5.8 | 2.9 | 95.13 | 96.85 | 5.4 | | |
| 5 | 200 | 0.26 | 0.00 | 85.23 | 89.65 | 11.42 | 2.91 | 4.4 | 1.8 | 97.12 | 100.00 | 5.2 | | |
| 5 | 300 | 0.00 | 0.00 | 88.79 | 92.55 | 5.59 | 0.38 | 3.4 | 1.3 | 100.00 | 100.00 | 4.9 | | |
| 5 | 400 | 0.00 | 0.00 | 92.03 | 93.70 | 1.99 | 0.34 | 2.4 | 1.1 | 100.00 | 100.00 | 4.7 | | |
| 5 | 500 | 0.00 | 0.00 | 94.36 | 94.55 | 0.64 | 0.31 | 1.7 | 1.0 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 95.84 | 95.89 | 0.34 | 0.27 | 1.2 | 0.7 | 100.00 | 100.00 | 3.7 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.94 | 1.74 | | | 8.89 | 4.40 | 3.6 | 1.7 | | | | | |
| 10 | 250 | 0.11 | 0.00 | 89.26 | 92.53 | 7.47 | 0.95 | 7.7 | 3.2 | 99.51 | 100.00 | 5.6 | all | 12/8 |
| 10 | 100 | 0.90 | 0.48 | 83.33 | 86.49 | 17.34 | 11.07 | 12.0 | 5.8 | 95.98 | 97.79 | 5.5 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 89.60 | 93.28 | 7.09 | 0.38 | 7.5 | 2.9 | 100.00 | 100.00 | 5.0 | all | std |
| 10 | 67 | 1.33 | 0.53 | 80.14 | 85.99 | 17.20 | 11.17 | 14.3 | 6.1 | 94.05 | 97.56 | 5.5 | | |
| 10 | 200 | 0.60 | 0.00 | 86.24 | 90.49 | 14.62 | 3.72 | 9.9 | 4.1 | 97.32 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 92.70 | 94.26 | 1.75 | 0.34 | 5.2 | 2.5 | 100.00 | 100.00 | 4.6 | | |
| 10 | 500 | 0.00 | 0.00 | 94.76 | 95.05 | 0.57 | 0.31 | 3.8 | 2.1 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 96.01 | 96.16 | 0.34 | 0.27 | 2.9 | 1.7 | 100.00 | 100.00 | 3.6 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.19 | 6.76 | | | 11.33 | 5.97 | 13.1 | 6.3 | | | | | |
| 20 | 250 | 0.49 | 0.00 | 88.88 | 91.79 | 10.34 | 2.25 | 25.2 | 11.2 | 99.28 | 100.00 | 5.7 | all | 12/8 |
| 20 | 200 | 1.71 | 0.00 | 86.38 | 89.83 | 15.45 | 9.34 | 30.9 | 13.9 | 97.49 | 100.00 | 5.5 | eff | std |
| 20 | 300 | 0.51 | 0.00 | 88.92 | 92.95 | 9.96 | 1.36 | 25.1 | 9.6 | 99.25 | 100.00 | 5.1 | all | std |
| 20 | 400 | 0.00 | 0.00 | 91.96 | 94.30 | 2.70 | 0.36 | 18.2 | 7.8 | 100.00 | 100.00 | 4.7 | | |
| 20 | 500 | 0.00 | 0.00 | 94.33 | 94.80 | 0.81 | 0.33 | 12.9 | 7.1 | 100.00 | 100.00 | 4.5 | | |
| 20 | 600 | 0.00 | 0.00 | 95.27 | 95.54 | 0.37 | 0.30 | 10.7 | 6.1 | 100.00 | 100.00 | 4.1 | | |
| 20 | 700 | 0.00 | 0.00 | 95.86 | 95.95 | 0.34 | 0.28 | 9.4 | 5.5 | 100.00 | 100.00 | 3.6 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 3 | Hartsells | Percent Sand, Silt, and Clay: 53,33,14 | Hydrologic Soil Group: B | Erodibility (K): .28

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.01 | | | 1.11 | 0.45 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 91.94 | 93.07 | 0.95 | 0.38 | 0.0 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 100 | 0.00 | 0.00 | 84.27 | 88.38 | 2.65 | 1.49 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 93.87 | 94.68 | 1.02 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 64.79 | 72.50 | 2.66 | 1.65 | 0.1 | 0.1 | 81.82 | 90.00 | 4.7 | | |
| 0 | 40 | 0.01 | 0.01 | 75.12 | 80.92 | 2.66 | 1.64 | 0.1 | 0.0 | 90.91 | 90.00 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 80.71 | 85.69 | 2.66 | 1.63 | 0.1 | 0.0 | 90.91 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 89.61 | 92.00 | 2.21 | 0.64 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 92.69 | 93.93 | 1.41 | 0.35 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 96.19 | 96.28 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.4 | | |
| 0 | 700 | 0.00 | 0.00 | 97.37 | 97.50 | 0.33 | 0.26 | 0.0 | 0.0 | 100.00 | 100.00 | 3.5 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.92 | 0.82 | | | 7.85 | 3.84 | 1.5 | 0.7 | | | | | |
| 5 | 250 | 0.06 | 0.00 | 95.08 | 96.90 | 5.84 | 0.91 | 1.5 | 0.6 | 99.42 | 100.00 | 5.6 | all | 10/6 |
| 5 | 67 | 0.47 | 0.23 | 87.72 | 91.59 | 14.18 | 9.36 | 3.7 | 1.5 | 95.46 | 97.67 | 5.4 | eff | std |
| 5 | 250 | 0.17 | 0.00 | 93.67 | 96.85 | 8.16 | 1.12 | 1.9 | 0.6 | 98.36 | 100.00 | 5.0 | all | std |
| 5 | 40 | 0.96 | 0.14 | 84.09 | 87.11 | 14.25 | 9.38 | 4.8 | 2.3 | 90.73 | 98.58 | 5.4 | | |
| 5 | 100 | 0.38 | 0.19 | 89.25 | 92.50 | 14.09 | 9.14 | 3.2 | 1.3 | 96.33 | 98.07 | 5.4 | | |
| 5 | 200 | 0.25 | 0.00 | 92.19 | 95.92 | 11.42 | 2.91 | 2.3 | 0.7 | 97.59 | 100.00 | 5.2 | | |
| 5 | 300 | 0.07 | 0.00 | 94.97 | 97.27 | 5.59 | 0.38 | 1.5 | 0.5 | 99.32 | 100.00 | 4.9 | | |
| 5 | 400 | 0.00 | 0.00 | 96.91 | 97.78 | 1.99 | 0.34 | 0.9 | 0.4 | 100.00 | 100.00 | 4.7 | | |
| 5 | 500 | 0.00 | 0.00 | 97.96 | 98.18 | 0.64 | 0.31 | 0.6 | 0.3 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 98.56 | 98.70 | 0.34 | 0.27 | 0.4 | 0.2 | 100.00 | 100.00 | 3.7 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.18 | 1.96 | | | 8.89 | 4.40 | 3.6 | 1.7 | | | | | |
| 10 | 250 | 0.17 | 0.00 | 95.24 | 97.24 | 7.48 | 0.94 | 3.4 | 1.2 | 99.33 | 100.00 | 5.6 | all | 12/8 |
| 10 | 67 | 0.87 | 0.49 | 89.77 | 92.58 | 17.20 | 11.17 | 7.3 | 3.2 | 96.56 | 98.00 | 5.5 | eff | std |
| 10 | 300 | 0.19 | 0.00 | 95.20 | 97.55 | 7.09 | 0.38 | 3.4 | 1.1 | 99.25 | 100.00 | 5.0 | all | std |
| 10 | 100 | 1.47 | 0.43 | 87.17 | 93.23 | 17.33 | 11.07 | 9.2 | 2.9 | 94.18 | 98.24 | 5.5 | | |
| 10 | 200 | 0.58 | 0.00 | 92.59 | 96.22 | 14.62 | 3.68 | 5.3 | 1.6 | 97.70 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 97.18 | 97.99 | 1.75 | 0.34 | 2.0 | 0.9 | 100.00 | 100.00 | 4.6 | | |
| 10 | 500 | 0.00 | 0.00 | 98.09 | 98.33 | 0.57 | 0.31 | 1.4 | 0.7 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 98.62 | 98.79 | 0.34 | 0.27 | 1.0 | 0.5 | 100.00 | 100.00 | 3.6 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 8.12 | 7.63 | | | 11.33 | 5.97 | 13.1 | 6.3 | | | | | |
| 20 | 250 | 0.82 | 0.00 | 94.63 | 96.93 | 10.16 | 2.99 | 12.2 | 4.2 | 98.93 | 100.00 | 5.6 | all | 18/12 |
| 20 | 200 | 2.12 | 0.20 | 91.90 | 95.78 | 15.34 | 8.75 | 18.4 | 5.8 | 97.24 | 99.73 | 5.5 | eff | std |
| 20 | 300 | 0.75 | 0.00 | 94.99 | 97.56 | 9.89 | 1.30 | 11.4 | 3.3 | 99.02 | 100.00 | 5.1 | all | std |
| 20 | 150 | 1.61 | 0.42 | 92.55 | 95.26 | 17.14 | 10.96 | 16.9 | 6.5 | 97.90 | 99.44 | 5.5 | | |
| 20 | 250 | 1.15 | 0.00 | 94.06 | 96.86 | 13.91 | 3.51 | 13.5 | 4.3 | 98.50 | 100.00 | 5.3 | | |
| 20 | 400 | 0.00 | 0.00 | 96.92 | 97.95 | 2.50 | 0.36 | 7.0 | 2.8 | 100.00 | 100.00 | 4.7 | | |
| 20 | 500 | 0.00 | 0.00 | 97.98 | 98.27 | 0.78 | 0.33 | 4.6 | 2.4 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 98.58 | 98.78 | 0.34 | 0.28 | 3.2 | 1.7 | 100.00 | 100.00 | 3.6 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 3 Pickwick | Percent Sand, Silt, and Clay: 9,68,23 | Hydrologic Soil Group: B | Erodibility (K): .32

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 1.11 | 0.54 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 83.64 | 86.12 | 0.95 | 0.38 | 0.1 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 200 | 0.00 | 0.00 | 77.46 | 84.10 | 2.21 | 0.64 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 87.31 | 89.22 | 1.02 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.04 | 0.03 | 31.53 | 40.62 | 2.66 | 1.65 | 0.3 | 0.1 | 42.86 | 50.00 | 4.7 | | |
| 0 | 100 | 0.02 | 0.01 | 64.12 | 74.97 | 2.65 | 1.49 | 0.1 | 0.1 | 71.43 | 83.33 | 4.7 | | |
| 0 | 150 | 0.01 | 0.00 | 72.32 | 81.13 | 2.49 | 1.12 | 0.1 | 0.0 | 85.71 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 84.79 | 87.78 | 1.41 | 0.35 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 400 | 0.00 | 0.00 | 89.13 | 90.42 | 0.84 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 500 | 0.00 | 0.00 | 91.78 | 92.30 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.4 | | |
| 0 | 700 | 0.00 | 0.00 | 94.22 | 94.74 | 0.33 | 0.26 | 0.0 | 0.0 | 100.00 | 100.00 | 3.5 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.87 | 0.77 | | | 7.85 | 3.84 | 1.7 | 0.8 | | | | | |
| 5 | 250 | 0.34 | 0.00 | 89.11 | 94.09 | 5.75 | 0.91 | 3.7 | 1.2 | 96.65 | 100.00 | 5.6 | all | 10/6 |
| 5 | 250 | 0.67 | 0.00 | 85.32 | 93.93 | 8.16 | 1.12 | 5.0 | 1.2 | 93.41 | 100.00 | 5.0 | eff | std |
| 5 | 250 | 0.67 | 0.00 | 85.32 | 93.93 | 8.16 | 1.12 | 5.0 | 1.2 | 93.41 | 100.00 | 5.0 | all | std |
| 5 | 40 | 1.43 | 1.35 | 71.61 | 71.43 | 14.25 | 9.37 | 9.7 | 5.8 | 85.93 | 85.98 | 5.4 | | |
| 5 | 100 | 1.20 | 0.66 | 74.44 | 82.23 | 14.09 | 9.15 | 8.7 | 3.6 | 88.19 | 93.15 | 5.4 | | |
| 5 | 200 | 0.83 | 0.13 | 81.80 | 91.31 | 11.42 | 2.91 | 6.2 | 1.8 | 91.83 | 98.65 | 5.2 | | |
| 5 | 300 | 0.40 | 0.00 | 88.52 | 94.91 | 5.59 | 0.38 | 3.9 | 1.0 | 96.06 | 100.00 | 4.9 | | |
| 5 | 400 | 0.00 | 0.00 | 93.56 | 95.92 | 1.99 | 0.34 | 2.2 | 0.8 | 100.00 | 100.00 | 4.7 | | |
| 5 | 500 | 0.00 | 0.00 | 96.19 | 96.68 | 0.64 | 0.31 | 1.3 | 0.7 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 97.34 | 97.68 | 0.34 | 0.27 | 0.9 | 0.5 | 100.00 | 100.00 | 3.7 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.10 | 1.87 | | | 8.89 | 4.40 | 4.1 | 1.9 | | | | | |
| 10 | 250 | 0.84 | 0.00 | 89.37 | 94.70 | 7.89 | 1.05 | 8.7 | 2.6 | 96.67 | 100.00 | 5.6 | all | 12/8 |
| 10 | 300 | 0.95 | 0.00 | 89.19 | 95.38 | 7.09 | 0.38 | 8.9 | 2.3 | 96.24 | 100.00 | 5.0 | eff | std |
| 10 | 300 | 0.95 | 0.00 | 89.19 | 95.38 | 7.09 | 0.38 | 8.9 | 2.3 | 96.24 | 100.00 | 5.0 | all | std |
| 10 | 67 | 2.73 | 1.49 | 76.35 | 84.21 | 17.20 | 11.16 | 19.4 | 7.8 | 89.19 | 93.91 | 5.5 | | |
| 10 | 100 | 2.60 | 2.39 | 76.64 | 77.61 | 17.32 | 11.07 | 19.2 | 11.1 | 89.70 | 90.23 | 5.5 | | |
| 10 | 200 | 2.08 | 0.60 | 82.72 | 90.54 | 14.69 | 3.78 | 14.2 | 4.7 | 91.76 | 97.55 | 5.4 | | |
| 10 | 250 | 1.56 | 0.00 | 86.14 | 94.56 | 11.41 | 1.19 | 11.4 | 2.7 | 93.82 | 100.00 | 5.2 | | |
| 10 | 400 | 0.00 | 0.00 | 94.23 | 96.30 | 1.75 | 0.34 | 4.7 | 1.8 | 100.00 | 100.00 | 4.6 | | |
| 10 | 500 | 0.00 | 0.00 | 96.42 | 96.96 | 0.57 | 0.31 | 2.9 | 1.5 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 97.47 | 97.83 | 0.34 | 0.27 | 2.1 | 1.1 | 100.00 | 100.00 | 3.6 | | |
| 20 | PD | 8.13 | 7.64 | | | 11.33 | 5.97 | 15.0 | 7.2 | | | | | |
| 20 | 300 | 1.38 | 0.00 | 91.74 | 95.38 | 3.70 | 1.37 | 21.4 | 7.2 | 98.19 | 100.00 | 5.5 | all | 12/8 |
| 20 | 300 | 3.37 | 0.00 | 88.46 | 95.19 | 10.04 | 1.76 | 29.9 | 7.5 | 95.59 | 100.00 | 5.1 | eff | std |
| 20 | 300 | 3.37 | 0.00 | 88.46 | 95.19 | 10.04 | 1.76 | 29.9 | 7.5 | 95.59 | 100.00 | 5.1 | all | std |
| 20 | 200 | 4.81 | 1.67 | 84.46 | 90.62 | 15.46 | 9.55 | 40.3 | 14.7 | 93.70 | 97.75 | 5.5 | | |
| 20 | 400 | 0.48 | 0.00 | 93.22 | 96.31 | 2.79 | 0.37 | 17.6 | 5.8 | 99.37 | 100.00 | 4.7 | | |
| 20 | 500 | 0.00 | 0.00 | 96.16 | 96.90 | 0.85 | 0.33 | 10.0 | 4.8 | 100.00 | 100.00 | 4.5 | | |
| 20 | 600 | 0.00 | 0.00 | 96.80 | 97.36 | 0.37 | 0.31 | 8.3 | 4.1 | 100.00 | 100.00 | 4.1 | | |
| 20 | 700 | 0.00 | 0.00 | 97.34 | 97.81 | 0.34 | 0.29 | 6.9 | 3.4 | 100.00 | 100.00 | 3.7 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged) (Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency (((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio (((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 3 Talbott | Percent Sand, Silt, and Clay: 2,23,75 | Hydrologic Soil Group: C | Erodibility (K): .24

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 1.65 | 0.93 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 54.76 | 58.96 | 1.45 | 0.71 | 0.2 | 0.1 | 100.00 | 100.00 | 5.3 | all | 10/6 |
| 0 | 20 | 0.00 | 0.00 | 46.01 | 44.99 | 3.04 | 1.99 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 60.83 | 66.19 | 1.61 | 0.37 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.00 | 0.00 | 47.11 | 47.20 | 3.04 | 1.99 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 48.13 | 48.98 | 3.03 | 1.91 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 51.82 | 55.01 | 2.71 | 1.25 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 57.45 | 63.22 | 2.05 | 0.51 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 400 | 0.00 | 0.00 | 64.25 | 68.52 | 1.18 | 0.35 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 71.20 | 72.61 | 0.82 | 0.33 | 0.1 | 0.1 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 78.95 | 78.79 | 0.35 | 0.29 | 0.1 | 0.0 | 100.00 | 100.00 | 3.9 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.71 | 0.65 | | | 11.29 | 6.51 | 2.0 | 0.1 | | | | | |
| 5 | 250 | 0.00 | 0.00 | 81.51 | 83.37 | 8.55 | 3.17 | 5.4 | 3.1 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 5 | 40 | 0.00 | 0.00 | 79.14 | 79.18 | 16.12 | 10.88 | 6.1 | 3.8 | 100.00 | 100.00 | 5.5 | eff | std |
| 5 | 250 | 0.00 | 0.00 | 81.47 | 83.36 | 12.09 | 3.31 | 5.4 | 3.1 | 100.00 | 100.00 | 5.2 | all | std |
| 5 | 100 | 0.00 | 0.00 | 79.60 | 80.05 | 15.54 | 10.83 | 6.0 | 3.7 | 100.00 | 100.00 | 5.5 | | |
| 5 | 200 | 0.00 | 0.00 | 80.72 | 82.16 | 14.14 | 5.63 | 5.6 | 3.3 | 100.00 | 100.00 | 5.4 | | |
| 5 | 300 | 0.00 | 0.00 | 82.35 | 84.65 | 9.13 | 1.52 | 5.2 | 2.8 | 100.00 | 100.00 | 5.1 | | |
| 5 | 400 | 0.00 | 0.00 | 84.64 | 87.33 | 4.68 | 0.37 | 4.5 | 2.3 | 100.00 | 100.00 | 4.9 | | |
| 5 | 500 | 0.00 | 0.00 | 87.26 | 88.83 | 1.59 | 0.34 | 3.7 | 2.1 | 100.00 | 100.00 | 4.6 | | |
| 5 | 600 | 0.00 | 0.00 | 89.94 | 90.10 | 0.55 | 0.32 | 2.9 | 1.8 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 91.12 | 91.19 | 0.36 | 0.30 | 2.6 | 1.6 | 100.00 | 100.00 | 4.1 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.67 | 1.56 | | | 12.50 | 7.30 | 4.6 | 2.5 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 82.80 | 84.88 | 13.45 | 2.79 | 11.9 | 6.6 | 100.00 | 100.00 | 5.7 | all | 18/12 |
| 10 | 67 | 0.00 | 0.00 | 80.66 | 81.05 | 18.65 | 12.62 | 13.4 | 8.3 | 100.00 | 100.00 | 5.6 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 83.55 | 86.03 | 12.19 | 1.42 | 11.4 | 6.1 | 100.00 | 100.00 | 5.2 | all | std |
| 10 | 100 | 0.00 | 0.00 | 80.92 | 81.53 | 18.68 | 12.60 | 13.2 | 8.1 | 100.00 | 100.00 | 5.6 | | |
| 10 | 200 | 0.00 | 0.00 | 82.06 | 83.66 | 17.89 | 8.56 | 12.4 | 7.2 | 100.00 | 100.00 | 5.6 | | |
| 10 | 250 | 0.00 | 0.00 | 82.76 | 84.87 | 14.83 | 3.35 | 11.9 | 6.6 | 100.00 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 85.66 | 88.32 | 3.81 | 0.37 | 9.9 | 5.1 | 100.00 | 100.00 | 4.8 | | |
| 10 | 500 | 0.00 | 0.00 | 88.13 | 89.67 | 1.44 | 0.34 | 8.2 | 4.5 | 100.00 | 100.00 | 4.6 | | |
| 10 | 600 | 0.00 | 0.00 | 90.65 | 90.82 | 0.43 | 0.32 | 6.5 | 4.0 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 91.60 | 91.82 | 0.36 | 0.30 | 5.8 | 3.6 | 100.00 | 100.00 | 4.0 | | |
| 20 | PD | 6.10 | 5.85 | | | 15.04 | 9.09 | 16.0 | 8.9 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 0.00 | 0.00 | 81.93 | 83.30 | 18.65 | 11.96 | 39.5 | 23.2 | 100.00 | 100.00 | 5.6 | eff | std |
| 20 | 250 | 0.00 | 0.00 | 82.61 | 84.53 | 16.01 | 7.55 | 38.0 | 21.5 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 300 | 0.00 | 0.00 | 83.32 | 85.70 | 14.05 | 3.64 | 36.4 | 19.8 | 100.00 | 100.00 | 5.3 | | |
| 20 | 400 | 0.00 | 0.00 | 85.18 | 88.20 | 5.87 | 0.50 | 32.4 | 16.4 | 100.00 | 100.00 | 4.9 | | |
| 20 | 500 | 0.00 | 0.00 | 87.64 | 89.53 | 1.61 | 0.35 | 27.0 | 14.5 | 100.00 | 100.00 | 4.6 | | |
| 20 | 600 | 0.00 | 0.00 | 90.23 | 90.71 | 0.53 | 0.33 | 21.3 | 12.9 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 91.33 | 91.67 | 0.36 | 0.30 | 18.9 | 11.6 | 100.00 | 100.00 | 4.0 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 4 | Hartsells | | Percent Sand, Silt, and Clay: | | 53,33,14 | Hydrologic Soil Group: | | | B | | Erodibility (K): .28 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.01 | 0.01 | | | 1.11 | 0.54 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 91.94 | 93.07 | 0.95 | 0.38 | 0.0 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 100 | 0.00 | 0.00 | 84.27 | 88.38 | 2.65 | 1.49 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 93.87 | 94.68 | 1.02 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 64.78 | 72.45 | 2.66 | 1.65 | 0.1 | 0.1 | 81.82 | 90.00 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 80.71 | 85.69 | 2.66 | 1.63 | 0.1 | 0.0 | 90.91 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 89.61 | 92.00 | 2.21 | 0.64 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 92.69 | 93.93 | 1.41 | 0.35 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 400 | 0.00 | 0.00 | 94.80 | 95.30 | 0.84 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 500 | 0.00 | 0.00 | 96.19 | 96.28 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.4 | | |
| 0 | 700 | 0.00 | 0.00 | 97.37 | 97.50 | 0.33 | 0.26 | 0.0 | 0.0 | 100.00 | 100.00 | 3.5 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.92 | 0.82 | | | 7.85 | 3.84 | 1.5 | 0.7 | | | | | |
| 5 | 250 | 0.06 | 0.00 | 95.07 | 96.89 | 5.87 | 0.91 | 1.5 | 0.6 | 99.42 | 100.00 | 5.6 | all | 10/6 |
| 5 | 40 | 0.46 | 0.49 | 87.81 | 87.17 | 14.25 | 9.38 | 3.6 | 2.3 | 95.56 | 95.03 | 5.4 | eff | std |
| 5 | 250 | 0.17 | 0.00 | 93.67 | 96.85 | 8.16 | 1.12 | 1.9 | 0.6 | 98.36 | 100.00 | 5.0 | all | std |
| 5 | 67 | 0.93 | 0.42 | 83.55 | 88.18 | 14.18 | 9.44 | 4.9 | 2.1 | 91.02 | 95.74 | 5.4 | | |
| 5 | 100 | 0.38 | 0.19 | 89.23 | 92.49 | 14.09 | 9.14 | 3.2 | 1.3 | 96.33 | 98.07 | 5.4 | | |
| 5 | 200 | 0.25 | 0.00 | 92.17 | 95.91 | 11.42 | 2.91 | 2.3 | 0.7 | 97.59 | 100.00 | 5.2 | | |
| 5 | 300 | 0.07 | 0.00 | 94.96 | 97.27 | 5.59 | 0.38 | 1.5 | 0.5 | 99.32 | 100.00 | 4.9 | | |
| 5 | 400 | 0.00 | 0.00 | 96.91 | 97.78 | 1.99 | 0.34 | 0.9 | 0.4 | 100.00 | 100.00 | 4.7 | | |
| 5 | 500 | 0.00 | 0.00 | 97.96 | 98.18 | 0.64 | 0.31 | 0.6 | 0.3 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 98.56 | 98.70 | 0.34 | 0.27 | 0.4 | 0.2 | 100.00 | 100.00 | 3.7 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.18 | 1.96 | | | 8.89 | 4.40 | 3.6 | 1.7 | | | | | |
| 10 | 250 | 0.17 | 0.00 | 95.23 | 97.25 | 7.48 | 0.93 | 3.4 | 1.2 | 99.33 | 100.00 | 5.6 | all | 12/8 |
| 10 | 67 | 0.87 | 0.94 | 89.74 | 89.38 | 17.20 | 11.18 | 7.4 | 4.6 | 96.56 | 96.16 | 5.5 | eff | std |
| 10 | 300 | 0.19 | 0.00 | 95.19 | 97.55 | 7.09 | 0.38 | 3.5 | 1.1 | 99.25 | 100.00 | 5.0 | all | std |
| 10 | 100 | 0.88 | 0.72 | 89.70 | 90.82 | 17.35 | 11.07 | 7.4 | 4.0 | 96.52 | 97.06 | 5.5 | | |
| 10 | 200 | 0.58 | 0.00 | 92.59 | 96.23 | 14.62 | 3.62 | 5.3 | 1.6 | 97.70 | 100.00 | 5.4 | | |
| 10 | 400 | 0.00 | 0.00 | 97.18 | 97.99 | 1.75 | 0.34 | 2.0 | 0.9 | 100.00 | 100.00 | 4.6 | | |
| 10 | 500 | 0.00 | 0.00 | 98.09 | 98.33 | 0.57 | 0.31 | 1.4 | 0.7 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 98.63 | 98.79 | 0.34 | 0.27 | 1.0 | 0.5 | 100.00 | 100.00 | 3.6 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 8.12 | 7.63 | | | 11.33 | 5.97 | 13.1 | 6.3 | | | | | |
| 20 | 250 | 0.83 | 0.00 | 94.60 | 96.96 | 10.21 | 2.87 | 12.2 | 4.2 | 98.92 | 100.00 | 5.6 | all | 18/12 |
| 20 | 200 | 1.55 | 0.19 | 93.07 | 95.82 | 15.33 | 8.66 | 15.7 | 5.7 | 97.98 | 99.75 | 5.5 | eff | std |
| 20 | 300 | 0.84 | 0.00 | 94.75 | 97.58 | 9.46 | 1.21 | 11.9 | 3.3 | 98.91 | 100.00 | 5.1 | all | std |
| 20 | 400 | 0.00 | 0.00 | 96.95 | 97.98 | 2.48 | 0.36 | 6.9 | 2.8 | 100.00 | 100.00 | 4.7 | | |
| 20 | 500 | 0.00 | 0.00 | 97.95 | 98.29 | 0.68 | 0.33 | 4.6 | 2.3 | 100.00 | 100.00 | 4.5 | | |
| 20 | 600 | 0.00 | 0.00 | 98.34 | 98.44 | 0.36 | 0.30 | 3.8 | 2.1 | 100.00 | 100.00 | 4.1 | | |
| 20 | 700 | 0.00 | 0.00 | 98.59 | 98.78 | 0.34 | 0.28 | 3.2 | 1.7 | 100.00 | 100.00 | 3.6 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 4 | Dandridge | Percent Sand, Silt, and Clay: | | 6,52,42 | Hydrologic Soil Group: | | | D | | Erodibility (K): .24 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.94 | 1.17 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 76.24 | 79.46 | 1.66 | 0.64 | 0.1 | 0.1 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 350 | 0.00 | 0.00 | 77.07 | 82.14 | 2.01 | 0.50 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 77.07 | 82.14 | 2.01 | 0.50 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | all | std |
| 0 | 20 | 0.02 | 0.02 | 37.21 | 41.53 | 3.26 | 2.21 | 0.2 | 0.1 | 66.67 | 66.67 | 4.8 | | |
| 0 | 67 | 0.01 | 0.01 | 51.81 | 58.18 | 3.25 | 2.20 | 0.2 | 0.1 | 83.33 | 83.33 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 57.06 | 63.63 | 3.25 | 2.18 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 150 | 0.00 | 0.00 | 63.01 | 69.10 | 3.23 | 1.94 | 0.1 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 66.98 | 72.86 | 3.04 | 1.61 | 0.1 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 300 | 0.00 | 0.00 | 73.91 | 79.32 | 2.40 | 0.77 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 500 | 0.00 | 0.00 | 84.46 | 86.46 | 1.03 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 700 | 0.00 | 0.00 | 89.95 | 89.99 | 0.37 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.1 | | |
| 5 | PD | 0.72 | 0.67 | | | 12.99 | 8.01 | 2.3 | 1.3 | | | | | |
| 5 | 250 | 0.27 | 0.00 | 83.84 | 87.81 | 12.45 | 4.60 | 5.1 | 2.5 | 96.46 | 100.00 | 5.7 | all | 18/12 |
| 5 | 200 | 0.39 | 0.16 | 81.54 | 85.43 | 15.18 | 8.31 | 5.8 | 3.0 | 94.89 | 97.82 | 5.5 | eff | std |
| 5 | 250 | 0.29 | 0.04 | 83.31 | 87.69 | 13.81 | 4.91 | 5.2 | 2.5 | 96.20 | 99.46 | 5.3 | all | std |
| 5 | 40 | 0.72 | 0.55 | 73.69 | 76.15 | 17.44 | 11.77 | 8.2 | 4.9 | 90.56 | 92.52 | 5.5 | | |
| 5 | 100 | 0.53 | 0.35 | 78.15 | 80.94 | 16.46 | 11.55 | 6.8 | 3.9 | 93.05 | 95.24 | 5.5 | | |
| 5 | 150 | 0.44 | 0.26 | 79.81 | 83.25 | 16.41 | 11.09 | 6.3 | 3.4 | 94.23 | 96.46 | 5.5 | | |
| 5 | 300 | 0.19 | 0.00 | 85.10 | 89.63 | 11.81 | 3.05 | 4.7 | 2.1 | 97.51 | 100.00 | 5.2 | | |
| 5 | 500 | 0.00 | 0.00 | 91.83 | 94.10 | 2.64 | 0.36 | 2.6 | 1.2 | 100.00 | 100.00 | 4.7 | | |
| 5 | 700 | 0.00 | 0.00 | 95.54 | 95.46 | 0.38 | 0.31 | 1.4 | 0.9 | 100.00 | 100.00 | 4.3 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.69 | 1.59 | | | 14.30 | 8.86 | 5.3 | 3.1 | | | | | |
| 10 | | | | | | | | | | | | | no tune | |
| 10 | 200 | 0.90 | 0.37 | 82.41 | 86.06 | 19.25 | 11.94 | 12.9 | 6.7 | 95.10 | 97.93 | 5.6 | eff | std |
| 10 | 300 | 0.45 | 0.00 | 85.71 | 90.31 | 14.36 | 2.47 | 10.5 | 4.7 | 97.55 | 100.00 | 5.4 | all | std |
| 10 | 67 | 1.16 | 0.76 | 78.95 | 82.22 | 19.32 | 13.48 | 15.5 | 8.5 | 93.68 | 95.74 | 5.6 | | |
| 10 | 100 | 1.16 | 0.75 | 79.51 | 82.37 | 19.32 | 13.28 | 15.1 | 8.5 | 93.68 | 95.80 | 5.6 | | |
| 10 | 150 | 0.98 | 0.81 | 80.88 | 82.37 | 19.27 | 13.20 | 14.1 | 8.5 | 94.66 | 95.46 | 5.6 | | |
| 10 | 250 | 0.67 | 0.11 | 84.15 | 88.33 | 16.93 | 6.78 | 11.6 | 5.6 | 96.35 | 99.38 | 5.5 | | |
| 10 | 400 | 0.00 | 0.00 | 89.18 | 93.39 | 7.53 | 0.50 | 7.9 | 3.2 | 100.00 | 100.00 | 5.0 | | |
| 10 | 500 | 0.00 | 0.00 | 92.25 | 94.30 | 2.40 | 0.35 | 5.7 | 2.7 | 100.00 | 100.00 | 4.7 | | |
| 10 | 700 | 0.00 | 0.00 | 95.63 | 95.63 | 0.37 | 0.31 | 3.2 | 2.1 | 100.00 | 100.00 | 4.3 | | |
| 20 | PD | 6.08 | 5.88 | | | 16.74 | 10.68 | 18.5 | 10.9 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 2.57 | 0.98 | 82.78 | 86.36 | 19.27 | 13.10 | 40.0 | 20.7 | 95.42 | 98.21 | 5.6 | eff | std |
| 20 | 300 | 1.77 | 0.00 | 85.34 | 89.22 | 15.10 | 6.72 | 34.0 | 16.4 | 96.85 | 100.00 | 5.5 | all | std |
| 20 | 150 | 2.55 | 0.98 | 82.27 | 86.10 | 19.29 | 13.23 | 41.2 | 21.1 | 95.46 | 98.21 | 5.6 | | |
| 20 | 250 | 2.04 | 0.52 | 84.02 | 87.59 | 18.45 | 11.49 | 37.1 | 18.8 | 96.37 | 99.05 | 5.6 | | |
| 20 | 400 | 0.24 | 0.00 | 88.53 | 92.49 | 9.36 | 1.32 | 26.6 | 11.4 | 99.57 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 91.80 | 94.09 | 2.63 | 0.37 | 19.0 | 9.0 | 100.00 | 100.00 | 4.7 | | |
| 20 | 700 | 0.00 | 0.00 | 95.45 | 95.29 | 0.37 | 0.32 | 10.6 | 7.1 | 100.00 | 100.00 | 4.3 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 4 Talbott | Percent Sand, Silt, and Clay: 2,23,75 | Hydrologic Soil Group: C | Erodibility (K): .24

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 1.65 | 0.93 | 0.0 | 0.0 | | | | | |
| 0 | 300 | 0.00 | 0.00 | 59.12 | 63.30 | 1.12 | 0.45 | 0.1 | 0.1 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 350 | 0.00 | 0.00 | 60.83 | 66.19 | 1.61 | 0.37 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | eff | std |
| 0 | 67 | 0.00 | 0.00 | 47.11 | 47.20 | 3.04 | 1.99 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | all | std |
| 0 | 20 | 0.00 | 0.00 | 46.01 | 44.98 | 3.04 | 1.99 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 100 | 0.00 | 0.00 | 48.13 | 48.98 | 3.03 | 1.91 | 0.2 | 0.1 | 100.00 | 100.00 | 4.8 | | |
| 0 | 200 | 0.00 | 0.00 | 51.82 | 55.00 | 2.71 | 1.25 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 57.45 | 63.22 | 2.05 | 0.51 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 400 | 0.00 | 0.00 | 64.25 | 68.52 | 1.18 | 0.35 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 71.20 | 72.61 | 0.82 | 0.33 | 0.1 | 0.1 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 78.95 | 78.79 | 0.35 | 0.29 | 0.1 | 0.0 | 100.00 | 100.00 | 3.9 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.71 | 0.65 | | | 11.29 | 6.51 | 2.0 | 1.1 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.01 | 79.13 | 78.86 | 16.13 | 10.88 | 6.1 | 3.9 | 100.00 | 99.86 | 5.5 | eff | std |
| 5 | 250 | 0.00 | 0.00 | 81.47 | 83.35 | 12.09 | 3.31 | 5.4 | 3.1 | 100.00 | 100.00 | 5.2 | all | std |
| 5 | 20 | 0.02 | 0.00 | 78.94 | 79.02 | 16.47 | 10.98 | 6.2 | 3.9 | 99.74 | 100.00 | 5.5 | | |
| 5 | 100 | 0.00 | 0.00 | 79.60 | 80.05 | 15.54 | 10.83 | 6.0 | 3.7 | 100.00 | 100.00 | 5.5 | | |
| 5 | 200 | 0.00 | 0.00 | 80.72 | 82.15 | 14.14 | 5.63 | 5.6 | 3.3 | 100.00 | 100.00 | 5.4 | | |
| 5 | 300 | 0.00 | 0.00 | 82.35 | 84.65 | 9.13 | 1.52 | 5.2 | 2.8 | 100.00 | 100.00 | 5.1 | | |
| 5 | 400 | 0.00 | 0.00 | 84.64 | 87.33 | 4.68 | 0.37 | 4.5 | 2.3 | 100.00 | 100.00 | 4.9 | | |
| 5 | 500 | 0.00 | 0.00 | 87.27 | 88.83 | 1.59 | 0.34 | 3.7 | 2.1 | 100.00 | 100.00 | 4.6 | | |
| 5 | 700 | 0.00 | 0.00 | 91.12 | 91.19 | 0.36 | 0.30 | 2.6 | 1.6 | 100.00 | 100.00 | 4.1 | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.67 | 1.56 | | | 12.50 | 7.30 | 4.6 | 2.5 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 82.80 | 84.88 | 12.95 | 2.75 | 11.9 | 6.6 | 100.00 | 100.00 | 5.7 | all | 18/12 |
| 10 | 67 | 0.00 | 0.00 | 80.66 | 81.03 | 18.64 | 12.62 | 13.4 | 8.3 | 100.00 | 100.00 | 5.6 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 83.55 | 86.03 | 12.19 | 1.39 | 11.4 | 6.1 | 100.00 | 100.00 | 5.2 | all | std |
| 10 | 100 | 0.00 | 0.00 | 80.92 | 80.98 | 18.67 | 12.60 | 13.2 | 8.4 | 100.00 | 100.00 | 5.6 | | |
| 10 | 200 | 0.00 | 0.00 | 82.06 | 83.66 | 17.93 | 8.52 | 12.4 | 7.2 | 100.00 | 100.00 | 5.6 | | |
| 10 | 250 | 0.00 | 0.00 | 82.76 | 84.86 | 14.82 | 3.31 | 11.9 | 6.6 | 100.00 | 100.00 | 5.4 | | |
| 10 | 500 | 0.00 | 0.00 | 88.14 | 89.67 | 1.44 | 0.34 | 8.2 | 4.5 | 100.00 | 100.00 | 4.6 | | |
| 10 | 700 | 0.00 | 0.00 | 91.61 | 91.82 | 0.36 | 0.30 | 5.8 | 3.6 | 100.00 | 100.00 | 4.0 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 6.10 | 5.85 | | | 15.04 | 9.09 | 16.0 | 8.9 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.00 | 0.00 | 81.36 | 82.30 | 18.60 | 12.54 | 40.7 | 24.6 | 100.00 | 100.00 | 5.6 | eff | std |
| 20 | 250 | 0.00 | 0.00 | 82.65 | 84.53 | 15.52 | 7.52 | 37.9 | 21.5 | 100.00 | 100.00 | 5.5 | all | std |
| 20 | 200 | 0.00 | 0.00 | 81.93 | 83.30 | 18.61 | 11.95 | 39.5 | 23.2 | 100.00 | 100.00 | 5.6 | | |
| 20 | 300 | 0.00 | 0.00 | 83.37 | 85.70 | 13.77 | 3.50 | 36.3 | 19.8 | 100.00 | 100.00 | 5.3 | | |
| 20 | 350 | 0.00 | 0.00 | 84.17 | 86.93 | 10.26 | 1.40 | 34.6 | 18.1 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 87.67 | 89.55 | 1.60 | 0.35 | 26.9 | 14.5 | 100.00 | 100.00 | 4.6 | | |
| 20 | 700 | 0.00 | 0.00 | 91.35 | 91.70 | 0.36 | 0.30 | 18.9 | 11.5 | 100.00 | 100.00 | 4.0 | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 5 Hartsells | Percent Sand, Silt, and Clay: 53,33,14 | Hydrologic Soil Group: B | Erodibility (K): .28

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.01 | | | 0.95 | 0.41 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 92.19 | 93.32 | 0.77 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 5.1 | all | 6/4 |
| 0 | 100 | 0.00 | 0.00 | 85.35 | 89.39 | 2.36 | 1.14 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 300 | 0.00 | 0.00 | 93.19 | 94.10 | 0.96 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 66.38 | 74.74 | 2.39 | 1.38 | 0.1 | 0.0 | 81.82 | 90.00 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 81.97 | 87.06 | 2.38 | 1.32 | 0.1 | 0.0 | 90.91 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 90.34 | 92.38 | 1.85 | 0.37 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 96.18 | 96.37 | 0.36 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 4.0 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.90 | 0.78 | | | 6.71 | 2.90 | 1.3 | 0.5 | | | | | |
| 5 | 200 | 0.10 | 0.00 | 94.50 | 96.77 | 6.86 | 0.97 | 1.5 | 0.5 | 99.02 | 100.00 | 5.7 | all | 10/6 |
| 5 | 40 | 0.44 | 0.22 | 88.20 | 91.66 | 13.18 | 8.10 | 3.1 | 1.2 | 95.71 | 97.73 | 5.3 | eff | std |
| 5 | 250 | 0.10 | 0.00 | 94.57 | 97.19 | 5.82 | 0.38 | 1.4 | 0.4 | 99.02 | 100.00 | 4.9 | all | std |
| 5 | 67 | 0.80 | 0.19 | 84.76 | 92.48 | 13.06 | 8.20 | 4.1 | 1.1 | 92.20 | 98.04 | 5.2 | | |
| 5 | 100 | 0.34 | 0.22 | 89.91 | 91.59 | 12.99 | 6.88 | 2.7 | 1.2 | 96.68 | 97.73 | 5.2 | | |
| 5 | 200 | 0.18 | 0.00 | 93.09 | 96.72 | 9.48 | 1.18 | 1.8 | 0.5 | 98.24 | 100.00 | 5.1 | | |
| 5 | 300 | 0.02 | 0.00 | 95.77 | 97.45 | 3.97 | 0.35 | 1.1 | 0.4 | 99.80 | 100.00 | 4.8 | | |
| 5 | 500 | 0.00 | 0.00 | 98.04 | 98.27 | 0.37 | 0.29 | 0.5 | 0.3 | 100.00 | 100.00 | 4.2 | | |
| 5 | 700 | 0.00 | 0.00 | 98.59 | 98.76 | 0.33 | 0.25 | 0.4 | 0.2 | 100.00 | 100.00 | 3.3 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 2.13 | 1.87 | | | 7.63 | 3.33 | 3.1 | 1.2 | | | | | |
| 10 | 250 | 0.07 | 0.00 | 95.83 | 97.52 | 2.58 | 0.37 | 2.7 | 0.9 | 99.72 | 100.00 | 5.4 | all | 12/8 |
| 10 | 100 | 0.79 | 0.30 | 90.38 | 94.13 | 15.19 | 9.55 | 6.2 | 2.1 | 96.85 | 98.76 | 5.5 | eff | std |
| 10 | 250 | 0.25 | 0.00 | 94.91 | 97.52 | 7.94 | 0.37 | 3.3 | 0.9 | 99.00 | 100.00 | 5.0 | all | std |
| 10 | 67 | 1.79 | 0.41 | 86.08 | 93.36 | 15.35 | 9.56 | 8.9 | 2.4 | 92.86 | 98.31 | 5.5 | | |
| 10 | 200 | 0.45 | 0.00 | 93.42 | 97.10 | 13.12 | 1.44 | 4.2 | 1.0 | 98.21 | 100.00 | 5.3 | | |
| 10 | 300 | 0.05 | 0.00 | 96.08 | 97.76 | 3.06 | 0.35 | 2.5 | 0.8 | 99.80 | 100.00 | 4.8 | | |
| 10 | 500 | 0.00 | 0.00 | 98.15 | 98.43 | 0.37 | 0.29 | 1.2 | 0.6 | 100.00 | 100.00 | 4.2 | | |
| 10 | 700 | 0.00 | 0.00 | 98.65 | 98.86 | 0.32 | 0.25 | 0.9 | 0.4 | 100.00 | 100.00 | 3.3 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 8.02 | 7.43 | | | 9.85 | 4.66 | 11.1 | 4.8 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 1.46 | 0.21 | 92.98 | 95.75 | 14.77 | 9.14 | 14.2 | 4.8 | 98.09 | 99.71 | 5.4 | eff | std |
| 20 | 250 | 0.77 | 0.00 | 94.80 | 97.61 | 10.51 | 1.44 | 10.5 | 2.7 | 98.99 | 100.00 | 5.1 | all | std |
| 20 | 200 | 1.20 | 0.00 | 93.63 | 96.65 | 13.97 | 4.77 | 12.9 | 3.8 | 98.43 | 100.00 | 5.3 | | |
| 20 | 300 | 0.23 | 0.00 | 95.85 | 97.77 | 6.10 | 0.38 | 8.4 | 2.5 | 99.70 | 100.00 | 4.9 | | |
| 20 | 400 | 0.00 | 0.00 | 97.47 | 98.22 | 1.31 | 0.33 | 5.1 | 2.0 | 100.00 | 100.00 | 4.6 | | |
| 20 | 500 | 0.00 | 0.00 | 98.07 | 98.49 | 0.37 | 0.30 | 3.9 | 1.7 | 100.00 | 100.00 | 4.3 | | |
| 20 | 700 | 0.00 | 0.00 | 98.63 | 98.92 | 0.32 | 0.26 | 2.8 | 1.2 | 100.00 | 100.00 | 3.3 | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 5: Pembroke | Percent Sand, Silt, and Clay: 8,52,40 | Hydrologic Soil Group: B | Erodibility (K): .28

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 0.95 | 0.41 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 76.26 | 78.79 | 0.77 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 5.1 | all | 6/4 |
| 0 | 150 | 0.00 | 0.00 | 68.42 | 74.07 | 2.15 | 0.59 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 300 | 0.00 | 0.00 | 78.61 | 80.72 | 0.96 | 0.32 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 41.42 | 47.36 | 2.39 | 1.38 | 0.2 | 0.1 | 71.43 | 83.33 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 57.71 | 65.27 | 2.38 | 1.32 | 0.1 | 0.1 | 85.71 | 100.00 | 4.7 | | |
| 0 | 100 | 0.01 | 0.00 | 63.02 | 69.71 | 2.36 | 1.14 | 0.1 | 0.1 | 85.71 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 72.02 | 76.62 | 1.85 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 86.56 | 86.79 | 0.36 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 4.0 | | |
| 0 | 700 | 0.00 | 0.00 | 90.05 | 90.45 | 0.32 | 0.24 | 0.0 | 0.0 | 100.00 | 100.00 | 3.1 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.77 | 0.66 | | | 6.71 | 2.90 | 1.3 | 0.5 | | | | | |
| 5 | 200 | 0.10 | 0.00 | 86.85 | 90.79 | 6.86 | 0.97 | 3.5 | 1.4 | 98.90 | 100.00 | 5.7 | all | 10/6 |
| 5 | 100 | 0.47 | 0.30 | 80.76 | 82.66 | 12.99 | 6.88 | 5.1 | 2.6 | 94.81 | 96.48 | 5.2 | eff | std |
| 5 | 250 | 0.09 | 0.00 | 87.26 | 91.90 | 5.82 | 0.38 | 3.4 | 1.2 | 99.01 | 100.00 | 4.9 | all | std |
| 5 | 40 | 0.59 | 0.30 | 79.25 | 82.74 | 13.18 | 8.10 | 5.5 | 2.5 | 93.48 | 96.48 | 5.3 | | |
| 5 | 67 | 0.70 | 0.28 | 76.70 | 83.42 | 13.06 | 8.20 | 6.2 | 2.4 | 92.27 | 96.71 | 5.2 | | |
| 5 | 200 | 0.22 | 0.00 | 85.02 | 90.67 | 9.48 | 1.18 | 4.0 | 1.4 | 97.57 | 100.00 | 5.1 | | |
| 5 | 300 | 0.00 | 0.00 | 89.17 | 92.50 | 3.97 | 0.35 | 2.9 | 1.1 | 100.00 | 100.00 | 4.8 | | |
| 5 | 500 | 0.00 | 0.00 | 94.30 | 94.45 | 0.37 | 0.29 | 1.5 | 0.8 | 100.00 | 100.00 | 4.2 | | |
| 5 | 700 | 0.00 | 0.00 | 95.61 | 95.76 | 0.33 | 0.25 | 1.2 | 0.6 | 100.00 | 100.00 | 3.3 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.86 | 1.61 | | | 7.63 | 3.33 | 3.1 | 1.2 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 89.43 | 92.88 | 2.58 | 0.37 | 6.8 | 2.6 | 100.00 | 100.00 | 5.4 | all | 12/8 |
| 10 | 100 | 1.05 | 0.39 | 82.30 | 86.68 | 15.19 | 9.55 | 11.3 | 4.8 | 95.34 | 98.20 | 5.5 | eff | std |
| 10 | 250 | 0.22 | 0.00 | 88.24 | 92.88 | 7.94 | 0.37 | 7.5 | 2.6 | 99.02 | 100.00 | 5.0 | all | std |
| 10 | 67 | 1.57 | 0.56 | 78.63 | 85.84 | 15.35 | 9.56 | 13.7 | 5.1 | 93.03 | 97.42 | 5.5 | | |
| 10 | 200 | 0.54 | 0.00 | 86.16 | 91.72 | 13.12 | 1.44 | 8.9 | 3.0 | 97.60 | 100.00 | 5.3 | | |
| 10 | 300 | 0.00 | 0.00 | 90.15 | 93.40 | 3.06 | 0.35 | 6.3 | 2.4 | 100.00 | 100.00 | 4.8 | | |
| 10 | 500 | 0.00 | 0.00 | 94.61 | 94.98 | 0.37 | 0.29 | 3.4 | 1.8 | 100.00 | 100.00 | 4.2 | | |
| 10 | 700 | 0.00 | 0.00 | 95.89 | 96.13 | 0.32 | 0.25 | 2.6 | 1.4 | 100.00 | 100.00 | 3.3 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.20 | 6.67 | | | 9.85 | 4.66 | 11.1 | 4.8 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 200 | 1.93 | 0.00 | 86.01 | 90.83 | 13.97 | 4.77 | 28.3 | 10.5 | 97.18 | 100.00 | 5.3 | eff | std |
| 20 | 250 | 1.14 | 0.00 | 87.73 | 92.74 | 10.51 | 1.44 | 24.8 | 8.3 | 98.34 | 100.00 | 5.1 | all | std |
| 20 | 300 | 0.00 | 0.00 | 89.50 | 93.48 | 6.10 | 0.38 | 21.2 | 7.4 | 100.00 | 100.00 | 4.9 | | |
| 20 | 500 | 0.00 | 0.00 | 94.45 | 95.10 | 0.37 | 0.30 | 11.2 | 5.6 | 100.00 | 100.00 | 4.3 | | |
| 20 | 700 | 0.00 | 0.00 | 95.73 | 96.24 | 0.32 | 0.26 | 8.6 | 4.3 | 100.00 | 100.00 | 3.3 | | |
| 20 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)

(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency

(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio

(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass

the Criteria noted

Minimum Size Criteria:

no tune= no adjustment in the outlet structure was required

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

| Zone 5 | Mimosa | | Percent Sand, Silt, and Clay: | | | 4,28,68 | Hydrologic Soil Group: | | | C | | Erodibility (K): .20 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slope | Psize | VWSS(10) | VWSS(2) | TE (10) | TE (2) | QPeak (10) | Q Peak (2) | Tons(10) | Tons (2) | VRR (10) | VRR (2) | Peak | Min Size | Adjusted |
| Percent | | ml/l | ml/l | % | % | cfs | cfs | Disch. | Disch. | | | Elev.(10 | Criteria | Outlet |
| 0 | PD | 0.00 | 0.00 | | | 1.45 | 0.75 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 60.62 | 64.16 | 1.14 | 0.38 | 0.1 | 0.1 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 20 | 0.00 | 0.00 | 50.81 | 49.72 | 2.76 | 1.71 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 65.83 | 69.18 | 1.12 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 67 | 0.00 | 0.00 | 51.99 | 52.24 | 2.75 | 1.70 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 100 | 0.00 | 0.00 | 53.05 | 54.16 | 2.75 | 1.58 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 56.82 | 60.55 | 2.36 | 0.71 | 0.1 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 62.47 | 66.73 | 1.61 | 0.36 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 75.72 | 75.22 | 0.38 | 0.30 | 0.1 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 80.76 | 80.99 | 0.34 | 0.27 | 0.1 | 0.0 | 100.00 | 100.00 | 3.6 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.60 | 0.54 | | | 9.99 | 5.30 | 1.4 | 0.7 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.00 | 81.05 | 80.78 | 14.50 | 9.55 | 4.2 | 2.5 | 100.00 | 100.00 | 5.4 | eff | std |
| 5 | 250 | 0.00 | 0.00 | 83.49 | 85.67 | 10.10 | 1.49 | 3.6 | 1.9 | 100.00 | 100.00 | 5.1 | all | std |
| 5 | 20 | 0.02 | 0.00 | 80.84 | 80.73 | 14.75 | 9.52 | 4.2 | 2.5 | 99.69 | 100.00 | 5.4 | | |
| 5 | 100 | 0.00 | 0.00 | 81.54 | 82.15 | 14.23 | 9.19 | 4.0 | 2.3 | 100.00 | 100.00 | 5.4 | | |
| 5 | 200 | 0.00 | 0.00 | 82.72 | 84.39 | 13.07 | 3.46 | 3.8 | 2.0 | 100.00 | 100.00 | 5.3 | | |
| 5 | 300 | 0.00 | 0.00 | 84.39 | 86.98 | 6.65 | 0.50 | 3.4 | 1.7 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 89.28 | 90.01 | 0.84 | 0.32 | 2.3 | 1.3 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 91.92 | 92.18 | 0.35 | 0.28 | 1.8 | 1.0 | 100.00 | 100.00 | 3.8 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.40 | 1.30 | | | 11.09 | 5.98 | 3.3 | 1.7 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 84.72 | 87.15 | 9.04 | 1.26 | 7.9 | 4.0 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 10 | 67 | 0.00 | 0.00 | 82.51 | 82.97 | 17.08 | 11.05 | 9.1 | 5.3 | 100.00 | 100.00 | 5.5 | eff | std |
| 10 | 250 | 0.00 | 0.00 | 84.69 | 87.15 | 13.25 | 1.41 | 7.9 | 4.0 | 100.00 | 100.00 | 5.3 | all | std |
| 10 | 40 | 0.01 | 0.01 | 82.29 | 82.32 | 17.10 | 10.97 | 9.2 | 5.5 | 99.94 | 99.93 | 5.5 | | |
| 10 | 100 | 0.00 | 0.00 | 82.77 | 83.04 | 17.01 | 10.98 | 8.9 | 5.3 | 100.00 | 100.00 | 5.5 | | |
| 10 | 200 | 0.00 | 0.00 | 83.99 | 85.93 | 14.98 | 4.46 | 8.3 | 4.4 | 100.00 | 100.00 | 5.4 | | |
| 10 | 300 | 0.00 | 0.00 | 85.49 | 88.26 | 9.10 | 0.38 | 7.5 | 3.7 | 100.00 | 100.00 | 5.1 | | |
| 10 | 500 | 0.00 | 0.00 | 90.06 | 90.85 | 0.75 | 0.32 | 5.2 | 2.9 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 92.40 | 92.81 | 0.35 | 0.28 | 3.9 | 2.2 | 100.00 | 100.00 | 3.7 | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 5.16 | 4.91 | | | 13.44 | 7.55 | 11.7 | 6.0 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.00 | 0.00 | 83.28 | 84.49 | 17.13 | 10.88 | 27.4 | 15.3 | 100.00 | 100.00 | 5.5 | eff | std |
| 20 | 250 | 0.00 | 0.00 | 84.65 | 86.96 | 13.94 | 3.33 | 25.2 | 12.9 | 100.00 | 100.00 | 5.3 | all | std |
| 20 | 100 | 0.00 | 0.00 | 82.82 | 83.91 | 17.02 | 10.99 | 28.2 | 15.9 | 100.00 | 100.00 | 5.5 | | |
| 20 | 200 | 0.00 | 0.00 | 83.50 | 85.70 | 15.40 | 7.92 | 27.1 | 14.1 | 100.00 | 100.00 | 5.5 | | |
| 20 | 300 | 0.00 | 0.00 | 85.39 | 88.18 | 9.86 | 1.11 | 24.0 | 11.7 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 89.83 | 90.92 | 0.79 | 0.32 | 16.7 | 9.0 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 92.23 | 92.89 | 0.35 | 0.28 | 12.7 | 7.0 | 100.00 | 100.00 | 3.7 | | |

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Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio

(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event

5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass

the Criteria noted

Minimum Size Criteria:

no tune= no adjustment in the outlet structure was required

eff= Efficiency Criteria Only were met

all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std

std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 6 | Lehew | Percent Sand, Silt, and Clay: 49,31,20 | Hydrologic Soil Group: C | Erodibility (K): .24

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.01 | | | 1.45 | 0.75 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 89.84 | 91.12 | 1.14 | 0.38 | 0.0 | 0.0 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 67 | 0.00 | 0.00 | 83.75 | 85.77 | 2.75 | 1.70 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 91.98 | 92.98 | 1.12 | 0.34 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.02 | 0.01 | 71.59 | 78.38 | 2.76 | 1.71 | 0.1 | 0.0 | 81.82 | 90.00 | 4.7 | | |
| 0 | 40 | 0.01 | 0.00 | 80.32 | 83.55 | 2.76 | 1.71 | 0.1 | 0.0 | 90.91 | 100.00 | 4.7 | | |
| 0 | 100 | 0.00 | 0.00 | 85.48 | 87.05 | 2.75 | 1.58 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 88.17 | 89.79 | 2.36 | 0.71 | 0.0 | 0.0 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 90.73 | 92.10 | 1.61 | 0.36 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 95.06 | 94.92 | 0.38 | 0.30 | 0.0 | 0.0 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 96.45 | 96.48 | 0.34 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 3.6 | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.85 | 0.78 | | | 9.99 | 5.30 | 1.7 | 0.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.31 | 0.51 | 91.53 | 88.87 | 14.50 | 9.55 | 2.2 | 1.7 | 96.58 | 94.12 | 5.4 | eff | std |
| 5 | 250 | 0.02 | 0.00 | 94.27 | 96.14 | 10.10 | 1.49 | 1.5 | 0.6 | 99.78 | 100.00 | 5.1 | all | std |
| 5 | 100 | 0.32 | 0.06 | 91.28 | 93.72 | 14.23 | 9.19 | 2.3 | 1.0 | 96.47 | 99.31 | 5.4 | | |
| 5 | 200 | 0.14 | 0.00 | 93.15 | 95.63 | 13.07 | 3.46 | 1.8 | 0.7 | 98.45 | 100.00 | 5.3 | | |
| 5 | 300 | 0.00 | 0.00 | 95.15 | 96.54 | 6.65 | 0.50 | 1.3 | 0.5 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 97.35 | 97.60 | 0.84 | 0.32 | 0.7 | 0.4 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 98.14 | 98.25 | 0.35 | 0.28 | 0.5 | 0.3 | 100.00 | 100.00 | 3.8 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.98 | 1.84 | | | 11.09 | 5.98 | 4.0 | 2.0 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 94.86 | 96.52 | 9.24 | 1.28 | 3.2 | 1.3 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 10 | 100 | 0.81 | 0.58 | 91.46 | 92.27 | 17.01 | 10.98 | 5.3 | 2.9 | 96.27 | 97.25 | 5.5 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 95.25 | 96.85 | 9.10 | 0.38 | 3.0 | 1.2 | 100.00 | 100.00 | 5.1 | all | std |
| 10 | 67 | 1.86 | 0.86 | 86.92 | 90.99 | 17.08 | 11.05 | 8.1 | 3.4 | 91.44 | 95.92 | 5.5 | | |
| 10 | 200 | 0.34 | 0.00 | 93.56 | 95.97 | 14.98 | 4.48 | 4.0 | 1.5 | 98.44 | 100.00 | 5.4 | | |
| 10 | 500 | 0.00 | 0.00 | 97.48 | 97.76 | 0.75 | 0.32 | 1.6 | 0.8 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 98.20 | 98.34 | 0.35 | 0.28 | 1.1 | 0.6 | 100.00 | 100.00 | 3.7 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.12 | 6.78 | | | 13.44 | 7.55 | 14.0 | 7.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.72 | 0.00 | 93.89 | 95.16 | 17.15 | 10.88 | 12.0 | 5.7 | 98.92 | 100.00 | 5.5 | eff | std |
| 20 | 250 | 0.05 | 0.00 | 94.78 | 96.48 | 13.95 | 3.44 | 10.3 | 4.2 | 99.92 | 100.00 | 5.3 | all | std |
| 20 | 200 | 0.59 | 0.00 | 94.10 | 95.91 | 15.48 | 8.76 | 11.6 | 4.8 | 99.11 | 100.00 | 5.5 | | |
| 20 | 300 | 0.00 | 0.00 | 95.31 | 96.88 | 10.26 | 1.17 | 9.2 | 3.7 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 97.42 | 97.76 | 0.80 | 0.33 | 5.1 | 2.6 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 98.17 | 98.36 | 0.35 | 0.28 | 3.6 | 1.9 | 100.00 | 100.00 | 3.7 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
Psize= Cubic yards storage per acre drainage area
VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter
(10)= Performance for SCS Type II 24 hour 10 year storm
(2)= Performance for SCS Type II 24 hour 2 year storm
TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)
QPeak = peak discharge (cubic feet per second) for the event
Tons Disch.= tons of sediment discharged for the event
VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)
Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed
Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted
Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 6 | Shouns | Percent Sand, Silt, and Clay: 17,53,30 | Hydrologic Soil Group: B | Erodibility (K): .28

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.01 | 0.00 | | | 0.95 | 0.41 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 82.77 | 84.69 | 0.77 | 0.34 | 0.1 | 0.0 | 100.00 | 100.00 | 5.1 | all | 6/4 |
| 0 | 100 | 0.00 | 0.00 | 72.94 | 77.79 | 2.37 | 1.14 | 0.1 | 0.0 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 300 | 0.00 | 0.00 | 84.61 | 86.17 | 0.97 | 0.32 | 0.0 | 0.0 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 20 | 0.01 | 0.01 | 55.97 | 61.15 | 2.40 | 1.39 | 0.1 | 0.1 | 88.89 | 87.50 | 4.7 | | |
| 0 | 67 | 0.01 | 0.00 | 69.00 | 74.53 | 2.39 | 1.33 | 0.1 | 0.0 | 88.89 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 79.56 | 82.99 | 1.85 | 0.37 | 0.1 | 0.0 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 90.62 | 90.73 | 0.36 | 0.27 | 0.0 | 0.0 | 100.00 | 100.00 | 4.0 | | |
| 0 | 700 | 0.00 | 0.00 | 93.15 | 93.43 | 0.32 | 0.24 | 0.0 | 0.0 | 100.00 | 100.00 | 3.1 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.81 | 0.70 | | | 6.71 | 2.90 | 1.3 | 0.5 | | | | | |
| 5 | 200 | 0.06 | 0.00 | 90.35 | 93.36 | 6.95 | 0.97 | 2.6 | 1.0 | 99.37 | 100.00 | 5.7 | all | 10/6 |
| 5 | 40 | 0.49 | 0.21 | 82.20 | 87.07 | 13.18 | 8.09 | 4.7 | 1.9 | 94.81 | 97.64 | 5.3 | eff | std |
| 5 | 250 | 0.05 | 0.00 | 90.62 | 94.14 | 5.82 | 0.38 | 2.5 | 0.9 | 99.47 | 100.00 | 4.9 | all | std |
| 5 | 67 | 0.46 | 0.21 | 83.17 | 87.03 | 13.06 | 8.20 | 4.5 | 1.9 | 95.13 | 97.64 | 5.2 | | |
| 5 | 100 | 0.35 | 0.11 | 84.92 | 88.99 | 12.99 | 6.88 | 4.0 | 1.6 | 96.30 | 98.77 | 5.2 | | |
| 5 | 200 | 0.15 | 0.00 | 88.79 | 93.29 | 9.48 | 1.18 | 3.0 | 1.0 | 98.41 | 100.00 | 5.1 | | |
| 5 | 300 | 0.00 | 0.00 | 92.16 | 94.93 | 3.97 | 0.35 | 2.1 | 0.8 | 100.00 | 100.00 | 4.8 | | |
| 5 | 500 | 0.00 | 0.00 | 95.94 | 96.20 | 0.37 | 0.29 | 1.1 | 0.6 | 100.00 | 100.00 | 4.2 | | |
| 5 | 700 | 0.00 | 0.00 | 96.95 | 97.22 | 0.33 | 0.25 | 0.8 | 0.4 | 100.00 | 100.00 | 3.3 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.95 | 1.70 | | | 7.63 | 3.33 | 3.1 | 1.2 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 92.25 | 94.88 | 2.58 | 0.37 | 5.0 | 1.8 | 100.00 | 100.00 | 5.4 | all | 12/8 |
| 10 | 67 | 1.03 | 0.39 | 84.54 | 89.28 | 15.35 | 9.55 | 9.9 | 3.9 | 95.59 | 98.27 | 5.5 | eff | std |
| 10 | 250 | 0.13 | 0.00 | 91.28 | 94.88 | 7.94 | 0.37 | 5.6 | 1.8 | 99.44 | 100.00 | 5.0 | all | std |
| 10 | 100 | 0.92 | 0.60 | 85.62 | 87.72 | 15.19 | 9.59 | 9.2 | 4.4 | 96.06 | 97.33 | 5.5 | | |
| 10 | 200 | 0.34 | 0.00 | 89.62 | 94.12 | 13.08 | 1.20 | 6.6 | 2.1 | 98.54 | 100.00 | 5.3 | | |
| 10 | 300 | 0.00 | 0.00 | 92.78 | 95.27 | 3.06 | 0.35 | 4.6 | 1.7 | 100.00 | 100.00 | 4.8 | | |
| 10 | 500 | 0.00 | 0.00 | 96.15 | 96.57 | 0.37 | 0.29 | 2.5 | 1.2 | 100.00 | 100.00 | 4.2 | | |
| 10 | 700 | 0.00 | 0.00 | 97.11 | 97.47 | 0.32 | 0.25 | 1.8 | 0.9 | 100.00 | 100.00 | 3.3 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 7.46 | 6.91 | | | 9.85 | 4.66 | 11.1 | 4.8 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 1.62 | 0.00 | 88.08 | 91.95 | 14.75 | 8.89 | 24.1 | 9.2 | 97.72 | 100.00 | 5.4 | eff | std |
| 20 | 250 | 0.85 | 0.00 | 90.47 | 94.93 | 9.35 | 0.99 | 19.3 | 5.8 | 98.80 | 100.00 | 5.1 | all | std |
| 20 | 200 | 1.08 | 0.00 | 89.53 | 93.43 | 13.87 | 3.68 | 21.2 | 7.5 | 98.48 | 100.00 | 5.3 | | |
| 20 | 300 | 0.00 | 0.00 | 92.54 | 95.49 | 5.75 | 0.37 | 15.1 | 5.1 | 100.00 | 100.00 | 4.9 | | |
| 20 | 500 | 0.00 | 0.00 | 96.06 | 96.67 | 0.37 | 0.30 | 8.0 | 3.8 | 100.00 | 100.00 | 4.2 | | |
| 20 | 700 | 0.00 | 0.00 | 97.08 | 97.52 | 0.32 | 0.25 | 5.9 | 2.8 | 100.00 | 100.00 | 3.3 | | |
| 20 | | | | | | | | | | | | | | |

Key to Abbreviations:

PD= predisturbed condition of drainage area

Psize= Cubic yards storage per acre drainage area

VWSS= 24 hour volume weighted settleable solids (discharged)
(Imhoff Cone Test) in milliters per liter

(10)= Performance for SCS Type II 24 hour 10 year storm

(2)= Performance for SCS Type II 24 hour 2 year storm

TE= Trapping Efficiency
(((Sediment in - sediment out)/ Sediment in)*100)

QPeak = peak discharge (cubic feet per second) for the event

Tons Disch.= tons of sediment discharged for the event

VRR= Volume weighted settleable Solids Ratio
(((vwss in-vwss out)/vwss in)*100)

Peak Elev.= Peak pond elevation reached during the event
5.7 feet is the maximum allowed

Min. Size Criteria= Minimum Pond Size Required to pass
the Criteria noted

Minimum Size Criteria:
no tune= no adjustment in the outlet structure was required
eff= Efficiency Criteria Only were met
all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-7 continued. Range of performance for varying pond sizes resulting from the Detailed Analysis.

Zone 6 | Talbott | Percent Sand, Silt, and Clay: 2,23,75 | Hydrologic Soil Group: C | Erodibility (K): .24

| Slope Percent | Psize | VWSS(10) ml/l | VWSS(2) ml/l | TE (10) % | TE (2) % | QPeak (10) cfs | Q Peak (2) cfs | Tons(10) Disch. | Tons (2) Disch. | VRR (10) | VRR (2) | Peak Elev.(10 | Min Size Criteria | Adjusted Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | PD | 0.00 | 0.00 | | | 1.45 | 0.75 | 0.0 | 0.0 | | | | | |
| 0 | 250 | 0.00 | 0.00 | 56.60 | 60.50 | 1.14 | 0.38 | 0.1 | 0.1 | 100.00 | 100.00 | 5.5 | all | 6/4 |
| 0 | 20 | 0.00 | 0.00 | 45.79 | 45.59 | 2.76 | 1.71 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | eff | std |
| 0 | 350 | 0.00 | 0.00 | 62.34 | 66.02 | 1.12 | 0.34 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | all | std |
| 0 | 100 | 0.00 | 0.00 | 48.26 | 49.48 | 2.75 | 1.58 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 200 | 0.00 | 0.00 | 52.41 | 56.51 | 2.36 | 0.71 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | 300 | 0.00 | 0.00 | 58.63 | 63.33 | 1.61 | 0.36 | 0.1 | 0.1 | 100.00 | 100.00 | 4.6 | | |
| 0 | 500 | 0.00 | 0.00 | 73.24 | 72.69 | 0.38 | 0.30 | 0.1 | 0.1 | 100.00 | 100.00 | 4.5 | | |
| 0 | 700 | 0.00 | 0.00 | 78.79 | 79.04 | 0.34 | 0.27 | 0.1 | 0.0 | 100.00 | 100.00 | 3.6 | | |
| 0 | 67 | 0.00 | 0.00 | 47.09 | 47.36 | 2.75 | 1.70 | 0.2 | 0.1 | 100.00 | 100.00 | 4.7 | | |
| 0 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 5 | PD | 0.70 | 0.63 | | | 9.99 | 5.30 | 1.7 | 0.8 | | | | | |
| 5 | | | | | | | | | | | | | no tune | |
| 5 | 40 | 0.00 | 0.00 | 79.12 | 78.81 | 14.50 | 9.55 | 5.5 | 3.3 | 100.00 | 100.00 | 5.4 | eff | std |
| 5 | 250 | 0.00 | 0.00 | 81.81 | 84.21 | 10.10 | 1.49 | 4.8 | 2.5 | 100.00 | 100.00 | 5.1 | all | std |
| 5 | 100 | 0.00 | 0.00 | 79.66 | 80.34 | 14.23 | 9.19 | 5.4 | 3.1 | 100.00 | 100.00 | 5.4 | | |
| 5 | 200 | 0.00 | 0.00 | 80.95 | 82.81 | 13.07 | 3.46 | 5.0 | 2.7 | 100.00 | 100.00 | 5.3 | | |
| 5 | 300 | 0.00 | 0.00 | 82.79 | 85.65 | 6.65 | 0.50 | 4.5 | 2.2 | 100.00 | 100.00 | 5.0 | | |
| 5 | 500 | 0.00 | 0.00 | 88.19 | 88.99 | 0.84 | 0.32 | 3.1 | 1.7 | 100.00 | 100.00 | 4.5 | | |
| 5 | 700 | 0.00 | 0.00 | 91.09 | 91.38 | 0.35 | 0.28 | 2.3 | 1.3 | 100.00 | 100.00 | 3.8 | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 10 | PD | 1.64 | 1.52 | | | 11.09 | 5.98 | 4.0 | 2.0 | | | | | |
| 10 | 250 | 0.00 | 0.00 | 83.17 | 85.85 | 9.24 | 1.28 | 10.5 | 5.3 | 100.00 | 100.00 | 5.6 | all | 18/12 |
| 10 | 67 | 0.01 | 0.00 | 80.50 | 80.73 | 17.08 | 11.05 | 12.1 | 7.2 | 99.95 | 100.00 | 5.5 | eff | std |
| 10 | 300 | 0.00 | 0.00 | 84.01 | 87.08 | 9.10 | 0.38 | 10.0 | 4.8 | 100.00 | 100.00 | 5.1 | all | std |
| 10 | 200 | 0.00 | 0.00 | 82.35 | 84.50 | 14.98 | 4.48 | 11.0 | 5.8 | 100.00 | 100.00 | 5.4 | | |
| 10 | 100 | 0.00 | 0.00 | 81.01 | 81.21 | 17.01 | 10.98 | 11.8 | 7.0 | 100.00 | 100.00 | 5.5 | | |
| 10 | 500 | 0.00 | 0.00 | 89.04 | 89.92 | 0.75 | 0.32 | 6.8 | 3.8 | 100.00 | 100.00 | 4.5 | | |
| 10 | 700 | 0.00 | 0.00 | 91.62 | 92.07 | 0.35 | 0.28 | 5.2 | 3.0 | 100.00 | 100.00 | 3.7 | | |
| 10 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 20 | PD | 6.05 | 5.76 | | | 13.44 | 7.55 | 14.0 | 7.2 | | | | | |
| 20 | | | | | | | | | | | | | no tune | |
| 20 | 150 | 0.00 | 0.00 | 81.55 | 82.90 | 17.15 | 10.88 | 36.3 | 20.2 | 100.00 | 100.00 | 5.5 | eff | std |
| 20 | 250 | 0.00 | 0.00 | 83.08 | 85.63 | 13.95 | 3.44 | 33.3 | 17.0 | 100.00 | 100.00 | 5.3 | all | std |
| 20 | 100 | 0.00 | 0.00 | 80.64 | 82.29 | 17.02 | 10.99 | 38.1 | 21.0 | 100.00 | 100.00 | 5.5 | | |
| 20 | 200 | 0.00 | 0.00 | 82.25 | 84.16 | 15.48 | 8.76 | 34.9 | 18.7 | 100.00 | 100.00 | 5.5 | | |
| 20 | 300 | 0.00 | 0.00 | 83.86 | 86.98 | 10.26 | 1.17 | 31.8 | 15.4 | 100.00 | 100.00 | 5.1 | | |
| 20 | 500 | 0.00 | 0.00 | 88.75 | 90.03 | 0.80 | 0.33 | 22.1 | 11.8 | 100.00 | 100.00 | 4.5 | | |
| 20 | 700 | 0.00 | 0.00 | 91.43 | 92.15 | 0.35 | 0.28 | 16.9 | 9.3 | 100.00 | 100.00 | 3.7 | | |

Key to Abbreviations:
PD= predisturbed condition of drainage area
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(Imhoff Cone Test) in milliters per liter
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the Criteria noted
Minimum Size Criteria:
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all= both Efficiency and Flow Criteria were met

Adjusted Outlet = the inlet/barrel dimensions in inches if not std
std= Standard outlet structure was used (24/18)

Percent Sand, Silt, and Clay is the dispersed distribution

Table A-8. Application of Foster algorithm for evaluated soil series eroded particle sizes. (Diameter adjusted for Aggregate Classes)

| Soil Series | K/HSG | Dispersed Particle Size Distribution (Sizes in millimeters) Sand 2-.063 Percent | Silt .063-.004 Percent | Clay <.004 Percent | Eroded Particle Size Class and Diameter. of Particles (in millimeters) Large Aggr. Dia. | Prim. Sand Dia. | Small Aggr. Dia. | Primary Silt Dia. | Primary Clay Dia. | Large Aggr. Fract. | Prim. Sand Fract | Small Aggr. Fract. | Prim Silt Fract. | Prim. Clay Fract. | Source (see key) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alcoa [Silt] Loam | 0.24 / B | 38.0 | 26.0 | 36.0 | 0.562 | 0.200 | 0.041 | 0.010 | 0.002 | 0.606 | 0.041 | 0.260 | 0.000 | 0.094 | 1 |
| Armour Silt Loam | 0.32 / B | 7.0 | 52.0 | 41.0 | 0.640 | 0.200 | 0.048 | 0.010 | 0.002 | 0.368 | 0.005 | 0.354 | 0.166 | 0.107 | 1 |
| Barfield Silty Clay Loam | 0.24 / D | 15.0 | 32.0 | 53.0 | 0.827 | 0.200 | 0.067 | 0.010 | 0.002 | 0.539 | 0.003 | 0.318 | 0.002 | 0.138 | 2 |
| Baxter [Cherty] Silt Loam | 0.28 / B | 23.0 | 46.0 | 31.0 | 0.484 | 0.200 | 0.033 | 0.010 | 0.002 | 0.423 | 0.036 | 0.414 | 0.046 | 0.081 | 1 |
| Beason Silt Loam | 0.28 / C | 7.0 | 46.0 | 47.0 | 0.733 | 0.200 | 0.058 | 0.010 | 0.002 | 0.415 | 0.003 | 0.318 | 0.142 | 0.122 | 1 |
| Bodine Cherty Silt Loam | 0.24 / B | 26.0 | 50.0 | 24.0 | 0.374 | 0.200 | 0.023 | 0.010 | 0.002 | 0.372 | 0.066 | 0.432 | 0.068 | 0.062 | 1 |
| Boswell Fine Sandy Loam | 0.28 / D | 58.0 | 19.0 | 23.0 | 0.359 | 0.200 | 0.023 | 0.010 | 0.002 | 0.593 | 0.157 | 0.190 | 0.000 | 0.060 | 3 |
| Bradyville Silt Loam | 0.20 / C | 14.0 | 38.0 | 48.0 | 0.749 | 0.200 | 0.059 | 0.010 | 0.002 | 0.490 | 0.005 | 0.312 | 0.068 | 0.125 | 2 |
| Brandon Silt Loam | 0.28 / B | 11.0 | 50.0 | 39.0 | 0.608 | 0.200 | 0.045 | 0.010 | 0.002 | 0.389 | 0.009 | 0.366 | 0.134 | 0.101 | 2 |
| Braxton Silt Loam | 0.24 / C | 16.0 | 27.0 | 57.0 | 0.889 | 0.200 | 0.073 | 0.010 | 0.002 | 0.579 | 0.002 | 0.270 | 0.000 | 0.148 | 2 |
| Calloway Silt Loam | 0.49 / C | 3.0 | 73.0 | 24.0 | 0.374 | 0.200 | 0.023 | 0.010 | 0.002 | 0.200 | 0.008 | 0.432 | 0.298 | 0.062 | 3 |
| Capshaw Silt Loam | 0.37 / C | 16.0 | 40.0 | 44.0 | 0.686 | 0.200 | 0.053 | 0.010 | 0.002 | 0.477 | 0.009 | 0.336 | 0.064 | 0.114 | 2 |
| Center Silt Silt Loam | 0.49 / C | 6.0 | 55.0 | 39.0 | 0.608 | 0.200 | 0.045 | 0.010 | 0.002 | 0.344 | 0.005 | 0.366 | 0.184 | 0.101 | 2 |
| Christian Silt Loam | 0.28 / C | 14.0 | 43.0 | 43.0 | 0.671 | 0.200 | 0.051 | 0.010 | 0.002 | 0.450 | 0.008 | 0.342 | 0.088 | 0.112 | 2 |
| Crider Silt Loam | 0.32 / B | 8.0 | 52.0 | 40.0 | 0.624 | 0.200 | 0.047 | 0.010 | 0.002 | 0.370 | 0.006 | 0.360 | 0.160 | 0.104 | 2 |
| Cumberland Silt Loam | 0.28 / B | 14.0 | 49.0 | 37.0 | 0.577 | 0.200 | 0.042 | 0.010 | 0.002 | 0.400 | 0.014 | 0.378 | 0.112 | 0.096 | 3 |
| Dandridge Silt Loam | 0.24 / D | 6.0 | 52.0 | 42.0 | 0.655 | 0.200 | 0.050 | 0.010 | 0.002 | 0.367 | 0.004 | 0.348 | 0.172 | 0.109 | 3 |
| Decatur Silt Loam | 0.28 / B | 15.0 | 39.0 | 46.0 | 0.718 | 0.200 | 0.056 | 0.010 | 0.002 | 0.484 | 0.007 | 0.324 | 0.066 | 0.120 | 3 |
| Dellrose Cherty Silt Loam | 0.24 / B | 16.0 | 45.0 | 39.0 | 0.608 | 0.200 | 0.045 | 0.010 | 0.002 | 0.435 | 0.014 | 0.366 | 0.084 | 0.101 | 1 |
| Dewey Silt Loam | 0.28 / B | 9.0 | 48.0 | 43.0 | 0.671 | 0.200 | 0.051 | 0.010 | 0.002 | 0.403 | 0.005 | 0.342 | 0.138 | 0.112 | 3 |
| Dickson Silt Loam | 0.43 / B | 24.0 | 43.0 | 33.0 | 0.515 | 0.200 | 0.036 | 0.010 | 0.002 | 0.452 | 0.032 | 0.402 | 0.028 | 0.086 | 3 |
| Dulac Silt Loam | 0.43 / C | 5.0 | 57.0 | 38.0 | 0.593 | 0.200 | 0.044 | 0.010 | 0.002 | 0.327 | 0.005 | 0.372 | 0.198 | 0.099 | 1 |
| Dunmore Silt Loam | 0.20 / B | 15.0 | 21.0 | 64.0 | 0.998 | 0.200 | 0.078 | 0.010 | 0.002 | 0.623 | 0.001 | 0.210 | 0.000 | 0.166 | 1 |
| Etowah Silt Loam | 0.28 / B | 39.0 | 26.0 | 35.0 | 0.546 | 0.200 | 0.039 | 0.010 | 0.002 | 0.604 | 0.045 | 0.260 | 0.000 | 0.091 | 1 |
| Fullerton Silt Loam | 0.28 / B | 15.0 | 31.0 | 54.0 | 0.842 | 0.200 | 0.069 | 0.010 | 0.002 | 0.547 | 0.003 | 0.310 | 0.000 | 0.140 | 3 |
| Gladeville Flaggy Silty Clay Loam | 0.24 / D | 14.0 | 42.0 | 44.0 | 0.686 | 0.200 | 0.053 | 0.010 | 0.002 | 0.458 | 0.008 | 0.336 | 0.084 | 0.114 | 2 |
| Grenada Silt Loam | 0.32 / C | 4.0 | 78.0 | 18.0 | 0.281 | 0.200 | 0.023 | 0.010 | 0.002 | 0.158 | 0.015 | 0.324 | 0.456 | 0.047 | 4 |
| Hampshire Silt Loam | 0.28 / C | 22.0 | 26.0 | 52.0 | 0.811 | 0.200 | 0.066 | 0.010 | 0.002 | 0.599 | 0.006 | 0.260 | 0.000 | 0.135 | 2 |
| Harpeth Silt Loam | 0.32 / B | 10.0 | 50.0 | 40.0 | 0.624 | 0.200 | 0.047 | 0.010 | 0.002 | 0.388 | 0.008 | 0.360 | 0.140 | 0.104 | 2 |
| Hartsells Loam | 0.28 / B | 53.0 | 33.0 | 14.0 | 0.234 | 0.200 | 0.023 | 0.010 | 0.002 | 0.384 | 0.249 | 0.252 | 0.078 | 0.036 | 3 |
| Hayter Silt Loam | 0.28 / B | 45.0 | 22.0 | 33.0 | 0.515 | 0.200 | 0.036 | 0.010 | 0.002 | 0.633 | 0.061 | 0.220 | 0.000 | 0.086 | 2 |
| Holston Loam | 0.28 / B | 27.0 | 44.0 | 29.0 | 0.452 | 0.200 | 0.030 | 0.010 | 0.002 | 0.436 | 0.049 | 0.426 | 0.014 | 0.075 | 1 |
| Humphreys Cherty [Silt Loam] | 0.24 / B | 23.0 | 42.0 | 35.0 | 0.546 | 0.200 | 0.039 | 0.010 | 0.002 | 0.462 | 0.027 | 0.390 | 0.030 | 0.091 | 2 |
| Inman Flaggy Silty Clay Loam | 0.24 / C | 12.0 | 35.0 | 53.0 | 0.827 | 0.200 | 0.067 | 0.010 | 0.002 | 0.509 | 0.003 | 0.318 | 0.032 | 0.138 | 2 |
| Jefferson Loam | 0.28 / B | 34.0 | 30.0 | 36.0 | 0.562 | 0.200 | 0.041 | 0.010 | 0.002 | 0.570 | 0.037 | 0.300 | 0.000 | 0.094 | 1 |
| Lax Silt Loam | 0.28 / C | 14.0 | 48.0 | 38.0 | 0.593 | 0.200 | 0.044 | 0.010 | 0.002 | 0.408 | 0.013 | 0.372 | 0.108 | 0.099 | 2 |
| Lehew Channery Fine Sandy Loam | 0.24 / C | 49.0 | 31.0 | 20.0 | 0.312 | 0.200 | 0.023 | 0.010 | 0.002 | 0.477 | 0.161 | 0.310 | 0.000 | 0.052 | 2 |
| Lexington Silt Loam | 0.32 / B | 11.0 | 64.0 | 25.0 | 0.390 | 0.200 | 0.023 | 0.010 | 0.002 | 0.269 | 0.026 | 0.450 | 0.190 | 0.065 | 4 |
| Litz Shaly Silt Loam | 0.24 / C | 20.0 | 46.0 | 34.0 | 0.530 | 0.200 | 0.037 | 0.010 | 0.002 | 0.427 | 0.025 | 0.396 | 0.064 | 0.088 | 2 |
| Lomond Silt Loam | 0.28 / B | 16.0 | 44.0 | 40.0 | 0.624 | 0.200 | 0.047 | 0.010 | 0.002 | 0.444 | 0.012 | 0.360 | 0.080 | 0.104 | 2 |

Table A-8 continued. Application of Foster algorithm for evaluated soil series eroded particle sizes. (Diameter adjusted for Aggregate Classes)

| Soil Series | K/HSG | Dispersed Particle Size Distribution (Sizes in millimeters) Sand 2-.063 Percent | Silt .063-.004 Percent | Clay <.004 Percent | Eroded Particle Size Class and Diameter. of Particles (in millimeters) Large Aggr. Dia. | Prim. Sand Dia. | Small Aggr. Dia. | Primary Silt Dia. | Primary Clay Dia. | Large Aggr. Fract. | Prim. Sand Fract | Small Aggr. Fract. | Prim Silt Fract. | Prim. Clay Fract. | Source (see key) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lonewood Silt Loam | 0.24 / B | 18.0 | 42.0 | 40.0 | 0.624 | 0.200 | 0.047 | 0.010 | 0.002 | 0.462 | 0.014 | 0.360 | 0.060 | 0.104 | 2 |
| Loring Silt Loam | 0.37 / C | 1.8 | 72.2 | 26.0 | 0.406 | 0.200 | 0.025 | 0.010 | 0.002 | 0.206 | 0.004 | 0.444 | 0.278 | 0.068 | 5 |
| Maury Silt Loam | 0.32 / B | 11.0 | 56.0 | 33.0 | 0.515 | 0.200 | 0.036 | 0.010 | 0.002 | 0.339 | 0.015 | 0.402 | 0.158 | 0.086 | 2 |
| Memphis Silt Loam | 0.49 / B | 1.0 | 72.4 | 26.6 | 0.415 | 0.200 | 0.026 | 0.010 | 0.002 | 0.205 | 0.002 | 0.440 | 0.284 | 0.069 | 6 |
| Mimosa Silt Loam | 0.20 / C | 4.0 | 28.0 | 68.0 | 1.061 | 0.200 | 0.078 | 0.010 | 0.002 | 0.543 | 0.000 | 0.280 | 0.000 | 0.177 | 1 |
| Montevallo Silt Loam | 0.24 / D | 27.0 | 39.0 | 34.0 | 0.530 | 0.200 | 0.037 | 0.010 | 0.002 | 0.488 | 0.034 | 0.390 | 0.000 | 0.088 | 2 |
| Mountview Silt Loam | 0.37 / B | 13.0 | 48.0 | 39.0 | 0.608 | 0.200 | 0.045 | 0.010 | 0.002 | 0.408 | 0.011 | 0.366 | 0.114 | 0.101 | 2 |
| Needmore Silt Loam | 0.32 / C | 10.0 | 34.0 | 56.0 | 0.874 | 0.200 | 0.072 | 0.010 | 0.002 | 0.513 | 0.002 | 0.336 | 0.004 | 0.146 | 2 |
| Oktibbeha Clay | 0.20 / D | 13.7 | 26.8 | 59.5 | 0.928 | 0.200 | 0.077 | 0.010 | 0.002 | 0.576 | 0.001 | 0.268 | 0.000 | 0.155 | 7 |
| Paden Silt Loam | 0.32 / C | 5.0 | 58.0 | 37.0 | 0.577 | 0.200 | 0.042 | 0.010 | 0.002 | 0.319 | 0.005 | 0.378 | 0.202 | 0.096 | 1 |
| Pembroke Silt Loam | 0.28 / B | 8.0 | 52.0 | 40.0 | 0.624 | 0.200 | 0.047 | 0.010 | 0.002 | 0.370 | 0.006 | 0.360 | 0.160 | 0.104 | 1 |
| Pickwick Silt Loam | 0.32 / B | 9.0 | 68.0 | 23.0 | 0.359 | 0.200 | 0.023 | 0.010 | 0.002 | 0.236 | 0.024 | 0.414 | 0.266 | 0.060 | 3 |
| Providence Silt Loam | 0.32 / C | 11.0 | 52.0 | 37.0 | 0.577 | 0.200 | 0.042 | 0.010 | 0.002 | 0.373 | 0.011 | 0.378 | 0.142 | 0.096 | 2 |
| Ramsey Loam | 0.28 / D | 36.0 | 38.0 | 26.0 | 0.406 | 0.200 | 0.025 | 0.010 | 0.002 | 0.473 | 0.080 | 0.380 | 0.000 | 0.068 | 2 |
| Ruston Fine Sandy Loam | 0.32 / B | 42.0 | 37.0 | 21.0 | 0.328 | 0.200 | 0.023 | 0.010 | 0.002 | 0.446 | 0.129 | 0.370 | 0.000 | 0.055 | 2 |
| Sequatchie Loam | 0.28 / B | 37.0 | 33.0 | 30.0 | 0.468 | 0.200 | 0.031 | 0.010 | 0.002 | 0.530 | 0.062 | 0.330 | 0.000 | 0.078 | 1 |
| Sequoia Silt Loam | 0.32 / C | 5.0 | 40.0 | 55.0 | 0.858 | 0.200 | 0.070 | 0.010 | 0.002 | 0.456 | 0.001 | 0.330 | 0.070 | 0.143 | 1 |
| Shouns Silt Loam | 0.28 / B | 17.0 | 53.0 | 30.0 | 0.468 | 0.200 | 0.031 | 0.010 | 0.002 | 0.363 | 0.029 | 0.420 | 0.110 | 0.078 | 2 |
| Shubuta Fine Sandy Loam | 0.28 / C | 53.0 | 31.0 | 16.0 | 0.250 | 0.200 | 0.023 | 0.010 | 0.002 | 0.427 | 0.222 | 0.288 | 0.022 | 0.042 | 2 |
| Statler Loam | 0.28 / B | 23.0 | 42.0 | 35.0 | 0.546 | 0.200 | 0.039 | 0.010 | 0.002 | 0.462 | 0.027 | 0.390 | 0.030 | 0.091 | 2 |
| Stiversville Loam | 0.32 / B | 47.0 | 33.0 | 20.0 | 0.312 | 0.200 | 0.023 | 0.010 | 0.002 | 0.464 | 0.154 | 0.330 | 0.000 | 0.052 | 2 |
| Talbott Silt Loam | 0.24 / C | 2.0 | 23.0 | 75.0 | 1.170 | 0.200 | 0.078 | 0.010 | 0.002 | 0.575 | 0.000 | 0.230 | 0.000 | 0.195 | 1 |
| Tellico Loam | 0.32 / B | 28.0 | 21.0 | 51.0 | 0.796 | 0.200 | 0.064 | 0.010 | 0.002 | 0.649 | 0.008 | 0.210 | 0.000 | 0.133 | 1 |
| Wallen Gravelly Loam | 0.28 / B | 42.0 | 35.0 | 23.0 | 0.359 | 0.200 | 0.023 | 0.010 | 0.002 | 0.477 | 0.114 | 0.350 | 0.000 | 0.060 | 2 |
| Waynesboro Loam | 0.28 / B | 29.0 | 33.0 | 38.0 | 0.593 | 0.200 | 0.044 | 0.010 | 0.002 | 0.545 | 0.027 | 0.330 | 0.000 | 0.099 | 1 |

Note: K= Erodibility Factor; HSG= Hydrologic Soil Group; Dia=diameter; Aggr=aggregate; Prim.=primary; Fract.= fraction

Source Key
1 SCS, Soil Survey Investigations Report No. 15: Soil Survey Laboratory Data Descriptions for Some Soils of Tennessee, USDA, 1967
2 SCS Form 5- Soil Particle Size Distribution Data: Courtesy of Dr. Tom Ammons' files (unpublished)
3 USDA, Mechanical Analysis Data, Bureau of Plant Industry, 1950
4 Foster, G.R., Young, R.A. and Neibling, W.H. Sediment composition for nonpoint-source pollution analysis. Trans. ASAE 28:133-139, 1985
5 Harmon, W.C., Meyr, L.D. and Alonso, C.V. A New Method for Evaluating Particle Size Distribution And Aggregated Portion of Eroded Sediment.Trans. ASAE 32(1) :89-96,1989
6 Meyer, L.D., Harmon, W.C. and McDowell, L.L. Sediment sizes eroded from crop row sideslopes. Trans. ASAE 23(4) :891-898, 1980
7 Meyer, L.D., Line, D.E. and Harmon, W.C. Size Characteristics of Sediment from Agricultural Soils. Journal of Soil and Water Conservation 47 n1: 107-111, 1992

# Appendix Figures

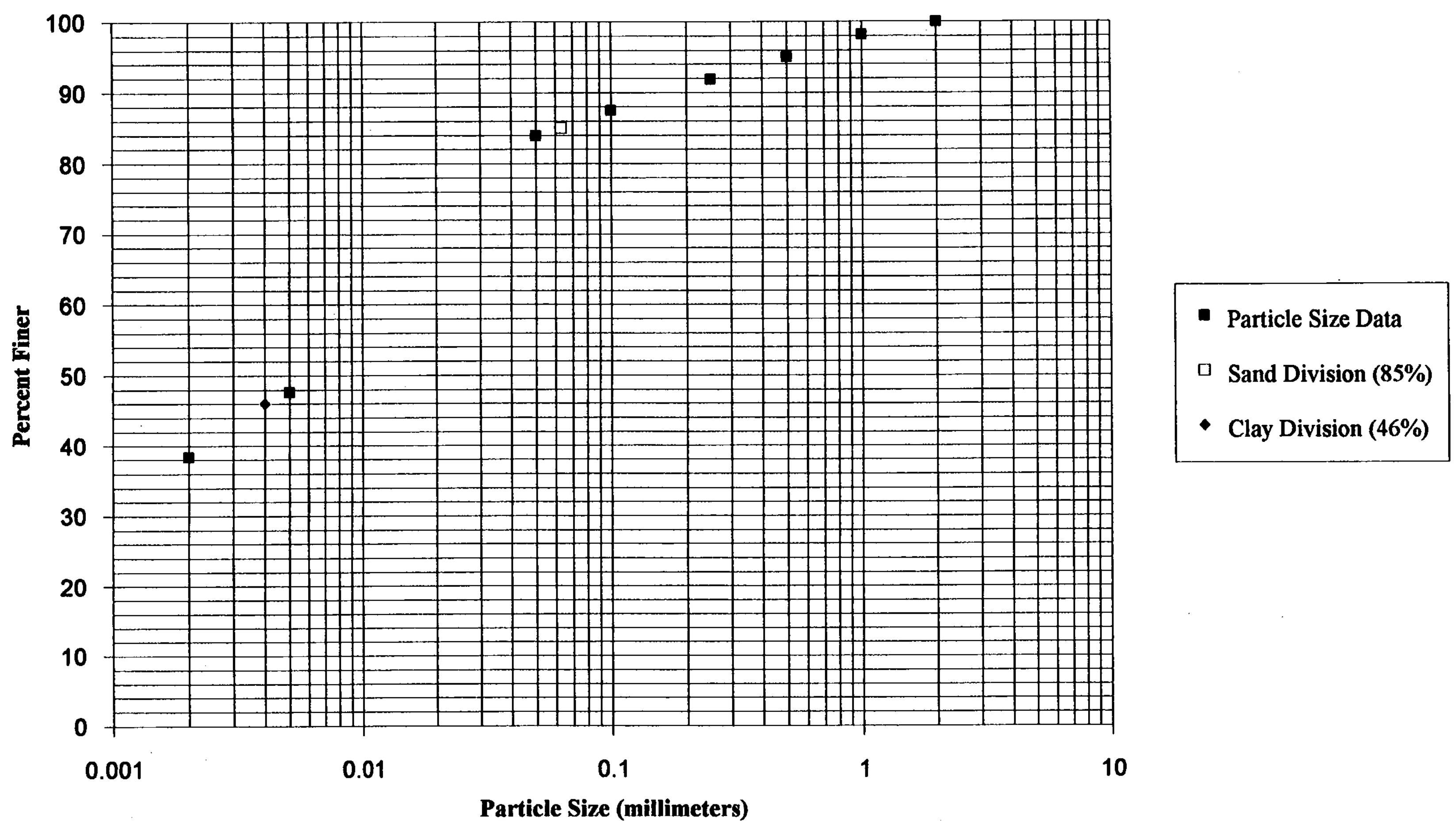



Figure A-1. Dispersed Particle Size Distribution for Decatur Silt Loam

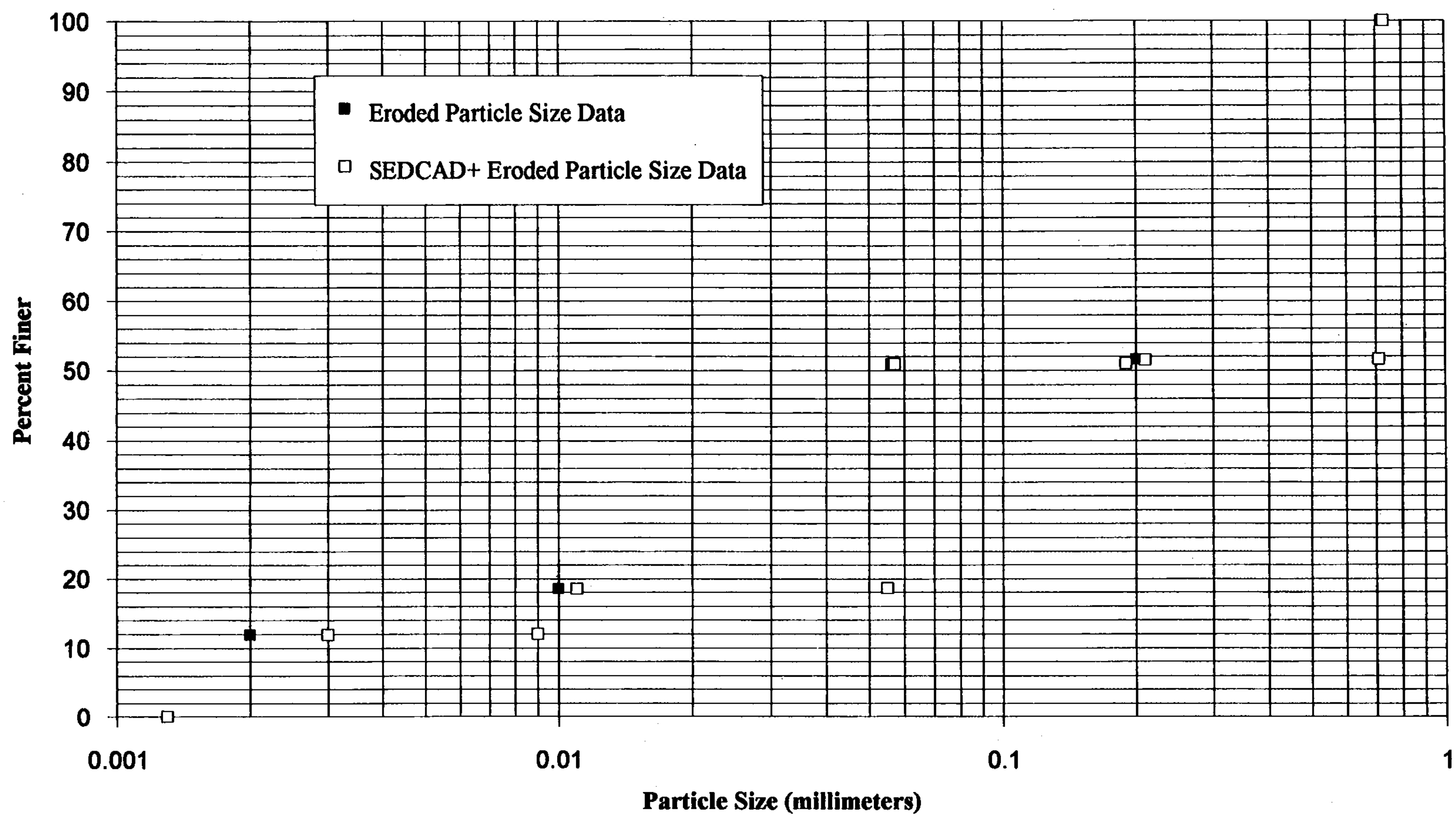



Figure A-2. Eroded Particle Size Distribution for Decatur Silt Loam (Eroded Particle size data are from the Algorithm and the SEDCAD+ eroded particle size data are the values modified for the Model).

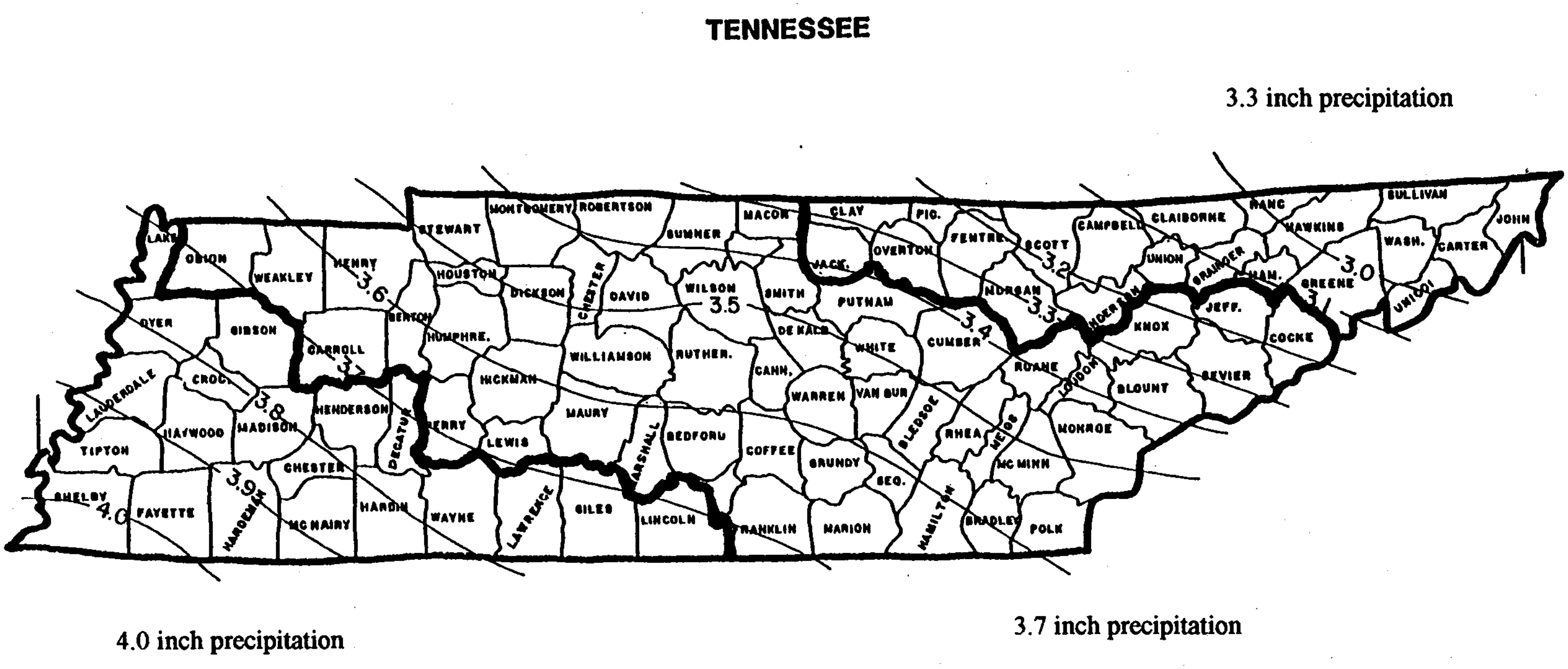
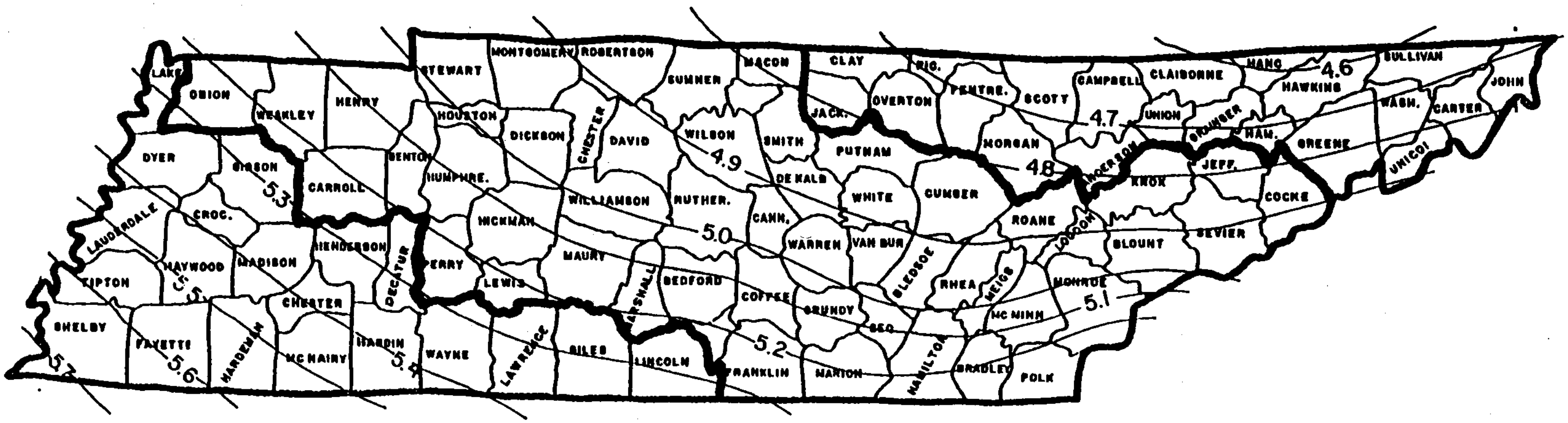



Figure A-3. Modified rainfall storm values (political divisions) overlayed on SCS Type II, 2-year 24-hour storm for the state of Tennessee. (Source of unmodified map: <u>Erosion and Sediment Control Handbook</u>, Knox County Soil Conservation District, 1981.)

**TENNESSEE**

4.8 inch precipitation




5.7 inch precipitation

5.2 inch precipitation

Figure A-4. Modified rainfall storm values (political divisions) overlayed on SCS Type II, 10-year 24-hour storm for the state of Tennessee. (Source of unmodified map: Erosion and Sediment Control Handbook, Knox County Soil Conservation District, 1981.)

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

067 10% SLOPE ZONE3 DECATUR

by

Name: RHCCIII

Company Name: ROBERT COE - GRADUATE STUDENT RESEARCH ONLY
File Name: \JUNK\Z3DEC07C

Date: 03-15-1994

Figure A-5. SEDCAD+ data Input and Output format: (A-5a) Decatur soil, Zone 3, 10 percent slope input data, (A-5b) Decatur soil, Zone 3,10 percent slope output data.

Civil Software Design -- SEDCAD+ Version 3.1


Company Name: ROBERT COE - GRADUATE STUDENT RESEARCH ONLY
Filename: \JUNK\Z3DEC07C User: RHCCIII
Date: 03-15-1994 Time: 21:43:51
067 10% Slope Zone3 Decatur
Storm: 5.20 inches, 10 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

GENERAL INPUT TABLE

Specific Gravity: 2.65
Submerged Bulk Specific Gravity: 1.25

Particle Size Distribution(s):

| Size (mm) | Decatur % Finer |
|---|---|
| 0.7300 | 100.00 |
| 0.7100 | 51.60 |
| 0.2100 | 51.50 |
| 0.1900 | 51.00 |
| 0.0570 | 50.90 |
| 0.0550 | 18.60 |
| 0.0110 | 18.50 |
| 0.0090 | 12.00 |
| 0.0030 | 11.90 |
| 0.0013 | 0.00 |

Figure A-5a

Civil Software Design -- SEDCAD+ Version 3.1


Company Name: ROBERT COE - GRADUATE STUDENT RESEARCH ONLY
Filename: \JUNK\Z3DEC07C User: RHCCIII
Date: 03-15-1994 Time: 21:44:08
067 10% Slope Zone3 Decatur
Storm: 3.70 inches, 2 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

GENERAL INPUT TABLE

Specific Gravity: 2.65
Submerged Bulk Specific Gravity: 1.25

Particle Size Distribution(s):

| Size (mm) | Decatur % Finer |
|---|---|
| 0.7300 | 100.00 |
| 0.7100 | 51.60 |
| 0.2100 | 51.50 |
| 0.1900 | 51.00 |
| 0.0570 | 50.90 |
| 0.0550 | 18.60 |
| 0.0110 | 18.50 |
| 0.0090 | 12.00 |
| 0.0030 | 11.90 |
| 0.0013 | 0.00 |

Figure A-5a (continued)

Civil Software Design -- SEDCAD+ Version 3.1


Company Name: ROBERT COE - GRADUATE STUDENT RESEARCH ONLY
Filename: \JUNK\Z3DEC07C User: RHCCIII
Date: 03-15-1994 Time: 21:43:51
067 10% Slope Zone3 Decatur
Storm: 5.20 inches, 10 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

POND INPUT/OUTPUT TABLE

CAUTION: THE STAGE OF YOUR PRINCIPLE SPILLWAY MAY CAUSE BED SCOUR.
YOUR OBSERVED EFFLUENT MAY NOT MEET THE DESIRED EFFLUENT STANDARD.
INCREASE THE STAGE OF YOUR PRINCIPAL SPILLWAY.

J1, B1, S1
Dec-.28-B-15-39-46

Drainage Area from J1, B1, S1, SWS(s)1: 5.0 acres
Total Contributing Drainage Area: 5.0 acres

DISCHARGE OPTIONS:

| | Drop Inlet | Floating Siphon | Emergency Spillway |
|---|---|---|---|
| Riser Diameter (in) | 24.0 | ---- | ---- |
| Riser Height (ft) | 4.50 | ---- | ---- |
| Barrel Diameter (in) | 18.0 | ---- | ---- |
| Barrel Length (ft) | 50.00 | ---- | ---- |
| Barrel Slope (%) | 3.00 | ---- | ---- |
| Manning's n of Pipe | 0.024 | ---- | ---- |
| Spillway Elevation | 104.5 | ---- | ---- |
| Lowest Elevation of Holes | ---- | ---- | ---- |
| # of Holes/Elevation | ---- | ---- | ---- |
| Entrance Loss Coefficient | ---- | ---- | ---- |
| Tailwater Depth (ft) | ---- | ---- | ---- |
| Notch Angle (degrees) | ---- | ---- | ---- |
| Weir Width (ft) | ---- | ---- | ---- |
| Siphon Crest Elevation | ---- | 101.0 | ---- |
| Siphon Tube Diameter (in) | ---- | 3.00 | ---- |
| Siphon Tube Length (ft) | ---- | 60.0 | ---- |
| Manning's n of Siphon | ---- | 0.015 | ---- |
| Siphon Inlet Elevation | ---- | 100.5 | ---- |
| Siphon Outlet Elevation | ---- | 100.0 | ---- |
| Emergency Spillway Elevation | ---- | ---- | 105.5 |
| Crest Length (ft) | ---- | ---- | 10.0 |
| Z:1 (Left and Right) | -- -- | -- -- | 2.0 2.0 |
| Bottom Width (ft) | ---- | ---- | 20.0 |

Figure A-5b

POND RESULTS:

| Sediment Storage* (ac-ft) | Permanent Pool (ac-ft) | Dead Space (%) | Sediment Algorithm |
|---|---|---|---|
| 0.06 | 0.00 | 15.00 | CSTRS |

*Sediment Capacity based on Average Annual R of 225.0 for 1.0 year(s)

| | Runoff Volume (ac-ft) | Peak Discharge (cfs) | Sediment (tons) | Peak Sediment Concentration (mg/l) | Peak Settleable Concentration (ml/l) | 24VW (ml/l) | 24AA (ml/l) |
|---|---|---|---|---|---|---|---|
| IN | 1.52 | 17.37 | 71.8 | 61315 | 41.61 | 23.16 | 6.08 |
| OUT | 1.52 | 17.20 | 10.9 | 10071 | 0.80 | 0.42 | 0.11 |

| Peak Elevation | Trap Efficiency (%) | Hydrograph Detention Time (hrs) |
|---|---|---|
| 105.5 | 84.79 | 0.91 |

***********************************************************************************

Figure A-5b (continued)

Civil Software Design -- SEDCAD+ Version 3.1


Company Name: ROBERT COE - GRADUATE STUDENT RESEARCH ONLY
Filename: \JUNK\Z3DEC07C User: RHCCIII
Date: 03-15-1994 Time: 21:44:08
067 10% Slope Zone3 Decatur
Storm: 3.70 inches, 2 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

==========================
POND INPUT/OUTPUT TABLE
==========================

CAUTION: THE STAGE OF YOUR PRINCIPLE SPILLWAY MAY CAUSE BED SCOUR.
YOUR OBSERVED EFFLUENT MAY NOT MEET THE DESIRED EFFLUENT STANDARD.
INCREASE THE STAGE OF YOUR PRINCIPAL SPILLWAY.

J1, B1, S1
Dec-.28-B-15-39-46

Drainage Area from J1, B1, S1, SWS(s)1: 5.0 acres
Total Contributing Drainage Area: 5.0 acres

DISCHARGE OPTIONS:

| | Drop Inlet | Floating Siphon | Emergency Spillway |
|---|---|---|---|
| Riser Diameter (in) | 24.0 | ---- | ---- |
| Riser Height (ft) | 4.50 | ---- | ---- |
| Barrel Diameter (in) | 18.0 | ---- | ---- |
| Barrel Length (ft) | 50.00 | ---- | ---- |
| Barrel Slope (%) | 3.00 | ---- | ---- |
| Manning's n of Pipe | 0.024 | ---- | ---- |
| Spillway Elevation | 104.5 | ---- | ---- |
| Lowest Elevation of Holes | ---- | ---- | ---- |
| # of Holes/Elevation | ---- | ---- | ---- |
| Entrance Loss Coefficient | ---- | ---- | ---- |
| Tailwater Depth (ft) | ---- | ---- | ---- |
| Notch Angle (degrees) | ---- | ---- | ---- |
| Weir Width (ft) | ---- | ---- | ---- |
| Siphon Crest Elevation | ---- | 101.0 | ---- |
| Siphon Tube Diameter (in) | ---- | 3.00 | ---- |
| Siphon Tube Length (ft) | ---- | 60.0 | ---- |
| Manning's n of Siphon | ---- | 0.015 | ---- |
| Siphon Inlet Elevation | ---- | 100.5 | ---- |
| Siphon Outlet Elevation | ---- | 100.0 | ---- |
| Emergency Spillway Elevation | ---- | ---- | 105.5 |
| Crest Length (ft) | ---- | ---- | 10.0 |
| Z:1 (Left and Right) | -- -- | -- -- | 2.0 2.0 |
| Bottom Width (ft) | ---- | ---- | 20.0 |

Figure A-5b (continued)

POND RESULTS:

| Sediment Storage* (ac-ft) | Permanent Pool (ac-ft) | Dead Space (%) | Sediment Algorithm |
|---|---|---|---|
| 0.07 | 0.00 | 15.00 | CSTRS |

*Sediment Capacity based on Average Annual R of 225.0 for 1.0 year(s)

| | Runoff Volume (ac-ft) | Peak Discharge (cfs) | Sediment (tons) | Peak Sediment Concentration (mg/l) | Peak Settleable Concentration (ml/l) | 24VW (ml/l) | 24AA (ml/l) |
|---|---|---|---|---|---|---|---|
| IN | 0.95 | 11.30 | 43.3 | 60035 | 40.74 | 22.44 | 5.63 |
| OUT | 0.95 | 11.17 | 5.9 | 8945 | 0.36 | 0.18 | 0.05 |

| Peak Elevation | Trap Efficiency (%) | Hydrograph Detention Time (hrs) |
|---|---|---|
| 105.2 | 86.40 | 0.93 |

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Figure A-5b (continued)

# VITA

Robert H. C. Coe III was born September 21, 1951 in Knoxville, Tennessee. After graduating from West High School in Knoxville, he served in the United States Navy from 1969 to 1971. He attended the University of Tennessee and received a Bachelor of Fine Arts degree in 1976 and a Bachelor of Science in Mechanical Engineering in 1983. He became a registered Professional Engineer in the State of Tennessee in 1989, and began full-time graduate studies at the University of Tennessee in 1992, receiving a Master's Degree in Environmental Engineering in May, 1994.